School of Information Systems
Faculty of Business and Law
Victoria University of Technology

An Assessment of the Internet's Potential in Enhancing Consumer Relationships

Submitted by: Noor Raihan Ab Hamid

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Student declaration

"I, Noor Raihan Ab Hamid, declare that the PhD thesis entitled 'An assessment of the Internet's potential in enhancing consumer relationships' is no more than 100,000 words in length, exclusive of tables, figures, appendices, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work".

Signature   Date

Acknowledgment

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Abstract

Motivated by the belief, 'to serve existing consumers costs less than acquiring new consumers', firms' marketing strategies then evolve around retaining consumers and building long-term consumer relationships. In the pursuit of acquiring consumer loyalty, enhancing consumer value has been the focus of many firms' relationship building efforts. Hence, this study aims to understand the affect of using the Internet as a relationship marketing tool on consumer retention as well as the determinants of online consumer satisfaction affecting loyalty and retention. Although there are many factors affecting the implementation of 'E-CRM', that is companies' CRM initiatives on the Internet channel; this study focuses on examining consumer perceptions towards the constituents of building online consumer relationships. Adopting a positivist approach, this research asks the following major questions: 1) How are online consumer satisfaction, loyalty and retention constructed?, and 2) How does the use of Internet technology in CRM influence the satisfaction, loyalty and retention of consumers? Data for this research were collected through questionnaire survey on Internet users in major cities of Malaysia and were analyzed using statistical techniques namely, descriptive, Structural Equation Modeling and Multivariate Analysis of Variance.

The results from this study reveal that the use of Internet in building consumer relationships affects consumer satisfaction, loyalty and retention. The effectiveness of E-CRM program determines the level of which online features, such as customer service efficiency, ease of navigation, information quality, personalization and online community would be implemented on firms' Web sites. In addition, older and well-educated users, more experienced as well as users who are involved in higher risk activities, such as online banking tend to be less tolerant. Hence, these groups of consumers seek superior quality of services from online service providers.

This research contributes to knowledge in several ways. Most importantly, it demonstrates the roles of Internet technology pertinent in enhancing consumer values

leading to long-term consumer relationships.   In particular, this research highlights the critical dimensions of E-CRM program, which firms should invest in their consumer retention strategies. While repeat visits do not necessarily reflect consumer loyalty and commitment to a Web site, this research advocates that when salient elements of building consumer relationships exist, service providers are more likely to improve satisfaction and gain consumer loyalty.   As indicated in the E-CRM model, firms' relationship marketing strategies should focus on identifying varying consumer expectations of service quality based on demographics, consumer level of experience with Internet technology and perceived risk.

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CHAPTER 1: INTRODUCTION

1.0   Introduction

The emergence of Internet technology, particularly the World Wide Web, as an electronic medium of commerce has brought tremendous changes in how companies compete in today's New Economy. Internet technologies provide companies with tools to adapt to changing consumers' needs and could be used to secure economic, strategic and competitive advantages. Companies that do not take advantage of Internet technology can be viewed as not delivering value added services to their consumers, and thus can be perceived as at a competitive disadvantage. In contrast, companies that utilize this technology (at least having a Web site that displays corporate and products information) are viewed as progressive and continuously striving to meet the current needs of consumers. These companies tend to have a low cost base and are able to produce competitive high quality products. This general industrial trend has created tremendous cost pressures on traditional businesses. Both companies and consumers acknowledge that the Internet can be seen as an effective tool for disseminating information. From a marketing perspective, the Internet is not merely another marketing tool, it can be a strategic tool to help companies increase consumer satisfaction, retain consumers as well as to acquire consumer loyalty. Hence, Internet technology is imperative in managing customer relationships for e-businesses.

Competition becomes immensely intense as the number of Internet companies and users grow rapidly. Most companies are facing difficulties in distinguishing themselves from competitors and in acquiring new consumers. Consequently, most companies seem to continuously rethink new ways of generating sales and increasing profits. These attempts include, among others, strategizing for the "new paradigm" of relationship marketing (Gronroos 1994; McKenna 1991; Morgan & Hunt 1994; Zineldin 2000). When a firm has a vast consumer base with limited direct contact with its consumers, a relationship approach is less obvious, but could well be profitable and possible — for example,

through the development of information technology and interactive media (Ab Hamid & Kassim 2004). The elements of interactivity (Furash 1999; Walsh & Godfrey 2000) and the ability to capture useful information from Internet technology have spurred interest in the feasibility of streamlining information provided, forecasting consumers' needs, understanding preferences, delivering personalized services and enabling customization. Thus the impetus of strategizing Customer Relationship Management (CRM), using Internet technology as an enabling tool, escalates as firms strive to deliver value to consumers in an intensified competitive market of cyberspace.

1.1   Research problem

Internet-based services continue to grow in importance in business-to-consumer and business-to-business environments. From the consumer's perspective, Internet-based services significantly reduce the costs for searching, widen the selection of vendors, deliver lower priced products/services, gain greater control over products/service offered and increase convenience (Anderson & Srinivasan 2003). For firms the increased importance of Internet channels can be seen in their contribution to disseminating information (Cho & Park 2001), enhancing consumer value (Yang & Peterson 2004), improving consumer satisfaction (Anderson & Srinivasan 2003) and retaining consumers, which in turn leads to better profitability (Reichheld & Schefter 2000) and to expanded market share.

However, with constant intense competition, an understanding of what constitutes consumer satisfaction and loyalty is imperative in an online environment. The extent to which a service improves consumer satisfaction may play a pertinent role in influencing one's intention to return. Researchers have examined the factors affecting e-satisfaction, e-loyalty and e-retention (Anderson & Srinivasan 2003; Lee-Kelley et al. 2003). Nevertheless, due to the dynamic nature of Internet technology, these constructs remain elusive and rapidly changing. Failure to identify the "new" elements affecting consumer satisfaction, loyalty and retention may lead to inferior service offerings, which fall below consumers' expectations as well as below industry standards at a point in time.

Identifying specific elements implicating different effects on satisfaction and repeated patronage behaviours as well as providing services that match consumers' expectations are important to managers, especially in determining relationship marketing strategies. Hence, an understanding of critical performance criteria in the assessment of satisfaction, loyalty and retention is crucial.

As companies become more efficient in managing buyer-seller relationships, particularly with the use of Internet (Boyle 2001; Bradshaw & Brash 2001), the need to adopt Internet technology is obviously increasing. The trend that drives industrial changes is raising consumer expectations and therefore companies need to refine their ability and provide the best service to consumers in order to create loyal consumers (Ab Hamid & Kassim 2004). In order to have a better understanding of the roles of the Internet in enhancing consumer relationships, the links between CRM attributes delivered on the Internet (E-CRM) and consumer satisfaction, loyalty and retention merit further investigation. Researchers have approached this issue by examining companies' usage of the Internet in consumer services and online communities (Adam et al. 2002; Ng et al. 1998; Poon & Swatman 1999), evaluating E-CRM software effectiveness on customers' businesses (de Ruyter et al. 2001), investigating the links between E-CRM implementation on e-tailing sites and consumer satisfaction (Lee-Kelley et al. 2003), and E-CRM attributes and their effect on consumer loyalty (Feinberg & Kadam 2002). However, the cause-effect links between E-CRM attributes, satisfaction, loyalty and retention, which are critical in making decisions about how resources should be invested in building long-term consumer relationships, ought to be examined.

Clearly, as is evident in today's global marketing, the previously ad hoc and fragmented techniques for dealing effectively with consumers are giving way to a more methodical relationship marketing approach of identifying, attracting and retaining the most valuable consumers in order to sustain profitable growth, that is, CRM (Ab Hamid & Kassim 2004). Motivated by economics of consumer management, firms have implemented retention programs, which are aimed at exerting influence on consumers' repeated patronage behaviours. However, recent evidence casts doubt on the effectiveness of

some of these CRM efforts. In essence, CRM programs should be differentiated across a consumer base in order to target more valuable accounts. Given this scenario, it is essential for firms to understand how consumers, who vary in their attitudes and behaviour, are from different segments of demographics, have varying years of experiences using the Internet and levels of risk tolerance, perceive services. Knowledge about these differences may provide useful insights in designing and implementing more effective consumer acquisition and retention strategies. This understanding of varied expectations from different consumer groups should be significant to managers and clearly needs to be examined.

1.2   Research issues and objectives

The primary objectives of this study are to assess the extent to which Internet technology can assist in building long-term consumer relationships. Based on the research problems above, it specifically addresses the following issues:

- *How are consumer satisfaction, loyalty and retention constructed?*
- *How does E-CRM influence the satisfaction, loyalty and retention of consumers?*
- *To what extent does consumers' demographics, users' level of Internet experience and perceived risk influence satisfaction, loyalty and retention?*

The research issues and propositions are shown in Table 1.1. In addressing the research issues, eleven propositions are put forward to investigate the extent to which E-CRM influences consumers' satisfaction, loyalty and retention. According to Feinberg and Kadam (2002), E-CRM is a term coined for CRM functions delivered via the Internet. This research aims to measure e-satisfaction, e-loyalty and e-retention. In addition, this study attempts to model the causal effect structure of E-CRM and satisfaction, loyalty and retention.

Table 1.1: Research Questions and Research Propositions

Research Questions (RQ)	Research Propositions (RP)
1.How are, satisfaction, loyalty and retention constructed?	RP1.1 : Satisfaction is a function of customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment, security and product/service range. RP1.2 : Loyalty is a function of emotional benefit, perceived value and trust. RP1.3 : Retention is a function of channel integration, customer service quality, online community, personalization and reward.
2. How does E-CRM affect satisfaction, loyalty and retention?	RP2.1: The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, order fulfillment level, online community, payment security, perceived value, personalization, reward and trust. RP2.2: E-CRM will influence consumers' satisfaction. RP2.3: E-CRM will influence consumers' loyalty. RP2.4: E-CRM will influence consumers' retention. RP2.5: E-CRM will influence loyalty, which is affected by satisfaction. In turn, consumer loyalty will lead to retention.
3. Do consumers' demographics, users' levels of experiences and perceived risk influence satisfaction, loyalty and retention?	RP3.1: Demographics affect satisfaction, loyalty and retention. RP3.2: Consumers' experience level with Internet activities affects satisfaction, loyalty and retention. RP3.3: Consumers' perceived risk with Internet activities affects satisfaction, loyalty and retention.

Previous studies have examined the impact of Internet technology on relationship marketing (Pitta 1998; Strauss & Frost 1999; Wang et al. 2000; Zineldin 2000; Geissler 2001); Internet consumers satisfaction (Cho & Park 2001; Feinberg & Kadam 2002; Kim& Lim 2001; Szymanski & Hise 2000), and Internet influence on customer loyalty (Dowling 2002; Foster & Cadogan 2000; Lee-Kelley et al. 2003; Mittal & Lassar 1998). However, these studies did not attempt to investigate E-CRM attributes, particularly in relation to enhanced consumer satisfaction and retention.

In addition, as users assimilate technology, in this case the Internet, they tend to have higher expectations towards the technology (Kalakota & Robinson 2000). As businesses that use the Internet expand, Internet technology serves as a primary marketing channel. This study aims to examine the different levels of service expectations of experienced users and within demographic segments. It is imperative that firms understand the service expectation level of users with varying level of Internet experience. Firms, whose target markets are experienced users, may need to design their online services according to the expectations of this group of savvy users and failing to do so may cause dissatisfaction. In particular, as today there are more educated and experienced users than before, firms need to fully comprehend the level of expectations of this group since, the more experienced users are with a technology, the higher the expectations of service (Geissler 2001; Nielsen 1999; Ward & Lee 2000). Although there are other demographic factors (such as martial status, race, income level, and occupation), this study focuses on three factors, namely gender, age and education level, as these three constructs are commonly used in studies on consumer satisfaction and loyalty assessment on the Internet (see, for example, Kim and Lim 2001; Lee-Kelley et al. 2003; Salisbury et al. 2001; Suki et al. 2002; Yang et al. 2003).

The types of activities conducted on the Internet may reflect users' level of risk tolerance. Users, who are merely information seekers deal with less risk compared to users who purchase products/services online. Users' readiness and willingness to be involved in riskier activities on the Internet may indicate their comprehension of the degree of risk and that the usefulness or value of interactions online far exceeds any fear. According to

Salisbury et al. (2001) and Kahneman and Tversky (1979), consumers' associated with the interaction with an innovation, such as the Internet where the outcome is not known, perceived risks far outweighs the value of interaction in determining adoption behaviours. Therefore, when firms are able to identify consumers' varying risk levels they can better decide on the extent of use of the Internet as a marketing tool: as an information distribution site or transactional site as well as offer their services according to these varying groups expectations. As such, this study also seeks to investigate the relationship between different types of Internet activities (from low to high risk activities) and satisfaction, loyalty and retention. Chapter 3 discusses research issues and the development of research propositions in detail (see Sections 3.2, 3.3 and 3.4).

1.3   Justification for research

This research contributes to the following: e-business, limitations in the literature and suggestions for future practice.

E-business in Malaysia.   As more companies in Malaysia realize the potential benefits of going online, Internet-based services appear to be growing in importance. A concerted effort by the government and regulatory bodies has further propelled the growth of the local Internet market. With almost 35 percent of the entire population as Internet users (8.6 million surfers), IDC (2004) has forecast that Internet market will grow at 19.9% percent at compound annual growth rate from 2002 to 2007 (*The Star Online* 2004a). Between 2002 and 2003, Malaysia has seen a 60 per cent growth in the number of Internet users. IDC (1999) projected that the user-buyer gap will continue to decline annually (see Figure 1.1 and Table 1.2): that is the conversion rate from user to buyer is forecast to increase each year.

Figure 1.1: Internet Users vs Internet Buyers in Malaysia
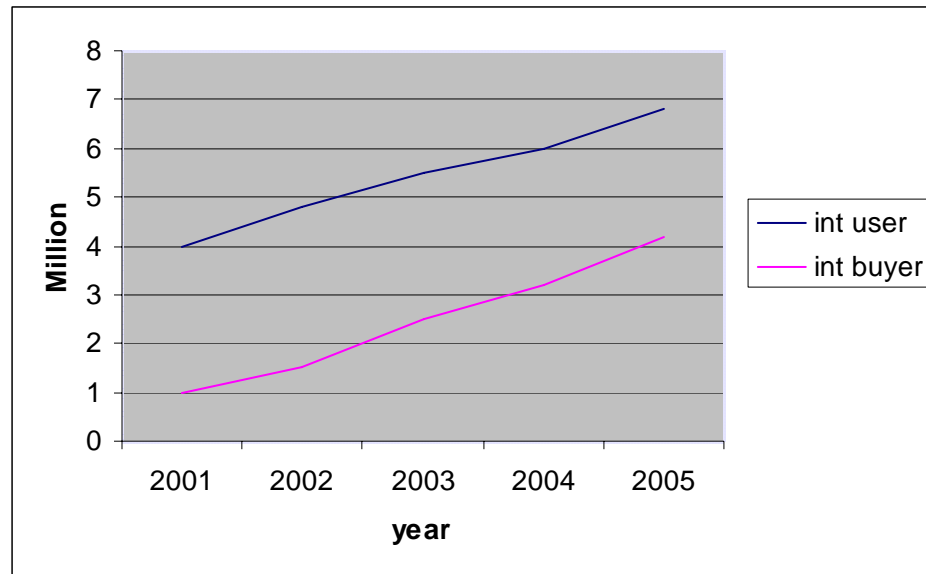
Source: IDC (1999).

Table 1.2: Internet Buyers in Malaysia, 1997-2003 (mil)

Type of user	1997	1998	1999	2000	2001	2002	2003
Home WWW buyers	0.01	0.01	0.03	0.06	0.13	0.27	0.55
Small bus. WWW buyers	0.00	0.01	0.03	0.05	0.10	0.14	0.20
Med/Lrg bus. WWW buyers	0.01	0.02	0.05	0.07	0.13	0.20	0.31
Gov. WWW buyers	0.00	0.01	0.02	0.03	0.07	0.10	0.16
Edu. WWW buyers	0.00	0.01	0.02	0.03	0.07	0.10	0.16
Total WWW buyers	0.02	0.05	0.10	0.18	0.34	0.53	0.87

Source: IDC (1999).

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In addition, with the further reduction in home-access broadband pricing and with the recently launched PC ownership campaign for rural areas the number of Internet users will continue to grow rapidly, suggesting good market potential for businesses that use the Internet.

Loh (2000) highlights that Malaysian markets have recently begun to understand the importance of CRM. This is clearly seen in the fact that firms have given CRM top priority in their investment decisions, particularly since most of the companies are transforming from product-oriented to customer-focused organizations (*The Star Online* 2004b). Companies are looking for dedicated CRM solutions to meet the challenges of meeting the dynamic needs of consumers. More recently, it was reported that there has been increasing interest in implementing E-CRM (Sharif 2004b) by even small-to-medium scale businesses. Primarily, the interest was led by traditional customer management economics. It appears that it costs industry five times as much to acquire a new consumer than to retain an existing one. Therefore, building long-term and sustainable consumer relationships is a sound strategy, from the point of view of both building life-time value relationships and the business cost savings involved (Peppers & Rogers 1995). The use of information technology, such as the Internet can be seen as a strategic business tool to remain competitive in the market (Sharif 2004b). The growing concern is the need for Malaysian firms to invest in core business applications, including CRM, which would boost business prospects.

In order to be able to compete in the global and borderless market of digital business, Malaysian companies have little option, but to maximize the potential of Internet technology. It appears to be no longer a choice, but a necessity. However, Malaysian companies appear to be lagging in utilizing the potential of the Internet in forging relationships with consumers. Primarily, Malaysian companies are prone to use the Internet merely for informational purposes rather than transactions (Ab Hamid & Kassim 2004). Most Web sites for example, display information on corporate profiles, product listings and contacts, but with no interactive features, such as shopping, placing orders, online payment, tracking orders, and online technical support and so forth. As such,

consumers visit company Web sites only to obtain information and may have to use other conventional channels, such as the telephone, fax or walk-in to purchase a product. This will result in higher operation costs for companies that run businesses by conventional means, while their competitors world-wide may be enjoying cost savings, speedy markets, better customer services and increases in repeat consumers, as a result of maximizing the potential of Internet technology. Hence, Malaysian companies are at a competitive disadvantage.

Limitations in the literature. Numerous researchers have dealt with the issue of an Internet users' satisfaction index (Cho & Park 2001; Feinberg & Kadam 2002; Kim & Lim 2001) but there is limited literature on *'e-retention' and 'e-loyalty'* measures. Since satisfaction does not necessarily entail loyalty (Mittal & Lassar 1998; Rust & Zahorik 1993) and an increase in the number of loyal consumers may result in an increase in profits (Anton & Hoeck 2002; Connely & Yoger 2001; Cusack 1998; Dowling 2002; Reichheld 1996; Rust & Zahorick 1993), further research needs to be carried out to identify the E-CRM attributes that increase consumer loyalty. Hence, this study aims to contribute to the pool of knowledge about 'e-retention' and 'e-loyalty' measures that would be applicable to the Internet medium. This contribution is deemed beneficial to marketers, especially when determining the Internet service features and the level of significance of each attribute associated with improved satisfaction and enhanced loyalty.

Researchers have debated the relationships between satisfaction, loyalty and retention. While some researchers suggest that satisfaction is an antecedent of loyalty, others argue that satisfaction leads to retention, but not loyalty (Dick & Basu 1994). Nevertheless, how satisfaction, repatronage behaviour and loyalty are related is still elusive. Recent studies highlight the importance of E-CRM in enhancing consumer satisfaction and retention. However, how E-CRM features affect consumers satisfaction, which in turn leads to loyalty and retention is unclear and needs further investigation.

Knowledge about consumers' varying needs and wants across demographics, experience level and risk-tolerance level is essential in order to effectively serve consumers.

Demographic characteristics may be potent forces in the global business environment (Kassim 2001; Webb 1998). The multi-ethnic and multi-cultural mix of a country's population, in the case of Malaysia and other South-East Asian countries for example, may cause local demographic characteristics to influence expectations of service, satisfaction and retention (Aliah 1999). Primarily, users' perception is a reflection of how much they comprehend a new technology, which in turn determines the level of risk tolerance. Therefore, an understanding of what influences the assessment of satisfaction and repeat purchase/visit behaviour of various groups is critical to managers.

Finally, this research is based in Malaysia. Compared to Western countries and regions, relatively limited studies on the use of the Internet in the Asian region have been undertaken. Exceptions include research carried out by Ab Hamid (2005), Ab Hamid and Kassim (2004), Chen and He (2003), Cho and Park (2001), Khalifa and Liu (2003), Kim and Lim (2001), Suki et al. (2002) and Yang et al. (2003).

Potential outcomes for managerial practice. This research is expected to shed light on how the implementation of E-CRM features is related to satisfaction, loyalty and retention. The findings of this research offer important managerial insights in assisting firms *define or reassess their E-CRM initiatives*. The E-CRM model indicates significant features which firms should implement on their sites in the quest for enhanced consumer value and increased competitive advantages.

An understanding of the connection between satisfaction, consumer loyalty and retention helps managers to essentially focus on upgrading services that will lead to increased satisfaction. By securing these basic services and adding value to their services, firms stand to gain a competitive edge that may attract consumers to return.

Better understanding of consumers' varying needs across segments leads to better planning of how to target marketing campaigns and investments for maximum competitive impact. This will provide some guidelines to managers on the levels of

quality and types of services, which should be given more emphasis in order to attract different segments of consumers.

In addition, the E-CRM process offers a high level framework of Internet technology contribution towards forging long-term consumer relationships. Firms should be aware of the *value of technology* in driving growth in a customer-focused organization. Synchronization with the entire business strategies technology, in general and the Internet, in particular may result in improved profits and increased market share in the long run.

1.4   Research methodology

This research was conducted in two stages: exploratory study and survey. Chapter 4 describes the steps and methods performed in these stages in detail. Having collected the data for this study, descriptive and causal analyses were performed to find answers to the propositions of the study.

Exploratory study. This stage involved a review of extant literature as well as discussions with experts in the subject matter. The latter provided useful insights in identifying the state of importance of Internet services in the context of Malaysia and helped in gauging the potential market behaviour towards E-CRM implementation. Their comments and opinions were sought on the variables identified leading to the development of a questionnaire survey, which was then used in the next stage.

Survey. Pursuing the first stage, a first draft of a questionnaire survey was developed. Prior to testing this instrument for a pilot study, academic experts' opinions were sought to review the questions for validity purposes. The questionnaire consisted of three sections: Section A comprised demographic questions; Section B asked about respondents' activities on the Internet in terms of frequency, years of experience and types of activities conducted; Section C sought their opinions on the Internet elements that influence relationship building, satisfaction, loyalty and retention to a site.

Next, data collection began with research assistants contacting and distributing the questionnaire to respondents from four major cities in Malaysia. The target population for this research was defined as individuals using the Internet either for merely browsing for information and/or conducting online transactions. In this study, the sampling method used in selecting the sample was systematic sampling.

Data analysis. Firstly, the data were coded and entered into a statistical software package, SPSS version 12.01. Then data were screened for missing responses and inconsistency as well as distribution issues. Descriptive analysis was performed for easy interpretation of data such as frequency distribution and mean. Next, correlation analysis and factor analysis were conducted to determine the existence of inter-relationships between variables and clustering data into identifiable components which were necessary steps before proceeding further with causal analysis. To understand the behaviour of Internet users, causal analysis of Structural Equation Modeling (SEM) was conducted using AMOS 5.0 software. Standardized betas were used to determine the strength and direction of relationships in the model. SEM provided the cause-effect relationships between research constructs as well as modeling E-CRM implementation in relation to consumer behaviour. A detailed description of analysis methods can be found in chapter 5.

1.5   Limitation of scope to Malaysia

Previous research on E-CRM, satisfaction, loyalty and retention has focused either on qualitative studies or on western countries and regions where Internet penetration rates are higher. No empirical studies on these topics have been carried out in Malaysia, although Malaysia has great potential for new markets. As a developing nation, Malaysia, one of the South-East Asian tigers, has reported a robust GDP growth at more than 4 percent per year since 2000 and has achieved a 7 per cent growth in 2004 (Malaysian Economic Report 2000-2004). With over 24 million population, as well as

economic and political stability, Malaysia is seen as having great potential, particularly for foreign direct investments venturing in Internet-based services.

Furthermore, the Internet users population is projected to grow about 20 percent each year, with more consumers making online purchases (IDC 1999). As a result of the increased awareness of the potential of information technology (including Internet technology), Malaysian firms are expected to spend about US$2.69 billion on upgrading information technology infrastructure, that is, an 8.6 per cent increase from year 2003 (*The Star Online* 2004b). Current trends in the e-business industry would make Malaysia a more attractive investment ground for firms, particularly multi-national companies that provide Internet-based services (*The Star Online* 2004b), as the markets in western regions mature and head towards saturation.

Part of this research concerns demographic characteristics, experience level and risk tolerance and their relationships with expectations, satisfaction, loyalty and retention of Internet consumers in Malaysia. Before conclusions and implications can be made to other countries of different cultures, further research should be conducted.

1.6   Conclusion and organization of thesis.

This chapter presents an overview of the thesis. It describes the perspectives and significance of this research, methods used and the limitations of the study. Reviews of literature pertaining to related disciplines underlying this study are presented in the next chapter.

This thesis is organized into six chapters. As indicated, this introductory chapter describes the research issues, objectives and research method and analysis. Chapter 2 presents an extensive review of the literature pertaining to the subject matter being studied. The theoretical framework underpinning this study is developed in the subsequent chapter together with eleven research propositions.

Chapter 4 describes and justifies the methodology used in this study: research design, sampling technique and the design, and administration of the survey. The data analysis methods and the appropriate statistical techniques adopted are also presented in this chapter. Detailed descriptions of the analysis of data are presented in chapter 5 and the findings of this research are examined, interpreted and reported. Finally, chapter 6 discusses the research findings in the light of implications for theory and practice.

CHAPTER 2: REVIEW OF LITERATURE

2.0   Introduction

This chapter presents the theoretical background of this study.   It discusses the literature related to the research issues; that is, the use of E-CRM and its effects on consumers' satisfaction, loyalty and retention. The chapter begins with background on the uses of the Internet and e-commerce in Malaysia, and is followed by a discussion of trends in Internet use.   Next, definitions of satisfaction, loyalty and retention are presented, followed by a detailed introduction to CRM and the pertinent roles of information technology in E-CRM.

2.1 Internet usage and E-commerce in Malaysia

The Internet is fast becoming popular among Malaysians and this is obvious with the rise in the percentage of users, that is, from 17 percent in the year 2001 to 21 percent in the year 2002, with usage levels increasing annually. A report by Malaysian Science and Technology Information Centre on the Internet population for the year 2002 shows that Internet users comprised mainly those who have received tertiary education and more in the science stream, professionals or those at management levels, above average household income level, youths and those who live in an urban locality (2003). They either accessed the Internet from home (44.8%), cyber cafes (41.2%), offices (25.8%), colleges (12%) and schools (11.6%).

However, although the Internet is gaining popularity, Malaysian consumers have yet to embrace electronic commerce. A study conducted by TNS Interactive revealed lack of trust in the online payment system as a major factor in hindering consumers to shop online (*Global E-Commerce Report* 2002). This finding is parallel to that of Suki et al. (2002) and Yee's (1998) study. Figure 2.1 illustrates the factors that contribute to low adoption rates of e-commerce by Malaysian Internet users. The survey shows that 38 per cent from the respondents felt that online shopping was not safe and 36 per cent were

reluctant to reveal their credit card details. 'Unable to inspect a product prior to purchase' was also cited as one of the factors hampering e-commerce adoption. The consumers who shopped online were mainly those who have conducted online transactions before and consumers who are technology literate. However, first time buyers would prefer to 'feel and test' the physical products prior to making purchases (Pardas 2002).

Figure 2.1: Reasons for Not Shopping Online

Reasons for not shopping online by Malaysian users

Reason	Percentage
Its more secure buying goods and/or services in a store	38
Don't want to give credit card details/security problems	36
Easier/more fun to buy goods/services in a store	23
Its too difficult/lack of knowledge	19
You don't know what you get	17
Prices too high/expect lower prices on the internet	14
Don't trust online brands/lack of trustworthiness	8
Time to deliver goods is too long/other delivery problem	7
Didn't pass the credit check	5
Products/services found on the internet are not interesting	5
Other reasons	6

Source: Global E-Commerce Report 2002 – TNS Interactive

The TNS report on the trend in Internet shopping behaviours among Malaysians highlights that only 3 per cent of Internet users shopped online in year 2002 (see Figure 2.2). The majority, (that is, 76 per cent) were using the Internet for non-shopping activities such as seeking information, playing games, entertainment, or communicating with friends and so forth. The number of Internet shoppers had declined from year 2000 to 2002 and this phenomenon was linked to an economic downturn in Malaysia.

Figure 2.2: Internet Shopping Behaviour in Malaysia
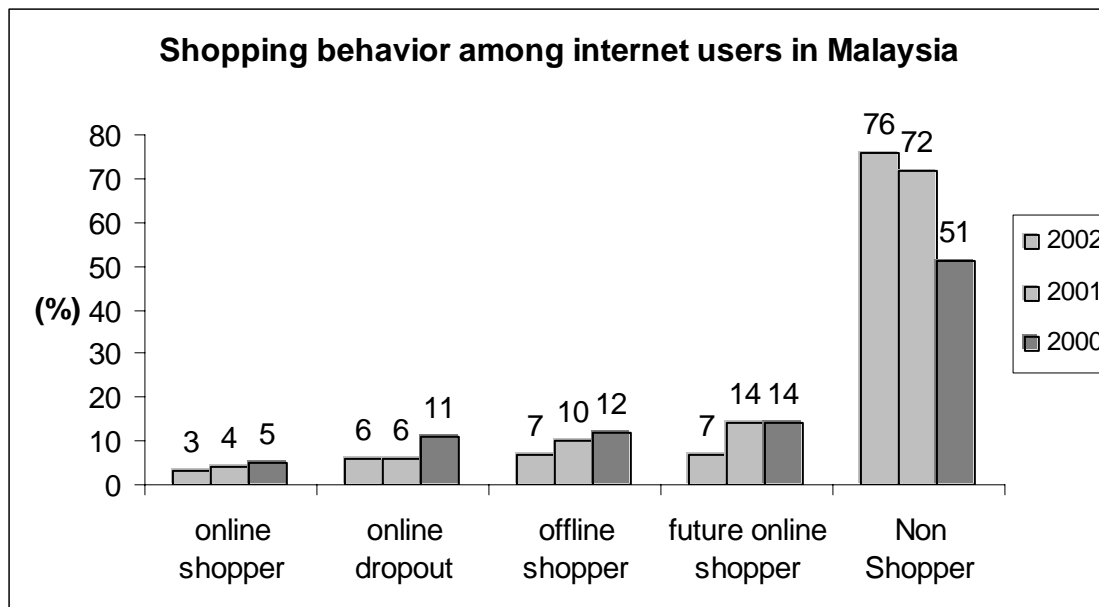
Source: Global E-Commerce Report 2002 – TNS Interactive

The validity of the report indicating a trend of declining Internet shoppers, however, is questionable and challenged by other studies. A more recent assessment report by Malaysian E-Commerce Readiness Assessment (MECRA), for example, projected that the e-commerce industry would see a more aggressive growth during the years 2002 and 2004, with a rise in total e-commerce revenue from US$426 million in 2000 to US$3 billion in 2004 (Jin 2002). In a similar vein, Khatibi et al. (2002) found that there is a positive trend of increasing awareness of the benefits of Internet marketing. Factors, such as global access and ubiquity, convenience, increased product information and availability of special services on the Internet were cited as possible means enhancing consumer satisfaction in cyberspace.

Furthermore, there seems to be a positive outlook for the adoption of e-commerce in Malaysia particularly in the forthcoming years. Between 2002 and 2003 there was a 60 per cent growth in the number of Internet users, and in 2004 there were 8.6 million users nationwide – 35 per cent of the entire population (*The Star Online* 2004a). This growth can be primarily attributed by the government's increased campaigns and incentives as

well as the telecommunication companies offer to reduce the cost of Internet access (*The Star Online* 2004a).   With this phenomenon, IDC projects a compound annual growth rate of 19.9 per cent from 2002 and 2007 in the Internet market (*The Star Online* 2004a) and a 93 per cent increase in the e-commerce market which includes business-to-business and business-to-consumer for 2004 (Sani 2003).

2.2   Current Trends in Internet Activities

The Internet has not only changed the way businesses are conducted but also has penetrated the public homes and is becoming a more important tool in day-to-day activities of individuals.   There has been for example, a considerable increase in the number of people, who made online purchases in Australia: from 1.2 million users in 2000 to 2.7 million in 2003 (Roy Morgan Research 2003).   Due to the convenience of searching for the right travel packages and purchasing airline tickets online, travel purchases have grown considerably in Australia.   Purchases of travel products on the Internet have increased from less than 1 per cent in 2000 to about 7 per cent in 2004 (Roy Morgan Research 2004).   The Internet appears to have positioned itself as one of the most important pre-departure tools for Australian travelers, that is, where the Internet medium has received equal rating vis-à-vis the travel agents as the most preferred means for making travel reservations. Besides online travel reservations, online banking, movie tickets reservations, books and gifts purchases are among other activities, which continue to grow in usage by Internet consumers.   Figure 2.3 depicts the trends in Internet purchases of Australian users.

On the other hand, Malaysian Internet users appear to opt for online banking activities, which are found to be the most popular activity. In fact, the most popular online banking site, Maybank2u.com now handles 2.6 million transactions a month, with transaction rates growing at an average of about 50 per cent each year (Sharif 2004c). A survey conducted by AC Nielsen on 8000 Internet users in early 2004 revealed that while only 20 per cent of the respondents purchased a product online more than 50 per cent of the respondents use the Internet for banking services (Sharif 2004a). Evidently, despite being

in existence for almost ten years, online shopping, particularly for physical products seem to be embraced lesser by Malaysian consumers (Sani 2003). In addition to online banking, consumers use the Internet for points redemptions (25%), purchasing airline tickets (14%) and movie tickets (13%), online auction (13%), making reservations for accommodation (10%), and purchasing books (8%).

Figure 2.3: Internet Purchases Trends in Australia
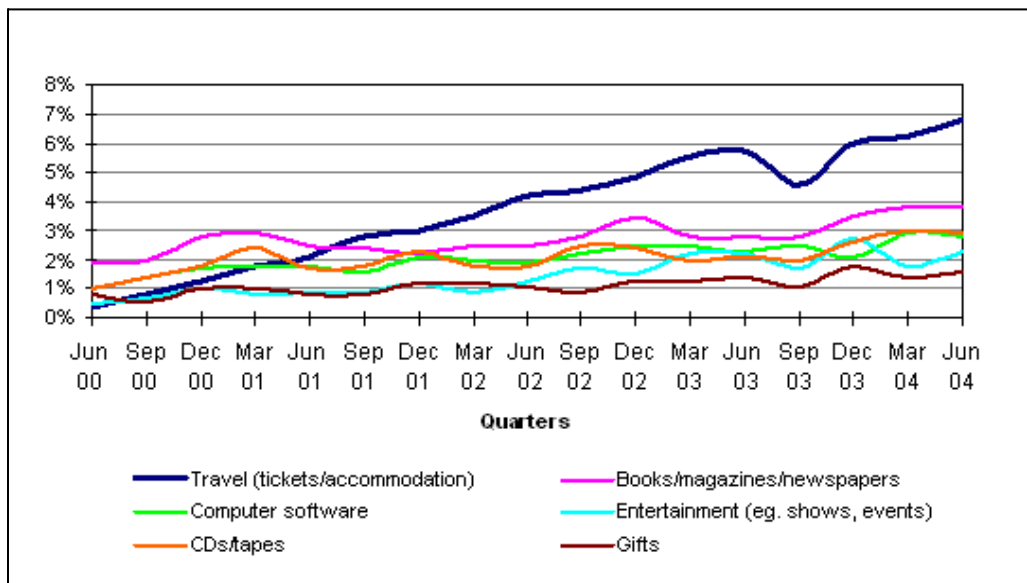
Source: Roy Morgan Research, available at http//www.roymorgan.com

2.3 Consumers' behaviour on the Internet: A different dimension from a traditional channel

The emergence of the Internet has altered the way people do business, communicate with each other and perform other daily activities. Consumers are shifting to the Internet channel as they perceive greater consumer values online. Although the Internet is viewed as another marketing channel for companies, online consumers behave differently from those using traditional channels (Andrews & Currim 2003; Brynjolfsson & Smith 2000;

Cho & Park 2001; Ward & Lee 2000). For instance, online consumers are demanding different relationships from the service providers (Xu et al. 2002). Consumer expectations are discussed in some detail below.

Seeking Value. Online consumers are more value-oriented than traditional consumers. Consumer value is defined as a relativistic preference characterizing a consumer's experience of interacting with some objects such as goods, services, things, places, events or ideas (Holbrook 1999). In simpler terms, consumer value is the perceived benefit that a consumer gains after using certain products or services, as against the experience of other individuals. There are four definitions of value for which supporting literature can be found. The first definition views value as low price (Bishop 1984; Hoffman 1984; Lapierre 1997; Schechter 1984; Ziethaml 1988), while the second suggests that value depends on the relative fulfillment of one's needs and satisfaction (Schechter 1984). The third, sees value as being concerned with the quality received, in return for the price paid (Ziethaml 1988) and finally, value is what the customer gets for what he gives (Lapierre 1997).

Indeed, value can be perceived as a trade off between benefits and costs. Consumers gain value when they benefit from what they have to give up or risks they have to face. To define the term *value* more broadly, Woodruff and Gardial (1996) suggest that value is - as consumers perceive it. Companies need to seriously focus on how and what consumers actually perceive as value in order to directly identify consumers' needs and enable formulation of retail value proposition, which will in turn contribute to the fulfillment of total consumer satisfaction.

Greater service quality. Next, consumers on the Internet tend to seek greater consumer service quality as compared to consumers using physical channels. This is seen in the fact that online consumers tend to demand for high quality experiences and evaluate the high quality services as most valuable attributes (Vrechopoulos et al. 2001). In addition, consumers on the Internet expect to get quick responses from customer service via emails

and Web chats, which are able to provide real time communications with the customer service.

Low price sensitivity. It has been found that price sensitivity is lower among online consumers than offline consumers (Degeratu et al. 1999; Lynch & Ariely 2000; Shankar et al. 2001). Since an information search through Internet is much easier, more non-price information such as product features and uses, reviews from previous users and so forth is readily accessible, and this allows consumers to objectively evaluate products against other criteria, rather than on price alone. Based on the information integration theory, Degeratu et al. (1999) further attest that, "As information on more attributes becomes available, the importance weights of the existing attributes, including price will be reduced".

Having presented the differences of consumer behaviour in an online channel, the next sections discuss the literature of the four major subjects of this study: satisfaction, retention, loyalty and CRM.

2.4   Satisfaction on the Internet

This section discusses the definitions of consumer satisfaction before reviewing the literature with the purpose of identifying the fundamental theories of constructing consumer satisfaction.

Defining consumer satisfaction

Consumer satisfaction on the Internet has become the focus of interests of many researchers (Cao et al. 2004; Cho & Park 2001; Feinberg & Kadam 2002; Koivumaki 2001; Lin 2003; Meuter et al. 2000; van Riel et al. 2001). Although a satisfaction construct remains elusive (Rosen & Suprenant 1998; Yu & Dean 2001) there appears to be two major interpretations of satisfaction, that is, from a marketing perspective and an information systems perspective.

Early studies of satisfaction, from the marketing concept, define satisfaction as an evaluative judgment of a post purchase measure (Bearden & Teel 1983; Churchill & Suprenant 1992; Oliver 1980; Oliver & DeSarbo 1988; Selnes 1993), that is, satisfaction/dissatisfaction is dependent on consumer's assessment of provider's performance, against consumer's expectations (Danaher & Haddrell 1996; Kotler 2000; Lin 2003). This *cognitive evaluation* is concerned with the consumer's experience with after-sale consumptions, that is, in relation to perceived performance and expectations, which are formed from consumers' past experiences, advice from friends, and information from marketers or competitors (Kotler 2000). Indeed, consumers may seem to benefit from the Internet, but they are not necessarily satisfied unless their experiences meet their expectations.

However more recent studies argue that an *emotional (affective) component* is equally important as the satisfaction construct, and therefore should not be ignored (Liljander & Strandvik 1997; Peterson & Wilson 1992; Stauss & Neuhaus 1997; Wirtz & Bateson 1999). These views are in response to the claim that consumers could be satisfied even though expectations never existed (Yi 1990). Quite simply, consumers arrive at satisfaction judgment, based on their "values" (needs and wants) and the matter of their evaluations (Parker & Mathews 2001). That is, satisfaction depends on whether their needs and wants or "object" of evaluations are fulfilled.

The emotional component has been the focus of more recent literature which supports the *affective evaluation* as one of the core components of satisfaction (Babin & Griffin 1998; Bagozzi et al. 1999; Cronin et al. 2000; Dube & Menon 2000; Fornell & Wernerfelt 1987; Stauss & Neuhaus 1997; Westbrook 1987; Westbrook & Oliver 1991). This proposition is further supported by Chin and Lee (2000), Kotler (2000), Liljander and Strandvik (1997) and Rust and Oliver (1994), who take on a contingency interpretation and posit that consumer satisfaction should include both cognitive and affective reactions.

Since online consumers are users of both products/services and information technology, an understanding of satisfaction judgment from an information systems perspective is

worthwhile. Satisfaction is judged by the system's ability to fulfill the *needs* of the users (Bailey & Pearson 1983; Cyert & March 1963; DeLone & McLean 1992; Doll & Torkzadeh 1988; Ives & Olson 1984; Somers et al. 2003). This concept, also known as User Information Satisfaction (UIS), developed by Cyert & March (1963) suggest that user satisfaction is a surrogate of systems success, that is, when users feel that the system is able to meet their information requirements, it is then perceived as effective (Bailey & Pearson 1983; Doll & Tokzadeh 1988; Somers et al. 2003). In other words, perceived usefulness (cognitive) of a system is dependent on meeting the needs (affective) of the users.

Doll & Tokzadeh (1988) had expanded the UIS measurement to investigate the End-User Computing Satisfaction (EUCS), which included constructs (content, accuracy, format, timeliness and ease of use), to measure end user satisfaction. They postulate "End-user satisfaction is the affective attitude towards a specific computer application by someone who interacts with the application directly" (1988, p. 261). Hence, the literature on information systems is in line with the marketing definitions of satisfaction, that is, as both cognitive and affective evaluation (Chin & Lee 2000; Khalifa & Liu 2003).

Now that the general agreement between marketing and information systems on satisfaction judgment has been examined, a comprehensive and integrated definition of consumer satisfaction on the Internet is proposed for this research:

> *Consumer satisfaction on the Internet is when a consumer finds pleasure in his/her experience of using the services, which is the result of the fulfillment of his/her needs and expectations.*

This definition of consumer satisfaction stems from the more recent studies in marketing and information systems on consumer satisfaction in which satisfaction judgment is based on cognitive and affective evaluations (Chin & Lee 2000; Khalifa & Liu 2003; Kotler 2000; Liljander & Strandvik 1997; Lin 2003; Rust & Oliver 1994).

An individual may be satisfied if the information provided on the Web site is what he/she wants and expects. Conversely, if a consumer develops a high expectation prior to the information search, he/she may still be dissatisfied even though his/her relatively lower need for information is fulfilled (Khalifa & Liu 2003). Otherwise, an individual may develop expectations based on some comparison standards and not be satisfied, if the actual performance falls below his/her information requirements (Chin & Lee 2000; Khalifa & Liu 2003; Lin 2003).

Consumers will be satisfied only if what they actually get lives up to what they need and expect. However, expectations and desires may vary among consumer demographics (Hair et al. 2000; Kotler 2000; McColl-Kennedy & Kiel 2000), that is, consumers from different age groups, income levels, gender, education and occupations may have unique interests, goals and perceptions (Scott & Schieff 1993). Thus, it is important for companies to understand consumer satisfaction construct, which is discussed in section 3.3.1.

2.5   Consumer loyalty on the Internet

This section discusses the definitions of loyalty. It then reviews the literature with the purpose of identifying the fundamental theories of constructing consumer loyalty.

Defining consumer loyalty

Driven by intense competition and cost-efficiency inspiration, firms are closely looking at marketing strategies that could win consumer loyalty. Businesses on the Internet are confronted with greater challenges as consumers' searching costs for price, quality information and comparisons across stores are much lower (Bakos 1997; Lynch & Ariely 2000), hence switching barriers almost do not exist (Yang & Peterson 2004).

For many years, numerous studies have attempted to define the loyalty construct. Researchers have used both attitudinal and behavioural measures to define and assess loyalty (Engel et al. 1982; Gremler 1995; Oliver 1999; Zeithaml 2000). From an

attitudinal perspective, consumer loyalty is viewed as a specific desire to continue a relationship with a provider (Czepiel & Gilmore 1987), while the latter view defines loyalty as repeat patronage (Bloemer & de Ruyter 1998; Kuehn 1962; Lipstein 1959; Neal 1999; Selnes 1993; Stum & Thiry 1991; Tellis 1998). However, the behavioural-based definitions are not sufficient because they do not distinguish true loyalty from spurious loyalty (Anderson & Srinivasan 2003).

To define true loyalty, studies have proposed that loyalty encompasses a non-random, behavioural response as an outcome from evaluation processes resulting in commitment (Assael 1992; Bloemer & Kasper 1995; Keller 1993). In addition, Dick and Basu (1994) suggest that loyalty is evident by more favorable *attitudes* towards a brand as compared to other alternatives.   Oliver (1999, p.34) further asserts that loyalty is "…a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviours". Therefore, loyalty includes both *attitudinal* and *behavioural* elements. Oliver (1999) builds a four-stage loyalty model, which classifies four different categories of loyalty for different phases of attitude development as shown in Figure 2.4:

Figure 2.4: Oliver's Four-stage Loyalty Model
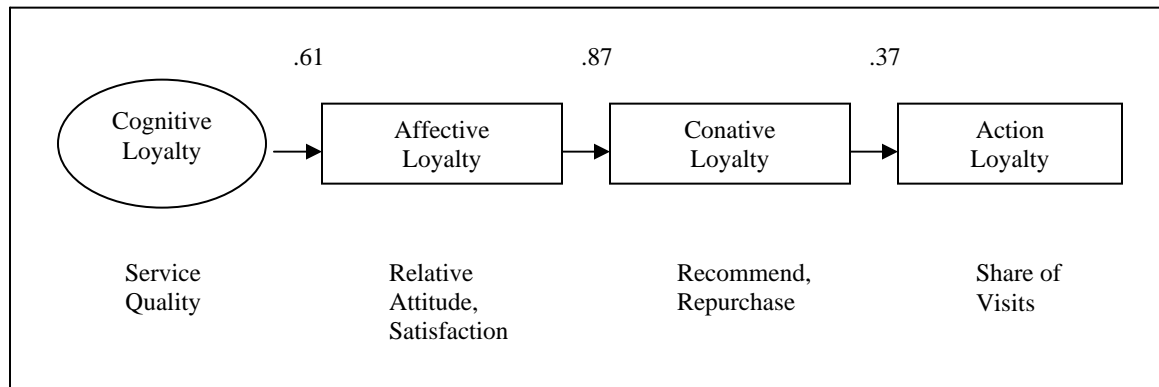
Source: Oliver (1999)

In the first phase, namely the *cognitive loyalty*, consumers have preferences towards a particular company or brand over other alternatives in the delivery of service quality. Once they are satisfied, affection will come into play, that is, where the consumers will move into the *affective loyalty* phase. In this second phase, consumers develop likings and positive attitudes towards the company or brand. With a continuous positive experience, the consumers would move into the *conative loyalty* phase; that is, a phase where they have intention and commitment to repurchase. This intention to purchase becomes readiness to act as a result of the confluence of the previous three stages. This stage is called the *action loyalty* phase, where consumers have greater commitment to repurchase from a brand or from preferred company consistently, accompanied by a desire to overcome obstacles that might prevent the act.

In addition, Pugh (1991) and Stum and Thiry (1991) categorize four types of characteristics that make up a loyal consumer. According to them, loyal consumers will not only make repeated purchases, but also be committed in purchasing across product and services lines, giving active referrals and demonstrating immunity to the pull of the competition.

Thus, this study defines consumer loyalty in e-commerce as:

> *Consumer's commitment to purchase/consume services from an online provider, resulting from perceived value and is impervious to other online competitors' influences.*

Based on the definitions above, in the context of this study in this research, retention and loyalty will have different meanings, that is, retention shall be defined as merely repetitive purchasing or behavioural responses, and loyalty includes both attitudinal and behavioural responses.

The distinction between retention and loyalty is that loyalty involves commitment, that is, emotional components, which encompass affection, fidelity and deep commitment towards a particular company (Baldinger & Rubinson 1996; Barnes 2002; Dall'Olmo et

al. 1997; Dyson et al. 1996; Fournier & Yao 1997; O'Malley 1998; Sivadas and Baker-Prewitt 2000). For example, consumers will be emotionally loyal when they feel appreciated: greeted by the first name, able to chat with customer service personnel and enjoy the experience of dealing with the company (Barnes 2002). In fact, the emotional or attitudinal preferences precede loyal behaviours (Foster & Cadogan 2000; Macintosh & Lockshin 1997). This is consistent with Ajzen and Fishbein (1977)'s finding that suggests attitudes and behaviours are consistent in most situations and that attitudes are a strong predictors of behaviours.

On the other hand, a company can retain mere behaviourally loyal consumers as long as the switching barriers exist. These barriers include technical and psychological difficulties to change suppliers and expensive switching cost. Khatibi et al. (2002) state that consumers may be 'loyal' due to unavailability of real alternatives. Indeed, the Internet makes it almost effortless for consumers to switch to other alternatives. In fact, Jacoby and Chesnut (1978) suggest that repeated purchasing is merely as coincidence and is not a valid indicator of loyalty. Hence, repeat purchase behaviours alone do not equate to loyalty (Barnes 2002).

2.6   Consumer retention on the Internet

This section discusses the definitions of consumer retention and then reviews the literature with the purpose of identifying the fundamental theories of constructing consumer retention.

Defining consumer retention

Research in understanding consumer retention has been the subject of investigation in the marketing area for a few decades. The motivation is driven by consumer economics in which keeping consumers may lead to securing sales (Jackson 1985) and serving repeat consumers costs less than acquiring new ones (Reichheld 1996). Consumer retention has been a primary goal of almost all companies, including Web-based companies (Peppers & Rogers 1995; Reichheld et al. 2000).

Researchers have debated the definition of retention. Intertwined with loyalty, retention in particular, refers to consumer repeat purchase behaviour in which prior satisfaction influences repatronage behaviour (Bolton et al. 2000). In other words, retention is a *behavioural* response towards a store or a product. Although many researchers claim that repeat purchases symbolize loyalty (Brown 1952; Lipstein 1959; Koufaris et al. 2002; Kuehn 1962; Yin 1999) others postulate that there is a distinction between true loyalty and spurious loyalty, that is, repeat purchase or retention does not translate into true loyalty, but is merely a consequence of lack of consumer choice (Day 1969; Jacoby & Chestnut 1978). A consumer may appear to be loyal to a particular store or brand, but in reality may have no other choice other than what is available (Anderson & Srinivasan 2003).

Drawing on the literature presented above, I propose that:

> *Consumer retention on the Internet refers to consumers' favorable behaviour toward a Web site resulting in willingness to revisit (or repurchase).*

Retention, in the context of this research, is defined on the basis of the *behavioural theory* (Barnes 2002). Repeat- purchase behaviours occur on the basis of situational cues, rather than on strong relational commitment (Campbell 1997). Consumers are likely to repatronize a Web site simply because of lack of alternatives and will "defect" as soon as a "better" one is available. Another explanation for repatronage is inertia (Anderson & Srinivasan 2003; Reinartz & Kumar 2002; Yu & Dean 2001). According to Anderson and Srinivasan (2003) and Reinartz and Kumar (2002), consumers visit a particular site out of habit, rather than by conscious determination, that is, on the basis of perceived benefits and costs offered by the sites . This could be due to lack of time and learning curve which results in consumers surfing familiar Web sites.

Nonetheless, the study of consumer retention continues to emerge in the academic and practitioners' research due to the beliefs that doing business with repeat consumers is more cost-effective than attracting new ones. Indeed a consumer will revisit a Web site

until there is another Web site that offers better quality service. In other words, it is the quality of products/services that makes the difference (Feinberg & Kadam 2002).   Thus the imperative of understanding the level of quality of service which may lead to retention should be investigated and is discussed next.

2.7   Managing customer relationships on the Internet

The earlier sections presented the theoretical foundations of satisfaction retention and loyalty constructs.   This section presents the definitions and theoretical foundations of E-CRM.

2.7.1   Customer relationship management (CRM)

The revolution of CRM has been referred to as the new "mantra of marketing" (Winer 2001). It is premised on the belief that developing a relationship with consumers is the best way to retain them and generate loyalty and that loyal consumers are more profitable than non-loyal consumers (Dowling 2002; Reichheld 1996).   Reichheld (1996) explains that this is because a small increase in consumer retention rate may lead to a dramatic increase in profits. Consequently, it is obvious that relationships help to create loyalty, which in turn has a positive effect on profitability (Reichheld & Sasser 1990; Rust & Zahorik 1993; Storbacka et al. 1994)

CRM refers to a comprehensive business and marketing strategy that involves integration of technology, process and all business activities around the consumers (Anton 1996; Anton & Hoeck 2002).   These processes and business activities range from sales and marketing at the front end to information technology, finance, operations, logistics and human resources at the back end (Fickel 1999; Goldenberg 2000). Bradshaw and Brash (2001) assert that CRM is "a management approach that facilitates companies to identify, attract and increase loyalty of profitable consumers by managing relationships between them".   To firms, CRM should mean cross functional, consumer driven, technology-integrated business process management strategies that maximizes relationships (Goldenberg 2000).   To consumers, on the other hand, CRM implies time and cost

savings, receiving better information and superior services (Kassanoff 2000), regardless of the channel or method used to interact with the company (Creighton 2000).

CRM is concerned with building long-term relationships with valuable consumers and has its roots in relationship marketing that focuses on improving long run profitability by shifting from transaction-based marketing (Chen & Popovich 2003; Christopher et al. 1991). This relatively new concept of relationship marketing is discussed next.

Relationship marketing. Relationship marketing has emerged as a "new paradigm" of a marketing strategy, as a reaction to aggressive competition surrounding the domestic and global market (Berry 1983; Dwyer et al. 1987; Ford 1990; Gronroos 1994; Gummesson 1995; Hakansson 1982; McKenna 1991; Morgan & Hunt 1994; Zineldin et al. 1997). Relationship marketing refers to broader organizational efforts involving personnel across the organizations (Zineldin 2000) directed towards establishing, developing and maintaining consumer loyalty and stimulating repeated purchases over time (Foster & Cadogan 2000; Morgan & Hunt 1994). Zineldin (2000) highlights that personal relationships, interactions and social exchanges are the most important elements of relationship marketing. It embraces the idea of treating each consumer in an individualized manner; that is delivering individualized products/services to each and every consumer (one-to-one marketing) (Moon 1999).

Gronroos (1997) asserts that relationship marketing does not only identify, establish, maintain and enhance relationships with consumers, but also terminates the relationships in order to meet objectives of all the parties involved. Indeed, it cannot be generalized that all consumers are "profitable". In fact, many consumers may not want to maintain a relationship with most of the products/services that they buy; simply because they do not have the time or interest to form relationships via a wide variety of products (Dowling 2002). Thus, identifying the profitable (and unprofitable) consumers is critical in managing relationships, particularly in terms of achieving the firm's objectivity of increased efficiency and effectiveness of target marketing. Moon (1999) asserts that the key to success of any relationship marketing effort is information. The application of

information technology, which tracks and analyzes consumer behaviours, allows firms to easily identify segments of consumers and to focus on marketing efforts (Chen & Popovich 2003).

Information technology, therefore, plays a pertinent role in consumer relationship management, which is further elaborated below.

CRM and information technology.   Chen and Popovich (2003) espouse that the effective management of information is critical in CRM, since information technology enables one-to-one marketing to grow faster (Zineldin 2000) and to deliver the promise of greater profitability from an increase in retention rate (Winer 2001). Winer (2001) further notes that the construction of a consumer database or information file is the foundation for any CRM program.   The historical data about consumers can be used to build consumer segmentations, which would be demographically or behaviourally based, and consumer profile (Gurau 2003; Winer 2001). The analyses would reveal consumer patterns, behaviours and develop predictive models (Chen & Popovich 2003), that is, depending on which, firms may identify consumers who would provide the most long-term profits from those who would not (Ness et al. 2001; Park & Kim 2003; Winer 2001). Expanding on consumer identification, the 'mining' of consumer data provides knowledge of each consumer's preferences, which are then used to deliver personalized products/services, based on their needs and values (Renner 2000).

The Internet application has brought new meaning to building consumer relationships, that is, large volumes of data can be collected, processed, and analyzed efficiently which allows firms to offer personalized products/services to every consumer (Gurau 2003; Winer 2001; Zineldin 2000).

2.7.2 CRM in South-East Asia

The notion that CRM implementation intensifies consumer retention and leads to firms' profitability has also captured the interests of many academics and practitioners. The CRM field has been predominantly developed and studied in the Western business environment. Recently, this trend has shifted to Asian countries particularly in China,

India, Indonesia, Malaysia, Singapore and Thailand where CRM industry growth is regarded as having the most potential in the near future (Picarille 2003). For example, researchers have attempted to understand the applications of relationship marketing in a business-to-business context (Roslin & Melewar 2004), in various services industry (Patterson & Smith 2001b; So & Speece 2000). In addition, Noordhoff et al. (2004) have examined the affect of loyalty schemes on consumer satisfaction and retention, while Arias (1996) and Ndubisi (2004) have qualitatively investigated the implications of cultural differences on relationship marketing.

Overall, these studies suggest that although there are common relationship marketing elements between the East and West (for example, trust in service providers, perceived risk, perceived value, reward, price discounts and personalization (Gwinner et al. 1998; Patterson & Smith 2001b)) these elements are reported to vary in degree of importance between these two regions. In a comparative study between consumers in Thailand (East) and USA (West) on their perceptions of benefits received resulting from maintaining relationships with service providers, Patterson and Smith (2001b) reported that Thailand consumers voted higher on perceived benefits a consumer would obtain in a personalized service (such as hair dressing) environment than standardized service (such as retail banking). In other words, where an interpersonal contact is high Eastern consumers tend to place higher confidence in the service provider, are more likely to be loyal and have higher expectations of special treatment (such as reward or price discounts) for returning.

Many researchers attributed these behaviour differences to *culture* (Arias 1996; Crotts & Erdmann 2000; Karande et al. 2002; Ndubisi 2004; So & Speece 2000). In particular, Ndubisi (2004) argued that "the cultural inclination of any market or market groups will determine the effectiveness of relationship marketing in delivering repeat purchases, consumer retention and sustained loyalty" (p. 77). Hofstede's (1980, 1983) model of national cultural typology provides very useful insights to understanding the salient dimensions of cultural differences between East and West. These dimensions are classified into five major elements:

- collectivism vs individualism - collectivism refers to the extent to which an individual perceives himself/herself as part of a larger group (Singhapakdi et al. 1999), integrated strong and cohesive in-groups (Patterson & Smith 2001a); high dependence on groups and more loyal (Karande et al. 2002).

- uncertainty avoidance behaviour - uncomfortable with unclear or unknown situations (Ndubisi 2004); high risk-averse and resistant to change (Patterson & Smith 2001b).

- power distance – the extent to which individuals accept that power is distributed unequally.

- feminity vs masculinity – feminine values refer to care for quality of life (Fontaine et al. 2002); interpersonal relationship prevails over performances (Hoeklin 1995); are less assertive, less competitive (Ndubisi 2004).

- Confucian dynamic/long-term orientation – refers to tenacity in the pursuit of sustainable outcomes (Ndubisi 2004).

Table 2.1 illustrates cultural typology between East-West countries.

Table 2.1: Hofstede's Typology of National Cultures (selected countries)

Country	Individualism/ Collectivism	Uncertainty avoidance	Power distance	Masculinity/ Femininity	Confucian dynamic
Indonesia	14	48	78	46	n/a
Malaysia	26	36	104	50	n/a
Singapore	21	7	75	47	48
Thailand	20	64	64	34	n/a
Australia	90	51	36	61	31
USA	91	46	40	62	29

Notes: Ratings range from 0 to 105 on each dimension.   Source: Adapted from Hofstede (1980), Hofstede (2001), Hofstede and Bond (1988), Kasper et al. (1999) and Patterson and Smith (2001b).

As shown in Table 2.1, Eastern culture is characterized by *collectivist, high power distance* and *femininity*.   As indicated in the table, eastern countries such as Indonesia Malaysia, Singapore and Thailand, score lower in *individualism,* which indicates individuals from these countries are highly *collectivist* and are inclined to view

themselves as part of a community. It is evident from the table that countries with an Eastern culture rank higher than Western culture (USA and Australia) in power distance, which implies that Eastern individuals regard a person who holds a higher position in a community more worthy of respect than do their counterparts in Western society. Lower ratings in *masculinity* affirm that Eastern culture is characterized by high femininity - that is, individuals tend to be less competitive due to their belief that interpersonal relationships should be given higher value than performance.

Applied to relationship marketing, CRM initiatives are more likely to succeed in a *collectivist* society, where group cohesiveness which is based on feelings of trust and benevolence has readily become an important component of the society (Ndubisi 2004). The inclination to be loyal is higher in the collectivist culture where strong loyalty is exhibited between close cohorts. In this instance, individuals would expect to receive incentives in return for loyalty (Patterson & Smith 2001a). According to Ndubisi (2004), firms can benefit from cohesive integration in product promotion and branding. Satisfied consumers may play an effective role to spread the word-of-mouth (WOM) on their pleasant encounters to members of the community, and in turn, positive WOM may lead to branding. Likewise, negative experiences may spread within the society equally fast or even faster.

Moreover, a high *femininity culture* is more conducive for value-driven relationship marketing efforts (Ndubisi 2004; Patterson & Smith 2001b). Contrary to individuals where masculine values prevail, consumers from feminine society are less judgmental, less materialistic and less competitive. When consumer perceived value is present, firms would be gaining more from CRM programs where consumers place a higher level of trust and commitment.

However, according to Patterson and Smith (2001b) in a high-*power distance* society, consumers may not expect to build close buyer-seller relationships. For example, perceived higher social standing of a doctor (service provider) than of a patient (customer) would imply that the patient does not expect to be treated like a personal

acquaintance, unless the doctor initiates a relationship. In certain service scenarios, consumers are even reluctant to establish a business relationship with a service provider, due to status quo (Ndubisi 2004). For example, in India the Brahmans community would not establish any business relationships with the outcasts and vice versa.

Hofstede (1980) postulates that individuals of high-power distance culture tend to avoid risks and seek more familiar and known outcomes. When there is a relationship, high *uncertainty avoidance* consumers would rely on service providers' support, if problems arise and in turn would increase perceived security (Ndubisi 2004). Hence, firms would continue to benefit from consumer loyalty in return for quality service.

In addition, *guanxi or personal connections*, an important value of the Chinese community, may have a strong influence on CRM implementation in South-East Asia (So & Speece 2000). Countries in South-East Asia, for example Indonesia, Malaysia and Singapore are highly populated with Chinese; hence there is a substantial Chinese influence. Many authors suggest that *guanxi* is a traditional form of relationship marketing (Bjorkman & Kock 1995; Wong & Chan 1999) although others argue that it is essentially a social concept, and hence it is different from the 'Western' relationship marketing (Ambler 1995; Arias 1996; Davies et al. 1995). While *guanxi* is strongly based on networks of social relationships, the salient dimensions of 'Western' relationship marketing: fulfillment of promises and the development of consumer trusts are paramount in maintaining business relationships (Arias 1996). Furthermore, gift-giving (reward) and entertainment are cited as key elements in building strong *guanxi* relationships (So & Speece 2000). Therefore, the elements of *guanxi,* should it be exerted in firms' retention strategy, would assist in the maintenance of consumer relationships in the Eastern culture context.

Similarly, in Malay (Malaysia's dominant population) culture, *budi* underpins the virtuous value of the society (Ali 1979). According to Dahlan (1997) *budi* commands reciprocity, that is, an individual who has been rendered kindness is regarded as *terhutang budi* (indebted) and should repay when an opportunity arises. Failing this, a

person is a symbol of *malu* (shame) to the community and to him/her self (Ali 1979). In addition, the Malay *budi* also emphasizes *jaga hati* (care for the feelings of others) where a person would suppress his own feelings so as not to hurt the feelings of others. The law of *budi* has its influence in customer relationships and is essential in explaining consumer loyalty. Dahlan (1997) suggests that in a business context, for example in a fish industry although a Chinese *towkay* (middle-man) presence has not always been honoured by the Malay fishermen the *towkay* would not be maltreated. It is common in *towkay*-fishermen relationships that in times of difficulties the *towkay* would readily render financial assistance to the fishermen. Then the rules of *terhutang budi* and *jaga hati* transpire where the fishermen reciprocate with kindness and would not abandon the *towkay* who is worthy of their loyalty.

A case study conducted by Peppers and Rogers Group (2002) on CRM implementation by ING Aetna, a multinational insurance company in Malaysia suggests that loyalty, gratification and *guanxi* essentially affect business competitiveness in the Eastern region. Providing support for Reichheld et al.'s (2000) proposition that employee relationships influence the success of CRM program, ING Aetna's case emphasizes the importance of employee sense of belonging to the firm in return for incentives. Highly motivated employees display loyalty and perform better to understand consumer varying needs. Subsequently, upon their feedback, ING Aetna learnt that Malaysian customers seek rapid and highly customized services, more than customers in other regions. As a result, new customer touch points were added where customers can now interact directly with ING Aetna and their unique loan requirements can be processed within much shorter times. Therefore, ING Aetna has added new functions to its existing systems as to fulfill the different needs of their Asian customers in its quest to build long-term customer relationships.

Meanwhile, it has been reported that the growth of CRM industry is proliferating in Asia. With the U.S.A market reaching its saturation the market potential in Asia is projected to grow from $445 million in 2002 to $739 million by the end of 2005 (Picarille 2003). However, CRM vendors should focus their investment in more matured market of Asia,

that is, in countries with the largest growth potential of CRM applications namely, Malaysia, China and India (Schneider 2003). In particular, the potential growth in the Malaysian market is attributed to the nation's sound infrastructure, increased liberalization and higher levels of education (Schneider 2003).

2.7.3 Electronic customer relationship management (E-CRM)

The use of the Internet as a marketing channel provides firms with a powerful tool to profile existing consumers (Peacock 2001), which in turn permits one-to-one marketing (Galbreath 2002; Gurau 2003; Winer 2001; Zineldin 2000). This distinctive feature of the Internet enables firms to establish an enduring relationship with individual consumers (Zineldin 2000).

E-CRM is a term coined for customer relationship management (CRM) functions, which are delivered on the Internet (Feinberg & Kadam 2002). It refers to the online marketing activities, tools and techniques, which are aimed at building and improving consumer relationships (Lee-Kelley et al. 2003). Fjermestad and Romano Jr. (2003) highlight that E-CRM is purported to improve customer services, retain valuable consumers as well as aid analytical capabilities. According to Dyche (2001), E-CRM can be divided into two main types: operational and analytical. The latter involves analytical technology for processing large amount of data into comprehendible information, such as demographics, purchasing patterns and other factors so as to identify new business opportunities. Operational E-CRM, on the other hand is concerned with the consumer contact points of call centers, emails, Web-based help desks, telephones, faxes and so forth. According to Winer (2001), any contact or touch points between consumers and service encounters would influence consumer relationships. Clearly, in this Internet age, Internet technology plays an important role in improving service levels by providing new forms of service delivery, strengthening consumer intimacy, responding more rapidly to consumers' needs and affording consumers the opportunity to help themselves (Mulligan & Gordon 2002).

2.8 Conclusion

This chapter presented the review of extant literature relating to the research issues. It outlined the theories underlying the formation of consumer satisfaction, loyalty, retention, and E-CRM constructs, which provides the basis of research propositions of this study. In the next chapter, I will describe and justify the research model for this study.

CHAPTER 3: CONSTRUCTION OF RESEARCH MODEL

3.0   Introduction

Following the discussions on theories pertaining to consumer satisfaction, retention, loyalty and E-CRM in chapter two, this chapter presents the research model and propositions of this study. It begins with the development of the research constructs, followed by research propositions and the development of competing models.

3.1 Causal Loop Diagram (CLD) – A modeling approach

This section provides a brief overview of the systems dynamics (SD) modeling technique employed. SD, originally developed by Forrester (1961), is a specific systems modeling approach that has proven to be extremely useful in organizational policy making settings where the focus is on '*messy*' problems: problems or issues that are characterized by complexity, uncertainty, inter-related sub-problems and recursive dependencies. One of its strengths is capturing complex feedback loops.

Typically, an SD model is developed using a two-stage approach: first, a *causal-loop diagram (CLD)* is established. This is then converted into *stock-flow* form. The advantage of CLDs over other modeling approaches is due to their simplicity. That is, CLDs are based on very simple modeling constructs and, hence, allow policy-makers to be involved in modeling sessions without much training.   On the other hand, stock-flow models, which enable a wide variety of complex simulations to be modeled are rather a more complex approach and can be implemented using sophisticated software packages. The purpose of this research is to examine the cause and effect relationships between the studied variables, hence CLDs are deemed appropriate.

CLDs are based on one very simple construct, where *A* and *B* are variables connected by an arrow indicating that *A* has some sort of causal effect on *B*. The arrow can be annotated

with either a *"+"* or a *"-"*, where the former indicates that the two variables move in the same direction and the latter shows that these variables move in opposite directions: for example, in the following case, as costs increase, profit will decrease (and a decrease in costs will result in an increase in profits).

$$\text{Costs} \xrightarrow{\quad - \quad} \text{Profits}$$
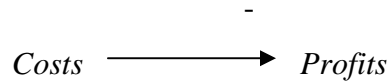
On the other hand, the following indicates that an increase or decrease in sales will result in a corresponding rise or fall in profits:

$$\text{Sales} \xrightarrow{\quad + \quad} \text{Profits}$$

3.2   Theoretical framework

According to Sekaran (2000), a *theoretical framework* provides the foundation on which an entire research project is based. It describes the relationship between variables that contribute to the research problem. The theoretical framework provides a clear understanding of the dynamics of the problem being investigated and thus facilitates the generation of testable hypotheses. Based on an exploratory research, this study identified seven variables that are considered relevant to the research problem. The dependent variables (DV) for this study include *consumer satisfaction, loyalty* and *retention*, while *the use of Internet technology in Customer Relationship Management (E-CRM), demographics, level of users' experience* and *perceived risk* are listed as the independent variables (IV). These variables build up a theoretical framework that is inline with the objectives of this research.   Figure 3.1 illustrates a schematic diagram that represents the theoretical framework of this study.

Figure 3.1: Schematic Diagram for Theoretical Framework
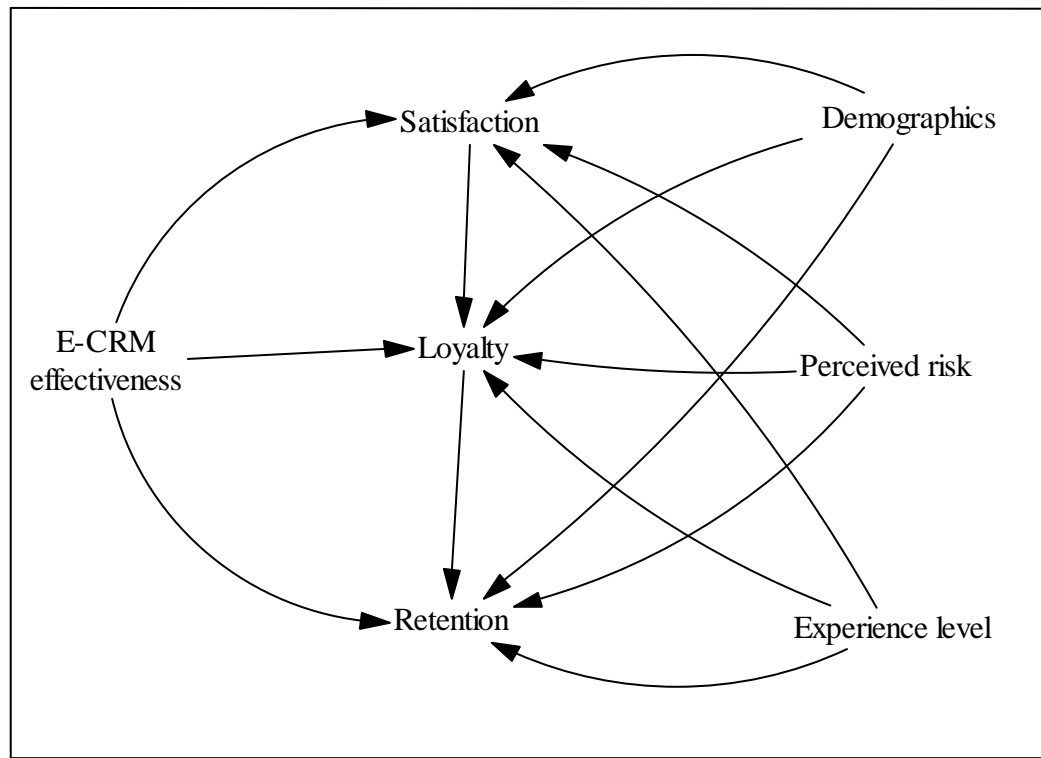
Source: Developed for this thesis

This framework illustrates that consumer satisfaction, loyalty and retention are the dependent variables (DV) and that their variances are explained by four independent variables (IV): E-CRM effectiveness, users' Internet experience, demographics and perceived risk. This study proposes that the effectiveness of an E-CRM program is a major determinant of the extent to which specific variables (namely channel integration, customer service quality, ease of navigation, emotional benefit, information quality, online community, order fulfillment level, payment security, perceived value, personalization level, lower prices, reward and trust) will be implemented. In turn, the use of the Internet in building consumer relationships (E-CRM) could increase consumer satisfaction, which leads to acquiring consumer loyalty. Certainly, repeat consumers potentially become loyal to a site, leading to profitability through retaining consumers in the long run. However,

without a good understanding of the dimensions of satisfaction, loyalty and retention, firms may not be able to differentiate their offerings across consumer segments and may easily lose their consumers. Although not illustrated in the diagram above, this study also seeks to investigate the dimensions of consumer satisfaction, loyalty and retention. Drawn from the literature (see Sections 3.3.1 to 3.3.3), this study proposes that satisfaction is constructed from seven independent variables: customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/service range. On the other hand, emotional benefit, perceived value and trust are proposed as the independent variables of loyalty, while retention is constructed from five independent variables: channel integration, customer service quality, online community, personalization level and reward. Table 3.1 illustrates the research issues as well as the dependent and independent variables for this research.

Extant literature suggests that CRM and E-CRM have a direct and indirect impact on consumer satisfaction and loyalty (Anton & Hoeck 2002; Connely & Yoger 2001; Cusack 1998; Swift 2001; Tschohl 2001). Despite the growing applications of CRM on building relationships on the Internet, there has been very little empirical work done on E-CRM (Feinberg & Kadam 2002). For example, studies have attempted to investigate the E-CRM influence on consumer loyalty (Lee-Kelley et al. 2003), E-CRM features affecting consumer satisfaction (Feinberg & Kadam 2002), E-CRM systems' usability and resistance (Fjermestad & Romano Jr. 2003), and E-CRM coordinated marketing and information strategy (Park & Kim 2003). Given the belief in the economic advantage of building relationships and the consumer value-generation potential of the Internet, there is agreement in the need to examine the influence of Internet-based CRM on satisfaction, retention and loyalty (Bobbit & Dabholkar 2001; Clark 1997; Gilbert 1996; Gronroos 1994; Parasuraman & Grewal 2000). Therefore, this study improves on prior research to provide empirical validation of an E-CRM model by determining its influence on consumer satisfaction, retention and loyalty.

Table 3.1: List of Research Issues, Dependent and Independent Variables

Research Issues	Independent Variables (IV)	Dependent Variables (DV)
1. How are - satisfaction constructed?	- customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/service range.	Satisfaction
- loyalty constructed?	- emotional benefit, perceived value and trust.	Loyalty
- retention constructed?	- channel integration, customer service quality, online community, personalization level and reward.	Retention
2. How does the use of Internet in CRM influence satisfaction, loyalty and retention?	E-CRM effectiveness	Channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust. Satisfaction, Loyalty, Retention
3. Do consumers' - demographics	- gender, age, education level	Satisfaction Loyalty Retention
- level of experience	- less than 6 months, for the past 6-12 months, for the past 1-3 years, for the past 3-5 years, more than 5 years.	
- perceived risk	- online registration, online reservation, online banking.	
influence satisfaction, loyalty and retention ?		

Source: Developed for this thesis

Past researchers have also investigated the relationship between online consumer satisfaction and loyalty and confirmed that there is a significant positive relationship between these variables.   For example, satisfaction is found to be a good predictor of loyalty in a business-to-business e-service environment (Taylor & Hunter 2002), an online banking context (Yang & Peterson 2004), and that information satisfaction has a positive effect on site loyalty in an online shopping context (Park & Kim 2003).   In addition, satisfaction is also reported to influence consumers' intention to return to a site (van Riel et al. 2001).   However, many of the satisfaction-loyalty relationship studies were carried out with a narrow definition of loyalty, that is, loyalty is interpreted as behavioural response or repatronage behaviour.   In this study, loyalty is defined as attitudinal loyalty which in turn, results in repurchase behaviour.

As suggested by past researchers, attitudinal loyalty is largely immune to competitors' marketing campaigns (Assael 1992; Bloemer & Kasper 1995; Dick & Basu 1994). Whereas repeat behaviours may simply indicate the absence of better alternatives than existing brands (Khatibi et al 2002), attitudinal loyalty reflects true loyalty; that is, a commitment to repurchase despite marketing efforts having the potential to cause switching behaviours (Oliver 1999).   This study aims to assess the factors contributing to consumer loyalty and retention and, as such, loyalty is defined as attitudinal responses whereas retention is a mere behavioral outcome (Barnes 2002, Campbell 1997).

Because previous research has not clearly articulated the E-CRM influence on satisfaction, loyalty and retention, the present study attempts to reduce this gap by investigating the relationships between these variables in the setting of business-to-consumer e-commerce. This study expands on the emerging stream which integrates the marketing concepts into relationship marketing and information systems theories.

3.3   Development of research constructs

This study attempts to investigate the dimensions of research constructs, namely, consumer satisfaction, retention and loyalty, and E-CRM program. This section presents the theories underpinning the development of these constructs.

3.3.1 Consumer satisfaction construct

With the emergence of electronic commerce, consumers have increasingly become the users of products/services as well as information technology. Hence, researchers have been urged to devote more efforts to comprehend consumer behaviour on the Internet (Yang et al. 2003; Zeithaml et al. 2002). Many researchers who study consumer satisfaction on the Internet depart from solely a marketing perspective (Anderson & Srinivasan 2003; Cao et al. 2004; Gurau 2003; Lin 2003; Starkey et al. 2002) and adopt an integrated marketing and information systems approach (Cho & Park 2001; Feinberg & Kadam 2002; Khalifa & Liu 2003; Kim & Lim 2001; Koivumaki 2001; Krishnan et al. 1999; Szymanski & Hise 2000; van Riel et al. 2001; Yang & Peterson 2004; Zhang & von Dran 2002).

Marketing research is concerned with behavioural aspects such as consumer expectations and perceptions as antecedents of satisfaction, service quality, price, consumer value and consumer management (Anderson & Srinivasan 2003; Cao et al. 2004; Gurau 2003; Lin 2003; Starkey et al. 2002). The integrated marketing and information systems approach on the other hand, focuses on systems characteristics as well as behaviour. For example, items such as site design, ease of navigation, security and privacy, information, customer service quality, the ordering process, product/services quality, price and payment methods are considered (Cho & Park 2001; Feinberg & Kadam 2002; Kim & Lim 2001; Koivumaki 2001; Luo & Seyedian 2004; Park & Kim 2003; Szymanski & Hise 2000; Turban et al. 2001; van Riel et al. 2001; Yang & Peterson 2004; Zhang & von Dran 2002). Table 3.2 depicts a summary of some important satisfaction measures tested by previous studies.

This study falls within the same interest of integrating marketing and information systems theories; therefore, the satisfaction construct is developed in relation to the integrated stream. To begin with, the widely used measurement of End-User Computing Satisfaction (EUCS) provides the information systems characteristics of the construct which include content, accuracy, format, timeliness and ease of use. Figure 3.2 illustrates the EUCS index.

Table 3.2: Empirical Measures of Consumer Satisfaction on the Internet

Authors	Description of study	Description of measures	Dimensions proposed by this study
Cho & Park (2001)	Electronic Commerce User Satisfaction Index (ECUSI)	*Customer service, purchase & delivery, site design, purchase process and product merchandising	Customer service quality
Kim & Lim (2001)	Determinants of satisfaction with Internet shopping	*Information quality, entertainment, speed and reliability.	Information quality
Luo & Seyedian (2004)	Relationships between attributes of online storefront and satisfaction	*Information quality, site design, convenience, privacy.	Information quality
Park & Kim (2003)	Factors affecting satisfaction and purchase behaviour	*Product merchandising, *ease of navigation, *security, *information quality.	Product/service range, ease of navigation, payment security, information quality.
Szymanski & Hise (2000)	Determinants of E-Satisfaction	Convenience, site design, product information and *financial security	Payment security
Torkzadeh & Dhillon (2002)	Perceived value as antecedent of satisfaction	*Online payment, *product choice, vendor trust, shopping convenience and shipping errors.	Payment security, product/service range.
Yang & Peterson (2004)	Measures of customer satisfaction	*Customer service, *order fulfillment, *ease of use, *product portfolio and *security/privacy.	Customer service quality, order fulfillment level, payment security, product/service range.
Zhang & von Dran (2002)	Web site quality and user satisfaction	*Information quality, *security, *price, *easy to navigate and site design.	Information quality, payment security, lower prices, ease of navigation.

*Note: * indicates the factor adopted by this study. Source: Developed for this thesis*

Figure 3.2: End-User Computing Satisfaction (EUCS) Index

Key:

Content

C1: Does the system provide the precise information you need?
C2: Does the information content meet your needs?
C3: Does the system provide reports that seem to be just about exactly what you need?
C4: Does the system provide sufficient information?

Accuracy

A1: Is the system accurate?
A2: Are you satisfied with the accuracy of the system?

Format

F1: Do you think the output is presented in a useful format?
F2: Is the information clear?

Timeliness

T1: Do you get the information you need in time?
T2: Does the system provide up-to-date information?

Ease of Use

E1: Is the system user friendly?
E2: Is the system easy to use?

Source: Doll & Torkzadeh (1988)

In addition to the above measures, Lee's model of Internet consumer satisfaction provides a foundation for the satisfaction construct of this study. This model suggests that retention is an outcome of satisfaction, which in turn is a result of Web technology attributes and the site shopping environment. Satisfaction includes customer support, logistic support, pricing and site quality. Site quality attributes involve online security, speed, system reliability, ease of use and information quality. Lee's model of consumer satisfaction on the Internet lends a more recent measurement of satisfaction in e-commerce, hence this study adopts the model as well. Figure 3.3 illustrates Lee's model.

Figure 3.3: Lee's Model of Internet Consumer Satisfaction
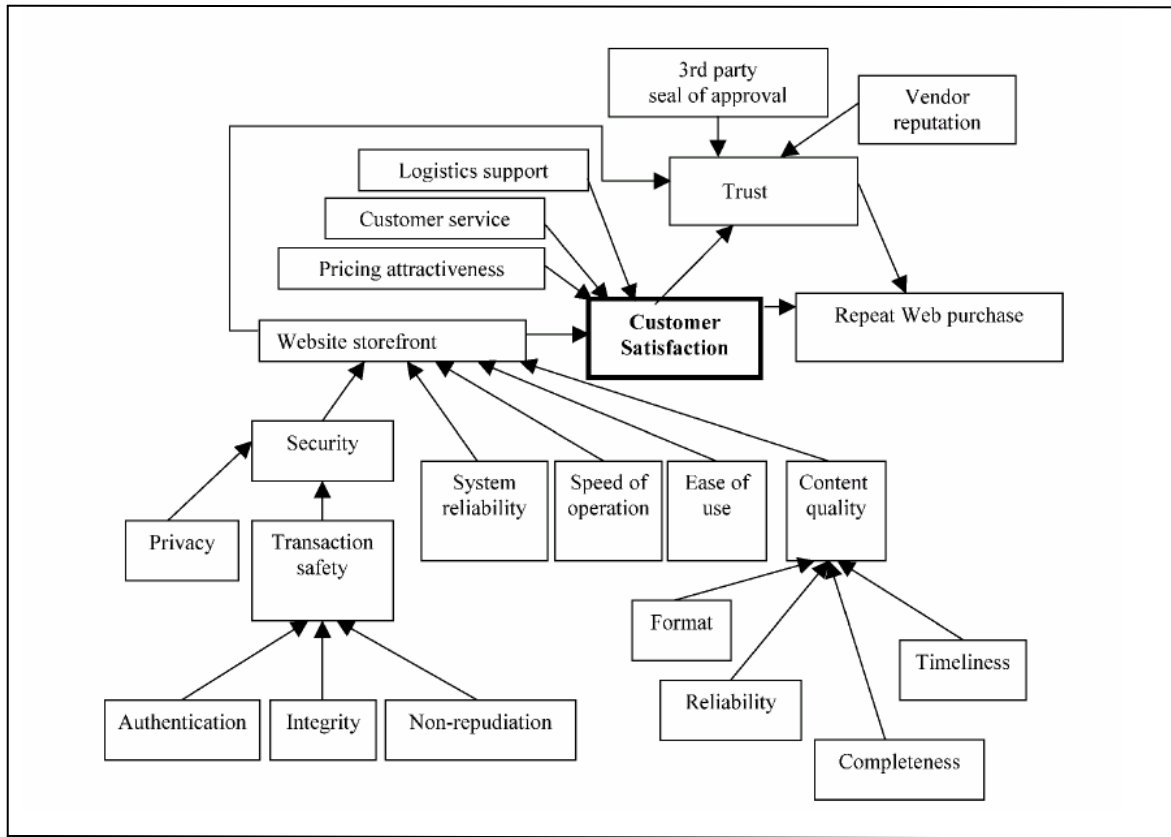
Source: Lee (1999)

The marketing literature has a bearing on the marketing characteristics, which include dimensions of lower prices, customer service quality, product/service range, and order fulfillment level. For this study, measures that exclusively focus on electronic commerce have been developed. Since in general this study aims at investigating the use of the Internet as a marketing tool, this study adapts the theories from marketing and information systems perspectives.

To develop the satisfaction construct, first the *marketing* elements were identified. *Product/service range* is cited as one of the important dimensions of satisfaction by many authors (Cho & Park 2001; Park & Kim 2003; Torkzadeh & Dhillon 2002; Yang & Peterson 2004), hence it was included. Lee's model suggests that logistics support plays an

important role in customer satisfaction (Turban et al. 1999).   Certainly, without efficient logistics, companies may not be able to deliver orders on time. Failing to fulfill orders as required by consumers may lead to consumer dissatisfaction.   Further, many authors suggest that order fulfillment, which also includes the delivery of the correct product, contributes to satisfaction (Cho & Park 2001; Reichheld & Schefter 2000; Yang & Peterson 2004). Therefore, *order fulfillment* encompassing delivery of the correct item and logistics support, which enable on time delivery, is another dimension of satisfaction. In agreement with Lee's model, Cho and Park (2001) and Yang and Peterson (2004) attest that the *quality of customer service* is an antecedent of satisfaction, hence this was included as one of the dimensions. *Lower prices* is cited by Lee's model as a factor contributing to satisfaction.   In fact, some believe that price and satisfaction are reversely related to suggest that Internet consumers are more attracted to lower prices (Goldberg 1998; McCune 1999; Zhang & von Dran 2002). Following these authors' proposals, this study posits that lower prices influence the assessment of satisfaction.

Next, the elements of *information systems* which are primarily concerned with the Web site storefront were considered. As suggested by Lee's model, *payment security* plays an important role in the satisfaction judgment. This view finds support in Luo and Seyedian (2004), Park and Kim (2003), Szymanski and Hise (2000) and Yang and Peterson (2004) studies.   Further, Lee's model proposes systems reliability, speed and ease of use as the technical characteristics of a good Web site. Indeed, the site accessibility, fast loading of pages and user friendly features of a site induces a pleasurable experience navigating a site. Moreover, the EUCS model highlights the importance of ease of use (user friendly) and format (interface design) of a site on user satisfaction assessment. These features are vital to ensure that users can *easily navigate* the site, leading to an increase in satisfaction level (Cho & Park 2001; Luo & Seyedian 2004; Park & Kim 2003; Szymanski & Hise 2000; Yang & Peterson 2004). Finally, Lee's model posits that content of a site contributes to satisfaction. Additionally, the EUCS model suggests that content of a good quality site should be timely and accurate. Indeed, the ubiquity of the Internet requires information that is relevant at the point of time it is displayed. Failing this may lead to consumer

dissatisfaction. Ensuring a high quality of information which is accurate, timely and understandable may increase satisfaction.

Therefore, this study seeks to investigate the satisfaction construct by the following seven dimensions: product/services range, information quality, lower prices, ease of navigation, order fulfillment level, customer service quality, payment methods and security. Figure 3.4 depicts a summary of these dimensions in relation to the relevant theories adapted in this study. A detailed description of each of these dimensions is discussed next.

Product/Service range. One of the common factors that contribute to consumer satisfaction on the Internet is the quality of products/services offered. Quality of products/services here refers to the online stores product/service related characteristics such as assortment and variety (Jarvenpaa & Todd 1997). The wider the range of products/services offered in an online store, the higher the possibility of a consumer's needs could be met and satisfied. This is more likely to be true especially when a traditional physical store lacks product assortment due to limited shelf space. A consumer's 'lesser' effort taken to locate a product on the Internet with the help of a search engine would lead to a higher probability of consumers being satisfied (Szymanski & Hise 2000). Furthermore, rich product information may assist consumers in their purchasing decisions and may increase satisfaction since better informed shoppers potentially make satisfying buying decisions.

In addition, quality includes the quality of the product items (Martensen et al. 2000; Szymanski & Hise 2000). Since consumers incur lower search costs over the Internet, it is thought that this would result in buying better quality products (Bakos 1997). However, most studies in the past only considered the service quality to measure

Figure 3.4: Theories Adapted for the Dimensions of Satisfaction

Internet consumer satisfaction model (Turban et al., 1999)	Dimensions proposed by this study	EUCS (Doll & Torkzadeh, 1988)	Other studies
	Product/service range		Cho & Park (2001), Park & Kim (2003), Torkzadeh & Dhillon (2002), Yang & Peterson (2004)
Logistics support	Order fulfillment level		Cho & Park (2001) Yang & Peterson (2004)
Customer service	Customer service quality		Cho & Park (2001), Yang & Peterson (2004)
Price attractiveness	Lower prices		Zhang & von Dran (2002)
Security	Payment security	Ease of use	Luo & Seyedian (2004), Park & Kim (2003), Szymanski & Hise (2000), Yang & Peterson (2004)
System reliability	Ease of navigation	Format	Cho & Park (2001), Luo & Seyedian (2004), Park & Kim (2003), Szymanski & Hise (2000), Yang & Peterson (2004)
Speed		Timeliness	
Ease of use		Accuracy	Kim & Lim (2001), Luo & Seyedian (2004), Park & Kim (2003), Szymanski & Hise (2000), Zhang & Von Dran (2004)
Content	Information quality	Content	

Source: Developed for this thesis

consumer satisfaction (Anderson & Fornell 1994; Dick & Basu 1994; Rust & Oliver 1994; Sivadas & Baker-Prewitt 2000). Service quality refers to an evaluation for the overall service delivery system of a company (Caruana & Pitt 1997; Edvardsson 1998; Iacobucci et al. 1995; Parasuraman et al. 1985; 1986).   It can be concluded that the higher the service quality delivered, the better the consumer experience and eventually the higher the level of consumer satisfaction (Anderson & Fornell 1994; Bitner et al. 1994)**.**

Information quality.   Although companies have a wide range of product/service assortments in their databases, failure to display up-to-date information regarding the product/service may be devastating. The site should have enough information to provide consumers with all necessary product/service information such as item description, price, ordering and delivery time, warranty and refund policy.   With more extensive product/service information and price-related information, consumers benefit from the low search cost as well as product and price comparisons, hence higher levels of consumer satisfaction can be achieved (Peterson et al.1997).

Based on information systems literature, information quality is a reflection of relevancy, recency, sufficiency, consistency and understandability (DeLone & McLean 1992; Moon & Kim 2001; Wang & Strong 1996). Since a consumer's decision making efficiency improves when searching is simplified, information presented on the sites should be easy to understand and up-to-date.

In fact, Koufaris et al. (2002) have proposed that consumers' buying decisions can be enhanced by value-added information on products. Making distinctions between value-added and non-value-added information, they emphasize that the former is generated uniquely by the online store and not available to the public. Examples of value-added information are product reviews, best selling items and recommendations from the online store. In this instance, information can provide important incentives for shoppers and may even be a source of differentiation (Jarvenpaa & Todd 1997).

Lower prices. A number of researchers have proposed that a significant number of e-commerce consumers are influenced by low prices (Goldberg 1998; McCune 1999; Zhang & von Dran 2002), which in turn affects satisfaction (Bolton & Lemon 1999). As the costs of searching for information decrease, consumers are more likely to compare prices and seek more value in products that they want to buy - which may lead to hunting for lower prices (Anderson & Srinivasan 2003).

Price on the Internet does not only refer to discounted price offered by a seller but also includes shipping and handling charges (Cassar 2001) since the delivery charge is part of the acquisition cost of a physical product purchased from a site. Online consumers can easily compare prices across e-tailers (retailers who use the Internet as their only marketing channel (Cao et al. 2004)). Consequently, if a price paid is higher than what is found in other e-tailers for a similar product, the consumer is significantly less satisfied (Anderson & Srinivasan 2003).

On the contrary, online consumers are not all pure bargain-hunters (Cao et al. 2004; Sinha 2000). Consumers who experience a higher level of overall satisfaction tend to be less price sensitive (Anderson & Srinivasan 2003). For example, consumers who find that the overall service quality and ordering process offered by one company are superior to those offered by other competitors are unlikely to defect despite a marginal increase in price. Nonetheless, online shoppers are not solely interested in convenience and service quality without concern about what they pay (Cao et al. 2004).

Ease of navigation. Ease of use has been one of the central issues in information technology satisfaction. The technology acceptance model (TAM) developed by Davis (1989) proposes that ease of use and usefulness of technology are the antecedents of user satisfaction and adoption of a new technology. The EUCS instrument includes *ease of use* and *format* as two of the five items contributing to end user computing satisfaction. Applied to a company Web site, *ease of use* refers to the user friendliness of the site while the latter relates to the user interface.

In brief, ease of navigation includes both good organization (*format*) of the content layout (Manes 1997) as well as simple-to-use navigation (*ease of use*) (Luo & Seyedian 2004). Sites that are easy to navigate offer quick access to information needed with minimized effort (Clawson 1993; Jarvenpaa & Todd 1997). Indeed, if consumers find a Web site too hard to navigate or is too time-consuming to get what they need, they may simply abort the search so as not to waste time (Luo & Seyedian 2004). On the other hand, sites that are fast to load, uncluttered, well organized and structured (Yang & Peterson 2004) are more pleasurable and satisfying to consumers (Eighmey & McCord 1998; Ernst & Young 1999; Fram & Grady 1995; Luo & Seyedian 2004; Patrick 1997; Szymanski & Hise 2000).

Order fulfillment level. According to Reichheld and Schefter (2000, p. 112), "the order fulfillment process is concerned with delivering the right product at the right time and responding to consumer inquiries". In its quest for consumer loyalty, Dell for example, adheres to strict performance standards which includes ensuring orders are delivered correctly. For the order fulfillment standard, the percentage of orders delivered to the consumer on time with complete accuracy is measured. As a result, Dell's customer retention rate has improved significantly. The experience of Dell and other successful online companies show that order fulfillment does not only contribute to satisfaction but is also a key driver of loyalty (Cao et al. 2004; Reichheld & Schefter 2000).

Ho and Wu (1999) identify five factors as antecedents of satisfaction and find logistical support the most important (Zhang & von Dran 2002). Effective logistics is a critical support activity for e-commerce to ensure on time delivery. However, from Reichheld and Shefter's (2000) definition, order fulfillment also includes delivery of the correct product. Indeed, if an order is delivered on time with the support from efficient logistics, consumers will still be dissatisfied if the product received is not as per ordered. Hence, order fulfillment is concerned with the correct item and on time delivery.

Customer service quality. To satisfy consumers, companies need to pay as much attention, if not more, to post purchase (consumption) service. The fact is that

competitors are just a click away. It is a necessity that an online company maximizes its efforts in communicating the firm's image and purpose to its consumers (Bitner 1992).

Consumers constantly demand for careful, continuous, useful communication with company representatives (Lohse & Spiller 1998). Since these attributes are frequently identified as salient dimensions in store selection behaviour (Jarvenpaa & Todd 1997; Kolesar & Galbraith 2000), company representatives should have the knowledge and basic technology skills to answer online questions.   They should understand consumer-specific needs, have the capacity to handle problems that arise and address consumer complaints in a friendly manner (Yang & Peterson 2004).

Payment security.   Another important factor contributing to online consumer satisfaction is payment issues and security as suggested by Lee's model and it is frequently cited by many studies (Anderson & Srinivasan 2003; Luo & Seyedian 2004; Park & Kim 2003; Salisbury et al. 2001; Szymanski & Hise 2000; Yang & Peterson 2004).   Basically, online security is concerned with user authentication, data and transaction security (Ratnasingam 1998; Rowley 1996).

Consumers are concerned about online payment security, reliability and privacy policy (Gefen 2000) since they have to provide their personal details and credit card information in the ordering process. This concern increases the perception of risk and simultaneously reduces the level of trust in an online company, which in turn adversely affects satisfaction (Elliot & Fowell 2000; Szymanski & Hise 2000). Hence, online companies that clearly communicate to consumers on how their private and transaction data are secured (Elliot & Fowell 2000; Park & Kim 2003) are more likely to benefit from increased consumer satisfaction.

A CLD representation of the satisfaction construct proposed by this study is illustrated in Figure 3.5. Table 3.3 summarizes the items of satisfaction and the dimensions they represent.

Figure 3.5:   A CLD Model of 'Satisfaction' Construct
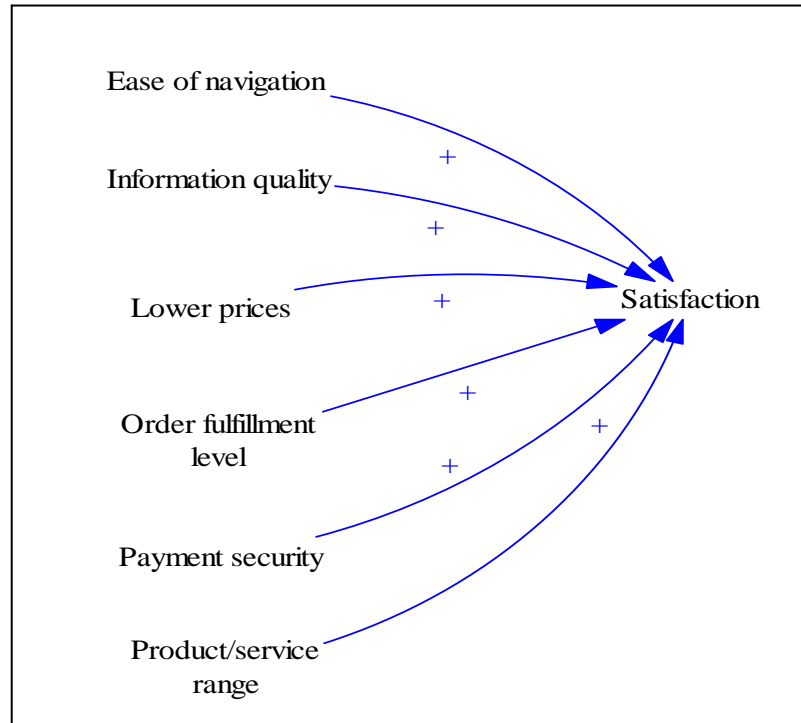
Source: Developed for this thesis

Nonetheless, past researchers claimed that satisfaction does not necessarily lead to profitability, but loyalty does. Thus it is important for firms to understand the salient dimensions of consumer loyalty. These dimensions are discussed in Section 3.3.2.

3.3.2   Consumer loyalty construct

Researchers in the marketing field have investigated the salient dimensions of consumer loyalty. Past studies have provided three main factors affecting consumer loyalty: perceived value, trust and emotional benefit.

Table 3.3: Items and Dimensions of Satisfaction

Items of Satisfaction	Dimensions of Satisfaction
Product/Service range items - Products/services offered are up-to-date - More varieties in product/services offerings	Product/Service range
Information quality items - In-depth information - Easy to understand - Accurate	Information quality
Lower prices items - More discount prices - Low delivery charges	Lower prices
Ease of navigation items - Web site is accessible - Easy steps to register - Few clicks to information - Load quickly - Links are clearly displayed - Language can be easily understood	Ease of navigation
Customer service quality items - Efficient in handling complaints - Friendly when answering enquiry - Always notify order status - Within 48 hours response - Multi-channel contact point - Appears to have wide knowledge of products/services - Professional in answering enquiry if any problem arises with customer orders - Professional in handling complaints - Will inform whenever a problem with orders arises - Keep updates of users' transactions records - Fast in resolving customers complaints	Customer service quality
Order fulfillment level items - Products received are in good condition - Products/services are delivered within the delivery time as promised	Order fulfillment level
Payment security items - Provides various types of credit cards for payment - Provides alternative payment method other than credit card - Privacy policy is clearly communicated to customers	Payment security

Source: Developed for this thesis

Perceived value. Consumers are willing to be loyal to firms that can deliver superior value relative to the offerings of competitors (Reichheld 1996). Zeithaml (1988) defines value as consumer's overall assessment of a product/service following his/her consumption based on perceptions of benefits and costs. Therefore, perceived value, which has its roots in equity theory (Oliver & DeSarbo 1988), refers to an evaluation of perceived benefits gained in return of perceived costs sacrificed associated with the offering (Iacobucci et al. 1994). In other words, total consumer value is the benefits a consumer expects from a given product/service, while total consumer cost is the costs a consumer expects to incur in evaluating, obtaining and using the product/service (Lin 2003). Consumers tend to feel equitably treated if they perceive that the ratio of their outcome to inputs is comparable to the ratio of outcome to inputs experienced by the company (Yang & Peterson 2004; Oliver & DeSarbo 1988) and that offered by other competitors.

In e-commerce, the importance of perceived value stems from the fact that the search facilities make it easy for consumers to find and compare product features and prices. The consumers will be able to compare the array of benefits that they will derive from the product/service that they intend to buy. Perceived value contributes to loyalty by reducing consumers' need to seek alternative service providers (Yang & Peterson 2004). Foster and Cadogan (2000) and Morgan and Hunt (1994) suggest that perceived value may result in more favorable attitudes – attitudinal loyalty about the provider. In turn, Koufaris et al. (2002) studied the context of flow, that is the holistic sensation that an individual would experience when he/she acts with total enjoyment (Csikszentmihalyi 1975; 1997; Csikszentmihalyi & Csikszentmihalyi 1988) and attest that perceived control; an attitudinal variable is a significant predictor of intention to return (Eighmey 1997; Jarvenpaa & Todd 1997). Certainly, consumers will feel empowered and in control when they are able to easily find a product/service, learn more about it and quickly make a purchase decision. For example, a site may provide features such as shopping carts, one-click ordering and order tracking to provide superior convenience and higher levels of consumer control (Batty & Lee 1995).

From an information systems perspective, site value refers to the extent to which users perceive a Web site is useful, important and valuable (Amit & Zott 2001; Kenny & Marshall 2000; Krauss 2001; Sweeney & Soutar 2001) as in providing convenience, ubiquity, low entry cost and the absence of time or space limitation (Luo & Seyedian 2004). Consumers adopt the disruptive innovation of the Internet mainly due to its superior value offerings (Sweeney & Soutar 2001). Indeed, users who do not perceive a site as valuable may never bother to experience the superior values rendered by the site.

Trust. Another factor which plays a significant role in creating loyalty is trust. Trust concerns earning the trust of consumers who will want to do business with the company (Reichheld & Schefter 2000). Morgan and Hunt (1994) define trust as the confidence in the reliability and integrity of an exchange partner. Trust is a key mediating variable in sustaining a buyer-seller relationship (Garbarino & Jonhson 1999; Morgan & Hunt 1994) and is perceived as the independent benefit of a long-term relationship (Ravald & Gronroos 1996). Specifically, the greater the trust in the provider, the greater the value placed on the relationship (Ramsey & Sohi 1997), thus the stronger the sense of loyalty.

Since online transactions are associated with perceived risk; trust and confidence in the firm seem imperative (de Ruyter et al. 2001) in a consumer's decision making. Consumers are concerned about security, privacy and protection against business fraud (Meditz 1998). In fact, most consumers have yet to shop or may have aborted an online transaction because of concerns about privacy and security (Hershel & Andrews 1997; Hoffman & Novak, 1996; Hoffman et al. 1999; Korgaonkar & Wolin 1999). Indeed, providing credit card information to an online company that has no physical location increases the perception of risk. Vatanasombut et al. (2004) claim that perceived *security* consists of two components: perception of security in using the Web technology to transact, and perception of security in interacting with the firm. Assurance of security in using the Web can be done by implementing security features such as digital certificates, secure servers and third party trusting agencies. As for the latter, firms can communicate

to the consumers the fact that they have implemented advanced technologies and safety procedures to prevent computer crimes and are always adhering to privacy principles.
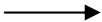
Emotional benefit.   Another important key driver of loyalty is emotional benefits perceived by consumers based on their experiences.   Consumers' emotional and judgmental reaction to products and services are influential factors for consumers' commitment and loyalty (Gronroos 1990).   According to Yu and Dean (2001), the emotional component of satisfaction serves as a good predictor of loyalty.   Mittal and Lassar (1998) address this emotional benefit as functional quality that is essential in winning consumer loyalty.   The emotional component includes positive emotions such as relief, elation, joy (Bagozzi et al. 1999), hopefulness and being positively surprised, and negative emotions such as being angry, depressed and humiliated (Yu & Dean 2001).   Indeed, consumers who are delighted with the superior services are more likely to return to the site (Lee et al. 2001; Parasuraman & Grewal 2000).   The CLD representation of loyalty construct is illustrated in Figure 3.6.   Table 3.4 summarizes the items for the dimensions of consumer loyalty.

Figure 3.6:   A CLD Model of 'Loyalty' Construct
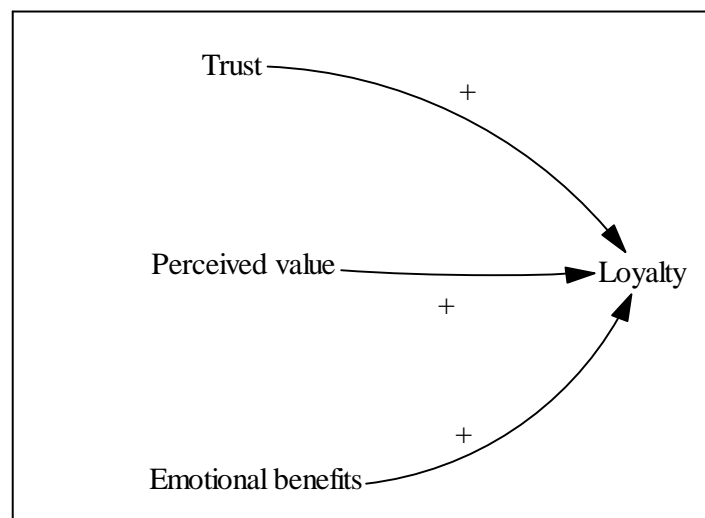
Source: Developed for this thesis

Table 3.4: Items and Dimensions of Loyalty

Items of Loyalty	Dimensions of Loyalty
Trust items - Adopts strict privacy policy - Provides third party verification - Customer service is reliable - Practices high security standard - Provides third party seal to for authentication	⟶ Trust
Perceived value items - Provides access to track orders - Allows changes to orders - Provides profile analysis - Enables custom-made product/service - Understands consumer needs - Keeps track of transaction	⟶ Perceived value
Emotional benefit items - Feel excited about entertainment features - Enjoy browsing	⟶ Emotional benefit

Source: Developed for this thesis

3.3.3 Consumer retention construct

The notion of consumer retention has captured the interests of many researchers. Propositions of consumer retention emerge from four main perspectives: service marketing, industrial marketing, general management (Ahmad & Buttle 2002) and information systems. The service marketing perspective argues that the way to retain consumers is to improve customer service quality and satisfaction (Berry & Parasuraman 1991; Gronroos 1990; Hocutt 1998; Shemwell et al. 1998; Zeithaml & Bitner 1996). A study in the context of relationships between banks and their small business customers in the UK further supports this proposition, that is, retention is influenced by service quality and customer relationships (Ennew & Binks 1996).

From the industrial marketing literature, it is suggested that retention is an outcome of forging relationships or multi-level bonds comprising *social, financial and structural bonds* (Ahmad & Buttle 2002). *Social bonds* refer to positive interpersonal relationship

between the buyer and seller. Implicitly, the latter refers to the relationships that are built upon joint investments and cannot be retrieved when the relationship ends (Turnbull & Wilson 1989). This may be due to the complexity of the relationships and high switching costs. For example, in suppliers from one machine to another may result in an increase in cost of retraining the technicians for the customer. Similarly, Jackson (1985) found that stronger relationships developed between mainframe computer customers and their suppliers who defined the parameters of the machine installation. In such a case, switching to another supplier would end up in higher risks of transferring programs from one computer to another and an investment in time (taken to make the 'switch'). Thus, customers are often at best advantage by forging a long-term contract than switching. Certainly, customers perceive value in saving costs of retraining or making a new investment with sellers, resulting in retention.

DeSouza (1992), Reichheld (1996) and Rosenberg and Czepiel (1984) offer a general management perspective of consumer retention. DeSouza (1992) suggests that by learning from complaints and service data and raising barriers to switching, companies can prevent consumers from defecting. In addition, an analysis of consumer portfolios, which includes first-time buyers, repeat buyers, switched then return and last-time buyers may help in reorganizing for consumer retention (Rosenberg & Czepiel 1984). Reichheld et al. (2000) advocate serving the 'right' customers and keeping employees since customer retention and employee retention reinforce one another. The latter focuses on rewarding an agent who is committed to building a long-term relationship with the business and who is likely to build longer relationship with customers. Targeting on consumers who are likely to do business over time is an ingredient for a successful consumer retention program. Indeed, an analysis of demographics and previous purchase history provide a good indication of consumers' patterns of behaviour.

The information systems perspective postulates that user retention on the Internet varies according to users' sophistication level. A study conducted on online banking users identified two different types of users: novice users and sophisticated users (Vatanasombut et al. 2004). The latter group of users views technical performance, such

as server speed and downloadable software, as the reason for building a longer relationship with providers. Novice users on the other hand, demand efficient customer support. For example, when a user fails to remember a login password, solutions are available almost immediately and effortlessly. At a more general level, Vatanasombut et al. (2004) cited perceived security, trust, feeling in control, online community of users and channel integration as important determinants of user retention.

An earlier study by Geissler (2001) supports these findings where a group of Web designers asserted that customer service, online community, and security are important attributes to lure first time visitors to come back. In addition, gathering consumer data is essential to help relationship marketing where personalized services can be offered to individual users. Certainly, users who are able to design their own display pages such as those offered by My Yahoo!, receiving personalized email promotions and recommendations, will feel more in control and are more likely to return in future. Reward, (contrary to Vatanasombut et al.'s (2004) finding) is another attribute Geissler (2001) reports as important to attracting consumers to revisit. For example, users who are easily intrigued by prizes for solving puzzles are more likely to come back for more rewards in the next visit.

More recent studies on consumer retention depart from an integrated approach of marketing and information systems to suit the nature of e-commerce. For example, Dabholkar (2000) reports that consumers who view technology-based services as easy-to-use, reliable and enjoyable perceive higher service quality, which in turn contributes to favorable marketing behaviours (such as repurchase). This proposition is well supported by many studies (for example, Andre and Saraiva (2000), Edvarsson et al. (2000), Feinberg and Kadam (2002), Koufaris et al. (2002), Parasuraman and Grewal (2000), Reichheld and Schefter (2000), Taylor and Hunter (2002), and van Riel et al. (2001)). Examining online service quality, Gronroos (2000) suggests four types of e-services (services delivered over the Internet channel (Rust & Lemon, 2000)) namely core service, facilitating, supplementary and user interface. Core service includes information on product/service offerings; facilitating service refers to search engines and ordering

facilities, and the outlook and usability of the site constitute user interface (van Riel et al. 2001). In relation to retaining online consumers, value-added supplementary services such as *personalized recommendations* and product reviews are believed to be an important driver of intentions to continue using a portal, that is a site serving as a starting point to the Web and features commonly used services (Koufaris et al. 2002; Luo & Seyedian 2004; Park & Kim 2003; van Riel et al. 2001; Winer 2001).

In addition, quality *customer service* is viewed as an antecedent of and a salient dimension of retention (Park & Kim 2003; Winer 2001; Yang & Peterson 2004). Indeed, it is vital for a firm to ensure that customer service has the capacity to handle frequently asked questions, inquiries pertaining to credit, return and payment policies as well as the ability to provide speedy answers accurately. As well, *rewards* in terms of loyalty discounts and other incentives such as free gifts, rebate or point redemption are viewed as another important attribute to influence purchase behaviour over the short run (Anderson & Srinivasan 2003; Winer 2001). To make a Web site more enticing Winer (2001) suggests building an *online community* of site users. This would make it more difficult for the consumer to leave the acquaintances who also patronize the company. Table 3.5 illustrates a summary of the dimensions of retention construct developed by past researchers. Drawing upon an integrated marketing and information systems stream, the following factors are proposed as the dimensions of consumer retention construct: *personalization, online community, reward, customer service and channel integration* (refer to the last column in Table 3.5).

Personalization level. Personalization, which has rapidly gained broad attention by businesses (Economist 2001), aims at providing products/services that serve an individual's personal needs and wants (Du et al. 2003; Galbreath & Rogers 1999) at the right time (Pine & Gilmore 1999). In fact, consumers' involvement in designing products/services offered by Web sites is imperative since consumers have the very best understanding of their needs and relay the information to the providers (von Hippel 1998). This knowledge of consumers' preferences is vital to avoid the sacrifice of

Table 3.5: Dimensions of Retention Construct Developed by Previous Studies

Authors	Discipline	Description of measures	Dimensions proposed by this study
Berry & Parasuraman (1991); Ennew & Binks (1996); Gronroos (1990); Hocutt (1998); Shemwell et al. (1998); Zeithaml & Bitner (1996)	Service marketing	*Customer service quality, satisfaction, customer relationship	Customer service quality
Ahmad & Buttle (2002); Turnbull & Wilson (1989); Jackson (1985)	Industrial marketing	Interpersonal relationship, switching cost.	
DeSouza (1992); Rosenberg & Czepiel (1984); Reichheld (1996, 2000).	General management	Identifying patterns and targeting right customer, personnel management.	
Geissler (2001)	Information systems	*Personalization, *reward, *online community, *customer service quality.	Personalization level, reward, online community, customer service quality
Koufaris et al. (2002)	Information systems	User empowerment	
Vatanasombut et al. (2004);	Information systems	User empowerment, *channel integration, security, *customer service	Channel integration, customer service
Luo & Seyedian (2004)	Integrated: Marketing and information system	*Personalization	Personalization level
Park & Kim (2003)	Integrated: Marketing and information system	*Personalization	Personalization level
Winer (2001)	Integrated: Marketing and information system	*Personalization, *reward/loyalty program, *online community and *customer service.	Personalization level, reward, online community and customer service.

*Note: * indicates the factor adopted by this study. Source: Developed for this thesis*

consumer goodwill and maintain superior satisfaction (Du et al. 2003). Indeed, personalization attracts consumers to come back repeatedly since it turns consumers into product 'makers' rather than simply product 'takers' (Winer 2001), Thus, consumers are empowered in ways that they can choose their own preferred design, colour, product updates and other attributes that go well with their tastes. Slywotsky (2000) refers to this process as a "choiceboard" where consumers take a list of product attributes and determine what they want. The consumers are actually facilitating the activities of the company especially in product design, data collection and consumer service, which in turn extract value from participating in the marketing process (Moon 1999). These customized offerings allow the companies to know their consumers' behaviour in greater depth (Reichheld & Schefter 2000). For example, apart from higher repeat-purchase rate, Levi's Stores, who provides customization for their consumers, also have lower product return rates and an increase in purchases per store visit (Moon 1999).

Online Community. Another factor that can help companies retain their consumers is by building an online community of consumers. An online community is an e-group, which is an online discussion forum for registered members of a site, where members receive the messages or emails posted and replied by other members in the group (Sands 2003). In this way, consumers are able to create relationships with the company and other consumers (Geissler 2001; Winer 2001).

Consumers can exchange information with each other and obtain online help from their online members when a product related problem arises (Moon 1999). These experiences create stickiness - the extent to which a company is able to attract consumers to use a site relatively longer and return (Strauss & Frost 1999), and consumers are more likely to revisit the site (Singh 2002). Therefore, online community can serve as an exit barrier since the relationship that develops among the members of the group may make it difficult for consumers to switch.

Reward. Reward is another attribute deemed important to attracting consumers to repatronize (Anderson & Srinivasan 2003; Geissler 2001; Stum & Thiry 1991; Winer

2001). Reward programs allow consumers to collect points for every purchase from or visit to a site, in exchange for free gifts, coupons or cash rebates. The program also provides greater membership privileges for returning consumers (Winer 2001). However, Winer (2001) claims that reward programs have their drawbacks. They are expensive to implement and there is the uncertainty of the real effect on increasing retention.

Channel Integration. Finally, another possible driver of consumer retention is the integration between the offline and online channels. Learning from the experiences of pure e-commerce companies such as Amazon.com and other click-and-mortar (a company that uses the Internet as a marketing channel in addition to other existing physical channels (Gulati & Garino 2000)), firms must still utilize the offline channel as part of their marketing strategies (Vatanasombut et al. 2004). Failures to match and integrate both channels will adversely affect consumers' repatronage behaviour (Lin 2003). The absence of integration in hybrid retail strategies will result in inconsistent and unsatisfactory consumer experiences, which will not make any online business successful (Bradshaw & Brash 2001). Barnes & Noble is an example of inconsistency and has sacrificed more than it gained by divorcing its online business from its established traditional stores (Gulati & Garino 2000).

For click-and-mortar companies, integration of the virtual and physical operations is crucial to ensure continuous consumer relationships in both channels. This is because consumers want to be able to deal with companies as single entities (Bradshaw & Brash 2001). They also expect to get the same consumer service level via all channels (Croen 2001). Thus, to provide consistent consumer experience, every consumer's details should be shared in a common database and accessible directly by both channels. With the integration system, both online and offline consumer databases are merged. James (2000) claims that this integration allows the companies to access more data about a consumer's preferences and purchase history. In this way, consumers will have no need to repetitively provide the same information upon login.
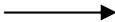
In fact, Xu et al. (2002) point out that the integration systems provide the highest quality and most timely information. Indeed, the more data a company gets the more accurate the company can be in terms of what it recommends to the consumers and how it communicates with them. This may lead to building good consumer relationships (James, 2000; Yakhlef 2001). By synchronizing the elements of online and offline channels, the consumers may approach the company through either channel preferred by them. They may purchase through the Internet but seek after-sales service from the physical store, or vice-versa. In addition, by providing useful information on the Internet, companies can facilitate the consumers' buying process in the physical store. For example, Office Depot, one of the leading office equipment retailers in the USA, has added an Internet channel to market its products. This site, among others readily allows its consumers to check product availability in a nearby store. Office Depot's site has actually increased the traffic at its physical outlets by providing information about store locations and inventory through its Web site (Gulati & Garino 2000). Through the Web channel, consumers can save valuable time and energy by checking whether their orders are ready for pick-up at the physical store. This will increase the value delivered to the consumers, thus increases the likelihood that they will continue to buy from the company in the future (Reichheld & Schefter 2000). Figure 3.7 depicts a CLD representation of the retention construct. Table 3.6 summarizes the items for the dimensions of retention.

Figure 3.7: A CLD Model of 'Retention' Construct
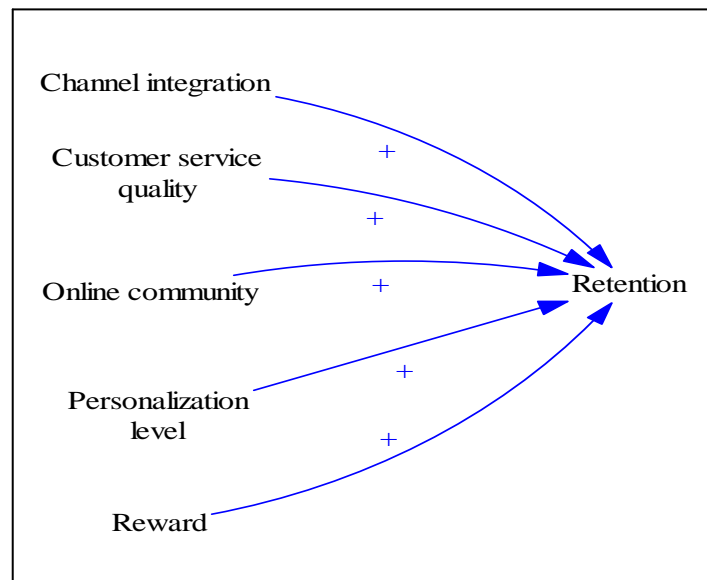
Source: Developed for this thesis

Table 3.6: Items and Dimensions of Retention

Items of Retention	Dimensions of Retention
Personalization level items - Keeps a transaction database - Personalized advertisement - Creates "My Account" - Custom-made product/service - Receives personalized email	Personalization level
Customer service quality items - Efficient in handling complaints - Friendly when answering enquiry - Always notify order status - Within 48 hours response - Multi-channel contact point - Appears to have wide knowledge of products/services - Professional in answering enquiry if any problem arises with customer orders - Professional in handling complaints - Will inform whenever a problem with orders arises - Keep updates of users' transactions records - Fast in resolving customers complaints	Customer service quality
Reward items - Reward for returning - Offers cash rebate - Point redemption - Offers coupons - Attractive gifts for purchase/subscription	Reward
Channel integration items - Pick-up orders at the nearest store - Check orders at the nearest store - Return products at the nearest store	Channel integration.
Online community items - Share/exchange information - Trade goods with group members - Obtain useful information about company from others	Online community

Source: Developed for this thesis

However, some researchers argue that repeat purchase behaviour is not a surrogate of long-term relationships and that it is susceptible to causes of switching. Therefore, it is imperative that firms comprehend the contributors to long-term consumer relationships. These dimensions are discussed in Section 3.3.4.

3.3.4 E-CRM dimensions

This study proposes that the implementation of E-CRM program would influence consumer satisfaction assessment, which in turn may lead to consumer loyalty and retention. Despite the increasing interests illustrated by academics and industries in managing consumer relationships on the Internet, there is very little empirical evidence on the salient dimensions of E-CRM programs. An important consideration in the development of the E-CRM dimensions is clearly the business environment in which consumers are engaged. E-CRM is concerned with delivering an effective relationship marketing program on the Internet. The Internet channel lacks physical contact, where in most instances companies offerings are usually information and service-based. In such environments, consumers' judgment of the performance of an online retailer is very much based on the quality of services delivered via the Internet technology. Hence, it seems reasonable that in this study the technology-based service quality framework proposed by Zeithaml et al. (2000) is adapted. The framework comprises 11 dimensions of technology-based service quality: access, assurance/trust, ease of navigation, efficiency, flexibility, personalization, reliability, responsiveness, security/privacy, site aesthetics and price knowledge. In addition, other studies suggest that an E-CRM program should include several items. Expanded on Anton and Postmus's (1999) 25 items of E-CRM, Feinberg and Kadam (2002) listed 42 items of E-CRM which companies should consider implementing on their sites. Table 3.7 illustrates these features of E-CRM.

Table 3.7: 42 Features of E-CRM

	E-CRM features		E-CRM features
1.	Complaining ability	22.	1-800
2	Privacy policy	23.	Track order status
3.	Product information online	24.	External links
4.	Product highlights	25.	Member benefits
5.	Preview product	26.	Spare parts ordering
6.	Site map	27.	On sale area
7.	Email	28.	Quick order ability
8.	Purchase conditions	29.	Site customizing
9.	Customer service page	30.	Postal address
10.	About company	31.	Order within 3-clicks
11.	Local search	32.	Domain fault repair
12.	Problem solving	33.	Find stores
13.	Cross sell/up sell	34.	Gift certificate
14.	Online purchasing	35.	Fax
15.	Check out	36.	Request catalog
16.	Info first time users	37.	Affinity program
17.	Membership	38.	Chat
18.	Mailing list	39.	Bulletin board
19.	Product customization	40.	Site tour
20.	Your account info	41.	VoIP
21.	FAQ	42.	Call back button

Source: Feinberg and Kadam (2002)

Since Internet technology changes rapidly alongside with consumers' expectations, the study of specific E-CRM features has made the past studies less appropriate. Instead, this study focuses on measuring an E-CRM program by investigating the salient dimensions of which encompass almost all of E-CRM activities.

Drawn from the theories presented above, this study proposes 13 dimensions of E-CRM: channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust. A CLD representation of this model is shown in Figure 3.8. Figure 3.9 summarizes the dimensions of E-CRM and the theories adapted for this study.

Figure 3.8: A CLD Model of E-CRM
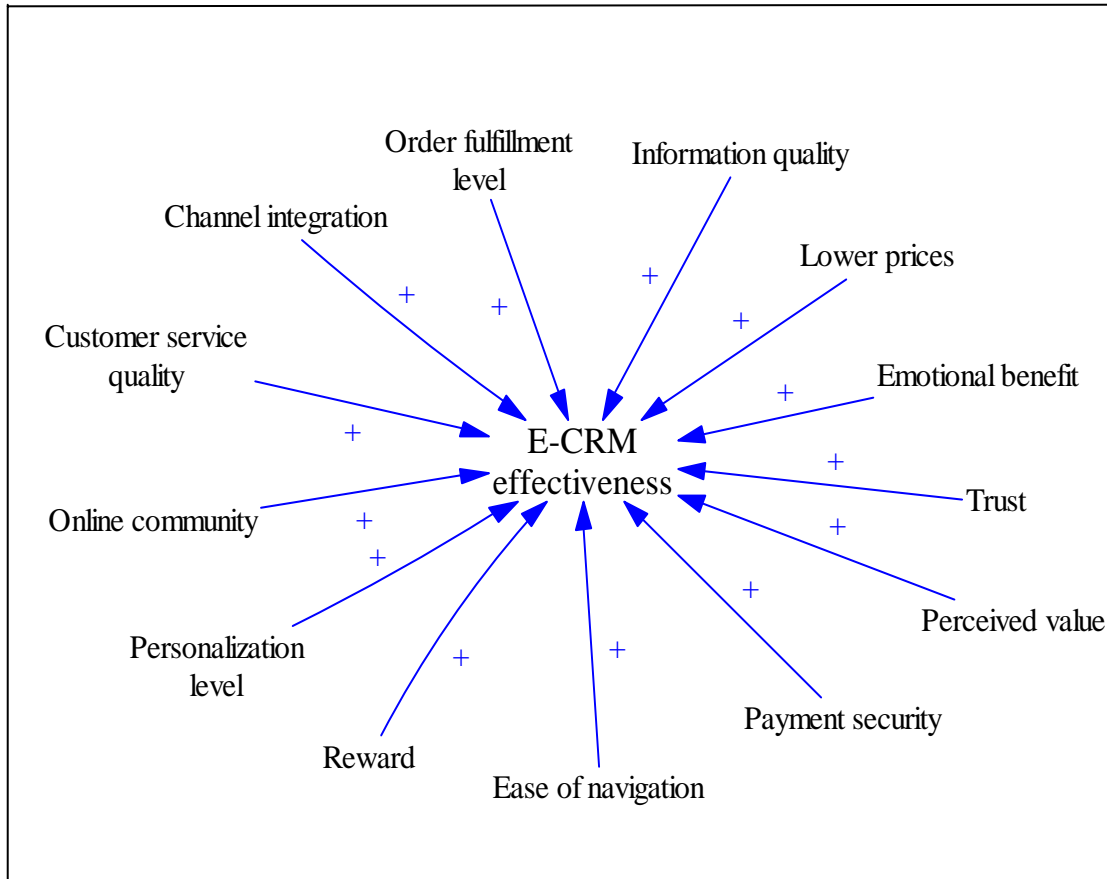
Source: Developed for this thesis

Figure 3.9: Dimensions of E-CRM and the Adapted Theories
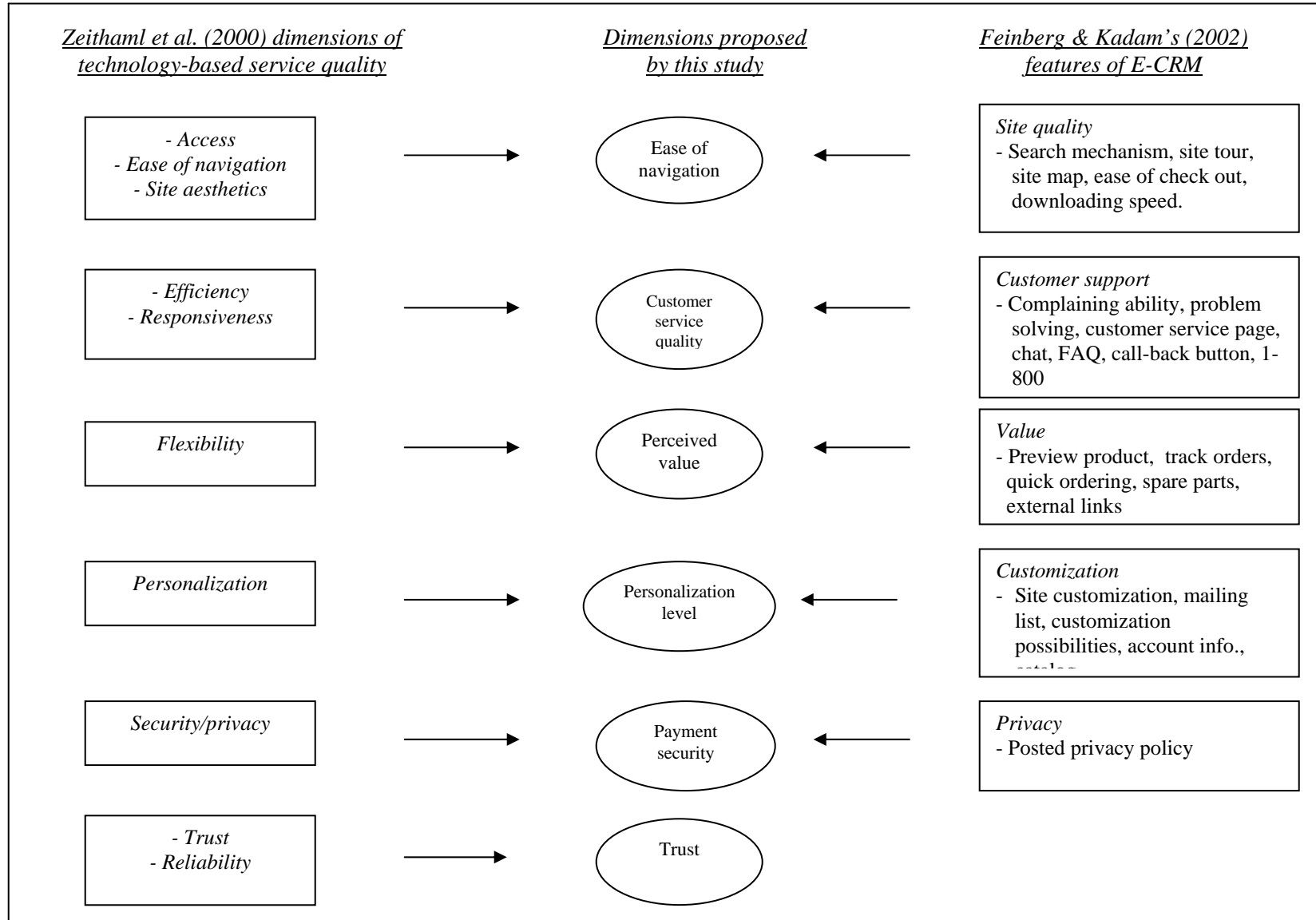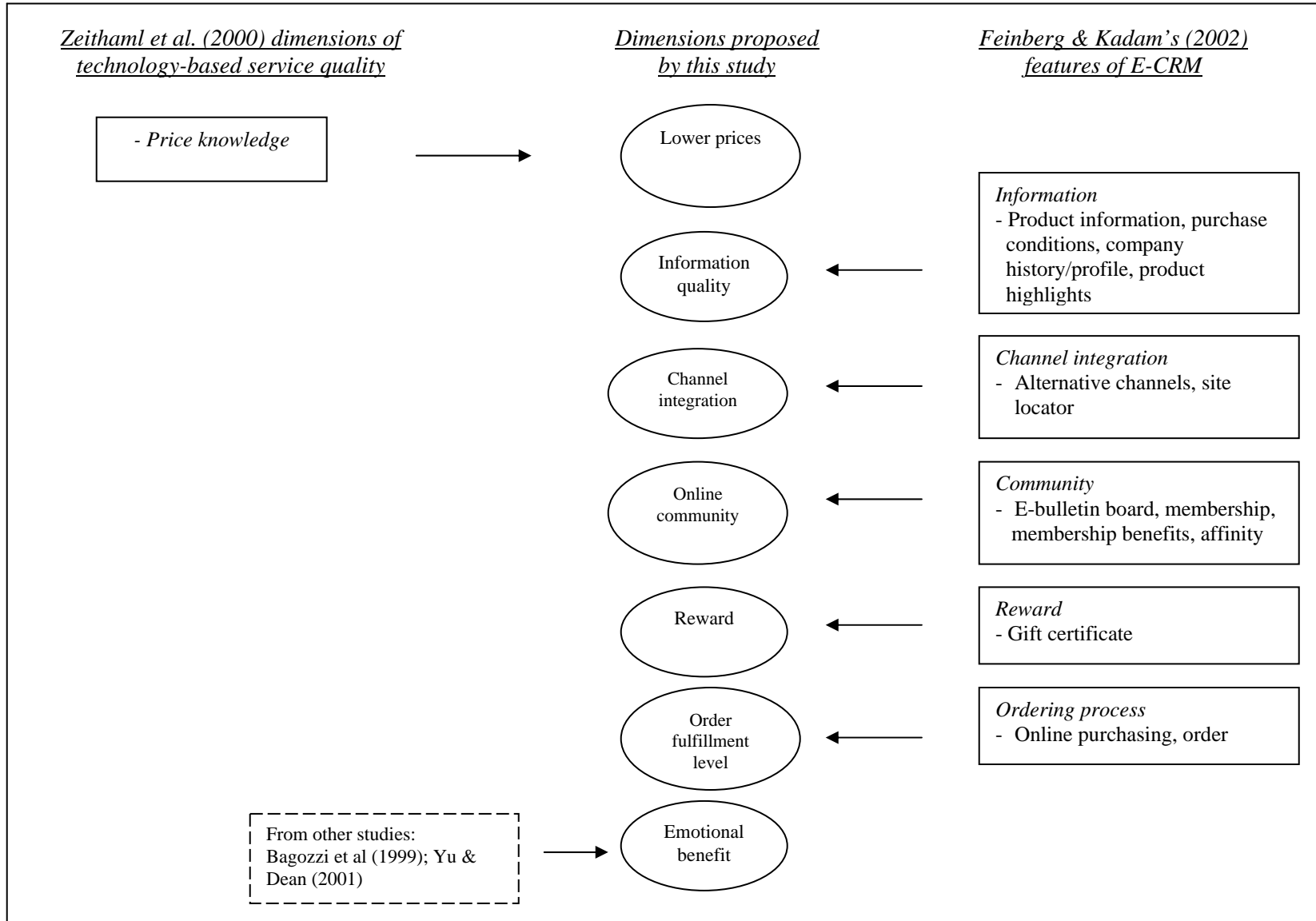
Figure 3.9: Dimensions of E-CRM and the Adapted Theories

3.4 Levels of model investigation

This section presents the models under examination by this study. Basically there are four levels of investigation namely, the dimensions, cause-effect structure, interrelationships between E-CRM and consumer characteristics, and finally the competing models. Alongside with the model investigation, relevant research propositions are introduced.

3.4.1 Level one: Dimensions of satisfaction, retention and loyalty.

As illustrated in Sections 2.7.3, E-CRM concerns winning loyal consumers on the premise that serving existing consumers is less costly than acquiring new ones (Reichheld 1996). Despite a widespread agreement that CRM and E-CRM is crucial, it is also clear that E-CRM implementation is quite challenging (Feinberg & Kadam 2002). That is, without a good understanding of the variables that E-CRM is related to firms' efforts may end up hurting profits (Ahmad & Buttle 2002; Dowling 2002; Feinberg & Kadam 2002; Reinartz & Kumar 2002). Therefore, it is vital to identify the dimensions that help build long-term relationships: improved consumer satisfaction, increased consumers intention to return, and acquired loyalty.

Dimensions of satisfaction. Although researchers debated the effect of satisfaction on long-term consumer relationships (Anderson & Fornell 1994; Anderson & Mittal 2000; Andre & Saraiva 2000; Oliver 1999; Rust et al. 1995; Taylor & Hunter 2002) it is worthwhile to identify the dimensions that contribute to satisfaction in an online environment. Indeed, satisfied consumers are more likely to have a higher usage level of a service (Bolton & Lemon 1999; Ram & Jung 1991), develop a closer relationship and may be dependent on a provider (Anderson & Srinivasan 2003). That is, the higher the satisfaction, the greater the intention to re-visit a site (Cho & Park 2001; Khalifa & Liu 2003; Yang & Peterson 2004; Zeithaml & Bitner 1996). Having presented the main theories of satisfaction construct in Section 3.3.1, this study seeks to investigate the satisfaction construct by the seven dimensions: product/service range, information

quality, lower prices, ease of navigation, order fulfillment level, customer service quality, and payment security.   Thus, a first hypothesis is proposed:

> *RP1.1: Satisfaction is a function of customer service quality, ease of navigation,   information quality, lower prices, order fulfillment level, payment security and product/service range.*

Dimensions of loyalty.   Researchers argue that repeat purchase behaviour does not necessarily convert into true loyalty (see Section 2.5). Consumers may appear to be loyal due to lack of alternatives or simply due to inertia (Anderson & Srinivasan 2003; Reinartz & Kumar 2002; Yu & Dean 2001). On the other hand, true loyalty is a result of evaluation processes leading to commitment to a site (Assael 1992; Bloemer & Kasper 1995; Dick & Basu 1994; Keller 1993; Oliver 1999).   That is, attitudinally loyal consumers are more likely to resist competitors' marketing campaigns, which result in commitment to return and are more profitable to keep. Based on the literature presented in Sections 2.5 and 3.3.2, this study defines loyalty as both attitudinal and behavioural responses which leads to a three-dimension loyalty construct. Thus, it is proposed that,

> *RP1.2: Loyalty is a function of emotional benefit, perceived value and trust.*

Dimensions of retention.   Past researchers claimed that satisfaction does not lead to profitability, but retention does (Foster & Cadogan 2000; Morgan & Hunt 1994; Reichheld 1993; Reichheld et al. 2000). Reichheld (1996) attests that a small increase in consumer retention can yield a significant increase in profits. That is, existing consumers are less costly to maintain than to acquire new accounts, which leads to the emphasis in building long-term relationships with consumers (Christopher et al.1991; Gilbert 1996; Reichheld & Sasser 1990; Winer 2001). Thus, it is important for firms to understand the salient dimensions of retention. Drawn on the literature presented in Section 3.3.3, a five-dimension of retention construct is pursued in the next hypothesis.

RP1.3: Retention is a function of channel integration, customer service quality, online community, personalization level and reward.

3.4.2 Level two: Causal structure of E-CRM, satisfaction, loyalty and retention.

The ultimate goal of customer relationship management is to generate customer loyalty, which in turn, may lead to an increase in profits. Thus, this drives the impetus to research on the cause and effect relationship between the use of E-CRM and satisfaction, loyalty and retention. Many researchers have examined these relationships and argued on the direct cause and effect of these variables.

Dimensions of E-CRM program. Studies in the past have examined the E-CRM features available on company Web sites (Anton & Postmus 1999; Feinberg & Kadam 2002). However, due to the rapidly changing Internet technology, previous studies of specific E-CRM features seem to be less relevant to the current business context, hence are less appropriate. Therefore, this study attempts to understand the factors contributing to a successful E-CRM program by measuring the dimensions of E-CRM. Drawing from the theories presented in Section 3.3.4, this study proposes that the effectiveness of an E-CRM program is accountable for the extent to which the 13 variables would be implemented.

RP2.1: *The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust.*

E-CRM and satisfaction. Although researchers debated on the direct relationship between CRM and consumer satisfaction, some claimed that CRM and E-CRM influence satisfaction. For example, a study on E-CRM attributes and consumer satisfaction found that mailing list, quick order ability, gift certificates, affinity program and account information influence consumer satisfaction with e-tailer's site (Feinberg & Kadam

2002).   Taylor and Hunter (2002) reported that E-CRM service quality influences customer satisfaction in a business-to-business customer relationship. Other elements of E-CRM such as quality information, ease of use, order fulfillment, perceived security and so forth are also found to affect satisfaction. Hence, the second hypothesis follows:

RP2.2: E-CRM will influence consumers' satisfaction.

Figure 3.10 depicts a CLD representation of this model.

Figure 3.10:   A CLD Model of E-CRM
and Satisfaction
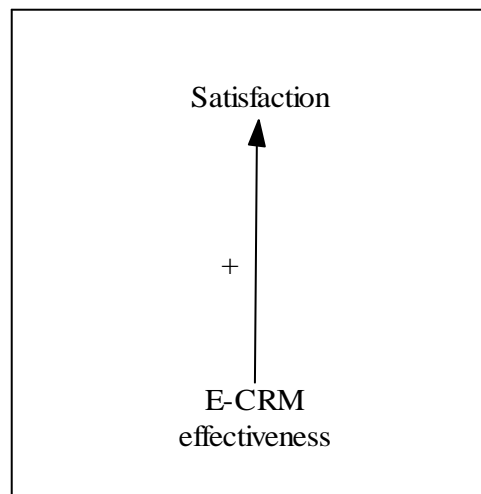
Source: Developed for this thesis

E-CRM and loyalty. As emphasized in Section 2.5, loyalty is interpreted as attitudinal and behavioural responses. In a technology-mediated relationship, loyalty is said to be a more important consideration than price (Griffin 1996; Reichheld & Schefter 2000). Developing relationships with loyal consumers is more profitable since they often will bring in substantial revenues, demand less time and attention from the firms, are less sensitive to price and may spread positive word-of-mouth (Anderson & Mittal 2000; Anderson & Sullivan 1993; Galbreath 2002; Iacobucci et al. 1994; Reichheld & Schefter

2000; Yang & Peterson 2004). In fact, a study conducted in the UK on consumers of entertainment-related products revealed that the E-CRM features of these sites enhance loyalty and reduce price sensitivity (Lee-Kelley et al. 2003). Hence, this study proposes that:

RP2.3: E-CRM will influence consumers' loyalty.

Figure 3.11 depicts a CLD representation of this model.

Figure 3.11:   A CLD Model of E-CRM
and Loyalty

Loyalty

+

E-CRM
effectiveness
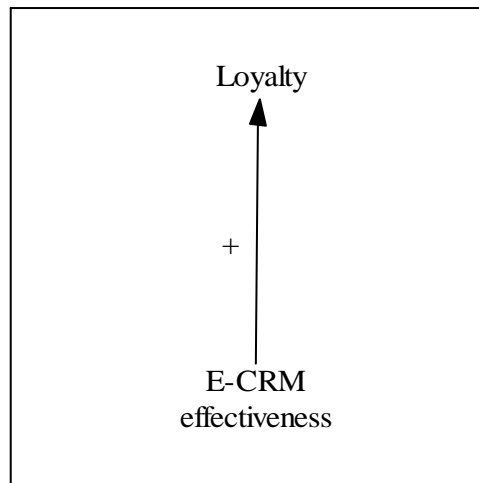
Source: Developed for this thesis

E-CRM and retention.   Many researchers claim that the notion of building consumer relationships centers on retaining them. Basically, CRM or E-CRM is a strategy labeled to engineering increased customer retention (Dowling 2002). Repeat consumers are more likely to have an intention to maintain a relationship with a provider (Ennew & Binks 1996; Garbarino & Johnson 1999; Hocutt 1998; Pritchard et al. 1999). For example, two companies, Vanguard Group and USAA - who have been leaders in developing trusting relationships, reported over 90 percent increase in retention rates (Anderson & Srinivasan 2003; Morgan & Hunt 1994). Storbacka et al. (1994) suggest

that the value of establishing consumer relationships relies on increasing revenue, that is, to increase price or to increase consumers' repatronage. Therefore, this study proposes that:

RP2.4: E-CRM will influence consumers' retention.

The CLD representation of this model is illustrated in Figure 3.12.

Figure 3.12: A CLD Model of E-CRM and Retention
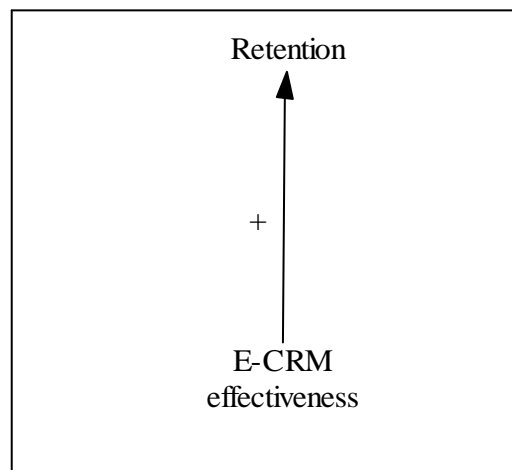
Source: Developed for this thesis

E-CRM, consumer satisfaction, retention and loyalty – the full model. E-CRM is premised on the economics of consumer retention and the way to retain consumers is to improve service quality and satisfaction (Berry & Parasuraman 1991; Cho & Park 2001; Koivumaki 2001; Zeithaml & Bitner 1996). Firms must shift from merely focusing on satisfying consumers to increasing retention rates and creating loyalty. Storbacka et al. (1994) claim that consumer satisfaction is not a surrogate for establishing relationships as to suggest that service quality leads to satisfaction and satisfaction leads to building relationships. Rather, consumer relationships are influenced by other relationship factors which include patronage behaviour and loyalty (Oliver 1997), which in turn are affected

by the mediating factor of satisfaction. Some researchers argue that loyalty refers to an attitudinal response towards a product brand or service (Czepiel & Gilmore 1987). Consumers have the desire to continue patronizing a site when they are satisfied with the service encounters. These feelings of commitment will lead to actual repurchase behaviour. That is, attitudinal loyalty will induce loyalty behaviours (Sharp et al. 1997). Indeed, these points sharply etch the need to better understand the E-CRM features and dimensions that are more likely to increase satisfaction, retention rates and create loyalty - more efficient and effective management of building long-term relationships (Feinberg & Kadam 2002). Thus, this model shows all the three variables with arrows pointing from E-CRM-satisfaction-loyalty-retention as shown in Figure 3.13.

Therefore a full model of this study hypothesizes that:

> *RP2.5 E-CRM will influence loyalty, which is affected by satisfaction. In turn,*
> *consumer loyalty will lead to retention.*

Figure 3.13: The CLD Model of E-CRM, Satisfaction, Loyalty
and Retention Relationship – the full model
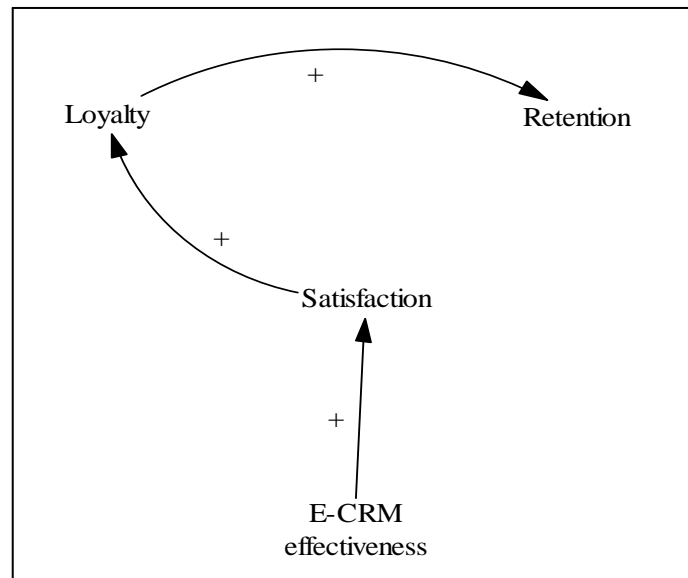
Source: Developed for this thesis

3.4.3 Level three: Relationships between consumer demographics, level of experience and perceived risk on satisfaction, loyalty and retention.

This study attempts to investigate the relationships between demographics, user's level of experience and perceived risk, and satisfaction, loyalty and retention.

Let us consider Internet consumers profiling. As competition is just a click away and consumers are gaining more bargaining powers, segmenting, targeting and positioning seem imperative in the development of relationship marketing strategy on the Internet (Geissler 2001). Segmentation refers to the grouping of consumers with similar needs and buying behaviour into segments, each of which entails different marketing campaigns (Assael & Roscoe 1976; Balttberg & Sen 1976; Wind 1978; Winer 2001). Consequently, these group segments will help marketers to target the most profitable consumers as well as tailor distinct promotional campaigns to the right groups – which is also known as positioning strategy (Geissler 2001; Winer 2001). Reichheld (1993) suggests that careful analysis of consumers' data will lead to a fairly homogeneous segment, which in turn improves the economy of serving each segment. In other words, to draw an effective marketing strategy online, a connection between consumer behaviour, segmentation and perceived value is essential (Gurau 2003).

Past researchers postulate that *demographics* characteristics such as age, gender, education, income, martial status, social class and so forth, to certain extent help marketers in segmentation. These characteristics can be associated with needs, wants, preferences, usage rates and purchasing habits (Hair et al. 2000; Kotler 2000; Lee-Kelley et al. 2003; McColl-Kennedy & Kiel 2000). For example, consumers who differ in income level, may differ in terms of their expectations of services (Gagliano & Hathcote 1994; Webb 1998; Webster 1989), intentions and behaviour towards usage of technology (Zeithalm et al. 2000) and propensity to buy on the Internet (Lee-Kelly et al. 2003). As such, to understand the differences in satisfaction, loyalty and retention of varying online consumers' profile seems appropriate (van Riel et al. 2001). The CLD representation of this model is illustrated in Figure 3.14.

Hence, a third hypothesis is proposed:

RP3.1: Demographics affect satisfaction, loyalty and retention.

Figure 3.14: The CLD Model of Satisfaction, Loyalty,
Retention and Demographic Relationship
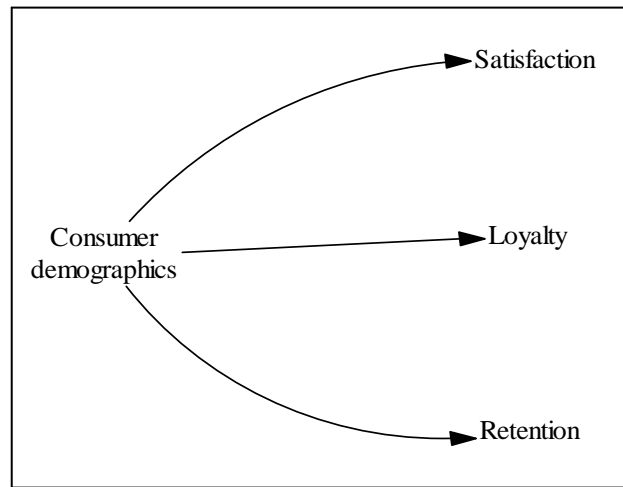
*Note: Since the direction of relationhsiops between
research variables are yet to be ascertained by this study,
hence no proposed indicators are shown in the above
diagram. Source: Developed for this thesis*

Next, this study adapts the Technology Acceptance Model (TAM) to formulate the following hypotheses. TAM, first introduced by Davis (1986) concerns the determinants of computer acceptance. That is, "in general, TAM is capable of explaining user behaviour across a broad range of end-user computing technologies and user populations" (Davis et al. 1989, p. 985). In adaptation to an earlier Theory of Reasoned Action (TRA) which accentuates that an individual behaviour is an outcome of attitudes that is formed by perceptions or norms (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975), TAM proposes that perceived usefulness and ease of use will influence an individual's intentions to utilize information technology (Salisbury et al. 2001). Relevant to TAM is the consumers' attitude towards a particular adoption and extending on this notion, is the

intention to patronize a site. Attitude is an outcome of cognitive evaluation, which is based on consumers' expectations and experience (Danaher & Haddrell 1996; Kotler 2000; Lin 2003). Thus, consumers' *level of experience* with the Internet activities will have an impact on perceived usefulness, which in turn influences their patronage behaviour.

It is believed that a well managed CRM may lead to increased profits and that profitability correlates to choosing the right consumers (Reichheld 1996). That is, better understanding of users' expectations and perceived value is indeed crucial. In essence, as users assimilate a new technology, they tend to have a higher level of expectations of that particular technology (Kalakota & Robinson 1997). For example, as users are more experienced in information searching, the process becomes much easier the next time. As a result, information searching becomes common and users tend to look for other new added-value services from a search engine. In other words, the higher the expectations, the higher the satisfaction judgments of a service (Oliver 1997). Ward and Lee (2000) found that more experienced Internet users tend to be more successful in information searching and are less-brand reliant, hence less loyal. With immense range of products/services, prices and providers and low cost of switching (Alba et al. 1997; Park & Kim 2003), experienced consumers are most likely to enjoy higher bargaining powers. Figure 3.15 depicts the CLD representation of this model.

This study hypothesizes that:

> *RP3.2: Consumers' experience level with Internet activities affects satisfaction,*
> *loyalty and retention.*

Figure 3.15: The CLD Model of Satisfaction, Loyalty,
Retention and Experience Level Relationship
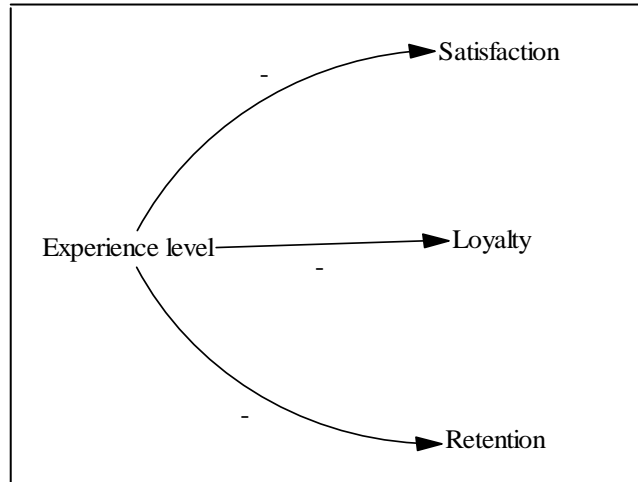
Source: Developed for this thesis

As users interact with a new technology, they will learn the usefulness as well as the risks associated with the technology. The Technology Acceptance Model (TAM) proposes that an increase in perceived usefulness leads to a greater intention to use (Davis 1986). This study extends this proposition to infer that perceived risk influences the intention to use the Internet. While there are other factors affecting consumers' patronage behaviour on the Internet, perceived risk is an impediment to the intention to return and purchase on the Internet (Hagel & Singer 1999; Luo & Seyedian 2004; Park & Kim 2003; Salisbury et al. 2001; Torkzadeh & Dhillon 2002; Vatanasombut et al. 2004; Yang & Peterson 2004; Zhang & von Dran 2002). In brief, perceived risk may influence the attitude and behaviour of consumers towards the Internet services (de Ruyter et al. 2001).

Perceived risk is defined as an assessment of uncertainties or lack of knowledge about the distribution of potential outcomes (March 1978) and the uncontrollability of outcome attainment (Vlek & Stallen 1980). In the case of purchasing on the Internet, it is possible that consumers may perceive disclosing their credit card information as risky, and they

have no control over this (Salisbury et al. 2001). Chellappa and Pavlou (2002) describe information security as the subjective probability with which consumers believe that their personal information will not be viewed, stored or manipulated during transit or storage by inappropriate parties, in a manner consistent with their expectations.

Indeed, uncertainties about how their financial information is treated by merchants will increase perceived risk associated with online transactions. This study adapts the notion proposed by TRA (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975) and TAM (Davis 1989) and suggests that the higher the perceived risk (perception) the lower the risk tolerance (attitude) and the less likely the intention to use (behaviour). Extending TRA and TAM suggestions, it seems plausible to suggest that the higher the perceived risk, the less likely consumers could possibly be satisfied, loyal and retained. That is, unless firms provide reliable and superior quality of service, firms may have difficulties in satisfying consumers, more so in gaining their loyalty and retaining them. Given the likelihood that perceived risk is associated with transactional information (Anderson & Srinivasan 2003; Park & Kim 2003; Salisbury et al. 2001; Szymanski & Hise 2000; van Riel et al. 2001; Vatanasombut et al. 2004; Wang et al. 1998; Zeithaml 2000), this study measures consumers' perceived risk by their behaviour towards these transactional activities.

That is, perceived high-risk activities include online banking where consumers assume greater risk transferring funds from their bank accounts to third party accounts, pay their utility bills or make inter-bank loan repayments and so forth. A medium-risk activity includes online reservation which involves the disclosure of consumers' financial account or credit card information but no transaction will take effect unless one appears physically before the service provider in order to confirm a purchase. On the other hand, online registration is considered as a low risk activity since it does not involve any disclosure of financial related information. It is important to note however, this study does not include online shopping as a high-risk activity since most Malaysian users were not embracing e-commerce well as compared to online banking, reservation and online registration (see Section 2.1). Due to low participation rates in e-commerce, therefore it seems reasonable at the point of time this study was conducted, to limit the online

activities to online banking, reservation and registration activities as the reflection of different levels of perceived risk in Internet transactions. That is, with these three online activities, the purpose of this study: to examine the relationships between the level of perceived risk and satisfaction, loyalty and retention, would be met. A CLD representation of the proposed model is shown in Figure 3.16.

Thus, this next hypothesis follows:

RP3.3: Consumers' perceived risk with Internet activities affects satisfaction, loyalty and retention.

Figure 3.16: The CLD Model of Satisfaction, Loyalty,
Retention and Perceived Risk Relationship
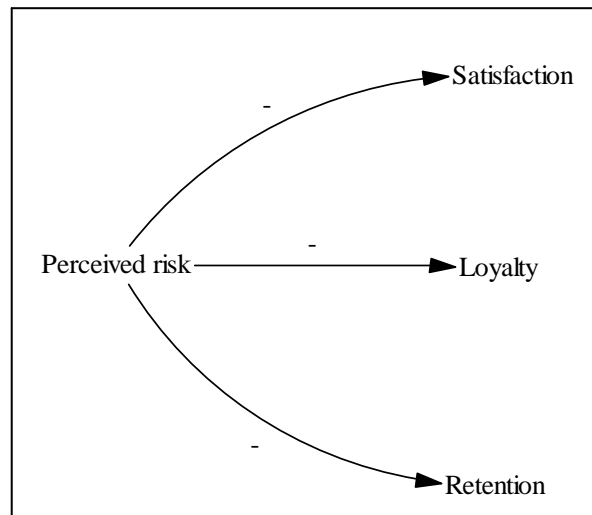
Source: Developed for this thesis

3.4.4   Level four: Development of competing models

Consequent to competing theories with regards to the cause-effect relationships between satisfaction, loyalty and retention, three competing models are proposed and are illustrated in Figures 3.17, 3.18, and 3.19.

First model: Satisfaction is an antecedent of retention. This model suggests that E-CRM influences repurchase behaviour, mediated by, although not exclusively, satisfaction (Oliver 1999; Rust et al. 1995). Satisfaction is believed to give a better indication of future performance of service firms, and that removing the causes of dissatisfaction is crucial for consumer retention (Anderson & Fornell 1994; Anderson & Mittal 2000). Extant literature believes that satisfied consumers do not necessarily become truly loyal to a provider (Bloemer & Kasper 1995; Elnan & Andersen 1999; Khatibi et al. 2002; Mittal & Lassar 1998). In fact, researchers claim that repeat consumers may be spuriously loyal due to lack of alternatives (Anderson & Srinivasan 2003; Day 1969; Jacoby & Chestnut 1978) and they may easily switch when there is a better marketing campaign from competitors. In other words, satisfaction leads to retention and this relationship has been shown in a range of consumer products (La Barbera & Mazursky 1983) and in service (Bitner 1990) until better offers from other competitors' avail. Section 2.6 discusses this issue in detail. Hence, the loyalty variable has been removed in the first model. The CLD representation of this model is depicted in Figure 3.17.

Figure 3.17: The CLD Model of Satisfaction
and Retention.
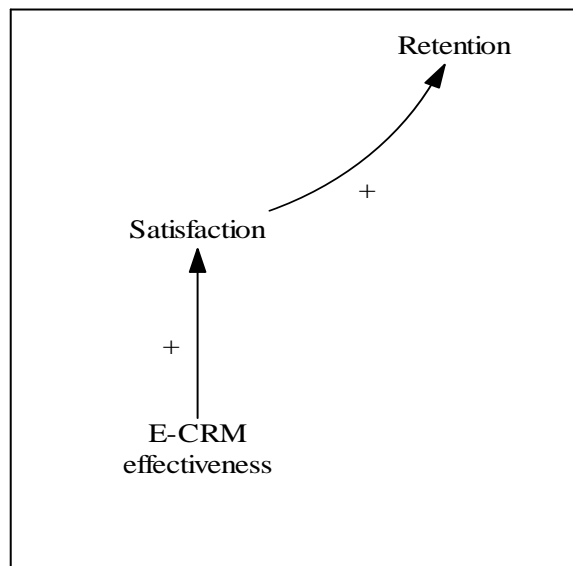
Source: Developed for this thesis

Second Model: Satisfaction leads to loyalty. Based on the argument that satisfaction leads to loyalty and that retention symbolizes loyalty (Bolton & Drew 1991; Brown 1952; Koufaris et al. 2002; Kuehn 1962; Lipstein 1959; Rust et al. 2000; Yin 1999), the second competing model is proposed. Van Riel et al. (2002) posit that consumer satisfaction with online support and the core service will both contribute to the creation of desired *behavioural* intentions in the form of loyalty. In brief, researchers interpret loyalty as repeat purchase or retention and argue that consumer satisfaction leads to loyalty (Anderson & Sullivan 1993; Bolton & Drew 1991; Cronin et al. 2000; Rust et al. 2000; Shemwell et al. 1998; Taylor & Baker 1994). In this model, the retention variable has been removed as shown in the CLD model in Figure 3.18.

Figure 3.18: The CLD Model of Satisfaction
and Loyalty
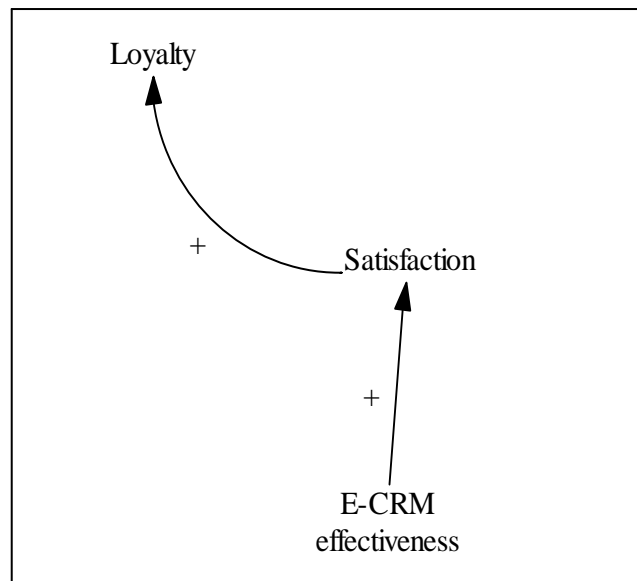
Source: Developed for this thesis

Third Model: Retention, not affected by satisfaction leads to loyalty. Next, let us consider consumers who continue patronizing and appear to be loyal without being

satisfied. Dick and Basu (1994) suggest consumers who are retained may not always be satisfied. Indeed, convenience and learning effort may hinder consumers who are already familiar with a site from switching. In this case, inertia may become an exit barrier (Anderson & Srinivasan 2003; Reinartz & Kumar 2002; Yu & Dean 2001). Nevertheless, consumers are viewed as loyal because they do not switch despite being dissatisfied. Figure 3.19 illustrates the relationships proposed by this model and the CLD representation.

Figure 3.19: The CLD Model of Retention and Loyalty
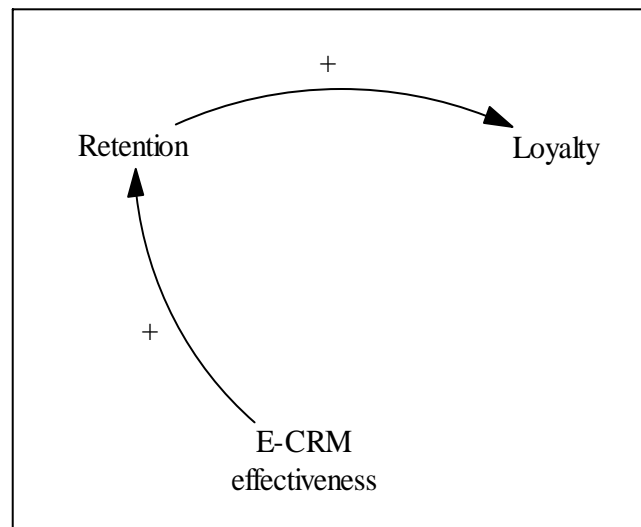
Source: Developed for this thesis

3.5   Conclusion

Based on the literature review, there are various types of Internet technology available to facilitate the enhancement of Customer Relationship Management (CRM). There may be various propositions forwarded on E-CRM with consumer satisfaction, retention and loyalty, but they are all tailored to the Western culture and population. Hence, it is worthwhile to conduct this study to investigate the issues of the subject matter in the Asian context, which is still lacking. The methodology undertaken by this research is discussed in chapter 4.

CHAPTER 4: RESEARCH METHODOLOGY

4.0   Introduction

In the previous chapter, the underlying theoretical framework of this study has been presented. This chapter describes the methodology undertaken in relation to justification of the research paradigm, questionnaire design, sampling process and data collection and administration. In addition, this chapter introduces the intended analysis strategy as to test the propositions of this study. Finally, the ethical consideration pertaining to data collection and relevant to this research is discussed.

4.1   Justification of paradigm and methodology

A paradigm is described as a holistic approach underlying a research methodology (Kassim 2001). It reflects the philosophy of knowledge or how we reach the knowledge while methodology focuses on the practicalities of how we come to know (Trochim 1998). In essence, the paradigm that is fundamental to this study can be categorized as post-positivist, or what is also known as realism (Hunt 1990; 1991; Perry et al. 1998; Trochim 1998). Realism deals with an external reality which cannot be known perfectly, that is in reality no one can claim to have perfect knowledge of what contributes to consumer satisfaction, loyalty or retention (Perry et al. 1998).   This study proposes that, firstly, data are collected and analyzed from various sources including literature, exploratory research, pilot study, and by a final survey. Secondly, a structural equation modeling of the surveyed data incorporates complex interdependencies using multi-item scales to measure latent, unobservable variables (Godfrey & Hill 1995; Kassim 2001). Drawn from literature pertaining to the subjects under study, several hypotheses are proposed and tested using the causal method, as to investigate the relationships between E-CRM implementation and satisfaction as well as loyalty and retention.

Research design

Subsequent to establishing a paradigm, the development of an appropriate research design is pursued. A research design, which is a function of the research objectives, is defined as "…a set of advance decisions that makes up the master plan specifying the methods and procedures for collecting and analyzing the needed information" (Burns & Bush 2002, p.120). An appropriate research design is essential as it determines the type of data, data collection technique, the sampling methodology, the schedule and the budget (Hair et al. 2003). Primarily, it helps to align the planned methodology to the research problems (Churchill & Iacobucci 2004; Malhotra 1999).

There are many frameworks of research designs and they can be classified into three traditional categories: exploratory, descriptive and causal (Aaker et al. 2000; Burns & Bush 2002; Churchill & Iacobucci 2004; Hair et al. 2003). As depicted in Figure 4.1, this study applies these research designs as to achieve the research objectives. Although not compulsory, it is common that researchers utilize multiple research designs (Burns & Bush 2002). That is, a researcher may begin with an exploratory study which will provide essential background information needed preceding a descriptive study. In turn, information obtained from a descriptive study may help the researcher design a causal experiment.

The aim of this study is to identify Internet users' perceptions towards online satisfaction, loyalty and retention. In addition, this study attempts to investigate the extent to which E-CRM features affect consumer assessment of satisfaction, loyalty and retention. To achieve these objectives, the research design of this study has been conducted in two phases. Phase one dealt with an exploratory study and the latter involved both descriptive and causal research. These phases are discussed next.

Figure 4.1: Outline of Research Design
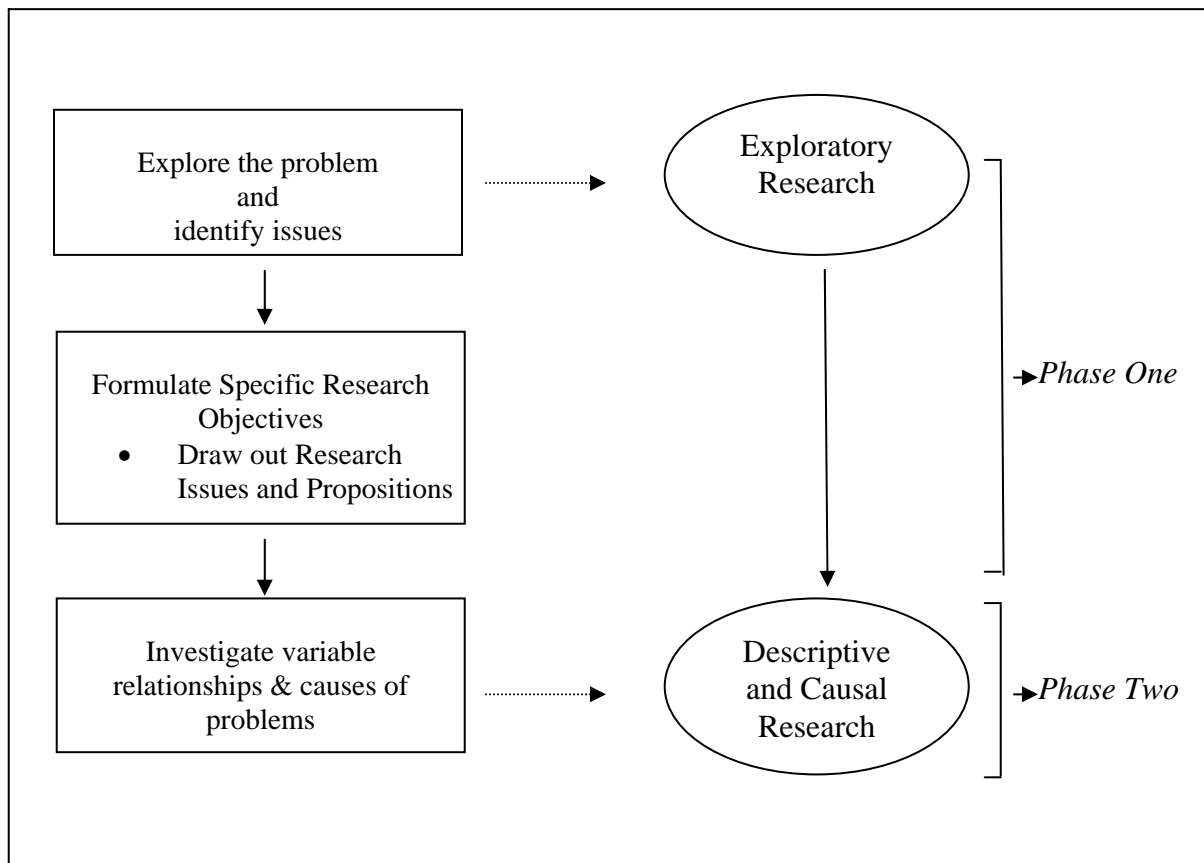
Source: Developed for this thesis

Phase one. *Exploratory research* was conducted to develop initial insights and to provide direction for any further research needed (Malhotra 1999; Parasuraman 1991). An exploratory study is essential when a researcher needs to define the problem more precisely and identify any specific objectives or data requirements to be addressed through additional research. Indeed, the Internet is a relatively new phenomenon in retailing in South-East Asia. Although the number of Internet users is proliferating, there is little empirical evidence to help marketers fully understand what constitutes consumer satisfaction, retention and loyalty from a South-East Asian perspective. Most of the users are reluctant to transact on the Internet, leaving the electronic retailing channel as merely

the information provider (Ab Hamid & Kassim 2004). Therefore, the imperative of an exploratory study is to gain much-needed background information pertaining to building a long-term consumer relationship in cyberspace.

Exploratory research is the foundation of a good study (Churchill & Iacobuci 2004) and it is normally flexible, unstructured and qualitative (Aaker et al. 2000; Burns & Bush 2002) and serves as an input to further research (Malhotra 1999). In addition to reviews from the literature, an experience survey, also known as key informant technique, taps the knowledge of those familiar with the subject matter, in this case, the efficacy of Internet in relationship marketing. In this study, interviews with 15 marketing and e-commerce executives within the Multimedia Super Corridor (MSC) area in Malaysia were conducted in January 2003. Similar to Silicon Valley in its industrial development concept, the MSC is an exclusive industrial zone in relation to information technology research and development as well as commercialization, where more than four hundred Internet-related businesses are located. A semi structured interview form (see Appendix 4.1) was used as the interview instrument and the data collection survey was completed in approximately four weeks. Insights from an Internet-based company (a company that uses the Internet as part of its marketing channel) marketing and e-commerce executives are deemed appropriate for this study as anyone who has an association with the Internet marketing effort is a potential source of rich information (Churchill & Iacobucci 2004). In brief, the representatives shared their opinions and experience on the Internet capabilities as a new marketing channel and consumer responses towards Internet marketing programs. In addition, interviews with three professors in marketing provided better understanding of customer relationship management issues in general and consumer behaviour from South-East Asian perspectives in particular.

The outcome of the exploratory study helped in developing the scales for the survey instrument in the subsequent descriptive research (phase two). For example, information on the types of Internet activities, which are familiar to Malaysian consumers, implies that the survey should not be heavily focused on the *online shopping* variable (see

Sections 2.1 and 2.2). In brief, based upon the literature an experience survey was conducted and in consequent the survey allowed for the subject matters to be refined.

Phase two. Having obtained some primary knowledge of the subject matter by an exploratory study, *descriptive research* was conducted next. Contrary to an exploratory research, a descriptive study is more rigid, preplanned and structured, and is typically based on a large sample (Churchill & Iacobucci 2004; Hair et al. 2003; Malhotra 1999). The purpose of descriptive research is to describe specific characteristics of existing Internet marketing phenomena, that is, it is used to determine the frequency of occurrence of phenomena like Internet usage on a sample from the population. In addition, it helps provide data that allows for identifying relationships or associations between two variables (Aaker et al. 2000).

As many researchers have noted, descriptive research designs are for the most part quantitative in nature (Burns & Bush 2002; Churchill & Iacobucci 2004; Hair et al. 2003; Parasuraman 1991). There are two basic techniques of descriptive research: cross-sectional and longitudinal. Cross-sectional studies collect information from a given sample of the population at only one point in time, while the latter deals with the same sample units of population over a period of time (Burns & Bush 2002; Malhotra 1999). The cross-sectional study is also referred to as a sample survey, that is selected individuals are asked to respond to a set of standardized and structured questions about what they think, feel and do (Hair et al. 2003). For the purpose of this study, a cross sectional study was the appropriate technique as opposed to a longitudinal study due to time constraints, and furthermore, this study does not attempt to examine trends.

Subsequent to the descriptive study, *causal research* was conducted. Descriptive studies may show that two variables are related but are insufficient for examining cause and effect relationships (Malhotra 1999). Causal research is most appropriate when the functional relationship between the causal factors and the effect predicted on the marketing performance variable is under investigation (Hair et al. 2003). This study concerns the causal relationships between E-CRM, satisfaction, loyalty and retention.

For example, does E-CRM cause satisfaction and does satisfaction in turn affect retention. Hence, a causal experiment is appropriate to generate the type of evidence necessary for making causal inferences about relationships between research variables (Parasuraman 1991).

4.2   Survey method and administration

In a survey, respondents may be asked verbally, in writing or via a computer a variety of questions regarding their behaviour, attitudes, demographic and lifestyle characteristics (Malhotra 1999). Typically the questions are standard and structured, which means a formal questionnaire is prepared and questions are asked in a prearranged order.

In this study, a survey was used as the method of primary data collection. The structured survey involved several steps from designing the questions to field work and assessing the reliability of the measurement used. These processes are illustrated in Figure 4.2 and are discussed next.

4.2.1 Specify the information needed

The objectives of the first stage were two fold: identify the information requirements and determine the source from which the information could be obtained. This stage begins with identifying the information needed to meet the research objectives. As such an exploratory study was carried out as discussed in Sections 1.4 and 4.1. From these interviews, insights were sought on the variables identified and on an initial format of a questionnaire.

4.2.2   Selection of survey method.

The decision to choose a survey method may be based on a number of factors which include sampling, type of population, question form, question content, response rate, costs, and duration of data collection (Aaker et al. 2000). The most appropriate survey

Figure 4.2:   Questionnaire Design Process

```
                          ┌─────────────────┐
                          │     Specify     │
                          │   Information   │
                          │   and Source    │
                          └─────────────────┘
                         /                   \
              ┌──────────────┐         ┌──────────────────┐
              │  Determine   │         │ Set operational  │
              │ survey method│         │   definitions    │
              └──────────────┘         └──────────────────┘

                     ┌─────────────────────────────┐
                     │ Develop questionnaire        │
                     │ • Measurement scale          │     ┌─────────┐
                     │ • Content & wording          │ ←── │ Revise  │
                     │ • Response format            │     └─────────┘
                     │ • Sequence                   │
                     │ • Physical layout            │
                     └─────────────────────────────┘

        ◇ Yes    ┌───────────────────────────┐   ◇ No
                 │ Pretest 1                 │
                 │ • Exploratory (30 users)  │
                 └───────────────────────────┘

                 ┌───────────────────────────┐   ◇ No
        ◇ Yes    │ Pretest 2                 │
                 │ • Pilot test (100 users)  │
                 └───────────────────────────┘

  ┌────────────┐  ┌───────────────────────────┐
  │ Prepare    │→ │ Questionnaire distribution│
  │ final draft│  │ and  administration       │
  └────────────┘  └───────────────────────────┘

                  ┌───────────────────────────┐
                  │ Reliability and           │
                  │ validity of               │
                  │ questionnaire             │
                  └───────────────────────────┘
```

Source: Adapted from Churchill (1991), Luck and Rubin (1987), Kassim (2001), Kinnear et al. (1993)
and Malhotra (1999) – developed for this thesis

method for this research was a personally administered one. This method was chosen for the following reasons (Kassim 2001):

- A list of Internet users contact details could be easily obtained from institutions' Web sites.

- The questions can be answered by circling the proper response format and with an interviewer present, respondents could seek clarity on any question as to meet consistent question objectives (Aaker et al. 2000; Sekaran 2000).

- The respondents are more motivated to respond as they are not obliged to admit their confusion or ignorance to the interviewer (Burns & Bush 2002; Sekaran 2000).

- A higher response rate of almost 100% can be assured since the questionnaires are collected immediately once they are completed (Malhotra 1999; Sekaran 2000).

- Higher anonymity of respondents because respondents are not required to disclose their identities (Burns & Bush 2002; Sekaran 2000).

- This method offered highest degree of control over sample selection (Burns & Bush 2002; Malhotra 1999).

- It can be very time consuming if a wide geographic region is involved. However for this survey, the Internet users are centred in major cities in Malaysia, hence data were collected from regions which are highly populated with Internet users only: Klang Valley, Penang, Johor Bharu and Kuching.

It is important to note that this research was fully funded by Multimedia University (MMU) and the Ministry of Science, Technology and Environment (MOSTE) of Malaysia. The fund received from these institutions was designated and used to finance the data collection and data entry. This research was part of a major research project entitled "Techno-legal Perspectives of Business-to-Consumer Electronic Commerce" which was a joint research project between Center for Multimedia and Technology Management (CMTM) and Center for Cyberlaw (CC). The aims of this project were twofold: to examine Malaysian Internet users' perception towards Internet technology as

a marketing medium; and to identify users' level of awareness on the legal issues arising from interacting with this technology.

For this major project, I represented CMTM while another researcher represented CC and each of us was responsible for a different aspect of business-to-consumer e-commerce; I was responsible for the use of Internet technology as a marketing channel while another researcher looked into the legal aspects of e-commerce. The outcome from the part of the research I was responsible for identified the extent to which Malaysian consumers use the Internet, while the other research highlighted the degree of consumer awareness on security issues arising from their interaction with the Internet. We collaborated in the data collection phase so as to ensure that data were collected from the same source - that is, respondents who answered my questionnaire also participated in the other study. The direction given to me was general and broad. I was responsible for all the detailed aspects of the project including research model development, designing the survey instrument, testing of hypotheses and data analysis. Figure 4.3 depicts the organization of research projects under the management and control of Multimedia University research committee - that is the Centre for Research and Postgraduate Program (CRPP).

4.2.3   Specify operational definitions

Next, issues of operationalization of variables need to be considered before designing the data collection instrument (Davis & Cosenza 1993). Operational definition refers to a specific question that will be used in a survey to measure the meaning of a construct (Burns & Bush 2002; Hair et al. 2003). Since constructs that are relevant to this study such as satisfaction, retention, loyalty and consumer relationship cannot be precisely measured, operationalization is used to indirectly measure them.

Figure 4.3: Organization of Jointly Funded Research Projects at Multimedia University
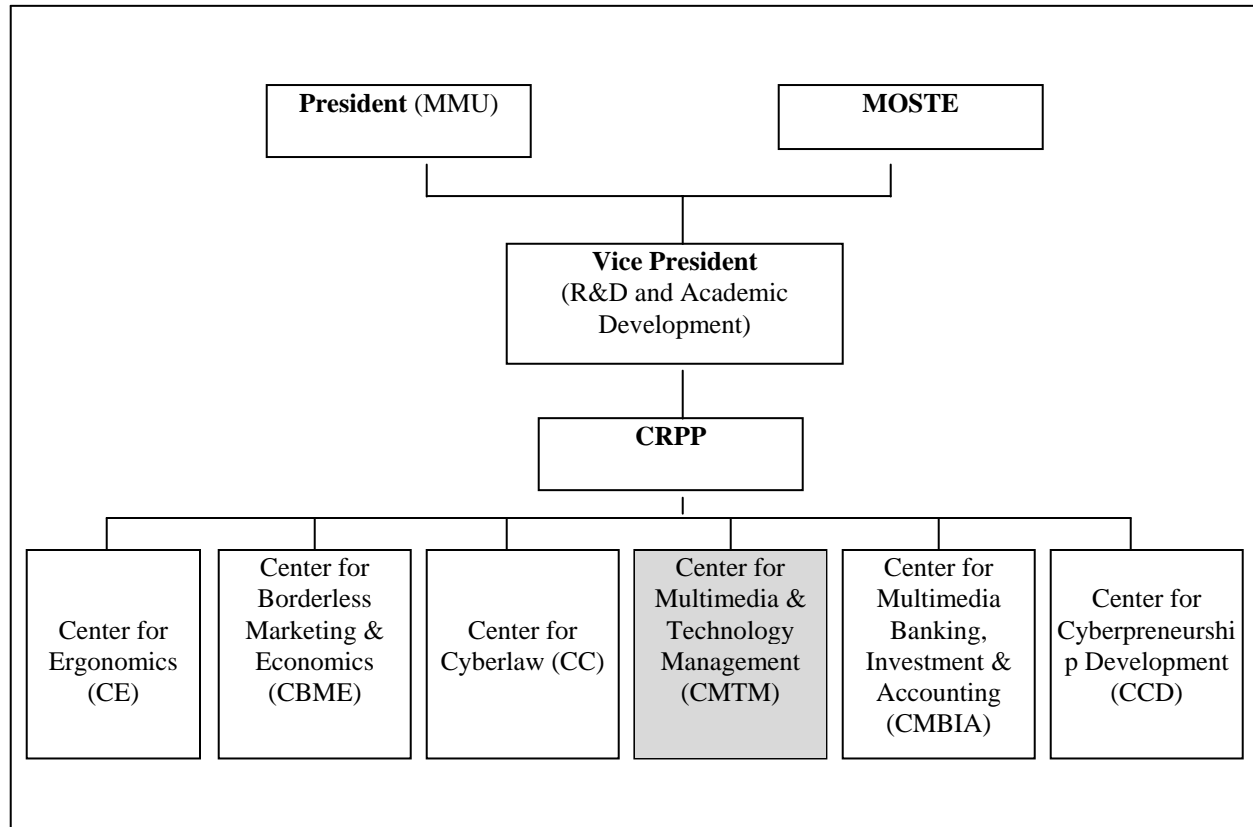
Operationalization of variables

E-CRM. As discussed in Section 3.3.4 this study adapts theories from past research in developing 13 dimensions of an effective E-CRM program.

Satisfaction. Adapting the scales from Cho and Park (2001) and Szymanski and Hise (2000) on consumer satisfaction, this study proposes a seven item satisfaction construct (see Appendix 4.2).

Retention. Adapted from Winer's (2001) model of retention program and other studies, this study proposes a five-item retention construct as illustrated in Appendix 4.2.

Loyalty. Drawing from the scales developed by previous researchers (Anderson & Srinivasan 2003; Zeithaml 1996), this study proposes that loyalty construct is itemized by seven items (see Appendix 4.2).

The items for other variables: *channel integration, customer service quality, ease of navigation, emotional benefit, information quality, online community, order fulfillment, payment security, perceived value, personalization level, price, reward* and *trust* were constructed from the literature pertaining to the respective subject matter. Detailed descriptions of each of these variables are presented in Sections 3.3.1 to 3.3.3. Appendix 4.2 illustrates the operationalization of constructs for this research.

It is important to note that in the operationalization of variables this study used a self-reported behaviour in Web site visitation, for example, "I will most likely revisit a Web site…". Although assessing consumers' actual behaviour would be ideal this method would result in smaller data sets and require a considerable amount of time. Furthermore, at the time this study was conducted Malaysian users were lagging in the adoption of e-commerce (perform online transactions). Therefore, this study aims to assess consumer perceptions toward the Internet as a marketing medium and adopting a self-reported behavior is deemed appropriate to achieve the objectives of this study.

4.2.4 Designing the questionnaire.

This step involves selecting appropriate measurement scales, question wording and content, response format and finally the sequence of questions. The questionnaire was written in Bahasa Melayu as it is the first language for Malaysians, hence can be easily understood by the respondents. A Bahasa Melayu-English language expert from the Centre of Modern Language of Multimedia University was asked to translate the questionnaire to English and the survey template (in English) employed is included in Appendix 4.3a. In addition, to ensure accuracy a reverse translation (from English to Bahasa Melayu) was performed. Appendix 4.3b displays the questionnaire in Bahasa Melayu.

Measurement scale.   As this study aims to measure consumer perception towards the Internet channel, multiple-item scales were deemed appropriate as it is frequently used in marketing research to measure attitudes (Parasuraman 1991).   The use of a multi-item scale would ensure that the overall score, which was a composite of several observed scores, was a reliable reflection of the underlying true scores (Hayes 1998).

Three types of measurement scales were used in this research: nominal, ordinal and interval. Nominal scales were used for identification purposes because they have no numeric value (Kinnear et al. 1993). For example, respondents were asked to select the location from which they access the Internet. On the other hand, ordinal scales were used to rank Internet users' tenure, age group and income level. These scales were then assumed to be interval scales, as is commonly practiced in social science research (Perry 1998).   Further, interval scales were used to measure the subjective characteristics of respondents. For example, in this study, respondents were asked about their attitudes and behaviours in relation to satisfaction, retention and loyalty. This scale was used due to its strength in arranging the objects in a specified order as well as being able to measure the distance between the differences in response ratings (Burns & Bush 2002; Churchill & Iacobucci 2004; Kinnear et al. 1993; Malhotra 1999).

Question content and wording.   In relation to question content and wording, the questions were designed to be short, simple and comprehensible, avoiding ambiguous, vague, estimation, generalization, leading, double barreled and presumptuous questions (Kassim 2001).   For example, one of the marketing experts suggested rephrasing a sentence from "The customer service is very responsive to my query" to "The customer service answered my query quickly".

Response format.   Two types of response format were chosen: dichotomous close-ended and labeled scales.   In order to obtain information pertaining to respondents' demographics and Internet activities a dichotomous close-ended question format was used.   In addition, as to obtain respondents perception towards online satisfaction,

retention and loyalty labeled scale response format was used. Apart from the simplicity to administer and code in further statistical analysis (Burns & Bush 2000; Luck & Rubin 1987) labeled scale response format is appropriate for marketing research as it allows the respondent to respond to attitudinal questions in varying degrees that describes the dimensions being studied (Aaker et al. 2000; Kinnear et al. 1993).

For this research, labeled Likert scales were appropriate to measure responses. This scale was adopted based on the following reasons (Kassim 2001):

- It yields higher reliability coefficients with fewer items than the scales developed using other methods (Hayes 1998)
- This scale is widely used in market research and has been extensively tested in both marketing and social science (Garland 1991).
- It offers a high likelihood of responses that accurately reflect respondent opinion under study (Burns & Bush 2002; Wong 1999; Zikmund 2000).
- It helps to increase the spread of variance of responses, which in turn provide stronger measures of association (Aaker et al. 2000; Wong 1999).

In relation to the number of scale points, there is no clear rule indicating an ideal number. However, many researchers acknowledge that opinions can be captured best with five to seven point scale (Aaker et al. 2000; Malhotra 1999; Sekaran 2000). In fact, researchers indicate that a five-point scale is just as good as any other (Malhotra 1999; Parasuraman 1991; Sekaran 2000). That is, an increase in scale does not improve the reliability of the ratings (Elmore & Beggs 1975) and may cause confusion to the respondents (Aaker et al. 2000; Hair et al. 2003). Thus, a five-point Likert scale was used in this research.

Sequence of questions. The questionnaire began with less complex and less sensitive questions and progressed to opinion-sought questions. The questionnaire consisted of three parts. The first part, Section A consisted of demographic information such as a respondent's age group and income level. Section B consisted of general information about a respondent's Internet activities. These questions included respondent's access location, number of years using the Internet, types of Internet activities and time spent in

a week on the Internet. The third part, Section C, was designed to assess the attributes affecting respondent's perception on Internet service quality, satisfaction, retention and loyalty on the Internet respectively. The respondents were asked to indicate their opinions on the various dimensions of the variables being studied.

4.2.5 Exploratory (pre-test) survey and revise questionnaire.

Separate to an exploratory survey (respondents were industry experts and academic researchers) which was conducted in Phase one (p. 94-95), an early draft of the questionnaire (developed in Section 4.2.4) was pre-tested in this pursuing stage. The aim of a pre-testing is to ensure that the questions are eliciting the responses required, uncover ambiguous wording or errors before the survey is launched at large (Burns & Bush 2002; Zikmund 2000). Prior to pre-testing, three marketing professors were asked to review the questions and give their opinions in the quest for *content validity*. Some overlapping questions were detected, for example, questions like "I like to receive personalized catalogue" and "I like to receive personalized advertisement", and hence were dropped from the list. After the review process, the questionnaire was ready to be pre-tested in an exploratory survey.

The exploratory survey started off in March 2003 with selecting a small group of 30 respondents from a convenient sample, as is common for pilot tests (Sekaran 2000; Zikmund 2000). The respondents were fellow researchers from the Faculty of Management, Multimedia University and MBA students. From this personal interview setting, respondents were asked to look for any difficulties with wording, problems with leading questions and biasness (Zikmund 2000). Some fellow researchers suggested that an example following the words "credit card" and "payment method" should be included. A list of credit card, "Visa, Mastercard, DinersClub and American Express" and a list of other payment method, "auto-debit, money order, cash-on-delivery" were added to incorporate these suggestions. In addition, one suggestion came from a senior marketing manager (who was an MBA student) to re-word "customized product" to "made to my specifications". This change was then incorporated.

The next stage of pre-testing involved a pilot survey in April 2003 on 100 Internet users around the MSC area whose compositions were similar to the final survey respondents (Burns & Bush 2002; Malhotra 1999; Parasuraman 1991; Zikmund 2000). The surveys were personally administered and at the end of week two, a total of 85 questionnaires were collected. After screening, 10 of the questionnaires were found to be unusable because of missing values, which resulted in 75 usable samples for analysis. Further, using SPSS the data were tested for reliability and yielded a high Cronbach alpha score (above 0.80).

Factor analysis

A principal component analysis (PCA) was performed on the data set of the exploratory study to reduce a large number of observed variables into a smaller number of factors measuring different constructs (Tabachnick & Fidell 2001). The steps involved in PCA are discussed next.

Factor extraction. This step involves identifying factors that can be used to best represent a unique construct (Pallant 2001). Although there are many types of extraction techniques, the most commonly used is principal components. Using the Kaiser's criterion, only components with eigenvalue of more than 1.0 were selected for further investigation.

Rotation. Once the numbers of components have been identified, the next step is to determine the pattern of loadings for easy interpretation. There are two main approaches for rotation: orthogonal and oblique. Orthogonal assumes that the variables are not correlated and helps to maximize the variance of factor loadings by making high scores higher and minimizing the low ones: items that load higher than 0.3 are retained while low loading items are dropped (Pallant 2001). Due to its ease to be interpreted, the orthogonal approach is most commonly used in research and deemed appropriate for this research. For the purpose of this study, the Varimax rotation (orthogonal) was used. Based on the eigenvalue of more than 1.0 the Varimax rotation yielded five factors for satisfaction; four factors for retention, and two factors for loyalty. As shown in

Appendix 4.4 the dimensions of satisfaction are information quality, product/service quality, order fulfillment, customer service quality and ease of navigation; the dimensions of retention are personalization, online community, reward and channel integration while the two dimensions of loyalty are trust and perceived value.

In brief, factor analysis was performed to reduce a large number of variables into identifiable components of interrelated variables.

4.2.6 Questionnaire distribution and administration.

This step involved the recruitment and training of research assistants as well as gaining access to Internet users' database. For the purpose of this research, six research assistants were recruited based on their projection of professionalism, enthusiasm and confidence (Luck & Rubin 1987; Malhotra 1999; Sekaran 2000). These aptitudes were necessary in order to establish rapport and trust with the respondents (Sekaran 2000). They were then trained to be able to make respondents feel comfortable enough to give answers without fear and to provide appropriate answers to respondents' inquiries. The primary roles of research assistants were contacting respondents, and distributing and collecting the questionnaire. This research called for data to be collected from four major cities in Malaysia where a majority of Internet users are located, namely Klang Valley, Penang, Johor Bharu and Kuching (Hashim & Yusof 1999; Malaysian Science and Technology Information Centre 2002). The allocation of research assistants was proportionate to the number of respondents in each location: three assistants were responsible for data collection in Klang Valley, while one research assistant was allocated to each of the remaining cities. They were hired specifically for the data collection for a maximum of three months on contract basis and were remunerated on daily wage. When the data collection process was over, only one research assistant was retained (contract renewed for another three-month term) to help in the data entry. It is important to note that I was fully responsible for designing the questionnaire and analyzing the data for this study.

The next step was to gain permission to access the Internet users' list from several institutions. The main source of the users' list came from various education, government and corporate institutions as most of Internet users can be found in these institutions in Malaysia (see Section 2.1). The nature of work that people do in these institutions requires the use of Internet, hence they are an appropriate source to obtain the study sample from. For example, it is common for university staff and students to use the Internet for communication or to conduct research. Likewise, most companies in the selected cities have Internet connections on their premises and the method of communication within these companies is mainly email. The Malaysian government is one of the leading examples of e-government, where Malaysia ranks as among the top 10 countries in e-government implementation in the world (Bishop & Anderson 2004; West 2003). Most of the government offices are Internet-enabled and in fact, the use of an Intranet within these departments is common. The purpose of this study is to measure individual user perceptions on the uses of Internet; hence, the institutions above are appropriate sources of individuals who make reasonable use of the technology.

Letters seeking permission to access the institution's list of users' database were sent out to 15 universities and colleges, 10 government and 50 corporate institutions. For reasons of confidentiality, neither the names of individuals nor the organizations they work for were included in the questions. From the correspondence, all the education institutions, eight government and 45 corporate institutions were willing to cooperate and allow us access to their directory of users (individuals with email accounts) and could be obtained from the institutions' Web sites. The rest did not respond to our letters or turned down our request.

Finally, the sampling process for this research involved a selection of a sufficient number of elements from the population, and based on the data collected from a subset, an inference of the characteristics of the entire population could be made (Churchill & Iacobucci 2004; Emory & Binks 1976; Sekaran 2000; Zikmund 2000). The sampling process included several steps: define the population, establish the sampling frame,

specify the sampling method, determine the sample size and select the sample (Luck & Rubin 1987; Malhotra 1999; Wong 1999).

Step 1: Population.   The target population for this study was defined as individuals using an Internet service in Malaysia at the time the survey was conducted. To recognize and treat a sampling frame difficulty, the target population was redefined (Kassim 2001) as those individuals who owned individual email accounts because they represented most of the Internet users in Malaysia (Sharif 2004a).

Step 2: Sampling frame.   To establish the sample frame, a list of users was obtained from education, government and corporate institutions of the four major regions, Klang Valley (West Malaysia), Kuching (East Malaysia), Penang (North Malaysia) and Johor Bharu (South Malaysia) (see Section 2.1). Although the respondents were selected from these institutions it was clearly expressed in the cover letter of the questionnaire (refer to Appendix 4.3) that their opinions should reflect their personal usage of the Internet.

Step 3: Sampling method.   Probability sampling was used as this research sought to generalize the results obtained as much as possible (Kassim 2001). A list of 300,000 email account owners and contact details was obtained from participating institutions' Web sites. Thereafter, a systematic sampling (see step 5 below) was deemed appropriate as this method ensures efficiency, speed, low cost as well as produces a more representative sample (Hayes 1998; Luck & Rubin 1987; Wong 1999).   Indeed, each sampling method is prone to bias. In this technique, bias is deemed to occur when the original list is arranged in a systematic pattern (Zikmund 2000), for example a consumers' list arranged according to frequency of visits. For this study, in order to minimize the sampling bias, several e-mailing lists of participating institutions' were used, as a mailing list provides a readily available list of population elements (Churchill & Iacobucci 2004): students, working adults, executives and non-executives.   Most importantly, these original lists were not arranged in sequence of users' level of experience with the Internet. From these lists a major sampling list was prepared, from which samples were systematically drawn.

Step 4: Sample size. Now that the sampling method was determined, the next step involved determining the sample size of this study. The required sample size depends on factors such as the proposed data analysis techniques, financial and access to sampling frame (Malhotra 1999). The proposed data analysis technique for this research is Structural Equation Modeling, which is very sensitive to sample size and less stable when estimated from small samples (Tabachnick & Fidell 2001). As a general rule of thumb, at least 300 cases is deemed comfortable, 500 as very good and 1000 as excellent (Comrey & Lee 1992; Tabachnick & Fidell 2001), thus it was decided to target a total of 1000 respondents from the four regions mentioned above.

Step 5: Sample selection. This step required a detailed specification of all the steps discussed above (Malhotra 1999). In this study, it was decided that every 300th individual from the list would be selected until the required sample size of 1000 respondents was reached. After having decided on the sampling process, the tests of reliability and validity of the instrument were pursued.

Step 6: Reliability and validity tests of the instrument.

Reliability. In order to test reliability, a Cronbach coefficient alpha was used as it is the most common method used for assessing the reliability for a measurement scale with multi-point items (Hayes 1998). The coefficient, which reflects homogeneity among a set of items, varies from 0 to 1. However, a good reliability should produce at least a coefficient value of 0.70 (Hair et al. 1995; Pallant 2001).

Content validity. Content of this research was validated by determining the variables which have been defined and used previously in the literature (Churchill & Iacobucci 2004). In this study, the dimensions of variables were identified from the marketing and information systems literature. Subsequently, opinions from field experts were sought to provide relevant inputs adding to what have been identified from the literature. Further, three marketing professors were requested to review a list of measurement scale in a questionnaire format before it was sent out for pre-testing.

Construct validity. *Construct validity* demonstrates the extent to which the constructs hypothetically relate to one another to measure a concept based on the theories underlying a research (Malhotra 1999; Parasuraman 1991; Zikmund 2000). For the purpose of this study, factor analysis was performed to measure the dimensions of a concept as well as to identify which items were appropriate for each dimension. Then, since this study sought to test the potential relationships among variables a confirmatory factor analysis using AMOS 5.0 was applied.

Further, to achieve construct validity, the measurement should demonstrate convergent validity and discriminant validity. Convergent validity refers to the items purporting to measure the same construct correlates positively with one another (Malhotra 1999; Parasuraman 1991). On the other hand, the latter requires that an item does not correlate too highly with other items of different constructs (Hair et al. 2003; Malhotra 1999). In this study, the correlation matrix and inter-construct correlation were analyzed for convergent and discriminant validity.

4.3   Data analysis strategy

Data analysis involved steps such as coding the responses, cleaning, screening the data and selecting the appropriate data analysis strategy (Churchill & Iacobucci 2004; Luck & Rubin 1987; Malhotra 1999; Sekaran 2000) as detailed below.

4.3.1   Coding of responses.

This task involved identifying, classifying and assigning a numeric or character symbol to data, which may be done in two ways: pre-coded and post-coded (Luck & Rubin 1987; Wong, 1999). In this study, most of the responses were pre-coded except for questions 1-11, which required post-coding. Taken from the list of responses, a number corresponding to a particular selection was given. This process was applied to every earlier questions that needed this treatment. Upon completion, the data were then entered to a statistical analysis software package, SPSS version 12.01, for the next steps.

4.3.2   Cleaning and screening data.

The process of cleaning and screening data included inconsistency checks and missing responses (Luck & Rubin 1987; Malhotra 1999). Details of procedures used to clean and screen the data are explained in Section 5.1.1.

4.3.3   Selecting a data analysis strategy.

The final step was to select the appropriate statistical analysis technique. To do this, research elements, namely the research problem, objectives, characteristics of data and the underlying properties of the statistical techniques are considered (Malhotra 1999). To meet the purposes of this study, descriptive and inferential analyses were applied.

Descriptive analysis refers to the transformation of raw data into a form that would provide information to describe a set of factors in a situation that will make them easy to understand and interpret (Kassim 2001; Sekaran 2000; Zikmund 2000). This analysis gives a meaning to data through frequency distribution, mean, and standard deviation, which are useful to identify differences among groups. Details are given in Section 5.1.2.

Inferential analysis refers to the cause-effect relationships between variables. Inferential statistics used for this research were *correlations*, *structural equation modeling (SEM)* and *multivariate analysis of variance (MANOVA)*.

Correlation analysis. Correlation analysis was used to test the existence of relationships between variables being studied. To do so, Pearson correlation coefficient was applied and is discussed in detail in Section 5.1.3.

Factor Analysis.   Prior to multivariate analyses, an *exploratory factor analysis* was performed to identify the common items of an underlying dimension, or also called factor (Hair, et al. 1998). The VARIMAX rotation was applied as to simplify the interpretation of factors (Tabachnick & Fidell 2001). Through this extraction technique, it was obvious which factors should be considered: the higher/lower loading factors will obviously

produce higher/lower values. Factors that produced eigenvalues greater than 1.0 were considered significant. Once these factors have been identified, large numbers of variables can be reduced to a more manageable number (Pallant 2001), which can be achieved, by factor extraction and rotation. Details of procedures taken are explained in Section 4.2.5.

SEM. Moving onto the second inferential analysis, *SEM* was applied to measure the relationships between the independent variables and dependent variables simultaneously as to test propositions 1 and 2 of this study. Since this study required the hypothesized models to be tested for the best-fit, SEM seemed to be the appropriate analysis method as it produces more comprehensive overall goodness-of-fit than those found in other traditional methods (Ramanathan 1989). AMOS version 5.0, a software package (Arbuckle 1997; Byrne 2001; Tabachnick & Fidell 2001) was used for SEM as it is user-friendly software that provides a graphical user interface, which is easy to understand. AMOS also enables data to be imported directly from SPSS. Figure 4.4 illustrates the variables involved in the inferential analysis, their functions and relationships. Details of procedures used in SEM are discussed in Section 5.4.

MANOVA. In order to test research proposition 3, Multivariate Analysis of Variance (MANOVA) was applied. *MANOVA* has its strength over other multivariate analysis because it maximizes the differences among group membership of variables as a whole and helps to understand groups' dimensions differences (Hair et al. 1998; Tabachnick & Fidell 2001). Details of steps taken in MANOVA are given in Section 5.5. Table 4.1 summarizes the data analysis methods used in this study.

Figure 4.4: Functions of Study Variables and their Relationships
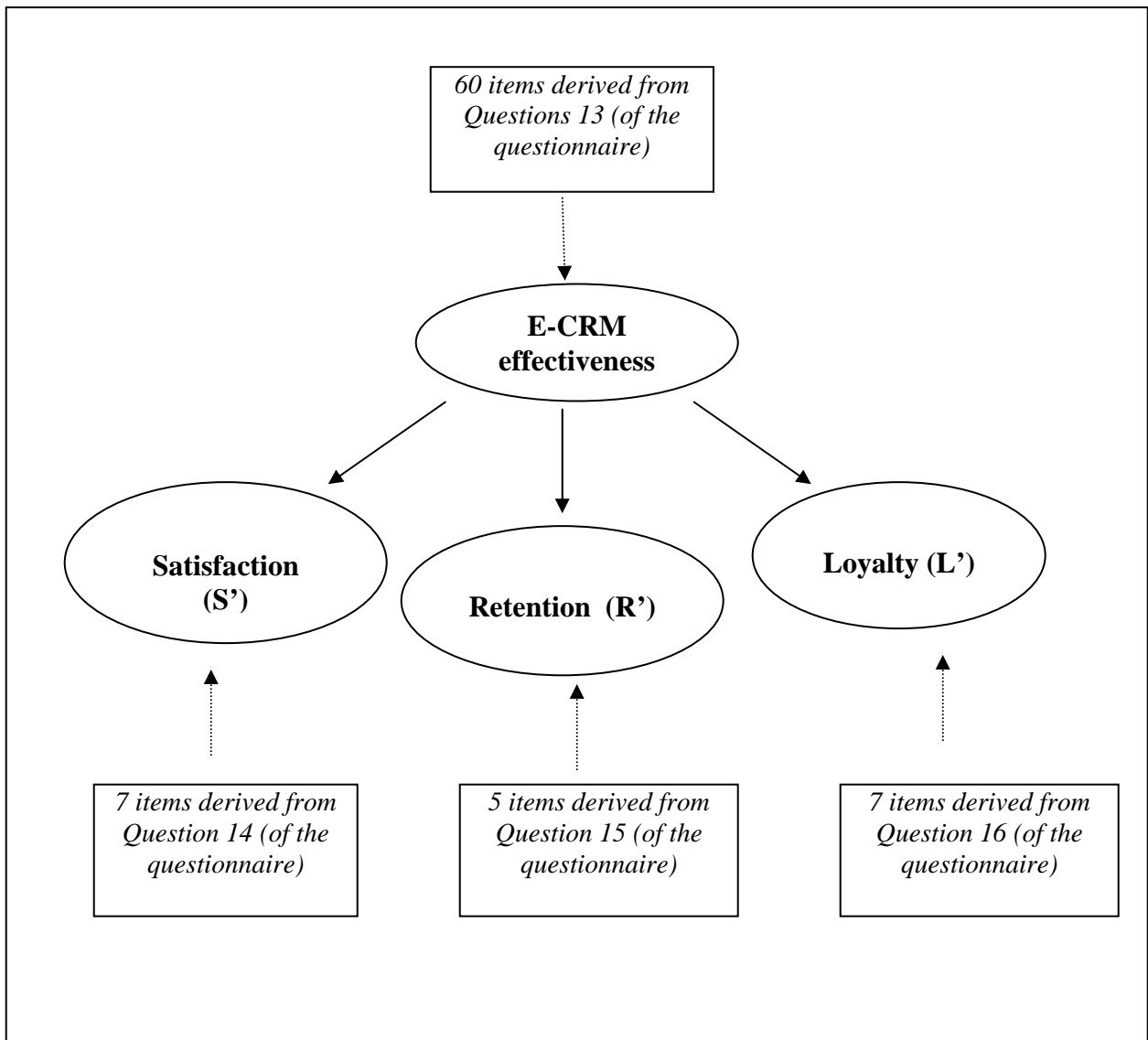
Source: Developed for this thesis

Table 4.1: Summary of Data Analysis Methods

Research Propositions(RP)	Methods of Analysis
RP1.1 : Satisfaction is a function of customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/services range.	Factor analysis, Measurement Model and Structural Equation Modeling (SEM)
RP1.2 : Loyalty is a function of emotional benefits, perceived value and trust.	
RP1.3: Retention is a function of channel integration, customer service quality, online community, personalization level and rewards.	
RP2.1: The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust.	Structural Equation Modeling (SEM)
RP2.2: E-CRM will influence consumers' satisfaction.	
RP2.3: E-CRM will influence consumers' loyalty.	
RP2.4: E-CRM will influence consumers' retention.	
RP2.5: E-CRM will influence loyalty, which is affected by satisfaction. In turn, consumer loyalty will lead to retention.	
RP3.1: Demographics affect satisfaction, loyalty and retention.	Multivariate analysis of variance (MANOVA)
RP3.2: Consumers' experience level with Internet activities affects satisfaction, loyalty and retention.	
RP3.3: Consumers' perceived risk with Internet activities affects satisfaction, loyalty and retention.	

Source: Developed for this thesis

4.4   Ethical considerations

Finally, it is pertinent to consider the proper conduct of this research. This research accommodated the responsibilities to protect the interests of the sponsor, the survey respondents and users. The sponsors of this research were my employer, Multimedia University and MOSTE, which hold their own code of research ethics to which I adhered to (Centre for Research & Postgraduate Programs 2000).

With regards to the survey respondents, no one was coerced to respond to this survey. The respondents were asked to participate on their own freewill, that is, they were told of their rights not to participate or to end their participation if they so wished (Kassim 2001; Sallant & Dillman 1994; Wong 1999). Besides, they were briefed about the purpose of the study and how or why they were chosen. As such they were free from deception or stress that might arise from their participation in this research. The respondents are also guaranteed protection through anonymity and all information that may reveal their identity are held in strict confidence.

The potential users of this survey are Malaysian industries who may be interested to understand the scenario of Malaysian consumers' behaviour in an online environment. Specifically, the institutions that have greatly helped this survey by allowing access to their list of users shall be treated with utmost care and respect to their reputation. Their identities will not be revealed and data obtained will be kept strictly confidential. Furthermore, the purpose of this study was explained to them and they will be informed of the findings if they so request later.

4.5   Conclusions

This chapter illustrates the research design, process taken in the questionnaire administration as well as an introduction to the data analysis. Finally, ethical considerations pertaining to the collection of data were discussed. In the following chapter, results of the data analysis are presented.

CHAPTER 5: DATA ANALYSIS

5.0 Introduction

The methodology to collect data for this research was described in the previous chapter. This chapter then reports the results of analyzing that data. Firstly, a preliminary examination of the data is described in section 5.1, which includes the process involved in data cleaning and screening, descriptive and correlation analysis. The profile and analysis of respondents are described in section 5.2 followed by a pattern of Internet usage in section 5.3. The results of hypotheses tests are discussed in their order of presentation in chapter 4 using a structural equation model (SEM) in section 5.4 and a General Linear Model of multivariate analysis of variance (MANOVA) in section 5.5. Section 5.6 concludes with a summary of this chapter and an early introduction of chapter 6.

5.1   Preliminary examination of data

This section presents the screening and cleaning of raw data before they were analyzed. Two broad categories of problems are discussed: case-related issues such as the accuracy of the data input, missing observations, and outliers; and distribution issues such as normality (Hair et al. 1998; Tabachnick & Fidell 2001).

5.1.1   Data cleaning and screening

Accuracy of data input.   Subsequent to collecting the questionnaire survey, a research assistant helped to enter the data into the SPSS statistical software version 12.01 in November 2003. A total of 671 (67.1%) respondents completed the survey.

Screening of the data sets was conducted through an examination of basic descriptive statistics and frequency distributions. Values that were found to be out of range or improperly coded were detected with straightforward checks (Kassim 2001). A frequency

test was run for every variable to detect any illegal and missing responses. Three cases with illegal responses were noted and corrected.

However, 45 cases of the completed questionnaires were found to be unusable because of missing responses. An inspection of the data set revealed that there were incomplete responses in Section A and Section B of the questionnaire, that is, questions pertaining to respondents' demographics and Internet activities. Hence, these missing responses were discarded immediately which resulted in 626 usable responses. This procedure is known as casewise deletion (Malhotra 1999) and was preferred to other methods of analyzing missing responses. In casewise deletion only cases with complete records are included, that is, all analyses are conducted with the same cases (Kline 1998), and hence consistency is maintained. Although the deletion of cases resulted in a substantially smaller than the original sample size, the number of cases of 626 was more than adequate for further analysis (see Section 4.2.6).

On the other hand, an alternative approach of *pairwise* deletion of cases excludes the missing responses for variables involved in a particular computation. This method uses all possible cases for each calculation, but it will result in inconsistency of the effective sample size from analysis to analysis. That is, results may be derived from different sample sizes. This feature of pairwise deletion presents a potential drawback to SEM or for any other multivariate analysis with grouped data because of the out-of-range correlations or covariances that occur (Kline 1998). Imputation is another method used for analyzing missing responses - this technique involves pattern matching which replaces "a missing observation with a score from another case with a similar profile of scores across other variables" (Kline 1998, p. 75). In this study, there were 38 missing responses scattered across items in Section C (respondent's perception towards Internet services) of the questionnaire. Since these missing responses were less than 10 per cent (of the data set) then imputation is appropriate and was performed.

Outliers. Having treated missing responses, the next step was to examine outliers. There are four reasons which cause outliers. The first occurs from incorrect data entry. In

this research, a few cases of these errors were noted and corrected as discussed above. The second type of outlier is the inclusion of missing values in calculations, and the third type is the result of sampling error wherein cases are not representative of the intended population. Finally, outliers include those observations within the intended population but are extreme in their combination of values across the variables. Some cases with the third and fourth types of outliers were identified in this research, and their treatment is discussed next.

First, an examination to detect *univariate* outliers was performed. Detecting univariate outliers was done on the observations of each variable (Hair et al. 1998). Distinct observations that fell at outer ranges of the distribution were selected as outliers. This was done by converting the data values to standard z scores of each variable. Hair et al. (1998) suggest that a common rule of thumb is that z scores can range from ± 3 to ± 4 for samples of more than 80. The z scores of ± 3.29 were selected for this research and represent one chance in a million (Tabachnick & Fidell 2001). Thirty univariate outliers were identified and after further investigation it was found that these cases were extreme – either they strongly agree or disagree to the interval scaled statements. However, since this study investigates consumers' perceptions towards Internet activities, it is normal that a consumer has strong feelings towards a variable and feels otherwise towards another. Consequently, it is quite conceivable for outliers to occur and that excluding these extreme cases will affect generalizability to the entire population of this study (Hair et al. 1998; Tabachnick & Fidell 2001). Hence, these cells were retained.

Next, *multivariate* assessment of outliers with Mahalanobis distance was conducted because some individual (univariate) outliers may also become multivariate outliers when several variables are combined (Hair et al. 1998; Tabachnick & Fidell 2001). In this research, each of the research models was examined for Mahalanobis distance. A critical χ^2 value with degrees of freedom equal to the number of independent variables and a probability of p<0.001 was compared (Kassim 2001; Kline 1998; Tabachnick & Fidell 2001). From this comparison, there were multivariate outliers in most of the models. However, the final decision about retaining or discarding outlier cases is not a

merely a technical one based on some critical value of χ^2. Of course, if outlier cases are that of different population than the rest of the cases, then outliers should be removed from the sample. However, if they appear to be simply cases with unusual scores within the same population, then they could be retained to maintain validity in the research. Indeed,

> "...if they do represent a segment of the population, they *should* be retained to ensure generalisability to the entire population. As outliers are deleted, the analyst is running risk of improving the multivariate analysis but limiting its generalisability" (Hair et al. 1998, p. 66: emphasis added)

However, some χ^2 values were far above the critical values shown in Appendix 5.1 and so some balance had to be made between retaining outlier cases and addressing the requirements of multivariate statistical tests such as SEM and MANOVA— problematic outliers can seriously distort these statistical tests (Hair et al. 1998, p. 64). Thus, cases where the χ^2 was above 100 and the outlier situation could not be explained were discarded. For this reason, 79 cases were deleted which resulted in 547 cases remaining for further analysis. The next step was to assess the normality.

Normality. Subsequent to outlier tests, an assessment of normality was performed (Churchill & Iacobucci 2004; Hair et al. 1998; Tabachnick & Fidell 2001). The first basic assumption about SEM is that all data have a multivariate normal distribution (Hooley & Hussey 1994; Hulland et al. 1996). Multivariate normality includes both the distributions of individual variables and the distributions of combinations of variables (Hooley & Hussey 1994). This assumption is necessary in order to allow significance testing using the t-test and F statistics (Arbuckle 1997; Baumgartner & Homburg 1996; Hair et al. 1998; Hooley & Hussey 1994; Tabachnick & Fidell 2001). For example, in the SEM model, estimation and testing are usually based on the validity of multivariate normality assumption, and lack of normality will adversely affect goodness-of-fit indices and standard errors (Baumgartner & Homburg 1996; Hulland et al. 1996; Kassim 2001).

To assess normality, *skewness* and *kurtosis* are two ways that can be used to validate an assumption. According to Tabachnick and Fidell (2001), skewness refers to the symmetry of a distribution, that is, a variable whose mean is not in the centre of the distribution is regarded as skewed variable. On the other hand, kurtosis relates to the peakedness of a distribution. A distribution is said to be normal when the values of skewness and kurtosis are equal to zero (Tabachnick & Fidell 2001). However, there are few clear guidelines about how much non-normality is problematic. Many authors suggest that absolute values of univariate skewness indices greater than 3.0 seem to describe extremely skewed data sets (for example, Chou & Bentler 1995; Hu et al. 1992; West et al. 1995). Regarding kurtosis, there appears to be less consensus and a conservative compromise seems to be that absolute values of the kurtosis index greater than 10.0 may suggest a problem and values greater than 20.0 may indicate a more serious one (Hoyle 1995; Kassim 2001; Kline 1998).

In this study, all variables were tested at a univariate and multivariate level for normality using AMOS. At the *univariate* level, of the 60 observed variables in the proposed models, none had skewness greater than 3.0 and none had kurtosis index greater than 8.0. These figures indicated that the data was distributed normally (see Appendix 5.2). However, these examinations of skewness and kurtosis at univariate level provided only an initial check on multivariate normality.

Further, to assess *multivariate* normality the observed variables of this study were tested by two methods (Kassim 2001; Tabachnick & Fidell 2001): Mardia coefficient (Arbuckle 1997) and an examination of the distribution of residuals (Diamantopoulos 1994). From the AMOS output, the Mardia coefficient of multivariate kurtosis indicated that the SEM models in this research did deviate from multivariate normality values above the critical value of ± *1.96*. Nevertheless, multivariate normality can also be tested by examining the distribution of standardised residuals (Diamantopoulos 1994). According to Joreskog and Sorbom (1989a, p. 32) residuals "...can be interpreted as standard normal deviate and considered "large" if it exceeds the value of 2.58 in absolute value". In all of the structural models, most z scores were below 2.58 (see Appendix 5.3); hence it was safe to

assume that multivariate normality appeared to generally exist. Moreover, to moderate the effect of multivariate non-normality, if it indeed existed, the maximum likelihood (ML) estimation, which is relatively robust against departures from multivariate normality (Anderson & Gerbing 1988; Diamantopoulos 1994; Kline 1998; Sweeney 2000; Tabachnick & Fidell 2001), was applied in this research.

5.1.2 Descriptive analysis

Subsequent to data cleaning and screening was analyzing the descriptive of the data sets. Descriptive statistics including minimum, maximum, means, range, standard deviation and variance were obtained for the interval-scaled variables.

From these statistics, the *means* for retention variables were somewhat lower compared to the other independent variables of satisfaction and loyalty, as shown in Appendix 5.4. However, the scores were tightly packed around the mean, indicating that most respondents share similar opinions towards satisfaction, retention and loyalty. For example, in this thesis, most of the *standard deviations* were less than 1.00, that is, the variations in respondents' opinions were small.

In relation to *range*, unlike the *variance* value, a large range for each variable (above 3) was observed as shown in Appendix 5.4. This suggests a greater variation or dispersion in the process. However, the range is based on only the maximum and minimum score, and it is often inferior to other measures of variation like the standard deviations that are based on the value of every score (Kassim 2001; Sekaran 2000; Triola & Franklin 1995).

In brief, mean, variance, range and standard deviation were used to determine the extent of spread of the data. The next step is to describe the relationships among the variables.

5.1.3   Correlation

Most multivariate procedures analyze patterns of correlation or covariance among variables prior to testing research models (Hair et al. 1998; Tabachnick & Fidell 2001) like those tested later in sections 5.4 and 5.5. Correlation coefficient provides the basis of association between two variables which further permits the specification of unique variance shared between variables (Schumacker & Lomax 2004). In this study, the Pearson correlation method was used to test the bivariate relationships between measured and latent variables as is commonly used in SEM (Schumacker & Lomax 2004). The Pearson correlation matrix obtained for the five interval-scaled variables is shown in Appendix 5.5. Most of the linear relationships reported were in the expected direction, that is, they were significantly correlated, thus signaling no difficulties with the SEM as described later in section 5.4 (Tabachnick & Fidell 2001).

However, the Pearson correlation coefficient is only appropriate to measure relationships between interval-scaled variables. The Spearman rho rank coefficient should be used to test interrelationships between demographic non-parametric variables (Pallant 2001). Thus, for this study the Spearman rho rank coefficient was applied to examine the strength of associations between the rank ordered demographic variables, namely gender, age and education, and Internet activities variables: online registration, online reservation and online banking.   From the test, these non-parametric variables were related in the expected direction and the results are illustrated in Appendix 5.6.

5.2   Respondent profile

In this section, frequency distributions were calculated for all cases in this research and were summarised in Table 5.1. These frequency distributions contained data about gender, race, age, education, income and location.

Table 5.1 indicates that the respondents were almost evenly split by race (37 per cent Malay, 34 per cent Chinese, 24 per cent Indian and 5 per cent others) and gender (50 per cent were male and 50 per cent female). More than half of the respondents were 21 to

Table 5.1: Frequency of Respondent Profile

	No.of Respondents	%		No.of Respondents	%
1. Gender			5. Monthly income		
- Male	274	50.1	- less than RM1,000	134	24.5
- Female	273	49.9	- RM1,001 – RM3,000	279	51.0
			- RM3,001-RM5,000	97	17.7
2. Age			- RM5,001 and above	37	6.8
- Below 20 years	56	10.2	6. Race		
- 21-30 years	281	51.4	- Malay	202	36.9
- 31-40 years	156	28.5	- Chinese	185	33.8
- 41-50 years	49	9.0	- Indian	132	24.1
- Above 50 years	5	.9	- Others	28	5.1
3. Education			7. Location		
- SPM	77	14.1	- Selangor	289	52.8
- STPM/Dip/Matrices	99	18.1	- Kuala Lumpur	206	37.7
- Degree	266	48.6	- Penang	35	6.4
- Masters	75	13.7	- Johor	11	2.0
- PhD	12	2.2	- Kuching	6	1.1
- Others	18	3.3			
4. Occupation					
- Student	150	27.4			
- Non Executive	93	17.0			
- Executive	260	47.5			
- Pensioner	1	0.2			
- Others	43	7.9			

Note: N= 547
Source: Analysis of survey data

30 years of age (51 per cent), followed by the age groups of 31 to 40 and below 20 years at 29 per cent and 10 per cent, respectively. These three groups contributed approximately 90 per cent of the overall total in terms of age. Forty-eight per cent of the respondents had spent at least 15 years in education. With regards to occupation and income level, 48 per cent of the respondents were executives and more than half of them earn between RM12,000 to RM36, 000 per annum (51 per cent).

5.3   Internet usage pattern

This section reports respondents' overall Internet activities, ranging from time spent on the Internet and experiences using the Internet, uses of Internet applications; (email, chat, surfing the World Wide Web and newsgroups); to online activities (namely online banking, online registration and online reservation). Table 5.2 summarizes the results of Internet usage pattern.

From the total of 547 cases, more than half of the respondents (57 per cent) spend less than 30 hours per week; (about 4 hours per day) on the Internet while 27 per cent were heavy users who spend more than 40 hours per week on the Internet. Fifty-five per cent of the respondents were experienced users who have been using the Internet for more than 5 years, followed by 26 per cent of the respondents who had 3-5 years of experience.

It is important to note that from the results, 15 respondents have not used the World Wide Web. This finding is not surprising since 32 per cent of the respondents were college students who may use the Internet mostly for online chatting. Their response however may reflect users who are "new" to the Internet technology and perceptions toward the services rendered on the Internet from less experienced users. However, it is important to note that non-Web users represent only 3 per cent of the respondents while the remaining 97 per cent could contribute meaningfully to the survey.

In terms of using different types of Internet applications, most of the respondents are quite familiar with all the Internet applications, particularly email. Almost half of the respondents (43 per cent) use email every few hours.   This is followed by visiting Web sites (41 per cent), communicating on Internet Relay Chat, that is, text-based communication between two or more users via a web site or using specific software (Britannica Online) (10 per cent) and lastly joining newsgroups discussions (5 per cent). However, about 30 per cent of the respondents had never joined a chat room or a newsgroup before.

Table 5.2: Frequency of Internet Usage

	No. of Respondents	%		No. of Respondents	%
1. Time spent on the Internet			5. World Wide Web		
- 1-20 hours	182	33.3	- Never	15	2.7
- 21-30 hours	129	23.6	- Rarely(Every few wks)	42	7.7
- 31-40 hours	89	16.3	- Sometime(Every few days)	120	21.9
- 41-50 hours	51	9.3			
- more than 51 hours	96	17.6	- Frequently(Everyday)	148	27.1
			- Very frequently(Every few hrs)	222	40.6
2. Internet Experience					
- less than 6 months	4	0.7	6. Newsgroup		
- 6-12 months	12	2.2	- Never	155	28.3
-1-3 years	86	15.7	- Rarely(Every few wks)	147	26.9
- 3-5 years	142	26.0	- Sometime(Every few days)	119	21.8
- more than 5 years	303	55.4			
			- Frequently(Everyday)	97	17.7
			- Very frequently(Every few hrs)	29	5.3
3. Email					
- Never	5	0.9	7. Online registration		
- Rarely (Every few wks)	51	9.3	- Yes	443	81.0
			- No	104	19.0
- Sometimes (Every few days)	108	19.7			
- Frequently (Everyday)	146	26.7	8. Online reservation		
- Very frequently (Every few hrs)	237	43.3	- Yes	265	48.4
			- No	282	51.6
4. Chat			9. Online banking		
- Never	179	32.7	- Yes	274	50.1
- Rarely (Every few wks)	149	27.2	- No	273	49.9
- Sometimes (Every few days)	107	19.6			
- Frequently (Everyday)	56	10.2			
- Very frequently (every few hrs)	56	10.2			

Note: N = 547
Source: Analysis of survey data

The results indicate that the respondents were almost evenly split on the use of online banking and online reservation: 50 per cent of the respondents have conducted online banking and 52 per cent have made reservations on the Internet. Furthermore, a majority of 81 per cent of the respondents surveyed have conducted online registration.

From the results presented above, it can be concluded that the overall majority of the respondents are Internet technology literate: they have sufficient knowledge of the Internet and were appropriate candidates to participate in this study.

5.4   Results from tests of research propositions

This section presents the results of data analysis in three major components: the measurement model tests followed by structural model and finally the MANOVA tests. In this study, Structural equation modeling (SEM) was used to test proposition 1 and 2. Premised on marketing and information systems theories, the use of Internet in CRM predicts consumer satisfaction with online service providers, which in turn predicts consumer loyalty and intention to return. SEM lends its strength in assessing and validating causal relationships between variables. Details of the processes and techniques of SEM applied to this study are discussed in Appendix 5.7.

5.4.1 Measurement model evaluation

In this research, the endogenous constructs of satisfaction and loyalty consist of seven indicator variables respectively while the retention construct consists of five indicator variables. Measurement models of latent endogenous variables such as information quality, ease of navigation, personalization, channel integration, perceived value, trust and so forth were assessed for their unidimensionality and goodness-of-fit. The variable labels used in this analysis are summarized in Appendix 5.8.

<u>Measurement model for satisfaction construct</u>

This section presents a unidimensional model for Internet user satisfaction. The initial model consisted of seven observed variables. However, from the analysis one indicator variable, OS4 that is "Wide range of products/services to choose from", had an unacceptably low standardized regression weight (0.13) and did not meet the acceptance value of 0.5 and above, hence it was dropped. The six indicator variable model of satisfaction has good factor loadings where each item loads more than 0.70 as illustrated in Table 5.3, suggesting that the indicators are good measures of satisfaction and provide an evidence of convergent validity. Moreover, an excellent Cronbach alpha value of 0.89 reflects the unidimensional of measured items: high internal reliability and consistency. The fit measures suggested a well fit model with RMSEA, CFI, TLI and AGFI were all above the desired level. This good-fitting model of satisfaction is illustrated in Figure 5.1.

Table 5.3: Goodness-of-fit Statistics for the Measurement Model of 'Satisfaction'

Reliability (Cronbach Alpha) -	0.89	
Standardised Regression Weight	<u>Estimate</u>	<u>Goodness-of-fit measures</u>
OS1 ← SATISFN	0.70	[a]Root mean error of est.(RMSEA) 0.059[1]
OS2 ← SATISFN	0.70	[b]Adjusted Goodness-of-fit index(AGFI) 0.96
OS3 ← SATISFN	0.83	[c]Tucker-Lewis index(TLI) 0.98
OS5 ← SATISFN	0.83	[d]Comparative Fit index(CFI) 0.99
OS6 ← SATISFN	0.81	
OS7 ← SATISFN	0.83	

Keys:	
SATISFN - Satisfaction	OS5- Customer service
OS1 - Information quality	OS6 - Order fulfillment level
OS2 - Lower prices	OS7 - Payment security
OS3 - Navigation ease	

Recommended value: [a]≤0.06 (Hu & Bentler, 1999); [b] close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1] RMSEA range: 0.033, 0.090. Source: Analysis of survey data

Figure 5.1: Measurement Model of Satisfaction
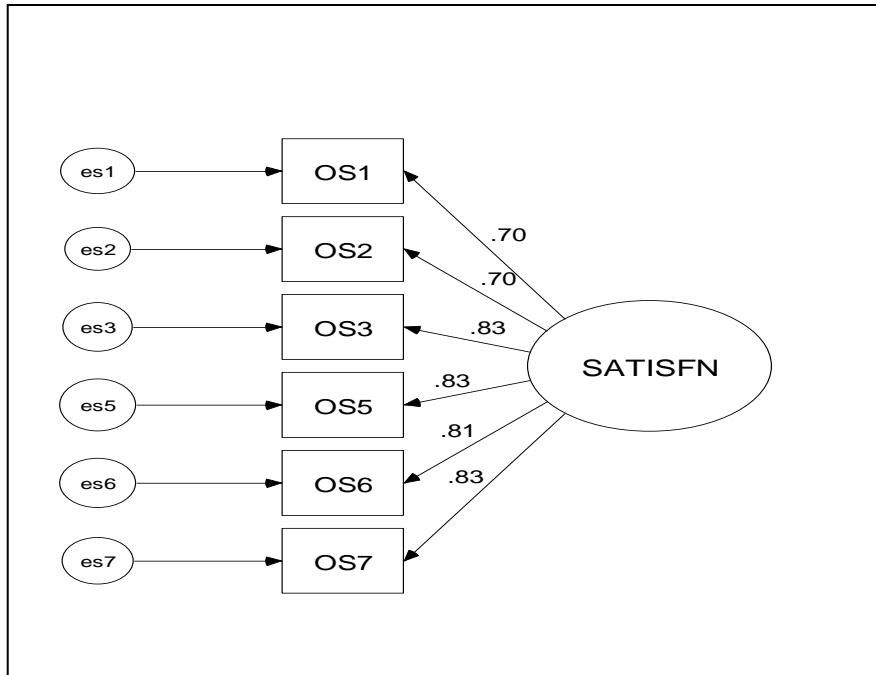
Measurement model for retention construct

The next step is to assess the measurement model for the retention construct. Two indicator variables, OR1 that is, "Reward"; and OR2, "Customer service quality" had unacceptably low factor loadings (0.42 and 0.44) and these items were dropped. The three-indicator model provides good measures and evidence of convergent validity. The internal reliability ($\alpha = 0.71$) was adequate to indicate the three items are reliable measures of retention. Further support for the model is provided by the fit values: RMSEA= 0.046; and all the fit indices are very close to one (CFI= 0.99, TLI= 0.98 and AGFI= 0.97). Table 5.4 shows the details of this result and the three-indicator model is illustrated in Figure 5.2.

Table 5.4: Goodness-of-fit Statistics for the Measurement Model of 'Retention'

Reliability (Cronbach Alpha) -	0.71	
Standardised Regression Weight	Estimate	Goodness-of-fit measures
OR3 ← RETENTION	0.55	[a]Root mean error of est.(RMSEA) 0.046[1]
OR4 ← RETENTION	0.73	[b]Adjusted Goodness-of-fit index(GFI) 0.97
OR5 ← RETENTION	0.72	[c]Tucker-Lewis index(TLI) 0.98
		[d]Comparative Fit index(CFI) 0.99

Keys:
RETENTION - Retention
OR3 - Personalization
OR4 - Channel integration
OR5 - Online community

Recommended value: [a]≤0.06 (Hu & Bentler, 1999); [b] close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1]RMSEA range: 0.005, 0.080. Source: Analysis of survey data

Figure 5.2: Measurement Model of Retention
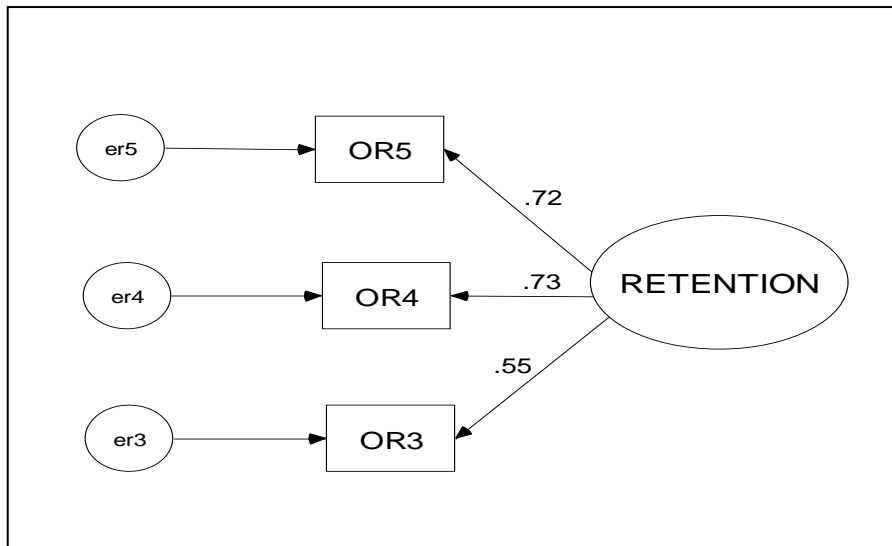
Measurement model for loyalty construct

The initial model consisted of seven indicator variables. However due to poor loadings, three variables: OL1 "Feel committed" (0.35); OL5 "Feel safe" (0.39); OL7 "Recommend to friends" (0.37) were deleted. The internal reliability for the four-indicator model was very good with Cronbach alpha equal to 0.87. This result suggests that the indicators are good measures of loyalty and provide evidence of convergent validity. Furthermore, the fit indices indicate a good fit model where the RMSEA, CFI, TLI and AGFI yielded values within the acceptable range as shown in Table 5.5. The four-indicator model is illustrated in Figure 5.3.

Table 5.5: Goodness-of-fit Statistics for the Measurement Model of 'Loyalty'

Reliability (Cronbach Alpha) - Standardised Regression Weight	Estimate	Goodness-of-fit measures	
OL2 ← LOYALTY	0.87	[a]Root mean error of est.(RMSEA)	0.042[1]
OL3 ← LOYALTY	0.94	[b]Adjusted Goodness-of-fit index(GFI)	0.98
OL4 ← LOYALTY	0.91	[c]Tucker-Lewis index(TLI)	0.97
OL6 ← LOYALTY	0.53	[d]Comparative Fit index(CFI)	0.99
Keys:			
LOYALTY - Loyalty			
OL2 - Sense of belonging		OL4 - Contented with own experience	
OL3 - Feel appreciated		OL6 - Reliable service	

Recommended value: [a]≤0.06 (Hu & Bentler 1999); [b]close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1] RMSEA range: 0.000, 0.104. Source: Analysis of survey data

Figure 5.3: Measurement Model of Loyalty
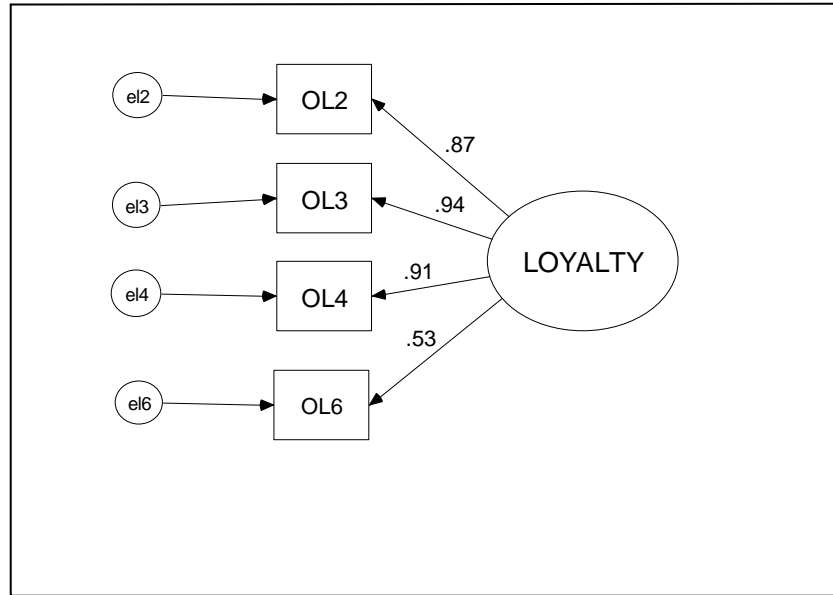
Measurement model for information quality dimension

This section presents a unidimensional model of information quality. The model consists of three observed variables. Its reliability level, standardised regression weights and goodness-of-fit statistics are displayed in Table 5.6. Support for convergent validity is evident from the factor loadings, where all items exceeded 0.80 and these items appeared to be reliable measures of information quality based on its internal reliability ($\alpha = 0.89$). The CFI, TLI and AGFI values are equal to 1.0 indicating a perfect fit. Based on the values of standardized regression weights, reliability and goodness-of- fit statistics, the measurement model of information quality fitted the data well. The three-indicator model is illustrated in Figure 5.4.

Table 5.6: Goodness-of-fit Statistics for the Measurement Model
of Information Quality

Reliability (Cronbach Alpha) -	0.89
Standardised Regression Weight	<u>Estimate</u>
I1 ← STINFO	0.85
I2 ← STINFO	0.86
I3 ← STINFO	0.83
Keys:	
STINFO - Information quality	
I1 - The information is accurate	
I2 - In-depth information on products/services	
I3 - Information displayed is easy to understand	

Source: Analysis of survey data

Figure 5.4: Measurement Model of Information Quality
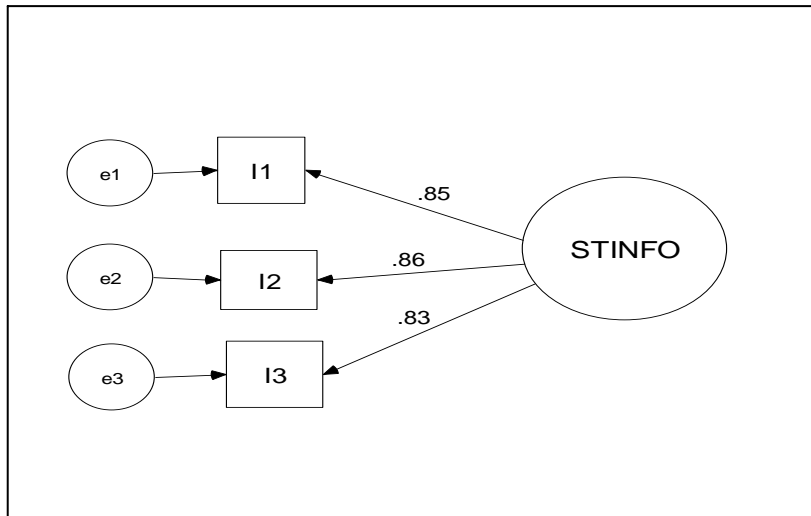
Measurement model for product/service range dimension

This section reports the measurement model of product/service range. Initially, the model consisted of three indicator variables. One indicator variable, P1, that is,"Products/services are of high quality", had an unacceptably low loading (0.19) and

was dropped.   Estimating a two-indicator model produces a perfect fit.   Table 5.7 displays the output of this model. Convergent validity is evident from the standardized regression weights exceeding 0.80 and Cronbach alpha value of 0.85 reflecting a high internal reliability and consistency. An illustration of the product/service range model is shown in Figure 5.5.

Table 5.7: Goodness-of-fit Statistics for the Measurement Model
of Product/Service Range

Reliability (Cronbach Alpha) -	0.85
Standardised Regression Weight	<u>Estimate</u>
P2 ← STPROD	0.87
P3 ← STPROD	0.85
Keys:	
STINFO - Product/Service range	
P2 - More varieties in product/services	
P3 - Products/services offered are up-to-date with current trend	

Source: Analysis of survey data

Figure 5.5: Measurement Model of Product/Service Range
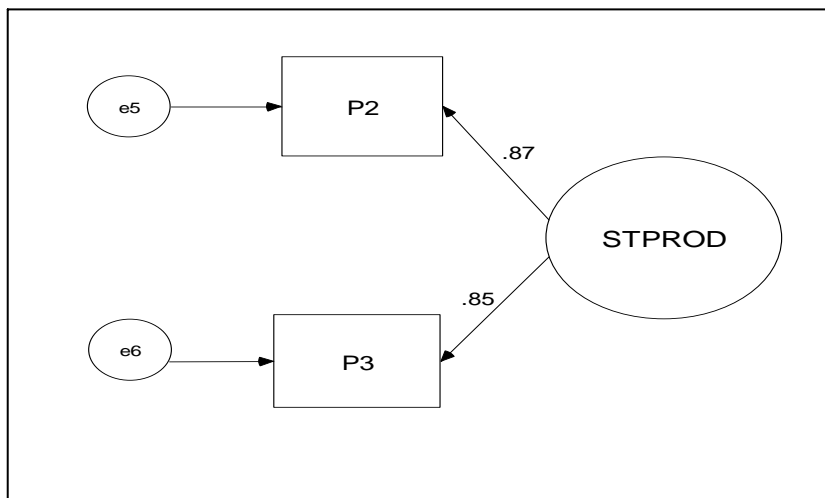
Measurement model for ease of navigation dimension

This section presents a unidimensional model of ease of navigation. Initially, the measurement model consisted of six observed variables. However, two items: N5 "The links are clearly displayed"; N6 "The Web site uses a language that can be easily understood" had poor loadings (0. 48 and 0.15) and were dropped. The reliability level, standardised regression weights and goodness-of-fit statistics indicate that the four-indicator variables are good measures of ease of navigation construct. As shown in Table 5.8, the standardized regression weights are all above the desired level (≥ 0.50).

In addition, the internal reliability is very good ($\alpha = 0.93$) indicating high internal reliability and consistency. The goodness-of-fit measures of this model are reinforced by RMSEA= 0.059, CFI= 0.99, TLI= 0.98 and AGFI= 0.97. Hence, the four-indicator model of ease of navigation provides evidence of good fit and is depicted in Figure 5.6.

Table 5.8: Goodness-of-fit Statistics for the Measurement Model
of Ease of Navigation

Reliability (Cronbach Alpha) -	0.93	
Standardised Regression Weight	Estimate	Goodness-of-fit measures
N1 ← STNAV	0.74	[a]Root mean error of est.(RMSEA) 0.059[1]
N2 ← STNAV	0.74	[b]Adjusted Goodness-of-fit index(GFI) 0.97
N3 ← STNAV	0.76	[c]Tucker-Lewis index(TLI) 0.98
N4 ← STNAV	0.69	[d]Comparative Fit index(CFI) 0.99
Keys:		
STNAV - Ease of navigation		
N1 - The Website is always accessible		N3 - Only a few clicks to get information
N2 - The Web site provide easy steps whenever a customer needs to register		N4 - The Web pages load quickly

Recommended value: [a]≤0.06 (Hu & Bentler 1999); [b]close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1] RMSEA range: 0.018, 0.098. Source: Analysis of survey data

Figure 5.6: Measurement Model of Ease of Navigation
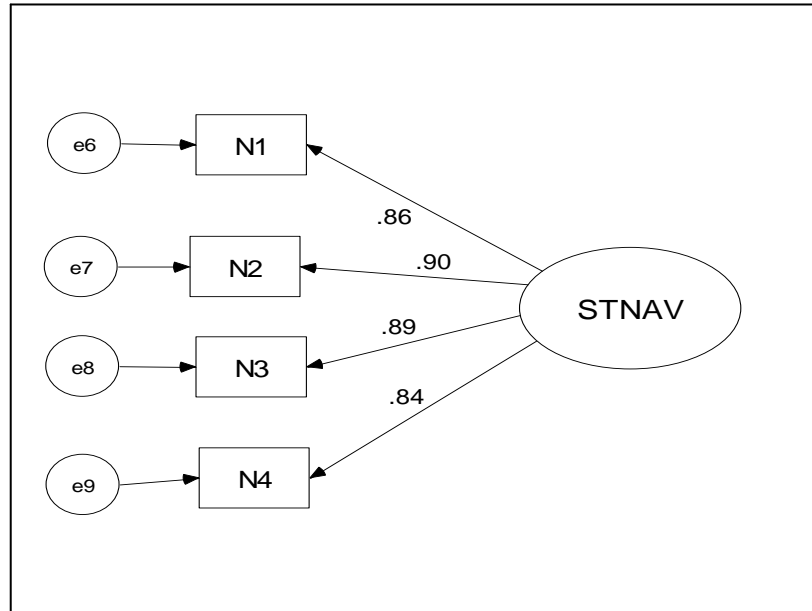
Measurement model for order fulfillment level dimension

This section reports on the measurement model of order fulfillment level. This model consists of two observed variables. Its reliability level, standardised regression weights and goodness-of-fit statistics are displayed in Table 5.9. Providing support for convergent validity are the factor loadings, which exceeded 0.80 and the items appeared to be reliable measures of order fulfillment level based on its internal reliability ($\alpha = 0.89$). The RMSEA, CFI, TLI and AGFI statistics indicated a perfect model fit. Based on the values of standardized regression weights, reliability and goodness-of-fit statistics the measurement model of order fulfillment level fitted the data well. The two-indicator model of order fulfillment level is illustrated in Figure 5.7.

Table 5.9: Goodness-of-fit Statistics for the Measurement Model
of Order Fulfillment Level

Reliability (Cronbach Alpha) -	0.89
Standardised Regression Weight	Estimate
F1 ← STFUL	0.91
F2 ← STFUL	0.87
Keys:	
STFUL - Order fulfillment level	
F1 - Products received are always in good condition	
F2 - Products/services are delivered within the delivery time as promised	

Source: Analysis of survey data

Figure 5.7: Measurement Model of Order Fulfillment Level
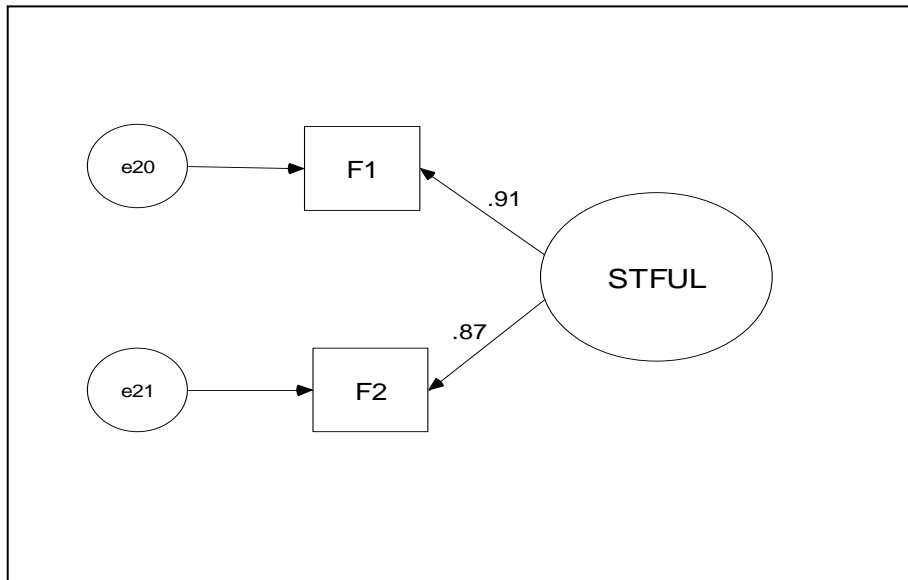
Measurement model for customer service quality dimension

This section presents a unidimensional model of customer service quality. Initially, this model contained 11 observed variables. However, due to unacceptably low factor loadings (<0.50), four items were eliminated. The measurement model of seven observed variables indicates a good fit to the data as shown in Table 5.10.

All the factor loadings of more than 0.70 provide support for this model. Further, internal reliability and consistency are evident from an excellent alpha= 0.93, which indicates that the seven-item model is a good measure of customer service quality construct. The fit indices: RMSEA=0.055; CFI, TLI and AGFI are close to 1.0, indicating a good fit. Based on the values of standardized regression weights, reliability and goodness-of-fit statistics, the measurement model of customer service quality fitted the data well. The seven-indicator model of customer service quality is illustrated in Figure 5.8.

Table 5.10: Goodness-of-fit Statistics for the Measurement Model
of Customer Service Quality

Reliability (Cronbach Alpha) -	0.93	
Standardised Regression Weight	Estimate	Goodness-of-fit measures
C1 ← CUSV	0.79	[a]Root mean error of est.(RMSEA) 0.055[1]
C2 ← CUSV	0.77	[b]Adjusted Goodness-of-fit index(GFI) 0.96
C3 ← CUSV	0.79	[c]Tucker-Lewis index(TLI) 0.99
C4 ← CUSV	0.73	[d]Comparative Fit index(CFI) 0.99
C5 ← CUSV	0.85	
C6 ← CUSV	0.83	
C8 ← CUSV	0.90	

Keys:
CUSV - Customer service quality
C1 -Efficient in handling complaints
C2 - Friendly in answering customers
    enquiries
C3 - Notify my order status
C4 - Responds within 48 hours

C5-Can be contacted through variuos
    channels
C6- Have wide knowledge of
    products/services
C8- Fast in resolving customers'
    Complaints

Recommended value: [a]*≤0.06 (Hu & Bentler 1999);* [b]*close to 0.90 (Kline 1998);* [c,d]*>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7.* [1] *RMSEA range: 0.031, 0.079. Source: Analysis of survey data*

Figure 5.8: Measurement Model for Customer Service Quality
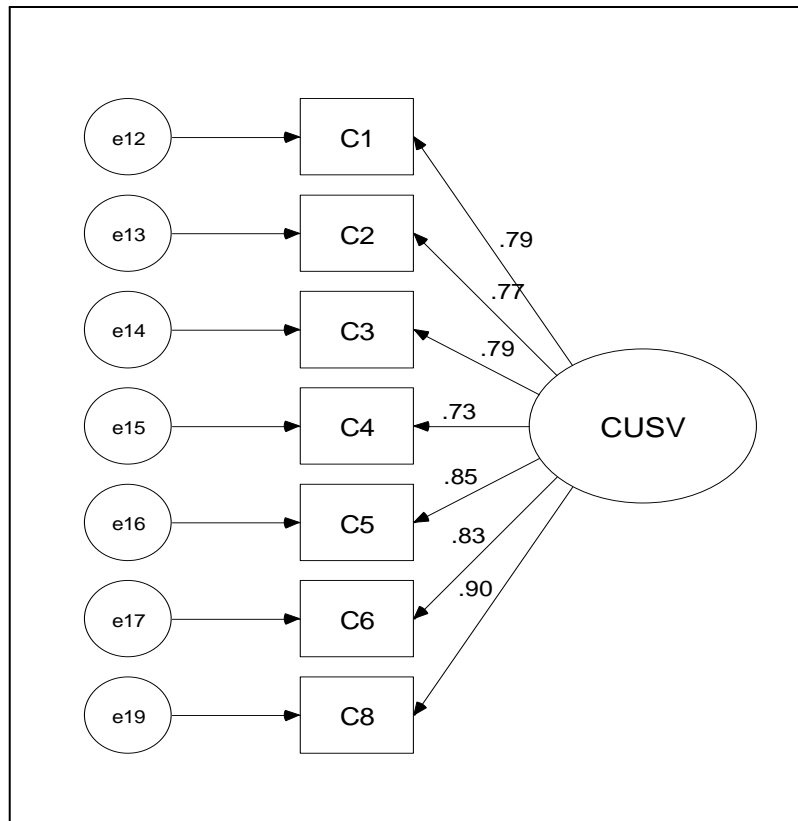
Measurement model for lower prices dimension

This section reports on the measurement model of lower prices. This model consists of two observed variables. Its reliability level, standardised regression weights and goodness-of-fit statistics are displayed in Table 5.11. Providing support for convergent validity are the factor loadings, which exceeded 0.80 and the items appeared to be reliable measures of lower prices based on its internal reliability ($\alpha = 0.91$).

The RMSEA, CFI, TLI and AGFI values indicated a perfect fit. Based on the values of standardized regression weights, reliability and goodness-of-fit statistics, the

measurement model of lower prices fitted the data well. The two-indicator model is illustrated in Figure 5.9.

Table 5.11: Goodness-of-fit Statistics for the Measurement Model of Lower Prices

Reliability (Cronbach Alpha) - Standardised Regression Weight	0.91 <u>Estimate</u>
PR1 ← STPRC	0.95
PR2 ← STPRC	0.87
Keys: STPRC - Lower prices PR1 **-** More attractive discounts and special promotions PR2 - Relatively low delivery charges	

Source: Analysis of survey data

Figure 5.9: Measurement Model for Lower Prices
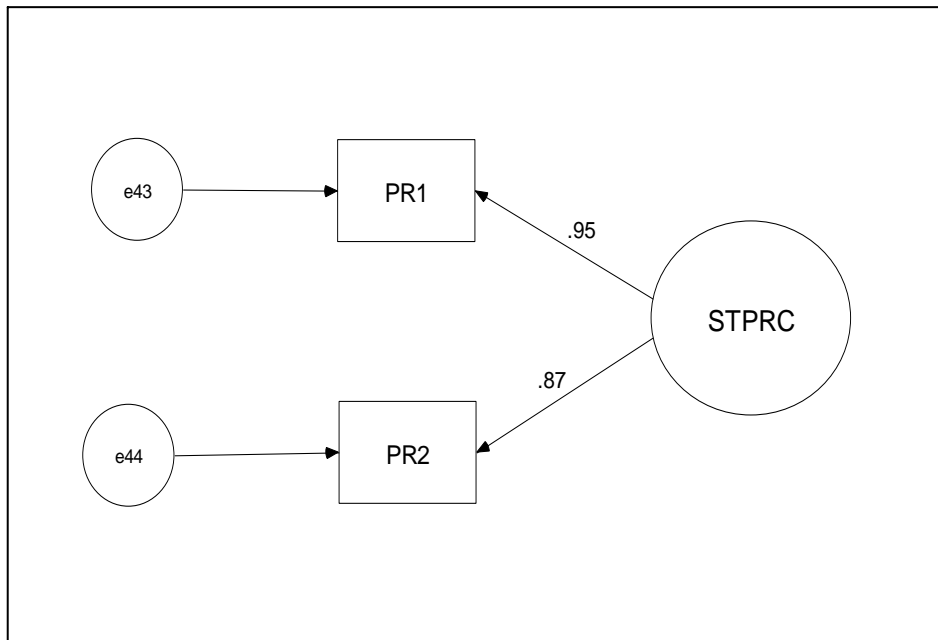
Measurement model for payment security dimension

Next, this section presents a unidimensional model of payment security. The measurement model consists of three observed variables. The reliability level, standardised regression weights and goodness-of-fit statistics are illustrated in Table 5.12. As shown in Table 5.12 the standardized regression weights are all above 0.70. In addition, the internal reliability is very good ($\alpha = 0.85$) indicating high internal reliability and consistency. In addition, the goodness-of-fit measures of this model: RMSEA, CFI, TLI and AGFI all indicated a perfect fit of the model to the data. Hence, the three-indicator model of payment security provides evidence of good fit and is depicted in Figure 5.10.

Table 5.12: Goodness-of-fit Statistics for the Measurement Model
of Payment Security

Reliability (Cronbach Alpha) -	0.85
Standardised Regression Weight	Estimate
SC1 ← STSEC	0.79
SC2 ← STSEC	0.88
SC3 ← STSEC	0.72
Keys:	
STSEC - Payment security	
SC1 - Provides various types of credit cards for payment	
SC2 - Provides alternative payment method other than credit card	
SC3 - Privacy policy is clearly communicated to consumers	

Source: Analysis of survey data

Figure 5.10: Measurement Model for Payment Security
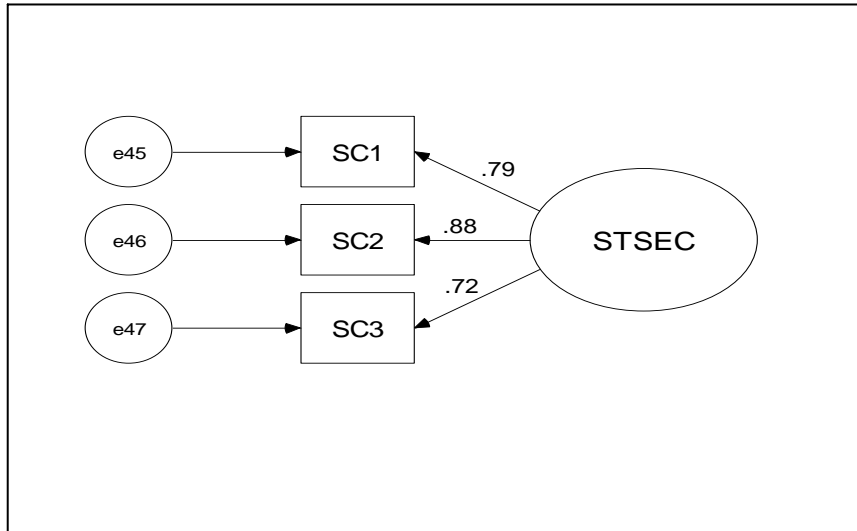
Measurement model for personalization dimension

Next, a unidimensional model of personalization level is presented in this section. Due an unacceptable loading, one item, Z5 "Receive personalized email" was dropped, resulting in a four-item model of personalization. The goodness-of-fit statistics for the four-indicator model are displayed in Table 5.13. Providing evidence in support of convergent validity, the measurement items weight are 0.50 and above. Based on the Cronbach alpha= 0.76, the items appeared to be adequate reliable measures of personalization.

The fit measures suggest a good model fit to the data: RMSEA= 0.058; CFI= 0.99; TLI= 0.97 and AGFI= 0.97. The measurement model in Figure 5.11 shows that the four-items are reliable measures of the personalization construct.

Table 5.13: Goodness-of-fit Statistics for the Measurement Model
of Personalization

Reliability (Cronbach Alpha) -	0.76	
Standardised Regression Weight	Estimate	Goodness-of-fit measures
Z1 ← RTPES	0.50	[a]Root mean error of est.(RMSEA) 0.058[1]
Z2 ← RTPES	0.68	[b]Adjusted Goodness-of-fit index(GFI) 0.97
Z3 ← RTPES	0.67	[c]Tucker-Lewis index(TLI) 0.97
Z4 ← RTPES	0.50	[d]Comparative Fit index(CFI) 0.99

Keys:
RTPES - Personalization

Z1 - Keeps a database of my transactions with them

Z2 - Receive online advertisements that match my interests

Z3 - Create "My Account" that will keep all past transactions details

Z4 – Can be custom-made based on my specification

Recommended value: [a]≤0.06 (Hu & Bentler 1999); [b]close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1]RMSEA range: 0.000, 0.117. Source: Analysis of survey data

Figure 5.11: Measurement Model for Personalization
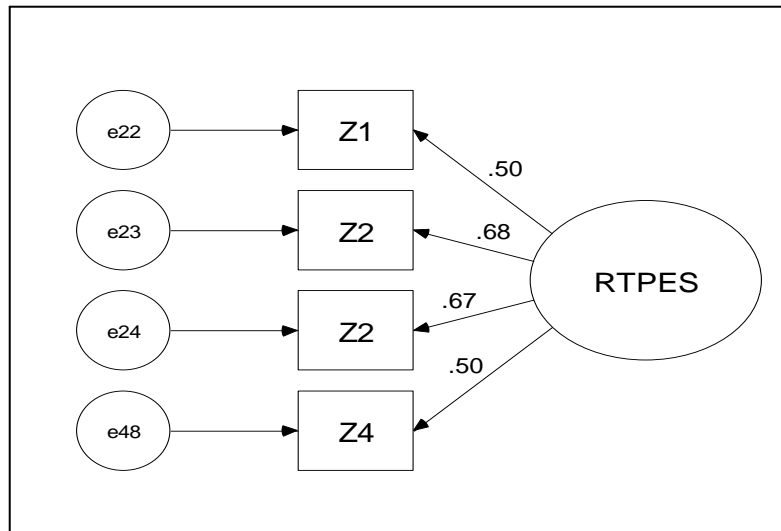
Measurement model for channel integration dimension

This section presents a unidimensional model of channel integration. The measurement model consists of three observed variables. The reliability level, standardised regression weights and goodness-of-fit statistics are shown in Table 5.14. All the three factor loadings are all above 0.70 and provide support for reliable measures of channel integration construct. In addition, the internal reliability is very good ($\alpha = 0.89$) indicating high internal reliability and consistency. The fit statistics indicate a perfect fit of the model to the data. The three-indicator model is depicted in Figure 5.12.

Table 5.14: Goodness-of-fit Statistics for the Measurement Model
of Channel Integration

Reliability (Cronbach Alpha) -	0.89
Standardised Regression Weight	Estimate
T1 ← RTINTG	0.91
T2 ← RTINTG	0.92
T3 ← RTINTG	0.72
Keys:	
RTINTG - Channel integration	
T1 **-** Can pick-up the products ordered via the Web at a nearest physical store	
T2 - Can check orders placed on the Internet through the physical and vice-versa	
T3 - Can exchange or return products bought from the Web in a physical store	

Source: Analysis of survey data

Figure 5.12: Measurement Model for Channel Integration
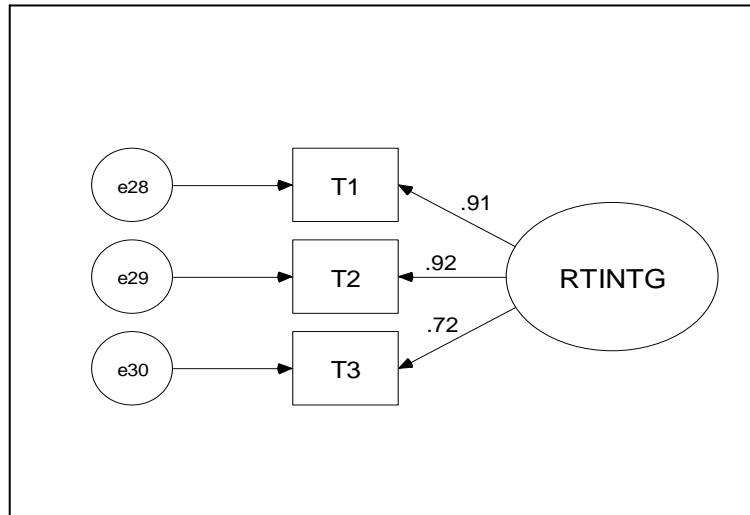
Measurement model for online community dimension

This section presents a unidimensional model of online community effectiveness. The measurement model of three observed variables indicates a good fit to the data as shown in Table 5.15. The standardized regression weights for all the items are above 0.90, providing support for convergent validity. High internal reliability and consistency indicated by Cronbach alpha= 0.90 provides evidence that the three factor model is a good measure of online community construct. Further, the fit indices CFI, TLI and AGFI are equal to 1.0 indicating a perfect fit. This three-indicator model of online community is illustrated in Figure 5.13.

Table 5.15: Goodness-of-fit Statistics for the Measurement Model
of Online Community

Reliability (Cronbach Alpha) -	0.90
Standardised Regression Weight	<u>Estimate</u>
Y1 ← RTCOM	0.93
Y2 ← RTCOM	0.91
Y3 ← RTCOM	0.90
Keys:	
RTCOM- Online community	
Y1- Exchange information with my buddies in an online forum	
Y2- Trade goods with my "friends" found on the same site	
Y3- Obtain useful information about a company from the online	
members	

Source: Analysis of survey data

Figure 5.13: Measurement Model for Online Community
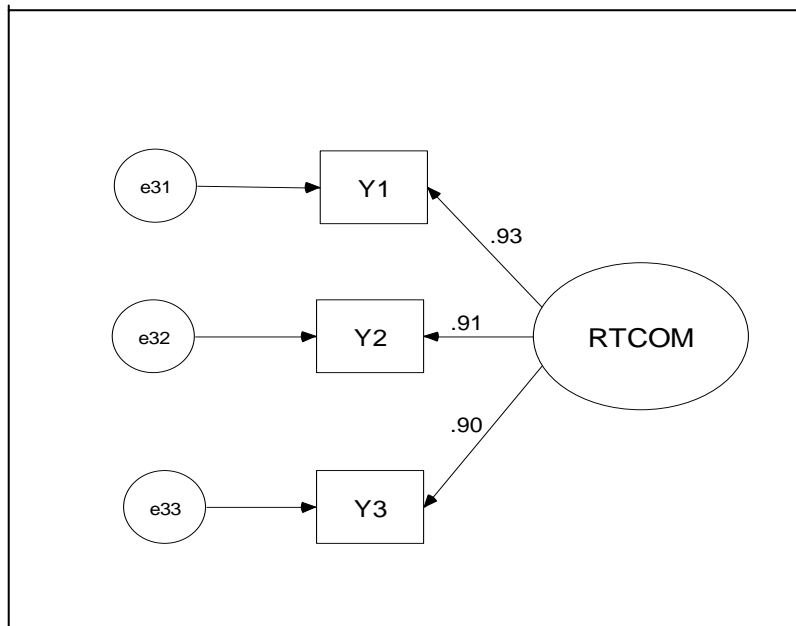
<u>Measurement model for reward dimension</u>

A unidimensional model of reward is presented in this section.   Although the initial model of reward comprised six items, two items: R5 "Receive rewards for purchasing (subscribing) and R6 "Offers attractive gifts for purchase (subscription)" produced unacceptable loadings (<0.5), hence were dropped. The goodness-of-fit statistics for the four-indicator model of reward is displayed in Table 5.16.   All the measurement items weights exceeded 0.80, providing evidence in support of convergent validity. Based on the Cronbach alpha= 0.95, the items appeared to be reliable and consistent indicating that four items are reliable measures of reward construct. The fit indices: RMSEA= 0.058; CFI= 0.99; TLI= 0.98; and AGFI= 0.96 suggest a good fit of the model.   The measurement model shows that the four items are reliable measures of reward construct as presented in Figure 5.14.

Table 5.16: Goodness-of-fit Statistics for the Measurement Model of Reward

Reliability (Cronbach Alpha) -	0.95	
Standardised Regression Weight	<u>Estimate</u>	<u>Goodness-of-fit measures</u>
R1 ← RTREW	0.89	[a]Root mean error of est.(RMSEA) 0.058[1]
R2 ← RTREW	0.90	[b]Adjusted Goodness-of-fit index(GFI) 0.96
R3 ← RTREW	0.81	[c]Tucker-Lewis index(TLI) 0.98
R4 ← RTREW	0.90	[d]Comparative Fit index(CFI) 0.99

RTREW - Reward

R1 - Receive rewards for returning to the site	R3 - Offers attractive points redemption for any purchase (subscription)
R2 - Offers attractive cash rebates for any purchase(subscription)	R4 – Offers attractive coupons for any purchase (subscription)

Recommended value: [a]≤0.06 (Hu & Bentler, 1999); [b]close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1]RMSEA range: 0.026, 0.92. Source: Analysis of survey data

Figure 5.14: Measurement Model for Reward
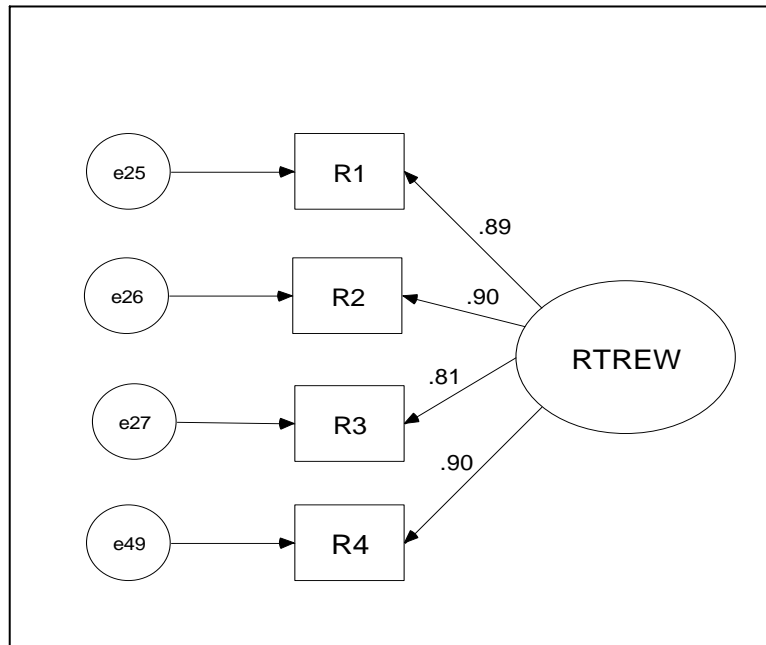
Measurement model for trust dimension

The initial model of trust comprises five items. However, two items: U4 "The company practices high security standard" and U5 "Provide third party verification to verify site's authenticity" loaded poorly (<0.50). These two items were dropped resulting in a three-indicator model. The standardized regression weights, reliability and goodness-of-fit statistics for the three-indicator model are displayed in Table 5.17. Support for convergent validity is provided by the factor loadings of all items are 0.80 and above. In addition, the internal reliability is excellent ($\alpha = 0.92$) indicating that these three items are good and reliable measures for trust construct. All the fit measures are equal to 1.0 suggesting a perfect fit to the data. An illustration of a three-indicator model of trust is in Figure 5.15.

Table 5.17: Goodness-of-fit Statistics for the Measurement Model
of Trust

Reliability (Cronbach Alpha) -	0.92
Standardised Regression Weight	Estimate
U1 ← LOTRUS	0.83
U2 ← LOTRUS	0.92
U3 ← LOTRUS	0.80

Keys:
LOTRUS - Trust
U1- Impose a strict privacy policy
U2- Provides third party verification to endorse Web site strict
     security standard
U3- The customer service is reliable

Figure 5.15: Measurement Model for Trust
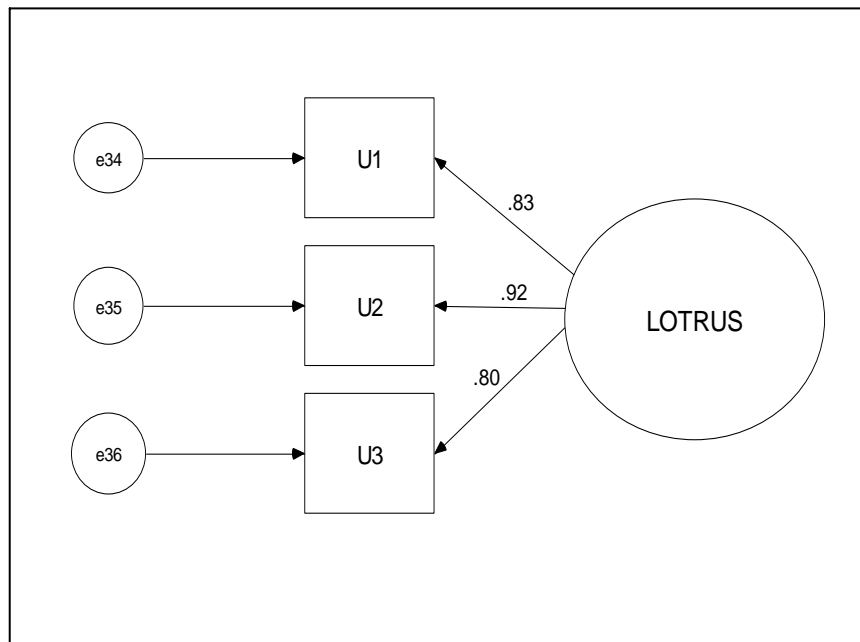
Measurement model for perceived value dimension

This section presents a unidimensional model of perceived value. The measurement model contained six observed variables. The standardized regression weights, reliability and goodness-of-fit statistics are presented in Table 5.18. Providing support for convergent validity, the standardized regression weights for all the items are above 0.70. High internal reliability and consistency indicated by Cronbach alpha= 0.92 is an evidence that the six indicator model is a good measure of perceived value construct.

The goodness-of-fit of this model is further reinforced by RMSEA= 0.058, CFI= 0.99, TLI= 0.98 and AGFI= 0.96. Hence, the six-indicator model of perceived value provides evidence of good fit to the data as illustrated in Figure 5.16.

Table 5.18: Goodness-of-fit Statistics for the Measurement Model
of Perceived Value

Reliability (Cronbach Alpha) -	0.92	
Standardised Regression Weight	Estimate	Goodness-of-fit measures
V1 ← LOVALU	0.85	[a]Root mean error of est.(RMSEA) 0.058[1]
V2 ← LOVALU	0.85	[b]Adjusted Goodness-of-fit index(GFI) 0.96
V3 ← LOVALU	0.85	[c]Tucker-Lewis index(TLI) 0.98
V4 ← LOVALU	0.81	[d]Comparative Fit index(CFI) 0.99
V5 ← LOVALU	0.81	
V6 ← LOVALU	0.71	

Keys:
LOVALU - Perceived value
V1 - Allows access to track my orders   V4- Can request for products/services
V2 - Allows changes to my orders   based on my specifications
    without much hassle   V5- The company understands my needs
V3 – Provides my account profile   V6- The company keeps track of my
    for my own further analysis   Transaction

Recommended value: [a]≤0.06 (Hu & Bentler 1999); [b]close to 0.90 (Kline 1998); [c,d]>0.95 (Hu & Bentler 1999). Details of model fit indexes are illustrated in Appendix 5.7. [1]RMSEA range: 0.031, 0.087. Source: Analysis of survey data

Figure 5.16: Measurement Model for Perceived Value
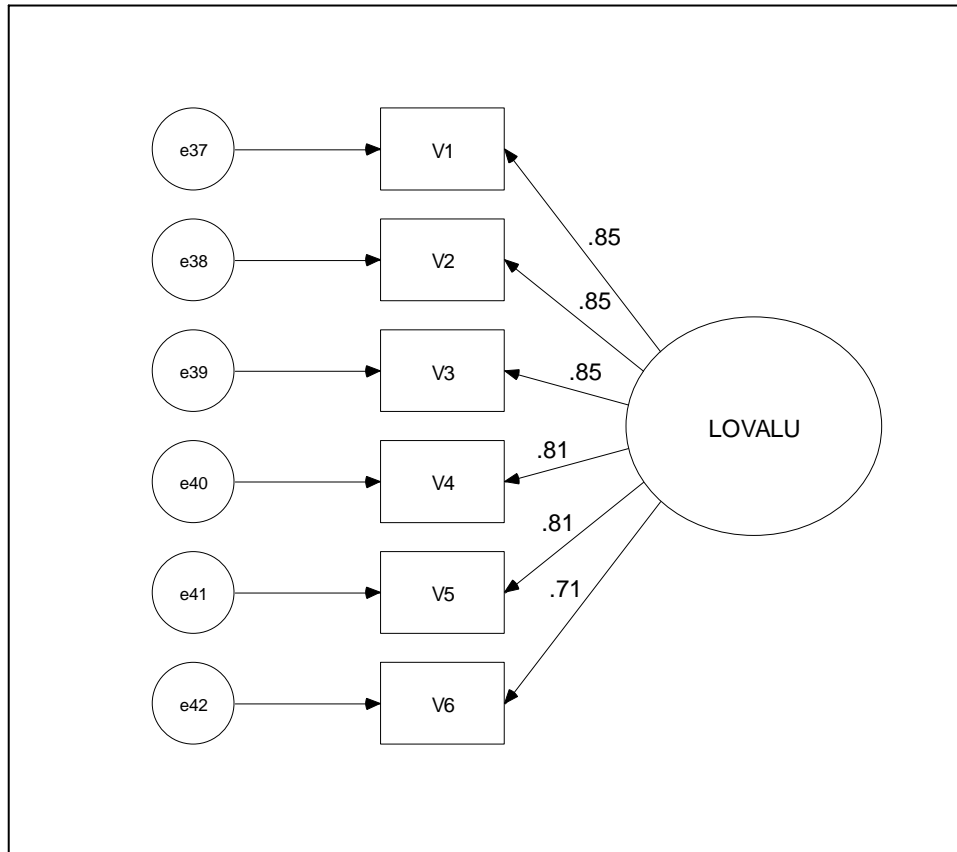
Measurement model for emotional benefit

This section reports on the measurement model of emotional benefit. This model consists of two observed variables. Its reliability level, standardised regression weights and goodness-of-fit statistics are displayed in Table 5.19. Providing support for convergent validity are the factor loadings, which exceeded 0.80 and the items appeared to be reliable measures of order emotional benefit based on its internal reliability (α = 0.88).

The RMSEA, CFI, TLI and AGFI values indicated a perfect fit. Based on the values of standardized regression weights, reliability and goodness-of-fit, statistics the

measurement model of emotional benefit fitted the data well. The two-indicator model is illustrated in Figure 5.17.

Table 5.19: Goodness-of-fit Statistics for the Measurement Model
of Emotional Benefit

Reliability (Cronbach Alpha) -	0.88
Standardised Regression Weight	Estimate
EM1 ← LOEMOT	0.83
EM2 ← LOEMOT	0.94

Keys:
LOEMOT - Emotional benefit
E1 - I feel excited about the entertainment features on the site
E2 - I enjoy browsing this site

Source: Analysis of survey data

Figure 5.17: Measurement Model for Emotional Benefit
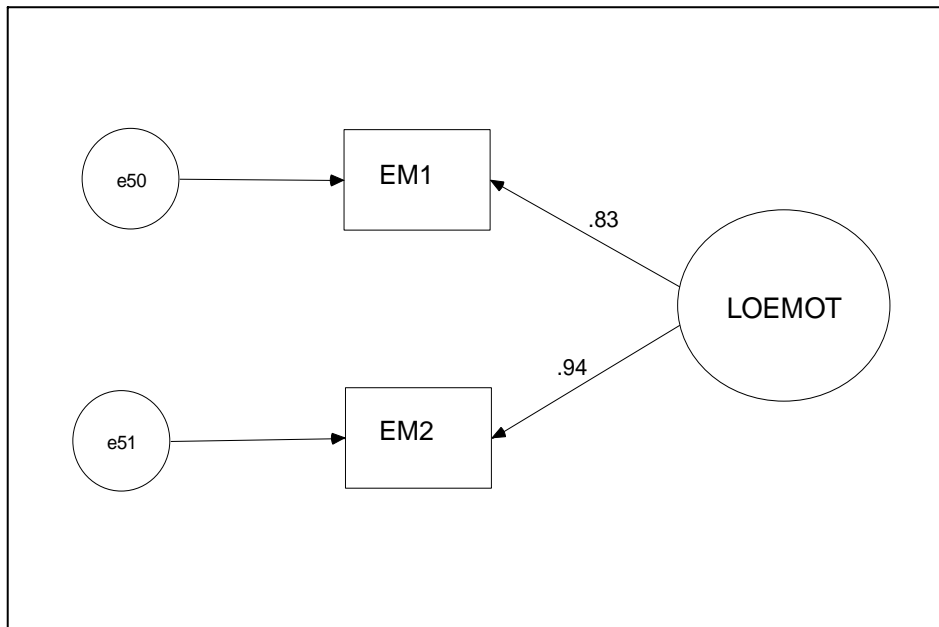
5.4.2 Structural model evaluation

Having evaluated the measurement models, the next step involves evaluating the *structural* models. This step involved the comparison of hierarchical or non-hierarchical models (Anderson & Gerbing 1988; Kline 1998). Nonhierarchical models usually represent competing *theories* about the phenomenon under study. In this research, nonhierarchical models had been developed based on the theories reviewed in chapter 2. Each model is illustrated in its respective subsection.

The following sections present the results of the full-hypothesized model and several competing models developed in section 3.4. The hypothesized model was dealt with first in the subsequent section, followed by the competing models. All models were estimated using ML estimation in AMOS 5.0 and the indicator variables were adopted from the measurement model of section 5.4.1.

<u>Testing proposition 1.</u>

This section presents the findings of proposition 1, which concerns the dimensions of consumer satisfaction, retention and loyalty. Essentially, how the dimensions suggested by the literature presented in chapter 2 contribute towards satisfaction, retention and loyalty respectively was investigated.

The propositions tested are:

RP1.1: Satisfaction is a function of customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/service range.

RP1.2: Loyalty is a function of emotional benefit, perceived value and trust.

RP1.3: Retention is a function of channel integration, customer service quality, online community, personalization level and reward.

The structural models are evaluated in terms of the hypothesized paths and their strength and the overall fit model are shown in Tables 5.20 to 5.25. Each of the dimensions above is presented next.

Structural model of Satisfaction construct

This section reports on a structural model of satisfaction. First, a seven-dimension model of satisfaction as suggested by the literature was tested. Then, a five-dimension model that has been proposed by the exploratory factor analysis (section 4.2.5) was presented.

Seven-dimension model. As suggested by the literature, a seven-dimension model which includes information quality, product quality, ease of navigation, lower prices, order fulfillment level, customer service quality and payment security was tested. The χ^2/df = 5.68 and RMSEA= 0.95 are above the required level, hence indicate a poor fit for this model. In addition, the CFI, TLI and AGFI are all below the acceptable level. Therefore, for this study, the seven-dimension model is not a valid model of satisfaction. Table 5.20(a) displays the results of the goodness-of-fit statistics.

Table 5.20(a): Goodness-of-fit Statistics for a 7-dimension Structural Model of Satisfaction

Goodness-of-fit measures	7-dimension	Recommended value
Chi-square, *p-value= 0.00*	1715.89	
χ^2/df	5.68	≤3.0[a]
Root mean square of error of estimation (RMSEA)	0.095[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.82	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.88	>0.95[d]
Comparative Fit Index (CFI)	0.89	>0.95[e]

[1] RMSEA range: (0.090, 0.099). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data

<u>Post hoc test</u>.　Further, the sources of misfit in the above model were investigated and it was discovered that the payment security (STSEC) factor was too strongly correlated (>1.00) with customer service quality (CUSV): that is the variables are somewhat measuring the same underlying construct (Byrne, 2001).　The STSEC factor that was causing this misfit was then deleted (Byrne 2001; Tabachnick & Fidell 2001), and subsequently a six-dimension model was tested.

Six-dimension model.　As reported in Table 5.20(b) the fit measures of the six-dimension model are not satisfactory. These are evident from the RMSEA= 0.093, that is above the desired level.　The CFI, TLI and AGFI indicate a poor fit. Hence, a six-dimension model of satisfaction is rejected.

Table 5.20(b): Goodness-of-fit Statistics for a 6-dimension Structural Model of Satisfaction

Goodness-of-fit measures	6-dimension	Recommended value
Chi-square, *p-value= 0.00*	1695.16	
χ^2/df	5.71	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.093[1]	≤ 0.06[b]
Goodness-of-fit index (GFI)	0.83	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.88	>0.95[d]
Comparative Fit Index (CFI)	0.90	>0.95[e]

[1] *RMSEA range: (0.089, 0.097).* [b,d,e] *Hu and Bentler (1999);* [a, c] *Kline (1998). Source: Analysis of survey data*

<u>Post hoc test.</u> As a result of poor fitting seven-dimension and six-dimension models, another post hoc test was performed.　Apparently, lower prices (STPRC) factor was found to be causing the misfit to the model- highly correlated with product/service range (STPROD).　Therefore, STPRC was deleted and a five-dimension model (as produced by the factor analysis in section 4.2.5) was subsequently tested.

Five-dimension model. The results of goodness-of-fit statistics of the five-dimension model are presented in Table 5.20(c). The χ^2/df = 2.91 and RMSEA= 0.058 are well within the recommended range of acceptability, thus indicating a good fit of the model to the data. Providing further support to the goodness-of-fit are the CFI= 0.97; TLI= 0.96 and AGFI= 0.91, which are all above the desired level.

Table 5.20(c): Goodness-of-fit Statistics for a 5-dimension Structural Model of Satisfaction

Goodness-of-fit measures	5-dimension	Recommended value
Chi-square, *p-value= 0.00*		
χ^2/df	2.91	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.058[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.91	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.97	>0.95[e]

[1] *RMSEA range: (0.054, 0.064).* [b,d,e] *Hu and Bentler (1999);* [a,c] *Kline (1998). Source: Analysis of survey data*

Therefore in this study, a five-dimension model is accepted as the dimensions of satisfaction. Figure 5.18 illustrates the CLD representation and Figure 5.19 presents AMOS output of this model. In addition, results from regression analysis show that these five factors explain 88 per cent of the variance in consumer satisfaction. As displayed in Table 5.20(d) *order fulfillment* level (β= 0.28, t-value= 10.25, *p*= 0.00) is the strongest predictor of satisfaction, while *product/service range* (β= 0.12, t-value= 4.8, *p*= 0.00) is the weakest.

Figure 5.18: The CLD Model of Satisfaction Construct
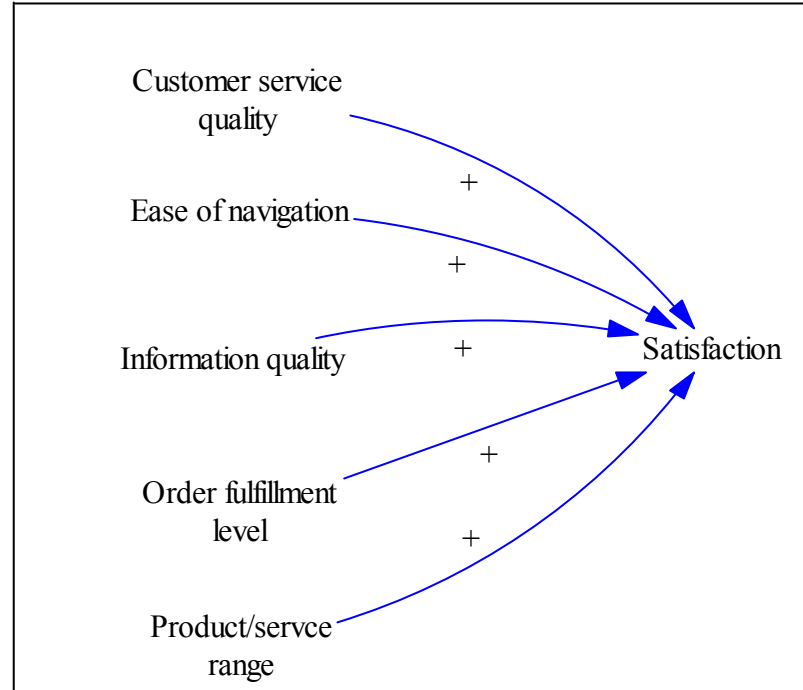
Source: Analysis of survey data

Table 5.20(d): Path Analysis Results for Dimensions of Satisfaction

Path	Standardised coefficient	t-value	r^2
STINFO → SATISFN	0.27	11.03	0.88
STPROD → SATISFN	0.12	4.80	
STNAV → SATISFN	0.26	10.04	
STFUL → SATISFN	0.28	10.25	
CUSV → SATISFN	0.17	6.23	
Keys: SATISFN – Satisfaction STINFO – Information STPROD – Product/service STNAV- Ease of navigation STFUL- Order fulfillment level CUSV- Customer service			

Figure 5.19: The SEM Model of Satisfaction Construct
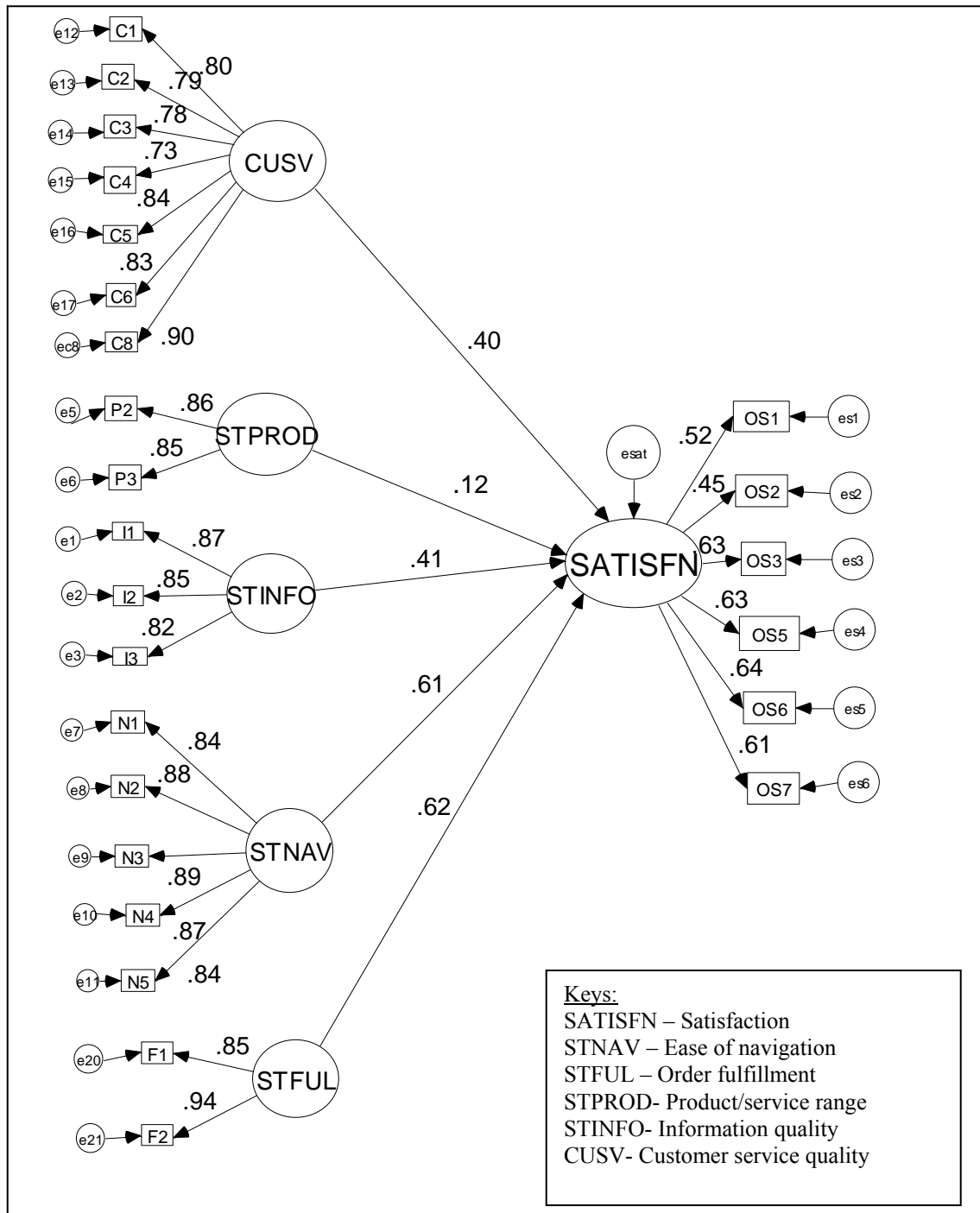
Derived from the results above, this study presents *e-satisfaction measures* as illustrated in Table 5.20(e). These measures were tested for unidimensionality, reliability and construct validity, as described in Appendix 5.7 and were found to be a relatively sound measure. Therefore these e-satisfaction measures have a capacity to be used for future research on related topics to assess the generalizability of the results.

Table 5.20(e): List of E-satisfaction Measures

Constructs/ Scale items	Cronbach alpha
Information quality (STINFO)	
I1 The information is accurate	0.89
I2 In-depth information on products/services	
I3 Information displayed is easy to understand	
Product/service range (STPROD)	
P2 More varieties in product/services	0.85
P3 Products/services offered are up-to-date with current trend	
Ease of navigation (STNAV)	
N1 The website is always accessible	0.93
N2 The web site provide easy steps whenever a customer needs to register	
N3 Only a few clicks to get information	
N4 The web pages load quickly	
Customer service quality (CUSV)	
C1 Customer service is efficient in handling complaints	0.93
C2 Customer service is friendly in answering customers enquiry	
C3 Customer service always notifies me of my order (subscription) status	
C4 Customer service always responds within 48 hours	
C5 Customer service can be contacted through variuos channels	
C6 Customer service appears to have wide knowledge of products/services	
C8 Customer service are always fast in resolving customers complaints	
Order fulfillment level (STFUL)	0.89
F1 Products received are always in good condition	
F2 Products/services are delivered within the delivery time as promised	

<u>Structural model of dimensions of Loyalty</u>

A structural model of loyalty is presented in this section.

Three-dimension model. The first structural model of loyalty included all the three dimensions of loyalty identified in the literature review in section 3.3.2, namely trust, perceived value, and emotional benefits.   Table 5.21(a) below presents the fit measures for this three-dimension model. The CFI= 0.90, TLI= 0.85 and AGFI= 0.88 and other goodness-of-fit statistic: χ^2 /df = 5.87 and RMSEA= 0.143 are not within the acceptable range. Hence, the three-dimension model indicated a poor fit to the data.

Table 5.21(a) Goodness-of-fit Statistics for a 3-dimension Structural Model of Loyalty

Goodness-of-fit measures	3-dimension	Recommended value
Chi-square, *p-value= 0.00*	1690.56	
χ^2 /df	5.87	$\leq 3.0^a$
Root mean square of error of estimation (RMSEA)	0.143[1]	$\leq 0.06^b$
Adjusted Goodness-of-fit index (AGFI)	0.88	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.85	$>0.95^d$
Comparative Fit Index (CFI)	0.90	$>0.95^e$

[1] RMSEA range: (0.129, 0.150). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data

<u>Post hoc test</u>. As a result of poor fitting three-dimension model, a post hoc test was performed.   The emotional benefit factor (LOEMOT) was found to be causing the misfit to the model - highly correlated with perceived value (LOVALU).   Therefore, the LOEMOT factor was deleted (Byrne 2001; Tabachnick & Fidell 2001) and a two-dimension model was subsequently tested.

Two-dimension model.   Table 5.21(b) presents the fit measures of a two-dimension model of loyalty indicated a good fit to the data (as reported by the exploratory factor analysis in Section 4.2.5).   The χ^2 /df= 2.72 and RMSEA= 0.056, are below the accepted level. Furthermore, the CFI= 0.99, TLI= 0.98 and AGFI= 0.93 indicated support for the model.

Table 5.21(b) Goodness-of-fit Statistics for a 2-dimension Structural Model of Loyalty

Goodness-of-fit measures	2-dimension	Recommended value
Chi-square, *p-value= 0.00*	152.04	
χ^2/df	2.72	$\leq 3.0^a$
Root mean square of error of estimation (RMSEA)	0.056[1]	$\leq 0.06^b$
Adjusted Goodness-of-fit index (AGFI)	0.93	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.98	>0.95[d]
Comparative Fit Index (CFI)	0.99	>0.95[e]

[1] *RMSEA range: (0.045, 0.067). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data*

Hence, a two-dimension model of loyalty is therefore preferred as opposed to a three-dimension. The CLD representation of this model is depicted in Figure 5.20 while Figure 5.21 illustrates the SEM and regression weights for this model. The results from the path analysis indicate that *trust* and *perceived value* explain 68 per cent of the variance in consumer loyalty with *trust* ($\beta= 0.46$, t-value= 12.10, $p= 0.00$) being a stronger predictor of loyalty than perceived value ($\beta= 0.42$, t-value= 10.95, $p= 0.00$). Table 5.21(c) displays these results.

Figure 5.20: The CLD Model of Loyalty Construct
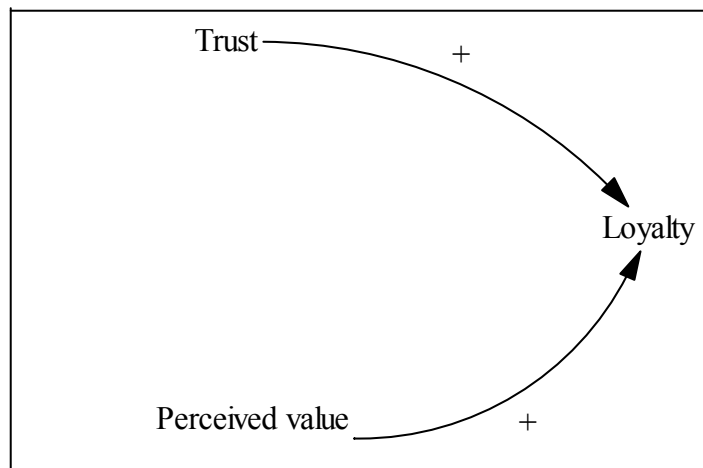
Source: Analysis of survey data

Table 5.21(c): Path Analysis Results for Dimensions of Loyalty

Path	Standardised coefficient	t-value	r^2
LOTRUS → LOYALTY	0.46	12.10	0.68
LOVALU → LOYALTY	0.42	10.95	
Keys:			
LOYALTY – Loyalty LOTRUS – Trust LOVALU – Perceived value			

Figure 5.21: The SEM Model of Loyalty Construct

Keys:
LOYALTY – Loyalty
LOTRUS- Trust
LOVALU- Perceived value
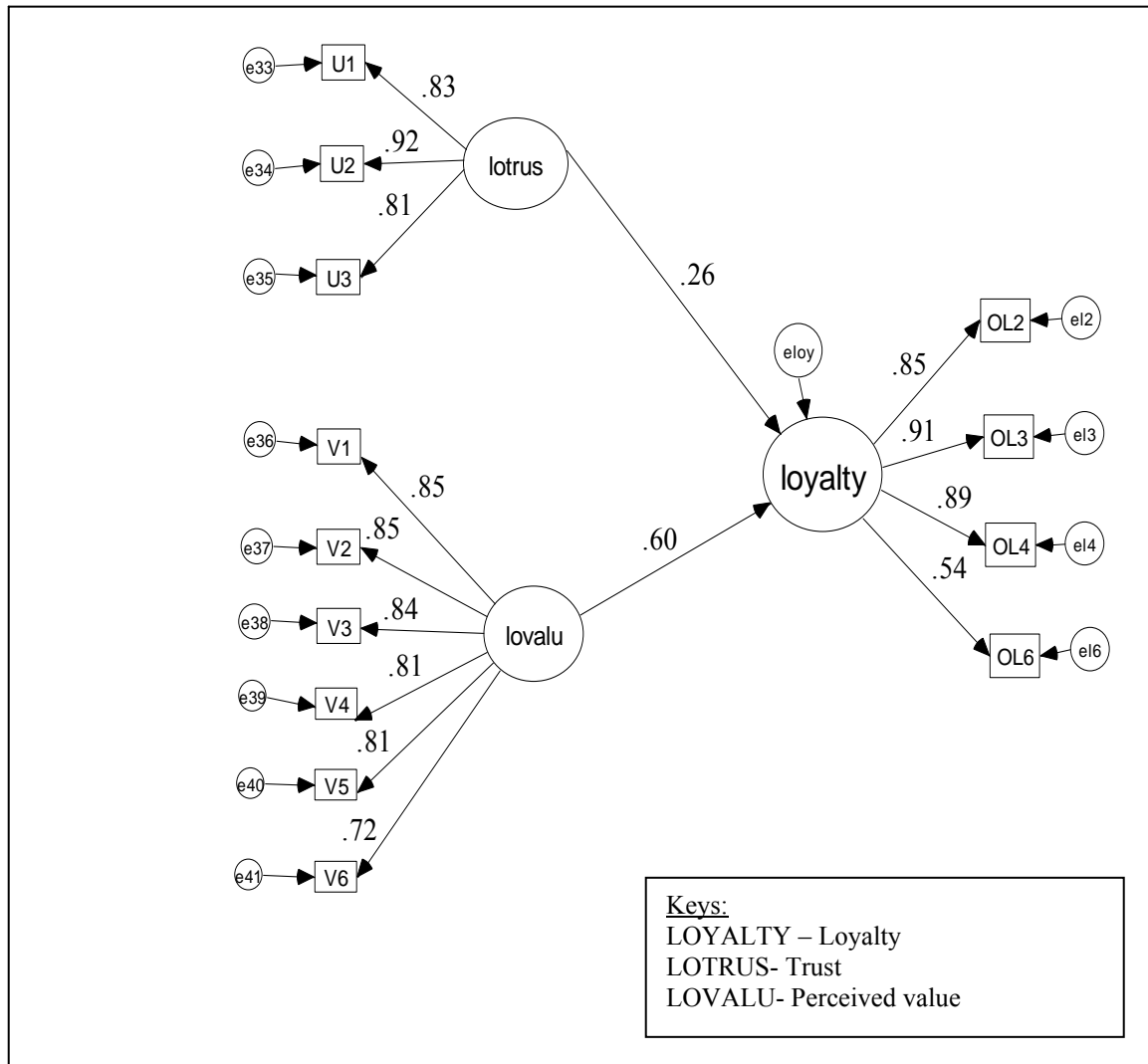
Following the results above, this study offers e-loyalty measures as illustrated in Table 5.21(d). These measures were tested for unidimensionality, reliability and construct validity, as described in Section 5.4.5 and were found to be a relatively sound measure. Therefore these e-loyalty measures have a capacity to be used for future research on related topics to assess the generalisability of the results.

Table 5.21(d): List of E-loyalty Measures

Constructs/ Scale items	Cronbach alpha
Trust (LOTRUS)	
U1 Impose a strict privacy policy	0.92
U2 Provide third party verification (eg. seal of approval) to endorse Web site strict security standard	
U3 The customer service is reliable	
Perceived value (LOVALU)	
V1 The company allows access to track my orders	0.92
V2 I can make changes to my orders without much hassle	
V3 Provide my account profile which I can use for my own further analysis	
V4 I can request for products/services based on my specifications	
V5 The company understands my needs	
V6 The company keeps track of my transaction	

Structural model of Retention construct

This section reports on a structural model of dimensions of retention. Adapted from Winer's (2001) retention program model, a five-dimension model of consumer retention proposed by this study was tested.

Five-dimension model. This model includes customer service, online community, personalization level, reward and channel integration as factors affecting consumer retention. Table 5.22(a) shows the goodness-of-fit statistics of this model. The fit indices indicate a poor fitting model: $\chi^2 /df = 4.80$ and RMSEA= 0.070 are above the desired level; CFI, TLI and AGFI values are below the acceptable range.

Table 5.22(a) Goodness-of-fit Statistics for a 5-dimension Structural Model of Retention

Goodness-of-fit measures	5-dimension	Recommended value
Chi-square, *p-value= 0.00*	1104.48	
χ^2/df	4.80	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.070[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.79	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.86	>0.95[d]
Comparative Fit Index (CFI)	0.89	>0.95[e]

[1] *RMSEA range: (0.064, 0.077).* [b,d,e] *Hu and Bentler (1999);* [a, c] *Kline (1998). Source: Analysis of survey data*

Post hoc test. The source of misfit was further investigated and it was found that customer service quality factor (CUSV) was too highly correlated (>1.00) to personalization factor (RTPES). Consequently, CUSV factor which was causing the misfit was dropped, resulting in a four factor model.

Four-dimension model. Next, a four-dimension model (as reported by exploratory factor analysis in Section 4.2.5) was tested. The results in Table 5.22(b) indicate a good fit to data: χ^2/df= 2.88, RMSEA= 0.058, CFI=0.98, TLI= 0.96 and AGFI= 0.92.   Hence, this study concludes that retention is constructed from four dimensions namely personalization, online community, reward and channel integration (as illustrated by the exploratory factor analysis results in Section 4.2.5). Section 6.1.1 discusses a possible explanation of this result. Figure 5.22 illustrates the CLD representation and Figure 5.23 presents the AMOS output of this model.   The regression results indicate that these four factors explain 65 per cent of consumer retention, where *online community* (β= 0.37, t-value= 4.16, *p*= 0.00) serves as the most important predictor of retention.   Table 5.22(c) shows the results of path analysis.

Table 5.22(b) Goodness-of-fit Statistics for 4-dimension Structural Model of Retention

Goodness-of-fit measures	4-dimension	Recommended value
Chi-square	176.30	
χ^2/df	2.88	$\leq 3.0^a$
Root mean square of error of estimation (RMSEA)	0.060^1	$\leq 0.06^b$
Adjusted Goodness-of-fit index (AGFI)	0.92	close to 0.90^c
Tucker-Lewis Index (TLI)	0.96	$>0.95^d$
Comparative Fit Index (CFI)	0.98	$>0.95^e$

[1] RMSEA range: (0.050, 0.071). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data

Figure 5.22: The CLD Model of Retention Construct
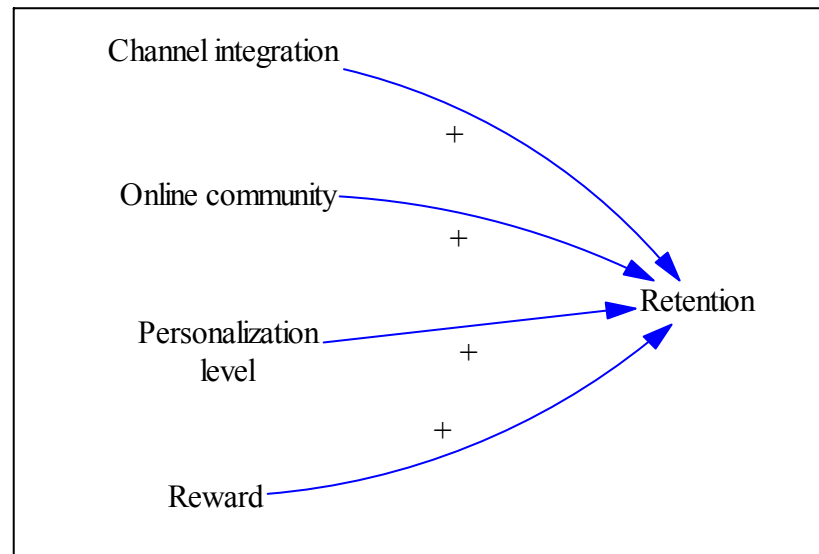
Source: Analysis of survey data

Table 5.22(c): Path Analysis Results for Dimensions of Retention

Path	Standardised coefficient	t-value	r^2
RTPES → RETENTION	0.24	7.39	0.65
RTREW → RETENTION	0.20	4.97	
RTCOM → RETENTION	0.37	4.16	
RTINTG → RETENTION	0.13	10.04	
Keys: RETENTION – Retention RTPES – Personalization RTINTG- Channel integration	RTCOM- Community RTREW – Reward		

Figure 5.23: The SEM Model of Retention Construct

Keys:
RETENTION – Retention
RTCOM- Online community
RTINTG- Channel integration
RTREW- Reward
RTPES- Personalization
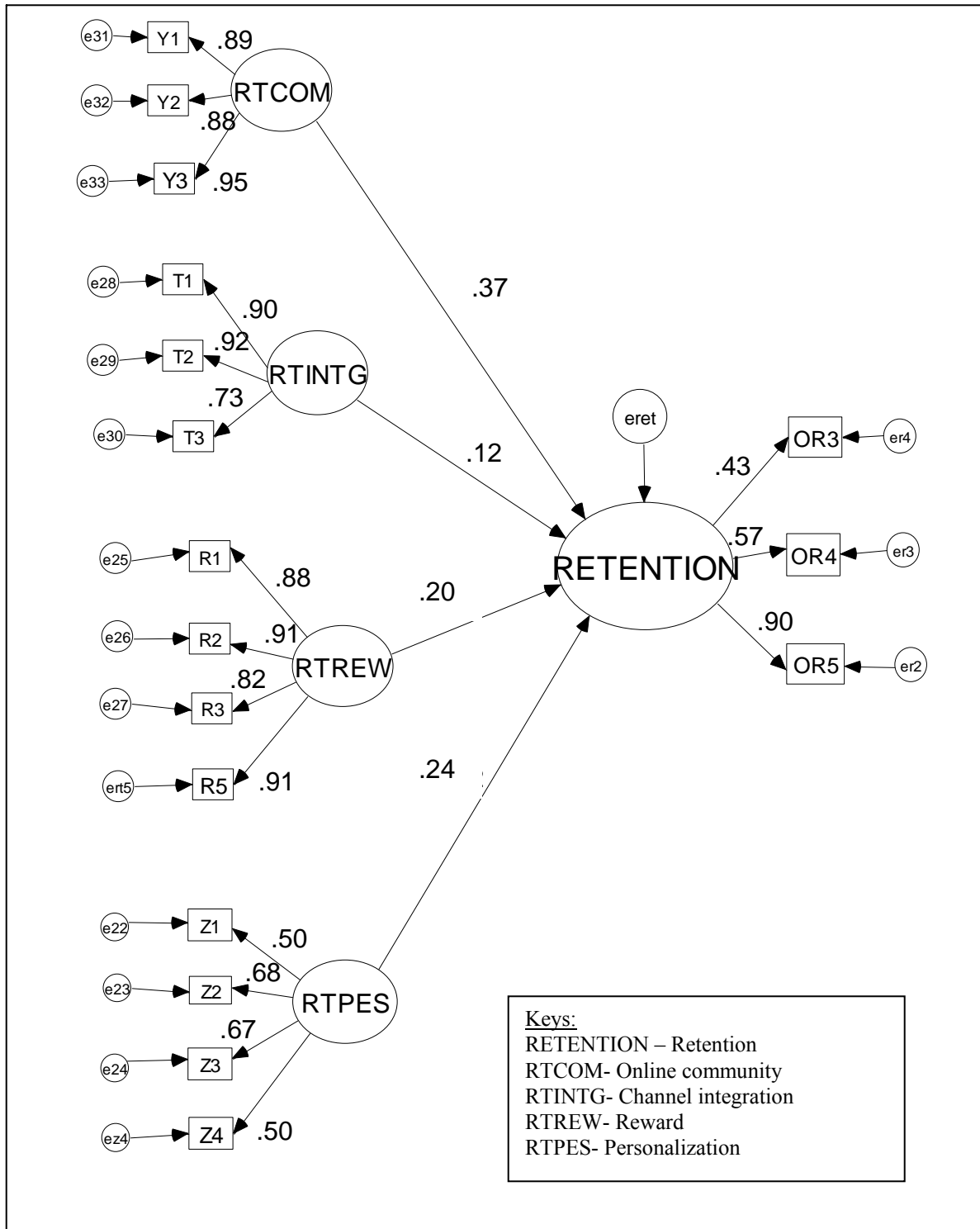
Arising from the four-dimension model are *e-retention measures* that have been evaluated with multiple criteria: unidimensional and construct validity: which comprises convergent and discriminant validity (see Section 5.4.5). The e-retention measures have not been previously reported in the literature; hence this study makes a contribution to the knowledge about defining online retention measurement. Table 5.22(d) illustrates a list of 14 attributes of online retention, which can be used for further examinations in related topics to assess generalizability.

Table 5.22(d): List of E-Retention Measures

Constructs/ Scale items	Cronbach alpha
Personalization (RTPES)	
Z1 The provider keeps a database of my transactions with them	0.76
Z2 I receive online advertisements that match my interests	
Z3 The Web site allows users to create "My Account" that will keep all past transactions details	
Z4 Products/services can be custom-made based on my specification	
Reward (RTREW)	
R1 I will receive rewards for returning to the site	0.95
R2 The Web site offers attractive cash rebates for any purchase (subscription)	
R3 The Web site offers attractive points redemption for any purchase (subscription)	
R4 The Web site offers attractive coupons for any purchase (subscription)	
Integration (RTINTG)	
T1 I can pick-up the products I ordered via the Web at a nearest physical store	0.89
T2 I can check orders placed on the Internet through the physical and vice-versa	
T3 I can exchange or return products bought from the Web in a physical store	
Online community (RTCOM)	
Y1 I can share/exchange information with my buddies in an online forum	0.90
Y2 I can trade goods with my "friends" found on the same channel/site.	
Y3 I can obtain useful information about a company from the online members	

<u>Testing proposition 2</u>

This section presents the results of proposition 2.1, 2.2, 2.3, 2.4 and 2.5 (the full model) on the components of E-CRM program as well as the cause and effect of E-CRM implementation on satisfaction, loyalty and retention. It is also the interest of this study to assess the three competing models, which were introduced and discussed in chapter 4.

The propositions tested are:

RP2.1: The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices online community, order fulfillment level, payment security, perceived value, personalization level, reward program and trust.

RP2.2: E-CRM will influence consumers' satisfaction.

RP2.3: E-CRM will influence consumers' loyalty.

RP2.4: E-CRM will influence consumers' retention.

RP2.5: E-CRM will influence loyalty, which is affected by satisfaction. In turn, consumer loyalty will lead to retention.

The three competing models are tested based on these hypotheses:

RP2.5(a): E-CRM will influence consumer satisfaction, which in turn leads to consumer retention.

RP2.5(b): E-CRM will influence consumer satisfaction, which in turn leads to consumer loyalty.

RP2.5(c): E-CRM will influence consumer retention, not affected by satisfaction which in turn leads to consumer loyalty.

Structural model of the dimensions of an effective E-CRM Program (RP 2.1)

To understand the dimensions of an effective E-CRM program a second factor model was performed. This model indicates that the effectiveness of an E-CRM program is accountable for the extent to which the 13 variables would be implemented. In other words, the E-CRM strategy of a firm predicts the employment of the types of marketing activities vital for managing relationships. Table 5.23(a) presents the goodness-of-fit statistics of the E-CRM program model.

The results indicate a good fit to data. Providing support for the model fitness are the χ^2 /df= 2.08, RMSEA= 0.044, CFI=0.96, TLI= 0.96 and AGFI= 0.89, that is the fit indices are within the acceptable level. Hence, this study concludes that an effective E-CRM program explains the extent to which channel integration, customer service quality, ease of navigation, emotional benefit, information quality, online community, order fulfillment level, payment security, perceived value, personalization level, lower prices, reward and trust components are employed in a firm's relationship marketing strategy.

A CLD representation is illustrated in Figure 5.24 while Figure 5.25 depicts the AMOS output of this model. The results of path analysis are displayed in Table 5.23(b). As indicated, the E-CRM program explains 83 per cent of the variance in *customer service quality* where the level of E-CRM implementation strongly predicts the quality of customer service (β= 0.91, t-value= 52.19, *p*= 0.00).

Table 5.23(a) Goodness-of-fit Statistics of E-CRM Program Model

Goodness-of-fit measures	ECRM Program	Recommended value
Chi-square, *p-value= 0.00*	1590.06	
χ^2 /df	2.08	$\leq 3.0^a$
Root mean square of error of estimation (RMSEA)	0.044^1	$\leq 0.06^b$
Adjusted Goodness-of-fit index (AGFI)	0.89	close to 0.90^c
Tucker-Lewis Index (TLI)	0.96	$>0.95^d$
Comparative Fit Index (CFI)	0.96	$>0.95^e$

[1] RMSEA range: (0.041, 0.047). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998).

Figure 5.24: The CLD Model of E-CRM Program Model
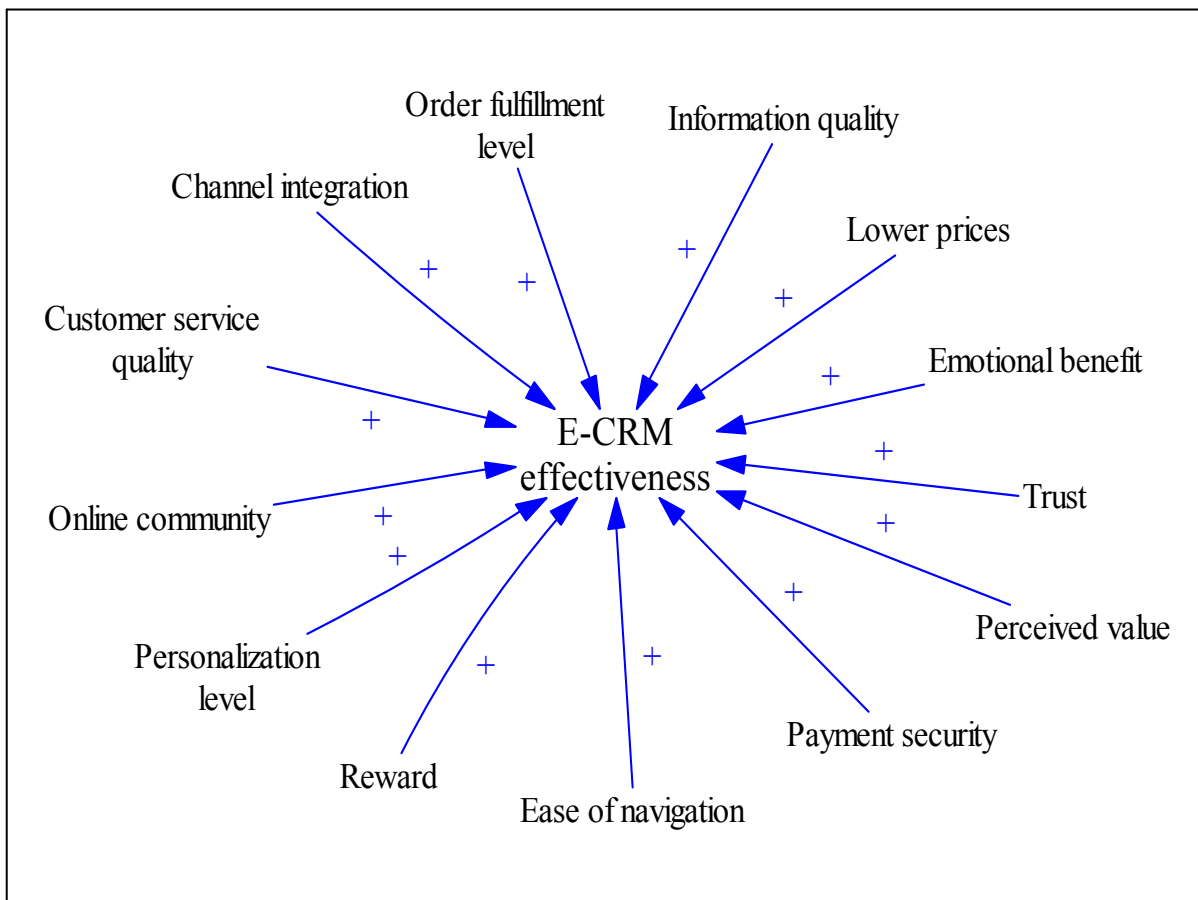
Table 5.23(b): Path Analysis Results for E-CRM Program Model

Path	Standardised coefficient	t-value	r^2
ECRM EFFECT → STINFO	0.76	27.65	0.58
ECRM EFFECT → STNAV	0.83	35.15	0.69
ECRM EFFECT → STSEC	0.84	35.98	0.70
ECRM EFFECT → STFUL	0.82	33.95	0.68
ECRM EFFECT → STPRC	0.77	28.36	0.59
ECRM EFFECT → CUSV	0.91	52.19	0.83
ECRM EFFECT → RTREW	0.81	31.86	0.65
ECRM EFFECT → RTINTG	0.77	28.46	0.60
ECRM EFFECT → RTPES	0.76	27.55	0.58
ECRM EFFECT → RTCOM	0.57	16.27	0.33
ECRM EFFECT → LOTRUS	0.74	25.85	0.55
ECRM EFFECT → LOVALU	0.74	25.46	0.54
ECRM EFFECT → LOEMOT	0.60	17.52	0.36

Keys:

ECRM EFFECT – Use of Internet in ECRM
STINFO- Information quality
STNAV – Ease of navigation
STFUL – Order fulfillment level
STPROD- Product/service range
STSEC – Payment security
STPRC – Lower prices
CUSV- Customer service quality
RTPES – Personalization
RTREW – Reward
RTCOM- Community
RTINTG- Channel integration
LOTRUS- Trust
LOVALU- Perceived value
LOEMOT – Emotional benefit

Figure 5.25: The SEM Model of E-CRM program – RP2.1
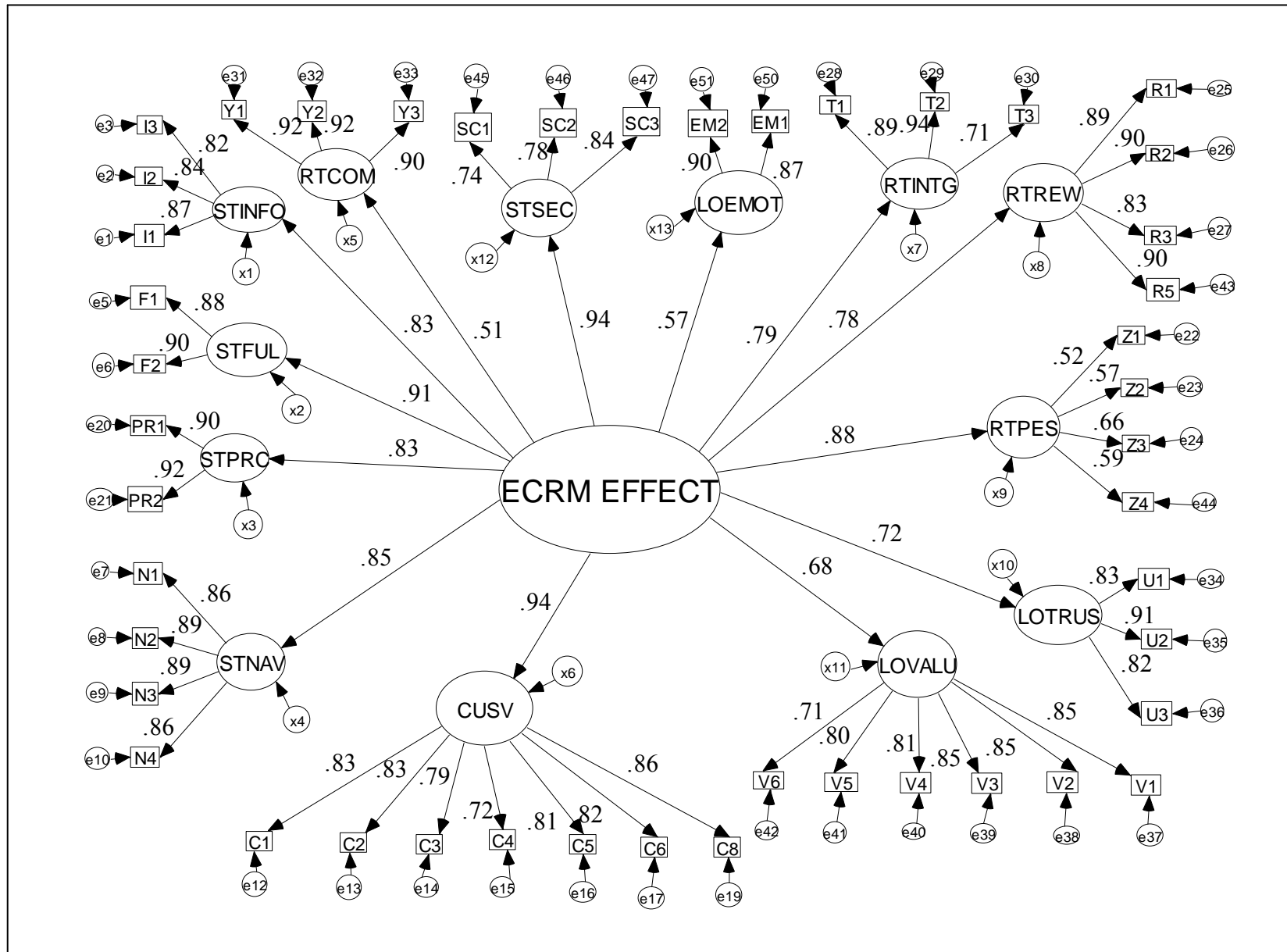
<u>Structural model of relationship between the use of E-CRM and Satisfaction (RP2.2)</u>

Table 5.23(c) indicates the goodness-of-fit measures of the cause-effect relationship of the use of E-CRM and satisfaction. This model yielded χ^2 /df= 2.10 and RMSEA= 0.045 which are within the acceptable range. The fit indexes values: CFI= 0.96; TLI= 0.96 and AGFI= 0.89 indicate a good fitting model. Therefore, the causal model of the use of E-CRM and satisfaction is acceptable for this research. Figure 5.26 displays the CLD presentation while Figure 5.27 illustrates the structural model of this model. Table 5.23(d) presents the path analysis results of this model. The regression analysis indicates that the model explains 81 per cent of the variance in consumer satisfaction. In addition, from the results it is evident that E-CRM program is a strong predictor of consumer satisfaction (β= 0.89, t-value= 47.36, p= 0.00).

Table 5.23(c): Goodness-of-fit Statistics for a Structural Model of the Relationship Between E-CRM and Satisfaction

Goodness-of-fit measures	ECRM-Satisfaction	Recommended value
Chi-square, *p-value= 0.00*	1430.43	
χ^2 /df	2.10	≤3.0[a]
Root mean square of error of estimation (RMSEA)	0.045[1]	≤ 0.06[b]
Goodness-of-fit index (GFI)	0.89	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.96	>0.95[e]

[1] RMSEA range: (0.042, 0.047). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data

Figure 5.26 The CLD Model of ECRM-Satisfaction
Relationship

Satisfaction

+

E-CRM
effectiveness
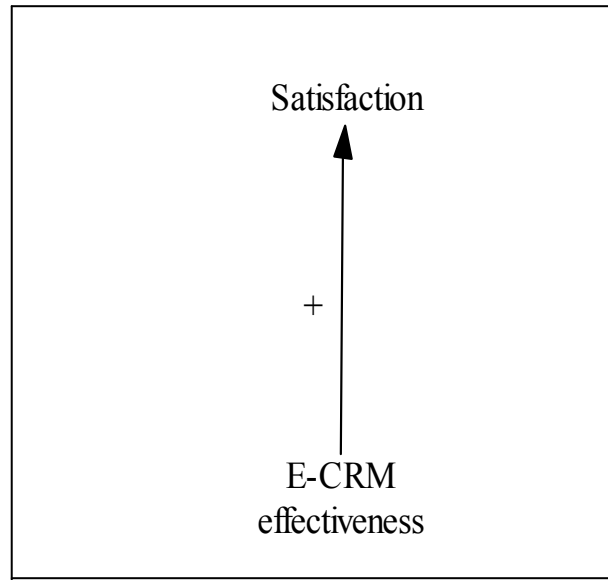
Source: Analysis of survey data

Table 5.23(d): Path Analysis Results for E-CRM-Satisfaction Relationship

Path	Standardised coefficient	t-value	r²
ECRM EFFECT → SATISFN	0.89	47.36	0.81
Keys: ECRM EFFECT – Use of Internet in ECRM SATISFN – Satisfaction			

Figure 5.27: The SEM Model of ECRM-Satisfaction Relationship – RP2.2

Keys:
ECRM EFFECT– Use of Internet in E-CRM
SATISFN – Satisfaction
STNAV – Ease of navigation
STFUL – Order fulfillment
STPRC- Price
STINFO- Information quality
RTCOM- Online community
CUSV- Customer service quality

STSEC-Payment security
LOEMOT –Emotional benefit
LOVALU –Perceived value
LOTRUS -Trust
RTPES -Personalization
RTREW -Reward
RTINTG-Channel integration
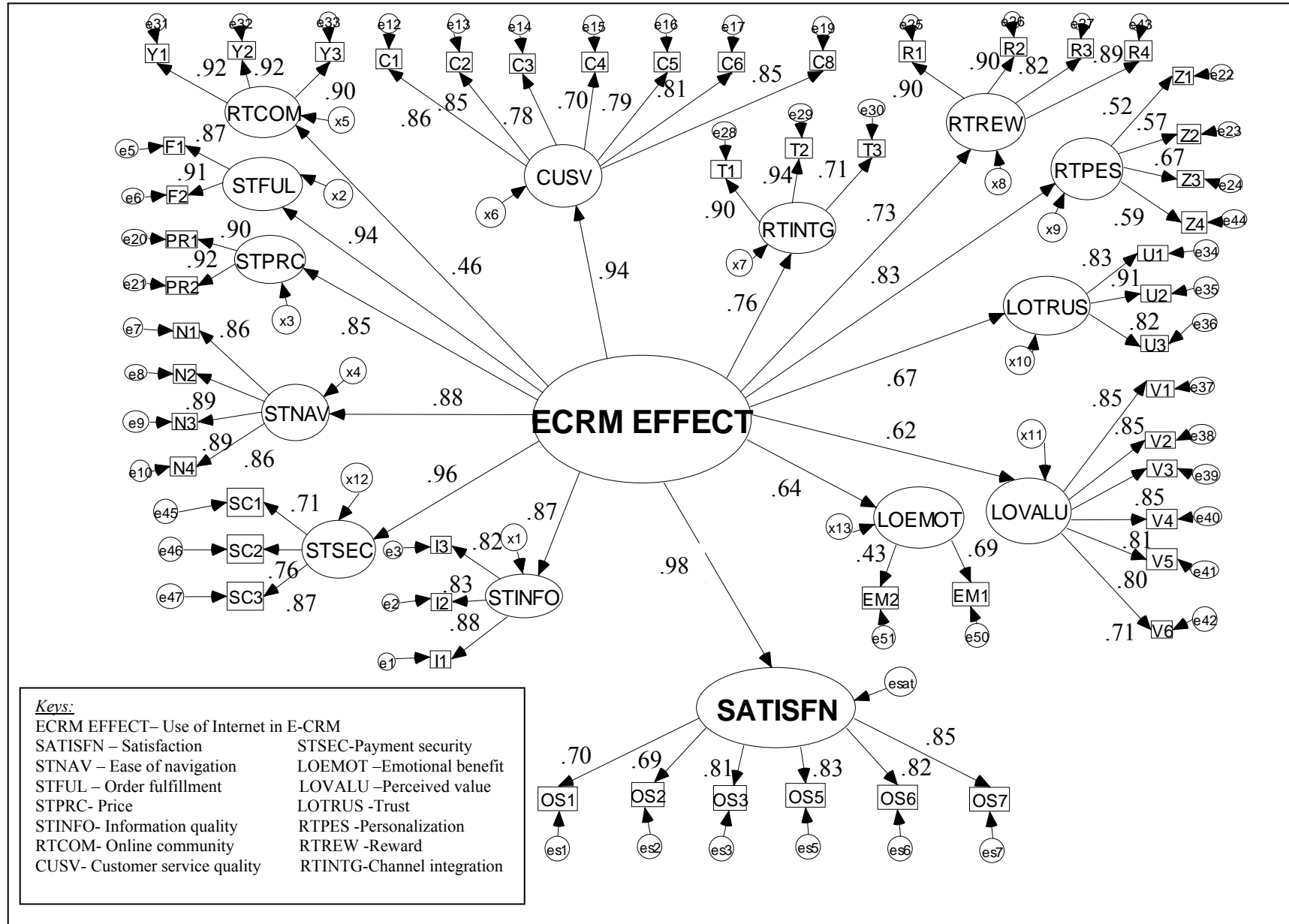
Structural model of relationship between the use E-CRM and Loyalty (RP2.3)

Table 5.23(e) presents the results of the structural model of the use of Internet in E-CRM and loyalty. The goodness-of-fit statistics of this model yielded the value of χ^2/df= 2.04 and RMSEA= 0.043 are within the acceptable range.   In addition, the fit indexes; CFI, TLI and AGFI each equals to 0.96, 0.96, 0.89 and are above the acceptable values, hence indicate a good fit of the model to the data. Therefore, the causal model of the use of E-CRM and loyalty is accepted. Figure 5.28 presents the CLD model while Figure 5.29 displays the SEM and factor loadings of this model. This model indicates that 65 per cent of the variance in consumer loyalty is explained by E-CRM activities where the implementation of E-CRM strongly predicts loyalty. The results from regression analysis are illustrated Table 5.23(f).

Table 5.23(e): Goodness-of-fit Statistics for a Structural Model of the Relationship between E-CRM and Loyalty

Goodness-of-fit measures	ECRM-Loyalty	Recommended value
Chi-square, *p-value = 0.00*	1906.39	
χ^2/df	2.04	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.043[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.89	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.96	>0.95[e]

[1] *RMSEA range: (0.041, 0.046).* [b,d,e] *Hu and Bentler (1999);* [a,c] *Kline (1998). Source: Analysis of survey data*

Figure 5.28 The CLD Model of ECRM-Loyalty
Relationship
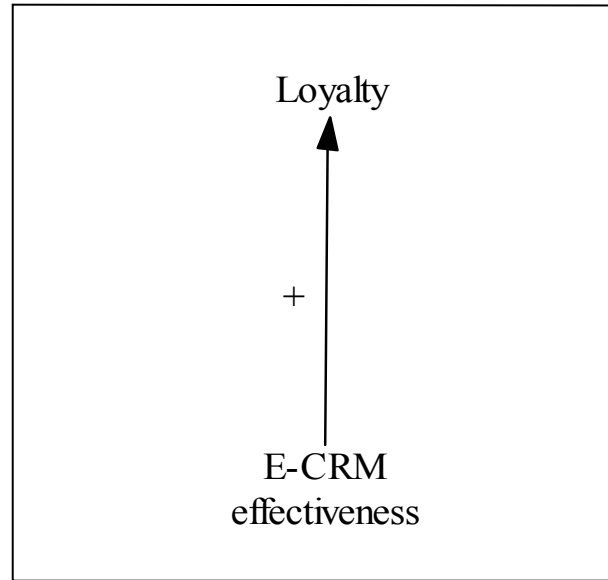
Source: Analysis of survey data

Table 5.23(f): Path Analysis Results for E-CRM-Loyalty Relationship

Path	Standardised coefficient	t-value	r^2
ECRM EFFECT → LOYALTY	0.81	31.71	0.65
Keys: ECRM EFFECT – Use of Internet in ECRM LOYALTY – Loyalty			

Figure 5.29: The SEM Model of ECRM-Loyalty Relationship
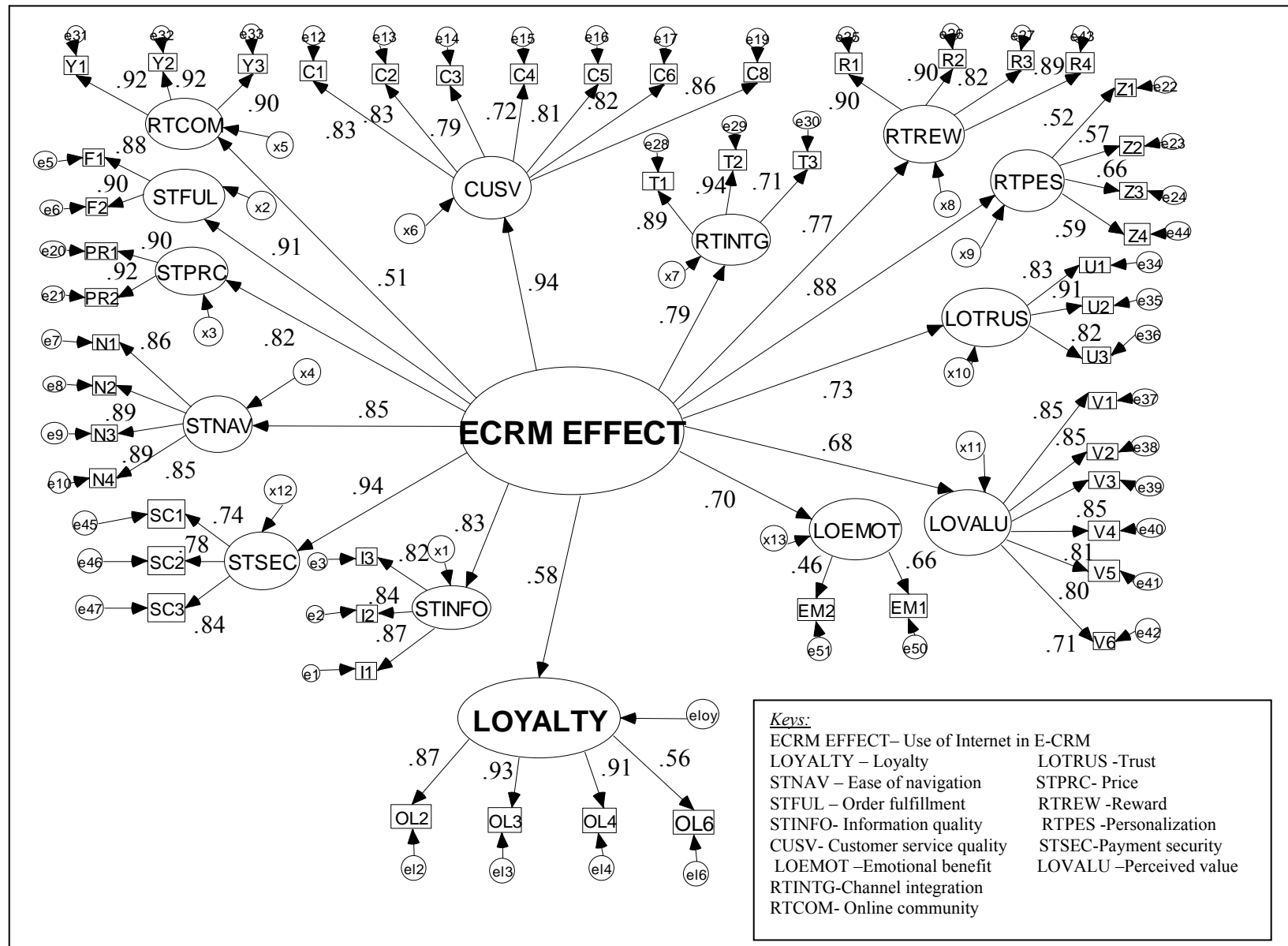
Structural model of the relationship between the use of E-CRM and Retention (RP2.4)

The fit measures for the cause-effect model of the use of E-CRM and retention is illustrated in Table 5.23(g). The $\chi^2/df= 2.02$ and RMSEA= 0.043 suggest a good fit of the model to the data. This is reinforced by CFI= 0.96, TLI= 0.96 and AGFI= 0.89. All are close to 1.0 providing more support for the model. Thus the structural model of the use of E-CRM and retention is accepted. The CLD representation of this model is illustrated in Figure 5.30 while Figure 5.31 depicts the structural model and the factor loadings. Table 5.23(h) displays the results of path analysis. The results provide the evidence that E-CRM implementation is an important factor driving retention ($\beta = 0.79$, t-value = 30.22).

Table 5.23(g): Goodness-of-fit Statistics for a Structural Model of the Relationship between E-CRM and Retention

Goodness-of-fit measures	ECRM-Retention	Recommended value
Chi-square, *p-value= 0.00*	1847.32	
χ^2/df	2.02	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.043[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.89	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.96	>0.95[e]

[1] *RMSEA range: (0.040, 0.046).* [b,d,e] *Hu and Bentler (1999);* [a,c] *Kline (1998). Source: Analysis of survey data*

Figure 5.30 The CLD Model of
ECRM-Retention Relationship

Retention

+

E-CRM
effectiveness
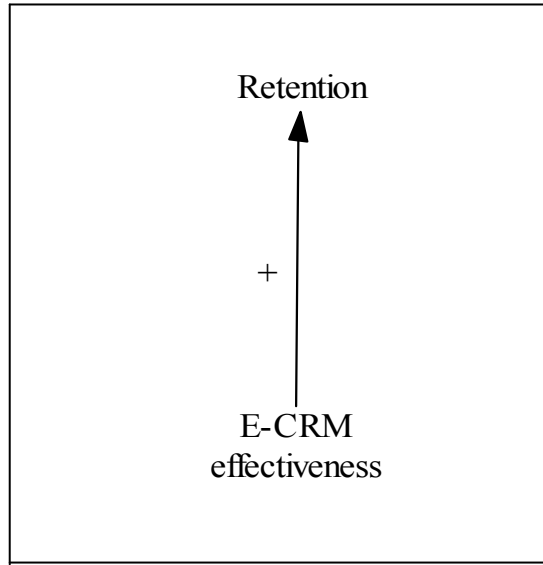
Source: Analysis of survey data

Table 5.23(h): Path Analysis Results for E-CRM-Retention Relationship

Path	Standardised coefficient	t-value	r^2
ECRM EFFECT → RETENTION	0.79	30.22	0.63
Keys: ECRM EFFECT – Use of Internet in ECRM RETENTION – Retention			

Figure 5.31: The SEM Model of ECRM-Retention Relationship
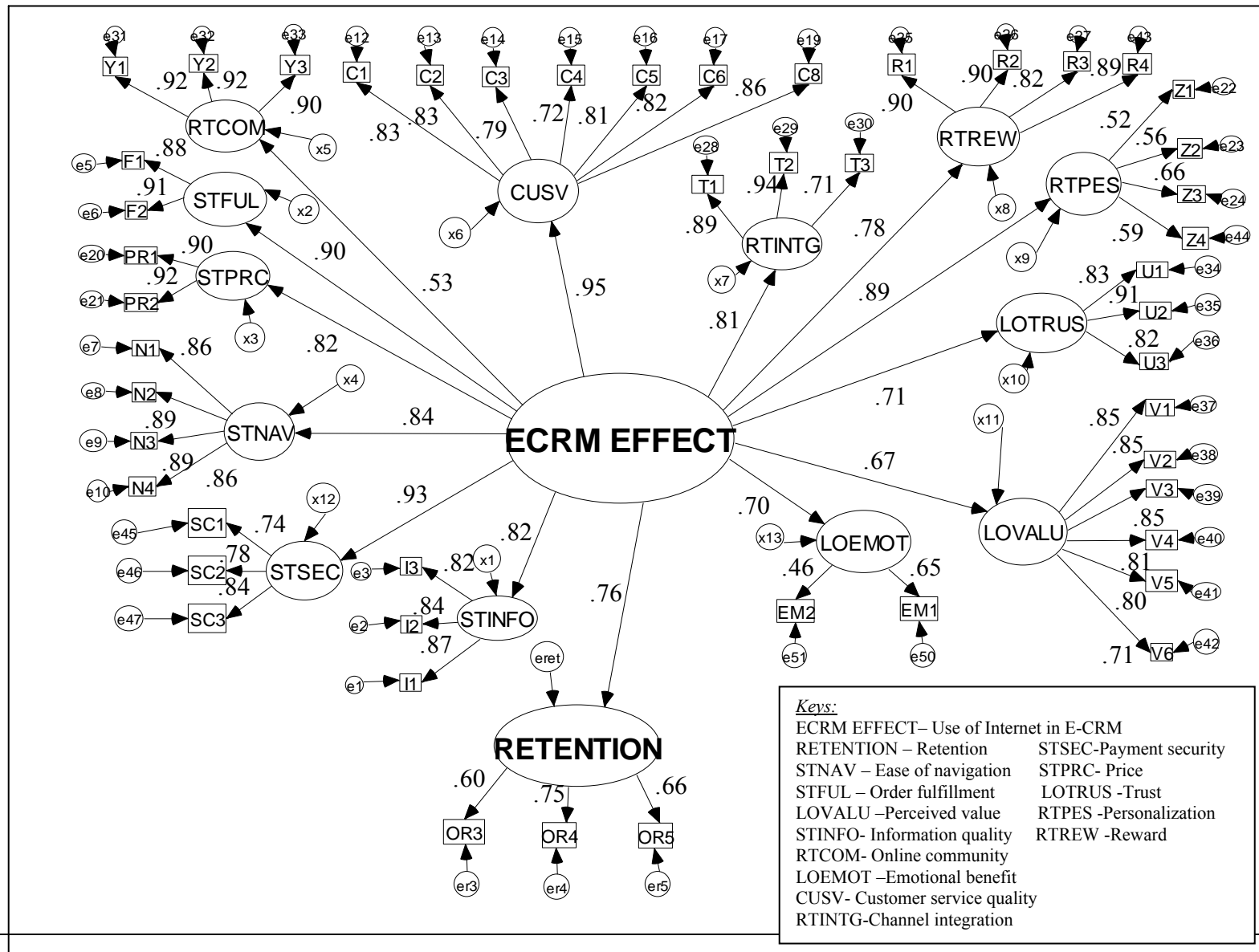
Keys:
ECRM EFFECT– Use of Internet in E-CRM
RETENTION – Retention   STSEC-Payment security
STNAV – Ease of navigation   STPRC- Price
STFUL – Order fulfillment   LOTRUS -Trust
LOVALU –Perceived value   RTPES -Personalization
STINFO- Information quality   RTREW -Reward
RTCOM- Online community
LOEMOT –Emotional benefit
CUSV- Customer service quality
RTINTG-Channel integration

<u>Structural model of relationship between the use of E-CRM and Satisfaction, Loyalty and Retention (RP2.5) – the full model</u>

An overall fit measure of the structural model of the use of E-CRM and satisfaction, loyalty and retention is presented in Table 5.24. The results suggest an acceptable fit of the model with the χ^2/df= 2.11 and RMSEA= 0.044. Providing more support for acceptable fit are the fit indexes: CFI= 0.96, TLI= 0.96 and AGFI= 0.89 all are above the desired level. This full model hypothesizes that the use of the Internet in E-CRM will influence satisfaction, which in turn will affect loyalty and ultimately increase likelihood of retention. Based on the above goodness-of-fit results, this hypothesis is accepted. Figure 5.32 illustrates the CLD representation of the model and the SEM and regression weights are illustrated in Figure 5.33. Table 5.24(a) displays the results of path analysis of this model.

Table 5.24: Goodness-of-fit Statistics for the Structural Model of the Cause-effect Relationship between the Use of E-CRM and Satisfaction -Loyalty-Retention

Goodness-of-fit measures	ECRM-Satisfaction-Loyalty-Retention	Recommended value
Chi-square, *p-value= 0.00*	2243.56	
χ^2/df	2.11	≤3.0[a]
Root mean square of error of estimation (RMSEA)	0.044[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.89	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.96	>0.95[e]

[1] *RMSEA range: (0.041, 0.047).* [b,d,e] *Hu and Bentler (1999);* [a, c] *Kline (1998). Source: Analysis of survey data*

Figure 5.32 The CLD Model of ECRM-Satisfaction-Loyalty-
Retention Relationship
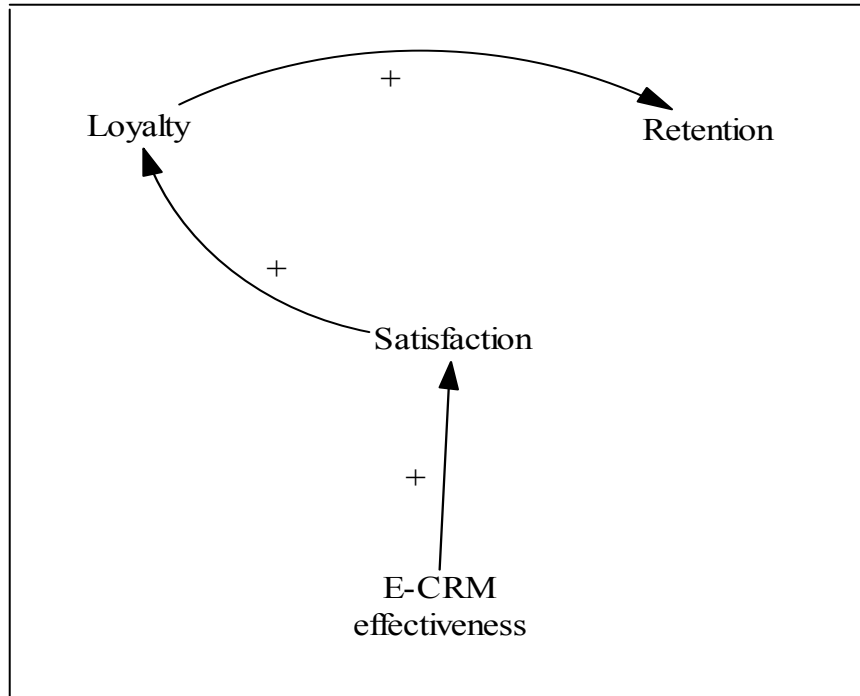
Source: Analysis of survey data

Table 5.24(a): Path Analysis Results for E-CRM-Satisfaction-Loyalty-Retention
Relationship – Full model

Path	Standardised coefficient	t-value	r^2
ECRM EFFECT → SATISFN	0.89	47.36	0.81
SATISFN → LOYALTY	0.70	23.04	0.50
LOYALTY → RETENTION	0.67	21.23	0.45
Keys: ECRM EFFECT – Use of Internet in ECRM SATISFN – Satisfaction RETENTION – Retention LOYALTY - Loyalty			

Figure 5.33: The SEM Model of ECRM-Satisfaction-Loyalty-Retention Relationship
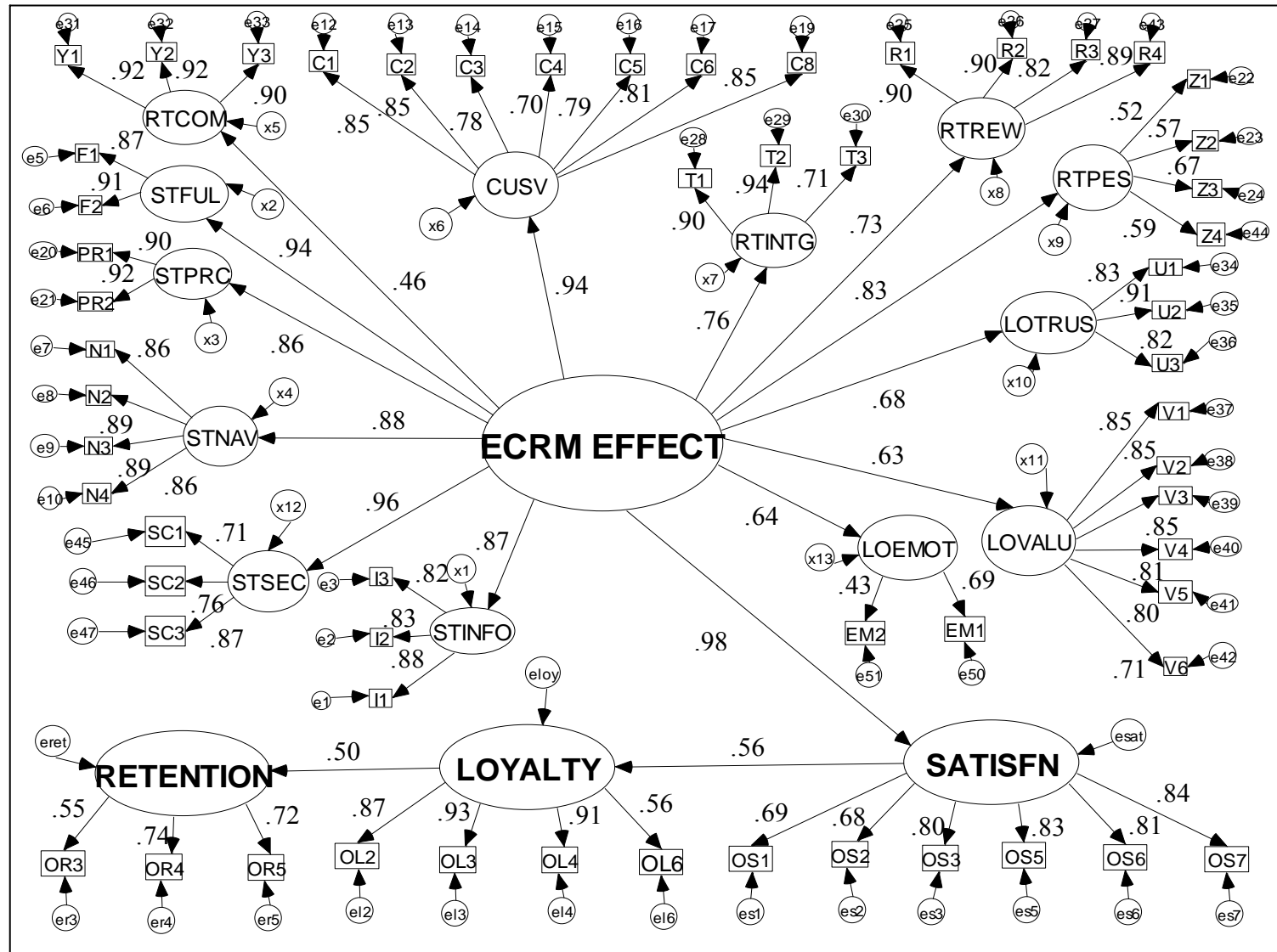
Conclusion: Table 5.23(a) illustrates a good model fit for the components of an E-CRM program. In addition, Tables 5.23 (c), (e), (g) and 5.24 depict the goodness-of-fit statistics of the effect of Internet technology on satisfaction, loyalty and retention. It is evident that satisfaction, loyalty and retention are influenced by the use of E-CRM. Hence, it is concluded that proposition 2.1, 2.2, 2.3 2.4 and 2.5 can be safely accepted.

5.4.3 Results from tests of competing models

Structural model of relationship between the use of E-CRM, Satisfaction and Retention

First competing model - RP2.5(a)

The results of competing models are presented next. As suggested by the literature (chapter 2) the first competing model aims to test the effect of using E-CRM on satisfaction and retention. The goodness-of-fit statistics as displayed in Table 5.25(a) indicate an acceptable fit of the model to the data.

The RMSEA yielded the value of 0.044, thus indicates an acceptable fit. The fit indexes: CFI= 0.95 and TLI= 0.95 are close to the desired level; hence indicate a satisfactory model fit. Furthermore the AGFI= 0.88 is close to 0.90 and is acceptable. Figure 5.34 illustrates the CLD representation while Figure 5.35 displays the SEM model and regression weights of this model.

Table 5.25(a) Goodness-of-fit Statistics for the First Competing Model –
ECRM-Satisfaction-Retention (RP2.5(a))

Goodness-of-fit measures	ECRM-Satisfaction-Retention	Recommended value
Chi-square, *p-value = 0.00*	2156.99	
χ^2/df	2.04	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.044[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.88	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.95	>0.95[d]
Comparative Fit Index (CFI)	0.95	>0.95[e]

[1] RMSEA range: (0.042, 0.047). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998).

Figure 5.34 The CLD model of ECRM-Satisfaction-Retention
Relationship

Source: Analysis of survey data

186
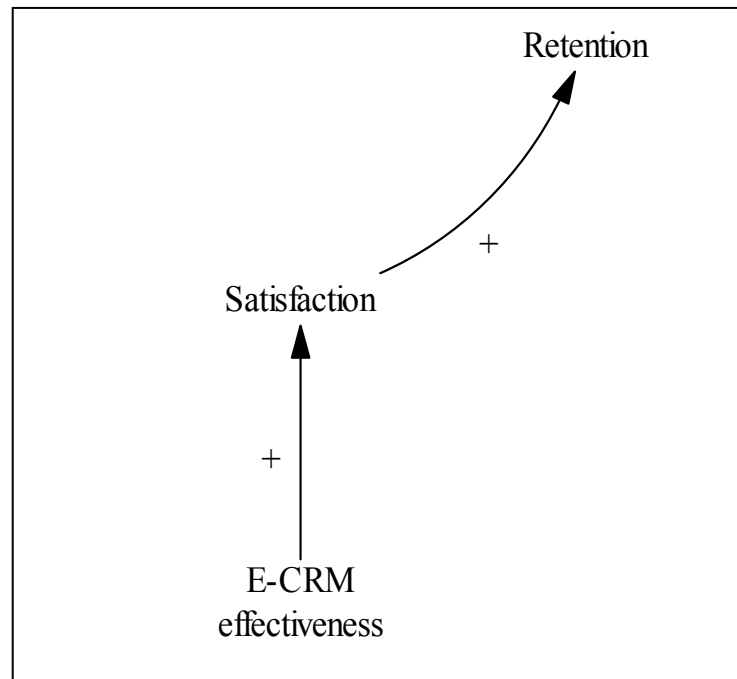
Figure 5.35: The SEM Model of ECRM-Satisfaction- Retention Relationship – First Competing Model
RP2.5(a)
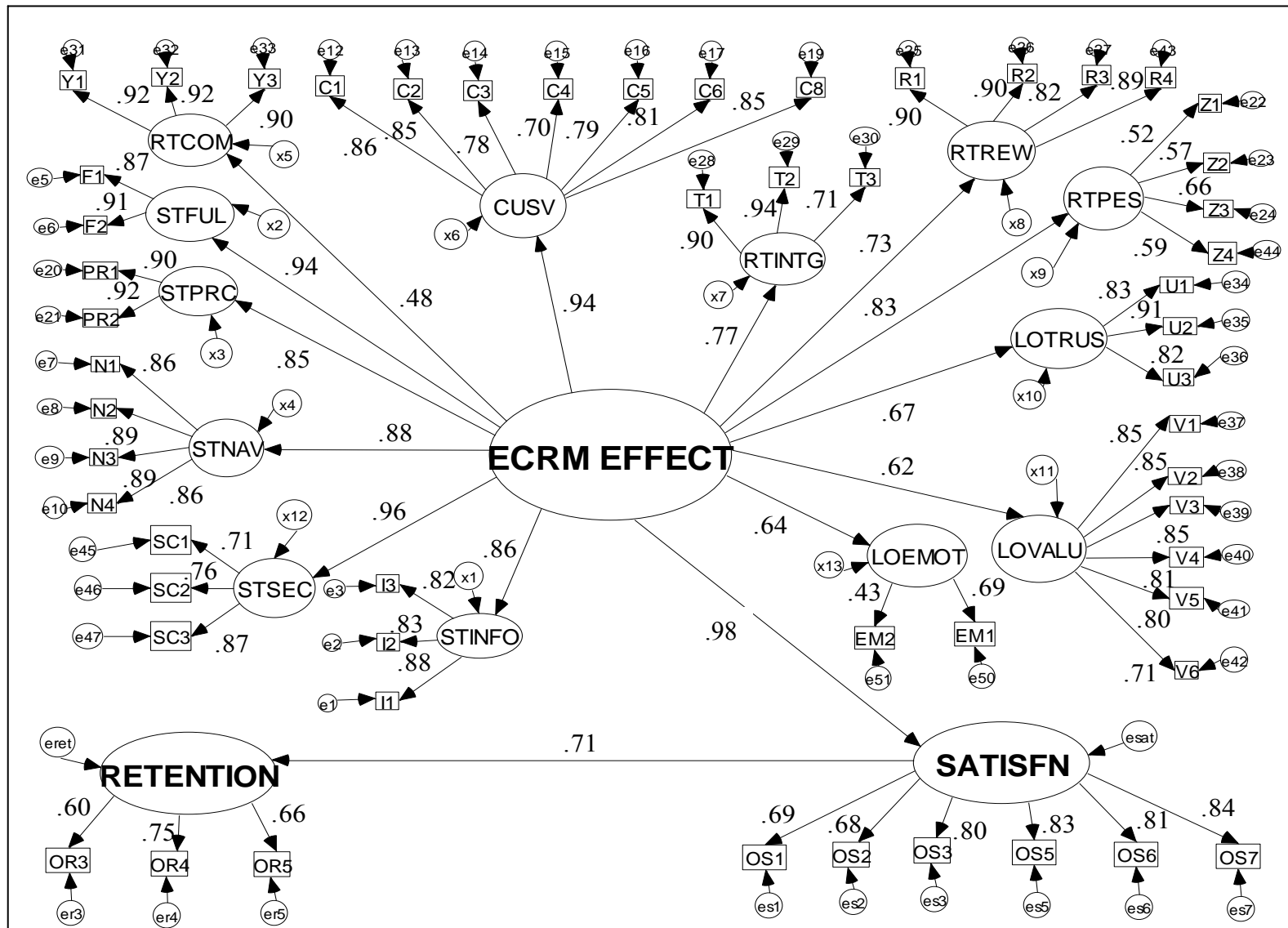
Structural model of relationship between the use of E-CRM, Satisfaction and Loyalty – Second competing model RP2.5 (b)

A structural model of the second competing model is presented next. The literature argues that satisfied consumers may be loyal to a company. Thus, the second competing model aims to test the effect of using Internet technology on satisfaction and its influence on loyalty.

The fit measures of this model displayed in Table 5.25(b) indicate a good fit of the model to the data. The fit indexes: $\chi^2/df = 2.06$, RMSEA= 0.044, CFI= 0.96, TLI= 0.96 and AGFI= 0.89 provide support for the model fit. Figure 5.36 displays the CLD representation of this model while Figure 5.37 presents the SEM model and the regression weights.

Table 5.25(b) Goodness-of-fit Statistics for the First Competing Model – ECRM-Satisfaction-Loyalty (RP2.5(b))

Goodness-of-fit measures	ECRM-Satisfaction-Loyalty	Recommended value
Chi-square, *p-value= 0.00*	2186.95	
χ^2/df	2.06	≤ 3.0[a]
Root mean square of error of estimation (RMSEA)	0.044[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.89	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.96	>0.95[d]
Comparative Fit Index (CFI)	0.96	>0.95[e]

[1] *RMSEA range: (0.042, 0.047).* [b,d,e] *Hu and Bentler (1999);* [a,c] *Kline (1998). Source: Analysis of survey data*

Figure 5.36 The CLD Model of ECRM-Satisfaction-Loyalty
Relationship
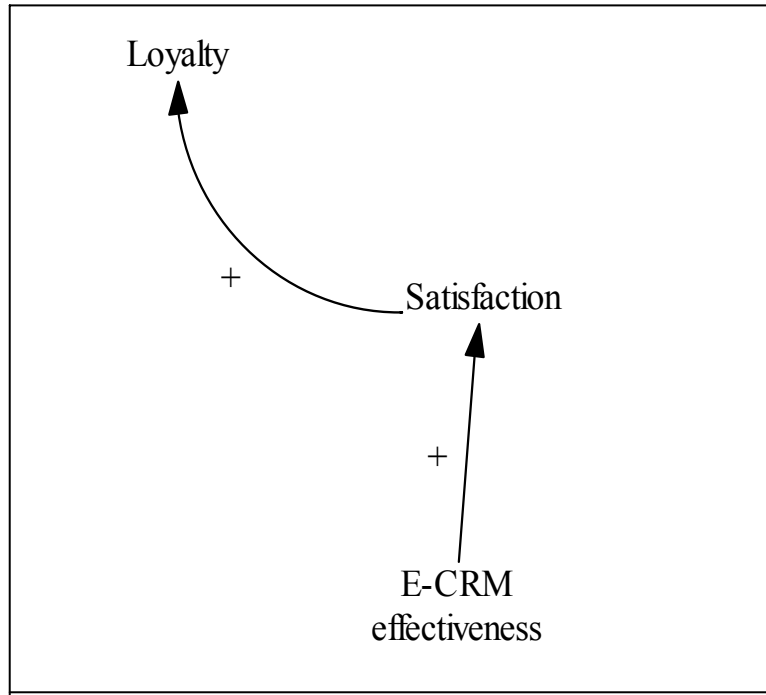
Source: Analysis of survey data

<u>Structural model of relationship between the use E-CRM, Retention and Loyalty - Third competing model RP2.5(c).</u>

Next, the causal structure of the third competing model is presented.   Some authors propose that consumers will continue patronizing even without being satisfied due to lack of alternatives.   Thus, the third competing model seeks to investigate the relationship between the use of Internet technology on retention and how this will in turn influence loyalty.

Figure 5.37: The SEM Model of ECRM-Satisfaction-Loyalty relationship- Second Competing Model
RP 2.5(b)
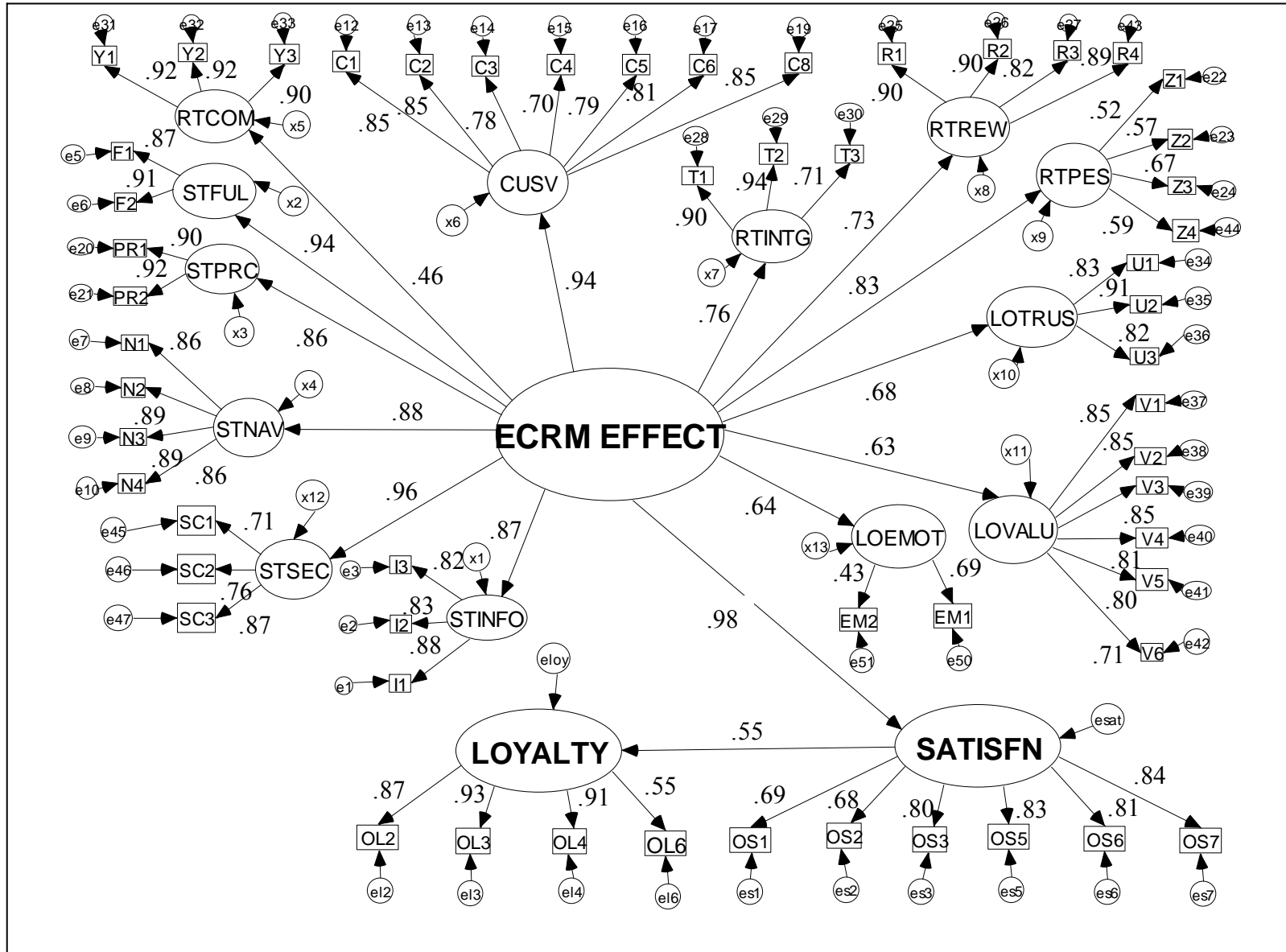
Table 5.25(c) displays the results of this test.   Although the RMSEA is within the acceptable range, the χ^2 /df= 3.34, CFI= 0.91, TLI= 0.90 and AGFI= 0.82 suggest that this model does not fit the data well. Based on the poor fit, the third competing model is therefore rejected. Figure 5.38 illustrates the CLD representation of the model while Figure 5.39 presents the SEM and regression weights of this model.

Table 5.25(c) Goodness-of-fit Statistics for the Third competing Model – ECRM-Retention-Loyalty (RP2.5(c))

Goodness-of-fit measures	ECRM-Retention-Loyalty	Recommended value
Chi-square, *p-value= 0.00*	3789.98	
χ^2 /df	3.34	≤3.0[a]
Root mean square of error of estimation (RMSEA)	0.056[1]	≤ 0.06[b]
Adjusted Goodness-of-fit index (AGFI)	0.82	close to 0.90[c]
Tucker-Lewis Index (TLI)	0.90	>0.95[d]
Comparative Fit Index (CFI)	0.91	>0.95[e]

[1] *RMSEA range: (0.053, 0.058). [b,d,e] Hu and Bentler (1999); [a, c] Kline (1998). Source: Analysis of survey data*

Figure 5.38 The CLD Model of ECRM-Retention-Loyalty Relationship
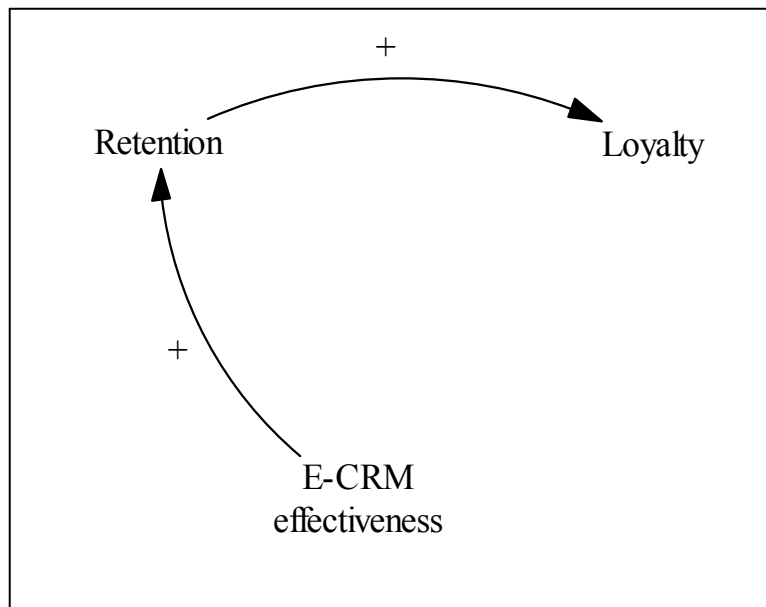
Source: Analysis of survey data

Figure 5.39: The SEM Model of ECRM-Retention-Loyalty Relationship –
Third Competing Model RP2.5(c)
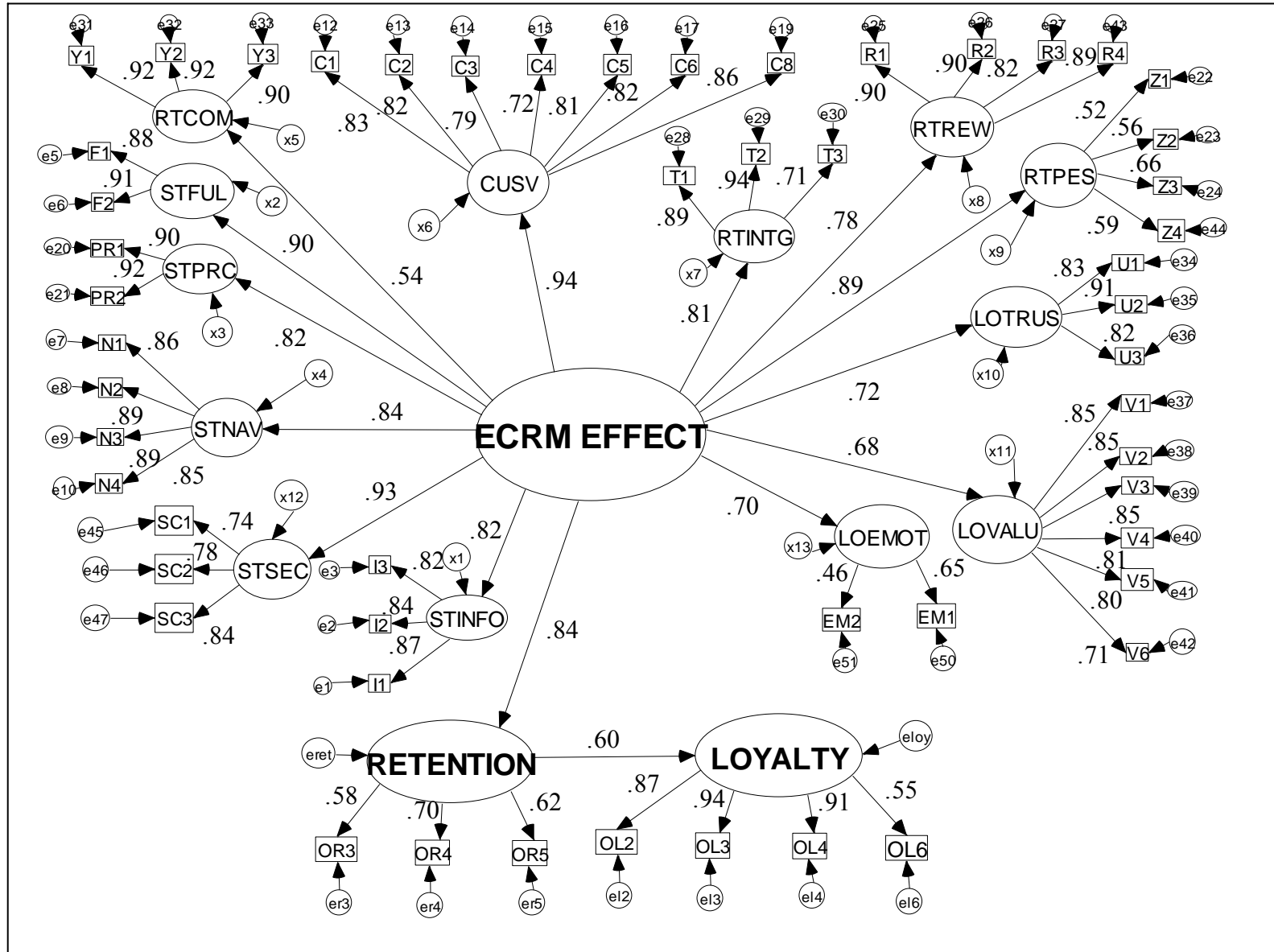
Conclusion: This section presents the goodness-of-fit statistics of competing models. It is evident that the use of E-CRM influences consumer satisfaction and that improving satisfaction is plausible to gain loyalty and increase consumers' intention to return to provider's sites.

5.5   Multivariate analysis of variance (MANOVA) and test of research proposition 3

The third proposition is to examine the association between demographics, Internet activities and level of experience and satisfaction, loyalty and retention.   Hence, Multivariate analysis of variance (MANOVA) was used to test proposition 3. MANOVA is useful to assess the group differences of effects of categorical variables (for example, age, education, experience, type of activities) on multiple interval dependent variables (Hair et al. 1995; Tabachnick & Fidell 2001; Varki & Rust 1997). A number of demographic variables influence consumers' ratings in satisfaction (Varki *&* Rust 1997), however, these have not yet been established for research on Internet consumer satisfaction and retention in Malaysia.   In this research, the general linear model (GLM) of SPSS was used to run the MANOVA tests following the procedures synthesized from Hair et al. (1998) and Tabachnick and Fidell (2001).

Distribution Tests and Outliers Detection. Like any other multivariate analysis, data screening was necessary. Sample distribution was tested for skewness and normality. Although there were some shapes of groups that were slightly skewed, this was not a reason for concern for a sample size of more than 200 cases unless the outliers caused skewness (Tabachnick & Fidell 2001). As MANOVA is very sensitive to outliers, detection for univariate and multivariate outliers were performed as discussed in section 5.1.1.   Wilks' Lambda was chosen for model estimation from a number of test statistics

available (for example, Hotelling's Trace, Pillai's Trace, Roy's greatest characteristic root). Wilks' Lambda is resistant to violations of the assumption of multivariate normality in a moderately sized sample in each group (Hair et al. 1995; Tabachnick & Fidell 2001). For this reason, Wilks' Lambda was employed in this research.

Dependent Variables Measurement. In addition, the relationships among the dependent variables should not be strongly correlated, that is, *r* should be less than 0.6 (Tabachnick & Fidell 2001). In this study the three dependent variables, satisfaction, retention and loyalty have been operationalized by several items. *Satisfaction and retention* were operationalized by six items respectively; while *loyalty* was operationalized by five items, thus a total of 19 items were listed. However, seven items were highly correlated (>0.60) and were deleted from the list, leaving 12 items for analysis. Table 5.26 displays the measurement items of satisfaction, retention and loyalty.

Table 5.26: Dependent Variable Measurement Items

Statements	Cronbach Alpha
Satisfaction items OS1 The information is always updated OS2 Prices of products/services are always lower compared to other companies OS5 Customer service responds to any enquiry quickly	0.79
Retention items OR1 More attractive rewards OR2 Complaints are handled more efficiently and effectively OR3 Receive personalized services from the company Web site OR4 Products/services can be accessed via both channels OR5 Obtain useful information about products/services from online members	0.74
Loyalty items OL3 I feel highly appreciated OL5 I can rely on the services OL6 I feel safe doing business with this site OL7 I will recommend this site	0.79

Source: Analysis of survey data

Furthermore, as a rule of thumb, the number of independent variables should be less than 6 or should not be more than the number of dependent variables for each group (Hair et al. 1995, p. 274). At no stage in this analysis have these rules been violated. For this research, the relationships among the dependent variables were not strongly correlated and the number of independent variables were 3 (Tables 5.27, 5.28 and 5.29).

Post-hoc Tests. When there is a significant difference in the mean reported, further post hoc test is performed to further investigate which particular dependent variable is affected. To do this, a univariate F-test is used to identify the effect on each of the dependent variables. An adjusted, higher alpha value is normally used to reduce the possibility of Type 1 error (Pallant 2001; Tabachnick & Fidell 2001). For this analysis, the formula suggested by Tabachnick and Fidell (2001, p. 349) was used and a new alpha value of 0.04 was applied. Further comparisons using Tukey HSD method was performed to assess any significant similarities or differences within a group. However, no comparison could be performed on Internet activities variables (registration, reservation and banking) due to the limited number of groups (less than three) for these variables.

Testing proposition 3

This section reports the results of proposition 3.1, 3.2 and 3.3 on the effect of demographic, Internet experience level and perceived risk variables on 12 dependent variables of *satisfaction, loyalty* and *retention* as summarised in Table 5.27. The following paragraphs summarize the general trend for satisfaction, loyalty and retention for each of these grouped variables.

The hypotheses tested are:

RP3.1: Demographics affect satisfaction, loyalty and retention.

RP3.2: Consumers' experience level with Internet activities affects satisfaction, loyalty and retention

RP3.3: Consumers' perceived risk with Internet activities affects satisfaction, loyalty and retention.

<u>Demographics effect on satisfaction, loyalty and retention</u>

Gender. Table 5.27 summarizes the respondents' satisfaction, retention and loyalty by gender: F= 0.89, *p*= 0.15. There is no significant effect of gender on the three constructs. Moreover, none of the two-way and three way interactions between the independent variables are found significant.

Age. Table 5.27 indicates that age has a significant effect on the dependent variables: F = 1.70, *p*<0.01. From the post hoc Tukey test, the significant differences are in retention items: "Receive personalized services from the company Web site" (OR3), F= 3.71, *p*<0.01; "Complaints are handled more efficiently and effectively*"* (OR2), F= 3.39 *p*<0.01; "Products/services can be accessed via both channels" (OR4), F= 2.88 *p*<0.01; and loyalty item: "I can rely on the service" (OL5), F= 3.25, *p*<0.05. An inspection of the mean scores reveals that respondents from the age group of 41-50 years old give the highest score, followed by 31-40 age group. From the mean scores it can be concluded that younger Internet users are more tolerant towards Internet service quality, than are older users - older users have higher expectations of services.

Education. There is a significant difference in education on the dependent variables: F = 1.45, *p*<0.05. From the post hoc Tukey test the only significant difference is in loyalty item: "I can rely on the service" (OL5), F=2.39, *p*<0.05. Report from the estimated mean indicates that PhD holders have the highest score, followed by Masters Degree holders. This indicates that the higher the education level of consumers a provider is attracting, the more competitive and effective the services should be.

Two-way interaction: Age-Education. The results indicate that there is a significant two-way interaction between age and education: F= 1.42, p<0.05. That is, the age effect

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on consumer assessment of service quality is modified by consumer level of education. The post hoc results indicate that retention item, "More attractive rewards" (OR1), F= 1.88, p<0.05 is significantly different. An inspection of the estimated means show that older consumer with lower level of education would be more likely attracted to reward programs.

Table 5.27: Multivariate Analysis of Variance of Demographics and Satisfaction, Loyalty and Retention

Effect	Wilks Lambda	F	p-value	Power[a]
Main Effects				
Age (Age)	0.858	1.701	**0.003**	0.999
Education (Edu)	0.849	1.453	**0.017**	0.999
Gender (Gen)	0.931	0.889	0.137	0.940
Two-way Interaction				
Age*Edu	0.842	1.423	**0.004**	1.000
Age*Gen	0.861	1.095	0.270	0.995
Edu*Gen	0.651	1.167	0.082	1.000
Three-way Interaction				
Age*Edu*Gen	0.817	0.948	0.618	0.988

Note: [a] Computed using alpha = 0.05
Source: analysis of survey data

The results above conclude that there are significant differences in two demographic variables: age and education on the measurement items of satisfaction, loyalty and retention construct.

Experience level effect on satisfaction, loyalty and retention

Next is the report on the effects of Internet experience levels on satisfaction, loyalty and retention. Table 5.28 illustrates the summary of the results followed by a paragraph describing the findings.

Table 5.28: Multivariate Analysis of Variance of Internet Experience and
Satisfaction, Loyalty and Retention

Effect	*Wilks Lambda*	F	p-value	Power[a]
Main Effect				
Internet experience (IEXP)	0.872	1.562	**0.011**	0.999

Note: [a] Computed using alpha = 0.05
Source: analysis of survey data

There is a significant difference in the level of Internet experience on the combined dependent variables, F= 1.56, $p<0.05$. The post hoc univariate F tests indicate that the satisfaction items are significant: "The information is always updated" (OS1), F= 2.72, $p<0.01$; "Prices of products/services are always lower compared to other companies" (OS2), F= 3.20, $p<0.01$; retention items: "More attractive rewards" (OR1), F= 2.97, $p<0.05$; "Complaints are handled more efficiently and effectively"(OR2), F= 4.53, $p< 0.01$; and loyalty items: "I can rely on the service" (OL6), F= 6.01, $p<0.01$; "I feel highly appreciated" (OL3), F= 4.04, $p<0.01$; "I feel safe doing business on the site" (OL5), F= 5.69, $p<0.01$. In summary, the mean scores indicate that more experienced users desire a higher quality of services in order to be satisfied as well as to re-visit a site and/or become loyal. The results show that respondents who use the Internet more than 5 years score the highest in all the 12 items. Specifically, the Tukey tests report significant mean differences among the Internet experience group (with less experienced users scoring lower): between 1-3 years and more than 5 years on dependent variables items OR2 and

OL3; between 1-3 years, 3-5 years and more than 5 years on OL6 and OL5, thus providing evident that more experienced users demand for more efficient services, sense of appreciation, delivery of promises and upholding consumers privacy.

This section explored differences in the levels of experience on satisfaction, loyalty and retention on the Internet.   The results show that experience level has a significant different effect on the three constructs.

Perceived risk effect on satisfaction, loyalty and retention

This section reports on the results of proposition 3.3 on the effect of user's activities on satisfaction, loyalty and retention respectively, as illustrated in Table 5.29. In this study, perceived risk is measured by the risk levels associated with different types of activities on the Internet (see section 3.4.3). The following paragraphs summarize the general trend for satisfaction, loyalty and retention for each of the Internet activities examined by this research. Note that, however no post hoc tests were performed due to insufficient number of groups (less than 3) in each of the independent variables.

Online Registration.   The findings show no significant difference in registration: F= 1.587, p= 0.81.   That is, registration activity does not have a significant effect on satisfaction, retention and loyalty.   Results from the two-way and three-way interactions indicate insignificant association between the three activities and the dependent variables.

Online Reservation.   No significant effect was reported in reservation activity on the dependent variables: F= 1.389, p= 0.17.   In other words, there is no significant difference within the study groups with regards to online reservation on the three dependent variables.

Online Banking.   Banking activity reports a significant difference in satisfaction, retention and loyalty items: F= 1.99, $p<0.05$.   The univariate F test reveals there are significant effects in retention items: "Receive personalized services from the company

Web site" (OR3), F= 5.80, $p<0.05$; "Obtain useful information about products/services from online members" (OR5), F= 5.53, $p<0.05$; "Complaints are handled more efficiently and effectively" (OR2), F= 6.23, $p<0.05$; and loyalty items: "I can rely on the service" (OL6), F= 12.04, $p<0.01$; "I feel safe doing business on the site" (OL5), F= 10.37, $p<0.01$. An inspection of the mean scores reveals that OL6; mean= 4.33, scored the highest among these 5 items, followed by OR2; mean= 4.23 and OL5; mean= 4.14.

Table 5.29: Multivariate Analysis of Variance of Internet Activities and Satisfaction, Loyalty and Retention

Effect	*Wilks Lambda*	F	p-value	Power[a]
Main Effects				
Registration (Regs)	0.966	1.587	0.099	0.850
Reservation (Resv)	0.961	1.389	0.174	0.878
Banking (Bank)	0.958	1.991	**0.027**	0.905
Two-way Interaction				
Regs*Bank	0.980	0.820	0.540	0.832
Regs*Resv	0.985	0.637	0.697	0.865
Bank*Resv	0.977	0.969	0.474	0.947
Three-way Interaction				
Regs*Bank*Resv	0.987	0.524	0.787	0.994

Note: [a] *Computed using alpha = 0.05*
Source: *analysis of survey data*

These results indicate that users who engage in banking activities seek for deepest commitment from companies to deliver high quality services and perceive fulfillment of services, after sales and security as critically essential. Having all these 'winning' criteria, consumer satisfaction will increase and companies have a better chance to secure sales or income from their loyal consumers. Prior to that, the reputation of a

company would be of greatest concern when trust becomes an important element before consumers decide to embark onto and carry out a high risk activity such as online banking.

The results of MANOVA tests on the effect of perceived risk on satisfaction, retention and loyalty revealed that only online banking has a significantly different effect on the measurement items. Analysis of multivariate variance was used to determine the effect of the independent variables on the dependent variables. Overall, the findings from Table 5.27, 5.28 and 5.29 suggested that age and education have significant effects for some measures of satisfaction, retention and loyalty. As well, Internet activities and levels of experience have a similar significant effect on the dependent variables.

5.6 Conclusion

This chapter began with the discussion on preliminary examination of research data followed by the presentation of results of the analyses. SEM was used to test proposition 1 and 2 as well as the competing models, while MANOVA was performed to determine the effect of demographic, experience level and perceived risk on the study constructs. From the descriptive statistics, respondents of this study were mainly working adults aged between 21 to 40 years with more than three years experience using the Internet. The SEM results indicate that the implementation of E-CRM should comprise of 13 salient dimensions of relationship marketing activities and that E-CRM does influence consumer satisfaction leading to loyalty and retention. Further, this study reports that consumer expectations of online services vary depending upon age group and education level, level of experience using the technology as well as perceived risk, as indicated by MANOVA test results. The implications for theory and practice from these results as well as limitations of this research are discussed in chapter 6.

CHAPTER 6:   DISCUSSIONS AND CONCLUSIONS

6.0   Introduction

Following the analysis of research data in Chapter five, this final chapter discusses the findings of the study.   It begins with discussion pertaining to research propositions followed by the contributions of this research to theoretical development.   In discussing the practical implications, a model of E-CRM model is proposed and Internet-based company managers may find it useful in comprehending the process of building long term relationship with online consumers.   Finally, the limitations and future directions of research conclude the chapter.

6.1   Discussions regarding research propositions

This section presents the discussion of each of the research propositions.   A brief summary of the literature of the four parent topics: satisfaction, loyalty, retention and E-CRM is presented followed by discussions pertaining to research findings and their differences and similarities with that of extant literature.   Table 6.1 summarizes the results of research propositions and the contributions of this research to the extant literature.

6.1.1   Dimensions of research constructs

The first consideration was to measure the salient dimensions of research constructs: satisfaction, loyalty and retention.

RP 1.1:-   Satisfaction is a function of customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/services range.   Drawing upon the salient dimensions suggested by the literature (see Section 3.3.1) the first proposition was put forward.   It is evident from the results that satisfaction is assessed on product/service range, information quality, ease of navigation, order fulfillment level and customer service quality.   In brief, derived from 30

Table 6.1: Results of Research Propositions and Contributions of Research to Extant Literature

Research propositions	Supported
RP1.1: Satisfaction is a function of customer service quality, ease of navigation, information quality, lower prices, order fulfillment level, payment security and product/services range.	Partially
RP1.2: Loyalty is a function of emotional benefits, perceived value and trust.	Partially
RP1.3: Retention is a function of channel integration, customer service quality, online community personalization level, and reward.	Partially
RP2.1: The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust.	Yes
RP2.2: E-CRM will influence consumers' satisfaction.	Yes
RP2.3: E-CRM will influence consumers' loyalty.	Yes
RP2.4: E-CRM influence consumers' retention.	Yes
RP2.5: E-CRM will influence loyalty, which is affected by satisfaction. In turn, consumer loyalty will lead to retention.	Yes
RP3.1: Demographics affect satisfaction, loyalty and retention	Age and education only
RP3.2: Consumers' experience level with Internet activities affects satisfaction, loyalty and retention.	Yes
RP 3.3: Consumers' perceived risk with Internet activities affects satisfaction, loyalty and retention	Yes

attributes, the data of this study rejects a seven-dimension consumer satisfaction model. Instead the results of the analysis suggest a five- dimension of consumer satisfaction on the Internet.

Parallel to Cao et al. (2004), Cho and Park (2001) and Voss et al. (1998) studies, the finding suggests that price is not a determinant of Internet consumer satisfaction.

Apparently, competition on the Internet is so intense and merchants are not merely measured against low prices. Consumers are keener to visit sites that offer high quality services, reliable information and customer service. As well, this study advocates that payment security does not directly influence satisfaction. However, it is important to note that although payment security is not an antecedent of satisfaction, later results report that security is an important item which directly influences consumer trust leading to loyalty.

RP 1.2:- Loyalty is a function of emotional benefits, perceived value and trust. This research found that loyalty is a two-dimension construct. That is, loyalty is influenced by consumers' trust and perceived value obtained from the sites. Thus, this finding provides support for the proposition put forward by Anderson and Srinivasan (2003) in relation to the effect of trust and perceived value on consumer loyalty. However, this study suggests that emotional benefits do not contribute to loyalty. In other words, this finding does not support previous research that loyalty is affected by sense of enjoyment and elation.

A possible explanation for this result is that elements of entertainment such as games, video clips, contests or greeting by personal name (for example, once a consumer creates his/her profile on a site, he/she will be greeted by his/her first name the next time he/she logs in to that particular site) may appeal to younger consumers only – teenagers and students. However, the respondents for this study were mainly working adults (more than 65 per cent). They are naturally busier and are more concerned about other vital characteristics in a service provider: criteria such as the quality of information and services, reliability and accountability are considered mandatory compared to mere emotional benefits. Thus emotional benefit elements are not considered as critical in gaining consumer loyalty.

RP 1.3:- Retention is a function of channel integration, customer service quality, online community, personalization level, and rewards. Following the integrated marketing and information systems perspective, this research hypothesizes that retention is constructed

from five dimensions. The finding suggests that consumer retention is affected by personalization of product/service, integration of delivery channel, receiving attractive rewards and creating a community of online users. However, this study does not support what has been suggested by Vatanasombut et al. (2004) and Winer (2001) that customer service directly influences repatronage behaviour. Instead, it postulates customer service as a stronger predictor of satisfaction than it is of retention. A possible explanation for this is that customer service support is deemed to be one primary criterion in the satisfaction process. Without good customer support dissatisfied consumers may easily switch to competitors.

6.1.2   Relationships between E-CRM and satisfaction, loyalty and retention.

Next, this study examined whether the use of E-CRM has an effect on consumer satisfaction, loyalty and retention.

RP2.1:- The level of E-CRM implementation is a determinant of channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust.

The results of this study support the proposition that the implementation of an E-CRM program includes several important aspects of marketing activities. This study suggests that channel integration, high quality of customer service, navigation ease, emotional benefit, information quality, online community, fulfillment of orders, payment security, perceived value, personalization of services, attractive pricing, rewards and gaining consumer trust are critical dimensions that should be given particular attention in firm's E-CRM efforts.

The results tend to agree with the findings of similar studies in E-CRM features by Feinberg and Kadam (2002) and technology-based service quality framework (Zeithaml et al 2000).

RP 2.2:- E-CRM will influence consumer satisfaction. Driven by the belief that the use of Internet technology enables building long term relationship with consumers, this study proposed the use of E-CRM will affect consumer satisfaction.   The finding supports the hypothesis that there is a relationship between the use of E-CRM and satisfaction. Consistent with the finding of Feinberg and Kadam (2002), the results indicate a link between the use of E-CRM features and consumer satisfaction.

RP 2.3:- E-CRM will influence consumer loyalty. According to past research, the ultimate aim of E-CRM is to gain consumer loyalty, leading to increased repeat purchases and profitability (Anderson & Mittal 2000; Galbreath 2002; Reichheld & Schefter 2000; Yang & Peterson 2004).   From the results, it is evident that there is a relationship between the use of E-CRM features and loyalty. This study coincides with the finding in Lee-Kelley et al. (2003) to suggest that in the context of Internet channel the implementation of E-CRM can directly improve consumer loyalty.

RP 2.4:-   E-CRM will influence consumer retention.   Extant literature emphasizes the imperatives of building consumer relationship in improving consumer retention rates (Ennew & Binks 1996; Morgan & Hunt 1994; Storbacka et al. 1994). However, there is a lack of empirical evidence that the use of E-CRM features will influence consumers' intention to return to Web sites. The results of this research indicate a positive relationship between the use of E-CRM and retention. That is, E-CRM implementation on Web sites will lead to increased intention to repatronize.

RP 2.5:- E-CRM will influence loyalty, which is affected by satisfaction. In turn, consumer loyalty will lead to retention. The full model of this research hypothesizes a link between E-CRM and satisfaction, loyalty and retention. The results suggest that E-CRM implementation directly influence satisfaction leading to loyalty which in turn increases consumers' intention to return. As there is a lack of empirical evidence of the proposed relationships, this study makes a contribution to knowledge about the effect of E-CRM on satisfaction, loyalty and retention. The finding indicates that satisfaction is an

antecedent of loyalty which is parallel to the finding of Cronin et al. (2000), Rust et al. (2000) and van Riel et al. (2002).

Tests of competing models. The purpose of competing models is to determine the best fitting model from several competing theories in relation to a subject matter (Hair et al, 2003). Drawing upon the literature, three competing models were tested as shown in Section 5.4.3. This research found that RP 2.5(b), which proposes that E-CRM implementation influences consumer loyalty through satisfaction produced the best model fit among all three models, thus indicating support for the findings of Anderson and Sullivan (1993), Bolton and Drew (1991), Cronin et al. (2000), Rust et al. (2000) and Shemwell et al. (1998) about the direct influence of satisfaction on repeat purchase behaviour. Although the relationships between E-CRM, satisfaction and retention model (RP 2.5(a)) indicates a good fit to the data the fit indexes were lower as compared to RP 2.5(b). As well, the finding does not support suggestions by previous researchers (Anderson & Srinivasan 2003; Dick & Basu 1994; Reinartz & Kumar 2002; Yu & Dean 2001) about consumers' repeat purchase behaviour not being affected by satisfaction (RP 2.5(c)).

6.1.3 The effect of demographics, experience level and perceived risk on satisfaction, loyalty and retention.

The third proposition arising from the literature concerns grouped variables, namely, demographics, years of Internet experience and types of activities carried out on the Internet and their relationships with satisfaction, loyalty and retention.

RP3.1:- Demographics affect satisfaction, loyalty and retention. The results from this proposition indicate that online satisfaction, loyalty and retention differ significantly depending on consumer's age and education level. Older and well educated consumers tend to have higher requirements of service in their quest for satisfaction. However, this study advocates that income level does not play an important role in determining online satisfaction, loyalty and retention. This may be true since this study captured consumers'

opinions mainly on Internet activities in general, that is what attracts a consumer to a site vis-à-vis other sites. This research may yield different findings if online shopping (e-commerce) was the main component being surveyed. At the time this study was conducted online shopping had not been well embraced by Malaysian Internet users, therefore online shopping was not the main focus of this study (see Sections 2.1 and Section 3.4.3). Hence, for the context of this study, the notion that consumer assessment of satisfaction, loyalty and retention are not affected by their purchasing power (income level) seems reasonable.

RP 3.2:- Consumers' experience level with the Internet activities affects satisfaction, loyalty and retention. Past research postulated that more experienced consumers have higher expectations of a service in their assessment of satisfaction. The findings by Geissler (2001) are supported in this study to suggest that consumer satisfaction judgment varies according to users' experience level. In addition, the results also indicate that consumer loyalty and retention are affected by Internet users' experience level. For instance, as consumers become familiar with Internet searching tools, they will seek other value added services in order to remain with the business.

RP 3.3:- Consumers' perceived risk with the Internet activities affects satisfaction, loyalty and retention. This study hypothesizes the higher the perceived risk, the less likely consumers can possibly be satisfied, be loyal and are retained. The findings provide support for the proposition. That is, consumers' level of loyalty and retention are significantly different in online banking as compared to other less risky activities such as online registration and reservation.

6.2 Implications for theory

Overall the findings and contributions of this research have several implications for theory about modeling the E-CRM implementation relationships with consumer satisfaction, loyalty and retention. However, it is important to note that the findings may

be applicable only to South-East Asia where culture and Internet penetration level are similar across the region.

As illustrated in Table 2.1 Hofstede's typology of national cultures indicates that South-East Asian countries such as Malaysia, Indonesia, Thailand and Singapore are characterised by collectivism, high power distance and femininity (Hofstede 1980; Hofstede 2001; Hofstede and Bond 1988; Kasper et al. 1999; Karande et al. 2002). Yang et al. (2003) conducted a survey on Internet users in Singapore to assess Singaporean perceptions toward Web site features in view of the Internet potential as a commercial tool. The study reported that Singaporeans rated security and privacy concerns the highest, followed by ease of navigation, service reliability and merchants' trustworthiness as well as downloading speed. Although Singapore ranks the highest among other South-East Asia countries in Internet penetration level (Singapore: 67%, Malaysia: 37%, Indonesia: 8% and Thailand: 12% (Internet World Stats 2005)), the results from Yang et al.'s study are quite similar to the results of this study and Suki et al.'s (2002) which were conducted in Malaysia. Likewise, a study on service marketing reveals that Thailand consumers place higher expectations on services from a service provider once a relationship is established (Patterson & Smith 2001b). The finding is quite similar to the result of this study, where Malaysian consumers seek more benefits (such as reward) in return of repeat visits. The similarities of consumer behaviour between Singapore, Malaysia and Thailand consumers indicate that Eastern culture, which is characterised by collectivism, high power distance and femininity, prevails across this region. However, other studies are required to affirm if the conclusions reached in this study apply to other regions and cultures.

6.2.1 Dimensions of research construct

Satisfaction. The dimensions of satisfaction are still debatable and elusive as shown in Table 3.2 of Section 3.3.1. To ensure that all attributes suggested by the literature are considered, this study hypothesized a seven-dimension model of satisfaction. However, a five-dimension model seemed to fit the data for this research well. This study concludes that consumers' online satisfaction can be improved if updated information, efficient

customer service, high quality of product/service, order fulfillment and ease of navigation attributes are present on the Web sites.

Loyalty. Many researchers have asserted the importance of trust in consumers' decision making in relation to online transactions (Anderson & Srinivasan 2003; de Ruyter et al. 2001; Reichheld & Schefter 2000). Anderson and Srinivasan (2003) tested the effect of trust and perceived value on satisfaction and loyalty and posited that the relationship between satisfaction and loyalty is moderated by trust and perceived value. However, further studies are needed to confirm how loyalty is constructed. That is, to determine the factors which directly contribute to consumer loyalty Dick and Basu (1994), Jones et al. (2002), Oliver (1999) and Yang & Peterson (2004) suggested that loyalty may consist of multiple dimensions; hence this study hypothesized a three-dimension model of loyalty. The results indicate that loyalty is a function of two dimensions: perceived value and trust. This finding provides an empirical evidence about the salient dimensions of loyalty and contributes to knowledge about how loyalty is constructed.

Retention. Winer (2001) introduced the notion that consumer retention programs should mainly consist of personalization of services, rewards and loyalty program, online community and efficient customer service. Subsequently, other researchers have empirically examined and proposed personalization (Geissler 2001; Luo & Seyedian 2004; Park & Kim 2003; Vatanasombut et al. 2004), rewards (Geissler 2001) and online community (Geissler 2001) as factors affecting retention. However, more recent research has increasingly suggested the importance of offline-online channel integration, leading to increased intention to return. (Vatanasombut et al. 2004). Therefore, this study extended on previous propositions to include channel integration as one of the determinants of retention. The finding provides good support for a four-dimension model of consumer retention on the Internet and postulates that customer service quality explains consumer satisfaction better than it does for retention. Although other studies have empirically tested several dimensions of retention, no previous research has proposed a four-dimension model: personalization level, online community, reward and

channel integration, hence this study provides a required empirical evidence of a four-dimension model of retention.

E-CRM program.   Little empirical evidence has been presented in the study of E-CRM program constituents.   This study provides the needed empirical evidence on the aspects of marketing activities that would assist in building long-term relationships with online consumers.   The finding extends on what has been examined by Anton and Postmus (1999) and Feinberg and Kadam (2002) to attest that an effective E-CRM program includes 13 dimensions of marketing activities: channel integration, customer service quality, ease of navigation, emotional benefit, information quality, lower prices, online community, order fulfillment level, payment security, perceived value, personalization level, reward and trust.   Hence, this study contributes to knowledge pertaining to the implementation of an E-CRM program.

6.2.2   Relationships between E-CRM and satisfaction, loyalty and retention.

Much has been discussed and examined about the links between CRM implementation and consumer satisfaction, loyalty and retention in a traditional retailing environment. However, studies related to the theoretical implications of this causal-effect structure in an online environment are lacking indeed (Gronroos 2000).   Although there have been several attempts to investigate consumer behaviour on the Internet, many tend to focus on consumer behaviour towards the Internet technology in general.   For example, Al Gahtani and King (1999), Geissler (2001), Torkzadeh and Dhillon (2002), and Vatanasombut et al. (2004) have examined consumer behaviour in relation to site design, downloading speed, entertainment and security factors while others aimed at understanding the factors that influence the relationships between e-satisfaction and e-loyalty (Anderson & Srinivasan 2003; Cho & Park 2001; van Riel et al. 2001; Yang & Peterson 2004).

Feinberg and Kadam (2002), Lee-Kelley et al. (2003), and Taylor and Hunter (2002) have uncovered the relationships between the presence of E-CRM features on Web sites and improving consumer satisfaction, intention to return and loyalty.   The suggestion

that E-CRM features lead to improved consumer satisfaction ($r^2 = 0.81$) and loyalty ($r^2 = 0.72$) reported by this study parallels the findings of Feinberg and Kadam (2002), Lee-Kelley et al. (2003), and Taylor and Hunter (2002) studies. Further, this study confirms what have been discovered by Taylor and Hunter (2002) in a business-to-business context, the e-satisfaction moderating role on e-loyalty ($r^2 = 0.55$) in E-CRM. Therefore this study provides the empirical evidence of online *satisfaction-loyalty* linkage in an E-CRM business-to-consumer environment.

For many years researchers have debated the definitions of *loyalty- retention constructs* and yet they remain elusive (see Sections 2.2.1 and 2.3.1). In accordance with loyalty and retention definitions adapted by this study, these two variables were treated as two different constructs and were examined with regards to their relationship with E-CRM activities. The findings indicate that the use of E-CRM features more strongly predicts loyalty ($r^2 = 0.72$) than it does retention ($r^2 = 0.59$). This indicates that E-CRM implementation on a site has a greater impact on consumer 'true loyalty'- deeply committed to continue patronizing a site, while it exerts lesser influence on consumer 'spurious loyalty' – mere repeat patronage behaviour. Therefore this study confirms the findings in previous research (Barnes 2002; Jacoby & Chesnut 1978) to suggest that loyalty and retention entail different meanings and implications theoretically.

Primarily, *the full model* of this study suggests that E-CRM is directly related to satisfaction and will influence loyalty, which in turn will increase consumers' repeat patronage. This study provides a contribution to knowledge on modeling the cause-effect structure of E-CRM implementation and consumer satisfaction, loyalty and retention. That is, the effective use of Internet technology in building consumer relationships (E-CRM) will increase consumer satisfaction leading to loyalty, which in turn influence consumer propensity to return. As well, results from the competing models do not confirm past researchers' suggestion that consumers are loyal and continue to return to a service provider, even though they are dissatisfied, due to lack of alternatives. Hence, this research makes a contribution to knowledge about the moderating effect of e-satisfaction on e-loyalty.

6.2.3   Demographics, experience level and perceived risk influence satisfaction, loyalty and retention.

Demographics.   Next, this research shows the effect of demographics on satisfaction, loyalty and retention.   Previous studies have empirically examined the effect of demographics on consumers' propensity to make online purchases (Lee-Kelley et al. 2003) and found that income level affects online purchase decisions, while Akinci et al. (2004) used demographics to categorize online banking consumers into three segments: speed seekers, cautious users and exposed users.   This study attempts to understand the effects of demographics on the attributes of satisfaction, loyalty and retention, which is lacking.   The findings indicate that consumer age (F= 1.70, p<0.01) and education level (F= 1.45, p<0.05) influence satisfaction, loyalty and retention.

Older and more educated consumers tend to seek more superior quality services than younger and less educated users. That is, consumer age and education level influence his/her judgment of satisfaction, which in turn affects loyalty. Particularly, these consumer groups prefer personalized services (F= 3.71, p<0.01), efficient customer service (F= 3.39, p<0.01) and integrated marketing channel (F= 2.88, p<0.05).   To gain consumer loyalty, providers must offer reliable services (F= 3.25, p<0.05).   These results provide the empirical evidence about the effects of demographics on the three studied variables.

Experience level.   Past researchers suggested that more experienced users are less likely to be satisfied with services that are not differentiated and are less brand reliant, and hence are less loyal (Ward & Lee 2000).   The suggestion that experience level (F= 1.56, p<0.01) influences satisfaction and loyalty finds support in this study.   The results show that more experienced users are less tolerant towards incompetent service and that providers have to offer higher quality of services in order to satisfy their consumers and gain consumer loyalty.

Specifically, more experienced users look for updated information (F= 2.72, p<0.05) and lower prices (F= 3.20, p< 0.05) in order to be satisfied. Rewards (F= 2.97, p<0.05) and

efficient customer service (F= 4.53, p<0.01) are the elements that can influence their repeat visit behaviour, while reliability (F= 6.00, p<0.01), the need to feel appreciated (F= 4.04, p<0.01) and perceived security (F= 5.69, p<0.01) are important features leading to loyalty.

Perceived risk. This research adapts the TRA and TAM theories to hypothesize that consumers' perceived risk influences satisfaction, loyalty and retention. Internet activities are categorized based on their risk levels and, drawing from the literature activities involving the disclosure of financial-related information, were classified as high risk. The results from this study suggest that consumers who are engaged in online banking (F= 1.99, p<0.05) differ significantly in their assessment of loyalty and retention. That is, the higher the risk, the higher are the users' expectations of service, particularly pertaining to reliability (F= 12.04, p<0.01) and perceived security (F= 10.37, p<0.01).

In an online environment, the degree of perceived risk is associated with perceived security as well reliability of an online firm when a consumer performs transactions on a site. When a consumer is engaged in a higher degree of perceived risk activity, perceived security and reliability tend to be the most critical factors a consumer would consider in his/her judgment of loyalty. Hence, it is plausible to infer that perceived risk plays a moderating role in consumer loyalty, that is the higher the perceived risk the higher consumer expectation of security practices and service reliability, which in turn would affect loyalty. Ensuring these features available on a firm's site would increase the likelihood of gaining consumer loyalty and retention. These features were parallel to Akinci et al.'s (2004) study in relation to the most important criteria in consumers' selection of online banks.

In addition, efficient customer service (F=6.23, p<0.01), personalized services (F=5.80, p<0.05) and online community (F= 5.23, p<0.05) are the elements affording repeat visits. This study provides the required empirical evidence about the relationship between perceived risk and the effect on loyalty and retention on the Internet.

6.3   Implications for practice

The results from this study have some implications for companies that use the Internet as part of their marketing strategies. This research identifies the key attributes into which firms should invest resources to enhance satisfaction, loyalty and retention leading to building long term relationships with consumers.

6.3.1   Dimensions of satisfaction, loyalty and retention

Satisfaction.   The results of this study indicate that Internet satisfaction assessment depends on quality of product/service, updated information, and efficient customer service, ease of site navigation and efficient delivery of orders.   To satisfy online consumers, firms must focus on these criteria of services. Firstly, *customer service quality* should be given a top priority since it is the first contact point for consumers to evaluate whether or not a firm is reliable. When one finds difficulty in communicating with the customer service, that is either an enquiry is not attended to within a reasonable time or representative appears to have insufficient knowledge, he/she would immediately make an adverse evaluation about a firm's service performance. In a highly competitive environment such as the Internet, this unpleasant experience (leading to dissatisfaction) would leave firms losing not only one potential consumer but perhaps many more, due to "word-of-mouth".   Hence, firms are well advised to attend to consumer complaints efficiently, clearly display the links to customer service and help desk, and to have a customer service representative always available.

Next, the *quality of information* should be another important attribute firms should be concerned about. Since Internet technology stems from computer technology, which is believed to process and deliver information at speed, the relevancy and accuracy of information seem to be compulsory criteria of a Web site. A site that displays information that has expired at a point of time may be viewed as inefficient.   In addition, it is vital for a firm to accurately capture and *deliver orders* within the promised time. Failing this will result in not only consumers' frustration but will adversely affect consumers' assessment of firms' performance. Then, *ease of site navigation* is also vital. Generally, Internet consumers are impatient (Geissler 2001) hence loading speed of the

site, simplicity of use and accessibility are critical.   This study reveals that *price* does not rule the Web. Indeed, Internet consumers are not all bargain hunters and those with high level of price tolerance tend to be seeking for other variables in products/service such as convenient (Reichheld & Schefter 2000) and value-added services.

Loyalty. In times when there are many similar products/services available in the market, ensuring repeat visits or purchases becomes the most challenging endeavor for service providers. Nevertheless, since it is cheaper to serve existing consumers than new ones, hence understanding the drivers of consumer loyalty is essential. Evidently, consumers' trust and perceived value are the key contributors to loyalty.

In order to be competitive, firms should strive for added value in their offerings. Providing facilities such as tracking orders, keeping and tracking a record of consumer history of purchases or activities, allowing some degree of customization, and understanding consumers' specific needs and preferences enhances consumers' perceived value thus increases loyalty.   However, firms should be aware that consumers are continuously looking for value and their assessment changes as the standard of service offerings in the market changes. That is, a feature which is regarded as value added today may be a common basic feature that is available on every site in the future. Therefore, in order to remain competitive and become the site of choice firms must constantly work at upgrading their services to enhance consumers' perceived value; otherwise consumers may switch to competitors.

The Internet channel lacks the interpersonal face-to-face interaction between service providers and buyers, and hence can increase the sense of fear of the unknown. Firms are well advised to adopt high security measures to ensure consumer's financial information and other personal details are kept safe and confidential: provide a third party seal of trust, site verification, as well as clearly defined privacy policy and terms and conditions of purchase or subscription.

Retention. Personalization level, rewards, channel integration and the effectiveness of online community are key drivers of consumer repatronage behaviour. Certainly, the Internet is a "new" medium of commerce which attracts different types of consumers than that of traditional shopping channel.   Undoubtedly, online consumers seek better characteristics than those that merely satisfy them in order to entice them to return. One of the differentiating factors is building an *online community of users*.

As the Internet is ubiquitous, it plays a significant role in real time communication and information sharing.   Firms are encouraged to provide a discussion group facility on their sites allowing consumers to share ideas and exchange opinions about products/services. Having an online community brings a long-term benefit to firms, that is consumers who are "attached" to their online members may find it difficult to switch to other sites (Winer 2001), hence leading to retention. Additionally, information shared on firms' sites may be analyzed enabling firms to learn about consumers' perceptions towards firms' performance.   Then, firms should invest their resources in enabling *personalization of products/services.*   Given the self-service nature of Internet technology, consumers may feel empowered and in control when they are provided with a choice to design a product/service as they want it to be. Indeed, through personalization, firms may use the information captured with regards to individual preferences and history to target marketing campaigns and product offerings.

Offering point redemption, cash rebate or gifts in return of a purchase or visits increases the likelihood of repeat purchase/visits (Winer 2001).   However, this *reward/loyalty program* should be well managed as to target consumers who are less likely to default for the many rewards offered to them. Lastly, there is a strong and growing need for *synchronized online-offline channels*. For example orders that are placed online are available for pick up at a nearest physical store.   Likewise, information about products and promotions in a physical store can also be found online. An explanation for this occurrence may lie in an increase in the number of brick-and-click companies in the market today.   Providing these features on firms' site may improve their relationship with consumers and gain a competitive edge.

6.3.2   E-CRM influences satisfaction, loyalty and retention.

This study reveals that the effective use of E-CRM has a bearing on consumer satisfaction level, which in turn is an antecedent of consumer loyalty. Although it is difficult to distinguish e-tailers sites in terms of their "physical" appearance and list of product/services, firms' "real" performance is assessed on their reliability, efficiency, and flexibility.   Consumers shall therefore evaluate firm's performance against their own expectations: either below, within or beyond consumers' expectations.   Therefore, ensuring that excellent service is at the forefront of consumer interactions – the Web site, is critical.

Most importantly, firms are encouraged to continuously monitor consumer satisfaction levels, due to the fact that the implementation of E-CRM, leading to loyalty, is through satisfaction. That is, consumers who have pleasant encounters with a site tend to build trust and are committed to the site, thus are more likely to return. Likewise, those who are not satisfied will not hesitate to switch to competitors.   The Internet market is borderless where the search for alternative e-tailers may be relatively effortless at a consumer's mouse-click.   Therefore, it is more critical now than ever for firms to improve and increase consumer satisfaction in order to retain an edge and influence consumers' intention to return.   Some suggest that consumers are loyal to a provider when the learning curve is high and switching is costly (Anderson & Srinivasan 2003; Reinartz & Kumar 2002; Yu & Dean 2001). However, this study concerns the business-to-consumer marketplace where switching to another e-tailer may incur the least cost. Besides, today's Web sites are designed to be more graphical and easy to navigate, hence new users may not find browsing a site as difficult.

Interestingly, the use of Internet in consumer relationship management has a stronger impact on acquiring "true" loyalty than on "spurious" loyalty behaviour. As ironic as it may seem to apply this finding to a traditional marketing environment, the results seem to offer a reasonable reflection of online consumer behaviour. On the Internet channel, consumers tend to be less price sensitive (Degeratu et al. 1999; Lynch & Ariely 2000; Shankar et al. 2001) and are more value-oriented compared to offline consumers

(Vrechopoulos et al. 2001; Ward & Lee 2000). In addition, information security is critical in consumers' judgment of loyalty. Hence, despite the vigorous competition and marketing campaigns, a consumer would decide to be deeply committed to a site that he/she has acknowledged of high service performance: sound security practice, high consumer value and reasonably priced (although not necessarily the lowest).

The result parallels to Noordhoff et al.'s (2004) study on loyalty card program and store loyalty in Singapore. In comparison to Netherlands consumers (West), Singaporeans (East) tend to display commitment to a store when relationships have already been established. The femininity culture of the East exerts consumer feelings of trust and loyalty, in return of perceived value. Further, in a collectivist community such as the East, individuals (consumers) are inclined to be 'truly' loyal when relationships exist. Specifically, in Malay culture the concept of *terhutang budi* (indebtedness) suggests that someone who has been rendered the act of kindness should reciprocate equally, and failure to repay is considered unappreciative for the kindness rendered, thus it is a serious offense (Ali 1979; Dahlan 1997.). Hence, consumers in the Malay (Eastern) community are more likely to be committed to service providers as a result of relationship marketing efforts than the Western consumers.

E-CRM program: The roles of Internet technology in enhancing consumer relationships.

Customer relationship management is no longer a new phenomenon– borderless markets leading to intense competition, more demanding consumers and dynamic consumer behaviour have forced firms to continuously focus on enhancing consumer value and building long-term relationships. In addition, the emergence of new Internet technologies intensifies competition alongside increased consumers' bargaining power. Due to the cost efficient Internet channel, firms choose to outline online marketing strategies revolving around this interactive technology.

Since it is more cost effective to serve loyal consumers, building trusting relationships seems imperative for business profitability. To remain competitive in the relationship

age, firms should understand the marketing activities an effective E-CRM program should adopt. This study identifies these dimensions leading to increased satisfaction, loyalty and retention.

Specifically, the Internet is most pertinent in *upgrading customer service efficiency* ($r^2 = 0.83$). Firms should understand that Internet consumers are convenience seekers whom generally have low tolerance towards poor quality and inefficient services. Online consumers' expectations of services increase as the technology itself is ubiquitous and speedy. It is expected that the customer service representatives are "well-informed" about each consumer's activities should there be any inquiry or problems in relation to a transaction. Hence, companies who could deliver answers to consumers' enquiries almost immediately via tools, such as FAQs, automatic email response, email or VoIP (a technology that allows voice to be transmitted over the Internet, for example, voice chat) would be more likely to succeed in establishing a relationship with a consumer.

In a high uncertainty avoidance culture such as the East (Malays), consumers tend to avoid ambiguity and are less tolerable to uncertainties. Further, the Eastern high-power distance nature would render high dependency on 'authorities' or source of information, whom would readily provide answers and clearly define their ambiguities as well as remove any uncertainties. To a consumer, customer service representative is the source of information, and hence reliable customer support is vital in an Eastern context of relationship marketing.

In addition, *site security* ($r^2 = 0.70$) is indeed an important factor in consumers' decision about whether or not a relationship should be established with a service provider. Consumers seek reliable security measures which leave them almost worry-free whenever they decide to give their financial information on the site. The Internet technology is supported with encryption technology, which incorporate standards such as the SSL (Secured Socket Layer) and SET (Secured Electronic Transaction). Furthermore, the Internet enables other features: auto-debit, e-cash and so forth; being an alternative to credit cards associated with the secured payment method. Certainly,

firms employing these enhanced security features tend to be more trustworthy, especially in an Eastern risk-avoidance culture. Therefore consumer propensity to return and build a long-term relationship increases.

The Internet technology enables speedy delivery of needed information at consumers' finger tips. *Navigational features* ($r^2 = 0.69$) such as search engines, useful links and graphical interface highlight the interactivity of this technology. Certainly, user-friendliness and speed are vital in site design consideration since consumers would abort their intentions to purchase due to poor page loading and difficulty to follow site links. Therefore, simple site design would suffice so long as the links are clearly displayed and the required information is easily accessible.

Another way to induce consumers into relationship building is by giving them *rewards* ($r^2 = 0.65$) for returning to a site. The result finds support in Patterson and Smith's (2001b) study on perceived benefits from business relationships in Thailand. The importance of reward in relationship marketing strategies can be explained by the Malay concept of *terhutang budi* (indebtedness) arising from collectivist and high femininity values. These values render loyalty a symbol of consumer act of maintaining relationships, and in return service providers should reciprocate with special benefits such as rewards or price discounts.

On the Internet, consumers' profiles can be captured when a consumer fills out a free registration form, subsequent to which a site can identify a consumer whenever he/she logins again. Online rewards in the form of electronic coupons, point redemption or rebates can be offered based upon consumer's history of activities stored in a database, which can be automatically retrieved to learn about a consumer's entitlement for reward. Thus, the Internet plays a significant role in influencing consumers' relationship decisions.

The Internet potential is not limited only to pure-click companies (companies that use the Internet as their only marketing channel). With the emergence of click-and-mortar

companies the potential of the Internet as a marketing tool is more prevalent. In order to be competitive, these firms adopt the Internet channel, allowing consumers to make contacts with the service providers via both channels: the Internet or the offline channels. For example, a consumer may place an order via a company Web site and choose to collect the merchandise at nearby store outlet. The *integration of marketing channels* ($r^2 = 0.60$), which is made possible by creating a link between the Internet platform and the enterprise system, provides convenience to consumers, thus increases the likelihood of building relationships.

Delivery of *information* ($r^2 = 0.58$) that is current and accurate is synonymous to the Internet. Consumers who browse on the information superhighway expect to receive accurate and up-to-date information. Consumers' pleasant experience could be enhanced when information displayed are in-depth yet relevant to their information needs. In addition, the Internet ability to capture, store, retrieve and deliver information to individual users enables firms to learn about consumer preferences. Consequently, consumers can receive, or even design, the information and services that match his/her interests. The *personalization* of services ($r^2 = 0.58$) may impose switching costs onto consumers hence increases the likelihood for a long-term relationship. Besides, personalization has rendered a better segmentation of consumers, which is useful for companies to design a more effective relationship marketing strategy in the future.

The interactive feature of Internet technology enables numerous *value added* services on firms' Web sites. For example, consumers can track their order status in real time, retrieve a list of activities conducted in the past and receive personalized recommendation on products/services. Consumers' perceived value ($r^2 = 0.54$) obtained from a firm's Web site enhances consumers experience, thus plays a vital role in consumers decision to build a long-term relationship with service providers.

Non-technology factor. It is important to note that the *basic principles of marketing* in a traditional channel are valid parameters and applicable for building online relationships. For example, *price* factor is found to be directly affecting E-CRM. Although price is not

important in consumers' assessment of satisfaction, low price does matter in building relationships. As such, in the battle of forging long term relationship, firms should also consider keeping prices competitive.

The *delivery of product/service* as and when consumers need it is pertinent in relationship building. The Internet may play an indirect role as a communication tool between the service provider and third party companies. However, logistics support is critical so as to ensure that the goods are delivered at the right time. Meanwhile, a firm is responsible to set out clear terms and conditions to consumers as this would help them place reasonable expectations as per the company capabilities. In addition, policies on refunds or returns and so forth must be well expressed

Consumer lifetime value. Furthermore, in order to be cost effective, an E-CRM strategy should consider the value of each consumer. That is the possibility of doing business with the consumer over time. Managing relationships then also means identifying the consumer switching level – consumers who are likely to default despite attractive incentives as well as consumers whose loyalty can be developed. An in-depth analysis of consumer's buying behaviour through data mining, for example, may help managers determine each consumer's lifetime value.

Now that the activities to be included in an E-CRM program have been discussed, a high level description of an E-CRM initiative is presented.

6.4   The E-CRM model

Given the discussion above, this study concludes with an E-CRM model that may be applicable to firms operating in a similar environment.

This study is premised on the belief that in a highly competitive environment of cyberspace building trusting relationships with consumers would be a cost effective marketing strategy. The interactive nature of Internet technology is a potential tool for

building long-term relationships: assist in identifying consumer preferences and delivering value-added services. Nevertheless, an effective use of this technology requires firms' understanding of how online consumers assess satisfaction, in order to gain loyalty and influence consumers' intention to repatronize.

In drawing out an effective E-CRM program, firms should be aware of the critical marketing activities. These activities, which comprise 13 salient dimensions, earn substantial managerial consideration as to ensure an effective implementation in consumer retention strategies. Any relationship building effort entails exhaustive analysis, which in turn helps marketers in planning a more effective program. An analysis of consumer behaviour is essential in order to obtain a comprehensive understanding of how consumers perceive service quality leading to increased satisfaction and loyalty. The assessments of satisfaction and loyalty vary among groups of consumers. Demographics, experience level and perceived risk may influence consumer satisfaction judgment as well as his/her loyalty decisions.

Given this, firms are well advised to focus their relationship marketing effort on uncovering the differences in their consumers. Hence, firms marketing plans require careful segmentation of consumers, and targeting the right relationship marketing tools to the right group of consumers, or even individuals. The attractiveness of relationship building lies in retaining consumers leading to profitability. With a comprehensive understanding of consumer preferences entailing thoughtful marketing strategies the notion of managing consumer relationship to increase profits may be realized. Figure 6.1 illustrates the E-CRM model proposed by this study.

All the above factors are critical considerations for firms faced with the challenge of building relationships with online consumers in times of fierce competition. However, it is important to note that these factors are a plausible reflection of E-CRM at the point of time this study was conducted. Given the rapidly changing nature of Internet technology, similar studies may yield different results and implications if they are to be carried out a few years later.

Figure 6.1: An E-CRM Model
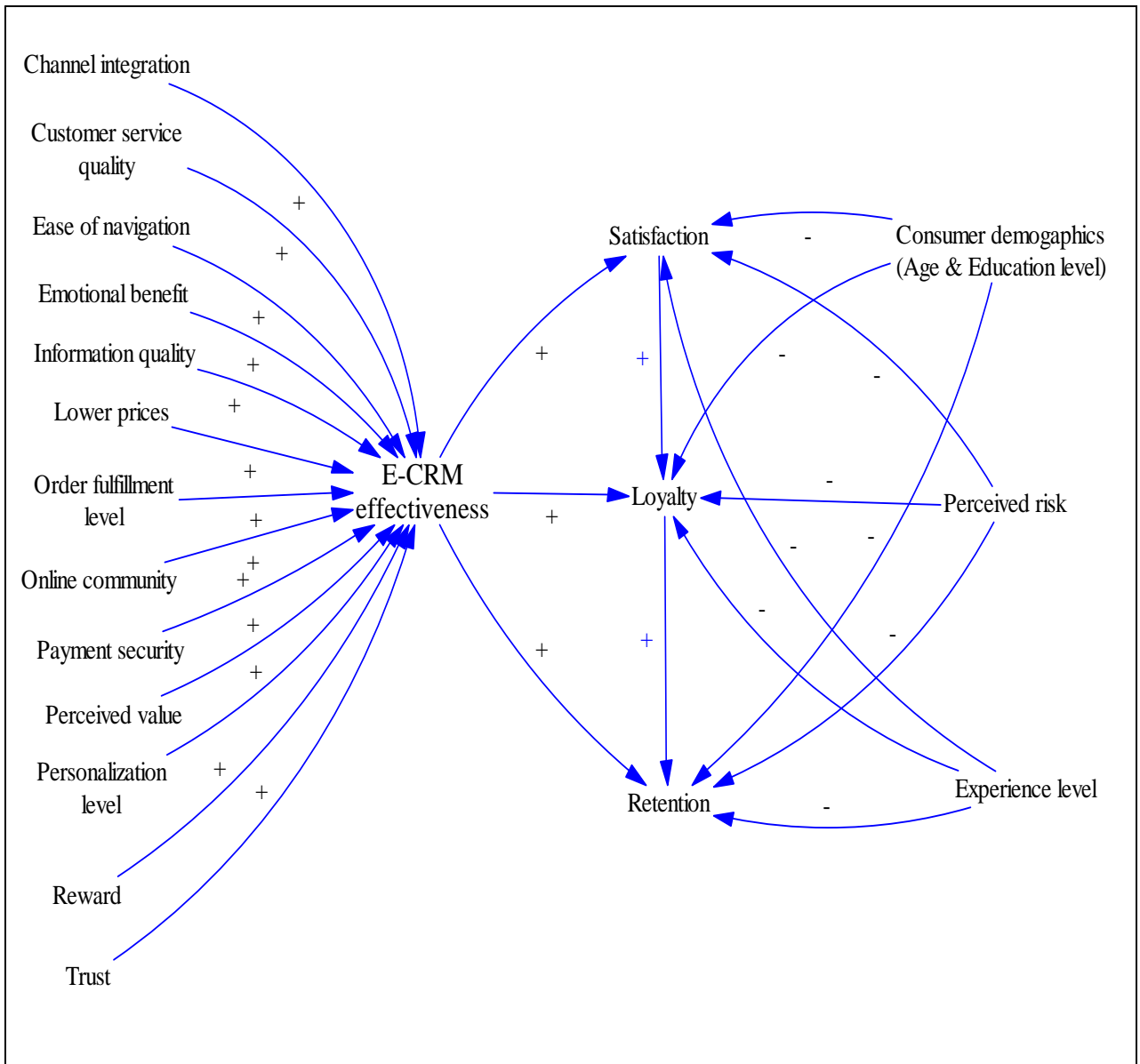
Source: Developed for this thesis

6.4.1 The E-CRM process

Pursuing the paradigm proposed by the E-CRM model above, managers are advised to draw out a CRM strategy unique to the online environment. Online firms should take

advantage of the interactive features of Internet technology to deliver value added services and in turn enhance consumer relationships.

Primarily, database technology plays a critical role in enabling firms to store and analyze a consumers' surfing or purchasing behaviour. An in-depth analysis of consumers' details database helps managers to better understand consumers' varying needs as well as each consumer value to the business. This analysis should be well interpreted into *knowledge about consumers*, allowing firms to understand the classification of consumers according to their value to the business. Combined with firms' business strategy, marketing campaigns can be well targeted to meet different needs of consumers. In addition, loyalty programs can be more cost effectively aimed at maintaining valuable accounts. This would lead to *product/service differentiation,* that is where products/services offered are differentiated across categories of consumers, leaving the notion of "one-product-serves-all" irrelevant. Certainly, Internet technology serves as an enabling tool for "one-product/service-to-one-consumer" marketing strategy. By doing so, consumer value could be enhanced. In turn, firms would benefit from enduring consumer relationships.

Firms should continuously evaluate their marketing strategy. Since competitors are just a click away, rethinking of value offerings and understanding consumers' current and anticipating their future needs are among the critical criteria to stay competitive in the electronic market. In brief, the E-CRM process requires synchronization between the use of technology and business strategy which outlines processes directed to forging long-term relationships with consumers. In other words, E-CRM is not about technology alone but rather the strategic use of technology to achieve a well defined business goal - consumer focus. Figure 6.2 illustrates the E-CRM process discussed above.

Overall, firms must not undermine the potential of Internet technology in managing consumer relationships. In an electronic environment where consumers have greater bargaining power over how products/services are offered and priced, a consumer orientation strategy seems imperative for firms' survival.

Figure 6.2: E-CRM Process
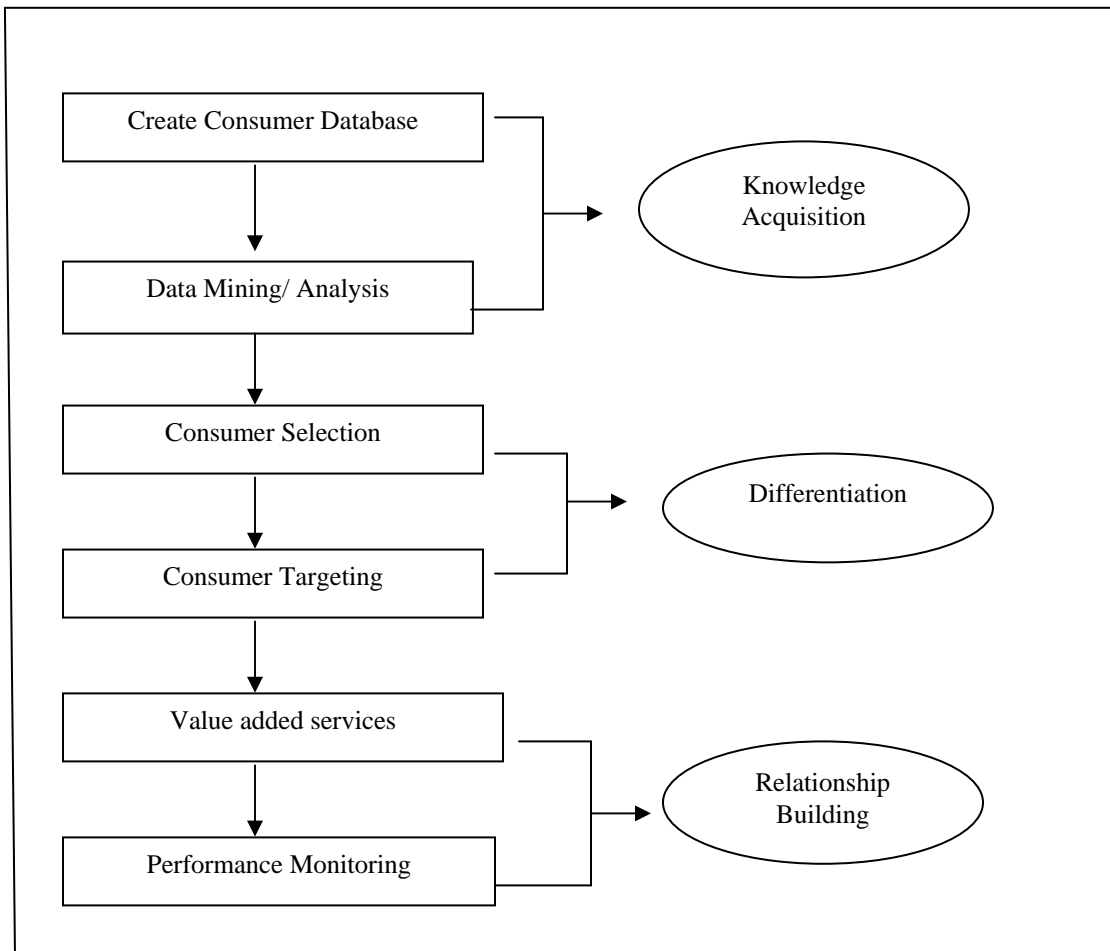
Source: Adapted from Winer (2001) and Moon (1999) - Developed for this thesis

6.4.2   Market segmentation

To pursue a consumer orientation strategy, firms are advised to segment consumers according to their values to the business as to cost effectively implement firms' retention strategies. Keeping and serving the right consumers requires a good understanding of consumer preferences and delivering value depending on their needs and wants. An understanding of how consumers differ demographically, level of experience and

perceived risk might provide insights for marketing managers in planning and implementing effective consumer acquisition and retention strategies. Segmentation of consumers should be connected to consumer behaviour profiling in order to learn about different values that should be delivered to a category of consumers or individual consumer.

Consumer demographics. This study provides some useful insights for marketing managers. A majority of Internet users are well educated and aged between 20-40 years and these results parallel the findings in Geissler (2001) and Methelie and Nysveen (1999). Further, most of them earn an average income level, contrary to the finding in Lee-Kelley et al. (2003). This study demonstrates that consumer satisfaction differs depending on age and education level. Specifically, Internet users above 30 years of age, seek higher level of personalization in their quest for greater control and empowerment; efficient customer service and cross channel ordering process are equally important to this group of consumers. Additionally, receiving superior quality of service, which exceeds their expectations, is imperative in improving satisfaction and gaining their loyalty. Similarly, highly educated users are particularly concerned with firm's delivery of services. Firms targeting this segment of consumer are well advised to evaluate their performance with regards to these attributes.

Experience level. More experienced users tend to seek more value from Internet services. This is plausible given the fact that experience helps reduce the cost of searching for alternative Web sites, hence switching is much easier for experienced consumers. The features that were found significantly related to satisfaction are updated information and low prices. Further, rewards and efficient customer support are the key drivers of repeat purchase (visits) while consumer loyalty depends most significantly on reliability of services and perceived security. Generally, the Internet has been in the market for many years and consumers at large are quite familiar with the technology. The respondents to this study were mainly those who have more than five years experience using the Internet technology. Users who are more familiar with a technology tends to have more accumulated knowledge of technology standards currently available

in the market. Comparing the levels of service quality may be easier for this consumer group. However, if a site can assure that the firm's services are highly reliable and consumer data is strictly protected, then the site may have an edge to win loyalty.

Perceived risk. Next, the results demonstrate that consumers who are involved in high risk activities such as online banking differ significantly in their assessment of satisfaction, loyalty and retention. The most important feature which increases loyalty is the delivery of promises. In brief, firms offering higher risk activities, which involve the disclosure of consumers' financial information, should focus on earning consumers' trust and confidence by improving the fulfillment quality. For example, a firm's performance will be assessed continuously at least based on what have been stipulated in the service terms and conditions and privacy policy. Subsequently, customer support quality and firms' security measures enhance perceived value leading to increased consumers' intention to return.

6.4.3 Limitations in E-CRM implementation

The notion that building enduring consumer relationships would result in firms' sustainable profitability underpins E-CRM implementation. As promising as it may seem, more companies have reported failures in their CRM projects than successful ones, as indicated by Forrester Research (2005): only 40 per cent of CRM implementations were successful. Although CRM may seem to be concerned with improving service quality at the consumer contact point (customer service), coordination from and changes in other interrelated departments within the business supply chain are essential. For example, it would be meaningless to increase customer service efficiency in taking orders if the product/service itself failed to be delivered as per ordered. In this instance, a change in business processes is almost mandatory and without top management support promoting dynamic *organizational culture* in adapting to changes, a firm's CRM initiatives would be a waste of efforts.

Companies often tend to employ CRM strategies with the use of enabling tools such as information technology (IT) which includes, among others the Internet. Many believe

that the use of IT would result in increased efficiency, which in turn improves consumer satisfaction as well as companies' margins. However, unrealistic projections and expectations resulted in many CRM projects failures. These include a management team's too high expectations of return on investment, inadequate project timeline, insufficient resource allocation as well as failure to anticipate problems arising from IT adoption. Hence, as in any other investment-oriented projects prudent *project management* is vital for successful E-CRM implementation.

Although this study indicated that E-CRM activities influence consumer satisfaction leading to loyalty, the 'real' benefits of E-CRM implementation may typically only be harvested by larger companies. Obviously, the implementation of E-CRM requires hefty investment in Internet technology infrastructure, leaving the *smaller businesses* at a disadvantage. In order to allow consumers to perform online transactions and track orders, for example, firms should invest heavily in transaction enabling technologies such as transaction servers and database technology. However, since E-CRM activities range from customer support (communicational tool) to tracking orders (transactional tool), firms may prioritize their investments in E-CRM according to the most critical relationship building activities for their businesses. For example, this study suggests that customer support is vital in building relationships where consumers use the Internet mainly to lodge complaints or post enquiries. Thus, companies may take full advantage of email, which is an affordable yet efficient mean of communication on the Internet. Moving from cheaper technology such as email to more costly technology may even be unnecessary. That is, if consumers tend to prefer to use an alternative physical channel to purchase a product/service and mainly use the Internet to obtain information instead of performing transactions, then investment in 'transactional' technology is unjustified and should not be pursued. Therefore, smaller firms' investment decisions should account for the effective use of the technology in serving *their* consumers.

To fully utilize the Internet capabilities in enhancing consumer relationships firms are striving for delivering value added products/services to consumers. These include personalization of services, online transactions and tracking history of activities and so

forth. Apparently, enabling these activities require consumers to disclose their personal and financial information to service providers.   In situations where perceived risk is higher, lack of sound *legal framework* to provide protection for both consumer and service provider may impede the implementation of E-CRM. For example, in countries where the enforcement of consumer protection is lacking, the development in E-CRM is likely to grow at a slower pace.

6.5   Limitations and future directions of research

This study is subject to several limitations. Firstly, the respondents from this research were mainly working adults in urban localities, well educated and have at least three years of experience using the Internet. Further research is needed to generalize the results across different groups of Internet users in Malaysia.   The results of this study may be applied to other countries with similar culture and business environment. Therefore, before conclusions and implications can be made to other countries with different culture and business environment (such as the Western region), further research should be conducted.

Secondly, the sample for this study came from Internet users in the business-to-consumers context. The results are limited to the e-tailing environment and may not be applicable to business-to-business relationships. As the growth of Internet transactions in the business-to-business sector is escalating, studies designed to investigate the relationships between E-CRM and customer satisfaction, loyalty and retention in a business-to-business environment may well be worthwhile.

In this survey, consumer perceptions towards e-commerce in general were assessed. More in depth studies could be carried out in future to investigate consumers' perception on the use of E-CRM in industry specific environments such as the financial sector, entertainment, health, government, and the education sector since E-CRM may imply different meanings to product-based versus service-based industries.

This study is concerned with E-CRM program and its effect on consumer retention. Although companies are well advised to adopt an E-CRM strategy its implementation may vary depending on the business scale. For example, small businesses may not be able to fully utilize the potential of Internet technology due to constraints in resources. Hence, E-CRM implementation in various business scenarios merits further investigation.

In this survey, respondents were asked to fill out a paper-based survey and try to recollect their past experiences on the features that influence their repeat visits behaviours. This study could be improved if a Web-based survey was conducted to concurrently assess respondents' reactions to a particular site features while they interact with the site. Therefore, another possible direction for further research might be to use an instantaneous Web-based survey in order to enhance validity.

While this research posits a positive relationship between E-CRM and satisfaction, loyalty and retention, E-CRM features may have changed rapidly since the point of time this study was conducted. Therefore other research may be necessary to incorporate other "new" factors of E-CRM not included in this study.

Although this research suggests that satisfaction, loyalty and retention differ depending on age, education level, experience level and perceived risk, this study lacks the empirical measures of consumers' lifetime values in relation to E-CRM implementation. Since the ultimate goal of managing consumer relationships is to improve profitability, further research should be conducted to identify the business value of establishing and developing relationships with varying groups of consumers.

This research could be applied more widely to verify to what extent the results can be transposed to other regions of the world. Potential areas of study are whether other factors of E-CRM, which influence assessment of satisfaction, retention and loyalty, can be identified in regions where consumers' behaviour may differ depending on culture, beliefs and technology acceptance level.

6.6   Conclusion

The Internet channel is perceived as fast, enabling real time access to information and processes, and allowing some level of control, thus expectations of online services are higher compared to the traditional channel.   This study emphasizes that firms striving to retain their online consumers should understand well the dimensions that will help them build and maintain consumer relationships on the Internet.   Although basic traditional marketing principles apply to the Internet environment as well, the differences in consumer behaviour that emerge as a result of interaction with "new" technology should be recognized.   Nonetheless, the prerequisite to loyalty and retention is consumer satisfaction.

In brief, the effect of E-CRM on consumer loyalty is contingent upon the levels of consumer satisfaction. A well integrated process of E-CRM will not be effective unless firms fully understand and observe the drivers of satisfaction, retention and loyalty.   This study contributes in identifying the e-satisfaction, e-retention and e-loyalty dimensions. Indeed, on the Internet, consumers who are dissatisfied may easily switch to another provider thus consumers must at least be satisfied with the services before making their decisions to revisit.   Thereafter, superior service quality, perceived value and trust will influence his/her intention to revisit and/or to remain loyal.

This thesis is organized into six chapters. It begins with an introductory chapter which describes the research issues, objectives, research method and analysis as well as the potential outcomes of the study. Chapter 2 presents an extensive review of the literature pertaining to consumer behaviour on the Internet, and the constituents of online consumer satisfaction, loyalty and retention. In addition, the concepts of CRM and E-CRM, as well as cultural issues affecting CRM implementation, are presented. The theoretical framework underpinning this study is developed in the subsequent chapter together with ten research propositions. Next, chapter 3 highlights the competing theories which this study partly aims to examine.

Chapter 4 describes and justifies the methodology used in this study: including the research design, sampling technique and the design (as well as the administration) of the survey. The data analysis methods and the appropriate statistical techniques adopted are also presented in this chapter. Detailed descriptions of the analysis of data are presented in chapter 5 and the findings of this research are examined, interpreted and reported. Causal Loop Diagrams and Structural Equation Modeling graphical outputs are displayed for easy interpretation of the statistical results. Finally, chapter 6 discusses the research findings in the light of implications for theory and practice. This study proposes an E-CRM model that emphasizes the relationships between E-CRM, effective implementation and increased consumer satisfaction, loyalty and retention. In addition, this model highlights the effect of consumer demographics, users' Internet experience and perceived risk on the assessment of satisfaction, loyalty and retention. This concluding chapter also discusses the study's limitations and directions for further research.

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Appendix 4.1
Instrument used in semi-structured interview with companies

Company Marketing Executives Interview Questions

1. Industry:
[ ] Finance
[ ] Education
[ ] Travel
[ ] Entertainment
[ ] Communication
[ ] Gifts, books
[ ] Others: ……………………

2. What is/are the Internet application(s) used for marketing communication?
[ ] Email
[ ] World Wide Web
[ ] Chat room
[ ] Newsgroup
[ ] Others: ………………………

3. Which of the applications in no. 2, is used by most of the consumers? Please rank using these scales: 1= mostly used; 2=sometime 3= the least used
[ ] Email
[ ] World Wide Web
[ ] Chat room
[ ] Newsgroup
[ ] Others: ……………………….

4. Do you agree that the Internet helps to do the followings to your company (please explain).

Understand consumer preferences   <u>Yes</u>   <u>No</u>
Create consumer database
Identify favorite web pages and/or activities
Keep users' history of activities
Provide information useful for pattern analysis
Others: ………………………

Deliver value-added services
The Internet enables personalization of services
Consumers can create their own account
Able to recommend product/service relevant to consumer needs
Consumers can track their orders/activities
More efficient in handling consumer enquiry/complaint
Others: ……………………..

5. Does the use of Internet interactive features increase the number of repeat visits and/or consumers? Please explain your answer.

6. Do you think the Internet has a significant role to play in building long-term relationship with consumers? Please explain your answer. In Malaysia?

7. What will be the future outlook for managing customer relationship in the internet age?

8. What will be the future outlook for Internet-based companies in Malaysia competing for global customers?

Appendix 4.2

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
E-CRM	Customer relationship management (CRM) functions delivered on the Internet (Feinberg & Kadam, 2002)	• Channel integration • Customer service quality • Ease of navigation • Emotional benefits • Information quality • Order fulfillment • Online community • Payment security • Personalization level • Perceived value • Price attractiveness • Rewards • Trust
Satisfaction (S')	Consumer satisfaction on the Internet is when a consumer finds pleasure in his experience using the services resulting from fulfillment of his needs and expectations.	[a]Overall, I am satisfied with the current Web site of my choice because… • The information is always updated • Prices of products/services are always lower compared to other companies • All links on the Web site are in proper working condition • A wide range of products/services to choose from • Customer service responds to any enquiry quickly • Products delivered are the right items as per ordered • All private information about customers are safeguarded from any unauthorized access

[a] *Scales adapted from Cho and Park (2001) and Szymanski and Hise (2000).*

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Retention (R')	Consumer retention on the Internet refers to consumer's favorable behavior towards a Web site resulting in willingness to revisit a particular online firm.	Overall, I will most likely re-visit a Web site … • I will re-visit a site that offers more attractive rewards (free gifts, coupon, points redemption, cash rebate) • I intend to return to a site where my complaints are handled more efficiently • I will re-visit a site that offers personalized recommendation on products/services • I will return to a site that can be easily accessed either on the Internet or through other traditional means (eg: a physical store, telephone etc) • I will return to a site where I can obtain useful information about products/services from other online members
Loyalty (L')	Consumer's commitment to purchase/consume services from an online provider resulting from perceived value and is impervious to other online competitors' influences.	[b]Overall, I am loyal and deeply committed to the Web site of my choice … • I feel committed to this site, hence I will stay. • I feel a sense of belonging to this site • I feel highly appreciated • I am contented with my experience with this site • I feel safe doing business with this site • I can rely on the service • I will recommend this site to friends and family
Demographic	Personal characteristics	• Gender • Age • Education • Occupation • Income • Race • Location

[b] *Scales adapted from Anderson and Srinivasan (2003) and Zeithaml et al. (1996).*

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Level of experience	Consumers tenure with the Internet	How long since have you started using the Internet? • Less than 6 months • For the past 6-12 months • For the past 1-3 years • For the past 3-5 years • More than 5 years
Perceived risk	An assessment of uncertainties or lack of knowledge about the distribution of potential outcomes (March, 1978)	[c] Have you ever carried out the following activities on the Internet • Online registration • Online reservation • Online banking
Information quality	The relevancy, recency, sufficiency, consistency and understandability of information displayed on a site (DeLone & McLean, 1992; Wang & Strong, 1996; Moon & Kim, 2001).	• The information is accurate • In-depth information on products/services • Information displayed is easy to understand
Product/service quality	The level of product/service variety (Jarvenpaa & Todd, 1997) and overall service delivery system of a company (Parasuraman, Zeithaml & Berry, 1985)	• Products/services are of high quality • More varieties in product/services • Products/services offered are up-to-date with current trend

[c]*Online shopping was not included in the list of activities due to low participation rate in e-commerce among Malaysian users (see Sections 2.1 and 3.4.3).*

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Lower prices	Discounted (Cassar, 2001) or lower prices than what offered by competitors (Anderson & Srinivasan 2003)	• Often provide more attractive discounts and special promotions • Relatively low delivery charges
Customer service quality	The extent to which company representatives understand customer-specific needs, able to handle problems that arise before and after sales and address customer complaints in a friendly manner (Yang & Peterson, 2004).	• Customer service is efficient in handling complaints • Customer service is friendly in answering customers enquiry • Customer service always notifies me of my order (subscription) status • Customer service always responds within 48 hours • Customer service can be contacted through variuos channels (eg. via email, chat, telephone, walk-in, fax etc) • Customer service appears to have wide knowledge of products/services • Customer service is always professional in answering enquiries • Customer service is always professional in handling complaints • Customer service will inform me if there is any problem with my order • Customer service is always updated with users' transaction records • Customer service are always fast in resolving customers complaints
Payment security	Perceived security with regards to user authentication, personal data and transaction information (Rowley, 1996; Ratnasingam, 1998).	• The Web site provides various types of credit cards for payment (eg. Visa, Mastercard, Diners, American Express) • The Web site provides alternative payment method other than credit Card (auto debit, money order etc) • The privacy policy is clearly communicated to consumers

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Order fulfillment	Delivering the right product at the right time and responding to consumer inquiries (Reichheld & Schefter, 2000 p. 112)	• Products received are always in good condition • Products/services are delivered within the delivery time as promised
Personalization level	The level of allowing consumers choose their own preferred design, colour, product updates and other attributes that go well with their tastes (Slywotsky, 2000)	• The provider keeps a database of my transactions with them • I receive online advertisements that match my interests • The Web site allows users to create "My Account" that will keep all past transactions details • Products/services can be custom-made based on my specification • I receive personalized email from the company on product promotions of my interest
Rewards program	A program which allows consumers to collect points for every purchase from or visit to a site, which in turn are redeemable for free gifts, coupons or cash rebates.	• I will receive attractive rewards for returning to the site • The Web site offers attractive cash rebates for any purchase (subscription) • The Web site offers attractive points redemption for any purchase (subscription) • The Web site offers attractive coupons for any purchase (subscription) • I will receive rewards for purchasing (subscribing). • The Web site offers attractive gifts for any purchase (subscription)
Online community	An online platform where a group of consumers receive messages or emails posted and replied by other members in the group (Sands, 2003).	• I can share/exchange information with my buddies in an online forum • I can trade goods with my "friends" found on the same channel/site. • I can obtain useful information about a company from the online members.

Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Channel integration	Synchronizing the elements of online and offline channels where consumers may approach the company through either channel preferred by them.	- I can pick-up the products I ordered via the Web at a nearest physical store - I can check orders placed on the Internet through the physical and vice-versa - I can exchange or return products bought from the Web in a physical store
Perceived value	Consumer's overall assessment perceived benefits gained in return of perceived costs sacrificed associated with the offering (Iacobucci, Grayson & Ostrom, 1994; Zeithaml, 1988).	- The company allows access to track my orders - I can make changes to my orders without much hassle - Provide my account profile which I can use for my own further analysis - I can request for products/services based on my specifications - The company understands my needs - The company keeps track of my transaction
Trust	The confidence in the exchange partner's reliability and integrity (Morgan & Hunt, 1994).	- Impose a strict privacy policy - Provide third party verification (eg. seal of approval) to endorse Web site strict security standard - The customer service is reliable - The company practices high security standard over transactions data - Provide third party verification (eg. seal of approval) to verify Web site's authenticity

Appendix 4.2
Research Variables, Definition and Operationalization of Variables

Variable	Definition	Operationalization of variable
Ease of navigation	One site's good organization (*format*) of the content layout (Manes, 1997) as well as simple-to-use navigation (*ease of use*)) (Luo & Seyedia, 2004).	- The Web site is always accessible - The Web site provide easy steps whenever a consumer needs to register - Only a few clicks to get information - The Web pages load quickly - The links to information are clearly displayed - The Web site uses a language that can be easily understood
Emotional benefit	Emotional reaction to a product which includes components such as relief, elation, joy (Bagozzi et al., 1999) hopeful and positively surprised (Yu & Dean, 2001).	- I feel excited about the entertainment features on the Web site - I enjoy browsing this site

Responden yang dihargai,

Saya …………………………….mewakili Universiti Multimedia, sedang menjalankan kajian mengenai gelagat pengguna-pengguna Internet sebagai sebahagian daripada projek penyelidikan di bawah Fakulti Pengurusan, Universiti Multimedia.

Saya benar-benar berbesar hati sekiranya saudara/i dapat meluangkan sedikit masa untuk menjawab soalan-soalan yang dilampirkan bersama-sama ini. Soal selidik ini bertujuan untuk mengenalpasti pendapat individu yang menggunakan Internet untuk kegunaan peribadi. Identiti saudara/i tidak akan didedahkan dan segala maklumat adalah sulit.

Kerjasama saudara/i dalam menjawab soalan-soalan amat dihargai..

Terima kasih.

SOAL-SELIDIK GELAGAT PENGGUNA INTERNET

Arahan : Untuk soalan 1-11 pilih hanya satu respons jawapan dengan menanda (/) dalam petak yang disediakan..

1. Jantina
   [ ] Lelaki   [ ] Perempuan

2. Umur
   [ ] bawah 20   [ ] 41-50
   [ ] 21-30   [ ] lebih 50
   [ ] 31-40

3. Tahap pendidikan tertinggi
   [ ] SPM
   [ ] STPM/Diploma/Metrik
   [ ] Ijazah pertama
   [ ] Ijazah sarjana
   [ ] Doktor falsafah
   [ ] Lain-lain (sila nyatakan) _____

4. Pekerjaan
   [ ] Pelajar
   [ ] Bukan eksekutif
   [ ] Eksekutif
   [ ] Tidak bekerja
   [ ] Pesara
   [ ] Lain-lain (sila nyatakan) _____

5. Pendapatan bulanan:
   [ ] kurang dari RM 1000
   [ ] RM 1001 – RM 3000
   [ ] RM 3001 – RM 5000
   [ ] RM 5001 ke atas

6. Bangsa

[ ] Melayu
[ ] China
[ ] India
[ ] Lain-lain (sila nyatakan) _____

7. Lokasi
    [ ] Selangor
    [ ] Kuala Lumpur
    [ ] Kuching
    [ ] Johor Baru
    [ ] Penang

SEKSEYN B : CORAK PENGGUNAAN INTERNET

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 8.   Adakah anda mempunyai komputer dengan sambungan kepada Internet?
    [ ] Ya   [ ] Tidal

9. Dari manakah anda paling kerap melayari Internet? **Pilih SATU.**
    [ ] Rumah
    [ ] Pejabat
    [ ] Sekolah/ Universiti
    [ ] Cyber Café
    [ ] Perpustakaan Umum
    [ ] Lain-lain (sila nyatakan) _____

10. Berapa lamakah anda menggunakan Internet dalam seminggu?
    [ ] lebih 51 jam   [ ] 21 - 30 jam
    [ ] 41 - 50 jam   [ ] 11 - 20 jam
    [ ] 31 - 40 jam   [ ] 1 - 10 jam

11. Sudah berapa lamakah anda menggunakan Internet?
    [ ] lebih 5 tahun   [ ] sejak 6-12 bulan lalu
    [ ] sejak 3-5 tahun lalu   [ ] kirang daripada 6 bulan
    [ ] sejak 1-3 tahun lalu

Bersambung

Arahan: Untuk soalan 12(a) sila gunakan skala berikut.

12(a) How often do you carry out these Internet activities?

1 = Tidak pernah
2 = Sangat jarang (selang beberapa minggu)
3 = Kadang-kadang (selang beberapa hari)
4 = Kerap (sekali sehari)
5 = Sangat kerap (selang beberapa jam)

	Sgt kerap (selang beberapa jam)	Kerap (sekali sehari)	Kadang-kadang (selang beberapa hari)	Sgt jarang (selang beberapa minggu)	Tidak pernah
Email	5	4	3	2	1
Chat	5	4	3	2	1
Newsgroup	5	4	3	2	1
Jaringan web	5	4	3	2	1

Arahan: Untuk soalan 12(b) i, ii and iii, sila tandakan [/] pada respons jawapan anda.

12b) Adakah anda pernah menjalankan aktiviti-aktiviti berikut melalui Internet?

i) Pendaftaran elektronik   [   ] Ya   [   ] Tidak
ii) Tempahan elektronik   [   ] Ya   [   ] Tidal
iii) Perbankan elektronik   [   ] Ya   [   ] Tidak

Bersambung…

SEKSYENC (BAHAGIAN 1): PERSEPSI PENGGUNA TENTANG KUALITI LAMAN WEB

Arahan: Soalan 13 bertujuan untuk mengenalpasti persepsi individu tentang kualiti laman web. Sila nyatakan pendapat anda dengan menggunakan skala di bawah:

1 = Sangat tidak setuju
2 = Tidak setuju
3 = Agak setuju
4 = Setuju
5 = Sangat setuju

13. Adakah anda bersetuju bahawa cirri-ciri di bawah boleh mempengaruhi pendapat anda apabila menialai kualiti sesebuah laman Web?

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak setuju
Produk/perkhidmatan yang berkualiti tinggi	5	4	3	2	1
Kepelbagaian produk/perkhidmatan	5	4	3	2	1
Produk/perkhidmatan disediakan selari dengan tren terkini	5	4	3	2	1
Maklumat yang dipaparkan tepat.	5	4	3	2	1
Laman Web menyediakan maklumat terperinci tentang produk/perkhidmatan	5	4	3	2	1
Maklumat yang dipaparkan mudah difahami	5	4	3	2	1
Laman Web sering menawarkan diskaun dan promosi istimewa	5	4	3	2	1
Caj penghantaran yang lebih rendah	5	4	3	2	1
Laman Web sentiasa boleh diakses	5	4	3	2	1
Laman Web menyediakan langakah-langakah apabila pelanggan perlu mendaftar	5	4	3	2	1
Beberapa klik sahaja untuk mendapatkan maklumat	5	4	3	2	1
Laman Web yang pantas untuk dimuat-turun	5	4	3	2	1
Rangkaian maklumat dipaparkan dengan jelas	5	4	3	2	1
Laman Web menggunakan bahasa yang mudah untuk difahami	5	4	3	2	1
Wakil khidmat pelanggan efisyen dalam mengendalikan aduan	5	4	3	2	1
Khidmat pelanggan yang mesra dalam menjawab pertanyaan pelanggan	5	4	3	2	1

Bersambung…

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak setuju

Khidmat pelanggan sering memberitahu status pesanan (langganan) saya	5	4	3	2	1
Khidmat pelanggan sering memberi maklumbalas dalam masa 48 jam	5	4	3	2	1
Khidmat pelanggan boleh dihubungi melalui pelbagai saluran (cth. email, chat, telepon, ke-pusat pelanggan, fax dll)	5	4	3	2	1
Khidmat pelanggan berpengetahuan luas tentang produk/perkhidmatan	5	4	3	2	1
Khidmat pelanggan sentiasa professional dalam menjawab pertanyaan	5	4	3	2	1
Khidmat pelanggan sentiasa professional dalam melayan aduan	5	4	3	2	1
Khidmat pelanggan akan menghubungi saya saya jika terdapat sebarang masalah dengan pesanan	5	4	3	2	1
Khidmat pelanggan sentiasa mengemaskini rekod urusniaga pelanggan	5	4	3	2	1
Khidmat pelanggan sentiasa pantas dalam menyelesaikan masalah/aduan pelanggan	5	4	3	2	1
Produk yang diterima sentiasa dalam keadaan baik	5	4	3	2	1
Produk/khidmat yang dihantar mengikut masa yang dijanjikan	5	4	3	2	1
Laman Web membolehkan penggunaan pelbagai kad kredit untuk bayaran (cth: Visa, Mastercard, Diners, American Express)	5	4	3	2	1
Laman Web membolehkan kaedah bayaran alternative selain kad kredit (debit-auto, kiriman wang dll)	5	4	3	2	1
Polisi mengenai perlindungan maklumat peribadi disampaikan dengan jelas kepada pelanggan	5	4	3	2	1
Penyedia perkhidmatan menyimpan pengkalan data urusniaga saya					
Saya menerima iklan elektronik sesuai dengan minat saya	5	4	3	2	1
Laman Web membolehkan pengguna membuka "Akaun saya" yang menyimpan semua maklumat urusniaga sebelumnya	5	4	3	2	1
Produk/perkhidmatan boleh disesuaikan mengikut kehendak saya	5	4	3	2	1

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak

					setuju
Saya menerima email khas daripada syarikat tentang promosi produk yang sepadan dengan minat saya	5	4	3	2	1
Saya akan menerima ganjaran menarik jika kembali kepada laman tersebut	5	4	3	2	1
Laman web menawarkan rebet tunai menarik bagi sebarang pembelian (langganan)	5	4	3	2	1
Laman web menyediakan mata tukaran bagi sebarang pembelian (langganan)	5	4	3	2	1
Laman web menyediakan kupon bagi sebarang pembelian (langganan)	5	4	3	2	1
Saya akan menerima ganjaran bagi pembelian (langganan)	5	4	3	2	1
Laman web menawarkan hadiah menarik bagi sebarang pembelian (langganan)					
Saya boleh mengambil sendiri produk yang dipesan melalui Web di kedai berhampiran	5	4	3	2	1
Saya boleh menyemak pesanan yang dibuat melalui Internet melalui saluran fizikal (kedai, telefon, fax) atau disebaliknya.	5	4	3	2	1
Saya boleh menukar atau memulangkan barangan yang dibeli dari Web tersebut di kedai berhampiran.	5	4	3	2	1
Saya boleh berkongsi/bertukar maklumat dengan 'rakan-rakan' di forum elektronik	5	4	3	2	1
Saya boleh berurusniaga barangan dengan 'rakan-rakan' yang ditemui dalam saluran/Web yang sama	5	4	3	2	1
Saya boleh memperoleh maklumat berguna tentang sesuatu syarikat daripada 'rakan-rakan' elektronik	5	4	3	2	1
Laman Web menggunakan polisi perlindungan maklumat peribadi yang ketat	5	4	3	2	1
Laman menyediakan pengesahan pihak ketiga (cth: tanda lulus) untuk menyokong kawalan keselamatan ketat yang diamalkan oleh laman Web tersebut.	5	4	3	2	1
Khidmat pelanggan yang boleh dipercayai	5	4	3	2	1
Syarikat mengamalkan paiwai keselamatan yang tinggi bagi maklumat-maklumat urusniaga	5	4	3	2	1

	Sangat	Setuju	Agak setuju	Tidak	Sangat

	setuju			setuju	tidak setuju
Laman menyediakan pengesahan pihak ketiga (cth: tanda lulus) untuk mengesahkan kesahihan laman Web tersebut.	5	4	3	2	1
Syarikat membolehkan akses untuk mengesan pesanan saya	5	4	3	2	1
Saya boleh menukar pesanan tanpa banyak kesulitan	5	4	3	2	1
Laman Web menyediakan akses ke profil akaun saya yang membolehkan saya membuat analisa selanjutnya	5	4	3	2	1
Saya boleh meminta produk/khidmat berdasarkan kemahuan saya	5	4	3	2	1
Syarikat memahami keperluan saya	5	4	3	2	1
Syarikat menjejaki ursuniaga saya	5	4	3	2	1
Saya rasa seronok dengan bentuk hiburan yang disediakan di laman Web	5	4	3	2	1
Saya suka meneroka laman Web tersebut.	5	4	3	2	1

SEKSYEN C (BAHAGIAN 2): PERSEPSI PENGGUNA TENTANG KEPUASAN PELANGGAN, ULANG-LAWAT DAN KESETIAAN

Arahan: Soalan 14, 15 dan 16 bertujuan untuk mengenalpasti persepsi individu tentang cirri-ciri yang mempengaruhi kepuasan pengguna, keinginan untuk kembali melawat dan setia(komited) terhadap sesuatu laman Web. Sila nyatakan pendapat anda menggunakan skala di bawah.

1 = Sangat tidak setuju
2 = Tidak setuju
3 = Agak setuju
4 = Setuju
5 = Sangat setuju

Bersambung…

14.   **Secara keseluruhannya, saya berpuas hati dengan lama Web pilihan saya sekarang kerana…**

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak setuju
Laman Web menggunakan maklumat yang telah dikemaskini	5	4	3	2	1
Harga produc/perkhidmatan selalunya lebih rendah berbanding syarikat lain	5	4	3	2	1
Semua pautan dalam laman Web berfungsi dengan baik	5	4	3	2	1
Laman Web menyediakan pelbagai jenis produk/perkhidmatan	5	4	3	2	1
Khidmat pelanggan yang efisyen	5	4	3	2	1
Produk/perkhidmatan dihantar dengan betul, seperti yang dipesan	5	4	3	2	1
Semua maklumat peribadi berkaitan pelanggna dilindungi daripada akses oleh pihak yang tidak berkenaan	5	4	3	2	1

15. Secara keseluruhannya, saya lebih cenderung untuk kembali melawat laman Web ini kerana …

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak setuju
Saya akan kembali ke laman Web yang menyediakan ganjaran menarik (hadiah percuma, kupon, tukaran mata, rebet tunai)	5	4	3	2	1
Saya akan kembali ke laman Web yang mengendalikan aduan dengan efisyen	5	4	3	2	1
Saya akan kembali ke laman Web yang menyediakan cadangan-cadangan tentang produk/perkhidmatan yang disesuaikan dengan minat saya.	5	4	3	2	1
Saya akan kembali ke laman Web yang mudah diakses samada melalui Internet atau kaedah traditional (cth: kedai fizikal, telefon dll)	5	4	3	2	1
Saya akan kembali ke laman Web di mana maklumat berguna tentang produk/perkhidmatan boleh diperoleh dari ahli-ahli laman Web.	5	4	3	2	1

16. Secara keseluruhannya, saya setia dan sangat komited kepad **saya kerana …**

	Sangat setuju	Setuju	Agak setuju	Tidak setuju	Sangat tidak setuju
Saya komited kepada laman Web ini, oleh itu saya akan terus mengunjunginya	5	4	3	2	1
Saya rasa seperti 'sebahagian' dari laman Web ini	5	4	3	2	1
Saya rasa sangat dihargai	5	4	3	2	1
Saya berpuas hati dengan pengalaman saya di laman Web ini.	5	4	3	2	1
Saya rasa selamat berurusniaga dengan laman ini	5	4	3	2	1
Khidmatnya boleh dipercayai	5	4	3	2	1
Saya akan mencadangkan laman ini kepada teman-teman dan keluarga.	5	4	3	2	1

Terima kasih atas kerjasama dan masa yang diluangkan. Segala maklumat adalah sulit.

SEKIAN.

Appendix 4.4

Factor Analysis for Components of Satisfaction

Item	Components				
	Customer service	Ease of navigation	Information	Order fulfillment	Product/service
Efficient in handling complaints	.82				
Friendly when answering enquiry	.69				
Always notify order status	.77				
Within 48 hours response	.31				
Multi-channel contact point	.31				
Appears to have wide knowledge of products/services	.85				
Professional in answering enquiry if any problem arises with customer orders	.78				
Professional in handling complaints	.82				
Will inform whenever a problem with orders arises					
Keep updates of users' transactions records	.82				
Fast in resolving customers complaints	.52				
Web site is accessible		.69			
Easy steps to register		.75			
Few clicks to information		.77			
Load quickly		.56			
Links are clearly displayed		.45			
Language can be easily understood		.43			
In-depth information			.77		
Easy to understand			.65		
Accurate			.57		
Products received are in good condition				.43	
Products/services are delivered within the delivery time as promised				.51	
High quality product/service					.49
Products/services offered are up-to-date					.84
More varieties in product/services offerings					.68

Appendix 4.4

Factor Analysis for Components of Retention

Item	Components				
	Channel integration	Customer service	Online community	Personalization	Reward
Pick-up orders at the nearest store	.84				
Check orders at the nearest store	.90				
Return products at the nearest store	.72				
Efficient in handling complaints		.82			
Friendly when answering enquiry		.69			
Always notify order status		.77			
Within 48 hours response		.31			
Multi-channel contact point		.31			
Appears to have wide knowledge of products/services		.85			
Professional in answering enquiry if any problem arises with customer orders		.78			
Professional in handling complaints		.82			
Will inform whenever a problem with orders arises					
Keep updates of users' transactions records		.82			
Fast in resolving customers complaints		.52			
Share/exchange information			.92		
Trade goods with group members			.79		
Obtain useful information about company from others			.93		
Keeps a transaction database				.78	
Personalized advertisement				.51	
Creates "My Account"				.55	
Custom-made product/service				.65	
Receives personalized email				.55	
Reward for returning					.72
Offers cash rebate					.89
Point redemption					.84
Offers coupons					.93
Attractive gifts for purchase/subscription					.88

298

Appendix 4.4

Factor Analysis for Components of Loyalty

Item	Components		
	Emotional benefit	Perceived value	Trust
Feel excited about entertainment features	.84		
Enjoy browsing the site	.72		
Provides access to track orders		.46	
Allows changes to orders		.48	
Provides profile analysis		.64	
Enables custom-made product/service		.62	
Understands consumer needs		.83	
Keeps track of transaction		.67	
Adopts strict privacy policy			.78
Provides third party verification			.96
Customer service is reliable			.58
Practices high security standard			.80
Provides third party seal to for authentication			.99

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in Dimensions of Satisfaction model

Critical value = 52.62
df = 25
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
101	73.349	268	55.856
528	70.799	21	55.734
406	70.731	459	55.300
227	70.731	14	55.230
55	67.846	172	55.082
22	66.638	608	54.999
563	63.749	109	54.378
380	63.749	79	54.060
18	62.238	440	54.010
50	61.805	124	53.821
409	60.477	52	53.591
159	60.238	126	53.149
266	58.612	35	53.079
119	57.543	414	52.888
23	55.973	455	52.707

Mahalanobis distance of outliers in Dimensions of Loyalty model

Critical value = 39.25
df = 16
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
604	72.825	233	43.087
206	63.492	179	42.901
199	63.075	128	42.860
73	62.702	155	42.444
201	59.911	153	42.110
151	54.831	96	41.453
524	52.913	584	40.910
116	48.977	7	40.892
197	48.852	5	39.732
52	48.439		
279	46.184		
74	45.139		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in Dimensions of Retention model

Critical value = 42.31
df = 18
p = 0.001

Case no.	Mahalanobis d^2
238	79.027
112	78.659
531	57.225
416	53.617
207	53.199
432	53.058
116	47.983
569	47.909
145	47.682
619	47.172
67	45.548
89	44.711

Mahalanobis distance of outliers in E-CRM program model

Critical value = 81.40
df = 46
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	119.725	23	94.497
227	109.806	112	94.323
406	108.252	524	94.092
179	105.624	19	93.289
2	100.829	119	92.462
101	100.375	153	91.456
450	98.902	513	88.714
52	98.203	116	87.845
151	96.910	142	87.721
22	96.400	242	86.760
201	96.220		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Satisfaction model

Critical value = 89.27
df = 52
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	127.411	525	94.238
151	124.151	463	94.117
126	119.573	380	94.117
406	117.209	96	93.584
227	117.209	142	92.613
179	115.599	528	92.388
101	110.255	519	92.262
450	107.143	50	92.187
22	105.816	242	92.018
416	105.622	268	91.754
2	105.595	183	91.708
113	104.151	18	91.436
238	103.617	455	90.673
513	101.129	109	90.604
84	101.005	130	90.120
152	100.198	116	89.933
52	99.934	172	89.671
128	98.663	414	89.246
524	97.347	71	89.075
61	97.076	19	89.062
143	96.888	45	88.730
266	96.797	20	88.723
153	96.375	364	88.343
66	96.127	432	87.706
119	95.946	79	87.196
112	95.739	159	87.094
23	95.159	608	86.991
289	94.923		
146	94.339		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Loyalty model

Critical value = 90.57
df = 53
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	123.211	45	95.326
101	121.918	289	95.180
151	120.649	71	94.772
22	119.257	66	94.437
227	118.070	183	94.301
2	114.552	7	93.452
406	113.287	238	93.191
179	112.756	525	92.518
116	112.226	84	91.503
96	109.602	199	91.080
206	109.300	245	90.331
450	108.513	204	90.270
126	108.152	242	89.573
130	105.824	73	89.557
416	104.767	197	89.473
52	104.485	364	89.031
463	103.623	146	88.955
380	103.623	185	88.903
128	103.434	139	88.874
19	103.406	61	88.475
112	102.043	124	88.331
142	101.508	163	88.262
201	101.479	182	87.900
119	100.555	50	87.880
23	100.260	268	87.718
524	99.445	366	87.509
513	99.012	20	87.409
153	97.930	155	87.328
387	97.132	35	87.203
152	96.615		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Retention model

Critical value = 89.27
df = 52
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	123.257	152	92.285
101	118.102	66	91.422
151	117.540	20	91.183
416	116.511	116	94.526
179	112.414	52	93.412
22	109.216	366	93.294
406	108.862	245	92.526
227	108.862	23	92.352
126	108.086	152	92.285
112	101.441	66	91.422
524	100.463	20	91.183
450	99.966	45	91.173
268	98.894	204	90.393
289	97.947	119	90.104
2	97.617	84	89.476
96	97.211	205	89.342
513	97.133	61	88.658
128	95.817	50	88.635
238	95.724	142	88.273
153	95.220	19	88.186
65	94.708	242	88.019
116	94.526	74	87.505
52	93.412	519	87.249
366	93.294	127	87.104
245	92.526		
23	92.352		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Satisfaction-Loyalty-Retention model

Critical value = 99.61
df = 64
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
101	141.828	84	109.645
616	135.482	108	109.625
55	134.318	144	109.259
126	133.916	525	109.017
151	133.881	528	108.900
22	132.989	268	108.429
227	130.646	524	108.315
179	129.462	124	108.160
2	127.135	74	107.903
406	126.500	153	107.900
128	126.119	197	107.769
116	125.377	146	107.651
96	124.258	7	107.537
622	121.862	199	107.475
450	119.470	89	107.085
238	117.841	45	106.891
152	116.619	376	106.722
52	116.578	65	106.022
119	116.148	183	105.788
172	115.694	632	105.270
201	115.219	18	104.731
206	115.186	387	104.339
130	115.052	61	104.277
513	114.480	366	104.149
380	114.359	143	103.637
463	114.359	50	103.293
455	113.934	67	103.006
289	112.605	414	102.923
185	112.415	445	102.879
20	112.359	559	102.051
19	111.783	519	101.678
71	111.656	242	100.734
142	111.633	132	100.469
113	111.148	155	100.409
23	110.611	205	100.290
66	110.487	63	99.875
127	110.355	109	99.322
259	110.056	208	99.288
566	109.731	173	98.866
608	109.679		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in Dimensions of Satisfaction model

Critical value = 52.62
df = 25
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
101	73.349	268	55.856
528	70.799	21	55.734
406	70.731	459	55.300
227	70.731	14	55.230
55	67.846	172	55.082
22	66.638	608	54.999
563	63.749	109	54.378
380	63.749	79	54.060
18	62.238	440	54.010
50	61.805	124	53.821
409	60.477	52	53.591
159	60.238	126	53.149
266	58.612	35	53.079
119	57.543	414	52.888
23	55.973	455	52.707

Mahalanobis distance of outliers in Dimensions of Loyalty model

Critical value = 39.25
df = 16
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
604	72.825	233	43.087
206	63.492	179	42.901
199	63.075	128	42.860
73	62.702	155	42.444
201	59.911	153	42.110
151	54.831	96	41.453
524	52.913	584	40.910
116	48.977	7	40.892
197	48.852	5	39.732
52	48.439		
279	46.184		
74	45.139		

Mahalanobis distance of outliers in Dimensions of Retention model

Critical value = 42.31
df = 18
p = 0.001

Case no.	Mahalanobis d^2
238	79.027
112	78.659
531	57.225
416	53.617
207	53.199
432	53.058
116	47.983
569	47.909
145	47.682
619	47.172
67	45.548
89	44.711

Mahalanobis distance of outliers in E-CRM program model

Critical value = 81.40
df = 46
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	119.725	23	94.497
227	109.806	112	94.323
406	108.252	524	94.092
179	105.624	19	93.289
2	100.829	119	92.462
101	100.375	153	91.456
450	98.902	513	88.714
52	98.203	116	87.845
151	96.910	142	87.721
22	96.400	242	86.760
201	96.220		

Mahalanobis distance of outliers in E-CRM-Satisfaction model

Critical value = 89.27
df = 52
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	127.411	525	94.238
151	124.151	463	94.117
126	119.573	380	94.117
406	117.209	96	93.584
227	117.209	142	92.613
179	115.599	528	92.388
101	110.255	519	92.262
450	107.143	50	92.187
22	105.816	242	92.018
416	105.622	268	91.754
2	105.595	183	91.708
113	104.151	18	91.436
238	103.617	455	90.673
513	101.129	109	90.604
84	101.005	130	90.120
152	100.198	116	89.933
52	99.934	172	89.671
128	98.663	414	89.246
524	97.347	71	89.075
61	97.076	19	89.062
143	96.888	45	88.730
266	96.797	20	88.723
153	96.375	364	88.343
66	96.127	432	87.706
119	95.946	79	87.196
112	95.739	159	87.094
23	95.159	608	86.991
289	94.923		
146	94.339		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Loyalty model

Critical value = 90.57
df = 53
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	123.211	45	95.326
101	121.918	289	95.180
151	120.649	71	94.772
22	119.257	66	94.437
227	118.070	183	94.301
2	114.552	7	93.452
406	113.287	238	93.191
179	112.756	525	92.518
116	112.226	84	91.503
96	109.602	199	91.080
206	109.300	245	90.331
450	108.513	204	90.270
126	108.152	242	89.573
130	105.824	73	89.557
416	104.767	197	89.473
52	104.485	364	89.031
463	103.623	146	88.955
380	103.623	185	88.903
128	103.434	139	88.874
19	103.406	61	88.475
112	102.043	124	88.331
142	101.508	163	88.262
201	101.479	182	87.900
119	100.555	50	87.880
23	100.260	268	87.718
524	99.445	366	87.509
513	99.012	20	87.409
153	97.930	155	87.328
387	97.132	35	87.203
152	96.615		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Retention model

Critical value = 89.27
df = 52
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
55	123.257	152	92.285
101	118.102	66	91.422
151	117.540	20	91.183
416	116.511	116	94.526
179	112.414	52	93.412
22	109.216	366	93.294
406	108.862	245	92.526
227	108.862	23	92.352
126	108.086	152	92.285
112	101.441	66	91.422
524	100.463	20	91.183
450	99.966	45	91.173
268	98.894	204	90.393
289	97.947	119	90.104
2	97.617	84	89.476
96	97.211	205	89.342
513	97.133	61	88.658
128	95.817	50	88.635
238	95.724	142	88.273
153	95.220	19	88.186
65	94.708	242	88.019
116	94.526	74	87.505
52	93.412	519	87.249
366	93.294	127	87.104
245	92.526		
23	92.352		

Appendix 5.1
Mahalanobis distance of outliers

Mahalanobis distance of outliers in E-CRM-Satisfaction-Loyalty-Retention model

Critical value = 99.61
df = 64
p = 0.001

Case no.	Mahalanobis d^2	Case no.	Mahalanobis d^2
101	141.828	84	109.645
616	135.482	108	109.625
55	134.318	144	109.259
126	133.916	525	109.017
151	133.881	528	108.900
22	132.989	268	108.429
227	130.646	524	108.315
179	129.462	124	108.160
2	127.135	74	107.903
406	126.500	153	107.900
128	126.119	197	107.769
116	125.377	146	107.651
96	124.258	7	107.537
622	121.862	199	107.475
450	119.470	89	107.085
238	117.841	45	106.891
152	116.619	376	106.722
52	116.578	65	106.022
119	116.148	183	105.788
172	115.694	632	105.270
201	115.219	18	104.731
206	115.186	387	104.339
130	115.052	61	104.277
513	114.480	366	104.149
380	114.359	143	103.637
463	114.359	50	103.293
455	113.934	67	103.006
289	112.605	414	102.923
185	112.415	445	102.879
20	112.359	559	102.051
19	111.783	519	101.678
71	111.656	242	100.734
142	111.633	132	100.469
113	111.148	155	100.409
23	110.611	205	100.290
66	110.487	63	99.875
127	110.355	109	99.322
259	110.056	208	99.288
566	109.731	173	98.866
608	109.679		

Assessment of Univariate and Multivariate Normality

Assessment of Univariate and Multivariate Normality of Satisfaction Measurement Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
OS1	-.509	-4.860	-.503	-2.403
OS2	-.138	-1.322	-1.024	-4.890
OS3	-.498	-4.759	-.704	-3.360
OS5	-.362	-3.455	-.957	-4.567
OS6	-.291	-2.782	-1.133	-5.411
OS7	-.579	-5.530	-.711	-3.394
Multivariate			10.308	12.303

Assessment of Univariate and Multivariate Normality of Loyalty Measurement Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
OL1	-.307	-2.934	-1.052	-5.023
OL2	-.284	-2.714	-.104	-.498
OL3	-.404	-3.859	.348	1.661
OL4	-.494	-4.717	.486	2.319
OL5	-.602	-5.748	-.598	-2.856
OL6	-.707	-6.751	-.397	-1.896
OL7	-.416	-3.977	.043	.207
Multivariate			17.068	17.781

Assessment of Univariate and Multivariate Normality of Retention Measurement Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
OR1	-.590	-5.638	-.365	-1.744
OR2	-.633	-6.047	-.439	-2.097
OR3	-.059	-.563	-.262	-1.253
OR4	-.189	-1.806	-.155	-.739
OR5	-.477	-4.558	.374	1.786
Multivariate			3.532	4.937

Appendix 5.2
Assessment of Univariate and Multivariate Normality

Assessment of Univariate and Multivariate Normality of E-CRM Program Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
R4	-.277	-2.648	-.724	-3.456
EM2	-.494	-4.717	.486	2.319
EM1	-.284	-2.714	-.104	-.498
PR1	-.324	-3.095	-.903	-4.311
PR2	-.297	-2.836	-1.112	-5.307
SC1	-.557	-5.322	-.340	-1.625
SC2	-.510	-4.870	-.405	-1.934
SC3	-.631	-6.029	-.445	-2.123
V6	-.321	-3.069	-.561	-2.676
V5	-.414	-3.949	-.489	-2.335
V4	-.467	-4.458	-.403	-1.924
V3	-.317	-3.023	-.710	-3.391
V2	-.453	-4.327	-.674	-3.215
U3	-.431	-4.111	-.550	-2.627
V1	-.600	-5.726	-.003	-.013
U2	-.429	-4.092	-.905	-4.320
U1	-.735	-7.017	-.305	-1.454
Z3	-.318	-3.038	-.504	-2.405
Z2	-.237	-2.262	-.126	-.601
Z1	-.389	-3.719	-.556	-2.654
N1	-.652	-6.222	-.405	-1.933
N2	-.447	-4.264	-.752	-3.590
N3	-.497	-4.748	-.541	-2.584
N4	-.563	-5.375	-.732	-3.495
N5	-.525	-5.012	-.615	-2.935
F1	-.445	-4.247	-.885	-4.224
F2	-.326	-3.108	-.999	-4.769
C8	-.222	-2.116	-.883	-4.215
C6	-.277	-2.646	-.584	-2.787
C5	-.413	-3.942	-.683	-3.260
C4	-.528	-5.044	-.232	-1.109
C3	-.453	-4.323	-.358	-1.710
C2	-.324	-3.094	-1.023	-4.884
C1	-.303	-2.891	-1.024	-4.891
R3	-.285	-2.723	-.731	-3.490
R2	-.203	-1.936	-.867	-4.140
R1	-.223	-2.134	-.843	-4.025
T3	-.189	-1.801	-.275	-1.313
T2	-.283	-2.698	-.708	-3.381
T1	-.377	-3.597	-.575	-2.744
Y3	-.486	-4.640	.282	1.345
Y2	-.227	-2.170	-.116	-.554
Y1	-.225	-2.146	-.317	-1.515
I3	-.548	-5.233	-.644	-3.075
I2	-.331	-3.163	-.872	-4.163
I1	-.362	-3.455	-.979	-4.674
Multivariate			389.424	68.529

Assessment of Univariate and Multivariate Normality of Dimensions of Satisfaction

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
C1	-.303	-2.891	-1.024	-4.891
C2	-.324	-3.094	-1.023	-4.884
C3	-.453	-4.323	-.358	-1.710
C4	-.528	-5.044	-.232	-1.109
C5	-.413	-3.942	-.683	-3.260
C6	-.277	-2.646	-.584	-2.787
C8	-.222	-2.116	-.883	-4.215
F1	-.445	-4.247	-.885	-4.224
F2	-.326	-3.108	-.999	-4.769
I1	-.362	-3.455	-.979	-4.674
I2	-.331	-3.163	-.872	-4.163
I3	-.548	-5.233	-.644	-3.075
N1	-.652	-6.222	-.405	-1.933
N2	-.447	-4.264	-.752	-3.590
N3	-.497	-4.748	-.541	-2.584
N4	-.563	-5.375	-.732	-3.495
N5	-.525	-5.012	-.615	-2.935
OS1	-.509	-4.860	-.503	-2.403
OS2	-.138	-1.322	-1.024	-4.890
OS3	-.498	-4.759	-.704	-3.360
OS5	-.362	-3.455	-.957	-4.567
OS6	-.291	-2.782	-1.133	-5.411
OS7	-.579	-5.530	-.711	-3.394
P2	-.310	-2.961	-.625	-2.985
P3	-.262	-2.505	-.773	-3.691
Multivariate			183.440	58.383

Assessment of Univariate and Multivariate Normality of Dimensions of Loyalty

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
OL1	-.307	-2.934	-1.052	-5.023
OL2	-.284	-2.714	-.104	-.498
OL3	-.404	-3.859	.348	1.661
OL4	-.494	-4.717	.486	2.319
OL5	-.602	-5.748	-.598	-2.856
OL6	-.707	-6.751	-.397	-1.896
OL7	-.416	-3.977	.043	.207
U1	-.735	-7.017	-.305	-1.454
U2	-.429	-4.092	-.905	-4.320
U3	-.431	-4.111	-.550	-2.627
V1	-.600	-5.726	-.003	-.013
V2	-.453	-4.327	-.674	-3.215
V3	-.317	-3.023	-.710	-3.391
V4	-.467	-4.458	-.403	-1.924
V5	-.414	-3.949	-.489	-2.335
V6	-.321	-3.069	-.561	-2.676
Multivariate			86.454	42.125

Assessment of Univariate and Multivariate Normality of Dimensions of Retention

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
OR1	-.590	-5.638	-.365	-1.744
OR3	-.633	-6.047	-.439	-2.097
OR4	-.059	-.563	-.262	-1.253
OR5	-.189	-1.806	-.155	-.739
OR6	-.477	-4.558	.374	1.786
R1	-.223	-2.134	-.843	-4.025
R2	-.203	-1.936	-.867	-4.140
R3	-.285	-2.723	-.731	-3.490
T1	-.377	-3.597	-.575	-2.744
T2	-.283	-2.698	-.708	-3.381
T3	-.189	-1.801	-.275	-1.313
Y1	-.225	-2.146	-.317	-1.515
Y2	-.227	-2.170	-.116	-.554
Z1	-.389	-3.719	-.556	-2.654
Z2	-.237	-2.262	-.126	-.601
Z3	-.318	-3.038	-.504	-2.405
Multivariate			59.477	28.980

Appendix 5.2
Assessment of Univariate and Multivariate Normality

Assessment of Univariate and Multivariate Normality of ECRM-Satisfaction-Loyalty-Retention Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
C1	-.303	-2.891	-1.024	-4.891
C2	-.324	-3.094	-1.023	-4.884
C3	-.453	-4.323	-.358	-1.710
C4	-.528	-5.044	-.232	-1.109
C5	-.413	-3.942	-.683	-3.260
C6	-.277	-2.646	-.584	-2.787
C8	-.222	-2.116	-.883	-4.215
F1	-.445	-4.247	-.885	-4.224
F2	-.326	-3.108	-.999	-4.769
I1	-.362	-3.455	-.979	-4.674
I2	-.331	-3.163	-.872	-4.163
I3	-.548	-5.233	-.644	-3.075
N1	-.652	-6.222	-.405	-1.933
N2	-.447	-4.264	-.752	-3.590
N3	-.497	-4.748	-.541	-2.584
N4	-.563	-5.375	-.732	-3.495
N5	-.525	-5.012	-.615	-2.935
OL1	-.307	-2.934	-1.052	-5.023
OL2	-.284	-2.714	-.104	-.498
OL3	-.404	-3.859	.348	1.661
OL4	-.494	-4.717	.486	2.319
OL5	-.602	-5.748	-.598	-2.856
OL6	-.707	-6.751	-.397	-1.896
OL7	-.416	-3.977	.043	.207
OR1	-.590	-5.638	-.365	-1.744
OR2	-.633	-6.047	-.439	-2.097
OR3	-.059	-.563	-.262	-1.253
OR4	-.189	-1.806	-.155	-.739
OR5	-.477	-4.558	.374	1.786
OS1	-.509	-4.860	-.503	-2.403
OS2	-.138	-1.322	-1.024	-4.890
OS3	-.498	-4.759	-.704	-3.360
OS5	-.362	-3.455	-.957	-4.567
OS6	-.291	-2.782	-1.133	-5.411
OS7	-.579	-5.530	-.711	-3.394
PR1	-.324	-3.095	-.903	-4.311
PR2	-.297	-2.836	-1.112	-5.307
R1	-.223	-2.134	-.843	-4.025
R2	-.203	-1.936	-.867	-4.140
R3	-.285	-2.723	-.731	-3.490
R4	-.277	-2.648	-.724	-3.456

Appendix 5.2
Assessment of Univariate and Multivariate Normality

Assessment of Univariate and Multivariate Normality of ECRM-Satisfaction-Loyalty-Retention Model

Variable	Skewness	Critical ratio	Kurtosis	Critical ratio
SC1	-.557	-5.322	-.340	-1.625
SC2	-.510	-4.870	-.405	-1.934
SC3	-.631	-6.029	-.445	-2.123
T1	-.377	-3.597	-.575	-2.744
T2	-.283	-2.698	-.708	-3.381
T3	-.189	-1.801	-.275	-1.313
U1	-.735	-7.017	-.305	-1.454
U2	-.429	-4.092	-.905	-4.320
U3	-.431	-4.111	-.550	-2.627
V1	-.600	-5.726	-.003	-.013
V2	-.453	-4.327	-.674	-3.215
V3	-.317	-3.023	-.710	-3.391
V4	-.467	-4.458	-.403	-1.924
V5	-.414	-3.949	-.489	-2.335
V6	-.321	-3.069	-.561	-2.676
V7	-.323	-3.083	-.528	-2.520
V8	-.544	-5.192	.593	2.831
Y1	-.225	-2.146	-.317	-1.515
Y2	-.227	-2.170	-.116	-.554
Y3	-.486	-4.640	.282	1.345
Z1	-.389	-3.719	-.556	-2.654
Z2	-.237	-2.262	-.126	-.601
Z3	-.318	-3.038	-.504	-2.405
Multivariate			687.585	87.481

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
1	0.08	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	-1.04	0.20	0.20	-1.87	-0.82	-0.87	-2.01
2	1.20	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	0.05	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
3	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-0.08	0.03	-0.97	-0.02	-0.13	0.15	0.15	-0.95	-1.11	0.05	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
4	1.20	-1.35	-1.30	-1.14	-2.31	-1.22	-0.80	-0.67	-2.36	-2.43	-2.12	-1.95	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
5	-1.04	-1.35	-0.03	-1.14	0.01	-1.22	0.19	-0.67	-0.11	-1.25	-1.05	-0.97	-0.02	-1.31	-0.86	0.15	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	0.21	0.19	0.14
6	1.20	-0.05	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-1.25	0.03	1.00	1.06	-0.13	0.15	1.14	0.13	0.03	0.05	1.28	1.28	0.20	0.21	0.19	1.21
7	0.08	-1.35	-1.30	-1.14	0.01	1.05	-0.80	-0.67	-0.11	-0.08	-1.05	1.00	-1.09	-1.31	1.15	1.14	0.13	1.17	1.14	0.20	0.20	0.20	-0.82	-0.87	0.14
8	1.20	1.25	-1.30	1.10	1.16	1.05	0.19	-0.67	1.01	1.10	1.10	1.00	1.06	-1.31	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
9	1.20	-1.35	-1.30	-0.02	0.01	1.05	1.18	1.14	-0.11	-1.25	-1.05	1.00	-0.02	-0.13	0.15	-0.85	1.21	0.03	1.14	1.28	1.28	1.23	1.23	1.25	1.21
10	-1.04	-0.05	-0.03	-0.02	-1.15	-1.22	-0.80	-1.57	-0.11	-0.08	0.03	0.02	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
11	0.08	1.25	1.25	-0.02	0.01	-0.09	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	-0.95	0.03	0.05	1.23	0.20	0.20	1.23	0.21	0.19	-0.93
12	1.20	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	1.28	1.28	-0.84	1.23	1.25	1.21
13	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-1.57	-1.24	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	-2.24	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
14	-1.04	1.25	1.25	1.10	-1.15	-0.09	-0.80	-0.67	1.01	1.10	1.10	1.00	1.05	-0.86	-0.85	-0.95	-2.24	-1.04	-0.89	-0.88	-1.87	-0.82	-0.87	-0.93	
15	-1.04	-1.35	-1.30	-2.26	0.01	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-2.17	-2.49	-0.86	-0.85	-2.03	-1.11	-1.04	-1.97	-1.96	-1.87	-1.85	-1.93	-0.93
16	1.20	-1.35	-1.30	-2.26	-2.31	-2.35	-1.80	-1.57	-3.28	-2.43	-2.12	-1.95	-2.17	-2.49	-1.86	-1.85	-0.95	-2.24	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
17	-3.28	-1.35	-1.30	-2.26	-1.15	-1.22	-2.79	-1.57	-2.36	-1.25	-1.05	-0.97	-2.17	-2.49	-1.86	-1.85	-3.11	-2.24	-2.13	-3.06	-3.04	-1.87	-2.87	-2.99	-3.08
18	0.08	1.25	1.25	-1.14	1.16	1.05	-0.80	0.23	-0.11	-1.25	-1.05	1.00	-0.02	-0.13	-0.86	-0.85	-0.95	1.17	1.14	1.28	1.28	1.23	-0.82	-0.87	1.21
19	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	0.19	-1.57	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	-1.86	0.15	0.13	0.03	-1.04	-1.97	-1.96	-0.84	-0.82	-0.87	-2.01
20	0.08	-1.35	-0.03	-1.14	0.01	-1.22	-1.80	-1.57	-0.11	-1.25	-1.05	0.02	-0.02	1.05	-0.86	0.13	-1.11	0.05	-0.89	-0.88	-0.84	0.21	0.19	-0.93	
21	-1.04	-0.05	-0.03	-1.14	0.01	-0.09	1.18	1.14	-0.11	-0.08	-1.05	-0.97	-1.09	-1.31	0.15	0.15	-2.03	1.17	1.14	-0.89	-0.88	0.20	-1.85	-1.93	0.14
22	-1.04	-1.35	-1.30	-1.14	-1.15	1.05	-0.80	-1.57	-1.24	-0.08	-1.05	1.00	-1.09	1.05	-0.86	0.15	-0.95	-1.11	1.14	0.20	0.20	-0.84	-1.85	-1.93	-2.01
23	-1.04	1.25	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-0.08	-1.05	0.02	-1.09	-0.13	-1.86	-0.85	0.13	-1.11	1.14	0.20	0.20	-0.84	-0.82	-0.87	0.14
24	0.08	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-1.31	0.15	0.15	0.13	1.17	1.14	0.20	0.20	1.23	-0.82	-0.87	0.14
25	-1.04	-0.05	-1.30	-0.02	0.01	-0.09	-0.80	-1.57	-1.24	-0.08	-1.05	-1.95	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
26	1.20	1.25	1.25	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	0.21	0.19	1.21
27	0.08	-0.05	-0.03	-0.02	-1.15	-0.09	0.19	0.23	1.01	1.10	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
28	0.08	1.25	1.25	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	-0.85	-0.95	1.17	1.14	-0.89	-0.88	1.23	-0.82	-0.87	-0.93
29	0.08	1.25	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	1.14	0.20	0.20	-0.84	0.21	0.19	0.14
30	0.08	-1.35	-1.30	-0.02	-1.15	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	0.02	1.06	-0.13	-0.86	-1.85	0.13	-1.11	0.05	-0.89	-0.88	0.20	-0.82	-0.87	0.14
31	0.08	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
32	-1.04	-0.05	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	1.00	-0.02	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	0.21	0.19	0.14
33	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	1.01	-0.08	0.03	-0.97	-1.86	-1.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93		
34	0.08	-0.05	-0.03	-0.02	-1.15	1.05	0.19	0.23	1.01	1.10	1.10	1.00	-0.02	-0.13	0.15	0.15	0.13	-1.11	0.05	0.20	0.20	0.20	-0.82	-0.87	-0.93
35	1.20	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-1.57	-1.24	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-1.85	1.21	-1.11	0.05	1.28	1.28	-0.84	0.21	0.19	0.14
36	1.20	1.25	-0.03	1.10	0.01	-0.09	0.19	0.23	1.01	1.10	1.10	1.00	1.06	-0.13	1.15	1.14	1.21	1.17	0.05	1.28	1.28	0.20	1.23	1.25	1.21
37	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	0.13	1.17	0.05	1.28	1.28	-0.84	0.21	0.19	1.21
38	1.20	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	1.06	1.05	0.15	1.14	-0.95	-1.11	-1.04	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
39	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-1.80	-0.67	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-1.85	0.13	-1.11	-1.04	-0.89	-0.88	0.20	0.21	0.19	-0.93
40	0.08	-0.05	-1.30	-0.02	-1.15	1.05	-0.80	-0.67	-1.24	-1.25	-1.05	-1.95	-1.09	-1.31	0.15	0.15	-2.03	0.03	1.14	-1.97	-1.96	1.23	-0.82	-0.87	-0.93
41	0.08	-0.05	-0.03	-0.02	0.01	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
42	1.20	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	-0.13	0.15	0.15	1.21	1.17	1.14	0.20	0.20	0.20	1.23	1.25	0.14
43	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	-1.05	1.00	-0.02	-0.13	0.15	0.15	-0.95	0.03	0.05	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
44	-1.04	1.25	1.25	-0.02	0.01	-0.09	1.18	1.14	-1.24	-0.08	-1.05	0.02	-0.02	1.05	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
45	0.08	-1.35	-2.57	-1.14	0.01	-0.09	-1.80	-1.57	-0.11	-1.25	-1.05	0.02	-1.09	-2.49	0.15	0.15	-2.03	-1.11	0.05	-0.89	-0.88	0.20	0.21	0.19	1.21
46	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-2.36	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
47	0.08	1.25	1.25	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	-1.09	-1.31	-0.86	-0.85	0.13	1.17	1.14	0.20	0.20	0.20	0.21	0.19	0.14
48	0.08	-0.05	-0.03	-0.02	-1.15	1.05	0.19	1.14	-0.11	-1.25	-1.05	0.02	-1.09	-2.49	0.15	1.14	-0.95	1.17	1.14	0.20	0.20	0.20	-0.82	-0.87	0.14

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
49	0.08	-0.05	-1.30	-0.02	1.16	1.05	-0.80	-0.67	-0.11	-1.25	-1.05	1.00	-0.02	-1.31	0.15	0.15	-2.03	1.17	1.14	-1.97	-1.96	0.20	-1.85	-1.93	0.14
50	0.08	-1.35	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-1.25	-2.12	1.00	-1.09	-1.31	-0.86	-0.85	-2.03	1.17	1.14	-1.97	-1.96	1.23	-0.82	-0.87	0.14
51	0.08	-0.05	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-0.02	-1.31	1.15	1.14	-0.95	1.17	1.14	-0.89	-0.88	0.20	-0.82	-0.87	0.14
52	-1.04	-0.05	-0.03	-1.14	0.01	-0.09	0.19	0.23	-0.11	-1.25	-1.05	-0.97	-0.02	-1.31	1.15	1.14	-2.03	1.17	1.14	-1.97	-1.96	0.20	-0.82	-0.87	-0.93
53	1.20	-0.05	-0.03	-0.02	-1.15	-0.09	0.19	0.23	-0.11	-1.25	-1.05	-0.97	-0.02	-0.13	0.15	0.15	-2.03	1.17	0.05	-1.97	-1.96	-0.84	-1.85	-1.93	-0.93
54	0.08	-0.05	-1.30	-0.02	-2.31	-1.22	-0.80	-1.57	-0.11	-1.25	-2.12	-0.97	-1.09	-2.49	-0.86	-1.85	-0.95	-1.11	0.05	-1.97	-1.96	-0.84	0.21	0.19	0.14
55	1.20	-0.05	-0.03	-0.02	0.01	-0.09	0.19	-2.48	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-1.86	-0.85	-0.95	-1.11	-2.13	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
56	1.20	-0.05	-0.03	-0.02	1.16	1.05	0.19	-1.57	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	0.21	0.19	0.14
57	-1.04	1.25	-0.03	1.10	0.01	-0.09	0.19	0.23	1.01	-0.08	0.03	0.02	-0.02	-0.13	0.15	-0.85	-0.95	1.17	1.14	0.20	0.20	0.20	0.21	0.19	0.14
58	1.20	1.25	1.25	-0.02	1.16	1.05	1.18	1.14	-0.11	-0.08	0.03	1.00	1.06	1.05	0.15	1.14	1.21	0.03	0.05	1.28	1.28	1.23	0.21	0.19	1.21
59	0.08	-1.35	-1.30		-1.15	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-1.31	0.15	0.15	0.13	0.05	0.20	0.20	0.20	1.23	1.25		0.14
60	0.08	-0.05	-0.03	-0.02	0.01	1.05	0.19	0.23	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	1.15	0.15	0.13	-1.11	0.05	-0.89	-0.88	0.20	0.21	0.19	-0.93
61	1.20	1.25	1.25	1.10	1.16	1.05	-0.80	1.14	-0.11	-0.08	1.10	0.02	-0.02	1.05	-0.86	-0.85	1.21	0.03	1.14	1.28	1.28	-0.84	0.21	0.19	1.21
62	-1.04	-1.35	-1.30	-1.14	0.01	1.05	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-0.02	-1.31	-0.86	-0.85	-2.03	-2.24	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
63	0.08	-0.05	-0.03	-1.14	0.01	-0.09	-0.80	-1.57	1.01	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	0.20	0.20	0.20	0.21	0.19	0.14
64	1.20	1.25	1.25	1.10	1.16	1.05	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
65	-1.04	-1.35	-2.57	-0.02	-1.15	1.05	-1.80	-1.57	-0.11	-1.25	-2.12	-1.95	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-1.04	-0.89	-1.96	-1.87	-1.85	-0.87	-0.93
66	-1.04	-0.05	-1.30	-2.26	-1.15	-2.35	-1.80	-1.57	-1.24	-1.25	-2.12	-1.95	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	0.19	0.14
67	-1.04	1.25	1.25	-1.14	-1.15	-1.22	0.19	-1.57	-2.36	-1.25	-1.05	-1.95	-2.17	-1.31	0.15	0.15	-0.95	-1.11	-1.04	-1.97	-0.88	-0.84	-0.82	0.19	-0.93
68	-1.04	-1.35	-0.03	-0.02	-1.15	-1.22	-0.80	0.23	-0.11	-0.08	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	0.20	-0.84	-0.82	0.19	-0.93
69	-1.04	-2.65	-1.30	-0.02	-1.15	-0.09	-0.80	-0.67	-0.11	-0.08	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
70	1.20	-0.05	-0.03	-0.02	0.01	-0.09	1.18	0.23	1.01	1.10	0.03	0.02	1.06	1.05	0.15	0.15	0.13	0.03	1.14	0.20	0.20	0.20	1.23	1.25	0.14
71	-1.04	-0.05	-0.03	-1.14	0.01	-1.22	-1.80	-1.57	1.01	1.10	1.10	-0.97	-2.17	-2.49	0.15	0.15	-0.95	0.03	1.14	0.20	-0.88	0.20	0.21	-0.87	-0.93
72	-1.04	-0.05	-0.03	-0.02		-0.09	-1.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
73	0.08	-0.05	-0.03	-0.02	0.01	-1.22	-0.80	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	-1.11	0.05	0.20	0.20	0.20	0.21	0.19	0.14
74	1.20	-0.05	-1.30	1.10	1.16	1.05	-0.80	-0.67	1.01	1.10	0.03	1.00	1.06	-0.13	1.15	0.15	0.13	1.17	1.14	1.28	1.28	1.23	0.21	0.19	1.21
75	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	0.23	1.01	-0.08	0.03	1.00		1.05	0.15	0.15	0.13	-1.11	-1.04	-0.89	0.20	-0.84	-0.82	-0.87	0.14
76	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-1.57	-1.24	-1.25	-1.05	-1.95	-2.17	-1.31	-1.86	-1.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
77	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	-0.86	-0.85	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
78	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
79	0.08	-0.05	1.25	-0.02	0.01	-0.09	-1.80	-1.57	-0.11	-0.08	-1.05	-0.97	-0.02	-0.13	-1.86	-1.85	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
80	1.20	1.25	-0.03	-0.02	-1.15	-1.22	0.19	0.23	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	-0.89	0.20	1.23	-0.82	-0.87	1.21
81	-1.04	-0.05	-1.30	-1.14	0.01	-1.22	-0.80	-0.67	1.01	1.10	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	0.05	-0.89	0.20	0.20	-0.82	-0.87	0.14
82	-1.04	-1.35	-1.30	-1.14	0.01	-0.09	-1.80	-0.67	-1.24	-0.08	0.03	-0.97	-2.17	-1.31	-0.86	-0.85	0.13	1.17	1.14	1.28	0.20	1.23	1.23	1.25	1.21
83	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
84	0.08	-0.05	1.25	1.10	1.16	1.05	-0.80	-0.67	1.01	1.10	0.03	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	1.14	-0.89	0.20	-0.84	-0.82	-0.87	-0.93
85	0.08	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	1.21	-1.11	0.05	1.28	1.28	0.20	1.23	1.25	0.14
86	0.08	-0.05	-0.03	-0.02	1.16	1.05	0.19	0.23	1.01	1.10	0.03	0.02	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
87	0.08	1.25	-0.03	-0.02	-1.15	-0.09	1.18	0.23	-1.24	-1.25	0.03	0.02	-0.02	1.05	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
88	0.08	-0.05	-0.03	-1.14	0.01	-0.09	-1.80	-1.57	1.01	1.10	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11		-0.89	-0.88	-0.84	-0.82	-0.87	0.14
89	1.20	-1.35	-1.30	-0.02	-1.15	-1.22	-0.80	-0.67	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	-0.95	-1.11	0.05	-1.97	-0.88	-0.84	-1.85	-1.93	-0.93
90	-1.04	-1.35	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	1.01	1.10	-1.05	0.02	-1.09	-0.13	-1.86	-1.85	-2.03	-2.24	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
91	1.20	1.25	1.25	1.10	1.16	1.05	0.19	0.23	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
92	1.20	1.25	1.25	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-0.02	1.05	-0.86	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	-0.82	-0.87	0.14
93	-1.04	1.25	1.25	-0.02	-1.15	-0.09	-1.80	-0.67	-0.11	-0.08	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	0.05	0.20	0.20	-0.84	0.21	0.19	0.14
94	0.08	-1.35	-0.03	-0.02	0.01	-0.09	-0.80	-1.57	-1.24	-0.08	-1.05	-0.97	-1.09	-0.13	-1.86	-1.85	-0.95	-2.24	-1.04	-1.97	-1.96	-1.87	-1.85	-1.93	-0.93
95	-1.04	-2.65	-0.03	-0.02	0.01	-0.09	0.19	0.23	-1.24	-0.08	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	-1.11	0.05	0.20	-0.88	0.20	-0.82	0.19	0.14
96	0.08	-1.35	-1.30	-0.02	-2.31	-0.09	-0.80	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	0.20	1.23	1.23	1.25	1.21
97	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-0.08	-1.05	-0.97	-1.09	-0.13	-1.86	-1.85	-0.95	-3.38	-1.04	-0.89	-0.88	-1.87	-1.85	-1.93	-0.93

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
98	-1.04	1.25	1.25	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	1.10	0.03	0.02	1.06	1.05	0.15	0.15	0.13	-1.11	0.05	0.20	0.20	0.20	0.21	0.19	0.14
99	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	1.14	0.20	0.20	1.23	0.21	0.19	1.21
100	1.20	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	-0.02	-0.13	0.15	0.15	0.13	1.17	1.14	0.20	0.20	1.23	0.21	0.19	0.14
101	-1.04	-1.35	-1.30	1.10	1.16	1.05	-0.80	-0.67	1.01	-0.08	0.03	0.02	-0.02	1.05	-1.86	1.14	1.21	-2.24	-1.04	0.20	0.20	0.20	-0.82	-0.87	1.21
102	1.20	-1.35	-1.30	1.10	1.16	-0.09	0.19	0.23	1.01	-0.08	1.10	1.00	1.06	1.05	0.15	0.15	1.21	-1.11	-1.04	1.28	1.28	-0.84	1.23	1.25	1.21
103	1.20	-1.35	-1.30	1.10	1.16	1.05	-0.80	-0.67	1.01	1.10	1.10	0.02	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	0.20	-0.82	-0.87	-0.93
104	0.08	1.25	-0.03	1.10	0.01	-0.09	0.19	0.23	1.01	-0.08	0.03	0.02	-0.02	-0.13	-0.86	1.14	0.13	1.17	1.14	0.20	0.20	1.23	-0.82	-0.87	0.14
105	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15		1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
106	0.08	-0.05	-0.03	1.10	0.01	-0.09	0.19	-1.57	1.01	1.10	0.03	1.00	-0.02	-0.13	0.15	-0.85	1.21	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
107	0.08	1.25	-1.30	1.10	1.16	1.05	-0.80	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	1.14	0.20	0.20	1.23	1.23	1.25	1.21
108	0.08	-0.05	1.25	-0.02	0.01	1.05	1.18	1.14	1.01	-0.08	0.03	1.00	-0.02	-0.13	-0.86	1.14	1.21	0.05		-0.89	-0.88	0.20	-0.82	-0.87	1.21
109	-1.04	-1.35	-1.30	-1.14	-2.31	-1.22	-0.80	-1.57	-1.24	-2.43	-2.12	-0.97	-1.09	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
110	-2.17	-1.35	-2.57	-2.26	-2.31	-1.22	-1.80	-1.57	-2.36	-2.43	-2.12	-0.97	-1.09	-0.13	-1.86	-1.85	0.13	-1.11	-1.04	-0.89	0.20	-0.84	-0.82	-0.87	0.14
111	0.08	-0.05	-0.03	-0.02	0.01	-1.22	0.19	-1.57	-0.11	-1.25	-1.05	-0.97	-1.09	-0.13	-0.86	-1.85	0.13	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
112	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	1.01	-0.08	0.03	0.02	-0.02	-0.13	-1.86	-1.85	0.13	0.03	0.05	-0.89	-0.88	0.20	-0.82	-0.87	0.14
113	-1.04	-0.05	-0.03	-0.02	0.01	-1.22	0.19	-1.57	-0.11	-0.08	-1.05	1.00	-1.09	-1.31	-0.86	-0.85	0.13	-1.11	0.05	-0.89	-0.88	0.20	-0.82	-0.87	0.14
114	0.08	1.25	1.25	1.10	0.01	-1.22	1.18	1.14	-0.11	-0.08	0.03	0.02	1.06	1.05	0.15	0.15	1.21	0.03	1.14	1.28	1.28	1.23	-0.82	-0.87	1.21
115	1.20	1.25	1.25	-0.02	-1.15	-1.22	-0.80	-0.67	1.01	1.10	0.03	1.00	1.06	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
116	0.08	-0.05	1.25	-0.02	-1.15	-0.09	-0.80	-0.67	1.01	-0.08	0.03	0.02	-1.09	-0.13	-0.86	-1.85	0.13	1.17	1.14	-0.89	-1.96	-0.84	-0.82	-0.87	0.14
117	-1.04	-0.05	-1.30	1.10		-0.09	0.19	0.23	1.01	-0.08	0.03	1.00	-0.02	-1.31	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
118	-2.17	-1.35	-0.03	-1.14	-1.15	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
119	0.08	-0.05	-0.03	-0.02	1.16	-0.09	1.18	1.14	1.01	-0.08	0.03	0.02	-0.02	-0.13	-1.86	-1.85	0.13	-2.24	-1.04	-1.97	0.20	-0.84	-0.82	-0.87	0.14
120	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
121	-2.17	-0.05	-1.30	-1.14	0.01	-0.09	0.19	0.23	1.01	1.10	1.10	0.02	-1.09	-1.31	-0.86	-0.85	1.21	1.17	0.05	1.28	1.28	0.20	0.21	-0.87	0.14
122	-3.29	-1.35	-1.30	-1.14	0.01	-1.22	-0.80	-1.57	-1.24	-1.25	-1.05	-1.95	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
123	-2.17	-0.05	1.25	-0.02	0.01	-0.09	0.19	-1.57	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-1.86	-1.85	0.13	0.03	-1.04	-1.97	-0.88	-0.84	-0.82	-0.87	0.14
124	1.20	-0.05	-1.30	-1.14	1.16	1.05	1.18	0.23	-0.11	1.10	1.10	0.02	-1.09	-1.31	0.15	0.15	0.13	1.17	1.14	0.20	0.20	1.23	0.21	0.19	1.21
125	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	-1.04	1.28	1.28	-0.84	0.21	0.19	1.21
126	1.20	-0.05	-1.30	-1.14	0.01	1.05	1.18	1.14	-1.24	-1.25	-1.05	0.02	-1.09	-0.13	0.15	-0.85	0.13	1.17	1.14	-0.89	-0.88	1.23	0.21	0.19	0.14
127	0.08	-0.05	-1.30	-1.14	0.01	-1.22	0.19	0.23	-1.24	-0.08	0.03	-0.97	-0.02	1.05	-0.86	-0.85	-0.95	-1.11	1.14	0.20	-0.88	0.20	0.21	0.19	0.14
128	0.08	-0.05	-0.03	-1.14	1.16	1.05	0.19	0.23	1.01	1.10	0.03	-0.97	-0.02	-1.31	0.15	-0.85	-0.95	-1.11	-1.04	0.20	0.20	0.20	0.21	-0.87	1.21
129	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
130	1.20	1.25	1.25	1.10	1.16	1.05	-1.80	-2.48	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	-2.03	-1.11	0.05	-0.89	-1.96	-0.84	-0.82	-0.87	-0.93
131	-1.04	-0.05	-0.03	-1.14	-1.15	-0.09	0.19	0.23	-0.11	-0.08	-1.05	-0.97	-1.09	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
132	-1.04	-0.05	-0.03	1.10	0.01	-0.09	0.19	0.23	1.01	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-1.85	0.13	0.03	0.05	0.20	0.20	-0.84	0.21	0.19	-0.93
133	0.08	-0.05	-1.30	-0.02	-1.15	-1.22	-1.80	-0.67	-1.24	-1.25		0.02	-1.09	-1.31	-0.86	-1.85	-0.95	-1.11		0.20	0.20	-0.84	0.21	0.19	-0.93
134	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
135	-1.04	-0.05	-0.03	1.10	0.01	1.05	0.19	0.23	1.01	-0.08	0.03	1.00	-1.09	-0.13	-0.86	-0.85	0.13	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
136	-1.04	-0.05	-0.03	1.10	0.01	-0.09	0.19	0.23	1.01	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	0.05	-0.89	0.20	-1.87	-0.82	-0.87	0.14
137	1.20	-0.05	-0.03	-0.02	1.16	-1.22	0.19	0.23	-0.11	-1.25	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	0.03	-1.04	-0.89	-0.88	-1.87	-0.82	0.19	-0.93
138	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-1.24	-1.25	-1.05	-0.97	-1.09	-0.13	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
139	0.08	-0.05	-0.03	-0.02	0.01	-1.22	0.19	-1.57	-0.11	-1.25	-1.05	0.02	-2.17	-1.31	-0.86	-1.85	0.13	0.03	0.05	1.28	1.28	-1.87	1.23	0.19	-0.93
140	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-2.36	-1.25	-1.05	-1.95	-2.17	-1.31	-1.86	-1.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
141	1.20	1.25	-0.03	-0.02	0.01	-1.22	0.19	-1.57	1.01	-0.08	0.03	1.00	1.06	1.05	-0.86	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	-0.82	0.19	0.14
142	0.08	-0.05	-0.03	-0.02	0.01	-1.22	0.19	0.23	-1.24	-1.25	-1.05	0.02	-1.09	-2.49	-1.86	-1.85	-2.03	-1.11	0.05	-0.89	-0.88	-0.84	-1.85	-1.93	-0.93
143	0.08	-1.35	-0.03	-1.14	1.16	-1.22	-1.80	-1.57	-1.24	-0.08	-1.05	-0.97	-2.17	-2.49	-1.86	-1.85	0.13	0.03	0.05	0.20	-0.88	-0.84	-0.82	-0.87	0.14
144	1.20	-0.05	-0.03	-0.02	-1.15	-0.09	-1.80	-0.67	-0.11	-1.25	-1.05	-0.97	-1.09	-0.13	-1.86	-1.85	-0.95	1.17	1.14	-0.89	-0.88	-0.84	-1.85	-1.93	0.14
145	1.20	1.25	1.25	-0.02	0.01	-1.22	0.19	0.23	-1.24	-0.08	0.03	0.02	1.06	1.05	0.15	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	0.21	0.19	-0.93
146	-1.04	-0.05	-1.30	-1.14	-1.15	-2.35	-1.80	-1.57	-1.24	-2.43	-1.05	-1.95	-2.17	-0.13	-1.86	0.15	-0.95	-1.11	-2.13	-0.89	-0.88	-1.87	-1.85	-1.93	-2.01
147	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	1.14	-0.95	0.03	0.05	0.20	-0.88	0.20	-0.82	-0.87	0.14

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
148	-2.17	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	0.23	-1.24	-0.08	-1.05	0.02	-1.09	-1.31	0.15	-0.85	-0.95	-1.11	0.05	-0.89	0.20	-0.84	-0.82	-0.87	-0.93
149	0.08	-0.05	-1.30	-1.14	0.01	-2.35	-1.80	-1.57	-0.11	-0.08	0.03	0.02	-0.02	-1.31	0.15	-0.85	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
150	-1.04	-0.05	-0.03	-0.02	-1.15	-0.09	0.19	-0.67	-1.24	-0.08	0.03	-0.97	-1.09	-0.13	0.15	-0.85	0.13	-1.11	0.05	-0.89	-1.96	-0.84	-0.82	0.19	0.14
151	-1.04	-0.05	-0.03	-1.14	0.01	-1.22	0.19	-1.57	-0.11	-1.25	0.03	-0.97	-1.09	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	0.20	-0.88	0.20	0.21	0.19	-0.93
152	-1.04	-0.05	1.25	-1.14	-1.15	-0.09	1.18	-1.57	-0.11	-0.08	-1.05	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
153	-1.04	1.25	1.25	-0.02	-1.15	-0.09	1.18	1.14	-0.11	-0.08	0.03	1.00	1.06	1.05	-0.86	0.15	0.13	1.17	1.14	0.20	0.20	0.20	0.21	0.19	1.21
154	-1.04	-1.35	-1.30	-1.14	-1.25	-1.05	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
155	1.20	1.25	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-2.03	-1.11	0.05	1.28	-0.88	-0.84	0.21	0.19	-2.01
156	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	0.03	-0.97	-1.09	-0.13	-0.86	0.15	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
157	-1.04	-1.35	-1.30	-1.14	-1.15	-2.35	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-1.85	-2.03	-2.24	-1.04	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
158	1.20	1.25	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	-1.11	-1.04	0.20	0.20	0.20	0.21	0.19	0.14
159	-1.04	-0.05	-0.03	-1.14	-1.15	-2.35	-1.80	-1.57	-2.36	-1.25	-1.05	-0.97	-2.17	-2.49	-0.86	-0.85	0.13	-2.24	-1.04	0.20	0.20	-1.87	-0.82	-0.87	0.14
160	-1.04	-0.05	-0.03	-1.14	-1.15	-0.09	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
161	-1.04	-0.05	-0.03	-1.14	0.01	-0.09	-0.80	-0.67	-2.36	-1.25	-2.12	-1.95	-1.09	-1.31	-0.86	-0.85	-0.95	-2.24	-1.04	-0.89	-0.88	-0.84	-1.85	-0.87	-0.93
162	0.08	-1.35	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-0.11	-1.25	-1.05	-1.95	-2.17	-1.31	-1.86	-1.85	-0.95	0.03	0.05	-0.89	0.20	-0.84	-0.82	-0.87	-0.93
163	-2.17	-1.35	-1.30	-0.02	-1.15	-1.22	-0.80	-0.67	-0.11	-1.25	0.03	0.02	-1.09	-0.13	-0.86	-1.85	-0.95	0.03	-1.04	0.20	-0.88	0.20	0.21	0.19	-0.93
164	-1.04	-0.05	1.25	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	1.10	0.03	-0.02	-0.02	-0.13	-0.86	-0.85	-2.03	0.03	0.05	0.20	-0.88	-0.84	-0.82	-0.87	-2.01
165	0.08	-0.05	-1.30	-1.14	1.16	-0.09	-1.80	0.23	-2.36	-1.25	-2.12	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
166	-1.04	-0.05	-1.30	-0.02	-1.15	1.05	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	1.06	1.05	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
167	0.08	1.25	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	1.06	-0.13	0.15	0.15	0.13	0.03	-1.04	0.20	0.20	0.20	0.21	0.19	0.14
168	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	-1.09	-1.31	0.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
169	-1.04	-0.05	-1.30	-1.14	-1.15	-0.09	-0.80	-0.67	1.01	-1.25	-1.05	0.02	-0.02	-0.13	1.15	0.15	1.21	-1.11	0.05	0.20	1.28	0.20	0.21	0.19	0.14
170	0.08	-0.05	-0.03	1.10	1.16	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	0.15	0.15	0.15	1.21	0.03	-1.04	0.20	1.28	0.20	0.21	0.19	0.14
171	-1.04	-1.35	-0.03	-0.02	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	1.00	-0.02	1.05	0.15	0.15	0.13	1.17	1.14	-0.89	0.20	0.20	0.21	0.19	0.14
172	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-1.57	-0.11	-2.43	-1.05	-1.95	-1.09	-0.13	0.15	0.15	-0.95	0.03	-1.04	-0.89	-0.88	-1.87	-1.85	-1.93	0.14
173	-1.04	-0.05	-1.30	-0.02	0.01	1.05	1.18	1.14	-0.11	-1.25	-2.12	1.00	-1.09	-2.49	1.15	1.14	0.13	1.17	1.14	0.20	-0.88	1.23	1.23	1.25	0.14
174	-1.04	-1.35	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-0.08	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	0.14
175	-2.17	-0.05	-0.03	-1.14	-1.15	-2.35	0.19	-1.57	-1.24	-0.08	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	0.13	-1.11	0.05	-0.89	0.20	-0.84	-0.82	-0.87	0.14
176	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
177	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
178	-2.17	-0.05	-1.30	-0.02	1.16	1.05	-0.80	-0.67	1.01	-0.08	-1.05	1.00	-1.09	-1.31	1.15	0.15	0.13	1.17	1.14	1.28	0.20	1.23	1.23	1.25	0.14
179	-2.17	-0.05	-0.03	-1.14	0.01	-2.35	-1.80	0.23	-1.24	-1.25	-1.05	-0.97	1.06	-0.13	-0.86	-0.85	0.13	0.03	0.05	0.20	-0.88	0.20	0.21	0.19	0.14
180	-1.04	-1.35	-0.03	-0.02	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	1.00	-0.02	-1.31	-0.86	0.15	0.13	-1.11	0.05	0.20	1.28	0.20	0.21	-0.87	-0.93
181	-1.04	-0.05	-0.03	1.10	-1.15	-1.22	-0.80	-0.67	-0.11	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
182	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	1.01	-0.08	1.10	1.00	1.06	-1.31	1.15	1.14	1.21	0.03	-1.04	0.20	1.28	-0.84	-0.82	-1.93	0.14
183	0.08	-0.05	-1.30	1.10	1.16	1.05	-0.80	-0.67	1.01	1.10	0.03	0.02	-0.02	1.05	-0.86	-0.85	1.21	1.17	0.05	-0.89	1.28	0.20	0.21	0.19	1.21
184	0.08	-0.05	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	-1.05	1.00	-1.09	1.05	-0.86	-0.85	1.21	1.17	0.05	-0.89	1.28	0.20	0.21	0.19	1.21
185	-1.04	-1.35	-1.30	-0.02	-1.15	1.05	0.19	0.23	1.01	1.10	1.10	1.00	-0.02	1.05	1.15	0.15	0.13	1.17	1.14	-0.89	0.20	0.20	0.21	-0.87	-0.93
186	0.08	1.25	1.25	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	1.14	-0.95	-1.11	0.05	-0.89	-0.88	0.20	-0.82	-1.93	-0.93
187	1.20	-0.05	-0.03	1.10	1.10	1.05	0.19	0.23	1.01	-0.08	0.03	0.02	-0.02	-0.13	1.15	0.15	0.13	0.03	1.14	0.20	0.20	1.23	1.23	1.25	0.14
188	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
189	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
190	-1.04	-0.05	-1.30	-1.14	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	0.03	-0.97	-0.02	-1.31	-1.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
191	1.20	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
192	-1.04	-1.35	-0.03	-0.02	0.01	-0.09	0.19	0.23	1.01	-0.08	1.10	1.00	-1.09	-1.31	0.15	0.15	-0.95	-1.11	-1.04	0.20	-0.88	0.20	-0.82	-0.87	-0.93
193	0.08	-0.05	1.25	-0.02	0.01	1.05	1.18	1.14	-0.11	1.10	1.10	1.00	1.06	-0.13	0.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	1.23	0.19	1.21
194	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
195	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	0.03	-1.04	0.20	-0.88	-0.84	-0.82	-0.87	-0.93
196	0.08	-0.05	-1.30	-1.14	-1.15	-0.09	-1.80	-1.57	-0.11	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	-2.03	0.03	-1.04	-0.89	-0.88	-0.84	-1.85	-0.87	-0.93
197	-1.04	1.25	-0.03	-1.14	0.01	-1.22	-0.80	-1.57	-1.24	-2.43	-1.05	-1.95	-1.09	-1.31	-2.87	-2.84	-0.95	-2.24	-2.13	-0.89	-0.88	-1.87	-1.85	-1.93	-0.93
198	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
199	0.08	-0.05	1.25	-0.02	0.01	-0.09	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	1.21	0.03	1.14	0.20	0.20	1.23	0.21	0.19	1.21

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
200	1.20	1.25	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	0.03	1.00	-1.09	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
201	-1.04	-0.05	-1.30	-2.26	-2.31	-1.22	-1.80	-0.67	-0.11	-0.08	0.03	-0.97	-1.09	-0.13	-1.86	-1.85	-0.95	0.03	0.05	0.20	0.20	-0.84	-0.82	-0.87	-0.93
202	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	-1.80	-0.67	-2.36	-1.25	-2.12	-2.93	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-1.85	-1.93	-0.93
203	-2.17	-1.35	-1.30	-2.26	-2.31	-2.35	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-0.93
204	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	1.17	1.14	1.28	0.20	0.20	1.23	1.25	1.21
205	-1.04	-1.35	-0.03	-0.02	0.01	-0.09	-0.80	1.14	-0.11	-0.08	-1.05	0.02	-1.09	-1.31	0.15	0.15	-0.95	-2.24	-1.04	-0.89	0.20	-0.84	-0.82	0.19	0.14
206	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	1.23	0.21	0.19	0.14
207	-1.04	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	-1.11	1.14	1.28	1.28	1.23	1.23	1.25	1.21
208	-1.04	-1.35	-1.30	-0.02	-2.31	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-0.13	0.15	-0.85	-0.95	0.03	0.05	-0.89	0.20	0.20	0.21	0.19	-0.93
209	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	0.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
210	1.20	-0.05	1.25	1.10			1.18	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	0.23	1.17	0.05	0.20	0.20	1.23	0.21	1.25	1.21
211	-2.17	-1.35	-1.30	-2.26	-1.15	-2.35	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-2.03	0.03	0.05	0.20	-0.88	-0.84	0.21	0.19	-0.93
212	-1.04	-0.05	-0.03	-1.14	-2.31	-1.22	0.19	0.23	-1.24	-1.25	-1.05	-1.95	-2.17	-2.49	-1.86	-1.85	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	0.21	-0.87	0.14
213	0.08	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.10	0.02	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.21
214	-1.04	1.25	-1.30	-1.14	0.01	-1.22	-0.80	-0.67	-0.11	-1.25	0.03	-0.97	-1.09	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	-0.88	0.20	0.21	0.19	0.14
215	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
216	1.20	1.25	1.25	1.10	0.01	-0.09	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	0.20	1.23	1.23	1.25	1.21
217	0.08	-1.35	-0.03	-1.14	0.01	-0.09	0.19	0.23	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	1.25	0.14
218	1.20	1.25	1.25	-0.02	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	1.14	1.28	0.20	0.20	0.21	1.25	1.21
219	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
220	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	1.14	1.28	1.28	1.23	1.23	1.25	1.21
221	-1.04	-0.05	-0.03	-2.26	-1.15	-2.35	0.19	0.23	-2.36	-1.25	0.03	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-1.04	-0.89	-0.88	-1.87	-1.85	-1.93	-0.93
222	-2.17	-2.65	-2.57	-1.14	-1.15	-1.22	-2.79	-2.48	-1.24	-1.25	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
223	-2.17	-2.65	-2.57	-2.26	-2.31	-2.35	-1.80	-1.57	-2.36	-2.43	-2.12	-1.95	-2.17	-1.31	-0.86	-0.85	-2.03	-1.11	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
224	1.20	1.25	1.25	1.10	1.16	1.05	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	1.28	1.23	1.23	1.25	1.21
225	1.20	-0.05	1.25	-1.14	0.01	-0.09	0.19	0.23	1.01	-0.08	0.03	0.02	-0.02	1.05	0.15	-0.85	-0.95	0.03	-1.04	-0.89	0.20	-1.87	-1.85	-0.87	0.14
226	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
227	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-1.24	-1.25	-3.20	-1.95	-3.25	1.05	-1.86	-1.85	-3.11	-3.38	-3.22	-3.06	-3.04	-2.91	-2.87	-2.99	-3.08
228	0.08	-0.05	-0.03	-1.14	-1.15	-0.09	-0.80	-0.67	-0.11	-1.25	0.03	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	-0.93
229	1.20	1.25	1.25	1.10	0.01	-0.09	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	1.21	1.17	1.14	1.28	1.28	0.20	1.23	1.25	0.14
230	0.08	-0.05	-0.03	1.10	1.16	-0.09	1.18	1.14	-0.11	-0.08	1.10	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	-0.88	1.23	1.23	1.25	1.21
231	-1.04	-1.35	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-1.05	-1.95	-2.17	-1.31	-0.86	-0.85	0.13	-1.11	0.05	0.20	0.20	0.20	0.21	0.19	0.14
232	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
233	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
234	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
235	1.20	-1.35	1.25	1.10	1.16	-1.22	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
236	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
237	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	1.00	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	0.20	0.21	0.19	-0.93
238	-1.04	1.25	1.25	-0.02	0.01	-0.09	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-2.01
239	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	0.19	-0.67	-0.11	-0.08	-1.05	-0.97	-1.09	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-1.87	-0.82	-0.87	-2.01
240	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
241	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
242	-1.04	-0.05	-0.03	-2.26	0.01	-0.09	-2.79	-2.48	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	0.15	-0.85	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-2.01
243	1.20	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	0.20	0.21	0.19	0.14
244	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
245	-1.04	-1.35	-1.30	-1.14	-1.15	-0.09	0.19	-1.57	-0.11	-0.08	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-2.03	-1.11	-2.13	-0.89	-1.96	-0.84	-0.82	-0.87	-2.01
246	-1.04	-1.35	-1.30	-0.02	-1.15	-1.22	0.19	-0.67	-1.24	-0.08	-1.05	-0.97	-1.09	-0.13	0.15	-0.85	-0.95	-1.11	0.05	0.20	0.20	-0.84	-0.82	-0.87	0.14
247	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	1.05	-0.86	-0.85	-0.95	1.17	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
248	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	-0.89	1.28	0.20	0.21	0.19	0.14
249	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-0.13	0.15	0.15	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
250	1.20	-0.05	1.25	1.10	0.01	1.05	0.19	1.14	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	-0.93
251	0.08	-1.35	-1.30	1.10	1.16	1.05	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	0.20	1.23	1.23	1.25	0.14
252	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	1.14	1.01	1.10	1.10	1.00	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	0.14

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
253	0.08	-0.05	-0.09	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
254	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
255	-1.04	-2.65	-0.03	-1.14	-1.15	-0.09	-0.80	-1.57	-2.36	-1.25	-2.12	-1.95	-2.17	-0.13	-0.86	-0.85	-2.03	0.03	-1.04	-1.97	-0.88	-0.84	-1.85	-1.93	0.14
256	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
257	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	0.20	1.23	1.23	1.25	1.21
258	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	1.14	0.20	0.20	0.20	0.21	1.25	1.21
259	1.20	1.25	1.25	1.10	1.16	1.05	0.19	1.14	-0.11	1.16	1.10	-0.02	-0.13	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14		
260	-1.04	-1.35	-1.30	-1.14	0.01	-0.09	0.19	-0.67	-1.24	-0.08	-1.05	-0.97	-0.02	-1.31	-0.86	-0.85	-0.95	-1.11	0.05	0.20	0.20	0.20	-0.82	-0.87	-0.93
261	0.08	-0.05	-0.03	-0.02	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	1.00	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
262	1.20	1.25	1.25	1.10	0.01	1.05	0.19	1.14	1.01	1.10	0.03	0.02	1.06	-0.13	1.15	1.14	1.21	0.03	1.14	1.28	1.28	1.23	0.21	1.25	1.21
263	-1.04	-0.05	-0.09	1.25	1.16	1.05	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	0.19	-0.93
264	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
265	1.20	1.25	1.25	1.10	1.16	1.05	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
266	0.08	1.25	-0.03	-1.14	1.16	-0.09	-1.80	-1.57	-1.24	-2.43	-1.05	0.02	-1.09	-2.49	-0.86	-1.85	0.13	0.03	-1.04	0.20	-0.84	-0.82	0.19	0.14	
267	0.08	-0.05	-0.03	-1.14	-1.15	-0.09	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
268	-1.04	-0.05	-2.57	-2.26	-2.31	-2.35	-1.80	-1.57	-1.24	-2.43	-3.20	-2.93	-1.09	-2.49	-1.86	-1.85	-3.11	0.03	-2.13	-3.06	-3.04	-2.91	-2.87	-2.99	-2.01
269	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	0.13	-1.11	0.05	0.20	-0.88	0.20	0.21	-0.87	-0.93
270	1.20	-0.05	-0.03	1.10	0.01	-0.09	1.18	1.14	1.01	1.10	0.03	0.02	-0.02	-0.13	1.15	1.14	0.13	0.03	1.14	0.20	0.20	0.20	0.21	0.19	-0.93
271	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
272	0.08	-0.05	-0.03	1.10	0.01	-0.09	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.10	1.00	1.28	0.20	1.23	1.23	1.25	1.21
273	0.08	-1.35	-0.03	1.10	0.01	1.05	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-0.13	-0.86	-0.85	-0.95	-1.11	-2.13	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
274	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-1.80	-1.57	-2.36	-1.25	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	-2.03	-2.24	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-0.93
275	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
276	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-1.57	-0.11	-1.25	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
277	0.08	-1.35	-1.30	-2.26	-2.31	-2.35	-1.80	-1.57	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
278	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-1.57	-2.36	-2.43	-2.12	-1.95	-1.09	-1.31	0.15	-0.85	-0.95	-1.11	0.05	-0.89	-0.88	0.20	0.21	-0.87	0.14
279	0.08	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	-0.82	-0.87	0.14
280	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
281	0.08	1.25	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	-1.09	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
282	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	1.17	1.14	0.20	0.20	1.23	1.23	0.19	1.21
283	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
284	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	-0.67	-0.11	-0.08	1.10	-0.97	-1.09	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
285	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
286	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	-1.04	0.20	1.28	0.20	0.21	0.19	1.21
287	-1.04	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	0.13	1.17	1.14	1.28	1.28	0.20	0.21	0.19	1.21
288	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	1.10	1.00	1.06	1.05	0.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
289	0.08	-0.05	-0.03	1.10	0.01	1.05	-0.80	1.14	-0.11	-1.25	-1.05	-0.97	-1.09	1.05	0.15	1.14	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
290	-2.17	-2.65	-1.30	-2.26	-1.15	-2.35	-1.80	-0.67	-1.24	-1.25	-1.05	-1.95	-2.17	-1.31	-0.86	-0.85	-2.03	-1.11	-2.13	-0.89	-0.88	-0.84	-0.82	-0.87	-2.01
291	-2.17	-2.65	-2.57	-1.14	-1.15	-1.22	-1.80	-1.57	-2.36	-1.25	-1.05	-1.95	-2.17	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
292	-2.17	-0.05	-0.03	-2.26	0.01	-0.09	-1.80	-1.57	-2.36	-2.43	-2.12	-1.95	-2.17	-2.49	-1.86	-1.85	-2.03	0.03	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
293	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	0.03	1.14	1.28	1.28	1.23	1.23	1.25	-0.93
294	-1.04	-1.35	-0.03	-1.14	0.01	-0.09	0.19	0.23	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
295	0.08	-0.05	-0.03	-0.02	1.16	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
296	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-0.11	-0.08	0.03	0.02	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
297	-1.04	-0.05	-1.30	-1.14	-1.15	-0.09	-0.80	-0.67	-0.11	-1.25	0.03	0.02	-1.09	-0.13	-0.86	0.15	1.21	1.17	-1.04	0.20	1.28	-0.84	0.21	0.19	0.14
298	-1.04	1.25	-1.30	-0.02	1.16	-0.09	0.19	0.23	-0.11	-0.08	-1.05	-0.97	1.06	-0.13	0.15	0.15	0.13	0.03	-1.04	0.20	0.20	-0.84	0.21	0.19	0.14
299	0.08	-0.05	-0.03	-1.14	0.01	-0.09	0.19	0.23	-0.11	1.10	1.10	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	1.28	0.20	1.23	1.23	1.25	0.14
300	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	0.15	0.15	1.21	0.03	1.14	0.20	0.20	1.23	1.23	1.25	1.21
301	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
302	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
303	-1.04	-2.65	-2.57	-2.26	-2.31	-2.35	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-2.03	-2.24	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
304	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	1.01	-0.08	0.03	1.00	1.06	-0.13	0.15	1.14	1.21	0.03	0.05	0.20	0.20	1.23	0.21	-0.87	0.14
305	1.20	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	0.19	1.21
306	0.08	-1.35	-1.30	1.10	1.16	1.05	1.18	1.14	-0.11	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
307	1.20	1.25	1.25	1.10	1.16	1.05	1.18	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	0.21	0.19	-0.93
308	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
309	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-1.57	-0.11	-0.08	-1.05	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	-1.04	0.20	0.20	-0.84	0.21	0.19	-0.93
310	0.08	-0.05	-0.03	1.10	0.01	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	-0.02	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
311	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
312	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
313	0.08	-0.05	1.25	1.10	1.16	-0.09	0.19	1.14	-0.11	-0.08	0.03	0.02	1.06	-0.13	0.15	0.15	0.13	0.03	1.14	0.20	1.28	0.20	0.21	0.19	-0.93
314	1.20	1.25	1.25	-0.02	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
315	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
316	0.08	-1.35	-0.03	-1.14	-1.15	-0.09	-0.80	-0.67	-0.11	-0.08	-1.05	0.02	-1.09	-1.31	-0.86	-0.85	0.13	-1.11	-1.04	0.20	0.20	0.20	0.21	0.19	0.14
317	0.08	-0.05	-0.03	-1.14	0.01	-0.09	-0.80	-1.57	-0.11	-0.08	1.10	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.05	-0.89	0.20	0.20	-0.84	0.21	0.19	0.14
318	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	-2.24	1.14	1.28	1.28	1.23	1.23	1.25	0.14
319	1.20	1.25	1.25	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	0.20	0.20	1.23	1.25	0.14
320	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	0.19	0.23	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-1.85	-0.87	-0.93
321	-1.04	-1.35	-1.30	-0.02	-1.15	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	0.20	-0.88	-0.84	-0.82	0.19	-0.93
322	0.08	1.25	1.25	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	0.13	0.03	1.14	0.20	0.20	0.20	0.21	0.19	0.14
323	1.20	1.25	1.25	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
324	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
325	1.20	-0.05	1.25	1.10	1.16	1.05	0.19	1.14	1.01	-0.08	0.03	0.02	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	1.23	1.23	1.25	1.21
326	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	1.14	1.28	1.23	1.23	1.23	1.25	1.21
327	0.08	-0.05	-0.03	-1.14	-1.15	-0.09	0.19	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-0.13	-1.86	-1.85	0.13	-1.11	-2.13	-0.89	-1.96	-1.87	-1.85	-0.87	-0.93
328	-1.04	-1.35	-1.30	-0.02	-1.15	-0.09	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-1.09	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	0.19	-0.93
329	0.08	-0.05	-0.03	1.10	1.16	-0.09	0.19	1.14	-0.11	-0.08	0.03	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
330	-1.04	-1.35	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
331	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
332	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	0.20	1.23	1.23	1.25	1.21
333	0.08	-0.05	1.25	-1.14	1.16	-0.09	1.18	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
334	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	1.21	1.17	0.05	0.20	1.28	1.23	1.23	1.25	1.21
335	1.20	1.25	1.25	1.10	1.16	1.05	0.19	1.14	1.01	-0.08	1.10	1.00	1.06	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
336	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-1.09	-1.31	0.15	-0.85	0.13	-1.11	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
337	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	0.23	-1.24	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	0.20	0.20	0.20	-0.82	0.19	0.14
338	1.20	1.25	1.25	1.10	1.16	1.05	0.19	0.23	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	1.21	1.17	0.05	-0.89	1.28	0.20	0.21	0.19	1.21
339	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
340	-2.17	-0.05	-0.03	-1.14	0.01	-0.09	-0.80	-0.67	-2.36	-2.43	-2.12	-1.95	-0.02	-0.13	-0.86	-0.85	-0.95	-2.24	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
341	-1.04	-1.35	-1.30	-1.14	0.01	-1.22	0.19	-0.67	-1.24	-1.25	0.03	-0.97	-0.02	-1.31	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	-0.93
342	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	-1.11	0.05	0.20	0.20	-0.84	0.21	0.19	1.21
343	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
344	1.20	1.25	1.25	1.10	1.16	-0.09	1.18	1.14	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
345	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
346	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
347	0.08	-0.05	1.25	-1.14	-1.15	-1.22	0.19	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
348	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-1.80	-1.57	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
349	-1.04	1.25	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	-0.93
350	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
351	-1.04	-1.35	-0.03	-1.14	-1.15	-0.09	0.19	-0.67	-1.24	-0.08	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	0.20	-0.84	0.21	0.19	1.21
352	-1.04	-0.05	-0.03	-1.14	0.01	-0.09	-1.80	-1.57	-1.24	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	-0.89	0.20	0.20	0.21	-0.87	-0.93
353	1.20	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
354	-1.04	-0.05	-0.03	-0.02	-1.15	-1.22	-0.80	-0.67	-1.24	-0.08	-1.05	-0.97	-0.02	-1.31	0.15	0.15	-0.95	-1.11	-1.04	0.20	-0.88	0.20	0.21	0.19	0.14
355	1.20	-0.05	1.25	1.10	1.16	1.05	0.19	-0.67	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
356	1.20	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	0.03	1.00	1.06	-0.13	1.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
357	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
358	-1.04	-0.05	-0.03	-1.14	0.01	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-1.09	-1.31	-0.86	-0.85	0.13	-1.11	-1.04	0.20	0.20	-0.84	-0.82	0.19	-0.93

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
359	1.20	-0.05	-0.03	1.10	0.01	1.05	0.19	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
360	1.20	-0.05	-0.03	1.10	1.16	1.05	0.19	1.14	1.01	1.10	1.10	1.00	-0.02	1.05	1.15	1.14	1.21	1.17	1.14	1.28	0.20	1.23	1.23	1.25	0.14
361	1.20	1.25	1.25	1.10	-1.15	-1.22	-0.80	-0.67	-2.36	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
362	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
363	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
364	-1.04	-0.05	-1.30	-1.14	0.01	-1.22	0.19	-0.67	-0.11	1.10	1.10	-0.97	-0.02	-0.13	-0.86	0.15	0.13	1.17	-1.04	-0.89	0.20	-0.84	-1.85	-0.87	0.14
365	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
366	1.20	-0.05	-0.03	1.10	0.01	-2.35	-0.80	-0.67	-0.11	-0.08	1.10	1.00	-0.02	-0.13	1.15	1.14	1.21	0.03	1.14	1.28	1.28	1.23	1.23	1.25	-0.93
367	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	1.28	1.23	1.23	1.25	0.14
368	-1.04	-0.05	-1.30	-1.14	-1.15	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-0.13	-0.86	0.15	0.13	0.03	0.05	0.20	-0.88	-0.84	-0.82	-0.87	-0.93
369	-1.04	1.25	-1.30	-1.14	0.01	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	1.23	1.23	1.25	1.21
370	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
371	0.08	-0.05	-0.03	-0.02	0.01	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-1.09	-1.31	0.15	0.15	0.13	0.03	-1.04	0.20	0.20	0.20	0.21	0.19	0.14
372	-1.04	-0.05	-0.03	-0.02	0.01	-1.22	-1.80	-0.67	-0.11	-1.25	-1.05	-0.97	-0.02	-1.31	-0.86	-0.85	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
373	0.08	1.25	1.25	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-1.25	0.03	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	1.14	0.20	0.20	0.20	0.21	0.19	0.14
374	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
375	-1.04	-1.35	-1.30	-1.14	-2.31	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-1.95	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-2.13	-0.89	-1.96	-1.87	-1.85	-1.93	-2.01
376	-1.04	-1.35	-2.57	-1.14	-2.31	-1.22	-1.80	-2.48	-0.11	-1.25	0.03	0.02	-1.09	-0.13	-1.86	-1.85	-2.03	0.03	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
377	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	1.14	1.21	1.17	1.14	1.28	0.20	1.23	0.21	1.25	0.14
378	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
379	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
380	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	0.23	-0.11	-1.25	-2.12	-2.93	-2.17	-1.31	-1.86	-0.85	0.13	-2.24	0.05	-0.89	-0.88	0.20	-0.82	-1.93	-0.93
381	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
382	1.20	1.25	1.25	-0.02	1.16	-0.09	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	0.05	0.20	0.20	-0.84	-0.82	-0.87	-0.93
383	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
384	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	1.17	1.14	0.20	-0.88	1.23	1.23	1.25	0.14
385	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
386	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	0.20	1.23	1.23	1.25	1.21
387	1.20	1.25	1.25	1.10	0.01	-1.22	-0.80	-0.67	-0.11	-1.25	-2.12	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-1.85	-1.93	-0.93
388	0.08	-0.05	-0.03	1.10	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
389	0.08	-0.05	-0.03	1.10	1.16	-0.09	0.19	1.14	-1.24	-1.25	-1.05	-1.95	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	-0.89	0.20	-0.84	-0.82	0.19	0.14
390	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	0.19	-0.67	1.01	1.10	1.10	0.02	1.06	1.05	0.15	0.15	0.13	-1.11	0.05	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
391	-1.04	-2.65	-0.03	-1.14	-1.15	-0.09	-0.80	-1.57	-2.36	-1.25	-2.12	-1.95	-2.17	-0.13	-0.86	-0.85	-2.03	0.03	-1.04	-1.97	-0.88	-0.84	-1.85	-1.93	-2.01
392	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
393	0.08	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
394	0.08	-0.05	-0.03	-1.14	-1.15	-2.35	-0.80	-0.67	-1.24	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	-0.93
395	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	0.15	0.13	0.03	1.14	0.20	0.20	1.23	1.23	0.19	0.14
396	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-1.95	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
397	-1.04	-1.35	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
398	-1.04	-1.35	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
399	1.20	-0.05	-0.03	1.10	0.01	-0.09	-0.80	-0.67	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	1.21	1.17	1.14	1.28	0.20	1.23	1.23	0.19	-0.93
400	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	1.17	1.14	0.20	0.20	1.23	1.23	0.19	1.21
401	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
402	0.08	-0.05	-0.03	1.10	1.16	-0.09	1.18	1.14	-0.11	-0.08	1.10	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	-0.88	1.23	1.23	1.25	1.21
403	-1.04	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	0.13	1.17	1.14	1.28	1.28	0.20	0.21	0.19	1.21
404	1.20	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	-0.97	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
405	0.08	-0.05	-0.03	-1.14	-1.15	-0.09	-0.80	-0.67	-0.11	-1.25	0.03	-0.97	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	-0.93
406	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-1.24	-1.25	-3.20	-1.95	-3.25	1.05	-1.86	-1.85	-3.11	-3.38	-3.22	-3.06	-3.04	-2.91	-2.87	-2.99	-3.08
407	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
408	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	1.17	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
409	-1.04	-0.05	-0.03	-2.26	-2.31	-1.22	-0.80	-1.57	-1.24	1.10	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
410	-1.04	-1.35	-1.30	-0.02	0.01	-2.35	0.19	-1.57	-2.36	-1.25	-2.12	-1.95	-1.09	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	0.19	-2.01

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
411	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	-1.24	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
412	1.20	-1.35	-0.03	1.10	1.16	1.05	1.18	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
413	0.08	-0.05	-0.03	1.10	1.16	-0.09	1.18	0.23	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	0.20	1.23	1.23	1.25	1.21
414	-1.04	-1.35	-1.30	-1.14	0.01	-0.09	-1.80	0.23	-1.24	-1.25	0.03	-0.97	-1.09	-0.13	-1.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	0.21	-1.93	-2.01
415	-2.17	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	0.15	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	0.21	-0.87	-0.93
416	0.08	-0.05	-1.30	-0.02	0.01	1.05	0.19	1.14	1.01	-0.08	-1.05	0.02	-1.09	1.05	-0.86	1.14	1.21	1.17	0.05	1.28	1.28	1.23	1.23	1.25	0.14
417	0.08	-1.35	-0.03	-1.14	-1.15	-1.22	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	-0.93
418	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
419	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
420	1.20	1.25	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	0.03	1.14	1.28	1.28	1.23	1.23	1.25	1.21
421	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	1.14	1.28	1.28	1.23	1.23	1.25	0.14
422	-1.04	-0.05	-1.30	-1.14	0.01	-0.09	-0.80	-0.67	-2.36	-2.43	-2.12	-0.97	-2.17	-1.31	-1.86	-0.85	-0.95	-2.24	-1.04	-1.97	-1.96	-1.87	-1.85	-0.87	-0.93
423	1.20	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
424	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
425	1.20	1.25	1.25	1.10	1.16	-0.09	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
426	0.08	-1.35	-1.30	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-1.05	-1.95	-1.09	-1.31	-0.86	-0.85	-2.03	-1.11	-1.04	-1.97	-1.96	-0.84	-0.82	-0.87	-0.93
427	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
428	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	1.10	1.10	1.00	1.06	1.05	0.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
429	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
430	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
431	1.20	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
432	0.08	1.25	-0.03	-0.02	1.16	1.05	0.19	-0.67	1.01	-0.08	1.10	1.00	1.06	1.05	-0.86	-0.85	0.13	0.03	-1.04	0.20	0.20	-0.84	0.21	0.19	-3.08
433	0.08	-0.05	1.25	1.10	1.16	1.05	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	1.14	1.21	0.03	0.05	1.28	0.20	0.20	0.21	1.25	1.21
434	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	-0.95	-1.11	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
435	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
436	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	0.20	0.20	0.20	0.21	0.19	-0.93
437	0.08	-0.05	-0.03	-1.14	0.01	-0.09	1.18	0.23	-0.11	-0.08	1.10	-0.97	-0.02	-0.13	0.15	1.14	0.13	0.03	0.05	-0.89	-0.88	0.20	0.21	-0.87	0.14
438	0.08	-0.05	-0.03	1.10	-1.15	-0.09	1.18	1.14	-0.11	-0.08	1.10	1.00	-0.02	-0.13	0.15	1.14	0.13	0.03	1.14	0.20	0.20	1.23	1.23	1.25	1.21
439	1.20	1.25	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	0.20	1.23	1.25	0.14
440	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	-0.95	-1.11	-1.04	0.20	0.20	-0.84	-0.82	0.19	0.14
441	-1.04	1.25	-0.03	-2.26	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-2.12	-1.95	-2.17	-2.49	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
442	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	-1.04	0.20	-0.88	-0.84	-0.82	0.19	-0.93
443	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	0.20	0.21	-0.87	-0.93
444	0.08	-0.05	-0.03	1.10	-1.15	-0.09	1.18	1.14	-0.11	-0.08	1.10	1.00	-0.02	-0.13	0.15	1.14	0.13	0.03	1.14	0.20	0.20	1.23	1.23	1.25	1.21
445	1.20	1.25	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	0.20	1.23	1.25	0.14
446	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
447	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
448	-1.04	1.25	-0.03	-2.26	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-2.12	-1.95	-2.17	-2.49	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
449	0.08	-0.05	1.25	1.10	1.16	1.05	1.18	1.14	1.01	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
450	1.20	-0.05	-0.03	-1.14	0.01	-0.09	-0.80	-0.67	1.01	-0.08	1.10	0.02	-0.02	1.05	-0.86	0.15	0.13	-1.11	-1.04	-0.89	0.20	0.20	0.21	0.19	0.14
451	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
452	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
453	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-2.01
454	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	0.03	-1.04	0.20	-0.88	-0.84	-0.82	0.19	-0.93
455	1.20	1.25	1.25	-0.02	-1.15	1.05	1.18	-0.67	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	1.21	1.17	0.05	0.20	0.20	-0.84	0.21	0.19	1.21
456	-1.04	-1.35	-1.30	-1.14	0.01	-2.35	-0.80	-0.67	-0.11	-0.08	-1.05	-1.95	-1.09	-0.13	-1.86	-1.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
457	-1.04	-0.05	-1.30	-1.14	0.01	1.05	-0.80	-0.67	-1.24	-2.43	-1.05	-1.95	-1.09	-1.31	-0.86	-0.85	-2.03	-2.24	-2.13	-0.89	-0.88	-0.84	-0.82	-0.87	-2.01
458	1.20	-0.05	1.25	1.10	0.01	-0.09	1.18	1.14	1.01	-0.08	0.03	1.00	-0.02	-0.13	0.15	0.15	1.21	1.17	1.14	1.28	1.28	-0.84	0.21	-0.87	0.14
459	-1.04	-0.05	-0.03	-0.02	-1.15	-0.09	-0.80	-0.67	-2.36	-0.15	-2.12	-0.97	-0.02	-0.13	-0.86	0.15	-0.95	-1.11	-1.04	0.20	0.20	-0.84	-0.82	-0.87	1.21
460	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
461	-1.04	-1.35	-1.30	-1.14	-1.15	-0.09	-0.80	0.23	-0.11	-0.08	0.03	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
462	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	0.05	0.20	0.20	0.20	0.21	0.19	0.14
463	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	0.23	-0.11	-1.25	-2.12	-2.93	-2.17	-1.31	-1.86	-0.85	0.13	-2.24	0.05	-0.89	-0.88	0.20	-0.82	-1.93	-0.93
464	-1.04	-1.35	-1.30	-0.02	0.01	-0.09	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
465	-1.04	-1.35	-1.30	-1.14	-2.31	-1.22	-0.80	-0.67	-1.24	-1.25	-2.12	-0.97	-1.09	-1.31	-1.86	-1.85	-0.95	-1.11	-2.13	-0.89	-1.96	-1.87	-1.85	-1.93	-2.01
466	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
467	-1.04	-1.35	-0.03	-1.14	-1.15	-0.09	0.19	-1.57	1.01	1.10	0.03	-0.97	-1.09	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	0.14
468	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	-1.11	0.05	0.20	0.20	0.20	0.21	0.19	1.21
469	1.20	-0.05	-0.03	1.10	0.01	1.05	0.19	1.14	1.01	1.10	0.03	1.00	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	1.23	0.19	1.21
470	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-0.11	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	1.17	1.14	0.20	-0.88	1.23	1.23	1.25	0.14
471	1.20	1.25	1.25	-0.02	1.16	-0.09	0.19	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	1.17	0.05	0.20	0.20	-0.84	-0.82	-0.87	0.14
472	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
473	-1.04	-2.65	-2.57	-2.26	-2.31	-2.35	-1.80	-1.57	-2.36	-2.43	-2.12	-1.95	-2.17	-2.49	-0.86	-0.85	-2.03	-2.24	-2.13	-1.97	-1.96	-1.87	-1.85	-1.93	-2.01
474	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
475	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-1.25	-1.05	0.02	-0.02	-0.13	-0.86	-0.85	-0.95	0.03	0.05	-0.89	-0.88	-0.84	0.21	-0.87	-0.93
476	-1.04	1.25	-1.30	-0.02	1.16	-0.09	0.19	0.23	-0.11	-0.08	-1.05	-0.97	1.06	-0.13	0.15	0.15	0.13	0.03	-1.04	0.20	0.20	-0.84	0.21	0.19	0.14
477	0.08	-0.05	-0.03	-1.14	0.01	-0.09	0.19	0.23	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	1.28	0.20	1.23	1.23	1.25	0.14
478	-1.04	-0.05	-1.30	-1.14	-1.15	-1.30	-0.80	-0.67	-1.24	-1.25	0.03	0.02	-1.09	-0.13	-0.86	0.15	1.21	1.17	-1.04	0.20	1.28	-0.84	0.21	0.19	0.14
479	-1.04	-1.35	-1.30	-2.26	-2.31	-0.09	-0.80	-0.67	-1.24	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	-3.11	-1.11	-2.13	-1.97	-3.04	-1.87	-1.85	-1.93	-2.01
480	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
481	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
482	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	-0.11	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	1.21
483	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	0.14
484	-1.04	-1.35	-1.30	-1.14	-1.15	-0.09	-0.80	-0.67	-0.11	-2.43	-1.05	-1.95	-1.09	-1.31	-1.86	-1.85	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
485	-1.04	-0.05	-0.03	-0.02	-1.15	-1.22	-1.80	-1.57	-1.24	-1.25	-1.05	-1.95	-2.17	-1.31	-0.86	-1.85	-0.95	-1.11	-1.04	0.20	-0.88	-0.84	-0.82	0.19	-2.01
486	0.08	-0.05	1.25	-0.02	0.01	-0.09	0.19	0.23	-1.24	-0.08	0.03	-0.97	-0.02	1.05	0.15	0.15	-0.95	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
487	1.20	-0.03	-0.03	1.10	1.16	1.05	1.18	0.23	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	0.19	-2.01
488	1.20	1.25	1.25	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	1.21
489	0.08	-0.05	1.25	-0.02	0.01	1.05	1.18	1.14	1.01	1.10	1.10	0.02	1.06	1.05	1.15	0.15	1.21	0.03	0.05	0.20	0.20	1.23	1.23	1.25	1.21
490	0.08	-0.05	-0.03	-0.02	-1.15	-1.22	-0.80	-1.57	-1.24	-1.25	-1.05	0.02	-1.09	-0.13	0.15	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	-0.93
491	0.08	-0.05	-0.03	1.10	1.16	1.05	1.18	1.14	1.01	1.10	0.03	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
492	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	1.01	1.10	-1.05	1.00	-0.02	-0.13	1.15	1.14	1.21	0.03	1.14	1.28	1.28	1.23	1.23	1.25	1.21
493	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
494	0.08	-0.05	-0.03	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	0.05	1.28	1.28	1.23	1.23	1.25	0.14
495	1.20	1.25	1.25	1.10	0.01	1.05	-0.80	0.23	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	-1.11	1.14	1.28	1.28	1.23	1.23	1.25	0.14
496	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
497	-1.04	-1.35	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
498	-1.04	-1.35	-1.30	-0.02	0.01	1.05	-0.80	-0.67	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
499	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-1.95	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
500	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	1.14	0.20	0.20	1.23	1.23	0.19	0.14
501	0.08	-0.05	-0.03	-1.14	-1.15	-2.35	-0.80	-0.67	-1.24	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	-0.93
502	0.08	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
503	1.20	-0.05	1.25	1.10	0.01	-0.09	1.18	1.14	1.01	1.10	0.03	1.00	-0.02	-0.13	0.15	0.15	1.21	1.17	1.14	1.28	1.28	-0.84	0.21	-0.87	0.14
504	-1.04	-0.05	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	0.03	-0.97	-1.09	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	0.19	-0.93
505	1.20	1.25	1.25	-0.02	0.01	1.05	0.19	1.14	1.01	1.10	0.03	1.00	-0.02	1.05	0.15	1.14	1.21	1.17	0.05	1.28		1.23	1.23	1.25	1.21
506	0.08	-0.05	-0.03	-0.02	0.01	-2.35	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
507	0.08	-0.05	-0.03	-0.02	-1.15	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	0.03	-1.04	-0.89	0.20	-0.84	-0.82	0.19	0.14
508	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
509	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	-1.04	-1.97	-1.96	-1.87	-1.85	-0.87	-0.93
510	1.20	1.25	-1.30	-1.14	-1.15	-1.22	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
511	0.08	-0.05	1.25	-0.02	0.01	-0.09	1.18	1.14	1.01	1.10	0.03	0.02	-0.02	-0.13	1.15	0.15	1.21	0.03	1.14	1.28	0.20	1.23	1.23	1.25	1.21
512	-1.04	-1.35	-0.03	-1.14	-1.15	-1.22	-0.80	-0.67	-0.11	-0.08	0.03	-0.97	-1.09	-0.13	-1.86	-0.85	0.13	0.03	-1.04	0.20	-0.88	-0.84	-0.82	0.19	-0.93
513	0.08	-0.05	-0.03	-1.14	-1.15	-1.22	0.19	-0.67	-0.11	-0.08	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-2.03	1.17	1.14	-0.89	-0.88	-1.87	-0.82	-0.87	-2.01
514	0.08	-1.35	-0.03	-0.02	0.01	-1.22	0.19	-0.67	-0.11	-1.25	0.03	-0.97	-1.09	-1.31	0.15	0.15	0.13	0.03	-1.04	-0.89	0.20	-0.84	-0.82	-0.87	-2.01
515	0.08	-0.05	-0.03	-0.02	-1.15	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	-0.86	-0.85	0.13	-1.11	-1.04	-0.89	0.20	-0.84	-0.82	-0.87	0.14
516	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	P1	P2	P3	I1	I2	I3	PR1	PR2	N1	N2	N3	N4	N5	N6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
517	1.20	-0.05	-0.03	1.10	0.01	-0.09	-0.80	-0.67	1.01	1.10	0.03	1.00	1.06	1.05	1.15	0.15	1.21	1.17	1.14	1.28	0.20	1.23	1.23	0.19	-0.93
518	-1.04	-1.35	-1.30	-1.14	-1.15	-0.09	0.19	-0.67	-1.24	-1.25	0.03	-0.97	-0.02	-0.13	-0.86	-1.85	-0.95	0.03	-2.13	-0.89	-0.88	-1.87	-0.82	-1.93	-2.01
519	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	-0.86	-0.85	-0.95	-1.11	-2.13	-0.89	-1.96	-1.87	-2.87	-0.87	-0.93
520	0.08	1.25	-0.03	-0.02	0.01	-0.09	1.18	1.14	-0.11	-0.08	0.03	0.02	1.06	1.05	0.15	0.15	-0.95	-1.11	-1.04	-0.89	0.20	-1.87	-0.82	-0.87	0.14
521	0.08	-0.05	-0.03	-0.02	0.01	-2.35	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
522	-2.17	-1.35	-1.30	-1.14	-1.15	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-1.09	-1.31	0.15	0.15	-0.95	-2.24	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
523	1.20	1.25	1.25	-0.02	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	0.15	1.21	1.17	1.14	0.20	-0.88	1.23	1.23	0.19	0.14
524	1.20	-0.05	1.25	-0.02	-1.15	-2.35	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	0.15	1.14	0.13	1.17	0.05	0.20	0.20	1.23	1.23	1.25	0.14
525	-1.04	-0.05	-1.30	-1.14	-1.15	-0.09	-0.80	-1.57	-0.11	1.10	0.03	-1.95	-1.09	-0.13	-0.86	0.15	0.13	0.03	-1.04	-0.89	0.20	-0.84	-0.82	0.19	-0.93
526	-1.04	-0.05	-0.03	-0.02	1.16	1.05	1.18	0.23	-0.11	1.10	0.03	1.00	-0.02	1.05	1.15	1.14	1.21	0.03	1.14	1.28	0.20	1.23	1.23	1.25	1.21
527	1.20	1.25	1.25	-0.02	0.01	1.05	0.19	1.14	1.01	1.14	0.03	1.00	-0.02	1.05	0.15	1.14	1.21	1.17	0.05	0.20	0.20	1.23	1.23	1.25	1.21
528	0.08	1.25	-0.03	-0.02	1.16	-1.22	1.18	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	-0.86	-0.85	0.13	1.17	-2.13	0.20	0.20	-0.84	-0.82	-0.87	-0.93
529	-1.04	-1.35	-0.03	-0.02	0.01	-0.09	1.18	1.14	-1.24	-1.25	-1.05	1.00	1.06	1.05	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.20	0.21	0.19
530	1.20	1.25	1.25	1.10	0.01	1.05	1.18	1.14	-0.11	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	0.20	1.28	1.23	1.23	0.19	0.14
531	0.08	-0.05	1.25	1.10	0.01	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
532	0.08	-0.05	-0.03	-0.02	0.01	-0.09	1.18	0.23	1.01	1.10	1.10	1.00	1.06	-2.49	0.15	0.15	0.13	0.03	0.05	0.20	-1.96	0.20	0.21	0.19	-0.93
533	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
534	-1.04	-1.35	-1.30	-1.14	-1.15	-1.22	-0.80	-1.57	-2.36	-2.43	-1.05	-0.97	-1.09	-2.49	-0.86	-0.85	-0.95	0.03	-1.04	0.20	-0.88	0.20	-0.82	-0.87	0.14
535	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	-0.93
536	0.08	-1.35	-0.03	-0.02	-1.15	-1.22	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	0.03	1.14	1.28	1.28	1.23	1.23	1.25	1.21
537	0.08	-0.05	-0.03	1.10	1.16	1.05	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	1.15	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
538	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	0.03	0.05	0.20	-0.88	-0.84	-0.82	0.19	0.14
539	0.08	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
540	-1.04	-1.35	-0.03	-1.14	-1.15	-0.09	0.19	-1.57	1.01	1.10	0.03	-0.97	-1.09	-0.13	0.15	0.15	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	0.14
541	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	0.13	0.03	0.05	0.20	0.20	0.20	0.21	0.19	0.14
542	1.20	1.25	1.25	1.10	1.16	1.05	1.18	1.14	1.01	1.10	1.10	1.00	1.06	1.05	1.15	1.14	1.21	1.17	1.14	1.28	1.28	1.23	1.23	1.25	1.21
543	-1.04	-0.05	-1.30	-1.14	-1.15	-1.22	-0.80	0.23	-0.11	-0.08	-1.05	0.02	-0.02	-1.31	-0.86	-0.85	0.13	0.03	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
544	0.08	-0.05	-0.03	-0.02	-1.15	-1.22	-0.80	-1.57	-1.24	-1.25	-1.05	0.02	-1.09	-0.13	0.15	-0.85	0.13	0.03	0.05	-0.89	0.20	-0.84	0.21	0.19	-0.93
545	-1.04	-0.05	-0.03	-0.02	0.01	-0.09	-0.80	-0.67	-1.24	-1.25	-1.05	-0.97	-0.02	-0.13	-0.86	-0.85	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	0.14
546	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93
547	0.08	-0.05	-0.03	-0.02	0.01	-0.09	0.19	0.23	-0.11	-0.08	0.03	0.02	-0.02	-0.13	0.15	0.15	-0.95	-1.11	-1.04	-0.89	-0.88	-0.84	-0.82	-0.87	-0.93

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
1	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	-1.90	-0.91	0.34	-1.64	-0.70	-1.58	-0.65	-0.65	0.33	0.55	-0.63	-1.65	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
2	1.06	0.15	-3.28	-3.12	-2.81	-0.98	-0.59	-0.84	-0.91	1.32	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
3	0.04	-0.83	-1.16	-0.98	-0.90	-0.98	0.53	0.23	0.31	-0.65	0.33	0.29	-0.62	0.35	-0.65	-0.64	0.55	-0.63	0.51	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
4	1.06	-0.83	-2.30	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	0.45	0.51	0.63	-1.44	-1.21	-0.01	-1.55	-1.25
5	-0.97	0.15	-1.16	-0.98	-0.90	-0.98	-0.59	0.23	-0.91	-1.63	-1.64	0.29	-0.62	-0.65	-0.65	-0.64	0.55	0.45	-0.57	0.63	-1.44	-0.07	-0.01	-0.31	-0.08
6	1.06	0.15	-0.02	0.09	1.01	1.23	1.64	1.30	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
7	0.04	-0.83	-1.16	-0.98	0.06	0.12	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	0.51	-0.49	-1.44	-0.07	-0.01	-1.55	-0.08
8	1.06	1.12	1.11	-0.98	1.01	1.23	-1.70	1.30	-0.91	1.32	1.31	1.29	1.32	1.35	0.31	0.33	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
9	1.06	0.15	-0.02	0.09	0.06	1.23	-0.59	1.30	-0.91	1.32	0.33	0.29	0.35	0.35	0.31	1.30	1.64	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
10	-0.97	-0.83	-0.02	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-0.54	-1.71	-1.65	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
11	0.04	1.12	-0.02	0.09	0.06	1.23	0.53	-0.84	0.31	1.32	1.32	1.31	1.29	1.32	1.35	1.27	0.33	0.55	0.45	0.63	-1.44	-1.21	-0.01	-0.31	-1.25
12	1.06	-0.83	-0.02	-0.98	-0.90	1.23	-0.59	1.30	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	1.59	0.63	0.95	-1.21	1.16	0.92	-1.25
13	-0.97	-1.80	-2.30	-2.05	-0.90	-0.98	0.53	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-1.19	-1.55	-1.25
14	-0.97	-0.83	1.11	1.15	-0.90	-0.98	-0.59	0.23	0.31	-1.63	-0.65	-0.70	-0.62	-0.65	-0.65	-1.61	-0.54	1.53	0.51	1.75	-1.44	-1.21	-1.19	-1.55	-1.25
15	-0.97	-0.83	-0.02	0.09	0.06	-2.09	-1.70	-0.84	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-0.57	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
16	1.06	-1.80	-2.30	-2.05	-1.85	-0.98	-0.59	1.30	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-1.61	-0.54	-0.63	-1.65	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
17	-3.00	-1.80	-1.16	-0.98	-1.85	-3.20	-2.82	-2.97	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-1.65	-1.61	-2.64	-2.35	-2.36	-2.78	-2.43
18	-0.97	-0.83	-1.16	-0.98	-0.90	1.23	0.53	0.23	0.31	0.34	0.33	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-1.55	-1.25
19	-1.99	-0.83	-0.02	0.09	0.06	-2.09	-1.70	-0.84	0.31	0.34	0.33	0.29	-0.62	0.35	-0.65	-0.64	0.55	-1.71	-0.57	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
20	-0.97	0.15	-1.16	0.09	-1.85	-0.98	1.64	0.23	-0.91	-0.65	-0.65	0.29	-0.62	-1.66	-0.65	0.33	0.55	-0.63	0.51	-0.49	-0.24	-1.21	-0.01	-2.78	-1.25
21	-1.99	1.12	-1.16	0.09	0.06	-0.98	-1.70	-0.84	0.31	0.34	0.33	0.29	1.32	0.35	0.31	0.33	-0.54	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-1.25
22	-1.99	-1.80	-1.16	-0.98	-1.85	0.12	0.53	-0.84	-2.14	-1.63	-1.64	-1.70	-0.62	-0.65	-1.61	-1.61	-1.62	-1.71	-2.72	-1.61	-2.64	-1.21	-1.19	-2.78	-1.25
23	-0.97	-1.80	-0.02	0.09	0.06	1.23	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	0.35	-0.65	0.31	-1.61	0.55	0.45	-1.65	0.63	-1.44	-1.21	-0.01	-1.55	-1.25
24	0.04	0.15	-0.02	0.09	1.01	0.12	-0.59	0.23	1.54	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
25	-0.97	-1.80	-1.16	0.09	-0.90	-0.98	-0.59	-0.84	0.31	0.34	0.33	0.29	0.35	0.35	-1.61	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-0.01	-1.55	-1.25
26	1.06	1.12	-0.02	0.09	1.01	1.23	1.64	0.23	0.31	0.34	1.31	1.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	1.16	-0.31	-0.08
27	0.04	-0.83	-1.16	-0.98	0.06	0.12	0.53	0.23	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-2.57	-2.58	-2.71	0.45	-0.57	0.63	-1.44	-1.21	-0.01	-0.31	-1.25
28	0.04	0.15	-1.16	-0.98	-0.90	-0.98	-0.59	0.23	0.31	0.34	1.31	1.29	1.32	1.35	0.31	0.33	0.55	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
29	0.04	1.12	-0.02	0.09	0.06	0.12	0.53	0.23	-0.91	-1.63	-1.64	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
30	0.04	-0.83	-1.16	-0.98	0.06	-0.98	0.53	-0.84	0.31	0.34	0.33	0.29	-0.62	-0.65	-0.65	0.33	0.55	0.45	0.51	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
31	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
32	-0.97	0.15	-0.02	0.09	0.06	-0.98	0.53	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
33	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	-1.70	0.23	0.31	-0.65	-0.65	0.29	0.35	0.35	0.31	-0.64	-0.54	1.53	1.59	1.75	-0.24	-1.21	-0.01	-0.31	-1.25
34	0.04	1.12	1.11	1.15	1.01	0.12	0.53	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
35	1.06	-1.80	-0.02	0.09	-0.90	1.23	0.53	1.30	-2.14	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	1.64	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-1.25
36	0.04	1.12	1.11	1.15	1.01	0.12	-0.59	1.30	0.31	-0.65	1.31	-0.70	0.35	0.35	-0.65	-0.64	-0.54	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
37	1.06	1.12	-1.16	-0.98	0.06	0.12	0.53	1.30	1.54	0.34	0.33	0.29	0.35	0.35	1.27	0.33	1.64	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	0.92	-0.08
38	0.04	-0.83	-0.02	0.09	-0.90	-0.98	-0.59	-0.84	-0.91	0.34	-0.65	-0.70	-0.62	-0.65	-1.61	-0.64	-0.54	0.45	-0.57	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
39	0.04	0.15	-1.16	-0.98	0.06	-0.98	0.53	-0.84	0.31	0.34	-0.65	-0.70	-0.62	0.35	-0.65	-0.64	0.55	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
40	0.04	0.15	-1.16	-0.98	0.06	-2.09	0.53	-0.84	1.54	0.34	-0.65	-1.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
41	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	1.64	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
42	1.06	1.12	1.11	-0.98	1.01	0.12	0.53	0.23	1.54	-0.65	0.33	0.29	0.35	0.35	0.31	0.33	0.55	-0.63	1.59	-0.49	-0.24	1.07	1.16	-0.31	1.09
43	-0.97	-0.83	-1.16	-0.98	0.06	-0.98	-0.59	-0.84	0.31	0.34	0.33	-0.70	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
44	0.04	0.15	-1.16	-0.98	-1.85	-0.98	-1.70	0.23	-2.14	-1.63	-1.64	-1.70	-2.55	-1.66	-0.65	-1.61	-1.62	-0.63	-1.65	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
45	-0.97	-1.80	-2.30	-2.05	-1.85	-0.98	0.53	0.23	-0.91	-1.63	-1.64	-0.70	-1.58	-0.65	0.31	-0.64	0.55	0.45	-0.57	0.63	-1.44	-2.35	-1.19	-0.31	-2.43
46	0.04	-1.16	-0.98	-0.90	0.12	-0.59	-0.84	0.31	-0.65	-0.65	0.29	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
47	0.04	1.12	-0.02	0.09	0.06	1.23	0.53	0.23	0.31	1.32	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
48	0.04	1.12	-1.16	-0.98	1.01	0.12	-0.59	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	1.53	0.51	1.75	-0.24	-0.07	-0.01	-0.31	-0.08

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
49	0.04	1.12	-1.16	0.09	0.06	-2.09	-1.70	0.23	0.31	-0.65	0.33	0.29	0.35	0.35	-0.65	-0.64	-1.62	0.45	0.51	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
50	0.04	1.12	-2.30	-0.98	0.06	-2.09	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	1.53	0.51	1.75	-1.44	-1.21	-0.01	-1.55	-1.25
51	0.04	1.12	-1.16	1.15	1.01	-0.98	-0.59	1.30	1.54	1.32	1.31	1.29	1.32	1.35	0.31	0.33	0.55	1.53	1.59	1.75	-1.44	-1.21	-1.19	-1.55	-1.25
52	-0.97	0.15	-1.16	-0.98	1.01	-2.09	-0.59	0.23	1.54	1.32	1.31	1.29	1.32	1.35	0.31	0.33	1.64	1.53	0.51	1.75	0.95	1.07	-1.19	0.92	1.09
53	1.06	1.12	-1.16	-0.98	-0.90	-2.09	-1.70	-0.84	0.31	1.32	0.33	1.29	1.32	0.35	0.31	0.33	1.64	1.53	1.59	1.75	-1.44	-1.21	-1.19	-0.31	-1.25
54	-0.97	-0.83	-2.30	-0.98	-0.90	-2.09	-0.59	-0.84	0.31	-0.65	-0.65	-1.70	-0.62	0.35	0.31	-0.64	0.55	0.45	-0.57	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
55	1.06	-2.78	-1.16	-2.05	-0.90	-0.98	-0.59	-2.97	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-2.57	-2.58	-1.62	1.53	0.51	1.75	-1.44	-1.21	-0.01	-0.31	-1.25
56	-0.97	-1.80	-0.02	0.09	-0.90	-0.98	-1.70	-0.84	-0.91	-0.65	-0.65	0.29	-0.62	-0.65	-0.65	-0.64	0.55	-0.63	-0.57	-0.49	-1.44	-1.21	-0.01	-0.31	-1.25
57	-0.97	0.15	-0.02	0.09	0.06	0.12	0.53	1.30	1.54	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	0.92	-0.08
58	1.06	1.12	-0.02	0.09	1.01	1.23	-0.59	1.30	0.31	0.34	-0.65	0.29	0.35	-0.65	1.27	0.33	1.64	1.53	0.51	1.75	0.95	-0.07	1.16	0.92	-0.08
59	0.04	-0.83	-0.02	0.09	0.06	0.12	1.64	0.23	0.31	-0.65	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-1.55	-0.08
60	-0.97	0.15	-0.02	0.09	0.06	-0.98	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	-0.57	0.63	-1.44	-1.21	-0.01	-1.55	-1.25
61	1.06	0.15	1.11	1.15	0.06	1.23	1.64	1.30	0.31	-0.65	0.33	0.29	0.35	0.35	0.31	-0.64	0.55	0.45	-0.57	0.63	-0.24	-1.21	-0.01	-0.31	-1.25
62	0.04	-0.83	-1.16	-0.98	-1.85	-2.09	-0.59	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-2.57	-2.58	-2.71	-2.78	-2.72	-2.73	-1.44	-1.21	-1.19	-1.55	-1.25
63	0.04	-0.83	-0.02	0.09	0.06	0.12	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	-1.65	-0.49	0.95	1.07	-0.01	0.92	1.09
64	1.06	1.12	-0.02	0.09	1.01	1.23	-1.70	-1.90	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
65	0.04	0.15	-2.30	-0.98	-0.90	-2.09	-0.59	-1.90	-0.91	-0.65	-1.64	-1.70	-1.58	-0.65	-0.65	0.33	-0.54	-1.71	-0.57	-0.49	-2.64	-1.21	-1.19	-2.78	-1.25
66	-0.97	-2.78	-2.30	-2.05	-0.90	-0.98	-1.70	-0.84	-2.14	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-0.54	0.45	0.51	-1.61	-2.64	-1.21	-1.19	-1.55	-1.25
67	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-2.82	-0.84	0.31	0.34	-0.65	-0.70	0.35	-0.65	-1.61	-1.61	0.55	0.45	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
68	-1.99	-0.83	-1.16	-0.98	0.06	0.12	0.53	0.23	0.31	-0.65	0.33	-0.70	-0.62	0.35	0.31	-0.64	0.55	0.45	-0.57	-0.49	-2.64	-1.21	-2.36	-1.55	-1.25
69	0.04	0.15	-2.30	-2.05	0.06	1.23	0.53	0.23	-0.91	0.34	-1.64	0.29	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-0.01	-0.31	-1.25
70	1.06	0.15	-0.02	0.09	0.06	0.12	0.53	1.30	0.31	0.34	-0.65	0.29	-0.62	0.35	0.31	-0.64	-0.54	0.45	0.51	0.63	0.95	-0.07	-0.01	-0.31	-0.08
71	-0.97	-0.83	-0.02	0.09	-1.85	-0.98	0.53	0.23	1.54	0.34	0.33	0.29	0.35	0.35	0.31	1.30	1.64	1.53	1.59	0.63	-0.24	-0.07	-0.01	0.92	-0.08
72	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-0.64	0.55	-0.63	-0.57	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
73	0.04	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	0.23	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	-0.54	-1.71	-0.57	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
74	1.06	0.15	1.11	1.15	1.01	1.23	-0.59	1.30	0.31	-0.65	0.33	-0.70	0.35	-0.65	-0.65	1.30	0.55	1.53	1.59	1.75	0.95	-1.21	1.16	-0.31	-1.25
75	0.04	0.15	-0.02	0.09	1.01	0.12	-1.70	-1.90	-0.91	1.32	1.31	1.29	1.32	1.35	0.35	1.64	1.64	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
76	-1.99	-1.80	-1.16	-0.98	-1.85	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
77	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	-1.21	-0.01	-1.55	-1.25
78	1.06	1.12	-0.02	0.09	1.01	1.23	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	0.31	0.33	0.55	-0.63	-0.57	0.63	-0.24	-0.07	-0.01	0.92	-0.08
79	1.06	1.12	-1.16	0.09	1.01	1.23	-0.59	1.30	0.31	0.34	1.31	-0.70	-0.62	-0.65	1.27	1.30	1.64	0.45	-0.57	0.63	0.95	-0.07	-0.01	0.92	-0.08
80	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	1.30	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-0.64	0.55	1.53	0.51	1.75	-0.24	1.07	-1.19	0.92	1.09
81	-1.99	-1.80	-0.02	0.09	-0.90	0.12	-0.59	0.23	0.31	0.34	0.33	0.29	0.35	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
82	-0.97	-0.83	-0.02	-2.05	-0.90	0.12	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
83	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-1.65	-1.61	-2.64	-2.35	-2.36	-2.78	-2.43
84	-0.97	-0.83	-0.02	0.09	1.01	1.23	-0.59	1.30	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	1.53	-0.57	1.75	-1.44	1.07	-0.01	0.92	1.09
85	0.04	-0.83	-0.02	0.09	0.06	1.23	1.64	1.30	-0.91	0.34	-0.65	0.29	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
86	0.04	1.12	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
87	-0.97	0.15	-0.02	0.09	1.01	-0.98	-1.70	-1.90	-0.91	0.34	0.33	0.29	1.32	0.35	0.31	0.33	1.64	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
88	0.04	0.15	-0.02	0.09	-0.90	-0.98	0.53	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	-0.07	-0.01	-0.31	-0.08
89	-0.97	-0.83	1.11	-0.98	-1.85	-0.98	0.53	0.23	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	0.31	-0.64	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
90	-0.97	-0.83	-1.16	-0.98	-0.90	-2.09	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
91	1.06	1.12	-0.02	-0.98	0.06	1.23	0.53	0.23	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
92	-0.97	-0.83	-0.02	-0.98	0.06	1.23	-0.59	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-1.62	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	-0.31	-0.08
93	0.04	-0.83	-0.02	1.15	-0.90	1.23	0.53	-0.84	0.31	-0.65	0.33	1.29	0.35	0.35	-0.65	-0.64	-0.54	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
94	-1.99	-1.80	-1.16	-0.98	-1.85	-2.09	-0.59	-0.84	-2.14	-0.65	-0.65	-0.70	-1.58	-1.66	-0.65	-0.64	0.55	0.45	-0.57	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
95	0.04	0.15	-0.02	0.09	0.06	-0.98	-0.59	0.23	-0.91	-1.63	-1.64	-0.70	-0.62	-0.65	-0.65	0.33	0.55	0.45	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
96	0.04	1.12	-1.16	-0.98	0.06	0.12	0.53	-0.84	0.31	-0.65	1.31	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
97	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-2.82	-1.90	-0.91	-1.63	-1.64	-0.70	-1.58	-0.65	-1.61	-1.61	-0.54	-1.71	-1.65	0.63	-0.24	-1.21	-1.19	-0.31	-1.25

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
98	-0.97	-0.83	-0.02	-2.05	0.06	1.23	0.53	-0.84	0.31	0.34	-0.65	0.29	0.35	0.35	0.31	-0.64	-0.54	1.53	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-1.25
99	1.06	1.12	1.11	0.09	1.01	0.12	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
100	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	1.54	-0.65	0.33	-0.70	0.35	0.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
101	1.06	1.12	-0.02	1.15	1.01	0.12	-2.82	-1.90	-2.14	-0.65	-1.64	-0.70	-2.55	-2.66	-0.65	-0.64	-1.62	-2.78	-2.72	-2.73	-0.24	-0.07	-0.01	-0.31	-0.08
102	1.06	0.15	1.11	1.15	1.01	1.23	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
103	0.04	1.12	1.11	0.09	-0.90	-0.98	-2.82	-0.84	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
104	0.04	1.12	-0.02	1.15	1.01	0.12	-1.70	-0.84	1.54	0.34	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
105	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	0.33	0.29	-0.62	-0.65	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
106	1.06	0.15	1.11	1.15	1.01	0.12	-0.59	0.23	0.31	0.34	-0.65	1.29	0.35	0.35	1.27	1.30	0.55	-0.63	0.51	-0.49	0.95	1.07	1.16	0.92	1.09
107	0.04	1.12	-0.02	0.09	0.06	1.23	-0.59	-1.90	-0.91	1.32	1.31	0.29	1.32	1.35	1.27	1.30	1.64	-1.71	-1.65	-1.61	-0.24	-0.07	-0.01	-0.31	-0.08
108	0.04	0.15	-0.02	0.09	0.06	-0.98	1.64	1.30	0.31	-0.65	-1.64	-1.70	-0.62	-0.65	-0.64	-0.54	-1.71	-1.65	-1.61	-1.44	-0.24	-0.07	-0.01	-0.31	-0.08
109	0.04	0.15	-0.02	0.09	-1.85	0.12	-0.59	0.23	-0.91	-1.63	0.33	0.29	-0.62	-0.65	-1.61	-1.61	-0.54	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-1.25
110	0.04	0.15	-0.02	0.09	-0.90	0.12	-1.70	0.23	-0.91	-1.63	-0.65	-0.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-1.25
111	0.04	-1.80	-0.02	0.09	-0.90	-0.98	0.53	0.23	0.31	-0.65	-0.65	-0.70	0.35	0.35	-0.65	-0.64	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
112	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	-1.70	0.23	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	1.53	-2.72	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
113	-0.97	0.15	-1.16	1.15	0.06	-0.98	0.53	1.30	0.31	-0.65	0.33	0.29	-0.62	-0.65	-1.61	-1.61	-0.54	1.53	0.51	0.63	-0.24	-1.21	-1.19	0.92	-1.25
114	0.04	1.12	-0.02	1.15	1.01	1.23	-2.82	1.30	1.54	0.34	1.31	1.29	1.32	1.35	0.35	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
115	1.06	1.12	-0.02	0.09	1.01	0.12	1.64	1.30	0.31	1.32	0.33	0.29	0.35	0.35	1.27	1.30	1.64	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
116	-0.97	-0.83	-0.02	1.15	0.06	-2.09	0.53	-1.90	0.31	-0.65	-1.64	0.29	0.35	-1.66	-0.65	-1.61	-0.54	0.45	0.51	-0.49	-0.24	-1.21	-1.19	-0.31	-1.25
117	1.06	1.12	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	-0.65	0.33	-0.70	0.35	-0.65	0.31	0.33	0.55	-0.63	-0.57	-1.61	0.95	1.07	1.16	0.92	1.09
118	-0.97	0.15	-0.02	-0.98	-0.90	-0.98	0.53	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	-0.49	-1.44	-1.21	-0.01	-1.55	-1.25
119	1.06	1.12	-0.02	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	1.32	0.35	0.31	-0.64	-0.54	-1.71	-1.65	-2.73	-0.24	-1.21	-1.19	-0.31	-1.25
120	1.06	1.12	1.11	1.15	1.01	1.23	0.53	0.23	1.54	1.32	0.33	1.29	0.35	1.35	1.27	1.30	1.64	-0.63	-0.57	-1.61	-0.24	-0.07	-0.01	-0.31	-0.08
121	-0.97	-0.83	1.11	1.15	-0.90	1.23	-0.59	1.30	0.31	1.32	1.31	1.29	1.32	1.35	0.31	-0.64	-0.54	-0.63	0.51	-1.61	0.95	1.07	1.16	0.92	1.09
122	-1.99	-1.80	-1.16	-0.98	-1.85	-0.98	-1.70	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-1.61	-1.62	-1.71	-1.65	-1.61	-2.64	-2.35	-1.19	-1.55	-2.43
123	-0.97	-0.83	-0.02	-0.98	-0.90	-0.98	0.53	0.23	0.31	-0.65	0.33	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	0.45	0.51	-0.49	-1.44	-1.21	-0.01	-0.31	-1.25
124	0.04	-0.83	1.11	0.09	0.06	0.12	0.53	-0.84	-0.91	0.34	-0.65	-0.70	0.35	-0.65	0.31	-0.64	0.45	0.45	0.51	-0.49	-0.24	-0.07	-1.19	-0.31	-0.08
125	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	-0.91	0.34	-0.65	0.29	-0.62	-0.65	0.31	1.30	1.64	-0.63	-0.57	-0.49	-1.44	-0.07	1.16	-0.31	-0.08
126	0.04	-0.83	-1.16	-0.98	1.01	-0.98	0.53	-0.84	1.54	0.34	0.33	-0.70	0.35	-0.65	1.27	1.30	0.55	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
127	0.04	0.15	1.11	1.15	1.01	-0.98	-0.59	0.23	-0.91	0.34	-0.65	-0.70	-0.62	0.35	0.31	1.30	1.64	-0.63	-0.57	0.63	-0.24	-1.21	-1.19	0.92	-1.25
128	0.04	-0.83	-1.16	-0.98	-0.90	0.12	0.53	-0.84	-0.91	-0.65	1.31	-0.70	0.35	0.35	0.31	-0.64	0.55	0.45	-0.57	-0.49	-0.24	-0.07	-1.19	-0.31	-0.08
129	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
130	0.04	0.15	1.11	1.15	0.06	-2.09	-1.70	1.30	-2.14	-1.63	-1.64	-1.70	-1.58	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-1.25
131	-0.97	-0.83	-1.16	-0.98	0.06	-0.98	-0.59	-0.84	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
132	-1.99	-1.80	-0.02	0.09	-0.90	0.12	-0.59	1.30	1.54	0.34	1.31	0.29	1.32	1.35	1.27	1.30	1.64	0.45	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
133	0.04	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	0.33	0.55	-1.71	-1.65	-2.73	-0.24	-0.07	-0.01	-1.55	-0.08
134	-0.97	-0.83	-1.16	-0.98	-1.85	-0.98	-0.59	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-0.57	-1.61	-0.24	-1.21	-1.19	-1.55	-1.25
135	-0.97	-1.80	-0.02	-0.98	-1.85	-0.98	-0.59	-0.84	-0.91	-1.63	-0.65	-1.70	-1.58	-1.66	-0.65	-1.61	-0.54	-0.63	-0.57	-1.61	-0.24	-0.07	-0.01	-0.31	-0.08
136	-1.99	-0.83	-1.16	-0.98	-0.90	0.12	0.53	1.30	0.31	-0.65	-0.65	-0.70	0.35	0.35	-0.65	-1.61	-1.62	0.45	0.51	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
137	1.06	-1.80	-0.02	0.09	-0.90	0.12	0.53	0.23	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-0.08
138	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
139	0.04	-1.80	-2.30	-2.05	-1.85	1.23	0.53	0.23	0.31	-0.65	0.33	-0.70	0.35	0.35	-0.65	-0.64	-0.54	0.45	0.51	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
140	-0.97	-1.80	-2.30	-2.05	-1.85	-0.98	-1.70	-0.84	-0.91	-1.63	-1.64	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-1.61	-0.24	-0.07	-1.19	-0.31	-0.08
141	0.04	-0.83	-0.02	0.09	-1.85	0.12	0.53	1.30	0.31	0.34	1.31	0.29	1.32	1.35	-0.65	-0.64	-0.54	0.45	1.59	0.63	-0.24	-1.21	-0.01	-0.31	-1.25
142	-0.97	0.15	-1.16	-0.98	-2.81	0.12	-0.59	-0.84	0.31	-1.63	-2.62	-2.69	-1.58	-1.66	-1.61	-1.61	-1.62	0.45	0.51	-0.49	-0.24	-1.21	-1.19	-1.55	-1.25
143	-0.97	-1.80	-1.16	-0.98	-1.85	-0.98	0.53	-0.84	-0.91	-1.63	-1.64	-0.70	-2.55	-1.66	-0.65	-0.64	0.55	-1.71	-0.57	-2.73	-2.64	-2.35	-1.19	-1.55	-2.43
144	1.06	-1.80	-1.16	-2.05	-0.90	-0.98	-0.59	0.23	1.54	0.34	-0.65	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	0.45	0.51	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
145	0.04	-0.83	-0.02	-0.98	-0.90	-0.98	1.64	0.23	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-2.57	-1.61	-2.71	-1.71	-0.57	-2.73	-0.24	-1.21	-0.01	-0.31	-1.25
146	-0.97	-0.83	-1.16	-2.05	-2.81	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-1.65	-2.73	-2.64	-2.35	-2.36	-1.55	-2.43
147	-0.97	1.12	-0.02	0.09	0.06	0.12	0.53	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-1.71	-0.57	-1.61	0.95	-0.07	-0.01	0.92	-0.08

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Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
148	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	0.53	-0.84	0.31	-0.65	0.33	-0.70	-0.62	0.35	-0.65	0.33	0.55	0.45	0.51	0.63	-1.44	-1.21	-1.19	-0.31	-1.25
149	0.04	-0.83	-0.02	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	0.35	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	-0.24	-1.21	-1.19	-1.55	-1.25
150	0.04	-0.83	-0.02	-0.98	0.06	-2.09	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-1.58	0.35	-0.65	0.33	0.55	0.45	0.51	0.63	-1.44	-1.21	-0.01	-0.31	-0.08
151	0.04	-0.83	-2.30	-2.05	-0.90	0.12	-0.59	0.23	0.31	-0.65	0.33	1.29	-0.62	0.35	0.31	-0.64	0.55	-0.63	-0.57	-0.49	0.95	-1.21	-1.19	0.92	1.09
152	1.06	-0.83	-1.16	0.09	-1.85	0.12	1.64	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	-2.78	-2.72	-2.73	-1.44	-1.21	-1.19	-0.31	-1.25
153	1.06	-0.83	-0.02	-0.98	0.06	0.12	1.64	1.30	0.31	-0.65	1.31	0.29	1.32	0.35	-0.65	-0.64	-0.54	1.53	1.59	1.75	-0.24	-0.07	-1.19	0.92	-0.08
154	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-1.90	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
155	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	0.23	-0.91	-0.65	0.33	-0.70	0.35	-0.65	0.31	-0.64	-0.54	-0.63	-0.57	-1.61	-1.44	-2.35	-2.36	-0.31	-2.43
156	0.04	0.15	-0.02	0.09	-0.90	-0.98	-0.59	-0.84	0.31	0.34	0.33	-0.70	0.35	-0.65	-0.65	0.33	0.55	-0.63	0.51	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
157	-0.97	-1.80	-0.02	0.09	-0.90	-0.98	-1.70	-1.90	-2.14	-1.63	-0.65	-1.70	-0.62	-1.66	-0.65	-1.61	-0.54	-1.71	-1.65	-2.73	-1.44	-1.21	-0.01	-0.31	-1.25
158	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	-0.91	-0.65	-0.65	-0.70	0.35	-0.65	1.27	1.30	1.64	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
159	0.04	-1.80	-1.16	-0.98	-0.90	0.12	0.53	-0.84	-0.91	0.34	1.31	1.29	0.35	1.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-1.55	-0.08
160	-0.97	-1.80	-1.16	-2.05	-1.85	-0.98	-0.59	-0.84	-0.91	-0.65	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
161	-0.97	-0.83	-2.30	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-1.65	-2.73	-1.44	-1.21	-1.19	-1.55	-1.25
162	0.04	-0.83	-1.16	0.09	-0.90	0.12	0.53	0.23	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-1.65	-2.73	-1.44	-1.21	-0.01	-0.31	-1.25
163	-1.99	0.15	-0.02	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	0.45	0.51	-0.49	-2.64	-2.35	-1.19	-2.78	-2.43
164	-0.97	-0.83	-0.02	-0.98	-0.90	-0.98	-2.82	-1.90	-0.91	-0.65	-0.65	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-2.78	-2.72	-2.73	-1.44	-1.21	-1.19	-1.55	-1.25
165	-1.99	-0.83	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-1.61	-0.54	-1.71	-1.65	-1.61	-0.24	-0.07	-1.19	-0.31	-0.08
166	-0.97	-0.83	-0.02	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
167	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	-1.71	-0.57	-1.61	-0.24	-0.07		-0.31	-0.08
168	0.04	0.15	-0.02	0.09	0.06	1.23	1.64	1.30	1.54	0.34	0.33	0.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	-0.49	0.95	1.07	1.16	0.92	1.09
169	-0.97	-0.83	-1.16	-0.98	-0.90	1.23	0.53	1.30	0.31	-0.65	-0.65	-0.70	-0.62	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-1.61	-1.44	-1.21	-1.19	-0.31	-1.25
170	0.04	0.15	-0.02	0.09	0.06	1.23	-0.59	1.30	0.34	-0.65	-0.65	-0.70	0.35	-1.66	-0.65	0.33	-0.54	0.45	-0.57	-0.49	-1.44	-1.21	-0.01	-1.55	-1.25
171	1.06	1.12	-0.02	-0.98	1.01	0.12	0.53	0.23	1.54	-0.65	-0.65	0.29	-0.62	0.35	1.27	1.30	1.64	-0.63	0.51	-0.49	-0.24	-0.07	-1.19	-1.55	-0.08
172	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	0.31	0.34	0.33	-0.70	0.35	0.35	-0.65	0.33	-0.54	0.45	0.51	0.63	-1.44	-2.35	-2.36	-0.31	-2.43
173	1.06	1.12	-2.30	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	1.53	1.59	0.63	0.95	-0.07	-0.01	0.92	-0.08
174	-0.97	-0.83	-3.43	-3.12	0.06	0.12	-0.59	0.23	-0.91	-0.65	0.33	0.29	0.35	0.35	-2.57	-2.58	-2.71	-1.71	-0.57	-1.61	-0.24	-0.07	-0.01	-0.31	-0.08
175	-0.97	-0.83	-1.16	-2.05	-2.81	0.12	-0.59	1.30	-2.14	0.34	0.33	0.29	0.35	0.35	-1.61	-0.64	-1.62	-0.63	-0.57	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
176	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	0.31	0.34	0.33	0.29	0.35	0.35	0.31	-0.64	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
177	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
178	1.06	1.12	-1.16	0.09	0.06	0.12	0.53	0.23	1.54	-0.65	0.33	-0.70	0.35	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-1.21	-1.19	0.92	-1.25
179	-0.97	-0.83	-1.16	1.15	0.06	-0.98	0.53	-1.90	0.31	-1.63	-1.64	0.29	-1.58	-1.66	-0.65	-0.64	-0.54	0.45	0.51	0.63	-1.44	-1.21	-1.19	-0.31	-1.25
180	0.04	0.15	-0.02	0.09	-0.90	1.23	0.53	0.23	0.31	0.34	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	-0.24	-0.07	1.16	0.92	-0.08
181	-0.97	-0.83	-1.16	-2.05	1.01	0.12	0.53	0.23	0.31	-2.62	-0.65	-0.70	-0.62	-0.65	-2.57	-2.58	-2.71	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
182	0.04	0.15	1.11	1.15	1.01	1.23	0.53	1.30	-0.91	-0.65	-0.65	-1.70	-1.58	-0.65	0.31	1.30	0.55	1.53	1.59	1.75	0.95	-1.21	-0.01	0.92	-1.25
183	1.06	0.15	-0.02	0.09	1.01	1.23	-0.59	1.30	1.54	-0.65	1.31	1.29	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	0.95	-1.21	-0.01	0.92	-1.25
184	-1.99	-1.80	-1.16	-0.98	-0.90	1.23	-0.59	1.30	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
185	1.06	-0.83	1.11	1.15	1.01	0.12	-1.70	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-1.65	-1.61	0.95	1.07	-0.01	0.92	1.09
186	1.06	1.12	1.11	1.15	1.01	0.12	-1.70	0.23	0.31	-0.65	-1.64	-0.70	-0.62	-0.65	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	-0.07	-1.19	0.92	-0.08
187	1.06	0.15	-0.02	1.15	0.06	0.12	-0.59	1.30	1.54	1.32	1.31	1.29	1.32	1.35	0.31	1.30	0.55	1.53	0.51	1.75	0.95	1.07	-0.01	0.92	1.09
188	1.06	1.12	1.11	1.15	1.01	0.12	0.53	-0.84	0.31	1.32	1.31	1.29	1.32	1.35	1.27	0.33	1.64	0.45	0.51	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
189	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	-0.63	0.51	1.75	0.95	1.07	1.16	0.92	1.09
190	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	0.53	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	-0.64	-0.54	0.45	-0.57	0.63	-0.24	-1.21	-1.19	-1.55	-1.25
191	1.06	1.12	1.11	0.09	1.01	1.23	0.53	1.30	1.54	1.32	1.31	1.29	1.32	1.35	-0.65	1.30	-0.54	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
192	-0.97	-0.83	1.11	1.15	0.06	1.23	0.53	0.23	0.31	-1.63	-0.65	-1.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
193	1.06	0.15	1.11	1.15	0.06	0.12	0.53	1.30	0.31	0.34	1.31	1.29	0.35	0.35	0.31	0.33	0.55	0.45	1.59	0.63	0.95	-0.07	-0.01	-0.31	1.09
194	1.06	0.15	1.11	1.15	1.01	1.23	-1.70	0.23	0.31	0.34	1.31	1.29	1.32	0.35	1.27	1.30	1.64	0.45	0.51	0.63	-0.24	1.07	-0.01	0.92	1.09
195	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	-0.84	0.31	-0.65	-1.64	-1.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
196	-0.97	-0.83	-1.16	-2.05	-0.91	0.12	-0.59	0.23	-0.91	-0.65	-1.64	-1.70	-0.62	-1.66	-0.65	0.33	0.55	-0.63	-0.57	-0.49	-0.63	-0.57	0.63	0.92	1.09
197	-0.97	-1.80	-1.16	-2.05	-1.85	-0.98	-0.59	-0.84	-2.14	-0.65	-0.65	-0.70	-0.62	-1.66	0.31	-0.64	-0.54	0.45	0.51	0.63	-2.64	-1.21	-2.36	-1.55	-1.25
198	1.06	1.12	1.11	1.15	1.01	1.23	-1.70	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	-1.71	-1.65	-0.49	0.95	1.07	1.16	0.92	1.09
199	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	-0.91	1.32	1.31	1.29	1.32	1.35	0.31	1.30	0.55	-0.63	-0.57	0.63	0.95	1.07	-1.19	0.92	1.09

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
200	1.06	1.12	-0.02	-0.98	1.01	1.23	-0.59	1.30	1.54	1.32	1.31	0.29	1.32	1.35	-1.61	0.33	-0.54	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	-0.08
201	-0.97	-0.83	-0.02	-0.98	-0.90	1.23	0.53	1.30	0.31	0.34	0.33	-0.70	0.35	0.35	-0.65	-1.61	-0.54	0.45	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
202	-0.97	-0.83	-2.30	-0.98	-0.90	0.12	-0.59	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-1.61	-0.54	-0.63	-1.65	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
203	-1.99	-1.80	-1.16	-0.98	-1.85	-0.98	-0.59	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-1.65	-1.61	-1.44	-1.21	-1.19	-1.55	-1.25
204	0.04	0.15	-0.02	0.09	1.01	-0.98	0.53	0.23	1.54	1.32	1.31	1.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	-0.08
205	0.04	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	1.32	0.33	-0.70	0.35	1.35	-0.65	0.33	0.55	1.53	0.51	1.75	-1.44	-0.07	-0.01	-1.55	-0.08
206	1.06	1.12	1.11	0.09	1.01	1.23	0.53	0.23	0.31	0.34	0.33	1.29	1.32	1.35	-1.61	-0.64	-0.54	0.45	1.59	1.75	-0.24	1.07	-0.01	-0.31	-0.08
207	1.06	1.12	1.11	1.15	1.01	0.12	-1.70	-0.84	-0.91	0.34	1.31	-0.70	0.35	0.35	0.31	1.30	-0.54	-0.63	-1.65	0.63	0.95	1.07	1.16	-0.31	1.09
208	0.04	0.15	-0.02	0.09	-0.90	-2.09	-1.70	-1.90	0.31	0.34	0.33	1.29	0.35	-0.65	0.31	-0.64	0.55	0.45	-0.57	0.63	-1.44	-1.21	-1.19	-0.31	-0.08
209	1.06	0.15	1.11	1.15	0.06	-0.98	-1.70	-0.84	1.54	1.32	1.31	0.29	1.32	0.35	1.27	1.30	0.55	0.45	1.59	-0.49	-0.24	-0.07	-0.01	0.92	-0.08
210	1.06	0.15	1.11	1.15	1.01	-2.09	-0.59	1.30	0.31	1.32	0.33	1.29	0.35	1.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
211	-1.99	-1.80	-0.02	-0.98	-1.85	-2.09	-0.59	-0.84	-0.91	0.34	-1.64	-0.70	-1.58	-1.66	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-1.19	-0.31	-1.25
212	-1.99	-1.80	-2.30	-2.05	-0.90	-2.09	-0.59	-1.90	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	-1.71	-0.57	-0.49	-2.64	-2.35	-1.19	-2.78	-2.43
213	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	-0.63	-0.57	-0.49	-0.24	-0.07	1.16	-0.31	-0.08
214	-0.97	0.15	-0.02	0.09	-1.85	0.12	0.53	0.23	0.31	-0.65	-0.65	0.29	-0.62	0.35	-0.65	-0.64	-0.54	1.53	1.59	0.63	0.95	1.07	-0.01	0.92	1.09
215	1.06	1.12	1.11	1.15	1.01	-0.98	-0.59	0.23	0.31	1.32	1.31	0.29	1.32	1.35	1.27	1.30	1.64	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
216	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	1.30	1.54	1.32	0.33	0.29	-0.62	-0.65	1.27	1.30	1.64	0.45	-0.57	0.63	0.95	1.07	-1.19	0.92	1.09
217	-0.97	-0.83	-1.16	-0.98	0.06	0.12	0.53	0.23	-0.91	-0.65	0.33	0.29	0.35	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
218	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	1.54	0.34	1.31	1.29	1.32	1.35	1.27	1.30	1.64	0.45	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
219	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	1.30	-0.91	1.32	1.31	1.29	1.32	1.35	-1.61	1.30	-1.62	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
220	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	1.30	-0.91	1.32	-0.65	1.29	1.32	-0.65	-0.65	1.30	0.55	0.45	0.51	-0.49	0.95	1.07	1.16	0.92	1.09
221	-1.99	-1.80	-2.30	-2.05	-1.85	-2.09	-0.59	-1.90	-0.91	-1.63	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
222	-1.99	-1.80	-0.02	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-1.63	-0.65	-0.70	-1.58	-0.65	-1.61	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
223	-1.99	-1.80	-0.02	-0.98	-0.90	-0.98	-1.70	-0.84	-0.91	-1.63	-1.64	-0.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
224	1.06	1.12	1.11	0.09	1.01	1.23	1.64	1.30	1.54	0.34	0.33	1.29	0.35	0.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
225	0.04	0.15	-1.16	1.15	0.06	0.12	-0.59	-0.84	-2.14	-1.63	-0.65	-1.70	-0.62	-0.65	-1.61	-0.64	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-0.01	-0.31	-1.25
226	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.45	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
227	-0.97	-0.83	1.11	-3.12	-0.90	-0.98	-1.70	-2.97	-2.14	-2.62	-2.62	-2.69	-2.55	-2.66	-2.57	-2.58	-2.71	-2.78	-2.72	-2.73	0.95	1.07	1.16	0.92	1.09
228	0.04	0.15	1.11	0.09	0.06	1.23	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
229	1.06	1.12	1.11	0.09	1.01	0.12	0.53	1.30	0.31	1.32	1.31	0.29	1.32	1.35	0.31	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	1.09
230	1.06	1.12	-0.02	0.09	0.06	-0.98	-0.59	0.23	-0.91	1.32	1.31	0.29	1.32	1.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
231	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
232	0.04	0.15	1.11	1.15	1.01	0.12	0.53	0.23	0.31	-0.65	-1.64	1.29	-1.58	-1.66	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	-0.01	0.92	1.09
233	1.06	1.12	1.11	0.09	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	-0.24	1.07	1.16	-0.31	1.09
234	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
235	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	-0.91	0.34	0.33	1.29	-0.62	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
236	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
237	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	0.51	1.75	-1.44	-1.21	-1.19	-1.55	-1.25
238	-0.97	-0.83	1.11	0.09	-0.90	0.12	-0.59	-0.84	0.31	-1.63	-1.64	0.29	-1.58	-1.66	-2.57	1.30	0.55	0.45	0.51	1.75	-1.44	-1.21	-1.19	-1.55	-1.25
239	-0.97	-0.83	-2.30	-2.05	0.06	-0.98	-0.59	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-0.65	-1.61	-1.61	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
240	1.06	1.12	-0.02	0.09	1.01	0.12	0.53	0.23	1.54	1.32	1.31	1.29	1.32	1.35	1.27	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	0.92	-0.08
241	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
242	-1.99	-0.83	-0.02	0.09	-2.81	1.23	0.53	0.23	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-1.61	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	1.16	0.92	1.09
243	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	-0.91	0.34	-0.65	1.29	0.35	0.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
244	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	0.51	0.63	0.95	1.07	1.16	0.92	1.09
245	0.04	-0.83	-0.02	0.09	0.06	1.23	-0.59	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	0.31	-0.64	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-1.25
246	0.04	-0.83	-0.02	-0.98	0.06	1.23	0.53	-0.84	0.31	0.34	-0.65	0.29	-0.62	0.35	-0.65	0.33	0.55	-0.63	0.51	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
247	-1.99	-1.80	-1.16	-0.98	0.06	-0.98	0.53	1.30	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
248	1.06	1.12	1.11	0.09	1.01	0.12	-0.59	-1.90	0.31	0.34	-0.65	0.29	0.35	0.35	0.31	1.30	0.55	0.45	0.51	0.63	-0.24	-0.07	1.16	0.92	-0.08
249	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
250	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	0.31	0.34	-0.65	0.29	-0.62	-0.65	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	1.16	0.92	-0.08
251	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	0.31	0.34	0.33	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
252	-0.97	-1.80	-0.02	-0.98	0.06	1.23	0.53	-0.84	-0.91	0.34	-0.65	0.29	0.35	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	0.92	1.09

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
253	0.04	0.15	-0.02	0.09	1.01	0.12	0.53	0.23	0.31	0.34	0.33	1.29	0.35	0.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
254	0.04	0.15	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
255	-1.99	-0.83	-1.16	0.09	-0.90	0.12	0.53	-0.84	-0.91	0.34	-0.65	-1.70	0.35	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-1.19	-0.31	-0.08
256	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
257	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	-2.78	1.09
258	1.06	1.12	1.11	0.09	1.01	0.12	1.64	1.30	0.31	1.32	1.31	1.29	1.32	0.35	-0.65	0.33	0.55	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	-0.08
259	0.04	0.15	-0.02	-0.98	1.01	-2.09	-0.59	1.30	0.31	0.34	1.31	1.29	0.35	0.35	0.31	0.33	1.64	1.53	1.59	1.75	0.95	-0.07	-0.01	0.92	-0.08
260	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	0.53	0.23	-0.91	0.34	-0.65	0.29	-0.62	0.35	-0.65	-0.64	0.55	-0.63	0.51	0.63	-1.44	-0.07	-1.19	-1.55	-1.25
261	-0.97	-0.83	-1.16	0.09	0.06	0.12	0.53	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
262	1.06	1.12	-0.02	1.15	1.01	1.23	0.53	0.23	0.31	0.34	-0.65	0.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
263	0.04	-0.83	-1.16	-0.98	-0.90	0.12	0.53	-0.84	-2.14	-1.63	-0.65	-0.70	-1.58	-0.65	-0.65	-0.64	0.55	-0.63	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
264	-1.99	-1.80	-1.16	-0.98	-0.90	0.12	0.53	0.23	-0.91	-0.65	-0.65	0.29	-0.62	-1.66	-0.65	-0.64	-0.54	1.53	1.59	1.75	-0.24	-1.21	-1.19	-0.31	-0.08
265	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
266	-0.97	-0.83	-2.30	-2.05	0.06	1.23	0.53	-0.84	-0.91	0.34	0.33	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
267	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
268	-3.00	-2.78	-0.02	-2.05	-2.81	1.23	0.53	-1.90	0.31	-1.63	-2.62	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-2.72	-1.61	0.95	1.07	1.16	0.92	1.09
269	0.04	-0.83	-0.02	0.09	0.06	1.23	0.53	-0.84	0.31	-0.65	0.33	-0.70	-0.62	-0.65	-0.65	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
270	1.06	1.12	-0.02	0.09	1.01	-0.98	0.53	0.23	0.31	-0.65	-0.65	0.29	-1.58	0.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	1.07	-0.01	-0.31	1.09
271	1.06	1.12	1.11	0.09	1.01	0.12	0.53	0.23	1.54	0.34	0.33	0.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
272	1.06	1.12	-1.16	0.09	1.01	1.23	0.53	-1.90	-0.91	0.34	0.33	1.29	0.35	1.35	1.27	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
273	-1.99	-0.83	-1.16	0.09	-1.85	-0.98	-0.59	-0.84	-0.91	-1.63	-0.65	-0.70	-1.58	-0.65	-0.65	-0.64	-1.62	-1.71	-1.65	-1.61	-2.64	-1.21	-2.36	-2.78	-1.25
274	-1.99	-0.83	-2.30	-2.05	-1.85	-2.09	-1.70	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	0.31	-0.64	0.55	-0.63	0.51	-0.49	-1.44	-2.35	-2.36	-1.55	-2.43
275	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
276	0.04	-0.83	-0.02	-0.98	-0.90	-0.98	0.53	0.23	0.31	-0.65	-0.65	0.29	-0.62	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
277	-1.99	-1.80	-1.16	-2.05	-1.85	-2.09	-0.59	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
278	-1.99	-1.80	-2.30	-0.98	-0.90	-2.09	0.53	-0.84	-0.91	-0.65	-0.65	0.29	-0.62	-0.65	0.31	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-1.19	-0.31	-1.25
279	-0.97	-0.83	-1.16	0.09	0.06	-2.09	-1.70	-0.84	0.31	-0.65	0.33	0.29	-0.62	0.35	-0.65	-0.64	0.55	-0.63	0.51	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
280	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	-0.08
281	1.06	1.12	-1.16	1.15	1.01	0.12	-0.59	1.30	0.31	1.32	-0.65	0.29	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	1.16	0.92	-0.08
282	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	0.53	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
283	1.06	1.12	-0.02	0.09	1.01	0.12	-0.59	0.23	0.31	-0.65	-1.64	-1.70	-1.58	-1.66	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
284	-0.97	-0.83	-0.02	0.09	1.01	1.23	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
285	1.06	1.12	1.11	-0.98	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
286	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	-0.84	1.54	1.32	1.31	1.29	1.32	1.35	0.31	0.33	1.64	1.53	1.59	0.63	-0.24	-0.07	1.16	-0.31	1.09
287	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	-0.62	-0.65	1.27	1.30	0.55	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
288	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
289	1.06	0.15	1.11	-2.05	-0.90	1.23	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
290	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	-0.59	-0.84	0.31	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-1.19	-0.31	-1.25
291	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.54	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
292	-1.99	-1.80	-2.30	-2.05	-1.85	-2.09	-1.70	0.23	-2.14	-1.63	-1.64	-1.70	-1.58	-1.66	-1.61	-1.61	-1.62	-1.71	-1.65	-1.61	-2.64	-2.35	-2.36	-2.78	-2.43
293	1.06	1.12	1.11	1.15	1.01	1.23	0.53	-0.84	1.54	-0.65	0.33	0.29	0.35	0.35	1.27	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
294	1.06	1.12	-1.16	1.15	1.01	1.23	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
295	1.06	1.12	-0.02	0.09	1.01	1.23	0.53	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
296	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
297	-0.97	-0.83	1.11	0.09	0.06	1.23	1.64	1.30	0.31	0.34	0.33	1.29	0.35	0.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
298	0.04	0.15	-0.02	-0.98	1.01	1.23	-0.59	-0.84	-2.14	-0.65	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
299	-0.97	-0.83	1.11	-0.98	-0.90	1.23	-0.59	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	-0.65	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
300	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	-0.07	-0.01	0.92	-0.08
301	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	1.54	0.34	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
302	1.06	1.12	-0.02	0.09	1.01	-0.98	0.53	-0.84	0.31	0.34	0.33	-0.70	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	-0.31	-0.08
303	-1.99	-1.80	-1.16	-2.05	-0.90	-0.98	-1.70	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-1.62	-1.71	-1.65	-1.61	-2.64	-2.35	-2.36	-2.78	-2.43
304	1.06	1.12	1.11	1.15	1.01	-0.98	1.64	-0.84	1.54	0.34	0.33	0.29	-0.62	1.35	0.31	0.33	-0.54	0.45	0.51	0.63	0.95	1.07	-1.19	0.92	1.09
305	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	0.31	1.30	-0.54	-0.63	0.51	0.63	0.95	1.07	1.16	0.92	1.09
306	1.06	1.12	1.11	1.15	1.01	1.23	0.53	0.23	0.31	1.32	1.31	0.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	-1.19	0.92	-1.25

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
307	1.06	1.12	1.11	1.15	0.06	1.23	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
308	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	-0.24	1.07	1.16	-0.31	1.09
309	-0.97	0.15	-0.02	0.09	0.06	1.23	0.53	-0.84	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	-1.62	-1.71	-1.65	-1.61	-0.24	-0.07	-0.01	-0.31	-0.08
310	0.04	0.15	1.11	1.15	1.01	1.23	0.53	1.30	0.31	-0.65	-1.64	1.29	0.35	0.35	1.27	1.30	-0.54	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
311	0.04	0.15	-0.02	0.09	1.01	0.12	0.53	0.23	-0.91	0.34	1.31	0.29	1.32	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
312	0.04	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	-0.70	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	-0.24	1.07	-0.01	0.92	-0.08
313	1.06	0.15	-0.02	-0.98	1.01	-0.98	0.53	0.23	0.31	0.34	0.33	-0.70	-0.62	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	-0.08
314	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	0.33	0.29	0.35	0.35	-0.65	-0.64	0.55	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
315	1.06	1.12	1.11	1.15	1.01	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
316	0.04	-0.83	-0.02	-2.05	-0.90	0.12	0.53	-0.84	-0.91	0.34	0.33	-1.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
317	0.04	-0.83	-1.16	1.15	-0.90	0.12	1.64	0.23	-0.91	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
318	1.06	1.12	1.11	1.15	1.01	1.23	1.64	-2.97	1.54	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
319	1.06	1.12	-0.02	0.09	1.01	0.12	-0.59	0.23	0.31	0.34	-0.65	-0.70	0.35	-0.65	0.31	0.33	-0.54	0.45	0.51	0.63	0.95	-0.07	-0.01	0.92	-0.08
320	-0.97	-0.83	-1.16	-0.98	-1.85	0.12	-0.59	-0.84	-0.91	0.34	-0.65	-0.70	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
321	0.04	0.15	1.11	0.09	0.06	0.12	0.53	-0.84	-0.91	-0.65	0.33	-1.70	0.35	-0.65	-1.61	-0.64	-0.54	0.45	0.51	0.63	-0.24	1.07	1.16	0.92	-0.08
322	1.06	0.15	1.11	0.09	0.06	0.12	-0.59	0.23	-0.91	0.34	0.33	1.29	0.35	0.35	1.27	1.30	-0.54	0.45	0.51	0.63	-0.24	1.07	-1.19	0.92	1.09
323	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
324	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	-0.31	1.09
325	1.06	1.12	-0.02	0.09	1.01	0.12	-0.59	-0.84	0.31	0.34	0.33	0.29	-0.62	0.35	1.27	1.30	-0.54	-0.63	0.51	0.63	0.95	-0.07	-0.01	0.92	-0.08
326	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	1.54	0.34	1.31	1.29	0.35	0.35			1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
327	-0.97	-1.80	-1.16	-2.05	-1.85	1.23	-0.59	-1.90	-2.14	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
328	0.04	-0.83	-0.02	-0.98	-0.90	0.12	0.53	-0.84	-0.91	-0.65	-0.65	-0.70	0.35	0.35	-0.65	-0.64	-0.54	0.45	0.51	0.63	0.95	-0.07	-1.19	0.92	-0.08
329	1.06	1.12	-0.02	1.15	1.01	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-1.62	-0.63	-0.57	-0.49	-0.24	1.07	-0.01	0.92	1.09
330	0.04	0.15	-0.02	-0.98	0.06	1.23	0.53	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	1.16	0.92	1.09
331	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
332	1.06	1.12	1.11	1.15	1.01	-0.98	0.53	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
333	1.06	1.12	1.11	1.15	0.06	1.23	0.53	1.30	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
334	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	1.54	1.32	0.33	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	-0.24	1.07	-0.01	0.92	-0.08
335	1.06	1.12	1.11	1.15	1.01	1.23	1.64	-0.84	1.54	1.32	1.31	0.29	0.35	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
336	-0.97	-0.83	-0.02	-0.98	0.06	0.12	-0.59	-0.84	-2.14	-0.65	0.33	-0.70	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
337	-0.97	-0.83	1.11	-0.98	-0.90	-0.98	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	0.33	-1.62	-1.71	-1.65	-1.61	-0.24	1.07	1.16	-0.31	1.09
338	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	1.30	-0.91	1.32	1.31	0.29	1.32	1.35	0.31	0.33	-0.54	0.45	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
339	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
340	-0.97	-0.83	-0.02	0.09	-1.85	-0.98	-0.59	-1.90	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
341	0.04	0.15	-1.16	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	-0.64	0.55	0.45	-0.57	-0.49	-1.44	-0.07	-0.01	-0.31	1.09
342	1.06	1.12	1.11	1.15	1.01	0.12	1.64	0.23	1.54	0.34	0.33	0.29	0.35	1.35	1.27	1.30	1.64	-0.63	0.51	0.63	-0.24	-0.07	1.16	0.92	1.09
343	1.06	1.12	1.11	1.15	1.01	1.23	0.53	-1.90	1.54	1.32	0.33	0.29	-0.62	0.35	1.27	0.33	0.55	1.53	1.59	0.63	0.95	-0.07	-0.01	0.92	-0.08
344	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	-0.08
345	-0.97	-0.83	-1.16	-0.98	-0.90	1.23	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
346	0.04	0.15	-0.02	-0.98	0.06	0.12	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
347	0.04	-0.83	-0.02	0.09	-0.90	0.12	-1.70	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	-0.31	-0.08
348	0.04	0.15	-0.02	0.09	0.06	1.23	-0.59	-1.90	1.54	-0.65	-0.65	-1.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	0.92	-1.25
349	0.04	0.15	1.11	1.15	1.01	1.23	0.53	-0.84	-0.91	1.32	0.33	0.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	-0.24	1.07	1.16	-0.31	1.09
350	1.06	1.12	1.11	1.15	1.01	1.23	0.53	-0.84	-0.91	1.32	0.33	0.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	-0.24	1.07	1.16	-0.31	1.09
351	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	1.32	1.31	-0.70	1.32	1.35	-0.65	-0.64	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
352	-0.97	-0.83	-0.02	-0.98	0.06	0.12	-0.59	0.23	1.54	-0.65	-1.64	-0.70	-0.62	-1.66	-0.65	0.33	-0.54	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
353	-0.97	-0.83	-0.02	-0.98	-0.90	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
354	-0.97	-0.83	-0.02	0.09	-0.90	0.12	0.53	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	0.33	0.55	0.45	0.51	0.63	-1.44	-1.21	-1.19	-1.55	-1.25
355	1.06	1.12	1.11	0.09	1.01	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
356	1.06	1.12	-0.02	0.09	1.01	0.12	-0.59	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	-0.54	0.45	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
357	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	-0.91	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
358	0.04	0.15	-1.16	-0.98	0.06	-2.09	0.53	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	-0.64	-0.54	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-1.25

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
359	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
360	1.06	0.15	1.11	1.15	1.01	0.12	-1.70	1.30	-0.91	-0.65	-0.65	-0.70	-0.62	0.35	0.31	1.30	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
361	-0.97	-0.83	-1.16	-0.98	1.01	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
362	1.06	1.12	1.11	1.15	1.01	-0.98	-0.59	-1.90	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	-0.07	1.16	0.92	-0.08
363	1.06	1.12	1.11	1.15	1.01	-0.98	1.64	1.30	1.54	1.32	1.31	-0.70	1.32	1.35	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-1.21	-0.01	-0.31	-0.08
364	-0.97	-0.83	-0.02	-0.98	-1.85	-0.98	0.53	-0.84	-0.91	-0.65	0.33	1.29	0.35	0.35	-1.61	-0.64	0.55	0.45	0.51	0.63	0.95	-0.07	-1.19	0.92	-1.25
365	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
366	1.06	1.12	-0.02	-0.98	0.06	0.12	0.53	0.23	1.54	-0.65	-0.65	0.29	-0.62	-0.65	1.27	-0.64	-1.62	-1.71	-1.65	-1.61	0.95	-1.21	-0.01	0.92	-0.08
367	1.06	1.12	-0.02	1.15	1.01	-0.98	-0.59	-0.84	1.54	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
368	0.04	0.15	-0.02	0.09	0.06	-0.98	-0.59	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-1.44	-0.07	-0.01	-1.55	-0.08
369	1.06	1.12	1.11	1.15	1.01	1.23	0.53	-0.84	1.54	1.32	0.33	1.29	-0.62	0.35	1.27	1.30	1.64	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	1.09
370	-0.97	-0.83	-0.02	0.09	-0.90	0.12	0.53	0.23	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-0.64	0.55	-0.63	-0.57	-0.49	-1.44	-0.07	-1.19	-0.31	-1.25
371	0.04	0.15	1.11	0.09	0.06	0.12	-0.59	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-2.36	-0.31	-0.08
372	-0.97	-0.83	-1.16	-0.98	0.06	-0.98	0.53	-0.84	-0.91	0.34	0.33	-0.70	0.35	-0.65	-0.65	-0.64	0.55	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-0.08
373	-0.97	0.15	1.11	1.15	-0.90	1.23	-0.59	0.23	-3.36	0.34	-0.65	0.29	-0.62	-0.65	0.31	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	-0.31	1.09
374	0.04	0.15	-0.02	1.15	1.01	0.12	0.53	0.23	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	0.63	-0.24	1.07	1.16	0.92	1.09
375	-0.97	-0.83	0.12	0.53	-1.90	-0.91	-1.63	-1.64	-0.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08		
376	-1.99	-0.83	-2.30	-2.05	-0.90	-2.09	-1.70	-0.84	0.31	-2.62	-2.62	-2.69	-2.55	-2.66	-1.61	-2.58	-0.54	0.45	0.51	0.63	-1.44	-2.35	-2.36	-1.55	-1.25
377	0.04	0.15	-0.02	1.15	1.01	0.12	0.53	-0.84	1.54	0.34	1.31	0.29	0.35	1.35	1.27	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
378	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	0.34	1.31	1.29	0.35	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
379	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
380	-1.99	-1.80	-1.16	0.09	-1.85	0.12	-1.70	-0.84	-0.91	-1.63	-0.65	-0.70	-1.58	-0.65	0.31	-0.64	0.55	-1.71	-1.65	-1.61	-1.44	-2.35	-2.36	-1.55	-1.25
381	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	0.53	-0.84	0.31	-0.65	0.33	-0.70	0.35	0.35	-0.65	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-0.07	-1.19	-0.31	-0.08
382	1.06	1.12	1.11	1.15	0.06	0.12	-0.59	0.23	1.54	-0.65	1.31	0.29	0.35	0.35	1.27	0.33	0.55	0.45	1.59	0.63	0.95	1.07	-0.01	-0.31	-0.08
383	1.06	1.12	1.11	1.15	0.06	-3.20	0.53	-0.84	1.54	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
384	0.04	1.12	1.11	1.15	1.01	-0.98	-0.59	1.30	0.31	-0.65	1.31	-0.70	-0.62	-0.65	0.31	0.33	-0.54	-1.71	-1.65	-1.61	-0.24	1.07	1.16	-0.31	1.09
385	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
386	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
387	-0.97	-0.83	-0.02	-0.98	0.06	1.23	-0.59	-1.90	-3.36	-2.62	-1.64	-2.69	-2.55	-1.66	-2.57	-2.58	-2.71	-2.78	-2.72	-2.73	0.95	1.07	-0.01	-0.31	-0.08
388	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	1.54	0.34	-0.65	-0.70	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-0.01	-1.55	-1.25
389	0.04	0.15	-0.02	-0.98	1.01	1.23	1.64	-0.84	-0.91	0.34	-0.65	-0.70	0.35	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-0.01	-0.31	1.09
390	0.04	0.15	1.11	0.09	1.01	1.23	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
391	-1.99	-0.83	-1.16	0.09	-0.90	0.12	0.53	-0.84	-0.91	0.34	-0.65	-0.70	0.35	0.35	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-1.19	-0.31	-0.08
392	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
393	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	1.54	1.32	1.31	1.29	1.32	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
394	-0.97	-0.83	-0.02	0.09	0.06	-0.98	-1.70	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
395	1.06	1.12	-0.02	0.09	0.06	1.23	-0.59	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
396	0.04	0.15	-0.02	0.09	0.06	1.23	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
397	0.04	0.15	-0.02	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
398	0.04	0.15	-0.02	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
399	1.06	0.15	-0.02	-0.98	1.01	-0.98	0.53	1.30	-0.91	-1.63	-1.64	0.29	-1.58	-0.65	0.31	0.33	-1.62	-1.71	-1.65	-1.61	-0.24	-0.07	1.16	0.92	-0.08
400	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	0.53	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
401	1.06	1.12	-0.02	0.09	1.01	0.12	0.53	1.30	0.31	1.32	1.31	0.29	1.32	1.35	0.31	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	1.09
402	1.06	1.12	-0.02	0.09	0.06	-0.98	-0.59	0.23	-0.91	1.32	1.31	0.29	1.32	1.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
403	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	-0.62	-0.65	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
404	1.06	1.12	-1.16	1.15	1.01	0.12	-0.59	1.30	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	1.07	1.16	-0.31	-0.08
405	0.04	0.15	1.11	0.09	0.06	1.23	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
406	-0.97	-0.83	1.11	-3.12	-0.90	-0.98	-1.70	-2.97	-2.14	-2.62	-2.62	-2.69	-2.55	-2.66	-2.57	-2.58	-2.71	-2.78	-2.72	-2.73	0.95	1.07	1.16	0.92	1.09
407	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
408	-1.99	-1.80	-1.16	-0.98	0.06	0.12	0.53	1.30	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
409	0.04	-0.83	-0.02	-0.98	-0.90	-0.98	0.53	1.30	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	-0.24	-0.07	-0.01	-0.31	-0.08
410	0.04	-0.83	-0.02	0.09	0.06	-2.09	-0.59	0.23	-0.91	-0.65	-0.65	-1.70	-0.62	-0.65	-1.61	-1.61	-0.54	-0.63	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
411	1.06	1.12	-1.16	1.15	1.01	0.12	1.64	-0.84	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
412	1.06	1.12	-0.02	1.15	1.01	1.23	-0.59	-1.90	1.54	1.32	-0.65	1.29	-0.62	-0.65	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
413	1.06	1.12	1.11	0.09	1.01	0.12	0.53	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
414	-1.99	-0.83	-1.16	-0.98	-2.81	0.12	-1.70	-0.84	-0.91	-1.63	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-2.35	-3.54	-2.78	-1.25
415	-0.97	-0.83	-1.16	-2.05	-0.90	-0.98	-0.59	0.23	-0.91	-1.63	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	0.45	0.51	0.63	-2.64	-1.21	-2.36	-1.55	-1.25
416	1.06	1.12	-0.02	1.15	1.01	1.23	1.64	1.30	-0.91	1.32	-0.65	1.29	-0.62	-0.65	0.31	0.33	1.64	0.45	-0.57	-0.49	-0.24	1.07	-0.01	0.92	1.09
417	0.04	0.15	-0.02	0.09	1.01	0.12	0.53	0.23	-0.91	-0.65	-0.65	-1.70	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
418	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
419	0.04	0.15	-0.02	0.09	1.01	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
420	1.06	1.12	1.11	1.15	1.01	0.12	1.64	0.23	0.31	1.32	1.31	1.29	1.32	0.35	1.27	1.30	0.55	0.45	1.59	1.75	-0.24	-0.07	-1.19	-0.31	-0.08
421	1.06	0.15	1.11	1.15	1.01	1.23	0.53	1.30	1.54	0.34	0.33	1.29	-2.55	-2.66	1.27	1.30	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
422	-0.97	-1.80	-0.02	0.09	-0.90	0.12	0.53	-0.84	0.31	0.34	-0.65	0.29	-0.62	0.35	-0.65	-1.61	-0.54	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	-0.08
423	0.04	0.15	-1.16	-0.98	1.01	-0.98	-0.59	0.23	0.31	0.34	-0.65	-0.70	0.35	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
424	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
425	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	0.35	1.27	1.30	-0.54	-0.63	0.51	0.63	0.95	1.07	1.16	0.92	1.09
426	-0.97	-0.83	-0.02	-0.98	-1.85	-2.09	-0.59	-0.84	-0.91	-1.63	-0.65	-0.70	-1.58	-0.65	-0.65	-0.64	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-0.08
427	1.06	1.12	1.11	1.15	1.01	-0.98	1.64	1.30	1.54	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
428	1.06	1.12	1.11	1.15	1.01	0.12	1.64	0.23	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	0.55	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
429	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
430	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
431	1.06	1.12	-0.02	0.09	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
432	0.04	-0.83	-0.02	0.09	0.06	0.12	-2.82	-0.84	-0.91	-1.63	-1.64	-0.70	-1.58	-1.66	-1.61	0.33	0.55	-1.71	0.51	0.63	0.95	1.07	1.16	0.92	1.09
433	1.06	1.12	1.11	1.15	1.01	0.12	0.53	0.23	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
434	-0.97	-0.83	-1.16	-0.98	0.06	-0.98	0.53	-0.84	0.31	-0.65	0.33	0.29	-0.62	0.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
435	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	0.53	0.23	0.31	1.32	1.31	1.29	0.35	0.35	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
436	0.04	0.15	-1.16	-0.98	0.06	-0.98	0.53	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	-0.64	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
437	0.04	0.15	-0.02	0.09	-0.90	0.12	0.53	0.23	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	0.31	-0.64	-0.54	0.45	0.51	0.63	-0.24	1.07	1.16	-0.31	-0.08
438	0.04	0.15	1.11	1.15	1.01	1.23	-0.59	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	0.33	-0.54	-1.71	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
439	0.04	0.15	-0.02	0.09	1.01	0.12	0.53	0.23	0.31	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	1.09
440	0.04	0.15	-1.16	-0.98	0.06	-0.98	0.53	-0.84	0.31	-0.65	0.33	0.29	-0.62	-0.65	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
441	-0.97	-0.83	-0.02	0.09	-2.81	1.23	-1.70	-0.84	-0.91	0.34	0.33	0.29	0.35	-0.65	-1.61	-0.64	-1.62	-0.63	-0.57	-0.49	0.95	-0.07	-1.19	0.92	-0.08
442	0.04	0.15	-1.16	-0.98	-0.90	0.12	-1.70	-0.84	0.31	-0.65	-0.65	-1.70	-1.58	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
443	-0.97	0.15	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	-1.61	-0.54	-1.71	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
444	0.04	0.15	1.11	1.15	1.01	1.23	-0.59	0.23	-0.91	0.34	0.33	0.29	0.35	0.35	-0.65	0.33	-0.54	-1.71	-0.57	-0.49	0.95	-0.07	-0.01	0.92	-0.08
445	0.04	0.15	-0.02	0.09	1.01	0.12	0.53	0.23	0.31	0.34	0.33	1.29	0.35	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	-0.07	1.16	0.92	1.09
446	1.06	1.12	-0.02	1.15	1.01	0.12	0.53	0.23	1.54	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
447	-0.97	-0.83	-0.02	0.09	0.06	0.12	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
448	-0.97	-0.83	-0.02	0.09	-2.81	1.23	-1.70	-0.84	-0.91	0.34	0.33	0.29	0.35	-0.65	-1.61	-0.64	-1.62	-0.63	-0.57	-0.49	0.95	-0.07	-1.19	0.92	-0.08
449	1.06	1.12	1.11	0.09	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
450	0.04	0.15	1.11	-2.05	0.06	-2.09	-2.82	-1.90	0.31	0.34	-0.65	0.29	0.35	-0.65	-2.57	-0.64	-1.62	-1.71	-1.65	-1.61	-0.24	-1.21	-1.19	-0.31	-1.25
451	1.06	1.12	1.11	-0.98	1.01	-0.98	-0.59	-0.84	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-1.62	-0.63	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
452	1.06	1.12	-0.02	0.09	1.01	-0.98	0.53	-0.84	0.31	0.34	-0.65	0.29	-0.62	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	-0.07	-1.19	0.92	-0.08
453	-0.97	0.15	-0.02	0.09	-0.90	-0.98	-1.70	-0.84	0.31	-1.63	-1.64	-0.70	-1.58	-1.66	-0.65	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
454	0.04	0.15	-1.16	-0.98	-0.90	0.12	-1.70	-0.84	0.31	-0.65	-0.65	-1.70	-1.58	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
455	1.06	1.12	1.11	1.15	1.01	1.23	-0.59	1.30	0.31	0.34	0.33	1.29	0.35	-0.65	1.27	1.30	1.64	0.45	0.51	0.63	0.95	1.07	-1.19	0.92	1.09
456	-0.97	-0.83	-1.16	0.09	-0.90	1.23	0.53	-0.84	0.34	-0.65	-0.65	-0.70	0.35	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
457	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	-0.84	-2.14	-1.63	-0.65	-0.70	-1.58	-0.65	-1.61	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
458	1.06	0.15	1.11	0.09	1.01	0.12	0.53	-0.84	0.31	-0.65	-0.65	0.29	1.32	0.35	0.31	-0.64	0.55	-0.63	-0.57	-0.49	-0.24	1.07	1.16	-0.31	-1.25
459	-0.97	-0.83	-0.02	-0.98	-0.90	0.12	1.64	-0.84	-0.91	1.32	0.33	1.29	1.32	1.35	1.27	0.33	0.55	0.45	0.51	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
460	-0.97	-1.80	-0.02	0.09	-0.90	0.12	0.53	0.23	0.31	0.34	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-0.08
461	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	-0.84	0.31	0.34	1.31	0.29	0.35	0.35	1.27	0.33	0.55	0.45	0.51	0.63	-0.24	1.07	1.16	-0.31	1.09
462	1.06	0.15	1.11	1.15	1.01	1.23	1.64	1.30	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
463	-1.99	-1.80	-1.16	0.09	-1.85	0.12	-1.70	-0.84	-0.91	-1.63	-0.65	-0.70	-1.58	-0.65	0.31	-0.64	0.55	-1.71	-1.65	-1.61	-1.44	-2.35	-2.36	-1.55	-1.25
464	-0.97	-0.83	-1.16	-0.98	-0.90	-0.98	-0.59	0.23	0.31	-0.65	0.33	-0.70	0.35	0.35	-0.65	-1.61	-0.54	-0.63	-0.57	-0.49	-1.44	-0.07	-1.19	-0.31	-0.08

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
465	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	0.53	-1.90	-0.91	-1.63	-1.64	-0.70	-1.58	-1.66	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
466	0.04	0.15	1.11	1.15	1.01	0.12	0.53	0.23	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	-0.24	1.07	1.16	0.92	1.09
467	-0.97	-0.83	1.11	0.09	0.06	1.23	0.53	0.23	0.31	0.34	-0.65	0.29	1.32	0.35	0.31	0.33	-0.54	1.53	0.51	0.63	0.95	-0.07	-0.01	0.92	-0.08
468	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
469	0.04	0.15	-0.02	0.09	0.06	-0.98	-0.59	0.23	0.31	1.32	1.31	0.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
470	1.06	1.12	1.11	1.15	1.01	-0.98	-0.59	1.30	0.31	-0.65	1.31	0.29	-0.62	-0.65	0.31	0.33	-0.54	-1.71	-1.65	-1.61	0.95	1.07	1.16	0.92	1.09
471	1.06	1.12	1.11	1.15	0.06	0.12	-0.98	0.23	1.54	-0.65	1.31	0.29	0.35	0.35	1.27	0.33	0.55	0.45	1.59	0.63	0.95	1.07	-0.01	-0.31	-0.08
472	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
473	-1.99	-1.80	-1.16	-2.05	-0.90	-0.98	-1.70	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-1.66	-0.65	-0.64	-1.62	-1.71	-1.65	-1.61	-2.64	-2.35	-2.36	-2.78	-2.43
474	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
475	0.04	-0.83	-0.02	-0.98	-0.90	-0.98	0.53	0.23	0.31	0.34	-0.65	0.29	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
476	0.04	0.15	-0.02	-0.98	0.06	1.23	-0.59	-0.84	-2.14	-0.65	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
477	-0.97	-0.83	1.11	0.09	-0.90	1.23	-0.59	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	-0.65	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
478	-0.97	-0.83	1.11	0.09	0.06	1.23	1.64	1.30	0.31	0.34	0.33	1.29	0.35	0.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
479	-1.99	-1.80	1.11	0.09	-0.90	1.23	0.53	-1.90	-2.14	-0.65	-0.65	-0.70	-0.62	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	0.95	-0.07	-1.19	-2.78	-0.08
480	0.04	0.15	1.11	0.09	1.01	0.12	-0.59	0.23	0.31	1.32	1.31	1.29	1.32	1.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
481	0.04	0.15	1.11	1.15	0.06	0.12	-0.59	0.23	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
482	0.04	0.15	1.11	1.15	1.01	-0.98	-0.59	-0.84	-0.91	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
483	1.06	1.12	1.11	1.15	1.01	1.23	0.53	1.30	-0.91	0.34	0.33	1.29	0.35	0.35	1.27	1.30	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
484	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	0.23	-0.91	0.34	0.33	-1.70	0.35	0.35	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
485	-0.97	-0.83	-0.02	0.09	-0.90	-0.98	-0.59	-1.90	-0.91	-1.63	-1.64	-1.70	-1.58	-0.65	-1.61	-1.61	0.55	0.45	-0.57	-0.49	0.95	1.07	1.16	0.92	-0.08
486	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-1.61	-0.54	-0.63	-0.57	-0.49	0.95	1.07	-1.19	0.92	1.09
487	0.04	1.12	1.11	1.15	1.01	1.23	-0.59	0.23	0.31	-1.63	-0.65	-0.70	-1.58	-1.66	-0.65	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-0.07	-1.19	-1.55	-0.08
488	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	0.23	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	1.16	0.92	1.09
489	1.06	1.12	-0.02	1.15	1.01	1.23	-0.59	-0.84	-0.91	1.32	1.31	0.29	1.32	1.35	0.31	0.33	-0.54	0.45	-0.57	-0.49	0.95	1.07	-0.01	0.92	1.09
490	-0.97	-0.83	-0.02	0.09	0.06	1.23	0.53	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	1.53	0.51	0.63	0.95	-0.07	-1.19	0.92	1.09
491	1.06	1.12	-0.02	1.15	1.01	0.12	-0.59	0.23	1.54	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
492	1.06	1.12	-1.16	-0.98	1.01	0.12	1.64	0.23	-0.91	1.32	1.31	-0.70	1.32	1.35	0.31	0.33	-0.54	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
493	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	-0.07	1.16	0.92	-1.25
494	1.06	1.12	1.11	1.15	1.01	0.12	-0.59	1.30	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
495	1.06	1.12	1.11	1.15	1.01	-0.98	1.64	0.23	0.31	0.34	1.31	0.29	0.35	1.35	0.31	-0.64	0.55	0.45	0.51	0.63	0.95	1.07	1.16	-0.31	-0.08
496	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	-0.07	-0.01	0.92	-0.08
497	0.04	0.15	-0.02	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
498	0.04	0.15	-0.02	0.09	0.06	-0.98	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
499	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-1.44	-0.07	-0.01	-0.31	-0.08
500	1.06	1.12	-0.02	0.09	0.06	1.23	-0.59	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
501	-0.97	-0.83	-0.02	0.09	0.06	-0.98	-1.70	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
502	1.06	1.12	1.11	1.15	1.01	0.12	0.53	1.30	1.54	1.32	1.31	1.29	1.32	0.35	1.27	1.30	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
503	1.06	0.15	1.11	0.09	0.06	-0.98	0.53	-0.84	0.31	-0.65	-0.65	0.29	1.32	0.35	0.31	-0.64	0.55	-0.63	-0.57	-0.49	-0.24	1.07	1.16	-0.31	-1.25
504	-0.97	-1.80	-0.02	0.09	-0.90	0.12	0.53	0.23	0.31	0.34	0.33	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	0.45	0.51	0.63	-0.24	-1.21	-1.19	-0.31	-0.08
505	1.06	1.12	1.11	1.15	1.01	1.23	1.64	0.23	0.31	1.32	1.31	0.29	1.32	1.35	0.31	0.33	-0.54	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
506	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
507	0.04	0.15	-0.02	0.09	0.06	-0.98	-0.59	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
508	1.06	1.12	1.11	1.15	1.01	-0.98	-0.59	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	-0.01	0.92	1.09
509	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	1.30	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
510	1.06	1.12	1.11	-0.98	-0.90	1.23	0.53	-0.84	-0.91	1.32	-0.65	1.29	1.32	1.35	1.27	1.30	-0.54	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
511	1.06	1.12	1.11	1.15	1.01	1.23	0.53	0.23	1.54	0.34	0.33	0.29	0.35	0.35	0.31	-0.64	-0.54	-0.63	0.51	0.63	-1.44	-0.07	-0.01	-0.31	-0.08
512	-0.97	-0.83	-0.02	0.09	0.06	0.12	-1.70	-0.84	-0.91	-0.65	0.33	-0.70	-0.62	-1.66	0.31	0.33	-1.62	-1.71	-0.57	-0.49	0.95	-1.21	-2.36	-1.55	-1.25
513	-0.97	-1.80	1.11	1.15	-1.85	1.23	-0.59	1.30	1.54	-0.65	-1.64	-1.70	-1.58	-1.66	-1.61	-0.64	-1.62	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
514	0.04	0.15	1.11	0.09	0.06	-0.98	-0.59	0.23	-2.14	-1.63	-1.64	-2.69	-1.58	-1.66	-1.61	-0.64	-1.62	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
515	0.04	0.15	-0.02	0.09	0.06	-0.98	-0.59	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	1.27	0.33	-0.54	-0.63	-0.57	-0.49	-0.24	-0.07	-0.01	-0.31	-0.08
516	1.06	1.12	1.11	1.15	1.01	-0.98	-0.59	1.30	1.54	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	1.07	-0.01	0.92	1.09

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	F1	F2	SC1	SC2	SC3	Z1	Z2	Z3	Z4	R1	R2	R3	R4	R5	T1	T2	T3	Y1	Y2	Y3	U1	U2	U3	U4	U5
517	1.06	0.15	-0.02	-0.98	1.01	-0.98	0.53	1.30	-0.91	-1.63	-1.64	0.29	-1.58	-0.65	0.31	0.33	-1.62	-1.71	-1.65	-1.61	-0.24	-0.07	1.16	0.92	-0.08
518	-0.97	-0.83	-0.02	0.09	-0.90	-2.09	-0.59	-0.84	-2.14	-0.65	-0.65	-1.70	-0.62	-1.66	-1.61	-0.64	-0.54	-0.63	-0.57	-0.49	-0.24	-1.21	-1.19	-0.31	-0.08
519	-1.99	-0.83	-2.30	-0.98	-0.90	0.12	-0.59	0.23	0.31	0.34	-0.65	-1.70	-1.58	-2.66	0.31	-0.64	-1.62	-0.63	-2.72	-2.73	-0.24	-2.35	-2.36	-1.55	-0.08
520	-0.97	0.15	-0.02	0.09	0.06	-0.98	-0.59	-0.84	-0.91	0.34	0.33	1.29	1.32	1.35	0.31	0.33	0.55	-0.63	-0.57	-0.49	-0.24	1.07	-0.01	0.92	-0.08
521	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
522	1.06	1.12	-1.16	-0.98	0.06	-0.98	0.53	0.23	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	-1.44	-1.21	-1.19	-0.31	-1.25
523	1.06	1.12	-0.02	1.15	1.01	1.23	0.53	0.23	0.31	1.32	1.31	0.29	1.32	1.35	0.31	0.33	0.55	1.53	1.59	0.63	-0.24	1.07	1.16	0.92	-0.08
524	1.06	1.12	-0.02	0.09	1.01	0.12	0.53	1.30	0.31	0.34	0.33	1.29	0.35	1.35	1.27	1.30	1.64	1.53	1.59	0.63	-2.64	-1.21	-1.19	-2.78	-1.25
525	-0.97	-0.83	-1.16	1.15	0.06	1.23	0.53	0.23	-2.14	-0.65	-0.65	0.29	-0.62	-0.65	-2.57	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	-1.21	-0.01	0.92	-1.25
526	1.06	0.15	-0.02	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	0.35	1.35	1.27	1.30	1.64	1.53	1.59	0.63	0.95	-0.07	1.16	0.92	-0.08
527	1.06	1.12	1.11	1.15	1.01	1.23	1.64	0.23	0.31	1.32	1.31	0.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	0.92	1.09
528	-0.97	-0.83	1.11	0.09	1.01	0.12	0.53	0.23	0.31	-0.65	-0.65	-1.70	-0.62	-1.66	-1.61	-1.61	-0.54	0.45	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
529	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	-0.91	1.32	1.31	0.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-1.19	-0.31	-0.08
530	1.06	0.15	1.11	1.15	1.01	0.12	-0.59	1.30	0.31	1.32	0.33	0.29	0.35	0.35	0.31	-0.64	-0.54	-1.71	-1.65	-1.61	0.95	1.07	1.16	0.92	1.09
531	1.06	1.12	1.11	1.15	1.01	0.12	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	-2.71	-2.78	-2.72	-2.73	0.95	1.07	1.16	0.92	1.09
532	0.04	-0.83	-0.02	0.09	0.06	0.12	-0.59	-0.84	-0.91	-0.65	0.33	-0.70	0.35	0.35	-0.65	-0.64	0.55	0.45	0.51	0.63	0.95	-1.21	-0.01	0.92	-1.25
533	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	0.31	1.32	1.31	1.29	1.32	1.35	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	1.16	0.92	1.09
534	-0.97	-1.80	-0.02	-0.98	-0.90	0.12	-1.70	-0.84	-0.91	0.34	-0.65	-0.70	-0.62	0.35	-0.65	-0.64	0.55	-0.63	-0.57	-0.49	-1.44	-1.21	-0.01	-0.31	-1.25
535	0.04	0.15	-0.02	0.09	0.06	0.12	0.53	0.23	0.31	-0.65	-0.65	0.29	-0.62	-0.65	0.31	0.33	0.55	0.45	0.51	0.63	0.95	1.07	-0.01	-0.31	1.09
536	1.06	1.12	-1.16	1.15	1.01	-0.98	1.64	-0.84	0.31	1.32	1.31	1.29	1.32	1.35	1.27	1.30	1.64	1.53	1.59	1.75	-1.44	-1.21	-1.19	-1.55	-1.25
537	-0.97	-0.83	-1.16	-0.98	-0.90	0.12	-0.59	-0.84	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	0.55	0.45	-0.57	-0.49	-1.44	-1.21	-1.19	-1.55	-1.25
538	-0.97	-0.83	-1.16	0.09	-0.90	-2.09	-0.59	0.23	-0.91	0.34	-0.65	-0.70	0.35	0.35	1.27	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	-0.01	-0.31	-0.08
539	0.04	0.15	1.11	1.15	1.01	0.12	0.53	-0.84	-0.91	0.34	-0.65	-1.70	0.35	-0.65	-1.61	-1.61	-1.62	-0.63	-0.57	-0.49	-0.24	-1.21	-0.01	-0.31	-1.25
540	-0.97	-0.83	1.11	0.09	0.06	1.23	0.53	0.23	0.31	-0.65	-0.65	1.29	1.32	0.35	0.31	0.33	-0.54	1.53	0.51	0.63	0.95	-0.07	-0.01	0.92	1.09
541	1.06	0.15	1.11	1.15	1.01	1.23	1.64	1.30	-0.91	0.34	0.33	0.29	0.35	0.35	0.31	0.33	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
542	1.06	1.12	1.11	1.15	1.01	1.23	1.64	1.30	1.54	1.32	1.31	1.29	-2.55	1.35	1.27	1.30	1.64	1.53	1.59	1.75	0.95	1.07	1.16	0.92	1.09
543	-0.97	-0.83	-0.02	0.09	-0.90	0.12	-0.59	-0.84	0.31	1.32	0.33	1.29	0.35	1.35	0.31	0.33	0.55	0.45	0.51	0.63	-0.24	-0.07	1.16	-0.31	1.09
544	-0.97	-0.83	-0.02	0.09	0.06	1.23	0.53	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	0.55	1.53	0.51	0.63	0.95	-0.07	-1.19	0.92	1.09
545	-0.97	-0.83	-0.02	0.09	0.06	0.12	-0.59	-0.84	0.31	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
546	0.04	0.15	-0.02	0.09	0.06	0.12	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09
547	0.04	0.15	-0.02	0.09	0.06	0.12	-0.59	-0.84	-0.91	-0.65	-0.65	-0.70	-0.62	-0.65	-0.65	-0.64	-0.54	-0.63	-0.57	-0.49	0.95	1.07	1.16	0.92	1.09

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
1	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	0.39	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	-2.30	-1.27	-0.74	-0.64	-0.24	-1.16	-1.16	0.39	-0.89	-1.45	-2.30
2	-1.26	-1.24	-1.22	-2.41	-2.42	0.07	-1.16	-2.69	-1.35	0.25	1.07	0.25	0.09	0.03	-2.71	-1.29	0.15	-2.41	-0.74	0.48	-0.24	-1.16	-2.65	-2.69	-2.78	-0.25	0.15
3	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-0.13	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	-0.89	-0.25	0.15
4	-0.05	-1.24	-1.22	-1.22	0.01	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07
5	-1.26	-2.41	-1.22	1.17	0.01	-1.16	0.21	0.39	-0.14	0.25	0.06	-0.92	-2.01	0.03	-0.85	-1.29	0.15	-0.13	0.50	0.48	-1.03	0.21	-1.16	0.39	0.05	-1.45	0.15
6	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-0.79	0.06	0.25	0.09	1.11	1.00	-1.29	0.15	-0.13	0.50	-1.76	-1.03	0.21	0.33	0.39	0.99	-0.25	0.15
7	1.15	-1.24	-1.22	-0.02	1.23	0.07	0.21	-1.15	1.08	-0.79	-0.94	-0.92	0.09	0.03	0.07	1.04	0.15	1.01	-0.74	-0.64	-1.82	0.21	-1.16	-1.15	-0.89	-1.45	0.15
8	-0.05	1.12	1.23	1.17	0.01	0.07	1.57	1.92	1.08	-0.79	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	1.60	-1.82	1.57	1.82	1.92	0.99	0.95	0.15
9	1.15	1.12	1.23	-0.02	1.23	1.30	1.57	1.92	-0.14	1.28	0.06	-0.92	0.09	0.03	0.07	-0.13	0.15	-0.13	-0.74	1.60	-1.03	1.57	1.82	1.92	0.05	0.95	0.15
10	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	1.42	-0.96	-1.04	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-2.65	-1.07
11	-1.26	-1.24	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	1.28	0.06	0.25	0.09	1.11	0.07	1.04	0.15	1.01	0.50	-0.64	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
12	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-1.29	-1.07	-0.13	-0.74	0.48	-0.24	0.21	0.33	0.39	-0.89	0.95	-1.07
13	-0.05	-1.24	-1.22	-2.41	-2.42	-1.16	-1.16	-1.15	1.08	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	-2.30	-1.27	-1.99	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	-2.30
14	-1.26	-1.24	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	1.07	1.42	-0.96	1.11	-0.85	-1.29	0.15	-1.27	1.75	-0.64	-0.24	0.21	0.33	0.39	-0.89	-1.45	0.15
15	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-1.95	-0.92	-0.96	-1.04	0.07	1.04	0.15	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-1.45	0.15
16	-0.05	-0.06	0.00	-1.22	0.01	0.07	0.21	0.39	-1.35	-1.82	-1.95	-0.92	-2.01	-1.04	-1.78	-2.45	-2.30	-2.41	-0.74	-0.64	0.55	0.21	0.33	0.39	-1.83	-0.25	-2.30
17	-2.46	-1.24	-2.45	-2.41	-2.42	-2.38	-2.52	-2.69	-1.35	-1.82	-1.95	-0.92	-2.01	-2.11	-1.78	-2.45	-2.30	-2.41	-0.74	-1.76	0.55	-2.52	-2.65	-2.69	-1.83	-2.65	-2.30
18	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	0.21	0.39	1.08	1.28	0.06	0.25	-0.96	0.03	-0.85	-1.29	0.15	-1.27	0.50	-0.64	-0.24	0.21	-1.16	0.39	-0.89	-1.45	0.15
19	-2.46	-2.41	-1.22	-2.41	-2.42	-2.38	0.21	-2.69	-0.14	-0.79	-0.94	-0.92	-0.96	0.03	0.07	-0.13	-1.07	-0.13	0.50	0.48	-1.03	0.21	-1.16	-2.69	0.05	-0.25	-1.07
20	-0.05	-1.24	-1.22	1.17	0.01	0.07	0.21	-1.15	-0.14	-1.82	-0.94	-0.92	0.09	-1.04	-1.78	-1.29	-1.07	-0.13	0.50	-1.76	-1.03	0.21	-1.16	-1.15	-0.89	-0.25	-1.07
21	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	1.28	0.06	0.25	0.09	1.11	0.07	-0.13	-1.07	-1.27	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
22	-1.26	-1.24	-1.22	-1.22	-1.20	-2.38	0.21	-1.15	-0.14	-0.79	0.06	-0.92	-0.96	-1.04	-1.78	-2.45	-2.30	-1.27	-0.74	-0.64	0.55	0.21	-1.16	-1.15	-1.83	-2.65	-2.30
23	-1.26	-0.06	0.00	-1.22	0.01	0.07	0.21	-1.15	-0.14	-1.82	-0.94	1.42	-2.01	-2.11	0.07	1.04	-1.07	-0.13	0.50	-0.64	-1.03	0.21	0.33	-1.15	-0.89	-0.25	-1.07
24	-0.05	-0.06	0.00	1.17	0.01	0.07	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	0.09	0.03	1.00	-0.13	-1.07	-1.27	1.75	0.48	-0.24	-1.16	-1.16	-1.15	0.99	-0.25	-1.07
25	-1.26	-1.24	-1.22	1.17	-1.20	-1.16	-1.16	-1.15	1.08	-0.79	0.06	0.25	-0.96	-1.04	-0.85	-1.29	-1.07	-1.27	0.50	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
26	1.15	-0.06	1.23	-0.02	0.01	0.07	1.57	1.92	-0.14	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	0.48	-1.82	1.57	1.82	1.92	0.99	0.95	0.15
27	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	-0.96	-1.04	0.07	-0.13	-1.07	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	-1.07
28	-0.05	-0.06	-1.22	-0.02	-1.20	-1.16	0.21	0.39	-0.14	1.28	0.06	1.42	0.09	0.03	-0.85	1.04	0.15	1.01	0.50	0.48	-1.03	0.21	0.33	0.39	-0.89	-0.25	0.15
29	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	1.07	1.42	0.09	0.03	0.07	-0.13	-1.07	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-1.45	-1.07
30	-0.05	-0.06	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	-2.01	0.03	0.07	-1.29	0.15	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-0.25	0.15
31	-1.26	-1.24	-1.22	-0.02	0.01	0.07	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	0.09	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
32	-0.05	-0.06	0.00	-0.02	1.23	0.07	-1.16	-1.15	-0.14	-0.79	0.06	0.25	-0.96	-1.04	0.07	-0.13	1.38	-0.13	0.50	-0.64	-1.03	-1.16	0.33	-1.15	0.05	-1.45	1.38
33	-0.05	-0.06	0.00	-1.22	0.01	0.07	0.21	0.39	1.08	0.25	-0.94	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	0.50	-0.64	-1.82	0.21	0.33	0.39	-0.89	-0.25	1.38
34	-0.05	-0.06	0.00	1.17	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	1.00	-0.13	-1.07	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.99	-0.25	-1.07
35	-1.26	-1.24	0.00	-1.22	0.01	0.07	0.21	-1.15	-1.35	-0.79	-1.95	-0.92	-0.96	-1.04	-0.85	-0.13	-1.07	-0.13	-0.74	0.48	-1.82	0.21	0.33	-1.15	-0.89	-1.45	-1.07
36	1.15	1.12	0.00	1.17	0.01	1.30	0.21	0.39	1.08	0.25	1.07	1.42	0.09	1.11	1.00	1.00	-1.07	1.01	1.01	0.48	-1.82	0.21	1.82	0.39	0.99	0.95	-1.07
37	-0.05	-0.06	0.00	-0.02	1.23	1.30	0.21	0.39	1.08	1.28	0.06	0.25	-0.96	1.11	0.07	1.04	1.38	1.01	1.75	-0.64	-1.82	0.21	0.33	0.39	0.05	-0.25	1.38
38	-0.05	-1.24	0.00	-1.22	-1.20	0.07	-1.16	-1.15	-0.14	0.25	1.07	0.25	1.13	-1.04	-0.85	-1.29	0.15	-0.13	-0.74	0.48	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
39	-0.05	-1.24	-1.22	-1.22	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	0.25	-0.96	0.03	0.07	-2.45	-1.07	-1.27	0.50	0.48	-0.24	-1.16	-1.16	-1.15	0.05	-1.45	0.15
40	-2.46	-2.41	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	0.25	-0.96	1.11	0.07	-1.29	1.38	-0.13	1.75	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-2.65	1.38
41	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
42	-0.05	-1.24	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	0.06	0.25	0.09	1.11	1.00	-0.13	-1.07	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.99	0.95	-1.07
43	-0.05	-0.06	0.00	-0.02	-1.20	-1.16	-1.16	-1.15	-0.14	1.28	1.07	0.25	0.09	0.03	-0.85	-0.13	0.15	-1.27	0.50	0.48	-1.03	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
44	-0.05	-0.06	0.00	-0.02	0.01	-1.16	0.21	-1.15	-0.14	1.28	-0.94	1.42	-0.96	1.11	-1.78	-0.13	1.38	-0.13	-0.74	-1.76	-1.82	0.21	-1.16	-1.15	-1.83	-0.25	1.38
45	-0.05	-1.24	-1.22	1.17	0.01	-1.16	-1.16	-1.15	-1.35	-1.82	0.06	-0.92	0.09	-1.04	-1.78	-0.13	0.15	-1.27	-0.74	-0.64	-1.03	-1.16	-2.65	-1.15	-0.89	-0.25	0.15
46	-1.26	-0.06	-1.22	-0.02	0.01	-1.16	0.21	-1.15	-0.14	0.25	-0.94	0.25	0.09	0.03	-0.85	-0.13	-1.07	-0.13	-0.74	-0.64	-1.03	0.21	-1.16	-1.15	-0.89	-0.25	-1.07
47	-0.05	-0.06	0.00	1.17	0.01	0.07	0.21	0.39	-0.14	1.28	-0.94	1.42	-0.96	1.11	0.07	-0.13	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
48	-0.05	-1.24	-1.22	-1.22	0.01	0.07	0.21	-1.15	-0.14	0.25	0.06	0.25	0.09	1.11	1.00	1.04	-1.07	-2.41	-0.74	-0.64	-1.82	0.21	0.33	-1.15	0.99	0.95	-1.07

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
49	-1.26	-1.24	-1.22	-1.22	1.23	0.07	0.21	-1.15	-0.14	-0.79	1.07	0.25	0.09	1.11	0.07	-0.13	-1.07	-1.27	0.50	-1.76	-0.24	0.21	0.33	-1.15	0.05	-0.25	-1.07
50	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	-1.15	-0.14	-0.79	-0.94	-0.92	0.09	1.11	0.07	1.04	0.15	-1.27	-0.74	-0.64	-1.82	0.21	-1.16	-1.15	0.05	-0.25	0.15
51	-1.26	-2.41	-1.22	-2.41	0.01	-1.16	0.21	-1.15	1.08	-0.79	0.06	0.25	0.09	1.11	1.00	1.04	0.15	-0.13	0.50	0.48	-1.82	0.21	0.33	-1.15	0.99	-1.45	0.15
52	-1.26	-1.24	-1.22	-3.26	-2.42	0.07	1.57	1.92	-0.14	0.25	0.06	0.25	-0.96	0.03	1.00	1.04	0.15	-1.27	0.50	0.48	-1.82	1.57	1.82	1.92	0.05	-1.45	0.15
53	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	1.08	0.25	0.06	0.25	0.09	1.11	-0.85	1.04	-1.07	-2.41	1.75	1.60	-1.03	-1.16	-1.16	-1.15	0.05	-0.25	-1.07
54	-1.26	-1.24	-1.22	-0.02	0.01	0.07	-1.16	-1.15	-1.35	-0.79	0.06	0.25	0.09	0.03	-0.85	-1.29	0.15	-1.27	0.50	-0.64	-1.03	-1.16	0.33	-1.15	0.05	-1.45	0.15
55	-0.05	-1.24	0.00	-1.22	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	-2.01	-2.11	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	-1.03	0.21	0.33	0.39	-0.89	-0.25	-1.07
56	1.15	1.12	0.00	-0.02	0.01	0.07	0.21	-1.15	1.08	0.25	0.06	0.25	-0.96	-1.04	-0.85	-1.29	0.15	1.01	-0.74	0.48	-1.03	0.21	-1.16	-1.15	-0.89	0.95	0.15
57	1.15	-0.06	0.00	1.17	1.23	0.07	1.57	0.39	-0.14	0.25	1.07	1.42	1.13	1.11	0.07	-0.13	1.38	-0.13	0.50	0.48	-1.03	1.57	0.33	0.39	0.99	-0.25	1.38
58	1.15	1.12	1.23	1.17	1.23	1.30	-1.16	0.39	1.08	1.28	1.07	1.42	0.09	1.11	1.00	1.04	1.38	1.01	0.50	1.60	-1.82	-1.16	-1.16	0.39	0.99	0.95	1.38
59	-0.05	-0.06	-1.22	1.17	0.01	-1.16	-1.16	0.39	-0.14	-0.79	-0.94	-0.92	0.09	-1.04	0.07	-0.13	0.15	1.01	0.50	-0.64	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
60	-1.26	-0.06	-1.22	1.17	0.01	-1.16	-1.16	0.39	-0.14	0.25	1.07	0.25	0.09	0.03	0.07	-0.13	-1.07	-0.13	0.50	0.48	-1.03	-1.16	-1.16	0.39	0.05	-1.45	-1.07
61	-1.26	-0.06	0.00	-0.02	-1.20	0.07	0.21	0.39	1.08	1.28	0.06	1.42	1.13	0.03	0.07	-0.13	-1.07	-0.13	-0.74	0.48	-0.24	0.21	0.33	0.39	0.05	-0.25	-1.07
62	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	0.06	-0.92	-0.96	-1.04	-1.78	1.04	0.15	1.01	-0.74	-2.88	-1.82	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
63	-0.05	-0.06	-1.22	-0.02	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	-0.94	0.25	0.09	0.03	0.07	-1.29	-2.30	-0.13	-0.74	-1.76	-1.82	-1.16	0.33	-1.15	0.05	-0.25	-2.30
64	-0.05	-0.06	0.00	-0.02	-1.20	0.07	0.21	0.39	1.08	-0.79	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	-0.74	1.60	-1.03	0.21	0.33	0.39	0.99	-0.25	1.38
65	-1.26	-1.24	-2.45	-2.41	-2.42	-1.16	-1.16	-1.15	-0.14	-1.82	-0.94	-0.92	-0.96	-1.04		-1.29	0.15	-1.27	-0.74	0.48	-0.24	-1.16	-1.16	-1.15	0.05	-1.45	0.15
66	-2.46	-1.24	-1.22	-1.22	-1.20	0.07	-1.16	-1.15	-1.35	-0.79	-1.95	0.25	-2.01	-1.04	-1.78	-0.13	-1.07	-1.27	-0.74	-0.64	-0.24	-1.16	0.33	-1.15	-1.83	-1.45	-1.07
67	-1.26	-1.24	-1.22	-0.02	-1.20	-1.16	0.21	0.39	-1.35	1.28	-1.95	1.42	-0.96	-1.04	-0.85	1.04	1.38	1.01	0.50	1.60	-1.82	0.21	0.33	0.39	-0.89	-0.25	1.38
68	-2.46	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	0.06	0.25	-0.92	-0.96	-1.04	0.07	-1.29	-1.07	-1.27	0.50	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-1.07
69	-0.05	-0.06	0.00	-0.02	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	-2.08	-0.96	0.03	0.07	-0.13	-1.07	-0.13	0.50	-1.76	-1.03	-1.16	-1.16	-1.15	0.05	-0.25	-1.07
70	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	0.06	0.25	1.13	0.03	0.07	-0.13	0.15	1.01	0.50	0.48	-1.82	0.21	0.33	0.39	0.05	-0.25	0.15
71	1.15	1.12	1.23	-0.02	1.23	0.07	0.21	1.92	-0.14	-1.82	-1.95	0.25	0.09	0.03	-0.85	1.04	1.38	-0.13	0.50	0.48	-1.82	0.21	1.82	1.92	-0.89	0.95	1.38
72	-1.26	-1.24	-1.22	-1.22	0.01	-1.16	0.21	0.39	-0.14	0.25	-0.94	0.25	-0.96	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	-1.03	0.21	0.33	0.39	-0.89	-1.45	0.15
73	1.15	1.12	1.23	1.17	1.23	-1.16	-2.52	0.39	-0.14	0.25	0.06	0.25	0.09	-1.04	-0.85	-1.29	-1.07	-1.27	0.50	-0.64	-1.03	-2.52	0.33	0.39	-0.89	0.95	-1.07
74	-1.26	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	1.07	0.25	0.09	1.11	1.00	-0.13	1.38	-1.27	0.50	1.60	-1.82	0.21	1.82	0.39	0.99	0.95	1.38
75	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	1.08	0.25	1.07	0.25	0.09	0.03	1.00	1.04	0.15	-1.27	-0.74	0.48	-0.24	-1.16	-1.16	-1.15	0.99	-1.45	0.15
76	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-1.95	-0.92	-2.01	-1.04	-1.78	-0.13	0.15	-1.27	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
77	-0.05	-0.06	1.23	-0.02	1.23	0.07	-1.16	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	1.60	-1.82	-1.16	0.33	0.39	0.99	-0.25	0.15
78	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.99	0.95	0.15
79	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-1.82	-0.94	0.25	-2.01	0.03	1.00	-1.29	0.15	1.01	0.50	1.60	-1.03	0.21	0.33	0.39	0.99	-0.25	0.15
80	1.15	1.12	0.00	-0.02	0.01	0.07	1.57	1.92	-1.35	0.25	1.07	1.42	1.13	0.03	1.00	-0.13	-1.07	1.01	-0.74	-0.64	-1.03	1.57	1.82	1.92	0.99	-1.45	-1.07
81	-0.05	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	0.09	-2.11	-1.78	1.04	0.15	-0.13	-0.74	0.48	-1.82	-1.16	-1.15	-1.15	0.05	-0.25	0.15
82	-0.05	-0.06	0.00	1.17	1.23	1.30	1.57	0.39	-1.35	-1.82	-1.95	-0.92	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	0.48	-1.82	1.57	1.82	0.39	-0.89	0.95	1.38
83	-2.46	-2.41	-2.45	-2.41	-2.42	-2.38	-2.52	-2.69	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	-0.24	-2.52	-2.65	-2.69	-0.89	-2.65	-1.07
84	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	-0.94	0.25	0.09	0.03	1.00	-0.13	1.38	1.01	0.50	0.48	-1.82	0.21	0.33	0.39	-0.89	-0.25	1.38
85	-1.26	-1.24	0.00	-0.02	-1.20	0.07	-1.16	-1.15	-0.14	-0.79	0.06	-0.92	-0.96	-1.04	0.07	-1.29	0.15	-1.27	-0.74	-0.64	-1.03	-1.16	0.33	-1.15	0.05	-0.25	0.15
86	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	0.06	0.25	0.09	0.03	0.07	-1.29	-1.07	-1.27	0.50	0.48	-0.24	0.21	0.33	0.39	0.05	-0.25	-1.07
87	-1.26	-1.24	-1.22	-1.22	0.01	-1.16	0.21	-1.15	-0.14	0.25	1.07	1.42	-0.96	-1.04	1.00	-0.13	-1.07	-1.27	-0.74	0.48	-0.24	0.21	0.33	-1.15	0.05	-1.45	-1.07
88	-0.05	-0.06	0.00	-1.22	-1.20	0.07	1.57	1.92	1.08	-1.82	0.06	0.25	0.09	0.03	-0.85	-0.13	0.15	-0.13	0.50	0.48	-0.24	1.57	1.82	1.92	-0.89	-1.45	0.15
89	-0.05	-0.06	0.00	1.17	0.01	0.07	1.57	0.39	-0.14	-0.79	1.07	-0.92	0.09	-1.04	-1.78	-0.13	1.38	-0.13	0.50	-0.64	-1.82	1.57	0.33	0.39	-1.83	0.95	1.38
90	-1.26	-1.24	-1.22	-0.02	-1.20	-1.16	-1.16	-1.15	-0.14	-1.82	0.06	-0.92	-0.96	0.03	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
91	1.15	1.12	1.23	-0.02	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	1.57	1.82	1.92	0.99	0.95	1.38
92	1.15	1.12	0.00	-1.22	-1.20	0.07	0.21	0.39	-0.14	-0.79	-0.94	1.42	-0.96	-1.04	0.07	-0.13	0.15	-0.13	-0.74	-1.76	-1.03	0.21	0.33	0.39	0.05	0.95	0.15
93	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-1.82	-0.94	1.42	0.09	-1.04	-0.85	1.04	1.38	-0.13	0.50	-0.64	-1.03	0.21	0.33	0.39	-0.89	-0.25	1.38
94	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	0.25	-0.94	-0.92	-2.01	-1.04	-0.85	1.04	0.15	1.01	-1.99	-0.64	-1.82	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
95	-0.05	-0.06	0.00	-0.02	-1.20	-1.16	-1.16	0.39	-0.14	0.25	-0.94	-2.08	-0.96	0.03	0.07	-1.29	-1.07	-0.13	0.50	-0.64	-1.03	-1.16	0.33	0.39	0.05	-0.25	-1.07
96	1.15	-0.06	0.00	-0.02	1.23	0.07	1.57	0.39	1.08	-0.79	1.07	-0.92	1.13	0.03	0.07	1.04	0.15	1.01	-0.74	-0.64	-1.03	1.57	-1.16	0.39	0.05	0.95	0.15
97	-1.26	-1.24	-1.22	-0.02	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	-0.94	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	-1.99	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	-1.45	0.15

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
98	-1.26	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	-1.04	-0.85	1.04	0.15	1.01	-0.74	0.48	-1.82	0.21	0.33	0.39	-0.89	-0.25	0.15
99	-0.05	-0.06	0.00	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	1.60	-1.82	1.57	1.82	1.92	0.99	-0.25	0.15
100	1.15	1.12	1.23	-0.02	0.01	1.30	0.21	0.39	1.08	0.25	0.06	1.42	0.09	1.11	1.00	-0.13	-1.07	-0.13	0.50	0.48	-1.82	0.21	0.33	0.39	0.99	0.95	-1.07
101	-1.26	-1.24	-1.22	-2.41	-2.42	-2.38	-1.16	-1.15	1.08	-0.79	-0.94	-0.92	0.09	1.11	1.00	-2.45	-3.53	-2.41	-1.99	-2.88	-0.24	-1.16	-2.65	-1.15	0.99	-0.25	-3.53
102	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-0.79	1.07	-0.92	0.09	0.03	1.00	-0.13	1.38	1.01	0.50	0.48	-1.82	0.21	0.33	0.39	0.99	0.95	1.38
103	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	1.08	-0.79	-0.94	-0.92	0.09	1.11	-0.85	-0.13	-1.07	-0.13	0.50	-1.76	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
104	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	1.42	-0.96	1.11	1.00	-1.29	0.15	1.01	1.75	0.48	-1.03	0.21	0.33	0.39	0.99	0.95	0.15
105	1.15	1.12	1.23	-0.02	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	0.09	1.11	1.00	-1.29	1.38	1.01	1.75	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	1.38
106	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	1.92	1.08	0.25	0.06	0.25	-0.96	0.03	1.00	1.04	-1.07	1.01	-0.74	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	-1.07
107	1.15	1.12	1.23	1.17	0.01	0.07	0.21	0.39	1.08	-0.79	1.07	1.42	1.13	-1.04	0.07	1.04	0.15	-0.13	0.50	1.60	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
108	-0.05	-1.24	0.00	-0.02	-1.20	-1.16		0.39	-1.35	1.28	0.06	0.25	0.09	1.11	0.07	-1.29	-1.07	1.01	1.75	-0.64	-1.03	-1.16	-1.16	0.39	-0.89	-1.45	-1.07
109	-1.26	-0.06	-1.22	-1.22	0.01	0.07	-1.16	-1.15	1.08	-0.79	-1.95	-0.92	-0.96	0.03	-1.78	1.04	-1.07	-0.13	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07
110	-1.26	-0.06	-1.22	-1.22	0.01	0.07	-1.16	-1.15	-1.35	-1.82	-1.95	-0.92	-0.96	0.03	-0.85	1.04	0.15	-0.13	-0.74	-1.76	-0.24	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
111	1.15	1.12	1.23	-0.02	-1.20	-1.16	1.57	1.92	-0.14	0.25	-1.95	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-1.27	0.50	-0.64	-1.03	1.57	1.82	1.92	-0.89	0.95	0.15
112	-0.05	-0.06	0.00	-0.02	0.01	0.07	-1.16	-1.15	-0.14	-0.79	0.06	-0.92	-2.01	-1.04	-0.85	1.04	0.15	1.01	0.50	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
113	-0.05	-0.06	0.00	1.17	1.23	1.30	0.21	0.39	1.08	0.25	-0.94	0.25	1.13	1.11	0.07	-0.13	0.15	1.01	0.50	-0.64	-1.03	0.21	0.33	0.39	0.05	-1.45	0.15
114	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	-0.64	-1.82	-1.16	-1.16	-1.15	0.99	0.95	1.38
115	1.15	1.12	0.00	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	1.07	1.42	1.13	1.11	1.00	-0.13	-1.07	1.01	-0.74	1.60	-1.03	0.21	1.82	0.39	0.99	0.95	-1.07
116	-0.05	-0.06	0.00	-0.02	0.01	-2.38	1.57	0.39	1.08	-0.79	-0.94	0.25	-0.96	-1.04	0.07	-1.29	-3.53	-0.13	0.50	-1.76	-1.03	1.57	1.82	0.39	-0.89	-1.45	-3.53
117	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	0.25	0.09	1.11	1.00	-0.13	1.38	1.01	-0.74	0.48	-1.03	0.21	0.33	0.39	0.99	0.95	1.38
118	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	0.25	0.06	0.25	0.09	-1.04	0.07	-1.29	0.15	-1.27	0.50	-0.64	-0.24	-1.16	-1.16	-1.15	0.05	-1.45	0.15
119	-0.05	-1.24	0.00	-0.02	0.01	0.07	-1.16	-2.69	-1.35	0.25	0.06	-0.92	-0.96	1.11	0.07	-0.13	-1.07	-1.27	-0.74	-1.76	-1.03	-1.16	-1.16	-2.69	0.05	-0.25	-1.07
120	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	0.50	1.60	-1.82	0.21	0.33	0.39	0.99	-0.25	0.15
121	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-1.35	0.25	-0.94	0.25	0.09	0.03	-0.85	1.04	1.38	1.01	0.50	0.48	-1.82	1.57	1.82	0.39	0.05	0.95	1.38
122	-1.26	-1.24	-1.22	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	-2.01	-2.11	-0.85	-1.29	-1.07	-1.27	0.50	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
123	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	0.39	-0.14	0.25	-0.94	0.25	-2.01	0.03	-0.85	-1.29	-1.07	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	0.39	-0.89	-0.25	-1.07
124	-1.26	-1.24	0.00	-0.02	-1.20	0.07	-1.16	-1.15	-0.14	1.28	-0.94	0.25	0.09	1.11	-0.85	-0.13	-2.30	-0.13	-0.74	-0.64	-1.82	-1.16	-1.16	-1.15	0.05	-0.25	-2.30
125	-1.26	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-1.29	0.15	1.01	-0.74	0.48	-0.24	-1.16	-1.16	0.39	0.99	-1.45	0.15
126	1.15	-1.24	-1.22	-0.02	-1.20	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	1.13	0.03	0.07	-1.29	-1.07	-0.13	-0.74	0.48	-1.03	-1.16	-1.16	-1.15	0.05	0.95	-1.07
127	-1.26	-1.24	-1.22	-1.22	0.01	0.07	0.21	0.39	-0.14	-0.79	0.06	0.25	0.09	-1.04	1.00	-0.13	-1.07	-0.13	0.50	1.60	-1.03	0.21	0.33	0.39	0.99	-0.25	-1.07
128	1.15	1.12	-1.22	-1.22	0.01	1.30	0.21	0.39	-0.14	0.25	-0.94	0.25	0.09	0.03	0.07	-0.13	0.15	-1.27	0.50	0.48	-0.24	0.21	-1.16	0.39	-0.89	-1.45	0.15
129	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
130	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-1.82	0.06	1.42	0.09	0.03	-1.78	-0.13	1.38	1.01	-0.74	-0.64	-1.82	0.21	-1.16	0.39	-1.83	-0.25	1.38
131	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	-0.94	0.25	-0.96	-1.04	0.07	-0.13	-1.07	1.01	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07
132	-0.05	-0.06	0.00	-0.02	1.23	0.07	1.57	1.92	-0.14	0.25	-0.94	0.25	-0.96	0.03	-0.85	1.04	1.38	-0.13	1.75	0.48	-1.03	1.57	1.82	1.92	0.05	-0.25	1.38
133	-1.26	-1.24	-1.22	-1.22	-1.20	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	-1.07
134	-0.05	-1.24	0.00	-0.02	0.01	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	-1.78	-1.29	-1.07	-1.27	-0.74	-1.76	-0.24	-1.16	-1.16	-1.15	-1.83	-0.25	-1.07
135	-1.26	-0.06	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	1.08	0.25	-0.94	0.25	-0.96	-1.04	-1.78	-0.13	-1.07	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	-1.83	-0.25	-1.07
136	-1.26	-0.06	-1.22	-0.02	0.01	-1.16	0.21	0.39	-0.14	0.25	0.06	0.25	-0.96	0.03	-0.85	-0.13	0.15	-1.27	-0.74	-0.64	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
137	-0.05	1.12	0.00	-0.02	0.01	-1.16	1.57	0.39	-0.14	0.25	-0.94	0.25	-2.01	-1.04	-0.85	-1.29	0.15	-1.27	0.50	-0.64	-1.82	1.57	0.33	0.39	-0.89	-0.25	1.38
138	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	-0.94	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	-0.64	-1.82	0.21	0.33	0.39	-0.89	-0.25	1.38
139	-1.26	-0.06	-1.22	-1.22	0.01	-1.16	1.57	1.92	-0.14	0.25	-0.94	0.25	-0.96	0.03	-0.85	1.04	1.38	-1.27	-0.74	-0.64	-1.03	1.57	1.82	1.92	-0.89	-0.25	1.38
140	-0.05	-0.06	0.00	-1.22	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	-1.07	-2.41	-0.74	-1.76	-0.24	0.21	0.33	0.39	-0.89	-1.45	-1.07
141	-1.26	-0.06	0.00	-0.02	0.01	0.07	0.21	-1.15	1.08	0.25	0.06	1.42	0.09	-1.04	-1.78	1.04	1.38	-0.13	-0.74	-0.64	-1.03	0.21	0.33	-1.15	-0.89	-0.25	1.38
142	-0.05	-1.24	-1.22	1.17	0.01	0.07	-1.16	0.39	-0.14	0.25	-0.94	0.25	-0.96	0.03	-1.78	-1.29	-1.07	-1.27	-0.74	-1.76	-0.24	-1.16	0.33	0.39	-1.83	-0.25	-1.07
143	-0.05	-1.24	-1.22	-1.22	-1.20	0.07	0.21	0.39	-0.14	0.25	-0.94	-0.92	-2.01	-1.04	-1.78	-1.29	0.15	-1.27	0.50	0.48	-0.24	0.21	0.33	0.39	-1.83	-2.65	0.15
144	-1.26	-1.24	-1.22	-1.22	0.01	0.07	0.21	0.39	-0.14	-0.79	-1.95	-0.92	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	1.75	-0.64	-0.24	0.21	0.33	0.39	0.05	-1.45	0.15
145	-1.26	-1.24	0.00	-1.22	-1.20	-1.16	0.21	0.39	-0.14	1.28	0.06	1.42	0.09	0.03	-0.85	-0.13	1.38	-0.13	0.50	-0.64	-1.03	0.21	0.33	0.39	0.05	-0.25	1.38
146	-1.26	-1.24	-1.22	-1.22	-2.42	-2.38	-1.16	-1.15	-2.57	-0.79	-0.94	1.42	-0.96	0.03	-1.78	-2.45	-1.07	-2.41	-1.99	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-2.65	-1.07
147	-0.05	-0.06	-1.22	-1.22	-1.20	-1.16	0.21	0.39	1.08	0.25	0.06	0.25	1.13	1.11	0.07	-1.29	0.15	-1.27	-0.74	-0.64	-0.24	0.21	0.33	0.39	0.05	-1.45	0.15

Multivariate normality - distribution of standardised residuals, z score below +2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
148	-0.05	-1.24	0.00	-0.02	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	-0.94	-0.92	-0.96	0.03	-0.85	-1.29	0.15	-1.27	-0.74	-0.64	-0.24	-1.16	0.33	-1.15	0.05	-0.25	0.15
149	-1.26	-0.06	-1.22	-0.02	-1.20	-1.16	0.21	-1.15	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	-0.24	0.21	-1.16	-1.15	-0.89	-0.25	-1.07
150	-1.26	-1.24	-1.22	-1.22	0.01	0.07	-1.16	-1.15	-1.35	0.25	0.06	0.25	-0.96	-1.04	0.07	-1.29	0.15	-1.27	0.50	-0.64	-0.24	-1.16	0.33	-1.15	0.05	-0.25	0.15
151	1.15	-1.24	1.23	-1.22	1.23	-1.16	-1.16	-1.15	-1.35	0.25	0.06	1.42	0.09	0.03	-0.85	-0.13	0.15	-0.13	-0.74	0.48	-1.03	0.21	0.33	0.39	-1.83	0.95	0.15
152	-0.05	-0.06	0.00	-0.02	-1.20	0.07	0.21	0.39	-1.35	1.28	-0.94	0.25	0.09	-1.04	-0.85	-0.13	0.15	1.01	-0.74	0.48	-1.03	0.21	0.33	0.39	-1.83	-0.25	0.15
153	1.15	1.12	1.23	1.17	-1.20	1.30	1.57	1.92	-0.14	1.28	1.07	1.42	-0.96	-1.04	0.07	1.04	1.38	1.01	0.50	-0.64	-1.03	1.57	1.82	1.92	0.05	0.95	1.38
154	-1.26	-1.24	-1.22	-1.22	0.01	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
155	-1.26	-2.41	-2.45	-1.22	0.01	-2.38	0.21	-2.69	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-1.27	0.50	0.48	-1.03	0.21	-1.16	-2.69	-0.89	-1.45	0.15
156	-1.26	-1.24	-1.22	-1.22	0.01	-1.16	-1.16	0.39	-0.14	-0.79	0.06	0.25	-0.96	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	0.48	-1.03	-1.16	0.33	0.39	-0.89	-0.25	0.15
157	-0.05	-1.24	-1.22	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-2.41	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	0.15
158	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	0.50	1.60	-1.82	0.21	0.33	0.39	0.99	-0.25	0.15
159	-0.05	1.12	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-1.82	-1.95	0.25	-0.96	-1.04	0.07	1.04	0.15	-1.27	-0.74	0.48	-1.03	0.21	1.82	0.39	-0.89	-0.25	0.15
160	-0.05	-0.06	0.00	-0.02	-1.20	0.07	0.21	-1.15	-1.35	-1.82	-0.94	0.25	-0.96	-2.11	-0.85	-0.13	-1.07	-0.13	0.50	-0.64	-0.24	0.21	0.33	-1.15	-0.89	0.95	-1.07
161	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-1.95	0.25	-0.96	-1.04	-1.78	-1.29	-1.07	-0.13	-0.74	0.48	-0.24	-1.16	-1.16	-1.15	-1.83	-1.45	-1.07
162	-2.46	-2.41	-2.45	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	-0.94	-0.92	-0.96	0.03	-0.85	-1.29	0.15	-0.13	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
163	-1.26	-1.24	-2.45	-1.22	-2.42	-2.38	-1.16	-2.69	-0.14	-0.79	-0.94	-0.92	-0.96	0.03	-0.85	-1.29	-2.30	-0.13	-0.74	-1.76	0.55	-1.16	-1.16	-2.69	-0.89	-1.45	-2.30
164	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	0.25	-0.96	0.03	-0.85	-3.62	-3.53	-1.27	-0.74	-1.76	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	-3.53
165	-1.26	-1.24	-1.22	-1.22	0.01	-1.16	0.21	-1.15	1.08	-0.79	-0.94	0.25	0.09	-1.04	-0.85	-1.29	0.15	-0.13	-0.74	-0.64	-0.24	0.21	-1.16	-1.15	-0.89	-0.25	0.15
166	-1.26	-0.06	0.00	-0.02	-1.20	-1.16	1.57	0.39	-0.14	-0.79	0.06	0.25	-2.01	-1.04	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	-1.03	1.57	0.33	0.39	-0.89	-1.45	-1.07
167	-1.26	-0.06	-1.22	-0.02	0.01	0.07	-1.16	-1.15	1.08	0.25	0.06	1.42	0.09	1.11	0.07	1.04	0.15	1.01	-0.74	0.48	-1.03	-1.16	0.33	-1.15	0.05	-0.25	0.15
168	1.15	1.12	0.00	-0.02	0.01	-1.16	-1.16	0.39	1.08	0.25	-0.94	0.25	0.09	0.03	0.07	-0.13	1.38	1.01	1.75	0.48	-1.82	-1.16	0.33	0.39	0.05	0.95	1.38
169	-0.05	-1.24	-1.22	-0.02	0.01	0.07	-1.16	0.39	-0.14	-0.79	0.06	0.25	0.09	0.03	-0.85	-1.29	0.15	-1.27	0.50	0.48	-0.24	-1.16	-1.16	0.39	-0.89	-0.25	0.15
170	-0.05	-1.24	0.00	-1.22	-1.20	0.07	-1.16	0.39	-0.14	0.25	0.06	0.25	-0.96	0.03	0.07	-1.29	0.15	-0.13	0.50	0.48	-1.03	-1.16	0.33	0.39	0.05	-1.45	0.15
171	-0.05	-0.06	-1.22	-0.02	0.01	0.07	-1.16	0.39	-0.14	0.25	0.06	-0.92	-0.96	1.11	1.00	-0.13	0.15	-1.27	0.50	0.48	-0.24	-1.16	0.33	0.39	0.99	-1.45	0.15
172	-1.26	-0.06	-1.22	-0.02	0.01	-1.16	0.21	-1.15	-0.14	-0.79	-1.95	-0.92	-2.01	0.03	0.07	-0.13	0.15	-2.41	-0.74	-1.76	-0.24	0.21	-1.16	-1.15	-0.89	-0.25	0.15
173	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	0.25	0.09	1.11	0.07	1.04	0.15	-2.41	0.50	0.48	-1.03	-1.16	-1.16	-1.15	0.05	0.95	0.15
174	-1.26	-1.24	-1.22	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	-0.96	-1.04	0.07	-0.13	-1.07	-1.27	-0.74	-2.88	-1.03	-1.16	-1.16	-1.15	0.05	-0.25	-1.07
175	-1.26	-0.06	0.00	-0.02	-1.20	-1.16	-1.16	-1.15	-1.35	0.25	-0.94	0.25	-0.96	0.03	-2.71	-0.13	0.15	-0.13	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	-2.78	-0.25	0.15
176	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	0.09	1.11	1.00	-0.13	0.15	1.01	0.50	0.48	-1.82	1.57	1.82	1.92	0.99	0.95	0.15
177	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	-1.03	0.21	0.33	0.39	0.05	-0.25	0.15
178	-0.05	-1.24	-1.22	-0.02	0.01	0.07	0.21	-1.15	-0.14	-0.79	0.06	0.25	0.09	1.11	0.07	1.04	0.15	-0.13	0.50	0.48	-1.03	0.21	-1.16	-1.15	0.99	-0.25	0.15
179	-0.05	-0.06	-2.45	-0.02	-2.42	-1.16	-2.52	-1.15	-1.35	-1.82	-0.94	0.25	-0.96	0.03	0.07	-3.62	0.15	-1.27	0.50	0.48	-0.24	-2.52	-1.16	-1.15	0.05	-1.45	0.15
180	-0.05	-0.06	0.00	-0.02	1.23	1.30	-1.16	-1.15	1.08	0.25	-0.94	0.25	0.09	0.03	0.07	-1.29	-1.07	-0.13	0.50	0.48	-2.88	-1.82	0.21	0.33	-1.15	0.95	-1.07
181	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	-1.15	1.08	0.25	0.06	0.25	-0.96	-1.04	1.00	1.04	-1.07	-0.13	0.50	-2.88	-1.82	0.21	0.33	-1.15	0.99	-0.25	-1.07
182	1.15	1.12	1.23	1.17	1.23	1.30	-1.16	-1.15	-1.35	-0.79	1.07	-0.92	1.13	-1.04	1.00	-1.29	-1.07	1.01	0.50	1.60	-1.82	-1.16	-1.16	-1.15	0.99	0.95	-1.07
183	-0.05	1.12	1.23	-0.02	1.23	1.30	1.57	0.39	1.08	0.25	1.07	0.25	0.09	0.03	1.00	-0.13	0.15	-0.13	0.50	-0.64	-1.03	1.57	1.82	0.39	-0.89	-0.25	0.15
184	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	0.06	0.25	-0.96	-2.11	0.07	-2.45	-1.07	-1.27	0.50	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	-1.07
185	-0.05	-0.06	-1.22	-0.02	0.01	0.07	-1.16	0.39	1.08	0.25	1.07	-0.92	1.13	-1.04	1.00	-1.29	0.15	1.01	-1.99	-0.64	-0.24	-1.16	-1.16	0.39	0.99	-0.25	0.15
186	-0.05	-0.06	-1.22	-0.02	1.23	0.07	-2.52	-1.15	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-1.29	-1.07	-1.27	-0.74	0.48	-1.03	-2.52	-1.16	-1.15	0.99	-0.25	-1.07
187	-0.05	1.12	0.00	-0.02	1.23	0.07	0.21	0.39	-0.14	0.25	0.06	-0.92	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	0.48	-1.03	0.21	1.82	0.39	0.99	0.95	0.15
188	-0.05	-1.24	0.00	-0.02	0.01	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	1.60	-1.03	0.21	0.33	0.39	0.99	-0.25	0.15
189	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	1.38
190	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	0.21	0.39	-0.14	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	1.04	0.15	-1.27	-0.74	-0.64	-1.03	0.21	0.33	0.39	-0.89	-1.45	0.15
191	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	1.01	1.75	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	0.15
192	1.15	-0.06	0.00	1.17	1.23	1.30	1.57	1.92	-0.14	0.25	-0.94	-0.92	0.09	-1.04	-0.85	1.04	1.38	1.01	0.50	-0.64	-1.03	1.57	1.82	1.92	0.05	-0.25	1.38
193	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	1.92	-0.14	1.28	1.07	0.25	0.09	0.03	0.07	-0.13	-1.07	-0.13	0.50	0.48	-1.82	0.21	1.82	1.92	0.99	0.95	-1.07
194	-0.05	1.12	1.23	-0.02	0.01	0.07	1.57	1.92	1.08	1.28	1.07	1.42	0.09	1.11	1.00	-0.13	0.15	1.01	-0.74	1.60	-1.82	1.57	1.82	1.92	0.99	0.95	0.15
195	1.15	1.12	1.23	1.17	1.23	0.07	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	-0.74	-0.64	-1.82	1.57	1.82	1.92	0.99	0.95	1.38
196	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	0.25	-0.94	-0.92	-0.96	-1.04	-1.78	-1.29	-2.30	-2.41	-0.74	-0.64	-1.82	-1.16	-1.16	-1.15	-1.83	0.95	-2.30
197	-0.05	-0.06	0.00	-0.02	-1.20	-1.16	0.21	0.39	-1.35	0.25	-0.94	0.25	-0.96	-1.04	-1.78	-1.29	1.38	-0.13	-1.99	-0.64	-1.82	0.21	-1.16	0.39	-1.83	-0.25	1.38
198	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	-1.07	1.01	-1.99	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	-1.07
199	-1.26	-1.24	0.00	-1.22	-1.20	0.07	-1.16	1.92	-0.14	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	1.60	-1.03	-1.16	-1.16	1.92	0.99	-0.25	0.15

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
200	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	0.25	0.06	0.25	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	-0.64	-1.03	1.57	1.82	1.92	0.99	0.95	0.15
201	-0.05	1.12	-2.45	-0.02	0.01	0.07	-1.16	1.92	-2.57	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	1.38	-1.27	-0.74	-0.64	-1.82	-1.16	0.33	1.92	-0.89	0.95	1.38
202	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	0.21	-1.15	-0.14	-0.79	-1.95	0.25	-0.96	-1.04	-0.85	1.04	-1.07	-1.27	0.50	-1.76	-1.82	0.21	0.33	-1.15	-0.89	-1.45	-1.07
203	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-1.95	-0.92	-2.01	-2.11	-1.78	-0.13	-1.07	-0.13	-1.99	-1.76	-1.03	-1.16	-1.16	-1.15	-1.83	-1.45	-1.07
204	-3.66	1.12	1.23	-0.02	0.01	0.07	1.57	1.92	-0.14	0.25	0.06	-2.08	0.09	0.03	1.00	1.04	1.38	1.01	1.75	0.48	-0.24	1.57	1.82	1.92	0.99	0.95	1.38
205	-1.26	-0.06	-1.22	-1.22	0.01	0.07	-1.16	0.39	-0.14	0.25	0.06	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	-0.64	-1.82	-1.16	0.33	0.39	-0.89	-0.25	1.38
206	-0.05	-1.24	1.23	-1.22	0.01	-1.16	0.21	-1.15	1.08	0.25	1.07	-0.92	1.13	0.03	1.00	1.04	1.38	1.01	0.50	-0.64	-0.24	0.21	1.82	-1.15	0.99	0.95	1.38
207	-0.05	1.12	1.23	-0.02	0.01	1.30	1.57	1.92	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	-1.07	1.01	0.50	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	-1.07
208	-0.05	-1.24	0.00	-1.22	-1.20	0.07	0.21	-1.15	-1.35	-0.79	-0.94	-0.92	0.09	-1.04	0.07	1.04	-1.07	-1.27	-0.74	0.48	-1.03	0.21	-1.16	-1.15	0.05	-1.45	-1.07
209	-1.26	-0.06	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	1.08	0.25	0.06	1.42	0.09	1.11	0.07	-0.13	1.38	1.01	-0.74	-0.64	-1.03	-1.16	-1.16	-1.15	0.05	0.95	1.38
210	1.15	-0.06	1.23	1.17	1.23	0.07	1.57	0.39	1.08	1.28	1.07	-2.08	1.13	1.11	1.00	-0.13	-1.07	1.01	0.50	0.48	-1.03	1.57	1.82	0.39	0.99	0.95	-1.07
211	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-2.52	-1.15	-2.57	-0.79	0.06	0.25	0.09	-2.11	-1.78	-1.29	0.15	-2.41	0.50	-0.64	-0.24	-2.52	-2.65	-1.15	-1.83	-1.45	0.15
212	-2.46	-1.24	-1.22	-1.22	-2.42	-2.38	-1.16	-1.15	-1.35	0.25	-1.95	0.25	-2.01	-2.11	-0.85	-1.29	-1.07	-2.41	-1.99	0.48	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
213	-0.05	1.12	1.23	1.17	0.01	0.07	0.21	0.39	1.08	1.28	0.06	-0.92	1.13	0.03	1.00	1.04	0.15	-0.13	-0.74	1.60	-1.03	0.21	0.33	0.39	0.99	0.95	0.15
214	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	1.42	0.09	-1.04	-1.78	-1.29	0.15	1.01	0.50	0.48	-1.82	0.21	0.33	0.39	-1.83	-0.25	0.15
215	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	0.25	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	0.15
216	-0.05	-0.06	0.00	-0.02	0.01	0.07	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	1.75	1.60	-1.82	1.57	1.82	1.92	0.99	0.95	0.15
217	-1.26	-1.24	0.00	-1.22	0.01	0.07	-1.16	0.39	-0.14	0.25	-0.94	0.25	0.09	-1.04	0.07	-0.13	0.15	-0.13	-0.74	0.48	-1.03	-1.16	-1.16	0.39	-0.89	-0.25	0.15
218	-0.05	1.12	1.23	-0.02	1.23	1.30	0.21	1.92	1.08	1.28	1.07	-0.92	1.13	0.03	1.00	1.04	0.15	1.01	0.50	1.60	-1.03	0.21	1.82	1.92	0.99	0.95	0.15
219	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	-2.08	1.13	1.11	1.00	1.04	1.38	1.01	-1.99	-1.76	-1.82	1.57	1.82	1.92	0.99	0.95	1.38
220	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	1.13	0.03	1.00	-0.13	-1.07	1.01	0.50	1.60	-1.03	1.57	1.82	1.92	0.99	0.95	-1.07
221	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	0.25	-0.94	-0.92	-2.01	-2.11	-1.78	-0.13	0.15	-0.13	-0.74	-1.76	-1.03	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
222	-0.05	-0.06	-1.22	-0.02	-1.20	0.07	0.21	0.39	-1.35	-2.85	0.06	-3.25	0.09	-2.11	-0.85	-1.29	0.15	-0.13	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	0.15
223	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	-1.95	-2.08	-2.01	-2.11	-1.78	-1.29	-1.07	-1.27	-1.99	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07
224	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	0.39	1.08	-0.79	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	1.01	1.75	0.48	1.34	1.57	0.33	0.39	0.99	0.95	0.15
225	-0.05	1.12	0.00	-0.02	0.01	-1.16	0.21	0.39	-0.14	-0.79	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	1.01	-0.74	-1.76	-0.24	0.21	0.33	0.39	0.05	-0.25	0.15
226	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	1.38	1.01	0.48	0.55	1.34	1.57	1.82	0.39	0.99	0.95	1.38
227	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	1.92	1.08	1.28	-2.95	-2.08	-2.01	-1.04	-2.71	-0.13	1.38	1.01	-1.99	-2.88	1.34	1.57	0.33	1.92	-2.78	0.95	1.38
228	1.15	1.12	0.00	-0.02	0.01	1.30	-1.16	-1.15	-0.14	0.25	0.06	0.25	0.09	1.11	-0.85	1.04	0.15	1.01	-0.74	0.48	0.55	-1.16	-1.16	-1.15	0.05	0.95	0.15
229	-0.05	-0.06	0.00	-0.02	0.01	1.30	1.57	0.39	-0.14	1.28	1.07	0.25	0.09	0.03	1.00	1.04	0.15	-0.13	0.50	-0.64	0.55	1.57	0.33	0.39	0.99	0.95	0.15
230	1.15	-0.06	0.00	-2.41	0.01	0.07	0.21	0.39	1.08	1.28	0.06	-2.08	0.09	1.11	1.00	1.04	0.15	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
231	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-1.82	-1.95	-0.92	-0.96	-1.04	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-0.25	-1.07
232	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	1.07	-0.92	1.13	0.03	1.00	-1.29	0.15	-0.13	0.50	-0.64	-0.24	-1.16	-1.16	-1.15	0.99	-0.25	0.15
233	1.15	-1.24	1.23	1.17	-1.20	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	0.15
234	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	0.50	1.60	1.34	1.57	1.82	0.39	0.99	0.95	0.15
235	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	-0.13	1.38	1.01	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38
236	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	0.15
237	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	0.06	-0.92	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	-0.74	0.48	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
238	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	-2.30	-2.41	-0.74	0.48	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	-2.30
239	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-2.57	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	-1.99	-0.64	1.34	-1.16	-1.16	-1.15	-0.89	0.95	1.38
240	1.15	1.12	0.00	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	-0.13	1.75	0.48	0.55	0.21	0.33	0.39	0.99	0.95	0.15
241	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	1.38
242	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-0.14	-1.82	-0.94	0.25	0.09	-1.04	-1.78	1.04	1.38	1.01	-0.74	-0.64	0.55	1.57	0.33	0.39	-1.83	0.95	1.38
243	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	-0.74	-0.64	-0.24	0.21	0.33	0.39	0.99	-0.25	1.38
244	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	-2.30	1.01	1.75	0.48	0.55	1.57	0.33	0.39	0.99	0.95	-2.30
245	-2.46	-2.41	-2.45	-1.22	-1.20	0.07	-1.16	-1.15	-1.35	0.25	-0.94	1.42	-0.96	0.03	0.07	1.04	1.38	1.01	-0.74	-1.76	1.34	-1.16	-1.16	-1.15	0.05	-1.45	1.38
246	-1.26	-0.06	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	1.42	-0.96	0.03	0.07	-1.29	-1.07	-0.13	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-0.25	-1.07
247	-0.05	-0.06	-1.22	-1.22	-1.20	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	0.07	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
248	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	0.15	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	0.95	0.15
249	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-0.13	0.15	-1.27	-0.74	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
250	1.15	1.12	0.00	1.17	1.23	1.30	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-0.13	-1.07	-0.13	0.50	-0.64	1.34	1.57	1.82	1.92	0.99	0.95	-1.07
251	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-0.14	0.25	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
252	1.15	1.12	1.23	1.17	0.01	0.07	0.21	0.39	-0.14	1.28	1.07	-0.92	0.09	-2.11	0.07	1.04	1.38	1.01	0.50	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	1.38

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
253	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	-0.14	-0.79	0.06	-0.92	0.09	0.03	1.00	1.04	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
254	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	0.09	0.03	1.00	1.04	1.38	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	1.38
255	-0.05	-1.24	0.00	-1.22	0.01	0.07	-1.16	-1.15	-0.14	-0.79	-1.95	-0.92	-0.96	-1.04	-1.78	1.04	0.15	-0.13	0.50	-1.76	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
256	1.15	1.12	1.23	1.17	1.23	1.30	-1.16	0.39	1.08	0.25	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	1.75	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
257	1.15	-0.06	1.23	1.17	1.23	0.07	-1.16	-1.15	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	-1.16	-1.16	-1.15	0.99	0.95	1.38
258	1.15	-0.06	0.00	-0.02	0.01	1.30	1.57	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	-0.13	1.75	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
259	-1.26	-0.06	0.00	1.17	1.23	1.30	1.57	0.39	1.08	1.28	0.06	0.25	1.13	1.11	1.00	1.04	-1.07	1.01	0.50	1.60	0.55	1.57	0.33	0.39	-0.89	0.95	-1.07
260	-1.26	-0.06	0.00	-1.22	-1.20	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	0.07	-1.29	0.15	-0.13	-0.74	0.48	0.55	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
261	-0.05	-0.06	0.00	-0.02	0.01	-1.16	0.21	0.39	-1.35	-0.79	-0.94	0.25	1.13	-1.04	-0.85	-1.29	-1.07	-1.27	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	0.95	-1.07
262	1.15	1.12	1.23	1.17	0.01	-1.16	0.21	0.39	1.08	-0.79	1.07	1.42	1.13	1.11	1.00	-1.29	-1.07	1.01	0.50	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
263	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	0.03	-0.85	-0.13	-1.07	-0.13	-1.99	0.48	-0.24	0.21	0.33	0.39	-0.89	0.95	-1.07
264	-1.26	-1.24	-1.22	-1.22	-1.20	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	-0.96	-2.11	-0.85	-1.29	-1.07	-0.13	-0.74	0.48	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	-1.07
265	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	1.75	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
266	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	-0.79	-1.95	1.42	-0.96	-2.11	-1.78	-0.13	0.15	-0.13	-1.99	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
267	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	-0.14	1.28	1.07	0.25	1.13	0.03	1.00	1.04	1.38	1.01	1.75	0.48	0.55	1.57	1.82	1.92	0.99	0.95	1.38
268	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-3.79	-1.82	-1.95	0.25	-2.01	-2.11	-2.71	-0.13	1.38	1.01	0.50	-0.64	1.34	0.21	0.33	0.39	-2.78	0.95	1.38
269	-0.05	-0.06	1.23	-0.02	0.01	-1.16	-1.16	-1.15	-1.35	0.25	0.06	0.25	1.13	-1.04	0.07	-0.13	-1.07	-1.27	0.50	0.48	0.55	-1.16	-1.16	-1.15	0.99	0.95	-1.07
270	-0.05	1.12	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	1.28	0.06	0.25	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	0.48	0.55	-1.16	-1.16	-1.15	0.99	0.95	0.15
271	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38
272	-0.05	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	-0.14	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	-0.13	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
273	-2.46	-2.41	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	1.08	-1.82	-0.94	-2.08	-2.01	-1.04	-1.78	-1.29	-1.07	-2.41	-0.74	-1.76	-1.03	-2.52	-2.65	-2.69	-0.89	-2.65	-1.07
274	-2.46	-2.41	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	-1.35	-0.79	-0.94	-2.08	-0.96	-2.11	-1.78	-2.45	-2.30	-2.41	-0.74	-0.64	-0.24	-2.52	-2.65	-2.69	-1.83	-2.65	-2.30
275	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-1.29	-1.07	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
276	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	0.06	-0.92	0.09	-1.04	-0.85	-1.29	0.15	-0.13	-0.74	0.48	1.34	0.21	0.33	0.39	-0.89	-0.25	0.15
277	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-1.82	0.06	-0.92	0.09	-2.11	-1.78	-0.13	0.15	-0.13	-0.74	0.48	1.34	0.21	0.33	0.39	-1.83	-0.25	0.15
278	-1.26	-1.24	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-1.95	-2.08	-0.96	-1.04	-0.85	-0.13	0.15	-1.27	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-2.65	0.15
279	-2.46	-2.41	0.00	-0.02	-1.20	-2.38	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	0.07	-2.45	-2.30	-2.41	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-1.45	-2.30
280	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
281	-1.26	1.12	0.00	1.17	1.23	-1.16	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-1.29	-1.07	1.01	-0.74	-0.64	-1.03	0.21	0.33	0.39	0.99	0.95	-1.07
282	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	-0.94	1.42	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	-0.89	0.95	1.38
283	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	-0.92	0.09	1.11		-1.29	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
284	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	1.00	-0.13	0.15	-0.13	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
285	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	1.38
286	1.15	1.12	0.00	1.17	0.01	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	0.48	1.34	1.57	1.82	0.39	0.99	-0.25	1.38
287	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	0.48	1.34	1.57	1.82	0.39	0.99	0.95	1.38
288	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	0.48	1.34	1.57	1.82	0.39	0.99	0.95	1.38
289	1.15	1.12	0.00	-1.22	-1.20	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	0.09	1.11	-0.85	-1.29	-1.07	1.01	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	-1.07
290	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-2.57	-1.82	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
291	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-1.82	-1.95	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-0.74	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	0.15
292	-2.46	-2.41	-2.45	-2.41	-2.42	-2.38	-2.52	-2.69	-0.14	-1.82	-1.95	-2.08	-2.01	-2.11	-1.78	-2.45	-2.30	-2.41	-1.99	-1.76	-1.03	-2.52	-2.65	-2.69	-1.83	-2.65	-2.30
293	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	0.15
294	1.15	1.12	1.23	-1.22	-1.20	1.30	1.57	1.92	-0.14	-0.79	-0.94	-0.92	-0.96	1.11	1.00	1.04	1.38	1.01	0.50	0.48	0.55	1.57	0.33	1.92	0.99	0.95	1.38
295	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	0.48	1.34	0.21	0.33	0.39	0.99	-0.25	0.15
296	-0.05	-0.06	0.00	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	-1.07	1.01	-0.74	1.60	0.55	0.21	0.33	0.39	-0.89	0.95	-1.07
297	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-1.35	-0.79	-0.94	-0.92	0.09	-1.04	0.07	-0.13	0.15	1.01	0.50	1.60	0.55	0.21	0.33	0.39	-0.89	0.95	0.15
298	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	0.09	0.03	-0.85	-1.29	0.15	-1.27	-1.99	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
299	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	1.42	1.13	0.03	-0.85	-1.29	0.15	-1.27	0.50	0.48	1.34	0.21	0.33	0.39	-0.89	-0.25	0.15
300	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	1.11	1.00	-0.13	0.15	-0.13	0.50	0.48	1.34	0.21	0.33	0.39	0.99	-0.25	0.15
301	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-0.13	-1.07	1.01	1.75	0.48	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
302	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	0.06	-0.92	1.13	0.03	1.00	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
303	-1.26	-2.41	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	-2.57	-1.82	-0.94	-2.08	-0.96	-2.11	-1.78	-2.45	-2.30	-1.27	-0.74	-0.64	-1.03	-2.52	-2.65	-2.69	-0.89	-2.65	-2.30
304	-0.05	1.12	0.00	-0.02	0.01	-1.16	-1.16	-1.15	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-1.29	-1.07	-0.13	0.50	-0.64	1.34	-1.16	-1.16	-1.15	0.99	-1.45	-1.07
305	1.15	1.12	1.23	1.17	0.01	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	0.15
306	-0.05	1.12	1.23	-0.02	0.01	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
307	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	0.25	1.07	1.42	1.13	1.11	0.07	1.04	0.15	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
308	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
309	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	0.03	0.07	1.04	1.38	1.01	0.50	-1.76	0.55	0.21	0.33	0.39	0.05	-0.25	1.38
310	-0.05	-0.06	0.00	-1.22	-1.20	0.07	1.57	0.39	1.08	-0.79	1.07	-2.08	1.13	0.03	1.00	-1.29	1.38	1.01	-0.74	-0.64	1.34	1.57	0.33	0.39	0.99	0.95	1.38
311	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	1.00	-0.13	0.15	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	0.15
312	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
313	-0.05	-0.06	1.23	-0.02	1.23	-1.16	-1.16	-1.15	-0.14	0.25	1.07	-0.92	0.09	0.03	1.00	-0.13	0.15	-0.13	-0.74	-0.64	1.34	-1.16	-1.16	-1.15	0.05	0.95	0.15
314	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
315	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-1.29	-1.07	-1.27	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
316	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	0.09	1.11	-0.85	-0.13	-1.07	-1.27	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	-1.07
317	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	0.06	0.25	0.09	-1.04	0.07	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	0.15
318	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-1.29	0.15	1.01	1.75	0.48	1.34	1.57	0.33	0.39	0.99	0.95	0.15
319	-0.05	-0.06	0.00	-0.02	0.01	-1.16	0.21	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	-1.29	-1.07	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	-1.07
320	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	0.39	-0.14	0.25	-0.94	0.25	0.09	-1.04	-1.78	-0.13	0.15	-0.13	-0.74	-0.64	0.55	1.57	0.33	0.39	-1.83	0.95	0.15
321	-0.05	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	-0.94	1.42	-0.96	0.03	0.07	-1.29	-1.07	1.01	-0.74	-0.64	-1.82	0.21	0.33	0.39	0.05	-0.25	-1.07
322	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	-0.92	0.09	0.03	1.00	1.04	-1.07	-1.27	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	-1.45	-1.07
323	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
324	1.15	1.12	1.23	-0.02	0.01	-1.16	0.21	0.39	-0.14	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	-0.13	1.75	0.48	0.55	0.21	0.33	0.39	0.99	0.95	0.15
325	-0.05	-0.06	1.23	1.17	1.23	1.30	1.57	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	-1.29	-2.30	-0.13	0.50	0.48	0.55	1.57	0.33	0.39	0.99	0.95	-2.30
326	1.15	1.12	1.23	1.17	0.01	1.30	1.57	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	1.38
327	-0.05	-1.24	-1.22	-1.22	0.01	0.07	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	-1.99	-0.64	-1.03	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
328	-0.05	-0.06	1.23	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-1.27	-0.74	-0.64	0.55	0.21	-1.16	0.39	-0.89	0.95	0.15
329	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
330	1.15	1.12	0.00	1.17	1.23	1.30	0.21	0.39	-0.14	0.25	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	0.15
331	1.15	1.12	-1.22	-0.02	0.01	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	0.50	-1.76	0.55	1.57	0.33	0.39	0.99	0.95	1.38
332	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-1.29	0.15	-1.27	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	0.15
333	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	0.25	-0.94	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	1.60	1.34	0.21	0.33	0.39	0.99	0.95	0.15
334	1.15	1.12	0.00	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	0.03	1.00	1.04	0.15	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
335	-0.05	1.12	1.23	1.17	0.01	0.07	0.21	0.39	-0.14	-0.79	1.07	1.42	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	0.15
336	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	-0.94	0.25	0.09	0.03	0.07	1.04	1.38	1.01	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38
337	1.15	1.12	0.00	1.17	0.01	1.30	0.21	0.39	-1.35	0.25	-0.94	0.25	-0.96	1.11	-0.85	1.04	1.38	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-1.83	0.95	1.38
338	1.15	1.12	0.00	-0.02	0.01	-1.16	1.57	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	-2.30	1.01	-0.74	-0.64	-0.24	1.57	0.33	0.39	0.99	0.95	-2.30
339	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	0.25	1.07	-0.92	0.09	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
340	-0.05	-0.06	1.23	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	-1.04	-1.78	-0.13	0.15	-0.13	-0.74	0.48	1.34	0.21	0.33	0.39	-1.83	0.95	0.15
341	-0.05	-1.24	0.00	1.17	1.23	0.07	0.21	0.39	-0.14	0.25	0.06	-2.08	0.09	0.03	0.07	1.04	0.15	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
342	-0.05	-0.06	0.00	1.17	1.23	1.30	0.21	0.39	1.08	0.25	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	-1.27	1.75	0.48	1.34	0.21	0.33	0.39	0.99	-0.25	0.15
343	-0.05	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	1.60	0.55	0.21	0.33	0.39	0.99	0.95	0.15
344	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
345	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	-0.89	0.95	1.38
346	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	-0.96	0.03	0.07	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	0.15
347	-1.26	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-0.94	1.42	-0.96	1.11	-1.78	-0.13	-1.07	-0.13	-0.74	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	-1.07
348	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	0.06	1.42	1.13	0.03	0.07	-0.13	0.15	-1.27	1.75	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-1.45	0.15
349	-0.05	-0.06	1.23	1.17	0.01	1.30	0.21	0.39	1.08	1.28	1.07	1.42	1.13	0.03	1.00	-1.29	-1.27	-0.74	0.48	-0.64	-0.24	0.21	0.33	0.39	0.99	0.95	0.15
350	1.15	1.12	1.23	1.17	1.23	0.07	1.57	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	-1.07	1.01	0.50	-0.64	1.34	1.57	0.33	0.39	0.99	0.95	-1.07
351	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	0.95	1.38
352	1.15	1.12	1.23	-0.02	0.01	1.30	0.21	0.39	-1.35	-1.82	-0.94	1.42	-0.96	-1.04	0.07	1.04	-1.07	1.01	0.50	-0.64	1.34	0.21	0.33	0.39	0.05	0.95	-1.07
353	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	0.39	1.08	0.25	1.07	-0.92	1.13	-1.04	-1.78	-0.13	-1.07	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	-1.07
354	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	0.06	-0.92	-0.96	-1.04	-0.85	1.04	0.15	-0.13	0.50	0.48	1.34	0.21	0.33	0.39	-0.89	-1.45	0.15
355	-0.05	-0.06	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	-1.78	-0.13	0.15	-0.13	0.50	-0.64	1.34	0.21	0.33	0.39	-1.83	0.95	0.15
356	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	-1.29	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
357	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	-0.79	1.07	0.25	1.13	1.11	1.00	-1.29	1.38	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
358	-0.05	-0.06	-1.22	-1.22	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	0.25	-0.96	-1.04	0.07	-1.29	-1.07	-1.27	0.50	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-1.45	-1.07

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
359	-0.05	1.12	0.00	1.17	1.23	0.07	0.21	0.39	1.08	0.25	1.07	1.42	1.13	0.03	1.00	1.04	0.15	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	0.15
360	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	1.08	0.25	0.06	-0.92	1.13	1.11	1.00	-1.29	1.38	1.01	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	1.38
361	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-1.35	-0.79	-0.94	1.42	0.09	-1.04	1.00	1.04	-1.07	-1.27	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
362	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
363	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	-0.13	1.75	-0.64	0.55	0.21	0.33	0.39	0.99	-1.45	0.15
364	1.15	1.12	0.00	1.17	1.23	0.07	1.57	0.39	-0.14	-0.79	-0.94	1.42	0.09	-1.04	-1.78	-0.13	1.38	1.01	0.50	0.48	0.55	1.57	0.33	0.39	-1.83	-0.25	1.38
365	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
366	-0.05	-0.06	-1.22	-0.02	0.01	1.30	1.57	0.39	-0.14	-0.79	0.06	-0.92	1.13	1.11	0.07	-1.29	-1.07	1.01	1.75	-1.76	0.55	1.57	0.33	0.39	0.99	0.95	-1.07
367	1.15	-1.24	0.00	-0.02	-1.20	0.07	0.21	0.39	1.08	0.25	1.07	1.42	0.09	1.11	1.00	-0.13	-1.07	-1.27	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
368	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	-0.96	0.03	-0.85	-0.13	0.15	-1.27	-0.74	0.48	0.55	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
369	1.15	1.12	1.23	1.17	1.23	0.21	0.39	-1.35	-0.79	1.07	1.42	1.13	1.11	1.00	-0.13	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38	
370	-0.05	-0.06	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-1.82	0.06	0.25	-0.96	0.03	-0.85	-0.13	0.15	-0.13	0.50	-0.64	-0.24	-1.16	-1.16	-1.15	0.05	-0.25	0.15
371	1.15	1.12	0.00	-0.02	0.01	1.30	0.21	0.39	-0.14	-1.82	-0.94	0.25	0.09	1.11	-1.78	-1.29	0.15	-0.13	-0.74	0.48	0.55	0.21	0.33	0.39	-0.89	-2.65	0.15
372	-1.26	-0.06	-1.22	-0.02	-1.20	0.07	0.21	0.39	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	0.07	-1.29	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-1.45	0.15
373	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-0.14	-0.79	0.06	1.42	0.09	-1.04	-1.78	1.04	1.38	1.01	0.50	1.60	1.34	1.57	0.33	0.39	-1.83	0.95	1.38
374	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	0.39	1.08	1.28	1.07	0.25	1.13	0.03	1.00	1.04	0.15	-0.13	1.75	-0.64	1.34	1.57	0.33	0.39	0.99	0.95	0.15
375	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-2.57	-0.79	-0.94	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
376	-3.66	-2.41	-2.45	-2.41	-1.20	-2.38	-1.16	-1.15	-2.57	-1.82	0.06	-2.08	-2.01	-2.11	-0.85	-0.13	-1.07	-3.55	-0.74	-0.64	1.34	-1.16	-1.16	-1.15	0.05	-2.65	-1.07
377	-0.05	1.12	-1.22	1.17	0.01	1.30	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	1.00	-0.13	-1.07	1.01	1.75	0.48	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
378	1.15	1.12	1.23	1.17	1.23	-1.16	0.21	0.39	1.08	-0.79	0.06	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	0.15
379	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
380	-2.46	-1.24	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	-1.35	0.25	-2.95	0.25	0.09	-1.04	-0.85	-1.29	0.15	-1.27	-0.74	0.48	-1.03	-2.52	-2.65	-2.69	0.05	-0.25	0.15
381	-1.26	-1.24	-1.22	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	-0.92	0.09	-1.04	-0.85	-2.45	-1.07	-1.27	0.50	-1.76	-0.24	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07
382	-0.05	1.12	0.00	-0.02	1.23	0.07	0.21	0.39	1.08	1.28	0.06	1.42	1.13	0.03	0.07	1.04	1.38	-0.13	1.75	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
383	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	0.07	1.04	1.38	1.01	1.75	0.48	1.34	0.21	0.33	0.39	0.05	0.95	1.38
384	-0.05	-0.06	-1.22	-2.41	-2.42	1.30	1.57	0.39	1.08	1.28	1.07	1.42	1.13	0.03	1.00	1.04	0.15	1.01	-0.74	-0.64	1.34	1.57	0.33	0.39	0.99	0.95	0.15
385	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	0.25	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	1.75	0.48	1.34	0.21	0.33	0.39	0.99	0.95	0.15
386	1.15	1.12	1.23	1.17	1.23	0.07	-1.16	-1.15	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	1.60	0.55	-1.16	-1.16	-1.15	0.99	0.95	0.15
387	-0.05	-0.06	0.00	-0.02	0.01	1.30	-1.16	-1.15	-0.14	-0.79	-1.95	1.42	-0.96	0.03	-1.78	1.04	-1.07	1.01	-1.99	-1.76	0.55	-1.16	-1.16	-1.15	-2.78	0.95	-1.07
388	-0.05	-0.06	0.00	-0.02	0.01	0.07	-1.16	-1.15	1.08	-0.79	0.06	0.25	0.09	1.11	0.07	-0.13	0.15	-0.13	0.50	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-0.25	0.15
389	1.15	-0.06	1.23	-0.02	0.01	1.30	0.21	0.39	1.08	-0.79	0.06	0.25	-0.96	0.03	-0.85	1.04	1.38	1.01	0.50	-0.64	-0.24	0.21	0.33	0.39	-0.89	0.95	1.38
390	-0.05	-0.06	-1.22	1.17	0.01	0.07	0.21	0.39	1.08	0.25	1.07	0.25	0.09	0.03	1.00	-0.13	-1.07	-0.13	-0.74	-0.64	-0.24	0.21	0.33	0.39	0.99	0.95	-1.07
391	-0.05	-1.24	0.00	-1.22	0.01	0.07	-1.16	-1.15	-0.14	-0.79	-1.95	-0.92	-0.96	-1.04	-1.78	1.04	0.15	-0.13	0.50	-1.76	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
392	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
393	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
394	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-1.35	-0.79	0.06	-0.92	0.09	-1.04	0.07	-1.29	0.15	-0.13	0.50	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-0.25	0.15
395	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	1.28	0.06	-2.08	0.09	0.03	0.07	-0.13	0.15	1.01	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
396	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	-1.95	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
397	1.15	-1.24	0.00	1.17	1.23	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
398	-0.05	1.12	0.00	1.17	1.23	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
399	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	0.21	0.39	-0.14	-0.79	1.07	0.25	1.13	1.11	1.00	-1.29	1.38	-0.13	-0.74	-1.76	1.34	0.21	0.33	0.39	0.99	0.95	1.38
400	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-1.35	-0.79	-0.94	1.42	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	-0.89	0.95	1.38
401	-0.05	-0.06	-1.22	-0.02	0.01	1.30	1.57	0.39	-0.14	1.28	1.07	0.25	0.09	0.03	1.00	1.04	0.15	-0.13	0.50	-0.64	0.55	1.57	0.33	0.39	0.99	0.95	0.15
402	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	0.06	-2.08	0.09	1.11	1.00	1.04	0.15	1.01	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
403	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
404	-1.26	1.12	0.00	1.17	1.23	0.07	0.21	0.39	1.08	1.28	0.06	0.25	1.13	1.11	1.00	1.04	-1.07	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
405	1.15	1.12	0.00	-0.02	0.01	1.30	-1.16	-1.15	-0.14	0.25	0.06	0.25	0.09	1.11	-0.85	1.04	0.15	1.01	-0.74	0.48	0.55	-1.16	-1.16	-1.15	0.05	0.95	0.15
406	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	0.39	1.08	1.28	-2.95	-2.08	-2.01	-1.04	-2.71	-0.13	1.38	1.01	-1.99	-2.88	1.34	1.57	0.33	0.39	-2.78	0.95	1.38
407	1.15	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38	
408	-0.05	-0.06	-1.22	-1.22	-1.20	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	1.13	-1.04	0.07	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
409	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	0.06	0.25	0.09	0.03	-1.78	-0.13	0.15	-0.13	0.50	0.48	1.34	0.21	0.33	0.39	-1.83	-0.25	0.15
410	-0.05	-0.06	0.00	-0.02	-1.20	-1.16	0.21	0.39	-0.14	-0.79	-0.94	0.25	-2.01	0.03	0.07	1.04	0.15	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	0.05	0.95	0.15

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
411	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
412	1.15	1.12	1.23	1.17	0.01	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-0.13	1.38	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
413	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	-0.92	1.13	1.11	1.00	1.04	-1.07	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	-1.07
414	-1.26	-1.24	-1.22	-1.22	-1.20	0.07	0.21	0.39	-0.14	1.28	-0.94	-0.92	0.09	-2.11	-2.71	-1.29	-1.07	-1.27	-0.74	-0.64	0.55	0.21	0.33	0.39	-2.78	-2.65	-1.07
415	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
416	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-1.35	-0.79	0.06	1.42	-0.96	1.11	1.00	1.04	-1.07	1.01	-3.23	1.60	1.34	1.57	0.33	0.39	0.99	-0.25	-1.07
417	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-1.35	-0.79	0.06	0.25	0.09	0.03	1.00	-0.13	0.15	-0.13	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	0.99	-0.25	0.15
418	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	-0.24	0.21	0.33	0.39	-0.89	-0.25	0.15
419	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	1.00	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	1.38
420	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	1.08	-0.79	1.07	0.25	1.13	1.11	1.00	-0.13	0.15	-0.13	0.50	0.48	0.55	-1.16	-1.16	-1.15	0.99	-0.25	0.15
421	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	-0.25	1.38
422	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-1.35	-0.79	-1.95	1.42	-2.01	-1.04	-0.85	1.04	0.15	1.01	-1.99	-1.76	1.34	0.21	0.33	0.39	-0.89	0.95	0.15
423	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	0.06	0.25	1.13	0.03	1.00	-1.29	-1.07	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.99	-0.25	-1.07
424	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
425	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	-0.13	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
426	-1.26	-1.24	-1.22	-0.02	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-1.95	-0.92	-0.96	-1.04	-1.78	-1.29	0.15	-1.27	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	-1.83	-1.45	0.15
427	-1.26	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	0.25	1.07	-0.92	1.13	1.11	1.00	-0.13	-1.07	-0.13	1.75	0.48	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
428	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-0.14	0.25	1.07	0.25	0.09	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
429	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	-1.07	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
430	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	-0.24	0.21	0.33	0.39	0.99	0.95	1.38
431	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.05	0.95	1.38
432	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-1.82	1.07	0.25	0.09	0.03	0.07	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	1.38
433	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	0.48	0.55	0.21	0.33	0.39	0.99	0.95	0.15
434	-0.05	-0.06	0.00	1.17	1.23	0.07	0.21	0.39	-1.35	0.25	1.07	-0.92	0.09	-1.04	0.07	-1.29	-1.07	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
435	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	0.06	-0.92	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
436	-1.26	-1.24	-1.22	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	0.25	0.06	0.25	-0.96	0.03	0.07	-1.29	-1.07	-1.27	-0.74	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	-1.07
437	-1.26	-1.24	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	0.25	0.06	0.25	-0.96	0.03	-0.85	-0.13	-1.07	-0.13	0.50	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-0.25	-1.07
438	-0.05	1.12	1.23	-0.02	0.01	0.07	-1.16	-1.15	-0.14	-0.79	1.07	-0.92	1.13	0.03	1.00	1.04	0.15	1.01	-1.99	-1.76	0.55	-1.16	-1.16	-1.15	0.99	-0.25	0.15
439	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	0.03	1.00	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38
440	-0.05	-0.06	0.00	1.17	1.23	1.30	1.57	0.39	-1.35	0.25	1.07	0.25	-1.04	-0.85	0.07	-1.29	-1.07	-0.13	0.50	0.48	0.55	1.57	0.33	0.39	0.05	-0.25	-1.07
441	-0.05	-0.06	1.23	-0.02	-1.20	1.30	-1.16	-1.15	-1.35	-1.82	-1.95	1.42	-2.01	-1.04	-2.71	1.04	-1.07	-1.27	-1.99	-0.64	1.34	-1.16	-1.16	-1.15	-2.78	-1.45	-1.07
442	-2.46	-2.41	-2.45	-1.22	-1.20	-2.38	-2.52	-2.69	-1.35	-1.82	-0.94	-2.08	0.09	-1.04	-0.85	-1.29	-1.07	-1.27	0.50	-0.64	-0.24	-2.52	-2.65	-2.69	-0.89	-1.45	-1.07
443	-2.46	-2.41	-2.45	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	0.06	0.25	-0.96	-1.04	-0.85	-1.29	-2.30	-1.27	-1.99	-1.76	0.55	-1.16	-1.16	-1.15	0.99	-0.25	0.15
444	-0.05	1.12	1.23	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	1.07	-0.92	1.13	0.03	1.00	1.04	0.15	1.01	-1.99	-1.76	0.55	-1.16	-1.16	-1.15	0.99	-0.25	0.15
445	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	0.03	1.00	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.99	0.95	1.38
446	-0.05	-0.06	0.00	-0.02	0.01	-2.38	-2.52	-2.69	1.08	1.28	1.07	-3.25	1.13	1.11	1.00	1.04	-1.07	-1.27	1.75	0.48	1.34	-2.52	-2.65	-2.69	0.99	0.95	-1.07
447	-0.05	1.12	0.00	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	0.06	0.25	-0.96	-1.04	-0.85	1.04	0.15	-0.13	-0.74	-0.64	1.34	0.21	0.33	0.39	-0.89	-0.25	0.15
448	-0.05	-0.06	1.23	-0.02	-1.20	1.30	0.21	0.39	-1.35	-1.82	-1.95	1.42	-2.01	-1.04	-2.71	1.04	-1.07	-1.27	-1.99	-0.64	1.34	0.21	0.33	0.39	-2.78	-1.45	-1.07
449	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	1.57	0.33	0.39	0.99	0.95	1.38
450	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	-1.35	-1.82	0.06	-3.25	-0.96	-1.04	0.07	1.04	1.38	-0.13	-1.99	-0.64	0.55	1.57	0.33	0.39	0.05	-0.25	1.38
451	1.15	1.12	1.23	-0.02	0.01	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	-1.07	1.01	-1.99	-0.64	-0.24	0.21	0.33	0.39	0.99	0.95	-1.07
452	-0.05	-0.06	0.00	1.17	0.01	-1.16	-1.16	-1.15	-0.14	1.28	1.07	-2.08	1.13	1.11	1.00	-0.13	0.15	-0.13	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	0.99	0.95	0.15
453	-0.05	-2.41	-2.45	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-1.82	0.06	-0.92	-0.96	-1.04	-0.85	-1.29	-2.30	-1.27	-0.74	-1.76	0.55	-1.16	-1.16	-1.15	0.99	0.95	-2.30
454	-2.46	-2.41	-2.45	-1.22	-1.20	-2.38	-2.52	-2.69	-1.35	-1.82	-0.94	-2.08	0.09	-1.04	-0.85	-1.29	-1.07	-1.27	0.50	-0.64	-0.24	-2.52	-2.65	-2.69	-0.89	-1.45	-1.07
455	1.15	1.12	0.00	1.17	1.23	1.30	0.21	0.39	-1.35	0.25	0.06	0.25	0.09	-1.04	1.00	-0.13	1.38	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	1.38
456	1.15	-1.24	-1.22	-1.22	-1.20	0.07	0.21	0.39	-1.35	-1.82	-0.94	1.42	-2.01	-1.04	-1.78	-1.29	0.15	-1.27	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-1.45	0.15
457	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-2.01	-1.04	-1.78	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-1.83	-0.25	0.15
458	-0.05	-0.06	-1.22	1.17	0.01	-1.16	0.21	0.39	-0.14	0.25	0.06	0.25	1.13	1.11	0.07	1.04	0.15	-0.13	-0.74	1.60	-0.24	0.21	0.33	0.39	0.99	-0.25	0.15
459	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	-0.14	-0.79	-1.95	0.25	-0.96	-1.04	-0.85	1.04	1.38	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	1.38
460	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	0.50	0.48	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
461	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	0.06	0.25	-0.96	-1.04	-0.85	1.04	0.15	1.01	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	0.95	0.15
462	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	1.08	1.28	1.07	-2.08	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	0.15
463	-2.46	-1.24	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	-1.35	0.25	-2.95	0.25	0.09	-1.04	-0.85	-1.29	0.15	-1.27	-0.74	0.48	-1.03	-2.52	-2.65	-2.69	0.05	-0.25	0.15
464	-1.26	-1.24	-1.22	-0.02	0.01	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	-0.92	0.09	-1.04	-0.85	-2.45	-1.07	-1.27	0.50	-1.76	0.55	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07

Appendix 5.3
Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
465	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-2.57	-0.79	-0.94	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
466	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	0.25	1.13	0.03	1.00	-0.13	-1.07	-0.13	1.75	-0.64	-1.82	0.21	0.33	0.39	0.99	0.95	-1.07
467	1.15	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	-0.14	-0.79	0.06	0.25	0.09	-1.04	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	0.95	0.15
468	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	1.28	1.07	0.25	0.09	1.11	1.00	1.04	1.38	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	1.38
469	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	0.09	0.03	1.00	1.04	-1.07	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
470	-0.05	-0.06	-1.22	-2.41	-2.42	1.30	0.21	0.39	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	-0.64	-0.24	0.21	0.33	0.39	0.99	0.95	0.15
471	-0.05	1.12	0.00	-0.02	1.23	0.07	0.21	0.39	1.08	1.28	0.06	1.42	1.13	0.03	0.07	1.04	1.38	1.01	1.75	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
472	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
473	-1.26	-2.41	-1.22	-2.41	-2.42	-1.16	-2.52	-2.69	-2.57	-1.82	-1.95	-2.08	-2.01	-2.11	-1.78	-2.45	-2.30	-2.41	-1.99	-0.64	-1.03	-2.52	-2.65	-2.69	-0.89	-2.65	-2.30
474	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-1.29	-1.07	1.01	1.75	1.60	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
475	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	-0.94	0.25	-0.96	-1.04	-0.85	-1.29	0.15	1.01	-1.99	-0.64	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
476	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	0.25	0.09	0.03	-0.85	-0.13	0.15	1.01	-1.99	-0.64	0.55	-1.16	-1.16	-1.15	-0.89	-0.25	0.15
477	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	1.42	0.09	0.03	-0.85	-1.29	0.15	-1.27	0.50	0.48	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
478	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	-0.94	-0.92	0.09	-1.04	0.07	-0.13	0.15	1.01	0.50	1.60	0.55	0.21	0.33	0.39	-0.89	0.95	0.15
479	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-0.79	0.06	-0.92	-0.96	-2.11	-1.78	1.04	0.15	-0.13	-1.99	-0.64	0.55	0.21	0.33	0.39	-1.83	-0.25	0.15
480	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	0.03	1.00	1.04	0.15	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
481	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	0.03	1.00	1.04	-1.07	1.01	0.50	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
482	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	1.28	1.07	-0.92	1.13	0.03	1.00	1.04	0.15	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	0.15
483	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	1.08	0.25	0.06	-0.92	1.13	1.11	1.00	-0.13	-1.07	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	0.99	-0.25	-1.07
484	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	-0.94	0.25	-2.01	-1.04	-0.85	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	0.95	0.15
485	-0.05	-0.06	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	-1.95	-0.92	-0.96	-1.04	-0.85	1.04	1.38	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	0.95	1.38
486	1.15	-0.06	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	-1.04	-0.85	1.04	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	0.15
487	-0.05	-0.06	-1.22	-1.22	-2.42	-2.38	-2.52	-2.69	1.08	-0.79	0.06	-0.92	1.13	1.11	1.00	-1.29	0.15	-1.27	-0.74	-0.64	0.55	-2.52	-2.65	-2.69	0.99	-0.25	0.15
488	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-0.14	1.28	1.07	-0.92	0.09	1.11	1.00	1.04	-1.07	1.01	-0.74	1.60	0.55	0.21	0.33	0.39	0.99	0.95	-1.07
489	-0.05	-0.06	0.00	1.17	0.01	0.07	1.57	0.39	1.08	1.28	1.07	-0.92	0.09	1.11	1.00	-0.13	0.15	-0.13	-0.74	0.48	0.55	1.57	0.33	0.39	0.99	0.95	0.15
490	-0.05	1.12	0.00	-1.22	-1.20	-2.38	-1.16	-1.15	-0.14	-1.82	-1.95	0.25	0.09	-1.04	-0.85	1.04	-1.07	1.01	0.50	1.60	-0.24	-1.16	-1.16	-1.15	-0.89	0.95	-1.07
491	-0.05	-0.06	0.00	-0.02	0.01	-2.38	-2.52	-2.69	1.08	1.28	1.07	-3.25	1.13	1.11	1.00	1.04	-1.07	-1.27	1.75	0.48	1.34	-2.52	-2.65	-2.69	0.99	0.95	-1.07
492	1.15	1.12	1.23	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	-0.64	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
493	1.15	1.12	1.23	1.17	1.23	0.07	1.57	1.92	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	1.75	1.60	1.34	1.57	1.82	1.92	0.99	0.95	0.15
494	1.15	1.12	0.00	-0.02	0.01	1.30	0.21	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	-0.13	1.38	-0.13	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	1.38
495	1.15	1.12	0.00	-0.02	0.01	1.30	1.57	1.92	1.08	-0.79	1.07	1.42	1.13	1.11	1.00	-0.13	0.15	1.01	0.50	0.48	1.34	1.57	1.82	1.92	0.99	0.95	0.15
496	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	1.42	0.09	0.03	0.07	1.04	1.38	1.01	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	1.38
497	1.15	-1.24	0.00	1.17	1.23	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
498	1.15	-0.06	-1.22	1.17	1.23	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
499	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	-0.79	0.06	1.42	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
500	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	1.28	0.06	-2.08	0.09	0.03	0.07	-0.13	0.15	1.01	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
501	-0.05	-0.06	0.00	-0.02	0.01	-1.16	-1.16	-1.15	-1.35	-0.79	0.06	-0.92	0.09	-1.04	0.07	-1.29	0.15	-0.13	0.50	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-0.25	0.15
502	1.15	1.12	1.23	1.17	1.23	1.30	1.57	1.92	1.08	0.25	1.07	0.25	1.13	1.11	1.00	1.04	0.15	1.01	0.50	0.48	0.55	1.57	1.82	1.92	0.99	0.95	0.15
503	-0.05	-0.06	-1.22	1.17	0.01	-1.16	0.21	0.39	-0.14	0.25	0.06	0.25	1.13	1.11	0.07	1.04	0.15	-0.13	-0.74	1.60	0.55	0.21	0.33	0.39	-0.89	-0.25	0.15
504	-0.05	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	0.50	0.48	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
505	-0.05	1.12	1.23	1.17	0.01	1.30	0.21	0.39	1.08	0.25	1.07	-0.92	0.09	1.11	1.00	1.04	0.15	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
506	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	-2.08	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	-0.24	0.21	0.33	0.39	0.05	-0.25	0.15
507	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	-2.08	0.09	0.03	0.07	-0.13	-1.07	-1.27	-1.99	0.48	-0.24	0.21	0.33	0.39	0.05	0.95	-1.07
508	-0.05	1.12	0.00	-1.22	-1.20	-1.16	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	1.60	0.55	1.57	1.82	1.92	0.99	0.95	0.15
509	-0.05	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	-0.64	0.55	0.21	0.33	0.39	0.05	-0.25	0.15
510	1.15	1.12	1.23	1.17	1.23	-1.16	0.21	0.39	-1.35	0.25	1.07	1.42	1.13	1.11	1.00	1.04	-1.07	-1.27	-0.74	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
511	-0.05	1.12	0.00	-0.02	0.01	0.07	1.57	1.92	-0.14	1.28	0.06	1.42	1.13	0.03	1.00	-0.13	0.15	1.01	0.50	0.48	1.34	1.57	1.82	1.92	0.99	0.95	0.15
512	-0.05	-0.06	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	-0.96	-1.04	0.07	-0.13	-1.07	-1.27	-0.74	-0.64	0.55	-1.16	-1.16	-1.15	0.05	-1.45	-1.07
513	-1.26	-1.24	-1.22	1.17	1.23	1.30	0.21	0.39	-2.57	-0.79	-0.94	-0.92	-0.96	-1.04	-0.85	-0.13	1.38	1.01	1.75	-0.64	1.34	0.21	0.33	0.39	-0.89	-1.45	1.38
514	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	0.39	-0.14	-0.79	-0.94	0.25	0.09	0.03	0.07	-0.13	1.38	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	1.38
515	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	-2.08	0.09	0.03	0.07	-0.13	-1.07	-1.27	-1.99	0.48	-0.24	0.21	0.33	0.39	0.05	0.95	-1.07
516	-0.05	1.12	0.00	-1.22	-1.20	-1.16	1.57	1.92	1.08	1.28	1.07	1.42	1.13	1.11	1.00	1.04	0.15	1.01	-0.74	1.60	0.55	1.57	1.82	1.92	0.99	0.95	0.15

Multivariate normality - distribution of standardised residuals, z score below ±2.58

No.	V1	V2	V3	V4	V5	V6	EM1	EM2	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OR1	OR2	OR3	OR4	OR5	OL1	OL2	OL3	OL4	OL5	OL6	OL7
517	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	0.21	0.39	-0.14	-0.79	1.07	0.25	1.13	1.11	1.00	-1.29	1.38	-0.13	-0.74	-1.76	1.34	0.21	0.33	0.39	0.99	0.95	1.38
518	-1.26	-1.24	0.00	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	-0.79	0.06	0.25	-0.96	-1.04	-0.85	-1.29	0.15	-1.27	-1.99	-1.76	-0.24	-1.16	-1.16	-1.15	-0.89	-1.45	0.15
519	-1.26	-1.24	-2.45	-1.22	-1.20	-2.38	-2.52	-2.69	-1.35	-0.79	-0.94	0.25	-0.96	-2.11	-1.78	-1.29	-1.07	-2.41	-0.74	-0.64	-0.24	-2.52	-2.65	-2.69	-0.89	-1.45	-1.07
520	-1.26	1.12	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	1.07	-2.08	-0.96	0.03	-0.85	1.04	-1.07	-1.27	-0.74	1.60	0.55	0.21	0.33	0.39	0.05	-0.25	-1.07
521	-0.05	-0.06	-1.22	-0.02	0.01	0.07	0.21	0.39	-0.14	0.25	0.06	-2.08	0.09	0.03	0.07	-0.13	0.15	-0.13	0.50	0.48	-0.24	0.21	0.33	0.39	0.05	-0.25	0.15
522	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-1.35	-0.79	-0.94	-0.92	1.13	0.03	0.07	-0.13	0.15	-0.13	-0.74	-0.64	1.34	-1.16	-1.16	-1.15	0.99	-1.45	0.15
523	-0.05	-0.06	1.23	1.17	1.23	0.07	0.21	0.39	1.08	1.28	0.06	0.25	1.13	1.11	1.00	1.04	1.38	1.01	0.50	1.60	0.55	0.21	0.33	0.39	0.99	0.95	1.38
524	1.15	-2.41	-1.22	1.17	1.23	0.07	0.21	0.39	-1.35	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	-0.13	1.75	1.60	0.55	0.21	0.33	0.39	0.99	-1.45	1.38
525	-0.05	-0.06	0.00	1.17	1.23	0.07	0.21	0.39	-1.35	-1.82	-1.95	1.42	0.09	-1.04	-0.85	1.04	0.15	1.01	-1.99	-0.64	1.34	0.21	0.33	0.39	-0.89	0.95	0.15
526	1.15	1.12	1.23	-0.02	0.01	1.30	1.57	0.39	-0.14	0.25	1.07	1.42	0.09	0.03	0.07	1.04	1.38	1.01	1.75	1.60	1.34	1.57	1.82	0.39	0.99	-0.25	1.38
527	-0.05	1.12	1.23	1.17	0.01	1.30	0.21	0.39	1.08	0.25	1.07	-0.92	0.09	1.11	1.00	1.04	0.15	1.01	-0.74	-0.64	0.55	0.21	0.33	0.39	0.99	0.95	0.15
528	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	0.39	1.08	1.28	1.07	0.25	-0.96	1.11	1.00	1.04	0.15	1.01	-0.74	0.48	1.34	0.21	0.33	0.39	0.05	-0.25	0.15
529	-0.05	-0.06	0.00	-0.02	0.01	1.30	1.57	0.39	-0.14	1.28	1.07	-0.92	0.09	0.03	0.07	1.04	0.15	-0.13	-0.74	0.48	0.55	1.57	0.33	0.39	0.05	-0.25	0.15
530	1.15	-0.06	0.00	-0.02	0.01	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	0.09	1.11	1.00	-0.13	1.38	1.01	0.50	-0.64	1.34	0.21	0.33	0.39	0.99	0.95	1.38
531	1.15	1.12	1.23	1.17	1.23	1.30	1.57	0.39	1.08	1.28	1.07	0.25	1.13	1.11	1.00	1.04	1.38	1.01	-3.23	-2.88	0.55	1.57	0.33	0.39	0.99	0.95	1.38
532	-0.05	-0.06	0.00	1.17	1.23	0.07	0.21	0.39	-0.14	1.28	1.07	-0.92	0.09	0.03	0.07	-0.13	-1.07	-0.13	-0.74	0.48	0.55	0.21	0.33	0.39	0.05	0.95	-1.07
533	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	-1.07	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	-1.07
534	-0.05	-1.24	0.00	-0.02	0.01	0.07	0.21	0.39	-1.35	-1.82	-0.94	-0.92	-2.01	-1.04	0.07	-0.13	0.15	-0.13	-0.74	0.48	-0.24	0.21	0.33	0.39	-0.89	-0.25	0.15
535	-0.05	-0.06	0.00	-0.02	0.01	1.30	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	1.11	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	0.21	0.33	0.39	0.05	0.95	0.15
536	1.15	1.12	1.23	1.17	1.23	-1.16	0.21	0.39	-0.14	1.28	1.07	-2.08	1.13	1.11	1.00	1.04	1.38	1.01	-0.74	1.60	-1.03	0.21	0.33	0.39	0.99	0.95	1.38
537	-0.05	-0.06	0.00	-1.22	-1.20	0.07	0.21	0.39	1.08	0.25	0.06	0.25	0.09	-1.04	-0.85	-0.13	0.15	-1.27	-0.74	-0.64	0.55	0.21	0.33	0.39	-0.89	-1.45	0.15
538	-1.26	-1.24	-1.22	-1.22	-1.20	-1.16	-1.16	-1.15	-0.14	0.25	0.06	0.25	0.09	-1.04	0.07	-1.29	-1.07	-1.27	0.50	0.48	1.34	-1.16	-1.16	-1.15	-0.89	-0.25	-1.07
539	-0.05	-0.06	0.00	-1.22	-1.20	-1.16	0.21	0.39	-0.14	-0.79	0.06	0.25	0.09	0.03	1.00	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.99	-0.25	0.15
540	1.15	-0.06	0.00	-0.02	0.01	1.30	1.57	0.39	-0.14	-0.79	0.06	0.25	0.09	-1.04	0.07	-0.13	0.15	-0.13	0.50	0.48	0.55	1.57	0.33	0.39	-0.89	0.95	0.15
541	-0.05	-0.06	0.00	-0.02	0.01	1.30	1.57	1.92	1.08	1.28	1.07	-2.08	1.13	1.11	1.00	1.04	0.15	-0.13	0.50	-0.64	1.34	1.57	1.82	1.92	0.99	0.95	0.15
542	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	1.08	1.28	1.07	-0.92	1.13	1.11	1.00	1.04	1.38	1.01	1.75	1.60	1.34	0.21	0.33	0.39	0.99	0.95	1.38
543	1.15	1.12	1.23	1.17	1.23	1.30	0.21	0.39	-0.14	-0.79	0.06	0.25	-0.96	-1.04	-0.85	1.04	0.15	1.01	0.50	0.48	1.34	0.21	0.33	0.39	0.99	0.95	0.15
544	-0.05	1.12	0.00	-1.22	-1.20	-2.38	-1.16	-1.15	-0.14	-1.82	-1.95	0.25	0.09	-1.04	-0.85	1.04	-1.07	1.01	0.50	1.60	-0.24	-1.16	-1.16	-1.15	-0.89	0.95	-1.07
545	-0.05	1.12	0.00	1.17	1.23	1.30	0.21	0.39	-1.35	-0.79	0.06	0.25	-0.96	-1.04	-0.85	1.04	0.15	-0.13	-0.74	-0.64	1.34	0.21	0.33	0.39	-0.89	0.95	0.15
546	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	1.04	1.38	1.01	-0.74	-0.64	1.34	0.21	0.33	0.39	0.05	0.95	1.38
547	1.15	1.12	1.23	1.17	1.23	0.07	0.21	0.39	-0.14	0.25	0.06	0.25	0.09	0.03	0.07	-0.13	0.15	-0.13	-0.74	-0.64	0.55	0.21	0.33	0.39	0.05	0.95	0.15

Appendix 5.4
Summary of descriptive statistics

Summary of descriptive statistics: Minimum, maximum, mean, standard
deviation, range and variance

Variable	Minimum	Maximum	Mean	Std. Deviation	Range	Variance
P1	1	5	3.93	.891	4	.794
P2	2	5	4.04	.769	3	.592
P3	2	5	4.02	.785	3	.617
I1	2	5	4.02	.891	3	.795
I2	2	5	3.99	.863	3	.745
I3	2	5	4.07	.881	3	.776
PR1	1	5	3.81	1.009	4	1.018
PR2	1	5	3.74	1.105	4	1.222
N1	1	5	4.10	.889	4	.790
N2	2	5	4.07	.851	3	.725
N3	1	5	3.97	.929	4	.864
N4	1	5	3.98	1.017	4	1.035
N5	1	5	4.01	.928	4	.861
N6	2	5	4.11	.848	3	.718
C1	1	5	3.85	.995	4	.991
C2	1	5	3.85	1.004	4	1.008
C3	1	5	3.88	.927	4	.859
C4	1	5	3.97	.880	4	.774
C5	1	5	3.96	.917	4	.841
C6	1	5	3.82	.922	4	.849
C7	1	5	3.82	.928	4	.860
C8	1	5	3.81	.967	4	.934
C9	1	5	3.80	.974	4	.948
C10	1	5	3.82	.943	4	.890
C11	1	5	3.87	.932	4	.868
F1	1	5	3.96	.985	4	.971
F2	1	5	3.85	1.026	4	1.052
SC1	1	5	4.02	.881	4	.776
SC2	1	5	3.92	.936	4	.876
SC3	1	5	3.94	1.047	4	1.095
Z1	1	5	3.89	.904	4	.817
Z2	1	5	3.53	.898	4	.806
Z2	1	5	3.78	.937	4	.877
Z4	1	5	3.75	.816	4	.666
R1	1	5	3.66	1.016	4	1.031
R2	1	5	3.67	1.018	4	1.036
R3	1	5	3.71	1.005	4	1.010
R4	1	5	3.64	1.035	4	1.070
R5	1	5	3.65	.997	4	.993
T1	1	5	3.67	1.042	4	1.085

Appendix 5.4
Summary of descriptive statistics

Summary of descriptive statistics: Minimum, maximum, mean, standard
deviation, range and variance

Variable	Minimum	Maximum	Mean	Std. Deviation	Range	Variance
T2	1	5	3.66	1.032	4	1.064
T3	1	5	3.49	.919	4	.844
Y1	1	5	3.58	.927	4	.859
Y2	1	5	3.53	.928	4	.861
Y3	1	5	3.44	.892	4	.796
U1	2	5	4.20	.835	3	.697
U2	2	5	4.06	.879	3	.773
U3	1	5	4.01	.852	4	.725
U4	2	5	4.25	.812	3	.659
U5	2	5	4.07	.852	3	.726
V1	1	5	4.04	.831	4	.690
V2	2	5	4.05	.849	3	.721
V3	2	5	4.00	.816	3	.667
V4	1	5	4.02	.836	4	.699
V5	2	5	3.99	.823	3	.678
V6	2	5	3.94	.816	3	.665
EM1	1	5	4.06	.895	4	.800
EM2	1	5	3.59	1.024	4	1.048
OS1	1	5	4.11	.822	4	.676
OS2	1	5	3.76	.969	4	.940
OS3	1	5	3.94	.996	4	.992
OS4	1	5	3.78	.855	4	.731
OS5	2	5	3.92	.955	3	.912
OS6	2	5	3.97	.932	3	.869
OS7	1	5	3.92	1.08	4	1.164
OR1	1	5	4.11	.859	4	.737
OR2	1	5	4.12	.877	4	.769
OR3	1	5	3.60	.803	4	.644
OR4	1	5	3.57	.894	4	.799
OR5	1	5	3.48	.846	4	.715
OL1	1	5	3.31	1.26	4	1.602
OL2	2	5	3.85	.733	3	.537
OL3	2	5	3.78	.671	3	.450
OL4	2	5	3.75	.651	3	.423
OL5	1	5	3.95	1.06	4	1.127
OL6	2	5	4.21	.832	3	.692
OL7	1	5	3.87	.815	4	.664

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	P1	1																					
2	P2	0.60	1																				
3	P3	0.59	0.74	1																			
4	I1	0.64	0.54	0.59	1																		
5	I2	0.56	0.54	0.54	0.73	1																	
6	I3	0.51	0.45	0.46	0.70	0.72	1																
7	PR1	0.54	0.52	0.59	0.63	0.58	0.56	1															
8	PR2	0.57	0.53	0.57	0.66	0.60	0.59	0.83	1														
9	N1	0.53	0.47	0.47	0.63	0.55	0.58	0.57	0.57	1													
10	N2	0.52	0.47	0.53	0.60	0.54	0.54	0.60	0.58	0.79	1												
11	N3	0.53	0.47	0.49	0.59	0.55	0.51	0.61	0.60	0.74	0.81	1											
12	N4	0.54	0.46	0.46	0.65	0.54	0.56	0.62	0.64	0.74	0.74	0.76	1										
13	N5	0.56	0.52	0.52	0.63	0.57	0.54	0.61	0.63	0.67	0.72	0.75	0.75	1									
14	N6	0.54	0.49	0.54	0.60	0.51	0.55	0.61	0.61	0.60	0.66	0.67	0.65	0.78	1								
15	C1	0.57	0.47	0.47	0.62	0.57	0.58	0.62	0.64	0.62	0.65	0.67	0.69	0.70	0.58	1							
16	C2	0.56	0.46	0.46	0.62	0.57	0.59	0.62	0.66	0.62	0.65	0.68	0.68	0.69	0.61	0.88	1						
17	C3	0.47	0.41	0.44	0.55	0.48	0.44	0.51	0.51	0.56	0.55	0.58	0.57	0.57	0.53	0.57	0.59	1					
18	C4	0.42	0.37	0.36	0.41	0.41	0.40	0.46	0.46	0.49	0.46	0.48	0.50	0.46	0.39	0.55	0.52	0.57	1				
19	C5	0.47	0.41	0.43	0.50	0.44	0.45	0.50	0.52	0.51	0.53	0.50	0.55	0.50	0.41	0.63	0.58	0.63	0.71	1			
20	C6	0.49	0.43	0.45	0.54	0.51	0.45	0.51	0.55	0.52	0.56	0.59	0.58	0.57	0.47	0.61	0.60	0.77	0.59	0.68	1		
21	C7	0.49	0.43	0.45	0.54	0.50	0.45	0.50	0.53	0.54	0.55	0.57	0.57	0.57	0.52	0.60	0.60	0.83	0.58	0.65	0.86	1	
22	C8	0.48	0.39	0.41	0.55	0.50	0.51	0.53	0.58	0.53	0.57	0.56	0.59	0.57	0.46	0.68	0.67	0.70	0.65	0.81	0.75	0.69	1
23	C9	0.49	0.40	0.42	0.55	0.50	0.47	0.54	0.55	0.54	0.57	0.62	0.58	0.59	0.50	0.66	0.63	0.78	0.61	0.72	0.82	0.78	0.83
24	C10	0.49	0.41	0.42	0.55	0.49	0.45	0.52	0.52	0.52	0.55	0.58	0.56	0.58	0.50	0.65	0.61	0.76	0.58	0.66	0.81	0.75	0.77
25	C11	0.45	0.39	0.41	0.51	0.48	0.48	0.52	0.53	0.49	0.51	0.51	0.54	0.55	0.44	0.56	0.57	0.72	0.55	0.64	0.68	0.70	0.70
26	Z1	0.28	0.32	0.28	0.27	0.28	0.28	0.30	0.32	0.32	0.30	0.29	0.28	0.30	0.31	0.32	0.34	0.47	0.33	0.29	0.50	0.54	0.34
27	Z2	0.25	0.21	0.26	0.27	0.24	0.25	0.30	0.32	0.28	0.30	0.29	0.34	0.34	0.30	0.36	0.35	0.44	0.35	0.38	0.43	0.45	0.36
28	Z3	0.36	0.32	0.32	0.37	0.37	0.32	0.37	0.35	0.42	0.42	0.41	0.44	0.41	0.33	0.43	0.43	0.54	0.57	0.55	0.53	0.57	0.52
29	Z4	0.33	0.34	0.35	0.40	0.37	0.35	0.37	0.40	0.42	0.40	0.43	0.42	0.41	0.34	0.46	0.45	0.39	0.47	0.50	0.40	0.42	0.48
30	F1	0.65	0.48	0.52	0.67	0.58	0.58	0.62	0.62	0.59	0.58	0.59	0.63	0.63	0.55	0.67	0.67	0.65	0.49	0.60	0.67	0.64	0.65
31	F2	0.55	0.48	0.51	0.68	0.61	0.62	0.63	0.69	0.62	0.60	0.61	0.65	0.66	0.58	0.73	0.75	0.60	0.54	0.59	0.61	0.59	0.68
32	SC1	0.46	0.47	0.48	0.54	0.50	0.49	0.52	0.52	0.57	0.60	0.66	0.57	0.57	0.59	0.54	0.57	0.48	0.40	0.38	0.47	0.48	0.43
33	SC2	0.41	0.39	0.45	0.52	0.50	0.50	0.52	0.51	0.54	0.56	0.60	0.54	0.56	0.51	0.58	0.60	0.54	0.45	0.49	0.52	0.50	0.53
34	SC3	0.55	0.44	0.48	0.69	0.56	0.58	0.62	0.65	0.61	0.61	0.62	0.65	0.65	0.59	0.69	0.69	0.64	0.54	0.56	0.62	0.61	0.63
35	R1	0.39	0.38	0.40	0.43	0.44	0.46	0.54	0.54	0.41	0.47	0.48	0.46	0.49	0.42	0.55	0.55	0.57	0.56	0.57	0.57	0.59	0.63
36	R2	0.34	0.40	0.41	0.43	0.43	0.43	0.48	0.51	0.40	0.44	0.48	0.45	0.48	0.37	0.53	0.52	0.55	0.52	0.55	0.56	0.57	0.60
37	R3	0.36	0.39	0.40	0.43	0.42	0.41	0.50	0.48	0.41	0.48	0.52	0.47	0.52	0.46	0.54	0.56	0.59	0.52	0.58	0.58	0.60	0.60
38	R4	0.35	0.37	0.39	0.41	0.38	0.42	0.50	0.49	0.39	0.43	0.45	0.42	0.43	0.37	0.51	0.49	0.50	0.52	0.54	0.50	0.53	0.55

(p<0.05; p<0.01)

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
39	R5	0.37	0.37	0.39	0.44	0.39	0.41	0.50	0.50	0.40	0.44	0.45	0.44	0.47	0.38	0.56	0.53	0.54	0.49	0.56	0.53	0.54	0.58
40	T1	0.43	0.38	0.41	0.46	0.44	0.41	0.51	0.55	0.46	0.48	0.52	0.50	0.54	0.46	0.58	0.57	0.58	0.49	0.59	0.60	0.58	0.61
41	T2	0.44	0.39	0.42	0.48	0.48	0.46	0.50	0.55	0.49	0.50	0.55	0.52	0.55	0.48	0.64	0.61	0.60	0.52	0.59	0.63	0.62	0.64
42	T3	0.29	0.28	0.26	0.29	0.32	0.30	0.52	0.34	0.29	0.32	0.36	0.33	0.38	0.31	0.40	0.39	0.44	0.36	0.44	0.45	0.44	0.43
43	Y1	0.19	0.25	0.21	0.23	0.24	0.24	0.34	0.25	0.30	0.29	0.31	0.31	0.41	0.22	0.34	0.32	0.36	0.39	0.39	0.34	0.37	0.37
44	Y2	0.23	0.27	0.24	0.26	0.29	0.26	0.26	0.29	0.31	0.31	0.38	0.36	0.35	0.25	0.39	0.37	0.42	0.42	0.41	0.39	0.40	0.40
45	Y3	0.20	0.24	0.21	0.23	0.21	0.25	0.31	0.24	0.28	0.27	0.31	0.31	0.34	0.24	0.34	0.34	0.35	0.35	0.36	0.32	0.34	0.37
46	U1	0.38	0.37	0.37	0.39	0.38	0.36	0.25	0.42	0.40	0.39	0.42	0.38	0.39	0.40	0.45	0.44	0.45	0.40	0.37	0.45	0.46	0.42
47	U2	0.38	0.38	0.40	0.45	0.42	0.42	0.42	0.49	0.42	0.43	0.43	0.41	0.45	0.45	0.50	0.50	0.46	0.41	0.39	0.44	0.46	0.44
48	U3	0.43	0.39	0.42	0.48	0.44	0.44	0.47	0.47	0.42	0.42	0.45	0.44	0.44	0.42	0.48	0.47	0.51	0.41	0.43	0.52	0.52	0.45
49	U4	0.35	0.39	0.37	0.41	0.39	0.36	0.47	0.41	0.43	0.39	0.40	0.36	0.38	0.39	0.46	0.45	0.46	0.40	0.38	0.44	0.46	0.42
50	U5	0.35	0.37	0.38	0.42	0.38	0.40	0.45	0.46	0.40	0.40	0.43	0.38	0.42	0.43	0.48	0.47	0.46	0.38	0.35	0.42	0.43	0.43
51	V1	0.35	0.33	0.36	0.37	0.38	0.38	0.45	0.41	0.39	0.38	0.39	0.39	0.37	0.38	0.42	0.42	0.45	0.35	0.32	0.40	0.45	0.40
52	V2	0.37	0.41	0.41	0.43	0.39	0.40	0.41	0.44	0.42	0.42	0.41	0.41	0.37	0.41	0.43	0.42	0.48	0.35	0.36	0.45	0.50	0.38
53	V3	0.38	0.38	0.40	0.41	0.42	0.43	0.41	0.42	0.38	0.39	0.40	0.38	0.38	0.39	0.41	0.42	0.49	0.34	0.35	0.44	0.48	0.41
54	V4	0.31	0.33	0.34	0.35	0.32	0.33	0.44	0.37	0.40	0.41	0.41	0.40	0.39	0.33	0.41	0.40	0.43	0.33	0.34	0.41	0.45	0.36
55	V5	0.33	0.30	0.31	0.34	0.33	0.35	0.38	0.36	0.36	0.36	0.38	0.38	0.35	0.31	0.39	0.38	0.39	0.33	0.33	0.40	0.43	0.34
56	V6	0.32	0.28	0.32	0.29	0.31	0.34	0.37	0.32	0.29	0.30	0.30	0.28	0.29	0.27	0.32	0.32	0.32	0.27	0.27	0.33	0.37	0.33
57	EM1	0.37	0.36	0.37	0.37	0.35	0.34	0.30	0.32	0.36	0.35	0.35	0.33	0.34	0.36	0.36	0.32	0.36	0.38	0.38	0.39	0.39	0.34
58	EM2	0.33	0.35	0.40	0.35	0.34	0.31	0.35	0.36	0.35	0.35	0.37	0.33	0.34	0.33	0.36	0.32	0.38	0.36	0.37	0.41	0.40	0.34
59	OS1	0.57	0.50	0.57	0.78	0.73	0.70	0.37	0.55	0.55	0.57	0.55	0.58	0.57	0.54	0.59	0.56	0.49	0.40	0.47	0.48	0.50	0.50
60	OS2	0.54	0.53	0.63	0.60	0.58	0.53	0.52	0.77	0.53	0.55	0.55	0.56	0.56	0.55	0.55	0.54	0.45	0.39	0.45	0.45	0.45	0.49
61	OS3	0.55	0.48	0.48	0.65	0.54	0.56	0.82	0.67	0.71	0.72	0.77	0.81	0.85	0.71	0.72	0.73	0.55	0.49	0.53	0.57	0.56	0.59
62	OS4	0.17	0.42	0.27	0.16	0.18	0.17	0.66	0.12	0.16	0.19	0.15	0.11	0.18	0.14	0.14	0.16	0.20	0.22	0.22	0.21	0.21	0.19
63	0S5	0.60	0.48	0.49	0.63	0.57	0.56	0.13	0.66	0.66	0.67	0.70	0.71	0.70	0.61	0.83	0.81	0.60	0.52	0.61	0.63	0.62	0.66
64	0S6	0.56	0.50	0.53	0.68	0.62	0.60	0.62	0.65	0.61	0.58	0.56	0.62	0.61	0.52	0.68	0.69	0.58	0.52	0.59	0.61	0.59	0.67
65	OS7	0.53	0.42	0.46	0.67	0.54	0.57	0.64	0.65	0.62	0.62	0.65	0.66	0.65	0.56	0.69	0.70	0.67	0.55	0.60	0.65	0.64	0.67
66	OR1	0.23	0.30	0.30	0.28	0.26	0.29	0.63	0.33	0.25	0.28	0.27	0.25	0.25	0.25	0.35	0.32	0.27	0.32	0.28	0.27	0.29	0.27
67	OR2	0.13	0.20	0.18	0.19	0.23	0.16	0.38	0.22	0.18	0.18	0.20	0.15	0.20	0.20	0.23	0.19	0.18	0.19	0.19	0.22	0.21	0.16
68	OR3	0.34	0.36	0.40	0.42	0.41	0.39	0.25	0.41	0.37	0.42	0.41	0.36	0.40	0.40	0.43	0.44	0.48	0.38	0.37	0.43	0.46	0.42
69	OR4	0.29	0.26	0.31	0.34	0.34	0.29	0.44	0.34	0.36	0.38	0.37	0.36	0.39	0.30	0.40	0.38	0.34	0.38	0.43	0.37	0.35	0.40
70	OR5	0.30	0.31	0.29	0.27	0.33	0.29	0.31	0.35	0.33	0.33	0.38	0.34	0.39	0.30	0.44	0.42	0.48	0.39	0.43	0.47	0.46	0.45
71	OL1	0.33	0.32	0.32	0.34	0.32	0.33	0.27	0.36	0.33	0.32	0.33	0.34	0.34	0.31	0.38	0.35	0.38	0.38	0.32	0.38	0.45	0.33
72	OL2	0.31	0.31	0.30	0.30	0.30	0.32	0.32	0.31	0.29	0.24	0.26	0.28	0.26	0.24	0.33	0.32	0.34	0.31	0.30	0.35	0.36	0.32
73	OL3	0.33	0.37	0.37	0.37	0.33	0.29	0.29	0.32	0.34	0.36	0.36	0.32	0.33	0.29	0.35	0.30	0.38	0.37	0.38	0.42	0.41	0.35
74	OL4	0.33	0.35	0.40	0.34	0.35	0.31	0.37	0.36	0.35	0.35	0.37	0.33	0.34	0.33	0.36	0.32	0.38	0.36	0.37	0.41	0.40	0.34
75	OL5	0.54	0.41	0.43	0.66	0.53	0.54	0.62	0.63	0.62	0.59	0.64	0.64	0.64	0.56	0.69	0.68	0.65	0.53	0.59	0.63	0.61	0.65
76	OL6	0.44	0.41	0.42	0.47	0.40	0.40	0.49	0.47	0.44	0.42	0.44	0.43	0.45	0.44	0.49	0.47	0.51	0.40	0.43	0.48	0.50	0.45
77	OL7	0.13	0.20	0.18	0.19	0.23	0.16	0.25	0.22	0.18	0.18	0.20	0.17	0.25	0.21	0.18	0.24	0.25	0.19	0.24	0.25	0.23	0.21

(p<0.05; p<0.01)

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1	P1																						
2	P2																						
3	P3																						
4	I1																						
5	I2																						
6	I3																						
7	PR1																						
8	PR2																						
9	N1																						
10	N2																						
11	N3																						
12	N4																						
13	N5																						
14	N6																						
15	C1																						
16	C2																						
17	C3																						
18	C4																						
19	C5																						
20	C6																						
21	C7																						
22	C8																						
23	C9	1																					
24	C10	0.91	1																				
25	C11	0.70	0.70	1																			
26	Z1	0.41	0.41	0.39	1																		
27	Z2	0.43	0.44	0.42	0.36	1																	
28	Z3	0.55	0.53	0.52	0.34	0.44	1																
29	Z4	0.44	0.41	0.40	0.19	0.34	0.36	1															
30	F1	0.67	0.66	0.60	0.35	0.35	0.44	0.41	1														
31	F2	0.63	0.62	0.56	0.31	0.30	0.41	0.46	0.80	1													
32	SC1	0.49	0.46	0.39	0.41	0.25	0.36	0.33	0.53	0.54	1												
33	SC2	0.53	0.51	0.48	0.37	0.28	0.43	0.40	0.55	0.62	0.70	1											
34	SC3	0.62	0.63	0.57	0.35	0.34	0.42	0.45	0.70	0.74	0.57	0.63	1										
35	R1	0.61	0.61	0.69	0.32	0.39	0.42	0.44	0.55	0.57	0.41	0.40	0.52	1									
36	R2	0.60	0.59	0.66	0.29	0.36	0.44	0.44	0.51	0.53	0.38	0.47	0.49	0.80	1								
37	R3	0.63	0.61	0.63	0.30	0.38	0.45	0.44	0.52	0.53	0.41	0.49	0.51	0.75	0.73	1							
38	R4	0.54	0.53	0.64	0.27	0.34	0.39	0.40	0.47	0.50	0.38	0.42	0.46	0.81	0.82	0.71	1						

(p<0.05; p<0.01)

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
39	R5	0.58	0.57	0.63	0.25	0.39	0.39	0.42	0.51	0.52	0.37	0.43	0.48	0.79	0.83	0.75	0.85	1					
40	T1	0.62	0.59	0.62	0.27	0.38	0.42	0.48	0.54	0.57	0.42	0.50	0.54	0.66	0.62	0.68	0.57	0.62	1				
41	T2	0.65	0.64	0.62	0.32	0.34	0.44	0.44	0.59	0.60	0.49	0.54	0.58	0.71	0.63	0.71	0.59	0.62	0.84	1			
42	T3	0.46	0.45	0.46	0.19	0.28	0.33	0.39	0.39	0.37	0.28	0.37	0.36	0.53	0.51	0.53	0.45	0.52	0.66	0.67	1		
43	Y1	0.38	0.38	0.41	0.20	0.35	0.37	0.39	0.31	0.29	0.23	0.31	0.30	0.44	0.43	0.42	0.43	0.42	0.40	0.41	0.56	1	
44	Y2	0.43	0.43	0.44	0.21	0.38	0.36	0.42	0.36	0.35	0.29	0.34	0.33	0.47	0.48	0.49	0.47	0.48	0.43	0.48	0.59	0.84	1
45	Y3	0.37	0.38	0.38	0.17	0.28	0.32	0.34	0.31	0.30	0.24	0.31	0.34	0.41	0.40	0.42	0.40	0.41	0.36	0.42	0.54	0.83	0.82
46	U1	0.46	0.47	0.41	0.44	0.28	0.33	0.28	0.46	0.44	0.52	0.45	0.47	0.41	0.40	0.40	0.38	0.38	0.38	0.43	0.23	0.27	0.31
47	U2	0.46	0.45	0.42	0.41	0.31	0.33	0.29	0.47	0.48	0.55	0.47	0.51	0.44	0.42	0.43	0.42	0.45	0.43	0.47	0.30	0.28	0.31
48	U3	0.50	0.50	0.46	0.39	0.35	0.38	0.31	0.51	0.46	0.49	0.44	0.51	0.43	0.39	0.42	0.40	0.42	0.41	0.46	0.27	0.26	0.32
49	U4	0.46	0.46	0.43	0.41	0.36	0.36	0.32	0.48	0.43	0.48	0.43	0.48	0.41	0.38	0.40	0.38	0.38	0.38	0.41	0.25	0.28	0.29
50	U5	0.46	0.46	0.41	0.41	0.33	0.33	0.29	0.43	0.44	0.51	0.44	0.48	0.45	0.42	0.42	0.39	0.42	0.43	0.46	0.28	0.27	0.29
51	V1	0.41	0.42	0.44	o.42	0.32	0.32	0.28	0.42	0.38	0.47	0.37	0.41	0.42	0.38	0.41	0.40	0.38	0.38	0.43	0.25	0.28	0.31
52	V2	0.44	0.45	0.49	0.43	0.33	0.33	0.28	0.44	0.40	0.51	0.44	0.44	0.43	0.42	0.42	0.40	0.42	0.39	0.45	0.26	0.29	0.32
53	V3	0.44	0.44	0.48	0.43	0.32	0.32	0.25	0.44	0.38	0.50	0.42	0.41	0.46	0.42	0.43	0.42	0.42	0.37	0.46	0.29	0.32	0.37
54	V4	0.42	0.43	0.44	0.36	0.31	0.31	0.33	0.37	0.37	0.44	0.40	0.37	0.39	0.35	0.40	0.37	0.39	0.35	0.39	0.29	0.31	0.35
55	V5	0.40	0.41	0.42	0.34	0.37	0.37	0.33	0.40	0.38	0.39	0.38	0.38	0.40	0.39	0.40	0.39	0.42	0.38	0.40	0.32	0.33	0.36
56	V6	0.36	0.35	0.39	0.40	0.31	0.31	0.23	0.34	0.29	0.44	0.31	0.31	0.37	0.38	0.35	0.34	0.34	0.31	0.37	0.23	0.21	0.23
57	EM1	0.39	0.39	0.38	0.27	0.33	0.33	0.24	0.36	0.32	0.40	0.30	0.35	0.37	0.40	0.41	0.42	0.39	0.31	0.34	0.25	0.24	0.26
58	EM2	0.41	0.39	0.41	0.31	0.34	0.34	0.25	0.39	0.31	0.42	0.33	0.36	0.37	0.36	0.37	0.40	0.38	0.31	0.37	0.30	0.27	0.28
59	OS1	0.48	0.49	0.48	0.25	0.35	0.35	0.35	0.59	0.60	0.47	0.51	0.57	0.41	0.44	0.41	0.42	0.41	0.40	0.41	0.26	0.25	0.29
60	OS2	0.45	0.43	0.49	0.24	0.35	0.35	0.39	0.56	0.56	0.43	0.42	0.52	0.48	0.47	0.43	0.46	0.46	0.45	0.45	0.31	0.25	0.27
61	OS3	0.60	0.59	0.55	0.27	0.32	0.42	0.44	0.64	0.69	0.54	0.55	0.68	0.53	0.48	0.52	0.47	0.50	0.54	0.57	0.37	0.34	0.37
62	OS4	0.18	0.19	0.17	0.27	0.16	0.18	0.17	0.15	0.15	0.18	0.19	0.11	0.16	0.17	0.15	0.18	0.14	0.17	0.15	0.22	0.22	0.24
63	0S5	0.64	0.62	0.55	0.35	0.36	0.45	0.44	0.66	0.73	0.56	0.60	0.67	0.52	0.51	0.55	0.48	0.52	0.60	0.62	0.39	0.30	0.35
64	0S6	0.60	0.59	0.54	0.30	0.31	0.43	0.44	0.78	0.84	0.53	0.57	0.69	0.52	0.49	0.48	0.46	0.49	0.52	0.55	0.33	0.28	0.31
65	OS7	0.66	0.65	0.60	0.32	0.34	0.45	0.49	0.72	0.74	0.53	0.64	0.91	0.55	0.52	0.54	0.49	0.52	0.59	0.62	0.41	0.33	0.36
66	OR1	0.30	0.31	0.34	0.29	0.20	0.22	0.21	0.31	0.34	0.33	0.31	0.34	0.42	0.47	0.41	0.47	0.45	0.29	0.30	0.23	0.25	0.26
67	OR2	0.23	0.21	0.18	0.24	0.25	0.24	0.19	0.20	0.17	0.25	0.21	0.18	0.24	0.25	0.23	0.21	0.25	0.21	0.24	0.19	0.22	0.27
68	OR3	0.46	0.47	0.41	0.40	0.33	0.34	0.23	0.42	0.42	0.51	0.45	0.47	0.39	0.38	0.37	0.35	0.37	0.32	0.36	0.24	0.24	0.25
69	OR4	0.37	0.37	0.36	0.20	0.39	0.40	0.62	0.34	0.38	0.29	0.38	0.35	0.37	0.37	0.35	0.34	0.37	0.42	0.39	0.41	0.45	0.46
70	OR5	0.48	0.47	0.44	0.27	0.27	0.33	0.36	0.39	0.38	0.36	0.42	0.39	0.54	0.50	0.51	0.45	0.48	0.58	0.63	0.78	0.54	0.57
71	OL1	0.37	0.37	0.41	0.40	0.35	0.35	0.32	0.38	0.34	0.43	0.39	0.38	0.43	0.39	0.39	0.41	0.41	0.36	0.40	0.28	0.36	0.37
72	OL2	0.35	0.33	0.37	0.33	0.24	0.29	0.23	0.29	0.29	0.39	0.32	0.33	0.36	0.38	0.34	0.36	0.35	0.28	0.32	0.25	0.25	0.27
73	OL3	0.40	0.39	0.40	0.30	0.31	0.36	0.29	0.39	0.30	0.41	0.35	0.38	0.39	0.41	0.41	0.43	0.42	0.31	0.38	0.32	0.31	0.34
74	OL4	0.41	0.39	0.41	0.39	0.31	0.42	0.33	0.36	0.31	0.31	0.34	0.25	0.37	0.36	0.37	0.40	0.38	0.31	0.37	0.30	0.27	0.28
75	OL5	0.65	0.63	0.57	0.32	0.31	0.44	0.51	0.72	0.75	0.52	0.65	0.87	0.52	0.51	0.54	0.47	0.51	0.58	0.59	0.39	0.29	0.33
76	OL6	0.50	0.51	0.46	0.40	0.30	0.36	0.33	0.52	0.46	0.49	0.42	0.50	0.43	0.44	0.43	0.41	0.45	0.43	0.46	0.27	0.28	0.34
77	OL7	0.25	0.21	0.24	0.19	0.22	0.27	0.22	0.31	0.33	0.37	0.32	0.31	0.34	0.33	0.33	0.30	0.33	0.35	0.21	0.17	0.13	0.21

(p<0.05; p<0.01)

Appendix 5.5

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
39	R5																						
40	T1																						
41	T2																						
42	T3																						
43	Y1																						
44	Y2																						
45	Y3	1																					
46	U1	0.28	1																				
47	U2	0.30	0.77	1																			
48	U3	0.26	0.67	0.74	1																		
49	U4	0.28	0.83	0.74	0.65	1																	
50	U5	0.29	0.78	0.92	0.71	0.75	1																
51	V1	0.27	0.62	0.64	0.62	0.60	0.63	1															
52	V2	0.30	0.67	0.66	0.65	0.65	0.63	0.75	1														
53	V3	0.34	0.64	0.63	0.63	0.62	0.61	0.74	0.76	1													
54	V4	0.30	0.52	0.53	0.60	0.53	0.49	0.65	0.66	0.65	1												
55	V5	0.32	0.53	0.52	0.58	0.54	0.48	0.64	0.63	0.64	0.81	1											
56	V6	0.22	0.52	0.52	0.54	0.50	0.51	0.63	0.58	0.59	0.56	0.60	1										
57	E1	0.25	0.47	0.46	0.52	0.48	0.43	0.52	0.55	0.52	0.47	0.49	0.60	1									
58	E2	0.29	0.49	0.51	0.55	0.50	0.49	0.53	0.58	0.52	0.49	0.49	0.58	0.78	1								
59	OS1	0.24	0.35	0.39	0.42	0.33	0.35	0.35	0.39	0.37	0.27	0.30	0.28	0.37	0.33	1							
60	OS2	0.21	0.34	0.40	0.40	0.36	0.40	0.35	0.37	0.39	0.34	0.34	0.31	0.34	0.38	0.57	1						
61	OS3	0.37	0.37	0.43	0.45	0.39	0.42	0.38	0.38	0.39	0.41	0.39	0.31	0.35	0.35	0.56	0.59	1					
62	OS4	0.19	0.20	0.20	0.23	0.22	0.18	0.23	0.25	0.22	0.20	0.17	0.20	0.25	0.26	0.13	0.13	0.14	1				
63	0S5	0.30	0.46	0.47	0.46	0.46	0.45	0.43	0.43	0.40	0.40	0.40	0.30	0.31	0.32	0.57	0.56	0.71	0.14	1			
64	0S6	0.25	0.41	0.45	0.46	0.44	0.41	0.38	0.38	0.36	0.36	0.34	0.28	0.31	0.32	0.60	0.58	0.63	0.19	0.68	1		
65	OS7	0.37	0.42	0.46	0.49	0.46	0.44	0.39	0.43	0.40	0.37	0.38	0.29	0.35	0.36	0.56	0.55	0.70	0.11	0.68	0.70	1	
66	OR1	0.25	0.43	0.44	0.43	0.39	0.41	0.38	0.44	0.42	0.34	0.41	0.40	0.41	0.35	0.27	0.32	0.25	0.14	0.30	0.32	0.31	1
67	OR2	0.22	0.31	0.33	0.37	0.32	0.31	0.34	0.33	0.33	0.30	0.33	0.35	0.31	0.35	0.13	0.21	0.18	0.15	0.21	0.21	0.17	0.46
68	OR3	0.22	0.51	0.55	0.60	0.52	0.52	0.53	0.57	0.55	0.49	0.48	0.49	0.47	0.47	0.37	0.37	0.35	0.24	0.44	0.41	0.42	0.53
69	OR4	0.40	0.21	0.23	0.28	0.23	0.24	0.25	0.22	0.26	0.30	0.34	0.22	0.23	0.23	0.33	0.33	0.39	0.14	0.39	0.35	0.38	0.15
70	OR5	0.52	0.29	0.33	0.41	0.29	0.31	0.32	0.34	0.36	0.34	0.34	0.29	0.27	0.34	0.27	0.34	0.38	0.24	0.42	0.37	0.39	0.26
71	OL1	0.34	0.53	0.54	0.57	0.53	0.50	0.62	0.60	0.61	0.67	0.78	0.62	0.51	0.49	0.32	0.29	0.35	0.16	0.39	0.32	0.37	0.37
72	OL2	0.25	0.46	0.44	0.47	0.47	0.43	0.52	0.54	0.49	0.50	0.55	0.70	0.64	0.56	0.30	0.26	0.28	0.23	0.29	0.28	0.30	0.38
73	OL3	0.31	0.48	0.49	0.54	0.47	0.46	0.49	0.56	0.51	0.47	0.51	0.58	0.82	0.86	0.34	0.35	0.34	0.28	0.30	0.31	0.39	0.39
74	OL4	0.29	0.49	0.51	0.55	0.50	0.49	0.53	0.58	0.52	0.49	0.49	0.58	0.30	0.24	0.33	0.38	0.35	0.26	0.32	0.32	0.36	0.35
75	OL5	0.32	0.40	0.43	0.46	0.44	0.42	0.35	0.39	0.35	0.35	0.36	0.26	0.32	0.33	0.54	0.53	0.70	0.10	0.69	0.71	0.93	0.31
76	OL6	0.29	0.73	0.71	0.78	0.71	0.69	0.65	0.71	0.66	0.59	0.58	0.53	0.49	0.49	0.39	0.43	0.43	0.21	0.50	0.46	0.48	0.47
77	OL7	0.22	0.31	0.33	0.37	0.32	0.31	0.34	0.33	0.33	0.30	0.33	0.35	0.21	0.17	0.13	0.21	0.18	0.15	0.21	0.21	0.17	0.46

(p<0.05; p<0.01)

Relationships among variables – Pearson correlation coefficient, two-tailed (N =547)

		67	68	69	70	71	72	73	74	75	76	77
39	R5											
40	T1											
41	T2											
42	T3											
43	Y1											
44	Y2											
45	Y3											
46	U1											
47	U2											
48	U3											
49	U4											
50	U5											
51	V1											
52	V2											
53	V3											
54	V4											
55	V5											
56	V6											
57	E1											
58	E2											
59	OS1											
60	OS2											
61	OS3											
62	OS4											
63	0S5											
64	0S6											
65	OS7											
66	OR1											
67	OR2	1										
68	OR3	0.48	1									
69	OR4	0.21	0.21	1								
70	OR5	0.23	0.30	0.40	1							
71	OL1	0.35	0.51	0.33	0.31	1						
72	OL2	0.31	0.44	0.22	0.30	0.25	1					
73	OL3	0.32	0.46	0.25	0.33	0.33	0.54	1				
74	OL4	0.47	0.23	0.34	0.30	0.19	0.78	0.86	1			
75	OL5	0.17	0.39	0.38	0.39	0.33	0.32	0.29	0.36	1		
76	OL6	0.33	0.56	0.23	0.33	0.27	0.55	0.46	0.49	0.46	1	
77	OL7	0.48	0.21	0.23	0.23	0.12	0.31	0.32	0.35	0.17	0.33	1

(p<0.05; p<0.01)

Appendix 5.6
Spearman rho correlations

Relationships among demographics variables – Spearman rho rank coefficient correlations two-tailed (N = 547)

		1	2	3	4	5
1	Gender	1				
2	Age	-0.08	1			
3	Education	0.68	0.32	1		
4	Occupation	-0.01	0.38	0.43	1	
5	Income	-0.08	0.47	0.44	0.65	1

(p<0.1; p<0.05; p<0.01)

Relationships among Internet usage variables – Spearman rho rank coefficient correlations two-tailed (N = 547)

	Internet usage	1	2
1	Internet experience (years)	1	
2	Length of use (hours/week)	0.23	1

(p<0.01)

Relationships among Internet activities variables – Spearman rho rank coefficient correlations two-tailed (N = 547)

	Activities	1	2	3
1	Registration	1		
2	Reservation	0.25	1	
3	Banking	0.13	0.40	1

(p<0.01)

Using Structural Equation Modeling (SEM)

Introduction

From the term, *structural* emphasizes the assumptions of invariant causal relation, and *equation* denotes a system of *linear equations* between all variables, latent and observed (Bollen 1989). SEM is a combination of regression analysis and principal component analysis (Bollen 1989; Hair et al. 1998, Tabachnick & Fidell 2001). In fact, SEM is a multiple regression analysis of factors. That is, posited by underlying theories, observed variables are assessed on their associations with latent variables (factors) and when this factor analysis is combined in multiple regression analyses a structural model of relationships is developed (Tabachnick & Fidell 2001). This structural model is preferred to other multivariate analyses because it enables a complex study of interrelationships between independent variables and multiple dependent variables, "even when a dependent variable becomes an independent variable in other relationships" (Hair et al. 1998, p. 585)

Steps in SEM

Basically there are six essential steps in building and validating SEM: developing a path diagram, determining the linear models, selecting an input matrix, assessing the model identification, evaluating model goodness-of-fit, and finally modifying the model, if so required (Hair et al. 1998; Tabachnick & Fidell 2001). The six-step process is illustrated in Figure A1.

Theoretical model and path diagram

The primary objective of this research is to investigate the cause and effect of E-CRM, consumer satisfaction, retention and loyalty. A theoretical framework has been developed (see section 3.2) to support the analyses of these causal relationships. After conceptualizing a structural model theoretically, the next process is to specify it statistically into a path diagram.

Appendix 5.7

Using Structural Equation Modeling (SEM)

Figure A1:   Six-steps Process of Structural Equation Modeling
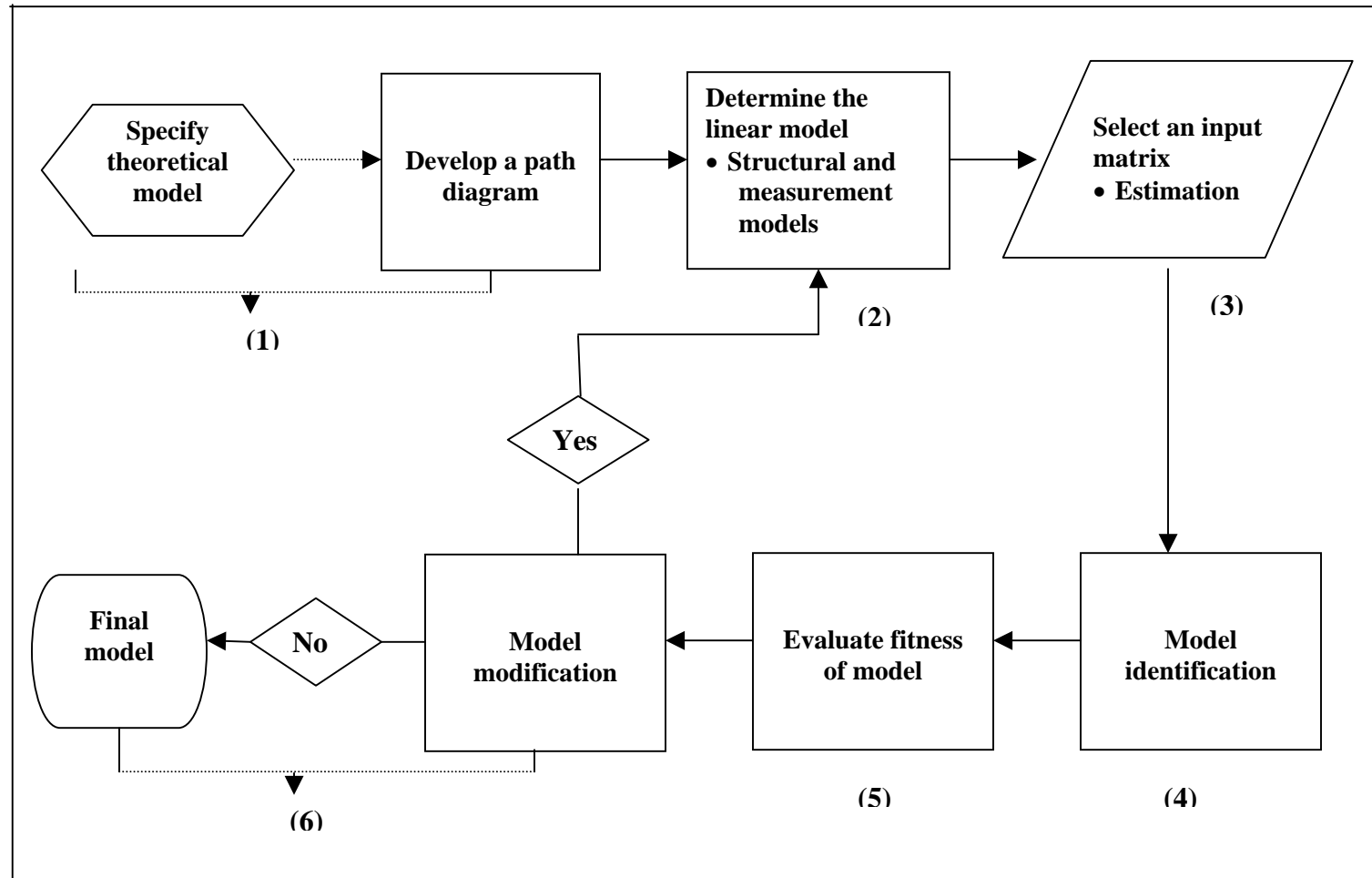
Source: Adapted from Hair et al. (1998) and Tabachnick and Fidell (2001) – developed for this thesis

Using Structural Equation Modeling (SEM)

A *path diagram*, first introduced by Sewall Wright is a graphical representation of hypothesized set of relationships (Cramer 2003; Tabachnick & Fidell 2001). An ellipse represents a latent (unobserved) variable while a rectangle denotes observed variable. A relationship between an indicator observe variable and a factor latent variable is indicated by an arrow from the factor to an indicator item – the construct predicts the observed variable (Byrne 2001; Cramer 2003). For example, the information quality factor predicts the level of information accuracy and relevancy. In SEM, there are two types of latent variables: exogenous and endogenous. The latter refers to latent dependent variable with at least one arrow leading to it while exogenous, or latent independent variable has no arrow pointing to it (Schumacker & Lomax 2004). In addition, a line with an arrow at both ends implies a covariance between two variables in unstandardised models, and indicates a correlation in standardized models with no hypothesized direction of effect (Tabachnick & Fidell 2001). Since no measures can be perfectly predicted, error estimates or residuals are included at both observed and latent variables respectively (Byrne 2001). The path diagrams for each of the research models are presented in Sections 5.4.1 and 5.4.2. Next, the liner models of research constructs pertaining to the analyses are discussed.

Linear models of research construct

Subsequent to the path diagram is the development of models indicating the relationships of constructs (and indicator variables). There are two types of linear models in SEM: measurement and structural.

Measurement model. A measurement model is a model that denotes the relationship between observed variable and the construct. For example, satisfaction, retention and loyalty each are latent variables (construct) and the indicator items of each of these construct form a measurement model (Byrne 2001; Tabachnick & Fidell 2001). There are several issues imperative to the measurement model: specifying the measurement

model, number of indicators and validity tests (Hair et al. 1998). These evaluation criteria are discussed in section 5.4.5

Structural model. In turn, a structural model depicts the relationships between the constructs; E-CRM, satisfaction, retention and loyalty. A structural model relates the initial theoretical causal relationships among the latent variables developed from underlying theories (Bollen & Long 1993; Kline 1998). In this research, the structural model of latent variables was developed from theories proposed by the literature in Section 3.4.

Input matrix and model estimation

Input matrix. SEM uses either a variance-covariance or correlation matrix as its input data (Hair et al. 1998). Prior to inputting data, several issues need to be addressed: screened data and sample size.

Data should be *screened* and treated for missing data, non-normality and outliers. Missing data, outliers and departure from multivariate normality pose problems to tests of causal relationships such as SEM since missing data can cause bias in the estimation process while non-normality and outliers may create bias in determining the significance of coefficient. In this study, these issues were addressed as discussed in section 5.1.1.

A sufficient *sample size* is required to obtain a stable or meaningful parameter estimates in SEM. Researchers offer a general guideline pertaining to sample size; a sample size of less than 100 is regarded as small, medium sample size is between 100 and 200 while large sample size is more than 200 (Hair et al. 1995; Hulland, Chow & Lam 1996; Kline 1998). In this study, a sample size of 547 is appropriate to proceed with the assessment of the model.

Using Structural Equation Modeling (SEM)

The decision to use the variance-covariance or correlation input matrix depends on the motive of research. *Variance-covariance matrix* is commonly used when a study aims to test the theory applicability across different populations or samples and to validate a causal relationship (Hair et al. 1998; Hulland et al. 1996). On the other hand, a *correlation matrix* is appropriate when a researcher seeks to understand the pattern of relationships between constructs and make comparisons across different variables. This study has chosen variance-covariance matrix as the input matrix since it aims to examine the causal relationships of variables across a sample of respondents.

Estimation technique. Sample size and normality of the data sets are important considerations in selecting an estimation technique. In this study, *maximum likelihood (ML)* estimation technique is preferred to other methods such as generalized least squares (GLS) and unweighted least squares (ULS). With a sample size of more than 500 and where multivariate normality is generally not violated, ML is appropriate for this study (Tabachnick & Fidell 2001); GLS requires a larger sample size (Anderson & Gerbing 1988) while ULS is sensitive to the measurement scales of observed variables (Kline 1998).

Model identification

After an input matrix and estimation technique have been specified, the next step is to determine whether the model is identified. Model identification refers to a definite and unique solution to each parameter of an equation model (Tabachnick & Fidell 2001). Researchers suggest that a model has to meet two requirements in order to be identified: the degrees of freedom of a model should be greater or equal to zero and that each construct should have an appropriate scale (Byrne 2001; Kline 1998; Schumacker & Lomax 1996).

Appendix 5.7

Using Structural Equation Modeling (SEM)

Specifically, a model is said to be *just-identified* when it has zero degrees of freedom. In this instance, the number of parameters perfectly reproduces the sample covariance matrix, and can never be rejected (Byrne 2001) because the hypotheses about the specific paths in the model can be tested (Tabachnick & Fidell 2001). Although a just-identified model provides a perfect fit, it is not of the interest of most researchers to discover that a model lacks generalizability. Kline (1998) posits that some versions of the just-identified model are implausible due to the nature of variables. There are instances where the models in this research are just-identified and the occurrences are noted in this chapter. On the contrary, an *over-identified* model fits the goal for a structural model, that is, there is a positive number of degrees of freedom to ensure that the model achieve generalizability – the larger the degrees of freedom the better generalizability (Hair et al. 1998). An *under-identified* model produces negative degrees of freedom, that is, the model attempts to estimate more parameters despite lack of information available. In this study, none of the models are under-identified.

Evaluation of model

A model is evaluated on two measures: the unidimensionality and the goodness-of-fit. First, consider evaluating the measurement model. Several issues are required when evaluating a measurement model: specifying the measurement model, the number of indicators and validity tests. *Specifying the measurement model* concerns the act of confirming the indicators that define each construct. To do so, this study conformed to Anderson and Gerbing's (1988) guidelines and a two-step approach was performed.

In the first phase, an exploratory factor analysis was conducted to assess the underlying factor structure of the scaled items (see section 4.2.5). However, a factor analysis performed in earlier steps of analysis allows each item to load on each factor, thus a factor is always a composite of all items. Subsequently, in a second phase a

confirmatory factor analysis was pursued. Confirmatory factor analysis indicators are specified to only one construct, thus a researcher has complete control over which variables define each construct. Following the theories underpinning this research, items are loaded onto each identified factor and items with poor loadings (less than 0.5) are dropped. There are instances in this study where the loadings were low and are noted as they occur (see section 5.4.1).

A sufficient *number of indicators* should be present for a model to be identified (Hulland et al. 1996). Practically, a minimum of three or five indicators per factor should suffice (Baumgartner & Homburg 1996; Hulland et al. 1996; Tabachnick & Fidell 2001). This study adheres to this principle as much as possible, except the *customer service quality construct* where 11 items were used as the indicator variables to reflect the aspects of the subject matter cited in the literature (see Section 3.3.1).

The extent to which indicators of each construct are correlated is an important consideration in a measurement model to ensure *construct validity*. Construct validity is discussed in detail in Section 4.2.6. It is concerned with two types of validity: convergent and discriminant. Following the procedures by Bollen (1989), in this study the convergent validity was evident by high loadings of items of the same construct, while discriminant validity was evident by the inter-construct correlation less than 1.0 (see Appendix 5.7a).

- **Unidimensionality**

A *unidimensional* model refers to a measurement model where its indicator variables load on only one factor and the measurement error terms are independent (Anderson & Gerbing 1988; Kline 1998) and reliable (Kline 1998). To measure internal reliability, *Cronbach coefficient alpha* is commonly used. Although alpha coefficient does not ensure unidimensonality, it is useful to assume that unidimensionalty exists. There

are some guidelines offered by the literature in relation to reliability coefficient; an alpha coefficient value of around 0.90 can be considered 'excellent', around 0.80 as 'very good,', around 0.70 as 'adequate' (Nunnaly 1978; Nunnally & Berstein 1994). Any value below 0.5 suggests that at least one-half of the observed variance may be due to random error, and measures that are unreliable should be avoided (Kline 1998). At no point in this study was the coefficient rule violated. However, coefficient alpha weights all item equally and it is not evident that a set of measures is unidimensional (Nunnally & Berstein 1994). Hence, to measure unidimensionality, it is more appropriate to use item loading standardised regression weights (Hulland et al. 1996).

The *standardised regression weight* measures item loading on each construct (Coote 1998; Tabachnick & Fidell 2001). An absolute value of 0.70 or more is recommended, but this guideline may be *readjusted* to lower or higher values depending upon the research area (Hair et al. 1998; Hulland et al. 1996; Kline 1998; Tabachnick & Fidell 2001). A minimum value of 0.5 has been suggested (Tabachnick & Fidell 2001) and is deemed acceptable in this research (Hair et al. 1998).

- **Goodness-of-fit statistic**.

The next step is to describe the measures of fit used in this research. There are three types of goodness-of-fit measures: absolute fit, incremental fit and parsimonious fit measures (Hair et al. 1998).

Absolute fit measures.   Absolute fit measures concerns the overall model fit while ignoring the overfitting of a model that might occur.

Chi-square test (χ^2). One of the most basic measures of absolute fit is the likelihood ratio measured with chi-square χ^2 (Hair et al., 1998). The χ^2 statistic value relative to degrees of freedom is said to be significantly different from zero (p<0.05 or p<0.01) when there is a difference between the population covariances matrix and the implied covariances

matrix (Shumacker & Lomax 1996). However, its use is limited by its sensitivity to the sample size leading to errorneous conclusions regarding analysis outcomes (Shumacker & Lomax 2004) such as rejecting a good fitting model (Anderson & Gerbing 1988; Hair et al., 1998; Kline 1998; Maruyama, 1998). That is, when the sample size is large the χ^2 statistic may be significant even though the differences between observed and model implied covariances are minor. Therefore, for these reasons, some researchers divide its value by the degrees of freedom (χ^2 /df) to reduce its sensitivity of χ^2 statistic to the sample size.

(χ^2 /df). This normed chi-square test statistic ratio (χ^2 /df), which appears as CMIN/DF in AMOS is a measure of absolute fit (Joreskog & Sorbom, 1986; Hayduk, 1987) and model parsimony complexity in SEM literature because it is unaffected by the sample size (Byrne, 2001; Tabachnick & Fidell, 2001). Although there is no clear guideline about what value of (χ^2 /df) is minimally acceptable one frequent suggestion is that the ratio is as low as 1.0 or as high as 3.0 (Kline, 1998); values close to 1 indicate good fit and values less than 1 may indicate over fit (Joreskog & Sorbom, 1979; Kline 1998). Hence this range of values was adopted in this research.

RMSEA. Another measure of absolute fit is the RMSEA (Tabachnick & Fidell 2001) This measure expresses model fit per degree of freedom, that is, in terms of the population and not just the sample the researcher uses to estimate the model (Baumgartner & Homburg, 1996). RMSEA value of 0.06 or less indicates a good model fit (Hu & Bentler 1999) while value higher than 0.08 suggests reasonable errors of approximation in the population (Baumgartner & Homburg 1996; Browne & Cudeck 1993; Byrne 2001; Hair et al. 1998). AMOS reports a 90 per cent interval which is useful to assess the precision of RMSEA estimates (Byrne 2001; Steiger 1990)

AGFI. Another measure of absolute fit is the adjusted goodness-of-fit index (GFI) (Hair et al., 1998). The AGFI indicates the population of the observed covariance

explained by the model implied covariance adjusted for the number of degrees of freedom (Bollen 1989; Byrne 2001). It does not compare the hypothesized model with any model at all (Hu & Bentler 1995). Values close to 0.90 indicate a good fit (Kline 1998).

Incremental fit measures

Incremental fit measures make a comparison between the hypothesized models against a standard baseline model (Bollen 1989; Byrne 2001). Bentler's *Comparative Fit Index (CFI)* and *Tucker Lewis Fit Index (TLI)* are two incremental fit indices reported in this research. These measures were used to indicate the proportion in the improvement of the overall fit of a model relative to a null model (Kline 1998; Shumacker *& Lomax* 1996). Consequently, Bentler (1990) has suggested that the CFI value should be the index of choice and is the most commonly reported in research.

The *CFI* measures a comparison of the hypothesized model against a baseline model which typically is the independence model or null model (Byrne 2001; Tabachnick & Fidell 2001). It measures a complete covariance in the data sets (Byrne, 2001) and values close to zero indicate a poor fit while CFI values equal to one indicate a perfect fit model. In this research, values equal to or greater than 0.90 indicate satisfactory fit (Hulland et al. 1996), and values above 0.95 indicate a well fitting model (Byrne 2001; Hu & Bentler 1999).

TLI is another relative comparison of the proposed model to the null model. It is also referred to as the nonnormed fit index (NNFI) because it is unaffected by the model complexity and it expresses fit per degree of freedom (Baumgartner & Homburg 1996; Kline 1998) In this research, values above 0.95 reflect a good model fit (Shumacker & Lomax 1996).

Appendix 5.7

Using Structural Equation Modeling (SEM)

Model modification

The final step in SEM involved the imposition of a constraint on the values of one or more parameter estimates that resulted in unfavorable goodness-of-fit (Kline 1998; Schumacker & Lomax 1996). In this study, there were few occurrences of structural model misfit and the treatment was discussed in the respective section (see section 5.4.2).

Discriminant validity assessment for the paired constructs

Variable	RTINTG	LOEMOT	LOVALU	LOTRUS	RTCOM	RTPES	RTREW	STFUL	STNAV	CUSV	STPROD	STSEC	STINFO	STPRC
RTINTG	1	.37	.47	.46	.54	.54	.75	.60	.57	.71	.43	.59	.50	.55
LOEMOT	.37	1	.76	.68	.30	.40	.44	.39	.41	.46	.42	.44	.41	.39
LOVALU	.47	.76	1	.62	.38	.47	.51	.48	.49	.56	.44	.56	.48	.48
LOTRUS	.46	.68	.62	1	.34	.43	.50	.55	.52	.60	.46	.62	.52	.53
RTCOM	.54	.30	.38	.34	1	.51	.51	.36	.38	.47	.27	.37	.29	.30
RTPES	.54	.40	.47	.43	.51	1	.55	.50	.53	.66	.39	.51	.44	.45
RTREW	.75	.44	.51	.50	.51	.55	1	.58	.57	.73	.47	.59	.52	.58
STFUL	.60	.39	.48	.55	.36	.50	.58	1	.63	.80	.56	.75	.73	.71
STNAV	.57	.41	.49	.52	.38	.53	.57	.63	1	.77	.58	.77	.71	.71
CUSV	.71	.46	.56	.60	.47	.66	.73	.80	.77	1	.54	.76	.68	.68
STPROD	.43	.42	.44	.46	.27	.39	.47	.56	.58	.54	1	.56	.62	.62
STSEC	.59	.44	.56	.62	.37	.51	.59	.75	.77	.76	.56	1	.70	.68
STINFO	.50	.41	.48	.52	.29	.44	.52	.73	.71	.68	.62	.70	1	.70
STPRC	.55	.39	.48	.53	.30	.45	.58	.71	.71	.68	.62	.68	.70	1

Appendix 5.8
Legend to labeling variables

Legend to labeling constructs/variables

Label	Construct/Variable
C1	Efficient in handling complaints
C10	Professional in answering enquiry
C11	Will notify if any problem arise with customer orders
C2	Friendly in answering customers enquiries
C3	Notifies my order status
C4	Responds within 48 hours
C5	Can be contacted through variuos channels
C6	Representatives have wide knowledge of products/services
C7	Keep updates of users transaction records
C8	Fast in resolving customers' complaints
C9	Professional in handling complaints
CUSV	Customer service quality
E1	I feel welcomed (greeted by my name)
E2	I feel contented with the experience dealing with the company
ECRM EFFECT	Use of Internet in CRM
F1	Products received are always in good condition
F2	Products/services are delivered within the delivery time as promised
I1	The information is accurate
I2	In-depth information on products/services
I3	Information displayed is easy to understand
LOEMOT	Emotional benefit
LOTRUS	Trust
LOVALU	Perceived value
LOYALTY	Loyalty
N1	The website is always accessible
N2	The web site provide easy steps whenever a customer needs to register
N3	Only a few clicks to get information
N4	The web pages load quickly
N5	The links are clearly displayed
N6	The Web site uses a language that can be easily understood
OL1	I feel committed to this site
OL2	I feel a sense of belonging to this site
OL3	I feel highly appreciated
OL4	I am contented with my experience on this site
OL5	I feel safe doing business with this site
OL6	I can rely on the service
OL7	I will recommend this site to friends and family
OR1	Will re-visit a site that offers more attractive rewards
OR2	Intend to return to a site where my complaints are handled more efficiently
OR3	Will re-visit a site that offers personalized recommendation on products/services

Legend to labeling constructs/variables

Label	Construct/Variable
OR4	Will return to a site (company) that can be easily accessed either on the Internet or through other traditional means
OR5	Will return to a site where I can obtain useful information about products/services from other online members
OS1	The Web site provides updated information
OS2	Prices of products/services are often lower compared to other companies
OS3	All links on the Web site are in proper working condition
OS4	The Web site offers a wide range of products/services
OS5	The customer service is efficient
OS6	Products/services are correctly delivered as per ordered
OS7	All private information about consumers are protected from unauthorized access
P1	High quality product/service
P2	More varieties in product/services
P3	Products/services offered are up-to-date with current trend
PR1	More attractive discounts and special promotions
PR2	Relatively low delivery charges
R1	Receive rewards for returning to the site
R2	Site ooffers attractive cash rebates for any purchase (subscription)
R3	Offers attractive points redemption for any purchase (subscription)
R4	Offers attractive coupons for any purchase (subscription)
R5	Offers attractive gifts for purchase/subscription
RETENTION	Retention
RTCOM	Online community
RTINTG	Channel integration
RTPES	Personalization
RTREW	Reward
SATISFN	Satisfaction
SC1	Provides various types of credit cards for payment
SC2	Provides alternative payment method other than credit card
SC3	Privacy policy is clearly communicated to customers
STFUL	Order fulfillment
STINFO	Information quality
STNAV	Ease of navigation
STPRC	Price attractiveness
STPROD	Product/service quality
STSEC	Payment security
T1	Can pick-up the products ordered via the web at a nearest physical store
T2	Can check orders placed on the Internet through the physical and vice-versa
T3	Can exchange or return products bought from the web in a physical store
U1	Impose a strict privacy policy
U2	Provides third party verification to endorse web site strict security standard
U3	The customer service is reliable

Appendix 5.8
Legend to labeling variables

Legend to labeling constructs/variables

Label	Construct/Variable
U4	Practices high security standard
U5	Provides third party seal for authentication
V1	Allows access to track my orders
V2	Allows changes to my orders without much hassle
V3	Provides my account profile for my own further analysis
V4	I can request for products/services based on my specifications
V5	The company understands my needs
V6	The company keeps track of my transaction
Y1	Exchange information with my buddies in an online forum
Y2	Trade goods with my "friends" found on the same site
Y3	Obtain useful information about a company from the online members
Z1	Keeps a database of my transactions with them
Z2	Receive online advertisements that match my interests
Z3	Create "My Account" that will keep all past transactions details
Z4	Can be custom-made based on my specification

List of publications

Reporting results from the thesis
The following papers report the findings from this thesis and are published in refereed international journal and proceeding:

1. Ab Hamid, Noor Raihan and McGrath, Michael, "The Diffusion of Internet Interactivity on Retail Web Sites: A Customer Relationship Model" Communications of the IIMA, Vol. 5, No. 2, 2005, pp. 35-46.

Abstract
The use of internet as an interactive marketing media has captured much attention from managers in their quest for a better relationship with online customers. The belief that serving existing customers are more profitable than acquiring new ones, entailing relationship building effort no longer a choice, but a necessity. This study attempted to uncover the measures of E-CRM program and determining the extent to which these features influence consumer satisfaction and loyalty. The findings revealed that firms should focus on various relationship marketing measures in order to build enduring consumer relationships. Further, this study provides evidence that the implementation of E-CRM on firm's web site does influence consumer satisfaction leading to loyalty. Finally, managerial implications and limitations of this study are discussed.

2. Ab Hamid, Noor Raihan and McGrath, G. Michael, "Customer Relationship Management in the Internet Age: A Model of Customer Satisfaction, Retention and Loyalty", Proceedings of the International Conference on Information and Communication Technology in Management 2005, May 2005, Melaka, pp. 892-910.

Abstract
Competition in cyberspace is becoming more intense. With vast information available on the Internet consumers may easily switch at low cost, thus gaining higher bargaining power in the electronic marketplace. In turn, companies have sought to use information technology to learn the needs and preferences of their customers. This study attempts to investigate the extent to which the use of Internet helps to build customer relationships. As such, questionnaire surveys were used to gather consumers' perceptions toward the internet as a shopping medium. In this study, we use system dynamics techniques to build a model of consumer online purchasing behavior. This model was then used to conceptually underpin a major Malaysian-based study aimed at investigating the effective use of E-CRM associated with consumer online satisfaction, retention and loyalty. This study determines the dimensions of the three variables: e-satisfaction,

e-retention and e-loyalty. The results show that E-CRM tools do influence consumer loyalty and retention through satisfaction. We discuss the results and suggest some directions for future research.

3. Ab Hamid, Noor Raihan, Burgess, Stephen, and McGrath, G. Michael, "Competing Theories on Consumer Satisfaction, Loyalty and Retention: An Internet Environment Perspective", accepted for presentation at 6th International We-B Conference, November 2005, Melbourne.

Abstract

Despite the growing importance of improving consumer satisfaction leading to loyalty and retention, the marketing and information systems literature reveals that researchers have different views on the relationships between these critical factors. This study explores and tests the theories of consumer behaviour in the context of Internet. Using a modelling technique we identify the model fit of each of the competing theories. The results suggest that consumer level of satisfaction determines his/her intention to return to a Web site. However, return consumers are not necessarily deeply committed and loyal to service providers. We discuss the findings and the implications for practice as well as the directions for future research.

Related work contributing to and cited in the thesis
The papers listed below contribute to the preliminary work related to this thesis and are published in refereed international journals and proceeding.

4. Ab Hamid, Noor Raihan, "E-CRM: Are we there yet?", Journal of American Academy of Business Cambridge, Vol 6, No. 1, 2005, pp. 51-57.

Abstract
Companies such as Amazon and Yahoo! offer interesting anecdotes on the strategic applications of Internet technology as to enhance customer relationship and towards acquiring customer loyalty. These companies' offerings of personalized services, confirmation of orders in real time and other value added activities substantiated the ability of the Internet as a competitive marketing tool. As the number of internet users is growing rapidly in Malaysia, retailers are under great pressure to take advantage of the online market potential. However the challenge is whether Malaysian online retailers do match up with other online competitors worldwide in terms of services rendered on the Internet. Therefore, this study seeks to investigate the level of Internet technology applied by Malaysian web sites in view of global electronic marketplace competition. This research investigated various web sites across Malaysian industries and found

that Malaysian retailers are still lag in fully utilizing the strategic potential of the Internet particularly in enhancing customer relationships.

5. Ab Hamid, Noor Raihan, Kassim, Norizan, "Internet Technology as a Tool in Customer Relationship Management", Journal of American Academy of Business Cambridge, Vol 4, No. 1&2, 2004, pp. 103-108.

Abstract

The growth of the Internet, particularly the World Wide Web, as an electronic medium of commerce has brought changes in market competition in industries. Past researchers have examined the impact of Internet technology on customer relationship management in various areas in small and large firms, services and business-to-business companies. However, there remains a need to empirically examine the impact of implementing Internet technology on various dimensions of relationship management in South-East Asia context. The results of this study indicate that click-and-mortar companies show a higher percentage in using the Internet for Customer Relationship Management (CRM) compared to pure dotcom companies. We discuss a possible explanation of this finding. In addition, there are positive relationships between the utilization of Internet technology and the CRM variables being studied. Finally, the limitations and future directions of this research are discussed.

6. Ab Hamid, Noor Raihan, Abdullah, Norasiah, and Shiraz, Adika, "The Applications of Web Technology in Customer Relationship Management", Proceedings of International Conference on Intelligent Agents, Web Technologies and Internet Commerce, IAWTIC 2001, July 2001, Las Vegas.

Abstract

In the age of electronic business, firms have little choice but to adopt the Internet technology, particularly the World Wide Web. The technology enables value added services to be delivered in a speedy manner.   There are various ways in which web based technology can be applied to enhance customer relationships. Firms can send emails on promotion and product updates to targeted customers as well as answer customers' enquiry in real time, for example via chat rooms. The question is which web technology Malaysian firms mostly adopt? In addition, does the use of Internet technology help firms to better understand their customers enabling higher quality of services offered? Therefore, this study identifies various types of web based technology used by Malaysian firms, in the light of determining the level of practice. The findings indicate that Malaysian firms mostly adopt emails as a mean of communication, while web form is used as a mean to obtain customers information. We discuss the limitations and future directions of this research.