Strategic Logistics Outsourcing Success Framework: A Study of Indian Businesses

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Abstract

The role of a supply chain has never been as critical as it is in today's globalised economy. Market competition has dynamically shifted to the extent where one supply chain is competing against another, rather than the traditional competition among firms. Thus, the chain versus chain competition paradigm has challenged firms to develop their supply chain strategy within the firm itself. The focus of the firm is then predominantly narrowed down to core businesses where their expertise lies. The help they need from external firms is to compete in other non-core activities to not only gain economic benefits, but to also care for the environment and society as a whole.

The shippers (those who outsource activities to others) have many reasons (i.e. economic, environmental and social) to outsource logistics activities to firms externally, the success of this strategic outsourcing yet remains a major challenge. While the strategic partnerships with third-party logistics (3PL) service providers transfer the responsibility of accomplishing non-core functions—such as transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding—the question is to what extent this is accomplished successfully to the satisfaction of shippers and customers. Studies on outsourcing abound in the literature where the focus is mostly on outsourcing reasons, activities outsourced, 3PL selection criteria and success factors of outsourcing. Some researchers argue that logistics outsourcing is a business risk where success is far from reality. It remains unclear as to what ensures outsourcing success, given that the shippers have many strategic reasons for outsourcing.

The objective of this research is to develop a strategic outsourcing success framework that considers three process enablers: governance mechanism (collaborative approach and mutual conflict resolution), 3PL selection criteria, and 3PL performance measurement. While the firms' outsourcing reasons are less likely to guarantee their success, these enablers are perceived to help achieving the outsourcing success. This study establishes the impact of these three enablers on outsourcing success and also explains how closely these enablers are aligned to the reasons for outsourcing. This research identifies a governance mechanism comprising a collaborative approach from both parties and mutual conflict resolution as tools to avoid conflicts and roadblocks in achieving success. The second enabler explored is the 3PL selection criteria that enable the right match between the shipper and the service provider (3PL). The third enabler is the performance evaluation of

the service provider (3PL), which encompasses strategic planning metrics, supplier metrics, production metrics, and delivery performance metrics.

Given the size and well-established businesses in India, it was decided to adapt a web-based survey method, combined with social media (e.g. LinkedIn and Facebook), to collect cross-sectional data through a questionnaire anchored to a 5-point Likert scale, where 1 = *totally disagree* to 5 = *totally agree*. An invitation was sent out to the participants drawn purposefully from manufacturing and service organisations in India that returned 278 responses representing about a 40% response rate. The data were analysed using covariance-based structural equation modeling to establish the hypothesised relationships among the study constructs.

The results from AMOS-SEM path analysis reveal that strategic outsourcing is likely to be successful and the perceived success is enabled by three process enablers: governance mechanism, 3PL selection criteria and performance measurement. While the businesses have reasonable reasons to outsource their non-core activities, they are less likely to be successful unless the outsourcing process enablers mediate the relationship positively.

This study provides both theoretical and practical contributions. Theoretically, it offers an empirical framework for strategic outsourcing success with three identified process enablers that help shippers achieve their outsourcing objectives. These study variables are conceptualised, defined and tested for their significant relationships using structural equation modeling, an analysis technique rarely used in the outsourcing literature. This study is unique in that the strategic logistics outsourcing objectives (reasons) may not necessarily drive outsourcing success but more indirectly through the abovementioned process enablers, thereby suggesting their significant role in the world of outsourcing between shippers and 3PL service providers.

Practically, this study provides valuable insights for managers about the way outsourcing success is strategically achievable in business entities (i.e. shippers' firm) from manufacturing and service sectors. It offers context-specific suggestions on the effectiveness of the enablers such as governance mechanism (collaborative approach and mutual conflict resolution), 3PL selection criteria and performance measurement of 3PL service providers. This study encourages shippers to view logistics outsourcing from a strategic partnership perspective to gain competitive advantage using the capabilities of

3PL service providers. The study alerts managers about the perceived desired outcome on the premise of an effective governance mechanism of collaboration and mutual conflict resolution between parties. Furthermore, using the right selection criteria and performance assessment of service providers could achieve targeted success in outsourcing.

Student Declaration

I, Vijayakumar Sangam, declare that the PhD thesis entitled *Strategic Logistics Outsourcing Success Framework: A Study of Indian Businesses* is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, 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: 28th of November 2017.

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The doctoral study program mentors and encourages a scholar to explore many areas related to research, beyond subject matter expertise, even though it can be a tedious and ongoing learning process. I would like to thank Victoria University for giving me this opportunity for a rigorous and controlled process of learning and also for offering me supportive scholarship to complete this study.

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I would like to thank Tina Thornton for providing support in the areas of editing and formatting this thesis and making it more readable and crisp. Her contributions are invaluable in completing this thesis.

I would like to take this opportunity to thank Victoria University Library staff members who have been most helpful to me as an external student, who had no physical access to the library. As and when I have approached the librarians with a request for specific articles, they made sincere efforts to obtain them from other universities, if necessary, and supported me in my study.

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Peer-Reviewed Publications Associated with the Thesis

Journal Articles

1. Sangam, V, Shee, HK, (2017), Strategic outsourcing objectives drive 3PL selection criteria in India, *International Journal of Logistics Systems and Management* (IJLSM), 27(1):20-39.

2. Sangam, Vijay. and Shee, HK, (2017) (forthcoming), Effective Governance defines Strategic Supply Chain Outsourcing Success in India, *International Journal of Logistics Systems and Management* (IJLSM) 28(3):355-374.

3. Sangam, Vijay., Shee, HK, (2015), Strategic outsourcing objectives drive 3PL selection criteria in India, 8th International ISDSI Conference, 2-4 Jan 2015, Pune, India.

CHAPTER 1

INTRODUCTION

The objective of this chapter is to present a summary of the study. The research background is provided and clearly demonstrates the gap in the current literature, research questions and objectives. The importance of supply chain outsourcing in India context is then elaborated, followed by a description of the methodology used for data collection and analysis. The next section proposes the significance of the study and ethical considerations. The chapter concludes with an outline of the thesis structure.

1.1 Research Aim and Background

Supply chain management (SCM) is considered as key to delivering superior performance to customers (González-Loureiro et al. 2015; Ronda-Pupo & Guerras-Martin 2012). Organisations are consistently undertaking strategy development to remain competitive in the market while working in a supply chain network organisation for a common goal (Defee & Stank 2005). Outsourcing has emerged as a strategy to manage the ever-changing market competition (Wee, Peng & Wee 2010). Outsourcing is generally perceived as a business process in which non-core activities are contracted out to a third party for cost savings and improving service levels. Thus, organisations can gain competitive advantage through cost reduction and improved responsiveness to changing market demand (Lau & Zhang 2006). Outsourcing acts as a strategic solution to deliver an organisation's strategic, tactical and operational objectives. Shippers are increasingly focusing on their core competencies and outsourcing non-core functions within the supply chain to achieve these objectives. Siems and Ratner (2003) appropriately point out that businesses should perform what they can do best, and outsource the rest. Furthermore, large corporations are heavily focusing on their core competency and rationalising all activities in search of improved efficiency and effectiveness.

In the absence of an integrated approach towards outsourcing, there is every risk of failure with this process (Relph & Parker 2014). The logistics outsourcing process requires a structured approach to minimise the risk of failures. Keeping in mind the risk and likely failure of outsourcing, this research study identifies the major challenges in managing the outsourcing process. The first challenge is to identify and document outsourcing

expectations in the form of outsourcing reasons, while also emphasising more than the cost implications. The second challenge is the compatibility of the shipper and the service provider while working for a common goal. Compatibility is measured through cultural fit, technology integration, willingness to collaborate in terms of business processes and the like. Andersson and Norrman (2002) posit that identifying a compatible service provider is the biggest challenge. The third challenge is a lack of a project governance mechanism that could lead to disastrous outcomes (Lynch 2004b). This deals with a collaborative approach, where it would be mutually beneficial for both the shipper and the service provider to collaborate and adapt their partnership approach to avoid conflicts (Lamming 1993). The fourth challenge is measuring the service provider's performance periodically to ensure the desired outsourcing performance. Many companies lack experience or knowledge of best practice in logistics contracts. Third-party (3PL) service providers, however, offer significantly better knowledge of logistics contracts with higher service levels (Relph & Parker 2014). Therefore, clear expectations of outsourcing, an effective governance mechanism, efficient performance measurement and compatible service prover selection will likely negate the risk of contracts.

Previous studies have focused on single outsourcing factors such as economic implications, outsourcing benefits, and information technology partnership. The transition from the transactional arrangement to true partnerships in a 3PL relationship proves more realistic (Razzaque & Sheng 1998b).

1.2 Research Questions and Aims

While the shippers have genuine reasons to outsource, it is unclear how the process enablers such as a governance mechanism, 3PL selection criteria and 3PL performance measurement facilitate the likely outsourcing success.

The fundamental question addressed through this research is how do the collaborative relationships between outsourcing strategy and governance mechanisms, selection of the service provider (3PL) and 3PL performance management measure success in the Indian business environment? The aim of this study, therefore, is to develop a theoretical framework incorporating the outsourcing reasons and the process enablers (i.e. outsourcing governance mechanism, 3PL selection criteria, and performance measurement) to deliver success for the shippers.

1.3 Supply Chain Outsourcing in the Indian Context

Sahay and Mohan (2006) have identified many reasons for outsourcing in the Indian context. The major reasons that dominate the decision are logistics costs reduction, focus on core competency, improved customer service, productivity improvement, improved return on asset, success of firms using 3PL, and induced flexibility into the operations. Furthermore, Mitra (2011) claims outsourcing reasons include revenue growth, profit growth, inventory reduction, customer satisfaction, geographic reach, return of asset (ROA) and customer acquisition. While the outsourcing reasons are well established, their success is less likely to be assured.

The strong economic growth of India has boosted logistics outsourcing despite the various structural headwinds, thus, more 3PL service providers are cashing in potential opportunities, partly due to increasing awareness and government support. Similar outsourcing success is expected among shipper organisations. It is believed that success is highly reliant on how outsourcing projects are governed. Governance can enhance coordination and communication among the dyads, minimising the risk and uncertainty associated with performance outcome (Fawcett et al. 2006). The studies do, however, ignore a governance mechanism in outsourcing, which is one of the distinct dimensions of this study. This can be considered as a gap in the current research exploring outsourcing processes in India.

Earlier studies on Indian 3PL services have their focus on 3PL practices that rest on firms' performances (Mothilal et al. 2012; Sahay & Mohan, 2006), on client performance (Rajesh et al. 2011), and customer satisfaction (Qureshi, Kumar & Kumar 2007). So far, there has been no study documented that establishes that the alignment between strategic objectives and 3PL selection criteria is critical to the outsourcing success, except the recent publication by Sangam and Shee (2017). An investigation of this relationship is thus timely for Indian businesses.

Furthermore, the focus has commonly been on generic outsourcing decisions without identifying the process enablers that influence the success or failure of an outsourcing decision. This study focuses on the alignment of reasons with the process enablers (i.e. a governance mechanism, 3PL selection criteria and performance measurement) and the influence of these enablers on outsourcing success.

1.4 Current Research Gap in the Indian Context

As India is an emerging country in the strategic logistics outsourcing domain, the focus of this current study is only on reasons behind outsourcing, selection criteria, a governance mechanism, 3PL performance evaluation and outsourcing success or failure. This researcher identified gaps in literature as listed below:

1. lack of a structured approach that safeguards outsourcing success
2. process enablers that are embedded in the structure
3. lack of knowledge how the identified process enablers collaborate with outsourcing reasons and influence the outsourcing successful outcome.

It is essential to identify a structured process to establish the research path to determine whether the pursued process will lead towards the desired results. The second step is to recognise the enablers entrenched in the process and their efficacy and functional influence on the ultimate outcome of logistics outsourcing. This aspect is considered as a gap in the current literature.

1.5 Research Methodology

Surveys are considered as efficient ways of gathering information and processing quantitative data, based on the responses received from the survey participants to the specific questions pertaining to the study (Cohen, Manion & Morrison 2013). As India is a vast country, it is very challenging to reach survey participants for their response to questionnaires. A web-based survey methodology was therefore adopted for this cross-sectional study. Baatard (2012) explains that surveys should be hosted on a website that can be recognised as trustworthy and legitimate; hence, Google Forms was selected as an appropriate tool.

A survey was sent out to approximately 1000 participants overall. The first phase included 10 randomly selected survey participants and the response rate was 100% with no changes required to the questionnaire. Responses were received from 297 participants, from which 19 responses were deleted as they contained incomplete data.

SPSS 24 (IBM) and AMOS 24 (IBM) software were used to analyse the data at different stages. The data reliability and validity was verified through confirmatory factor analysis

(CFA). Structural equation modeling (SEM) was used to analyse the data for hypotheses testing.

This research is based on resources-based view theory and the theory and the relationship with the research is discussed under the heading of theoretical background (3.2)

1.6 Significance of this Study

The significance of the study is explained in two parts, the first part deals with theoretical significance and the second part addresses practical significance. Theoretical significance is about adding knowledge in areas of an existing research gap and providing statistical evidence. The practical significance looks at the research contribution in areas of the identified gap being large enough and valuable to the practising manager and the practical world.

This study fills the gap theoretically by expanding and exploring new dimensions uncharted in the prior research on strategic logistics outsourcing. Literature evidence regarding logistics outsourcing research is based mainly on cost advantage (e.g. price, cost reduction, low cost distribution, expected leasing cost, operation cost, warehousing cost and cost savings), accessing competitive resources, specific technology (EDI, tracking/tracing, material handling etc.), and skilled labour and so forth (Aguezzoul 2014; Mothilal et al. 2012; Schoenherr 2010). However, defining the logistics outsourcing objectives and aligning them with the 3PL selection is a complex task. It gets more complex when non-core activities are passed on to a third party to manage that require complex coordination until the desired outcomes are realised. With this backdrop, the relationship between shippers (outsourcers) and 3PL service providers may not necessarily result in a satisfactory performance (Zhu et al. 2017). There could be situations where outsourcing may be likely to fail (Yang & Zhao 2016). Aguezzoul (2014) argues, therefore, for a more comprehensive framework-based empirical study considering strategic issues of outsourcing as opposed to short-term transactions (p. 77). As the strategic outsourcing arrangement adds value (e.g. knowledge transfer and associated values) to shippers as well as their customers beyond cost advantages, it is thus imperative to have a structured approach (Power et al. 2007). The literature is, however, very sparse on the long-term strategic partnerships in logistics outsourcing research. This calls for more research on strategic outsourcing where it is likely that both outsourcers and service

providers will look for long-term benefits beyond the basic outsourcing benefits of transportation and warehousing (Andersson & Norrman 2002; Hsiao et al. 2010, Mothilal et al. 2012). This study attempts to apply a framework that explores the strategic relationship between the outsourcers and their reasons to outsource and expected success in this process. Three enablers are introduced in this endeavour on the premise that the outsourcing is not as simple as it looks at the beginning.

The outsourcing of logistics functions is a strategic process (Sahay & Mohan 2006), and a process-driven approach is required to be successful in this endeavour (Shivakumar 2014). Building upon existing research on 'what' and how' to outsource, this study goes further to include enablers that manage the outsourcing processes. While the 'what' to outsource is very clear to the shippers via their motivation to outsource, the later part of 'how' is very critical to gain the desired success. These process enablers are likely to answer the 'how' of the outsourcing and act as an interface between the reasons (motivation) and success. These enablers are well-constructed processes with built-in diligence to provide checks and balances for a governance mechanism in process management (Power 2006). These are perceived as control mechanisms to reduce the possible risk of failure that has been viewed as inevitable in outsourcing (Andersson & Norrman 2002; Relph & Parker 2014). Though other studies have addressed trust, commitment and relational norms as a governance mechanism for outsourcing effectiveness in achieving the targeted outcomes (Lai, Tian & Huo 2012; Yang & Zhao 2016), this study proposes these process enablers as control mechanisms while strategically establishing the relationship between outsourcing reasons and success. Three process enablers used in the conceptual framework are 3PL selection criteria, governance mechanism, and 3PL performance measurement. These are new dimensions being added and novel in their contribution.

Identification of 3PL selection criteria, as the first enabler, is critical in the decision to outsource. Though the key benefits of logistics outsourcing like cost reduction, delivery flexibility, service improvement, and technology access have been addressed earlier (Yeung et al. 2012; Zhu et al. 2017), this study focuses on the right choice and appropriate control of these criteria. Second, the outsourcing process requires an effective governance mechanism (i.e. one that is aligned, communicative, interdependent) (Richey et al. 2010). Raue and Wieland (2015) believe that little research has been done to reveal how to successfully govern the strategic relationship between shippers and 3PL providers. The

main focus of the earlier studies on a governance mechanism has been transactional, such as contract control (Yang & Zhao 2016), and integrative, such as collaboration (Chenet al. 2010). The relationships between the shipper and 3PL are collaborative but driven by legal contracts (Lynch 2004a). Furthermore, Lynch (2004a) describes society as litigious and recommends alternative dispute resolution as an effective method to control disagreement. Conflicts are often not minor disagreements but have a strategic impact on logistics outsourcing (Lacity & Willcocks 2017). The current research uses a governance mechanism comprising a collaborative approach and conflict resolution method in an attempt to achieve outsourcing success and thus contributes a valuable input to the literature.

Third, it is necessary to establish 3PL performance measurement as a control measure. Aguezzoul and Pires (2016) believe that measuring the service provider's performance periodically delivers two distinct benefits. First, it deals with measuring outsourcing success, and second, it provides an opportunity to continuously improve performance. Law (2016) argues that a gap always exists in logistics performance measurement between shippers and 3PLs. Furthermore, he emphasises the need for performance measurement to implement business process re-engineering. This research categorises the performance measurement in five distinct groups (e.g. Strategic Planning metrics, Order Planning Metrics, Supplier Metrics, Production Metrics, Delivery Performance Measures) adding new dimensions in the strategic outsourcing framework used in this study.

This research delivers valuable practical significance by identifying the three critical enablers and stressing the need for a structured process embedded with the identified enablers. Due to financial pressure on the organisations, managers are forced to focus on quick gains such as cost reduction. Cost reductions will occur during the first year of outsourcing; however, subsequent years may not produce the same results. In some cases, these cost reductions may not occur even in the first year and may end up as a failure due to a lack of transparency and collaboration between the shipper and the 3PL. This study advocates a collaborative approach and gain sharing to encourage the 3PL to focus on continuous improvements, which then pave the way for long-term collaborative relationships. Furthermore, this research guides the practising managers on two aspects, the first deals with a process-driven strategic approach and the second aspect focuses on

factors that benefit organisations beyond cost savings, such as gaining access to skilled labour, IT advancement, global reach and finally, total customer satisfaction.

Establishing a strategic outsourcing process means identifying enablers and understanding their relationship with the objectives and outcome. This research guides the managers in documenting their expectations in the form of outsourcing reasons segmented into three parts, economic, strategic, and business environmental reasons. This documented objective will help in selecting a compatible service provider and emphasises the need for the governance process that uses a collaborative approach and mechanism to handle conflicts and resolution. Finally, this study identifies major key performance indicators in measuring the selected 3PL to drive the process towards a successful experience. This study firmly establishes that cost savings are critical, not simply in outsourcing, but also in aligning with collaborative alliance partners who, with their vast experience and specialisation, add value to the business and deliver a competitive advantage in the marketplace. This enables organisations to excel in customer satisfaction and customer retention, which are critical in today's capricious and dynamic business world.

1.7 Ethical Considerations

It is an essential and critical requirement prescribed by Victoria University to ensure the ethical conduct of research when it involves humans as research participants. The data for the research and analysis were collected through a web-based survey questionnaire from several individual supply chain professionals in different organisations during this study. Approval was obtained from the Ethics Committee (Appendix 2) in accordance with the Victoria University guidelines with regard to ethical review of research involving human participants.

The main ethical considerations of this study are its merits and completeness of the study, its integrity, and respect for people and their privacy. In order to achieve this, the participants were informed in writing and their informed consent was sought. Participation in the survey was voluntary and anonymous. The survey participants were assured of the confidentiality of the data provided in response to the questionnaire. Further, the participants were given the option to withdraw from the survey at any given point of time. The relevant document is provided as Appendix 3. Participants were assured that the

summary of the research outcome would be provided on request. To protect the privacy of the participants, their names were converted to numbers in the SPSS database.

1.8 The Structure of the Thesis

This research aims to investigate the drivers of outsourcing in the Indian 3PL market, critically reviews the three performance variables (enablers) contributing to strategic supply chain outsourcing success or failure, and aims to help develop a strategy and outsourcing process framework to maximise the success of strategic supply chain outsourcing in India. Furthermore, this study also provides a critical review of the concepts of outsourcing objectives, strategic focus, service provider, compatibility, effective outsourcing project implementation and collaborative approaches. In addition, it addresses joint participation, effective governance plans, periodical performance evaluations, effective conflict resolution, positive performance outcomes, and economic benefits that are positively related to success of strategic supply chain outsourcing in the Indian 3PL context. This is subsequently followed by the research methodology employed in this study, which aims to examine the hypothesised relationship between the concepts and the theoretical framework achieved through data analysis, measurement modeling and path analysis through structural equation modeling. The research findings, discussion, conclusion and study implications are explained in later chapters of the research. The chapter details are discussed below.

Chapter 1: Introduction

Chapter 1 contains an introduction to the study, which includes background to the study, objectives, aim, and hypothesis and an overview of outsourcing objectives and key factors influencing supply chain outsourcing. This section also contains the problem statement and provides the significance of the study with its expected contribution to the literature in terms of academic and practical contribution.

Chapter 2: Strategic supply chain outsourcing contextual background

This chapter comprises background information on the supply chain, logistics and the 3PL industry. It focuses on general, current conditions followed by key challenges related to each industry regarding outsourcing objectives, strategic focus, and service providers. Compatibility, outsourcing project implementation, collaborative approach, joint

participation, governance plan, periodical performance evaluation, effective conflict resolution, positive performance outcome, and economic benefits are all examined in this chapter.

Chapter 3: Theoretical background and literature review

This chapter reviews the empirical studies on various researches on SCM and, moreover, it also identifies research gaps and sets out the theoretical framework for the study with particular relevance to outsourcing objectives, strategic focus, service provider, compatibility and outsourcing project implementation. Literature pertaining to the following are also explored: collaborative approach, joint participation, governance plan, periodical performance evaluation, effective conflict resolution, positive performance outcome, and economic benefits and its impact on successful strategic outsourcing.

Chapter 4: Hypothesis development and conceptual framework

This chapter presents the research hypotheses and the theoretical framework proposed. This section provides a framework of critical factors that would impact the success of outsourcing in the Indian 3PL industry.

Chapter 5: Research methodology

This chapter presents the methodology adopted for this research, indicating where it would shed light on the research design and processes chosen. Included concepts are sampling, sample size, pilot study, mail survey procedure, data collection, development of final questionnaire, target population, reliability and validity, limitations of the methodology and ethical issues are also discussed in this section.

Chapter 6: Preliminary data analysis

This chapter presents the preliminary and descriptive analysis to ensure that the participants included in the survey are representative. It includes details of respondents' demographic status, assessment of missing values, outlier assessment, non-response bias assessment, multicollinearity and multivariate normality assessment, common method variance assessment, and exploratory factor analysis that are examined thoroughly before conducting the structural equation modeling (Efendigil et al. 2008).

Chapter 7: Structural equation modeling analysis

In this chapter, the data were evaluated using confirmatory factor analysis and structural equation modeling. This analysis facilitated the development of measurement models and, by using AMOS software, the hypothesised relationship among the variables is tested.

Chapter 8: Discussion, implications, conclusion and limitations

In this chapter, the findings obtained in previous two chapters are discussed critically regarding the research questions and hypotheses developed. The research particularly focuses on the path model for the success of outsourcing in the Indian 3PL logistics industry. This chapter also provides a summary of the study's findings and a conclusion. In particular, the academic contributions, its practical implications, the fulfilment of research objectives, the limitations of the study, and recommendations for future research are provided

1.9 Conclusion

This first chapter has presented the study context, research questions, study background, background to India's industry and an overview of the present study. Furthermore, this chapter has identified the current research gap in the Indian context. This chapter has outlined the thesis structure, which is the driving force behind the current research. The next chapter will review the contextual background/supply chain, logistics, and 3PL industry evolution.

CHAPTER 2

STRATEGIC SUPPLY CHAIN OUTSOURCING CONTEXTUAL BACKGROUND

2.1. Introduction

India is an emerging market in the area of supply chain outsourcing with the industry showing strong growth year-on-year. Gupta, Singh, and Suri (2015) report that India spent about 14% of its GDP on logistics-related activities with industry experts expecting the logistics sector to grow at a faster rate and create overall worth of US$385b by 2015. The automobile, electronics, fast-moving consumer goods (FMCG), pharmaceutical, food processing and agricultural sectors are actively outsourcing their logistics activities. Their core objectives are to optimise the resources and to collaborate with their supply chain partners to facilitate timely and quality delivery.

2.2. Industry and Country Context

According to the Fitch group credit rating agency, the 3PL industry outlook seems to be stable (Press Trust of India [PTI] 2014). The revenue of value-added services provided by the freight companies are reported to grow at an impressive rate of 12–15% as compared to the growth rate of 8–10% during the 2014–15 fiscal year. The same report predicted that the 3PL industry will grow at a low double-digit rate; this could be due to the current disintegrated logistics industry in India. “India Ratings & Research has assigned a stable outlook to the logistics sector for FY15. This is based on the strong likelihood of the sector continuing to display overall moderate growth rate despite a continued economic slowdown” (PTI 2014, para 1).

2.2.1 Outsourcing industry enablers

It is obvious that to grow and prosper the 3PL industry in India, three enablers—*infrastructure, industrial growth* and the *tax/duty structure*—are needed to favourably support the growth. Economic and industrial growth is critical to the third-party logistics (3PL) industry. Guchshina (2016) explains that India's gross domestic product advanced 7.3% year-on-year in the third quarter of 2016, following a 7.1% expansion in the previous

period. He further explained that private consumption had expanded at a faster pace while government spending slowed down and fixed investment dropped further.

The infrastructure propelling the growth of the 3PL industry can be divided into three parts: transportation; power generation to bolster the industrial growth, which in turn grows the 3PL industry; and information technology networking to deliver supply chain visibility (Kearney 2014).

There is an impressive growth in air freight movement with a compound annual growth rate (CAGR) of 6.6% over FY 06–13 with 2.1 million tonnes of freight carried in FY 2014. India has 13 major ports and 200 non-major ports with the 2013 cargo traffic recorded as 933.7 million metric ton (MT) and is expected to reach 1,758 million MT by 2017. India's external trade is estimated to have grown to US$765b in FY 2014 with CAGR of 14.9%. Key to India's growth is what is considered as the fourth longest railway network in the world. The government is planning to invest US$153b during the 12th five-year plan (2012–2017). Indian Railways is targeting a freight market share of 50% in 2030, building from its from 30% share in 2010. This type of positive infrastructural development is leading towards 3PL industry growth. On August 27, 2014, Deutsche Post DHL announced that it had chosen India to pilot its e-commerce business model for the Asia-Pacific region and the company is planning to invest €100 million over 2016–2017. As part of this ongoing development, the Department of Information Technology has established one million Internet-enabled service centres across India. In August 2008, the Department of Telecommunication allowed operators to use WiMAX networks as an alternative to cable and digital subscriber line (DSL) to offer voice services as a way to enable faster delivery of wireless broadband services. Cumulative FDI inflows into the telecom sector over April 2000–February 2014 amounted to US$13b (IBEF 2014).

These examples of industrial growth largely depend upon power generation. India's power generation in 2014 stood at 967 TWh, excluding captive generation. India's installed power generation capacity increased at a CAGR of 10.6% during FY 09–14 to reach 245.39 GW. Frost & Sullivan, the UK research and consulting firm, suggested that the 3PL penetration in India is highest in the automobile sector, followed by IT hardware and electronics, with lower penetration in consumer goods and pharmaceuticals (Biederman 2008). Furthermore, pharmaceutical, automobile, industrial, textile, computers and electronics,

telecom, FMCG and consumer durable industries are active users of outsourced services (Mitra 2006). Specific industry highlights reflecting India's growth include the following.

- India is projected to become the fourth largest automobile production house globally by 2020. The auto component industry is experiencing robust growth and its turnover is expected to reach U$115b by 2021.
- The electronics market is one of the largest markets in the world and it is anticipated to reach US$400b, which is approximately 140% growth, with an annual growth rate of 24.4% during 2012–2020.
- India is billed as the fifth largest consumer durable market in the world by 2025 and its consumer electronics market is expected to achieve US$400b by 2025 and US$104b by 2016.
- With a 7.2% share in the active pharmaceutical ingredient market by 2016, another indication of pharmaceutical growth in India is indicated through drug master filings in the US as India filed 49% of overall drug master filings (DMFs).
- The FMCG market is expected to grow and reach US$110.4b during 2012–2020 with a CAGR of 14.7% and the rural FMCG is expected to increase at a CAGR of 17.7% and reach US$100b during 2012–2025.
- According to the report released by the Telecom Regulatory Authority of India (TRI 2014), India's tele-density increased from 76% to 76.36% in a one-month period and, based on Wikipedia reports, it is reported as second in the list as far as tele-density is concerned.
- India is expected to reach four million barrels of oil per day by FY 2016, expanding at a CAGR of 3.2% during the financial years 2008–2016 and by 2025, India is expected to overtake Japan to become the third largest consumer of oil in the world.

Source: India Brand Equity Foundation (IBEF 2014).

The third enabler is the very complex tax and duty structure in India that restricts the free flow of goods and the velocity of the supply chain impedes the industry and 3PL growth. By the unbundling of logistics of the supply chain—including physical movement, storage, valued-added services, order management, freight forwarding, and order management—tax management will increase business opportunities and add value to the customer (Chandra & Jain 2007). Considered as the biggest tax reforms since 1947, on December

19, 2014 the Indian Finance Minister introduced a Goods and Service Tax as the 122nd amendment to the Constitution. The sole objective of this Bill was to ensure the seamless transfer of goods and services across the country by removing the cascading effect of several state and central levies (Express News Service 2014). Harmonised taxes, policies and procedures across states will facilitate this flow of goods and services (Chandra & Jain 2007).

2.2.2 Outsourcing industry in India

The above information shows that India is on the right growth path to be a global economic centre, thereby indicating an optimistic growth prospect for the 3PL industry. Indian logistic industries have the potential for sustainable growth and global development. Logistics costs are around 13% of GDP in India, which is higher than other countries like the US with 10%, Europe with 11% and Japan with 10% (Alexander et al. 2013). In the past, India's economic performance has been equally impressive with GDP growing at a rate of 9.4% during the fiscal years 2006–2007 making it the second fastest growing major economy in the world. In 2008, the GDP of India was at US$1.25t and was considered as the third largest in terms of purchasing power parity (Judd 2008). It was observed that India could save around US$20b a year resulting in a 4.3% reduction in Indian goods prices globally and making them more competitive if the GDP level is brought down to the US GDP rate (Mitra 2008). The 3PL market in India is comprised of two segments, the first known as asset-based 3PL and second one recognised as non-asset-based 3PL (Gupta et al. 2011a). The asset-based 3PL companies create infrastructure to provide a variety of services, and non-asset-based 3PL service providers source their infrastructure such as warehouse, equipment and so forth from other service providers.

Table 2.1 Challenges faced by the Indian logistics industry

Factors Troubling Logistics Industry in India	Background
Cost Factors	• *High Cost and Low Margins* • *Fragmented Market Conditions* • *Variety of Taxes* • *Service Tax on Services @ 12.36% makes logistics costs expensive.*
Lack of Trust and Awareness	• *Outsourcing of Logistics (Strategic) is around 10% compared to 50% in developed countries.* • *Expectations are high by the outsourcing companies on IT infrastructure; asset deployment; and more value added services.*
Competition	• *Stiff competition on pricing due to MNC operators.* • *Small local operators are unable to sustain and grow.* • *Preference towards single integrated operator.*
Infrastructure	• *Poor Road Infrastructure (>60% moves by road).* • *Sluggish movement of material due to variety of Govt. regulations (inter state movement).* • *Low penetration of IT and lack of proper communications infrastructure.* • *no real-time to track goods in transit; no process by which a shipper may know about the availability of trucks and going rates at the destination market.*
Skilled Manpower Shortage	• *Lack of skilled and knowledgeable manpower in the logistics sector in India is a big challenge.*

Source: Mitra (2008)

The logistics industry is, however, in a nascent stage and fragmented due to a variety of issues such as poor infrastructure, taxes, and government regulations, as explained in Table 2.1 (Mitra 2008). The report published by Indian Foundation of Transport Research and Training (Gupta 2012) revealed that India's logistics' cost as a percentage of the GDP is unusually high. When compared with developed countries it is double. As a percentage of GDP the logistics costs in India is estimated to be around 13–14% compared to 7–8% in developed countries. The World Economic Forum report on supply chain outlook (Doherty 2013) indicated that, due to inadequate supply chain and logistics infrastructure and management, two-thirds of the produce, worth US$65b in revenue, was wasted or lost in transit every year in India. From these facts, it is obvious that India's logistics outsourcing industry is facing difficulties and several challenges, such as cost factors, lack of trust and awareness in the industry, competition, poor infrastructure and manpower shortages. Table 2.1 outlines the current situation by classification (Mitra 2008). Despite this, it is estimated that the 3PL market in India is expected to grow over 20% per annum, compared to an average 10% across the globe (Mitra 2008).

Outsourcing preferences differ from country to country as well as among developed countries and developing countries, with many different challenges. The reasons for outsourcing can be classified into three categories—economic reasons, strategic reasons and environmental reasons (Lau 2006). Two key factors drive outsourcing, namely cost-related aspects (Gonzalez, Gasco & Llopis 2005) and focusing on core activities (Prahalad & Hamel 2006). Outsourcing drivers are compared among two fast-growing and competing economies in the world against the developed economies in the western world in Table 2.2.

Table 2.2 Outsourcing drivers and obstacles - India vs China vs Western developed countries

Drivers of Outsourcing	China	India	Western Developed Countries
Economic Factors	• *Cost Reduction* • *Cost Savings* • *Capital Investment Reduction*	• *Cost Reduction* • *Improve return on Assets* • *Improve Inventory Turns*	• *Cost Reduction* • *Cost Savings* • *Capital Investment Reduction*
Strategic Factors	• *Accelerate Re-engineering* • *Focus on Core Competencies* • *Increase Flexibility* • *Market Penetration*	• *Productivity Improvement.* • *Focus on Core Competencies* • *Flexibility* • *Market Penetration*	• *Accelerate Re-engineering* • *Focus on Core Competencies* • *Increase Flexibility*
Environ-mental Factors	• *IT Development* • *Capability of Suppliers*	• *Access to Technology* • *Improve Supply Chain Partnerships*	• *IT Development* • *Capability of Suppliers* • *Globalisation*
Obstacles and Problems	• *Loss of Control* • *Lack of Capable Service Providers* • *Poor IT and Transportation Infrastructure* • *Govt. Regulations* • *Lack of post outsourcing Reviews.*	• *Lack of Capable Service Providers* • *Poor Transportation Infrastructure* • *Govt. Regulations*	• *Loss of Control* • *Loss of Critical Skills*

Source: Data for India (Mitra 2006; Sahay & Mohan 2006); China (Lau & Zhang 2006); Western Developed Countries (Hung Lau & Zhang 2006)

Wang, Sadler and Shee (2017) believe that by outsourcing to China companies in Australia are experiencing significant cost savings and other benefits, but not to the extent planned before outsourcing. Furthermore, it is believed that while the risk of outsourcing is significant, none of the companies that participated in the research are not planning to pull

out of the arrangement currently with the companies in China. This signifies that outsourcing importance and opportunity to improve through mutual collaboration.

The perception of outsourcing, outcomes, activities and relationship status differ from outsourcer and the service provider. The literature on outsourcing non-core activities can be reviewed from three perspectives—user perspective, service provider perspective and user-provider perspective (Rahman 2011).

Table 2.3 Outcome of research from three different perspectives

Perspective Type	Research Outcome	Reference
User Perspective	○ Users of 3PL services are satisfied with their providers and are likely to increase their usage of contact logistics in the future—Australia and Singapore.	Sohal et al. 2002, Bhatnagar et al. 1999 Pilar et al. 2006
	○ Mexican vs Europe and US comparison—firms in Mexico focus on core competency-related benefits and in Europe and US they focus on tactical and integrated functions.	Sohail et al. 2004, Cilliers & Nagel 1994
	○ Studies conducted in Ghana and South Africa revealed that the logistics outsourcing is just transactional and no strategic and tactical activities were considered.	
Providers' perspective	○ Research conducted in among Danish logistics firms revealed that the service providers tend to be niche firms and focus on internal markets and mainly in the food and beverage industry.	Cilliers & Nagel 1994
	○ Research in mainland China revealed current and future business objectives, operations priorities, business performance and painpoints of the 3PL providers in China.	Wang et al. 2006
Users–providers' perspective	○ The research conducted in US long ago indicated lack of agility, proactiveness and business continuity solutions.	Daugherty et al. 1996
	○ Highly aligned with regard to factors in successful 3PL relationships and both the service provider and outsourcer are enjoying the relationship.	Murphy & Poist 2000
	○ The Australian study findings revealed many users are outsourcing logistics activities and are using multiple service providers. The activities outsourced are mainly warehouse management, fleet management and order fulfilment. The service provider satisfaction level is high and user's commitment to use of 3PL in the future is high on the agenda.	Rahman 2011

2.3 The 3PL Industry Evolution

The 3PL evolution is an ongoing process with its first stage being transactional outsourcing such as transportation, freight forwarding, and customs brokerage. The second phase moves into integration of warehousing and transportation, and the third phase demonstrates the third-party logistics service providers where consulting, finance and IT companies entered the 3PL industry (Van Laarhoven, Berglund & Peters 1999). The proliferation of 3PLs has resulted in appointment of a 4PL to manage the 3PL companies and managing a variety of outsourced non-core activities. While companies struggled to find new fiscal equilibrium during a financial downturn there was a good value proposition in consolidating the management of logistics processes through 3PL (Dutton 2009). The growth of 3PL services triggered the evolution of 4PL.

2.3.1 Generic 3PL definition and India outsourcing perspective

The 3PL is defined as, "the relationships between interfaces in the supply chains and third-party logistics providers, where logistics services are offered from basic to customized ones in a shorter or longer term relationship with the aim of achieving the effectiveness and efficiency" (Bask 2001cited in Karatzas, Daskalakis, Dimitrov & Godsell 2016, p. 2). Mitra (2006, p. 3) explained the outsourcing perspective in India and, according to him, this involved:

> building a successful logistical alliance requires, besides mutual trust and transparency, a clear internal assessment of logistics cost components and outsourcing of only those services that are really needed, an unambiguous contract detailing roles and expectations, and constant communication with the service provider.

The existing definitions of outsourcing mainly focus on the function or activity of outsourcing and related parameters and lack focus on the strategy to deliver competitive differentiation and value-based focus. Ideally, the outsourcing of logistics and supply chain management could be defined as "a strategic process driven by core competency objective to deliver competitive advantage by outsourcing non-core functions to a service provider whose core competency is managing effectively non-core functions on behalf of shipper". This is a win–win situation for both the shipper and the 3PL as both are delivering competitive advantage to the ultimate customer in the marketplace and achieving customer excellence.

2.4 Conclusion

This chapter has briefly reviewed the Indian economy, 3PL growth prospects, 3PL business enablers, outsourcing industry in India, outsourcing evolution and the intricate relationships within the supply chain and 3PL. As this study focuses on 3PL outsourcing, 4PL roles and significance are deliberately ignored to enable a focus on the core objective of the research. Furthermore, this chapter comprehensively benchmarks the challenges facing the 3PL practices in India, China and western countries, along with outsourcing drivers and obstacles in India. The next chapter focuses on a literature review of topics such as supply chain management definitions, outsourcing, 3PL selection, governance plan, performance measurement, outsourcing success and reasons for outsourcing failure.

CHAPTER 3

THEORETICAL BACKGROUND AND LITERATURE REVIEW

3.1 Introduction

The objective of this chapter is to depict and critique the most recent literature on strategic supply chain outsourcing. This chapter leads and helps in developing a conceptual framework of the research in identifying the gaps in current knowledge, specifically in the area of outsourcing in India. This chapter defines the concept of the supply chain and the logistics flowing within. Furthermore, this chapter deals with strategy, outsourcing reasons, governance mechanism, 3PL selection criteria, performance evaluation; and finally, critical elements of outsourcing success and their impact on organisational growth.

3.2 Theoretical Background

The theoretical background apprising this research draws on the resources-based view of the firm (Barney, 1991). A majority of supply chain management literature, investigating the relationship between resources and performance, is based on the premises of the resource-based view (Zimmermann & Foerstl 2014). Barney (1991) believes that through a resource-based view (RBV) firms gain sustainable competitive advantages by ensuring appropriate access to a bundle of differentiating variables, such as valuable, rare, non-imitable and non-substitutable resources. Rothaermel (2012) argues RBV as key to superior firm performance. If a resource exhibits its value, rarity, imitability and organisation (VRIO) attributes, the resource enables the firm to gain and sustain competitive advantage.

The strategic logistics and supply chain outsourcing is primarily based on core competency of both shippers and 3PL firms (Hamel & Prahalad 1990).While the shippers focus more on core activities and their resource allocation for competitive advantage, the identified non-core activities are outsourced to external firms (i.e. 3PL) where the shippers gain access to their expertise and core competencies. The 3PL firms act as extended firms to the shippers. The literature that investigates core competency and its impact on performance has referred to a resource-based view (Carter et al. 2017).

The core competency initiatives simplify complex processes within firms focusing more on the core activities (Rao & Young 1994). The simplifying process could include identifying the core capabilities and managing complex processes, including strategic logistics outsourcing.

Underpinned by the competitive advantage and core competency strategy that is closely associated with a resource-based view (RBV), this research develops a framework to explain how strategic outsourcing non-core activities—such as transportation, warehousing, kitting, customs clearance and so forth—delivers sustainable competitive advantage enabling the organisation to be successful in their endeavour. The core competency objectives identified in this study to include improve business focus, increase competitiveness, leverage the firm's skill and resources, and enhance customer satisfaction.

3.3 Strategic Supply Chain Outsourcing Strategy

The supply chain is a very popular topic and has been well defined in the literature. For the purpose of this research on outsourcing, it is defined as the planning and management of all logistics activities involved insourcing and procurement of components to convert them to finished and semi-finished goods. It includes where channel partners such as suppliers, intermediaries, third-party service providers, transporters and customers coordinate and collaborate with each other to accomplish the tasks. In essence, supply chain management integrates supply and demand within and across companies (Council of Supply Chain Management Professionals [CSCMP] 2013). It has been established that supply chain management is then positively associated with enhanced competitiveness (Li et al. 2006).

There is, however, a general misconception that supply chain and logistics are two different topics. To add to the confusion, a new term of 'value chain' was recently introduced. The term supply chain was introduced in the early 1980s by business consultants (Oliver & Webber 1982) and since 1989, academics have attempted to structure the term of supply chain (Stevens 1989). In 1998, the Council of Logistics Management revised the definition of logistics management to be "Logistics is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services, and related information from the point-of-origin to the point-of-consumption in order to meet customer requirements" (Stock & Lambert 2001, p.

2). This definition clears the ambiguity and establishes that logistics is part of the supply chain; it also reflects the path used in this research whereby the logistics outsourcing enablers and their role are investigated.

The effectiveness of the supply chain involves a critical process of coordinating business processes to meet both end users' and stakeholders' needs (Almuiet & Salim 2013). The supply chain plays a critical role in business growth and transformation strategies. Supply chain strategies can help to improve organisational integration within the supply chain network and its customers, as well as enhancing the business performance of the organisation and its supply chain network partners (Roh, Hong & Min 2014). In recent times, it has been firmly believed that a supply chain strategy is a 'prerequisite'. Top-performing organisations have a clearly defined supply chain strategy aligned with their overall business reasons and customer requirements (Varma, Wadhwa & Deshmukh 2006). Business strategy and organisational strategy are all about creating and sustaining a competitive advantage. Competitive advantage is the ideal at the core of strategy formulation and the deployment of organisational resources and capabilities within its industry environment. The two key factors within strategy development are a comprehensive understanding of the industry environment and effective analysis of resources and capabilities (Grant 2016).

The conventional belief is that future companies will not compete with each other, rather it will be the supply chains themselves. With a strategy to reduce operational costs, companies are constantly on the lookout for chain partners who can be entrusted to complete a job. Sangari, Hosnavi, and Zahedi (2015) explain that in the modern business environment the focus has shifted from an organisation focus to a focus on supply chains. The more likely scenario is companies competing and winning based on the capabilities they could muster across their supply networks (Rice & Hoppe 2001). This emphasises the importance of supply networks and alliances through partners such as suppliers, transporters, IT companies, freight forwarders, 3PLs, 4PLs and so forth.

Today's business environment is influenced by intense competition, volatile customer demands and constant pressure to reduce costs that are forcing organisations to outsource a variety of activities as they re-examine their business models and organisational structure (Merino & Rodríguez 2007). Outsourcing is defined as "the use of external companies to perform logistics functions that have traditionally been performed within an organization"

(Gadde & Hulthén 2009, p.1); in other words, handing over control and activities usually handled in-house to external partners, known as third-party logistics service providers—3PLs.

Outsourcing is considered as a business strategy because it enables the organisation to hand over critical functions to be managed by the experts in the field, enabling the organisation to gain a competitive advantage (Sakolnakorn & Naipinit 2016). With outsourcing, even the employees can shift their focus from peripheral activities towards customer-focused functions that enhance business competitiveness (Dover 2013).

Collaboration between shippers, 3PLs and customers is the key to the success of logistics outsourcing. All the involved parties work towards a common set of goals and reasons and when a meaningful exchange of information occurs with regard to planning, management, execution and performance measurement, the outcome is beneficial to all parties involved. To be a meaningful and effective relationship, collaboration must go well beyond vague expressions of partnerships and aligned interests (Langley, Morton & Wereldsma 2009). Collaboration is the flavour and foundation of this study.

3.4 Strategic Supply Chain Outsourcing Reasons

The hierarchy of value chain or supply chain decisions are divided into three categories: strategic, tactical and operational (Ganeshan & Harrison 1995). Reasons for strategic supply chain are shown below in Figure 3.1.

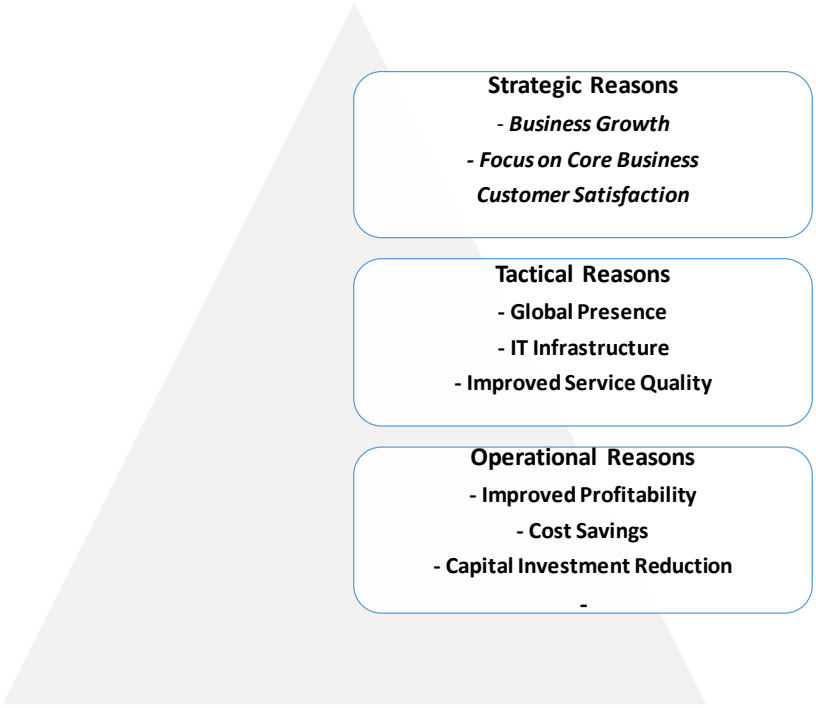

Figure 3.1 Strategic supply chain outsourcing reasons

3.4.1 Strategic reasons

The outsourcing decision has become strategic in nature, aligning with each organisation's long-term goals to reap the benefits in the future (Greaver 1999). It helps organisations to focus on core competencies; increase flexibility to meet dynamic market conditions; as well as to increase product and service value, customer satisfaction and shareholder value (Greaver 1999). Drivers for outsourcing appear to be shifting from cost to strategic issues such as core competence and flexibility (Roberts 2001). Today's customers are more demanding and expect an error-free environment, prompt deliveries, and customised and specialised solutions. Value-add and specialised services have become the rule, rather than the exception (Lynch 2004a).

3.4.2 Tactical reasons

Tactical reasons include global presence, IT infrastructure and improved service quality. Globalisation is driving business entities to establish distribution networks across the globe and outsourcing is an effective tool in achieving this goal (Lynch 2004a). The manufacturing firms have the advantage of reduction in inventory levels, order cycle times, lead time to the customer, and improvement in customer service through outsourcing distribution networks across the globe (Bhatnagar & Viswanathan 2000).

Information is the key supply chain driver as supply chain visibility enables an integrated approach (Chopra & Meindl 2007). The financial downturns, saturation of global markets, and developed information technology have enabled customers to understand the product; it is no longer just price and quality driving the business, growth and long-term relationships are now playing a critical role (Sheikh & Rana 2011).

To manage customer relationships, business entities are depending heavily on information technology and customer relationship management as part of an enterprise resource planning tool. These tools allow business processes to build infrastructure for automated information exchange between suppliers and customers to increase customer profitability and satisfaction. With the rapid growth of information technology and e-business, many organisations are taking advantage of these advances to enhance the effectiveness of their supply chains. Information technology is an enabler to managing an ever-increasing supplier base and customers, as well as creating a necessary networking and communication platform for a seamless flow of information (Ngai, Cheng & Ho 2004).

As information technology is constantly evolving, more and more companies prefer to outsource their IT capability through 3PL companies. The latest *Third-Party Logistics Study* (2015) report indicates that shippers identified three IT requirements: supply chain visibility tool, electronic data interchange (EDI) and web portals, and cloud computing. The same report indicated that 96% of the survey participants felt that IT capability was a necessary element of 3PL elements and only 60% of the shippers were satisfied with the IT capability of the 3PL (Langley & Capgemini 2015). IT capability of the 3PL is an important outsourcing selection criteria (Aghazadeh 2003). It has been suggested that the level of information technology capability considerably impacts the competitive advantage of 3PL at the time of selection (Lai, Li, Wang, & Zhao 2008).

Improving service quality is a key tactical reason for outsourcing. Customers are demanding more responsiveness from 3PL operators, and service providers are investing in various alternative solutions to meet these needs while also trying to deliver differentiation in the service offerings (Langley & Capgemini 2015). One service provider in India has improved order processing time and achieved a reduction in shipping errors; this has indirectly impacted the improved customer service (Chandra & Jain 2007). The 3PLs can deliver better service than the shipper because of the economy of scale and effective skill sets in the areas of outsourced activities (Anderson et al. 2011). The shippers

can improve competitiveness of the supply networks through outsourcing, which could help organisations achieve service goals through improved relationships between supply network members (Alfalla-Luque & Medina-Lopez 2009). The latest report published on 3PLs revealed that order-fill rate had improved by 6% and order accuracy improved by 5% compared with the previous year's figures (Langley & Capgemini 2015).

3.4.3 Transactional/operational reasons

This particular objective mainly comprises improving day-to-day operation effectiveness and delivering cost advantages, thus improving profitability. An organisation's profitability results from a variety of cost innovations such as operational cost optimisation, productivity improvement, inventory reduction, distribution cost reduction, and by reducing working capital requirements. Operational efficiency of the 3PLs and their market competitiveness requires benchmarking and measurement of deliverables (Min & Jong Joo 2006). Performance measurement helps organisations understand their progress in outsourcing and indicates outcomes.

Organisational performance metrics can be grouped into six categories: cost efficiency, productivity, profitability, growth, cash management, and market ratios. The purpose of these metrics is to provide a comprehensive view of the financial characteristics of the firm at the time of outsourcing. This is the ideal way of defining expectations before embarking on outsourcing.

The financial competitiveness of an organisation is evaluated and analysed in terms of its profitability and operating efficiency by assessing the contribution of revenue, cost and assets, which are known as drivers of financial performance (Sullivan 2007). As explained above, profitability comes in many forms and researchers contend that an important source of cost reductions is the outsourcing firm's access to economies of scale and the unique expertise that a large outsourcing vendor can deliver (Roodhooft & Warlop 1999). Jiang, Frazier, and Prater's (2006) study used cost efficiency metrics to measure output and input through the total revenue or sales, and through total costs and overhead costs incurred to generate outputs.

There is a positive association between the rate of outsourcing and productivity growth (Ten Raa & Wolff 2001). Outsourcing not only results in a shift of labour, but also enhances productivity thus resulting in competitive advantage. In this process, the shipper

has equal responsibility to work towards enhanced productivity through 3PLs (Qureshi et al. 2007). In India, Sahay and Mohan (2006) reported there were substantial financial indicators of growth from using 3PL services; these improvements included sales revenue up by 13.5%, working capital up by 12.3%, returns on assets up by 10%, capital assets reduced by 10%, production costs reduced by 10.5%, labour costs reduced by 10.0%, and logistics costs reduced by 15%. In 2015, the *Third-Party Logistics Study* revealed that 9% of logistics costs were reduced, inventory costs were reduced by 5% and logistics fixed asset reduced by 15%, all of which enable working capital available for other business growth areas (Langley & Capgemini 2015).

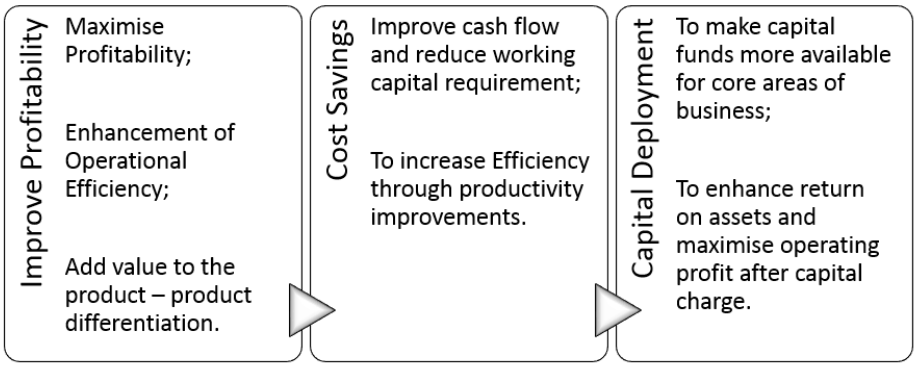

Figure 3.2 Summary of transactional/operations reasons

Source: Profitability Improvement: Qureshi, Kumar, and Kumar (2007), Sloper (2004) and Gonzalez, Gasco, and Llopis (2005)
Cost Savings: Vyas and Shah (2016), Claver, González, Gascó, and Llopis (2002b)
Capital Deployment: Quinn (2013), Razzaque and Sheng (1998a) Lynch (2004a).

3.5 3PL Selection Criteria

Service provider selection criteria and processes are critical to the success of outsourcing. The selection of a suitable supplier is the most critical step in establishing a successful partnership and rushing into the relationship without adequate preparation often leads to the failure of relationship, thus leading to outsourcing failure (Gupta, Ali & Dubey 2011b).

The firm's competitiveness strategy and its external environment affect the selection criteria (Menon, McGinnis & Ackerman 1998). Core competency is not a product or a process, it refers to intellectual uniqueness and the sets of skills and systems that a company applies at "best in world" levels, thus creating product differentiation (Quinn 2013). The core competency strategy would determine the non-core functions of the

supply chain to be outsourced; hence, the activities to be outsourced also play a critical role in selecting the 3PL (Anderson et al. 2011). Selecting a service provider for a strategic supply chain function, however, needs strategy, care and caution. The dynamic variables associated with selecting a 3PL can make the outsourcing decision-making process fraught with pitfalls if not executed effectively.

Ideally, the investigation and identification of 3PL selection criteria should start with understanding the reasons for outsourcing failures, as well as the reasons for insourcing. Cost, service levels, IT integration, supply chain security, and a lack of trusting relationships are some of the reasons given by the companies' insourcing logistics activities (Langley & Capgemini 2010).

Compatibility plays a key role and becomes a fundamental selection criterion (Bowersox 1990). Collaboration also becomes key selection criterion to gain competitive advantage in a complex global chain (Hwang, Chen & Lin 2016). The ability of the user, provider and their support systems to work together in a coordinated manner is critical and remains the foremost selection criterion (Andersson & Norrman 2002). Cost of service is often the major driving factor for supply chain outsourcing and a very critical element in selecting the service provider (Tam & Tummala 2001). It is estimated that cost savings up to 20% are anticipated by the shippers, mainly derived through direct labour costs (Elliott 2006). Furthermore, there are cost reductions in capital investments in facilities and equipment (Richardson 1992). The third cost reduction could develop from avoiding investment in information technology (Fantasia 1993).

Apart from cost, service expectations of the outsourced activities have to be met and these include: quality of service, operational performance, flexibility in operations and service, speed of delivery, and global reach. All these factors play crucial roles in selecting an appropriate service provider (Boyson et al. 1999; Daugherty & Pittman 1995; Razzaque & Sheng 1998a; Stock, Greis & Kasarda 1999; Tam & Tummala 2001).

Service provider reputation also plays a significant role and the ability to demonstrate expertise in the selected field of operation is critical. The financial stability of the service provider will ensure continuity in services, regular upgrades of equipment and infrastructure, and have the ability to invest in capital assets and information technology. An advanced IT capacity helps in reducing uncertainties and issues regarding inventory

level; additionally, tracking of goods become an easy process (Ackerman 1996; Andersson & Norrman 2002; Lynch 2004a).

A survey conducted in 2007 by *Information Week* identified several measures to select a 3PL service provider and, based on importance given for the selection measure by the survey responders, the figure below has been created.

Figure 3.3 Summary of 3PL selection criteria based on importance

Source: Brown and Wilson (2007).

3PL selection is considered as a multi-criterion decision-making process, and past researchers have developed research frameworks that organise selection criteria according to a hierarchical structure (Hwang & Shen 2015). One 3PL evaluation framework comprises the six major criteria of IT, quality assurance, cost, services, performance and intangibles (Vaidyanathan 2005). It could then be concluded that 3PL selection is a structured process comprising multiple selection criteria that are both qualitative and quantitative in nature (Hwang & Shen 2015).

Jharkharia and Shankar (2007) suggested a very structured approach, as outlined below:

- Determinants:
    - Capability, cost, quality and reputation

- Dimensions:
    - Long-term relationship, operational performance, financial performance and risk management.
- Enablers:
    - Performance measurement, use of intellectual capital, flexible approach, quality management, information sharing, size, experience, delivery performance, employee satisfaction level, market share, range of services offered, geographic spread, surge capacity, arbitration and exit; flexibility in operations and delivery.

The above structure is then converted into a scorecard and weight index that is subsequently applied to measure the suitability of a service provider.

3.6 Governance Mechanism

Organisational success largely depends upon the strategies and phenomenal growth of outsourcing that have made the outsourcing strategy an important component (Gottfredson, Puryear & Phillips 2005). Strategy alone will not deliver success and make the supply chain successful; we need networking partners who are service providers. Selecting the right service provider is the second critical step towards organisational success through outsourcing strategies. It was mentioned in the Richmond Events Logistics & Supply Chain Forum that mismatch of 3PL cost one Fortune 500 company hundreds of millions of dollars (Tompkins 2005). The third critical step towards outsourcing success is a project governance mechanism. After engaging the service provider, the project initiation phase begins; this is when the operation controls change hands and this stage can be best described as one of chaos that is dominated by chaotic issues (Power 2006). The project implementation has two components, the first being a collaborative approach, and the second deals with mutual conflict resolution.

Pratap (2014) explains that logistics outsourcing failure can be negated if the shipper sees outsourcing as an “ongoing activity” to be managed collaboratively, as opposed to considering it as a one-time *opportunistic act*.

It is well-known that logistics outsourcing can fail due to many reasons. Some of these include, failure to have a true meeting of minds, making promises that cannot be fulfilled, a desire for failure, a money-losing contract, and intolerable service failures (Ackerman

1996). All these issues can be addressed through an efficient project governance mechanism.

3.6.1 Governance

Resolution of competing and conflicting interests of the parties can be attempted through a project governance mechanism and this is a confluence point where resolution is achieved. The key components of the governance mechanism are subject to the influence, interests and knowledge of the key players (McGrath & Whitty 2015). It is possible that the key players involved in developing the governance process may have different understandings or may have competing governance models (Ahola, Ruuska, Artto & Kujala 2014). Russell (2013) explains that understanding of the term governance has been influenced by many people's perceptions and views—in his words, "Kantian Spectacles". The overall objective is simple and relies on moving from confusion to clarity and certainty, which are critical for project success. In the absence of clarity and certainty "project blindness" obliterates project objectives. Project blindness consists of the following elements, where some of the reasons for failure include, but are not limited to:

- Failure to have a true meeting of minds, promises that cannot be fulfilled, a desire to failure, money-losing contract, and intolerable service failures (Ackerman 1996).
- Unrealistic expectations, lack of strategy and inefficient or lack of outsourcing process could lead to outsourcing failure. It is recommended that shippers use an outsourcing decision-making scorecard (Brown & Wilson 2007).
- The belief that most failed outsourcing projects are hastily integrated without synchronising with company's strategy (Simonson, Tompkins & Upchurch 2005).
- Most of the time, the outsourcing fails due to unrealistic expectations (Lynch 2004b).
- The lack of a competency strategy—outsourcing is a hierarchical sequence of decisions and the fundamental decision is whether or not to outsource a business process or function (Beaumont & Sohal 2004).

3.6.2 Collaborative approach

Supply chain outsourcing means an unknown entity takes control of established processes and tries to replicate the performance and deliver targeted results. As long as the roles are well defined in the implementation process and a collaborative approach is adopted, the project will be successful. Research and studies of successful and collaborative outsourcing relationships are based on a methodology designed, and structure aligned, to an innovative and collaborative outsourcing arrangement (Vitasek & Manrodt 2012).

Collaboration and strategic alliances have become critical enablers for global competitiveness (Zineldin & Bredenlöw 2003). Core content of outsourcing is the division of labour and coordination, "every organized human activity … gives rise to two fundamental and opposing requirements: the division of labour into various tasks to be performed and the coordination of these tasks to accomplish the activity" (Mintzberg 1979, p. 93). Multiple barriers hinder the collaboration needed to create an agile supply chain and gain its invaluable benefits. Supply chain (SC) collaboration is defined as, "the ability to work across organizational boundaries to build and manage unique value-added process to better meet customer needs" (Fawcett, Magnan, & McCarter, 2008, p. 93). SC collaboration means sharing resources, information, people and technology among supply chain partners to create synergies for competitive advantage. Collaboration is all about managing relationships for creativity and continuous improvement, which then deliver a competitive advantage. The core objective is to develop and implement an approach to solve problems and deliver value to customers. The collaborative relationships can be governed either informally or through written contracts, but for both of these, trust is the governing principle (Fawcett, Magnan & McCarter 2008). Creating synergistic relationships between partners with the objective of maximising customer value and delivering profitable outcomes for members upstream is the key to the success of globalised supply chains (Fugate, Sahin & Mentzer 2006).

3.6.3 Joint participation

It is a common belief, and a myth, that once an activity has been outsourced, the shipper can disengage from the operations. According to David Blythe, the logistics manager for medical-grade products supplier Smith & Nephew, "Just because you outsource doesn't mean you disengage" (cited in Trunick 2004a, p.1). Tom Wage, logistics divisional manager of Yamaha Motor Corporation agrees and adds that, "things don't operate in

practice as they do in theory" (cited in Trunick 2004a p. 1). Both these logistics managers maintain a high-profile relationship with their 3PLs and that has been one of the keys to their success (Trunick 2004b). Robert E. Sabath, a supply chain consultant, pointed out very succinctly that:

> Successful managers of outsourcing relationships need to be problem solvers, innovators, facilitators, and negotiators who have exceptional people skills and the ability to get things done. Most managers who take the traditional logistics career path never have a chance to learn the skills required to be a good relationship manager. Nor do they have an interest in them. (cited in Lynch 2004a, p. 237)

Joint participation, lateral coordination and relationship management are critical to the success of project governance.

3.6.4 Mutual conflict resolution

Conflicts are bound to arise during SC implementation and problems could arise due to people, processes, technology, or contract—thus conflict resolution management is a critical part of the project governance plan. The governance plan is the glue that holds the outsourcing relationship together (Power 2006). The famous American essayist Ralph Waldo Emerson once said, "Out greatest glory is not in never failing, but in rising up every time we fail" (<http://www.values.com/inspirational-quotes/7057-our-greatest-glory-is-not-in-never-failing-but>). In this context 'rising up' means that the 3PL recognises the problem and initiates action to fix it effectively through a mutually acceptable method. As mentioned earlier, the outsourcing process is complex and there is potential for conflicts (Wallenburg 2009). Conflict is defined as disagreement between parties involved in the relationship and it could emerge in response to friction; conflict is most often viewed negatively and as a state that has to be overcome (Andrade, Plowman & Duchon 2008).

In summary, project governance is a very critical aspect of the outsourcing process. The ten traps of outsourcing, as identified by Mark J Power, in one way or another are related to outsourcing process management. These traps include:

- lack of management commitment
- lack of outsourcing methodology knowledge
- lack of communication plan
- failure to recognise outsourcing risks

- failure to tap external expertise
- not dedicating best internal resources
- rushing through the milestones
- failure to recognise cultural differences
- failure to recognise what it takes vendor productive
- poor relationship management. (Power 2006)

3.7 3PL Performance Measurement

> Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it.

The above quote comes from H. James Harrington, an international performance improvement guru who was born in January 1929. Outsourcing success has to be quantified and that is only possible when the outcome of logistics outsourcing is measured and quantified against the targeted objectives.

Galileo Galilei is reported to have said, “We must measure what can be measured and make measurable what cannot be measured” (cited in Lynch 2004, p. 242). Over the years, this statement has evolved to a more direct and often quoted axiom, “You cannot manage what you cannot measure” (Lynch 2004a, p. 242). The sole objective of supply chain outsourcing is to achieve a competitive advantage through performance enhancement; it is therefore critical to assess this aspect from time to time to understand the reality against agreed deliverables. These reviews are known as “Quarterly Business Reviews” in the business world. There is no quicker way of sabotaging an outsourcing relationship than to allow unpleasant surprises (Lynch 2004b).

Performance is the outcome that results from activities undertaken and a specific objective or goal and performance measurement are ways of determining and thus quantifying the results (Asthana, Bhat & Singh 2015). In simple terms, an outcome is translated into qualitative and quantitative results. Performance measurement is the key to understanding and improving performance from its current state to an agreed state. Performance is measured by a variety of metrics and depends on the organisational requirements and the service-level agreements. Business continuity and progression in the 21st century is largely contingent on supply chain performance. The strategic and operational targets are

evaluated within the framework based on four levels: performance targets, planning activities, logistics operations and the performance attributes of logistics operations (Kayakutlu & Buyukozkan 2011).

Organisations measure 3PL performance-based service-level agreements signed by the parties and the activities that are outsourced. For example, a pharmaceutical client would be much more interested in monitoring batch controls and first-in first-out (FIFO) and error rates as compared to a consumer electronics manufacturer (Lynch 2004b). Broadly, we can classify the service measurement into the five categories of customer focus/service, cost, operational excellence, information, and network efficiency.

3.7.1 Customer focus/service

The objective of this measure is to maximise the customer satisfaction and indirectly help business growth. The focus areas could include, but are not limited to, the following, based on past research:

- Customer satisfaction and quality service (Andersson, Aronsson & Storhagen 1989; Fawcett & Cooper 1998; Goetschalckx, Vidal & Dogan 2002; Korpela & Lehmusvaara 1999; Mukhopadhyay, Bandyopadhyay & Chatterjee 2011; Ross 2000; Rudberg & Olhager 2003)
- Mass customisation (Rabinovich, Dresner & Evers 2003)
- Customer capital (Barad & Even Sapir 2003; Krakovics et al. 2008; Kušar et al. 2005; Lai, Lee, Ip 2003; Parhizgari & Ronald Gilbert 2004; Zhao & Stank 2003)
- Customer segmentation (Kušar, Berlec, Grum & Starbek 2005; Mentzer, Myers & Cheung 2004)
- Demand chain (Cheng, Lai & Yeung 2005; De Treville, Shapiro & Hameri 2004; Hsiao, Kemp, Van der Vorst & Omta 2010; Van Landeghem & Vanmaele 2002)
- Focus accredited customers (Bottani & Rizzi 2006)
- Customer complaints and feedback; order cycle time; perfect order fulfilment rate; enquiry response time (Keebler & Durtsche 2001a).

3.7.2 Cost factors

The cost plays a very important role and one of the key elements in any business transaction is cost savings. There are a variety of measures considered in evaluating the cost savings and several that are measured include, but are not limited to, the following:

- Outbound freight cost; inbound freight cost; inventory carrying costs; storage costs; cost per unit vs budget; cost to service (Keebler & Durtsche 2001a)
- Distribution cost of sales; distribution cost as a percentage of cost of goods sold (COGS); distribution cost per unit shipped; days on hand of raw material; inventory shrinkage as a percentage of total inventory; material handling damage; cost of capital deployed etc. (Manrodt & Vitasek 2010).

3.7.3 Supply chain and distribution network optimisation and lead time optimisation

The main objective of the supply chain and distribution network optimisation is to improve the lead time and thus facilitate a faster supply to the marketplace. The distribution network also enables the organisation to place the goods at the right time, at the right place and enables business to avoid a loss of sales. It is critical to determine where to store the goods, and some of the questions to be raised in setting up the distribution network consider if it will be a centralised or decentralised operation.

3.7.4 Operational excellence

Operational performance excellence delivers three distinct benefits to any organisation—cost, velocity and quality and consistency. Enhanced performance leads to customer satisfaction, and ultimately, customer satisfaction leads to business growth. Achieving excellence means this should be a golden thread running through all the 3PL's actions in delivering committed outcomes to the customers. Operational excellence is driven through people, process and technology improvements on a continuous basis. Some of the operation performance measurement parameters include, but are not limited to:

- On-time delivery; order-fill rate; line item fill; back orders; order cycle time; invoice accuracy; case fill; over supply/shortages and damages; freight costs; enquiry response time; and forecasting and planning accuracy (Keebler & Durtsche 2001a)
- Average capacity used; peak warehouse capacity used; inventory count accuracy (dollar and units); location accuracy; order picking accuracy; material handling equipment capacity utilisation; order picked and shipped per person per hour; dock to stock cycle time; and order receipts per hour etc. (Manrodt & Vitasek 2010).

3.7.5 Information sharing and planning

Information sharing is the vital link in delivering the agreed performance and exceeding the agreed levels. Lack of information could cause chaos and inconsistent performance. To execute a seamless supply chain, supply chain visibility and planning tools are two key enablers. Some of the performance metrics researched include, but are not limited to:

- Effective scheduling of transportation; inventory level monitoring to identify SLOB (slow and obsolete); production and procurement scheduling accuracy; customer order processing and sharing the status to the customer; IT system integration and EDI outcomes (successful or failed EDI signals); and email communication etc. (Cheong 2004)
- Strategic planning and operational planning. (Hamdan & Rogers 2008; Irani, Gunasekaran & Love 2006; Kim 2009)

Lynch summarised the performance evaluation of 3PLs by identifying four critical parameters for performance measurement. The first deals with managing operations through performance metrics—unless one measures the performance measures, it is impossible to manage or improve the performance. The second deals with identifying activities to be measured and setting measurable and achievable standards. The third deals with measuring what is relevant to the business and actionable. It was observed that some managers are obsessed with metrics without understanding the contribution the metric can make to the improvement of the business. Last, but not least, is to balance performance measurement. Too many measures could create friction between departments and too few or too generic measures may not lead to improved performance (Lynch 2004b).

3.8 Strategic Supply Chain Outsourcing Success

Strategic supply chain outsourcing success comes in several forms, with some being quantifiable and others qualitative in nature. This author believes that outsourcing success comes in the form of three vital business improvements—business growth, cost reduction, and the ability to focus on core competency to outsource non-core functions, as explained in Figure 3.4.

Outsourcing success can be measured in different ways, including: increases in outsourcing globally, operational efficiencies, business growth to the shipper, customer

satisfaction with both 3PL and the shipper. As explained earlier, some of these are tangible and some of them are more qualitative in nature, they may either directly or indirectly impact business outcomes and business results.

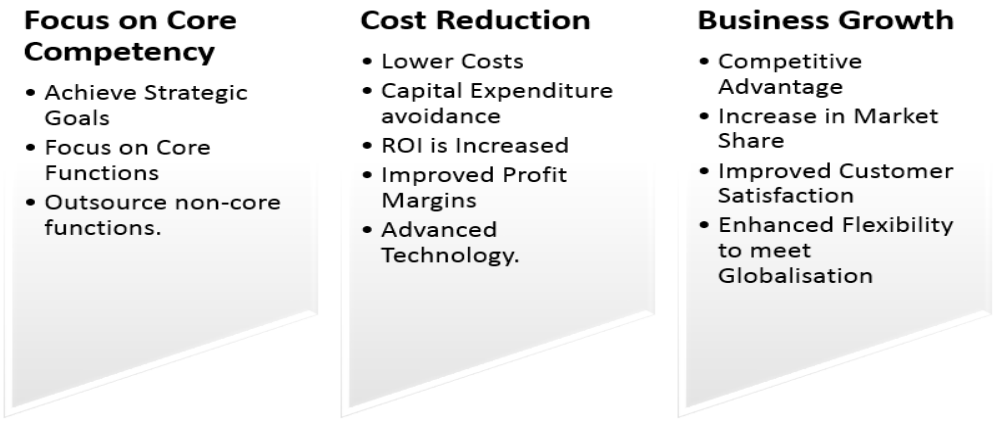

Figure 3.4 Factors of outsourcing success

Source: Hassan, Othman and Ismail 2016; Mothilal et al. 2012; Prahalad and Hamel 2006; Vissak 2008.

Langley and Capgemini's (2016, p. 9) global survey report indicated highly satisfying success outcomes of outsourcing expressed by participants to include:

- relationships we have with 3PLs generally have been successful 93%
- our use of 3PLs has contributed to improving service to our customers 83%
- 3PLs provide new and innovative ways to improve logistics effectiveness 75%
- overall, we are increasing our use of outsourced logistics services 73%
- our use of 3PLs has contributed to reducing our overall logistics costs 70%.

By interpreting the above outcomes, it is evident that collaboration takes the top spot. Service levels improved, which then delivered a competitive edge, and innovation and continuous improvement delivered cost-effectiveness. Similarly, increasing outsourcing activity establishes that the outsourcing is successful and finally, outsourcing is seen to improve cost-effectiveness. The combination of collaboration, enhanced service, innovation and cost-effectiveness leads to organisational competitive effectiveness in global and volatile markets.

The successful outcomes in India were expressed in two forms. Figure 3.5 shows the improvements in business objectives through outsourcing and Figure 3.6 shows the reasons for use of 3PL services providers in India and the impact of those services on their business (Sahay & Mohan 2006). The top five business objectives include improving DIFOT (delivery in full and on time), leveraging the logistics expertise due to lack of expertise in the country, velocity improvement, a focus on core competency and reducing cost of operations.

The top reasons for outsourcing in India, as explained in Figure 3.6, are (a) to reduce capital investment; (b) to reach out to global markets; (c) operational-related reasons dealing with improving technology capability as a globalised operation largely depends upon supply chain visibility; (d) flexibility related to globalisation and (e) to improve productivity.

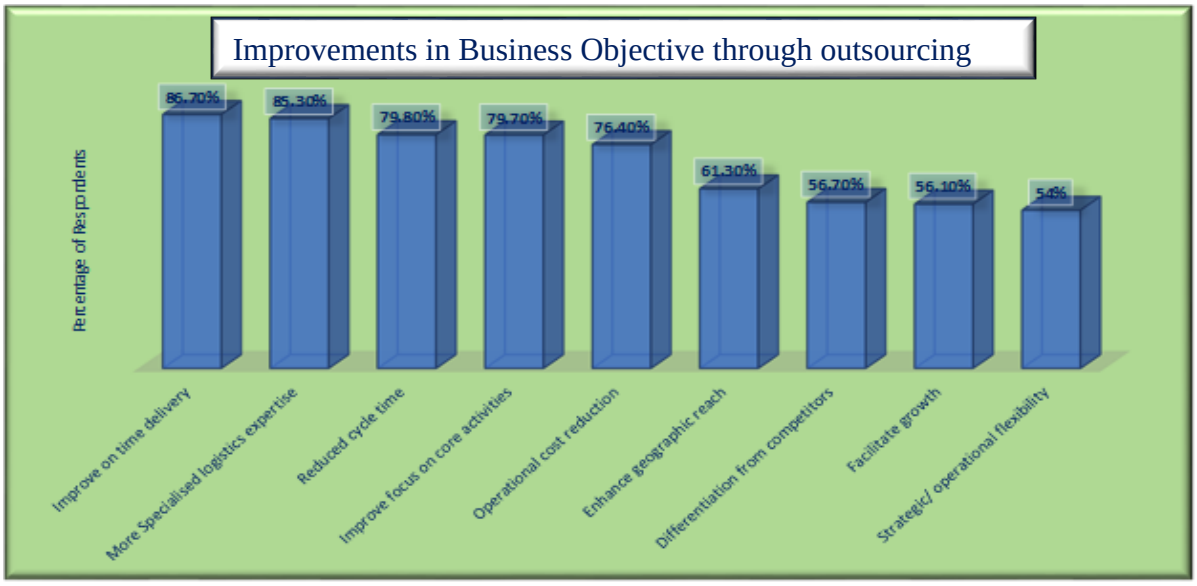

Figure 3.5 Improvement in business objectives related to logistics system performance

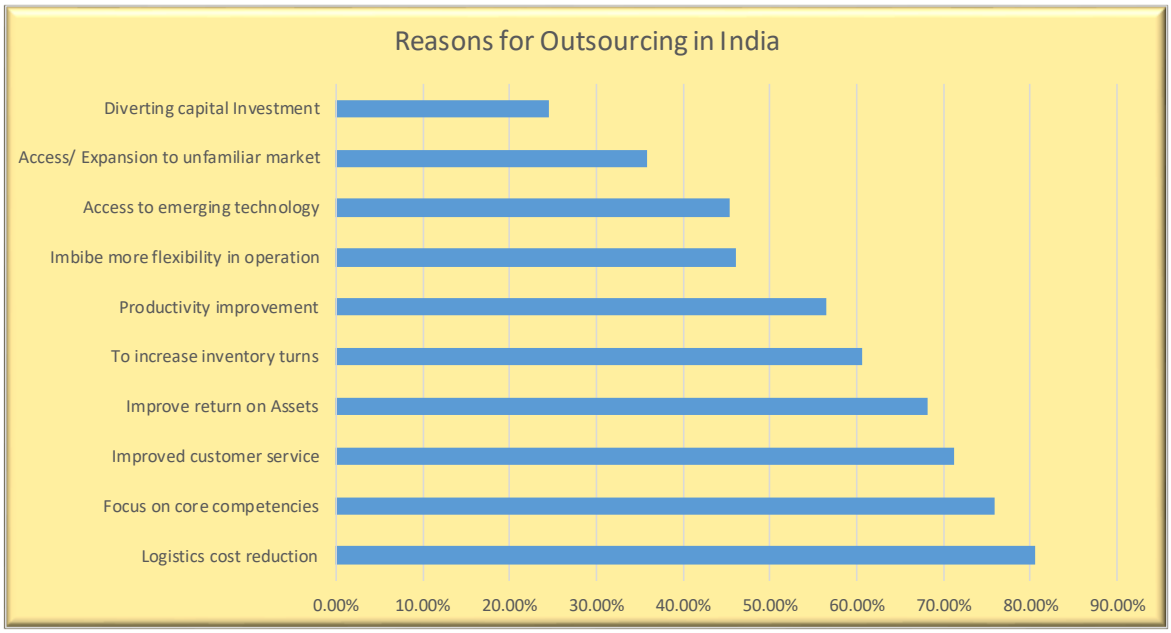

Figure 3.6 Reasons for outsourcing in India

Through their survey in India, Mothilal et al. (2012) came up with a very interesting way of explaining the relationship between outsourcing success through key success factors versus performance measures. These included breadth of services leading towards revenue growth, industry focus of 3PL resulting in profit growth, relationship with 3PLs resulting in profit growth, on-time delivery enhancing customer satisfaction, and finally skilled logistics professionals helping the outsourcing company in enhancing profit growth and customer satisfaction.

The latest survey of supply chain outsourcing conducted in Canada has indicated very positive and encouraging outcomes (Smyrlis 2014). Before the outcomes are discussed, it would be ideal to recognise the challenges and show the alignment between challenges and outcomes. The challenges identified include to: reduce costs (51%), enhance customer service (13), improve supply chain execution (9%), improve supply chain information (6%), and keep up with logistics technology (5%).

The outcomes in the form of survey feedback (respondents in %) included: logistics cost declined = 30%; service improved = 34%; logistics assets declined = 7%; average order cycle length shortened = 3%; overall inventories declined = 3%. Furthermore, survey participants rated the 3PL on a scale of 1 to 5 (1 being *lowest* and 5 being *highest*) on five parameters and the results were: managing and servicing account = 3.77, reacting quickly

to changes or problems = 3.58, meeting promises on execution = 3.69, being price competitive = 3.76, and understanding intricacies of client business = 3.57. When it comes to future trends, 81% of the respondents indicated they would outsource their logistics and supply chain activities (Smyrlis 2014).

The *19th Annual Third-Party Logistics Study* (2015) survey results reflected the continuing, positive overall collaborative shipper–3PL relationships. Both shippers and the 3PLs believed that their outsourcing was successful. In a nutshell, the operational results included a 9% reduction in average logistics cost, 5% inventory cost reduction and 15% average fixed logistics cost reduction. Furthermore, 73% of the shippers were satisfied that they have received open, transparent and effective communication from their partner. Clearly, 92% of the shippers reported that their relationships with 3PLs have generally been successful, with 98% of the 3PL reporting the same (Langley & Capgemini 2015).

A survey conducted in Kenya revealed some very impressive outcomes of outsourcing. The results, based on mean value, included:

- make capital fund available for other purposes (4.092)
- to gain access to world class capabilities (4.091)
- help to share risks (4.091)
- to gain competitive advantage in the global economy (4.027)
- it helps organisation to focus on its core competencies (3.873)
- it's a cost-effective business practice (3.872)
- take advantage of resources not available internally (3.872)
- it leads to development of more flexible organisations to the needs of consumers (3.872)
- it frees resources for other purposes (3.782)
- non-core functions are too complex (3.672).

The unique findings in this survey were that the focus was more on expertise, sharing risk, avoidance of capital investment, and gaining a competitive advantage in the global market. This is typical within under-developed economy preferences (Thiong'o 2014).

A survey conducted in Turkey in 2007 provided feedback on the impact of logistics outsourcing by current users and prospective users. This is a very interesting way of understanding the outsourcing outcome. Table 3.1 explains the impact.

Table 3.1 The impacts of outsourcing logistics activities in Turkey

Measure	Current Users	Prospective Users
Lowering costs	87%	78%
Improving service quality	85%	87%
Meeting demands just-in-time	84%	83%
Ability to reach wider markets	69%	64%
Focus on core business activities	61%	54%
Efficient inventory management	43%	36%

The author summarised that no significant difference was found in different industries in regard to partnership and capital structure parameters. The most popular reasons were logistics costs, order fulfilment and improved customer service. The firms with a foreign share capital structure were focusing on core business as a priority among other reasons for outsourcing (Aktas et al. 2011).

The *2014 Third-Party Logistics Study* published by the Council of Supply Chain Management Professionals also revealed very impressive results for outsourcing success globally. The measurable benefits included logistics cost reduction of 15%, inventory cost reduction of 8%, logistics fixed assets reduction of 26%, order-fill rate improvement of 7% and order accuracy improvement of 5%. It was also noticed that 55% respondents reported they were much more collaborative with their 3PLs. A survey of 33 global 3PL CEOs was conducted in 2013 by Dr Robert C. Lieb from Northeastern University and Dr Kristin Lieb from Emerson College and revealed that 77% of those responding on profit said they were profitable, 6.6% broke even, and 16.6% said they were unprofitable. Furthermore, it was estimated there was faster growth in the Asia-Pacific region (8.6%). This indirectly indicates the success of outsourcing (Trunick 2014).

A similar survey conducted in the United Arab Emirates (UAE) revealed very impressive results for the organisational impact of logistics outsourcing. The performance measures included, logistics costs were 99% positive and had a very positive impact, 100% customer satisfaction was positive and had a very positive impact, and finally, 100% positive and very positive impact on internal logistics system performance (Sohail et al. 2005).

The American Productivity and Quality Center (APQC) conducted a survey in 2012 in the United States and some of the outsourcing outcomes revealed were fascinating. Regarding inventory carrying costs, those who were extensively outsourcing warehousing reported inventory carrying costs of 4%, organisations who were outsourcing warehousing to some

extent reported costs of 14%, whereas companies who were not outsourcing reported inventory carrying costs of 8%. Regarding perfect order, organisations involved in extensive warehousing reported 92%, in contrast to organisations with limited outsourcing of outbound transportation reporting 85% perfect order. It could be concluded that that by outsourcing warehousing and outbound transportation the deliveries will arrive at the customer's end on time and complete. When asked whether they were satisfied with their 3PL companies, none of the shippers reported negatively. This question was responded to by the shippers who outsourced transportation, distribution centre management and product returns management and so forth (Partida 2012).

Dapiran, Lieb, Millen, and Sohal's (1996) survey in Australia revealed success factors focusing on cost, customer satisfaction, logistics system performance and employee morale, as shown in Table 3.2.

Table 3.2 Outsourcing success and area of impact – Australia

	Nature of Impact			
Areas of improvement	***Very Nagative***	***Negative***	***Positive***	***Very Positive***
Logistics costs	**0**	**12**	**74**	**14**
Customer satisfaction	**4**	**4**	**71**	**21**
Internal logistics system performance	**2**	**9**	**78**	**11**
Employee morale	**2**	**30**	**64**	**4**

3.9 Reasons for Outsourcing Failure

The decision to outsource has two potential results—a successful outcome or failing miserably; however, failure could be due to ineffective management of outsourcing processes. The outsourcing initiative could fail, not due to an inherent problem with outsourcing, but due to a lack of strategy and clearly defined expectations, or even due to lack of transparency and trust in the relationship (Bounfour 1999).

The cost benefits could be eroded if the manager cannot project the true costs at the time of outsourcing. Estimating the transition costs is considered as one of biggest and weakest links in under-estimating costs. In some cases, management turns a blind eye until the overall outsourcing costs shoot through the roof. *Loss of control over the 3PL:* The key to success is the effective control of outsourced logistics operations. Since the business process is outsourced and information is fed through the 3PL it would not be complete or may not be accurate thus resulting in ineffective decision-making. *Problems of evaluating*

and monitoring 3PL performance: It is well established that what you measure is what you get and what is not measured is lost. Periodical evaluation of 3PL performance is a critical and complex process. To achieve what is targeted through outsourcing, an effective monitoring system is very critical. *Conflicts of firms' cultures*: Last but not least, is the alignment of organisational cultures. It is very critical that the shipper and the 3PL work towards common goals that are well documented and reviewed periodically (Wang & Regan 2003).

Some of the other reasons that could contribute to failure are overstated or overestimated benefits. In the initial phase, the 3PLs are likely to perform better but the consistency may not be maintained (Schwyn 1999). Lack of well-structured and defined outsourcing methodology could also lead to outsourcing failure (Bounfour 1999). Gao suggests that a lack of skills to manage 3PLs are also a risk of failure (Kremic, Tukel & Rom 2006).

Some organisations do not outsource supply chain and logistics activities for various reasons. After careful analysis based on the *2013 Third-Party Logistics Study*, one can classify these reasons into five categories, company policy, cost reasons, perceptions, 3PL inability, and service considerations. From 2006 to 2013 (excluding 2011), the top three reasons included, 'logistics is our core competency', 'cost reduction will not be experienced', and 'logistics is too important to be outsourced' with part of that reason being that service levels will not be achieved. The rankings of all other reasons have changed from year to year. These other reasons include: corporate philosophy excludes the use of outsourced logistics providers; we have more logistics expertise than most 3PL providers; control over the outsourced function(s) would diminish; too difficult to integrate our IT systems with the 3PL's systems; issues relating to security of shipments; inability of 3PL providers to form meaningful and trusting relationships; global capabilities of 3PLs need improvement; we previously outsourced logistics, and chose not to continue.

Reasons for not Outsourcing Logistics Activities	Yearly Ranking						
	2013	2012	2010	2009	2008	2007	2006
Logistics Is a Core Competency At Our Firm	1	1	1	2	1	1	1
Cost Reductions Would Not be Experienced	2	3	2	1	2	2	2
Logistics Too Important to Consider Outsourcing	3	2	4	3	4	3	6
Service-Level Commitments Would Not Be Realized	4	6	5	5	5	3	5
Corporate Philosophy Excludes the Use of Outsourced Logistics Providers	5	8	7	7	7	7	7
We Have More Logistics Expertise Than Most 3PL Providers	5	7	6	6	6	6	4
Control Over the Outsourced Function(s) Would Diminish	7	5	3	3	3	5	3
Too Difficult to Integrate Our IT Systems with the 3PL's Systems	7	4	8	10	NA	NA	NA
Issues Relating to Security of Shipments	9	10	11	12	8	9	9
Inability of 3PL Providers to Form Meaningful and Trusting Relationships	9	12	12	11	9	10	10
Global Capabilities of 3PLs Need Improvement	11	11	9	9	9	8	8
We Previously Outsourced Logistics, and Chose Not to Continue	12	9	10	8	NA	NA	NA

Figure 3.7 Reasons for not outsourcing ranking by year (2006–2013)

***NA* –** That reason was not ranked during the corresponding year.
Note: 2011 report was not published.

Source: Langley & Capgemini (2006–2013).

3.10 Conclusion

In summary, strategic logistics outsourcing is driven by strategy and objectives and supported by other variables such as project governance mechanism, 3PL selection criteria and performance evaluation. Strategy or objectives or reasons for outsourcing clearly define what the expectations of outsourcing are that pave the way for developing a governance mechanism that is collaborative in nature and defines the selection criteria. The reasons for outsourcing also help the organisation to build their performance evaluation metrics. The variables identified above facilitate achieving the targeted outcome of outsourcing success if shippers follow the prescriptive process. At the same time, logistics outsourcing could end up as a failure if the identified variables are not effectively managed.

Supply chain outsourcing is a strategic decision that keeps the long-term benefits of the organisation in view. The initiative will be successful and the targeted results will be achieved only when it is driven through a structured and collaborative process, starting from clearly defining and understanding the deliverables of outsourcing. Mitra (2006) explained outsourcing in the Indian context and believes that building a successful logistical alliance requires a clear understanding of cost components, trust and transparency, and clearly communicated expectations of the relationship, further highlighting that these factors are critical to its success.

Apart from defining the strategy, it is also necessary to clearly identify the expectations and share the information with the 3PL to help them develop a customised solution based on the facts and figures provided by the shipper. A 3PL arrangement is often compared with marriage and the marriage would only be successful when the relationship between the partners blossoms. Before reaching the relationship, the alliance goes through three distinct phases, the first one is courtship—the period of happiness all around and it corresponds with the request for quotation (RFQ) stage. The second phase is hardship and during this phase the contract goes through to the implementation phase and often hits rough weather because of financial and operational disconnects and inefficiencies causing service-level challenges. If the senior management of both sides do not interfere and address the issues then the arrangement goes into turbulent weather, and that is known as the battleship stage. During this phase, the situation becomes ugly and can deteriorate into litigation. If the alliance or the arrangement successfully passes through this phase and gets into the final stage, which is known as relationship, the outsourcing will be successful for a long time and it becomes a partnership (Sangam 2005).

It is critical for the shipper to be honest, a good partner, to maintain transparency and to expect reciprocal behaviour from the partner and the service provider (Lynch 2004a). Outsourcing is not a commodity, it is a relationship and it flourishes on trust, integrity and a collaborative approach.

3.10.1 Research gap

In the last 10 years, more than 42,000 articles have been published on logistics outsourcing and each article deals with different perspectives and different countries' preferences. One could always ask if we need one more PhD level-research on supply chain outsourcing. The answer lies in the research gap. This research is focusing on the Indian market and the majority of research is aiming at outsourcing success. Empirical evidence suggests that there has been no attempt made to understand what delivers success and what triggers failure in an integrated approach (discussed in Chapter 1). This research is all about investigating outsourcing processes in India through a structured method and placing emphasis on process enablers such as governance mechanism and examining the outcome of the investigation. At the point of the literature review, it is hard to predict the outcome of this research; however, globally and locally in India there is ample evidence that logistics outsourcing is successful. Furthermore, currently most research in India is only

focusing on logistics services outsourcing success or failure. Focusing on strategic logistics outsourcing will add value to the research as the strategic supply chain focuses on competitive advantage as its fundamental objective and the key objective of strategic supply chain outsourcing is to deliver the same result. Furthermore, the key enablers of outsourcing processes and their importance in driving successful outsourcing are valuable additions to the existing literature.

In summary, this research is not about success or failure of strategic logistics outsourcing in India; the value proposition of this research is all about the process and collaborative enablers that drive the outsourcing initiative towards the goal. The next chapter deals with conceptual framework and the hypothesis development.

CHAPTER 4

HYPOTHESIS DEVELOPMENT AND CONCEPTUAL FRAMEWORK

4.1 Introduction

In this research study, it is essential to identify and develop a suitable conceptual framework to represent an extant model incorporating the study constructs. This chapter illustrates and discusses the process used to generate the conceptual framework for the present study. This chapter also formulates the hypotheses that describe the relationship among the constructs of outsourcing reasons, third-party service provider selection criteria, governance mechanism (collaborative approach and mutual conflict resolution), performance measurement, and outsourcing success of strategic supply chain outsourcing.

4.2 Conceptual Framework

A conceptual framework is defined as a visual or written concept, one that "explains, either graphically or in narrative form, the research objectives to be studied—the key factors, concepts, or variables—and the presumed relationships among them" (Miles & Huberman 1994, p. 18). The conceptual framework is primarily an idea or model in practice and, through research, a study is conducted to understand and develop a tentative theory of the phenomena that is being investigated. A conceptual framework helps the investigator to generate hypotheses and identify the association between the study variables to enhance the understanding of the study aims (Bryman & Bell 2015). There are four major steps to develop a conceptual framework: firstly, identification of concepts aims to find out all the views related to research question and objective. Secondly, the identified concepts must be defined to clarify its use in the study. Thirdly, the association between cause and effect or concepts must be discovered to respond to the research question. Finally, operationalisation of concepts is termed as decision-making to measure concepts when the study is quantitative in nature.

The conceptual framework for the research is constructed based on identified problems in the literature. The foundation for the framework is the "research problem" and forms part of the conceptual framework; verbalising the research problem is often identified as a

critical task of designing the study (Maxwell 2012). A conceptual framework is a theoretical model which drives the objectives to address the gaps in the existing field of knowledge by conducting a critical literature review.

4.3 Development of Research Hypotheses

As explained above, based on the identified five problems derived through the theoretical background discussed in Chapter 3, this research focuses on key five aspects of outsourcing that include, outsourcing reasons, governance mechanism (collaborative approach and mutual conflict resolution), 3PL selection criteria, performance measurement and outsourcing success.

4.3.1 Reasons for supply chain outsourcing and governance mechanism

Outsourcing is driven by a core competency strategy which distinguishes core functions from non-core functions (Hamel & Prahalad 1990). To experience a successful outsourcing process, the critical element is the strategy that defines reasons for outsourcing activities that are usually handled in-house.

The concept of core competencies was introduced by Hamel and Prahalad (1990) and is defined as "a harmonized combination of multiple resources and skills that distinguish a firm in the marketplace" (Schilling 2005, p. 117). Core competencies enable organisations to deliver competitiveness in three critical areas. First, it expands the access to a wide variety of markets; second, it enables the organisation to contribute significantly to the perceived customer benefits of the end product; and third, it makes it difficult to be imitated by competitors (Hamel & Prahalad 1990). New generation corporate managers are in an outsourcing spree to create more value for their businesses (Greaver 1999). Outsourcing supply chains is inevitable, though their success inherently depends on a well-defined strategy behind the process.

Supply chain and logistics outsourcing could fail due to many reasons, such as: failure to have a true meeting of minds, promises that cannot be fulfilled, a desire for failure, money-losing contract, and intolerable service failures (Ackerman 1996). Unrealistic expectations, lack of strategy and inefficient or lack of outsourcing process could also lead to outsourcing failure. Employing best practice in outsourcing decisions may help avoid failure. Furthermore, it is recommended that an outsourcing decision-making scorecard is

used (Brown & Wilson 2007). Simonson, Tompkins, and Upchurch (2005) believe that most failed outsourcing projects are hastily integrated without synchronising with the company's strategy. Lynch (2004c) indicated that many outsourcing arrangements failed because of unrealistic expectations. He further clarified that outsourcing itself is not a strategy, rather it is a vehicle for achieving the strategy. According to Beaumont and Sohal (2004), outsourcing is a hierarchical sequence of decisions and the key is whether or not to outsource a business process or function.

Elmuti (2003) claims flexibility is a key element of business strategy. From the results of a survey, Elmuti et al. (cited in Fapohunda 2013, p. 45) indicated that "sufficient flexibility to respond to market conditions" was one of the reasons for outsourcing. Lack of flexibility poses a risk in establishing outsourcing relationships (Tompkins 2005). Größler, Timenes Laugen, Arkader, and Fleury (2013) empirically proved that flexibility was an important factor for companies that outsource domestically, while international outsourcing was due to cost benefit. Similarly, the study by Chiang, Kocabasoglu-Hillmer, and Suresh (2012) claims that both flexibility and strategic sourcing are related to firm supply chain agility. Organisational success therefore largely depends upon the business strategies and phenomenal growth of outsourcing (Gottfredson, Puryear & Phillips 2005).

Strategy without a well-developed governance mechanism will be disastrous. Once logistics are outsourced, accountability shifts to the 3PL service provider; however, both the shipper and the 3PL improve their respective benefits at the cost of the other (Lynch 2004b). This situation occurs when operating controls change hands and it is being dominated by chaotic issues (Power 2006). This is the reason logistics outsourcing is always a complex task requiring a high level of formalities between the parties involved (Leuschner, Carter, Goldsby, & Rogers 2014). The managers of shipper organisations therefore encounter a range of uncertainties, risks and criticisms (Mohr, Sengupta & Slater 2011).

It is argued that the risk of outsourcing 'blindness' can be mitigated through effective governance. Governance can be defined as a mechanism where partners cope with uncertainty by minimising complexity, simplifying routines and sharing information through their knowledge structures (Van Ees, Gabrielsson & Huse 2009). Governance helps both parties in a business relationship, thereby ensuring the end customer receives value-added services (Richey et al. 2010). An effective governance mechanism is likely to

result in organisational success. Without adequate governance structures, projects can be at risk of conflicts and inconsistencies, which may prevent the project from reaching its goal. Authors in earlier studies have demonstrated that 3PL selection criteria can have positive effects on financial, marketing, process and delivery performance (Mothilal et al. 2012; Rajesh et al. 2011). Until these criteria are controlled and monitored effectively, however, outsourcing is far from successful and stakeholders are likely to be affected. The association between outsourcing objectives and governance of outsourcing is therefore paramount and can be hypothesised thus:

- Hypothesis 1 (H1): Logistics outsourcing reasons are positively associated with project governance mechanism.

4.3.2 Logistics outsourcing reasons and 3PL selection criteria

Outsourcing reasons determine the 3PL selection criteria and are indirectly based on the customised reasons and business environment. Mothilal et al. (2012) pointed out that Indian organisations are gradually realising the benefits of outsourcing and the government is also working towards improving and developing the infrastructure, which had been the main road block for outsourcing. Some of the main reasons reported in the literature for opting for outsourcing include that 3PL companies are investing in IT systems and there is a greater breadth of services offered by the 3PLs (Piplani, Pokharel & Tan 2004). Successful relationships with 3PLs result in successful outcomes (Joong-Kun Cho, Ozment & Sink 2008), with these delivered through skilled logistics professionals—this is a big concern in a developing country like India (Aktas & Ulengin 2005)—and finally the ability to integrate supply chains by outsourcing delivers a competitive advantage (Wind 2005).

Vyas and Shah (2016) have identified four reasons for outsourcing in India. Based on their survey, these reasons include cost reduction (27%), strategic reasons (26%), process effectiveness (24%), and finally, lack of internal capability (11%). These research findings closely align with the above findings. Today's business environment is volatile and there is fierce competition in the marketplace. Furthermore, constantly changing customer demands are adding pressure on the organisations to reduce their costs by re-examining their business model (Merino & Rodríguez 2007). The cost factor is a dominating reason worldwide due to our globalised economy. A resource-based view is one of the popular theories in strategic management of business to focus on resources that deliver an

organisational competitive advantage (Karatzas et al. 2016). The competitive advantage is a compelling factor influencing the decision to outsource. Due to uncertainty in the marketplace's ability to adapt, having flexibility is becoming the backbone of an organisational strategic approach to meet customers' needs (Childerhouse, Aitken & Towill 2002). To negate their business risks, organisations are constantly focusing on strategic renewal and creative solutions to meet their customers' needs; one of the most popular strategies adopted by organisations is logistics outsourcing (Mello, Stank & Esper 2008). In summary, organisations are outsourcing as part of their strategy to gain a competitive advantage, while also reducing costs and creating a flexible organisation to deal with continuously evolving marketplace challenges through collaborative alliances.

Ferruzzi, Neto, Spers, and Ponchio (2011) identified several reasons for shippers outsourcing their logistics functions, citing from several research outputs. These reasons include: unique skills of 3PLs, which are considered as specialisation in outsourced activities; the ability to focus on their core activity; increases in productivity; enhanced access to up-to-date technological innovations; lack of skilled personnel to handle issues in-house; the ability to improve quality of customer service and customer orientation; and improved flexibility and reduction and optimisation of operating costs. At a strategic level, the reduction in fixed assets (infrastructure) and achieving competitive advantage are both critical to the business.

From an Indian perspective, there are several strategic, economic and environmental reasons for outsourcing what is considered as a non-core activity. Globalisation has become a key force in transforming business strategies (Cooper 1993). A survey conducted by Sahay and Mohan (2006) identified logistics costs reduction as a core reason among three-quarters of the shippers who participated in the survey. This was followed by improving customer satisfaction, improving return on asset utilisation, increased inventory turns, and last, but not least, was productivity improvement.

To achieve the benefits identified above, which are similar all over the world, the most important element is collaboration between the shipper and the 3PL. Collaboration leads to successful outcomes. Successful relationships lead to successful outsourcing arrangements via collaboration with external partners (Webb & Laborde 2005). Collaboration with service partners is critical to optimise goods and information flow within the supply chain network and to achieve cost reduction (Aguezzoul 2014). An organisation's strategy and

objectives are all about future creation. Differentiation between firms is not just because they have different supply chains, resources and competency level; the real differentiations are delivered through value-added services. Foulds and Luo (2006) indicated that 3PL providers in New Zealand offer value-added services for sustainable outsourcing.

The first and foremost aspect that determines the suitability or selection criteria is a collaborative approach. Partners' involvement in planning, execution and decision-making emphasise the importance of collaboration with the 3PL (Ramanathan & Gunasekaran 2014). The literature review suggests there are eight selection criteria that are deemed most critical and these have been summarised in Table 4.1.

Table 4.1 3PL selection criteria

Selection Criteria	Relevance to Logistics Outsourcing	References
Compatibility	The critical aspect for logistics outsourcing success is compatibility of the service provider and collaborative approach.	Sasananan et al. 2016, Van Binh & Kien 2016
Cost factor	The objective of the logistics outsourcing is to reduce operational cost; hence it is critical.	Anderson et al. 2011, Hunt & Davis 2008
Service quality	Quality of the service provided enhances customer satisfaction.	Hwang et al. 2016
IT capability	Information technology has become the driving force to answer the globalised markets; 3PLs with strong IT capabilities will also address ever-increasing e-business markets in the retail sector.	Langley & Capgemini 2016, Qureshi et al. 2008
3PL reputation	Reputation is a perception of the current users; it will help in the screening and selection process.	Aguezzoul & Pires 2016, Chen & Wu 2011
Willingness to use manpower	As a strategy, organisations are filling the gap in human resources capabilities through outsourcing.	Sasananan et al. 2016, Anderson et al. 2011
Flexibility in billing and payments	Billing by 3PL and payment by the shipper are routine business processes, but should never end up in conflict, thus enhancing the goodwill of 3PL.	Van Binh & Kien 2016, Cirpin & Kabadayi 2015, Chen & Wu 2011
Risk management	Risk mitigation is a key quality in today's uncertain environment.	Anderson et al. 2011

The above depicts some of the key 3PL selection criteria for outsourcing; but selection criteria depend upon the conditions, environment, country and organisation, and hence it may not possible to pin down the all the measures used to select the 3PL. Furthermore, these references to selection criteria were chosen from sources describing the early stages

of outsourcing to the current stage to demonstrate the consistency used in selecting the 3PL. The major issues of supply chain outsourcing include partnerships and environment (Varma, Wadhwa, & Deshmukh 2006). The above-identified outsourcing reasons specific to India are closely aligned to 3PL selection criteria. Hence, it can be hypothesised that:

- Hypothesis 2 (H2): Outsourcing reasons are positively associated with 3PL selection criteria.

4.3.3 Logistics outsourcing reasons and 3PL performance measurement

Lynch (2004c) argued that a logistics outsourcing strategy should be a well thought out process with clearly identified and communicated standards of performance. Emphasising the importance of the outsourcing strategy and its association with 3PL performance measurement, he referred to Tom Landry's phrase, "Setting the goal is not the main thing, it is deciding how you will go about, achieving it and staying with that plan" (cited in Lynch 2004, p. 57). It is critical to align the logistics outsourcing objectives with 3PL performance measurement; any disconnect will lead to an unsuccessful experience. Bititci, Carrie, and McDevitt (1997, p. 3) define performance measurement as, "a process by which the company manages its performance in line with its corporate and functional strategies and objectives". Organisational performance depends on the supply chain partner's performance outcomes in an outsourced environment and demonstrates alignment of performance with their objectives and strategies. In summary, two parameters describe organisational performance—its effectiveness in meeting customers' expectations, and its efficiency in how economically organisational goals are accomplished (Bititci, Carrie & McDevitt 1997).

Logistics performance is defined as the process of measurement of constituents using efficiency, effectiveness and social referents to measure how well the 3PL meets the aspiration levels of the shipper (Thompson 2011). Performance metrics and measurement play essential roles in evaluating performance, determining future courses of actions and setting objectives (Gunasekaran, Patel & McGaughey 2004).

The components of performance measurement will vary by type of organisation and the components of the performance measurement process should be directly linked to the outcomes of outsourcing (Greaver 1999). Greaver (1999) identified eight critical measures

for evaluating the outcomes of outsourcing success that include productivity, quality, timeliness, cycle time, utilisation, creativity, outputs, and financial.

Performance measurement, and measurement more generally, enable organisations to transform complex reality into simplified numerical concepts that can be easily communicated and acted upon (Lebas 1995). Periodical performance measurement of the project is critical to understand and control its progress to ensure that it stays on course to deliver the targeted outcomes in the future (Jensen & Sage 2000). Performance measurement is considered as an essential tool to evaluate any system. This tool helps to attain the required objectives, and to achieve a satisfactory organisation strategy/mission statement. When the integration level of the supply chain is increased, it offers quick access to requisite information sources, more sensitivity towards the customer's needs and also allows faster response time to create competitive benefits among competitors (Sezen 2008).

Keebler, Manrodt, Durtsche, and Ledyard (1999) explained that very few firms measure the performance of the logistics supply chain, especially logistics outsourcing. This is mainly due to a lack of empirical research and what research has been done is mostly driven by a systems perspective. Logistics service providers are focusing more on value-added services (Vaidyanathan 2005). This is making it even more important to measure and improve the performance of 3PL service providers. High-level mutual interaction is critical between shippers and 3PLs and continuous measurement of 3PL service providers has become more important to achieve efficient and effective performance (Sink & Langley 1997). The performance of a 3PL is effectively measured on three variables—service quality, organisational effectiveness and relationship management (Panayides & So 2005).

The performance measurement of 3PLs contributes towards the profitability of the shipper by reducing costs and increasing revenues in expanding markets. Furthermore, 3PLs provide an opportunity to enhance their market value by reducing the ownership of assets, which translates to improved operating profit after capital charges (improved return on investment). Each stakeholder in the organisation looks at it from a different perspective and measurement criteria. The Chief Operating Officer focuses more on price-competitive service providers (3PL) to control higher costs of existing operations. The Chief Marketing Officer will look for expanding the market and flexibility, whereas the Chief Financial

Officer will focus on optimising costs and reducing assets by improving return on assets. The Chief Information Officer will measure the technological capability to avoid dependency on legacy systems and investing in new IT systems. Lastly, chief logistics officers will focus on achieving targeted results without creating infrastructure and resources (Keebler & Durtsche 2001b).

What distinguishes winners from losers is the unique competitive differentiation. Organisations need to ensure that key logistics processes are aligned with organisational strategies and measured against predetermined performance objectives (Keebler & Durtsche 2001b). In an outsourced environment, the service providers (3PLs) are expected to bring the systems, process design, and managerial expertise to support and implement a comprehensive logistics measurement effort. Irrespective of the approach a firm takes in establishing measurement, the real value is delivered when information output is analysed and suitable actions initiated to achieve targeted goals (Keebler & Durtsche 2001a). Hence, it can be hypothesised that:

- Hypothesis 3 (H3): Logistics outsourcing reasons are positively associated with 3PL performance measurement.

4.3.4 Governance (collaborative approaches, mutual conflict resolution) and supply chain strategic outsourcing success

Collaboration is a form of relationship used in inter-organisational alliances and the high level of integration allows partners to work more effectively and deliver successful outcomes (Nyaga et al. 2013; Wilding & Juriado 2004). The objective of collaboration is to make the 'pie' larger so that all partners can get a larger piece than they had earlier (Cao & Zhang 2011). One of the critical issues of the outsourcing process is how to manage relationships effectively in a collaborative arrangement between shippers and 3PL providers. Relationship management is a critical success factor in logistics outsourcing. Although many factors are used as elements of relationship quality (Athanasopoulou 2009), the popular dimensions like trust, commitment, openness and information sharing are used in this research (Schmoltzi & Wallenburg, 2012). Furthermore, this research used other important dimensions such as well-understood goals and objectives, top management support (Power 2006), sharing risk and reward, resources availability, spirit of partnership, service-level agreement, governance, and well-constructed contracts (Lynch 2004b). Collaboration is long-term agreement as against an arm's-length arrangement. Social

exchange theory explains collaboration in dyadic relationships as being supported by trust (Nyaga et al. 2013, citing Ganesan 1994) that acts as glue to strengthen relationships in an outsourcing environment. Further communication, through formal and informal sharing of information, is also key to logistics outsourcing success. It is characterised by information adequacy, accuracy, timeliness, credibility and completeness of any information exchanged between a dyad (Mohr & Spekman 1994). Logistics outsourcing means an unknown entity taking control of established processes where trust, communication and commitment are likely to play crucial roles in collaboration governance. As long as the roles are well defined in the implementation process and a collaborative governance approach is followed, the project will most likely approach success. The complexity of decision-making in an uncertain environment demands a collaborative governance mechanism due to factors such as diversity of output, the extent of customisation (input) and strong interdependencies, the unexpected rate of change, and the difficulty of goals (Galbraith 1994).

Once an activity is outsourced, it is believed that the shipper can disengage from the operations. Trunick (2004a, p. 20), with reference to logistics practices, states that "just because it is outsourced doesn't mean you disengage". Lynch (2004b) asserts that successful managers of outsourcing relationships need to be good at problem-solving, innovation, facilitation and negotiation, with exceptional people skills. Disengagement means managers are away from 3PL providers, pushing the dyadic arrangement towards risk and uncertainty. This involves a robust conflict resolution process as part of a governance mechanism in a dyadic relationship. A mutual conflict relationship is a collaborative endeavour by both shipper and 3PL provider with a common intent, joint risks and reward sharing. Through collaborative conflict resolution processes partners are more likely to engage in joint problem-solving to ease the complexities and uncertainty along the way (Nyaga et al. 2013). Huiskonen and Pirttilä (2002) argue that due to complexity and uncertainty of the decision-making situation in logistics outsourcing with high customer service requirement, it is beneficial to collaboratively avoid conflicts. A collaborative approach and mutual conflict resolution process encourages relationship management and is critical to the success of outsourcing.

Outsourcing outcomes can become more effective by managing inter-organisational cooperation that could result in successful outcomes such as improved performance,

reduced costs, and effective interactions and cooperation in outsourcing services (Faghihi & Chenari 2015). While conflict is inevitable in any relationship, the challenge is how to establish interpersonal relationships and resolve cultural differences, while also achieving outsourcing goals. Conflict resolution has a deeper impact on both shipper and service provider (Goles & Chin 2005). Conflicts are bound to arise during implementation and the problems could relate to people, process, technology or contract. Conflict resolution management is the critical part of a governance plan and this governance plan is the glue that holds the outsourcing relationship together (Power 2006). The true problem occurs when both parties recognise the problem and set out to rectify it independently; it is the mutual conflict resolution (MCR) approach that would save relationship (Greaver 1999). There is no generic conflict resolution mechanism; however, greater understanding of the reasons for conflict, willingness to engage in dialogue, listening to the point of view of other people, and searching for collaborative ways of working always create opportunities in resolving conflicts and avoiding them escalating to the next level (Stewart 1998). Through an effective conflict resolution process, both the shipper and the 3PL can minimise the risk and can help achieve outsourcing success. The outsourcing relationship is supported by the governance plan (Power, Bonifazi, & Desouza 2004). Joint participation, MCR and collaborative relationship governance are argued as the antecedents of outsourcing success, consequently, it is hypothesised that:

- Hypothesis 4 (H4): A collaborative approach and mutual conflict resolution as a governance mechanism is positively associated with successful logistics outsourcing experience.

4.3.5 Association between 3PL selection criteria and logistics outsourcing success

Supply chain partner selection criteria are critical and fundamental to logistics outsourcing success and have a significant impact on the overall supply chain. The selection process and the decisions are challenging, however, because of the tangible and intangible factors involved that complicate, create ambiguity and result in vagueness (Wu & Barnes 2014).

Selecting a service provider for outsourcing supply chain functions needs strategy, care, and caution to align with the organisational core objectives intended for successful outsourcing. 3PL selection is considered as a multi-criterion decision-making process and past researchers have developed research frameworks that organise selection criteria into a

hierarchical structure (Hwang & Shen 2015). The majority of published research has focused on the operational aspects, thus ignoring the strategic importance of outsourcing, as well as the significance of a collaborative partnership to deliver competitive outcomes. Leuschner, Carter, Goldsby, and Rogers (2014) believe that setting the goal is not the primary task, achieving the identified goals and staying with the plan is what matters. Thus, achieving identified objectives with successful outcomes is critical, and aligning them with 3PL selection is paramount.

The selection of 3PL service providers is likely to be guided by the ultimate objectives that the firms are trying to achieve. Menon, McGinnis, and Ackerman (1998) argue that both firm competitiveness and external environment (i.e. market competition, new market entry) influence the selection criteria, for example, on-time delivery performance, financial stability and operational excellence. The literature, however, suggests a range of multiple and conflicting criteria that 3PL offers. Aguezzoul (2014) summarised these into eleven meaningful and most used criteria—cost, relationship, services, quality, information/equipment system, flexibility, delivery, professionalism, financial position, location, and finally, reputation. Bagchi and Virum (1998) suggest that the selection criteria should typically include cost. Sink and Langley (1997) focus on qualitative factors such as supplier reputation and referral from clients having a good experience in the past. Meade and Sarkis (2002) argue for timeliness, quality, cost and flexibility as eventually playing vital roles in selecting the service provider. Aghazadeh (2003) suggests that the selection criteria should include better relationship management that helps with stronger collaboration. Hwang, Moon, Chuang, and Goan, (2005) identified a comprehensive list of elements for outsourcing manufacturing activity such as serviceability (meeting the lead time), inventory rotation rate, production flexibility, and multi-item production capability that lead to ultimate customer satisfaction. Efendigil, Önüt, and Kongar (2008) argued for performance indicators such as on-time delivery ratio, confirmed fill rate, service quality level, unit operation cost, capacity usage ratio, total order cycle time, system flexibility index, integration level index, increment in market share, environmental expenditures, and customer satisfaction index.

Outsourcing success means different things to different people. Evaluating the performance of a 3PL and determining its success is a complex process and needs a sophisticated measurement model (Knemeyer, Corsi & Murphy 2003). Stank, Goldsby,

Vickery, and Savitskie (2003) proposed a three-dimensional conceptualisation that includes the areas of operational performance, relational performance and cost performance. Engelbrecht (2004) recommends measuring outsourcing success with the two constructs of goal achievement and information exchange. Knemeyer, Corsi, and Murphy (2003) explained that outsourcing performance includes operational performance, channel performance, and asset reduction performance. From the above discussion, it can be deduced that goal achievement through relationship management, cost, operational excellence and asset reductions are the four critical elements of outsourcing success.

The sustainable competitive advantage has been the "Holy Grail" of the western world management. In their research, Hines and Rich (1998) established how Toyota Japan achieved the elusive competitive advantage in the UK through outsourcing and how the use of *kyoryoku kai* (Japanese term for supplier association) was applied to a working model and how this approach could be emulated in the West. With productivity as a measure, 80% of Toyota's achievement of competitive advantage over its UK-based rivals is based on its effective use of its supplier alliances (Hines 1997).

As India is a developing country, technology plays an important role; innovation and cheaper information flows from the advanced information technology systems of 3PLs will enable the shipper to achieve immediate cost reductions in its operations and also improve productivity gains in future years (Vinay, Kannan & Sasikumar 2009).

Power (2006) split the word outsourcing into two words—"out" and "sourcing". Sourcing means transferring in-house work, responsibilities and an extent decision responsibility to a third party. As logistics outsourcing means handing over in-house tasks to an external agency, it is critical that the outcome is successful. Identifying 3PL selection criteria should ideally start by understanding the reasons behind outsourcing failures that drive the organisations towards insourcing (Bandeira, Maçada & Mello 2015). It is clear that selection of a service provider plays a key role in outsourcing success. Hence, it can be hypothesised that:

- Hypothesis 5 (H5): 3PL selection criteria are positively associated with outsourcing success.

4.3.6 Influence of performance measurement on outsourcing success

The performance measurement of the service provider is critical to strategic supply chain success as it provides an opportunity to identify gaps and correct them at an early stage. Cooke-Davies (2002) believes that project success is measured against the overall objective of the project. The project management success is measured by time, cost and quality. Garvin (1993, p. 11) coined the phrase as "If you cannot measure it, you cannot manage it" and there is a compelling truth in this statement. Quoting anonymous observations, Schmitz and Platts (2004) state that the key missing link between strategic plans and execution is the performance measurement system, structure and management.

The core objective of the strategic supply chain is to enable firms to achieve reduced operating costs and increased revenue in the existing and expanding markets. Furthermore, the 3PLs offer an opportunity to enhance their market value by reducing ownership of assets thereby enabling higher return on their remaining assets and greater operating profit after capital charge to shareholders. It also enables firms to make use of the cutting edge technology of their service providers to deliver enhanced customer service (Keebler & Durtsche 2001b).

Defining strategic objectives is the stepping stone of outsourcing success. This success will become reality only when performance is constantly measured and compared with objectives. What constitutes performance measurement criteria for a 3PL is subject to various parameters and is closely associated with organisational strategy and objectives. Deciding on the appropriate measurement norms and establishing appropriate management processes that support continuous improvement and control of the supply chain outcomes are critical (Schmitz & Platts 2004). Hence, it can be hypothesised that:

- Hypothesis H6: 3PL performance measurement is positively associated with outsourcing success.

4.4 Proposed Conceptual Framework

The above section investigates the association among constructs identified from a literature review. This study developed a research framework based on the fundamental principles of input, process and output (Figure 4.1). The input is the strategy formulation; the process includes selection of 3PL service providers, governance mechanism (collaborative

approach, and MCR and performance measurement). The output is the success or failure of the strategic supply chain outsourcing decision. The existing research revolves around transactional or tactical outsourcing with short- to medium-term decisions, while the proposed research focuses on long-term strategic outsourcing decisions. Strategic outsourcing places the emphasis more on joint participation and a collaborative approach to achieve outsourcing success. The aim of the research is to understand the strategic outsourcing preferences of Indian firms by examining the impact of the three variables on their outsourcing success.

4.4.1 Independent variables

In research, independent variables would be manipulated or varied by the investigator; thereby dependent variables can be measured (Toivo 2008). The independent variable is said to be presumed as the cause, while the dependent variable is the presumed effect. In this study, outsourcing reasons, 3PL selection criteria, governance mechanism (collaborative approach and MCR), performance measurement, are treated as independent variables and they are expected to predict outsourcing success (dependent variable).

4.4.2 Dependent variables

The dependent variable has been described as the "Presumed effect of, or response to, a change in independent variables". Conversely, this variable is influenced by independent variables (Hair 2010, p. 2). In this study, the only dependent variable is outsourcing success. Outsourcing success is considered as the dependant variable, which is expected to be explained by a set of independent variables (reasons for outsourcing, 3PL selection criteria, governance mechanism, performance measurement).

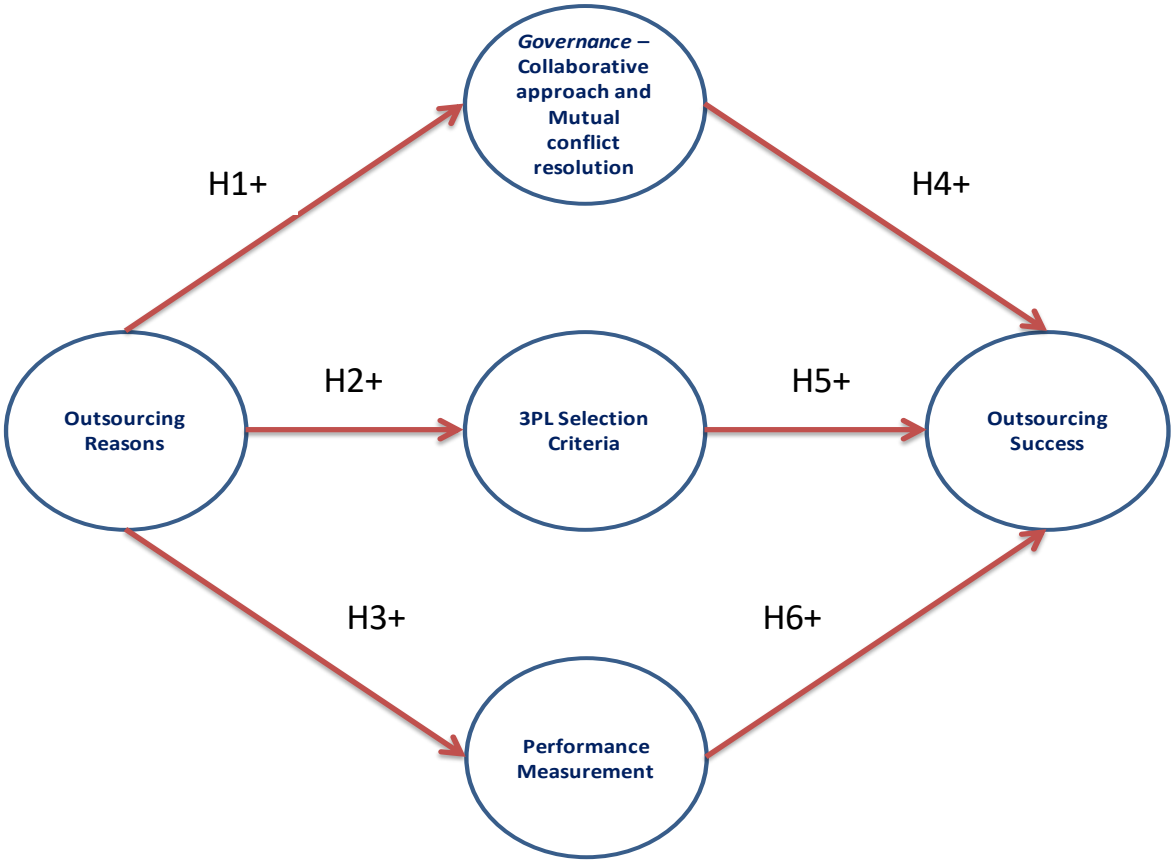

Figure 4.1 Conceptual research framework

The conceptual research framework is expanded to make it realistic and logical. It is not difficult to see that reasons for outsourcing are expected to influence the way outsourcing governance is undertaken, what criteria are used to select 3PL service providers and the performance measurement strategy. For example, a firm opting for outsourcing with emphasis on only economic objectives may use different criteria to select a 3PL compared to a firm that focuses on strategic impact. The same logic holds good for governance mechanism and performance measurement.

4.5 Conclusion

This chapter focuses on a system of ideas and goals aligning to the research objectives and standards. A conceptual framework signifies the researcher's synthesis of literature on how to explain a phenomenon; thus, the proposed conceptual framework is the researcher's explanation of how particular variables in the study connect with each other. The objective of this exercise is to identify the variables required to achieve logistics outsourcing success

through this research investigation. In other words, it is the researcher's investigation map that leads to a desired outcome.

As McGaghie, Bordage and Shea (2001, cited in "*Problem Statement, Conceptual Framework, and Research Question"*, p. 19) describe it:

> The conceptual framework 'sets the stage' for the presentation of the particular research question that drives the investigation being reported based on the problem statement. The problem statement of a thesis presents the context and the issues that caused the researcher to conduct the study.

The next chapter deals with the research methodology and discusses the methods used to collect data, sampling, questionnaire preparation and different types of analysis used to arrive at the conclusion.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 Introduction

Rajasekar, Philominathan, and Chinnathambi (2006 p. 5) define research methodology as a "systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology". It refers to an investigative procedure, based on which the investigation is undertaken. The major aim of this chapter is to present an outline of the investigative methodologies that were used during the preparation of this thesis, including the detailed descriptions of the information gathering and information assessing procedures, survey measurement tool, participants, specifics of the considered sample, and statistical methods of analysis and modeling.

The primary objective of this study was to identify the strategic supply chain outsourcing preferences in India. The empirical study intended to explore the relationship between strategic outsourcing reasons and three variables (enablers) and their impacts on outsourcing success. The three variables identified in this research included, project governance mechanism, 3PL selection, and performance evaluation. This research is based on quantitative research and data collected to enable a variety of data analyses, the method adopted for collecting the data was the online survey method. Surveys are an efficient way of gathering information and processing quantitative data based on a consistent set of questions (Cohen, Manion & Morrison 2013). A web-based survey methodology was adopted for this study. Baatard (2012) explains that surveys should be hosted on a website or domain that can be recognised as trustworthy, legitimate and identified as a survey-hosting website. The invitation to participate in the survey was sent to logistics and supply chain professionals mainly working in manufacturing and service industries. The participants were selected from all levels of hierarchy and age groups.

This section commences with the outline of the investigative plan and study philosophy and elucidates the utilisation of these by the investigator. The section explains the study

intent, the investigative methodology utilised, the populace that was targeted, the size of the sample study, the method used for sampling, tools used in the study, ethical considerations, the dependability of the survey questionnaire and moral concerns. In discussing the methodologies utilised in this investigation, it is essential to take into account the basic intention of the investigation and that the investigative method is suitable for the investigation (Punch 2013). This section further elucidates and validates the use of the sampling methodology applied and justifies employing raw data for this statistical study. The sources of primary and secondary information are clarified with relevant rationales. The compilation of the thorough questionnaire and the procedure utilised are explained in this section, followed by the reliability and validity tests.

5.2 Research Methodology

Quantitative research is based on positivism. The positivist paradigm of exploring social reality is based on the philosophical ideas of the French philosopher, August Comte, who emphasised observation and outcomes as a means of understanding human behaviour (Comte 1868). Cronbach drew attention to the existence of the disciplines of scientific psychology as early as 1957. There are two different types of psychological analysis: the first deals with testing general principles about humans and animal behaviours and is considered as documenting average performances. The second type is involved in interpreting individual differences, in particular, various dimensions of intellectual ability, personality and psychopathology. The first type of researchers conduct experiments on small samples, and the second type draw on samples and responses through survey questionnaires on a large scale. The results are analysed based on t-tests and analyses of variance in the first type, whereas the second type tends to use correlations, regression, and factor analysis techniques (Everitt & Hay 1992). Fadhel Kaboub, Associate Professor of International Studies; Philosophy, Politics and Economics at Denison University, Ohio, explains that in the application of critical judgement in investigating multiple research questions using multiple measures, samples, designs, and analyses are necessary to permit a convergence on valid understanding of a phenomenon (Kaboub 2008). Existing theory is used to develop hypotheses to be tested in research using positivism. Ramanathan (2009) explained the key features of positivism and his findings are presented in Table 5.1.

Table 5.1 Key features of positivism

Characteristics	Positivism
The observer	Must be independent
Human interests	Should be irrelevant
Explanations	Must demonstrate causality
Research progress through	Hypotheses and deductions
Concepts	Need to be operationalised so that they can be measured
Units of analysis	Should be reduced to simplest terms
Generalisation through	Statistical probability
Sampling requires	Large numbers selected randomly

Crowther and Lancaster (2012) explained that, as a general rule, positivist studies usually adopt a deductive approach. Furthermore, it was suggested that the researcher needs to concentrate on facts. The deductive research process follows a structured process that starts with hypothesis formulation, the second step involves data collection from the relevant environment, the third step is to analyse the data collected to present the outcome and determine whether the hypothesis is supported or not. Figure 1 presents the flow of the deductive research process.

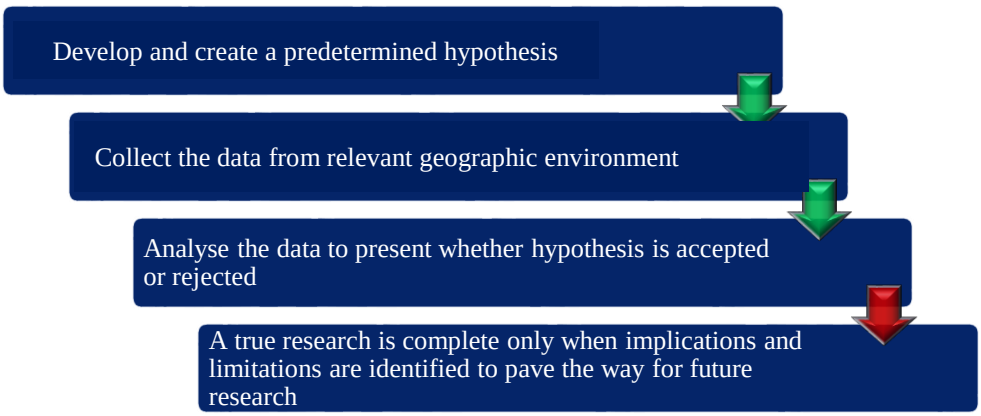

Figure 5.1 Deductive research process flow

Conducting any type of research project can be complex and, at times, frustrating. Some of these problems and issues are common to all types of social research. Unlike the physicist or chemist, social science researchers do not have the benefit of the laboratory and application of some of the processes and methodologies in some situations is impossible due to the uncontrollability factor. Similarly, quantification and statistical analysis and verification may turn out to be problematic in social science research (Lancaster 2005).

Lancaster (2005) explains that analysing data is the process of turning data into information. The purpose of information extracted from the data is decision-making. He further explained that analysis has four key roles —distillation, classification, identification and communication.

Blaxter (2001) identified four terms that illustrate the core objectives and process of analysis, namely: concepts, theories, explanations, and understanding. With concepts, analysis is often aimed at developing understanding about how a researcher thinks about the research topic. Analysis also explains the nature and cause and effect through theories. Through explanation, analysis seeks to make things intelligible, explaining why things are the way they are. Analysis seeks to develop and underpin the knowledge about the meaning of the research topic under consideration.

5.3 Research Design

This thesis is based on three different categories of a general investigative approach: exploration, description, and explanation (Neuman 2006). The exploratory approach is typically used when there is insufficient knowledge of the expected outcomes and intrinsic relationships between the variables. The aim of an exploratory study is to create a better preliminary perception of certain aspects associated with the study. This includes gaining preliminary information about possible relationships between the variables, forming reasonable perceptions about the expected outcomes, and constructing reasonable hypotheses and grounds for further, more detailed and specific studies or analyses (Sekaran 2006). The exploratory approach is typically based on rather simple techniques such as qualitative approaches, case studies, methods of descriptive statistics—including consideration of average values, simple correlation analysis, exploratory factor analysis (EFA), some basic preliminary tests, and so forth. This allows the establishment of approximate possible relationships and trends, as well as possible avenues for further, more detailed and rigorous, analyses and models.

The descriptive approach is typically used after the completion of an exploratory study or if there are reasonable prior expectations of potential outcomes, relationships and trends, and a rather clear understanding of how the analysis should be conducted (e.g., on the basis of the available literature, prior designs, or an exploratory study). A descriptive study should be designed to enable comprehensive outcomes with sufficient scientific rigour and

reliability, based on comprehensive data collection, theoretical or experimental analyses, mathematical models, cataloguing, or other investigative methods to comprehend a certain occurrence (Neuman 2005). The outcomes of a descriptive study should typically provide a reasonable description/prediction of certain effects or occurrences under investigation.

The explanatory approach is typically used where sufficient knowledge of the subject is available (e.g., from the available literature or prior descriptive and/or exploratory studies), and where further explanations or extension of this knowledge are required. An explanatory study typically explains, assesses, improves, backs up, and connects the developed theories and their predictions with observations and occurrences (Neuman 2005).

As indicated at the beginning of section 5.1, the current thesis used all three investigative approaches. The exploratory approaches (in the form of the EFA and summary statistics) were employed for the preliminary consideration of the obtained survey data, understanding and confirming groupings of the survey items into possible factors (latent variables), and for the appropriate selection of suitable mathematical models (described below in this chapter). The descriptive approach was used for the design and implementation of the comprehensive supply chain management (SCM) survey (data collection) based on the prior literature findings and methods, and for the development of rigorous mathematical models on the basis of the survey data and its preliminary exploratory investigation. Finally, it can also be said that this thesis used the explanatory approach as it explained and extended the existing knowledge of SCM into the Indian context, focusing on the detailed examination and explanation of the issues associated with SCM.

5.4 Population and Sampling

One of the key characteristics of positivism study is its large base of randomly selected participants (Ramanathan 2009); hence, every care has been taken to invite survey participants across different industries. The crucial part of the research is data gathering as the data collected contributes to a better understanding of a theoretical framework (Bernard 2011). The survey questions will decide the objectives on which the methodology will be based, hence, choosing the sampling method is critical for data collection (Tongco 2007). Those survey participants who understand the study context and the purpose of the

questions will be able to provide meaningful responses by answering the questions appropriately and thus help meet the objective of these questions.

5.4.1 Recruitment of study participants

To ensure adequate convenience sampling with the targeted sample size of about 300 participants from Indian supply chain organisations, a research company GuiRes Research LLP (32, 1st Cross Street, Kasturba Nagar, Adyar, Chennai- 600 020, Tamil Nadu, India) was engaged to provide further support and to help with the data collection within the India business environment. The participant recruitment process continued for 6 months and targeted SCM professionals from Indian companies involved in manufacturing and trading activities.

An initial attempt was made to search online for Indian supply chains using various keywords in Google, Bing and Yahoo search engines; two databases of more than 120 companies in total were thus created. The identified companies were then approached by phone or email to recruit their suitable employees for participation in the study. Regretfully, none of the approached companies from either of the two constructed databases responded positively in relation to the request for participation in the study, and no suitable study participants were recruited.

In consequence, to ensure coverage of greater audiences of potential participants, a different recruitment procedure was designed using the two social networking online platforms—Facebook™ and LinkedIn™—with two online accounts created specifically for the purpose of recruiting participants for this study. Supply chain professionals/companies/groups were then approached using personalised messages on Facebook and LinkedIn. The total number of Indian SCM professionals contacted through LinkedIn was 407, while 293 professionals were contacted through Facebook.

Another attempt to further boost the number of study participants was undertaken by identifying and directly approaching logistics supply chain companies on the following logistics directories and websites:

- http://www.indiacatalog.com/logistics_directory/logistics_directory.html
- http://www.logisticsindia.net/
- http://chain.net/

- http://www.tradeboss.com/default.cgi/action/viewcompanies/searchterm/supply+chain+managment/searchtermcondition/1/
- http://www.indiacatalog.com/logistics_directory/logistics_directory.html

This was again, largely unsuccessful, with only two additional participants recruited for the study.

The total numbers of approaches and recruiting attempts during the process of recruiting the study participants were, through social networking, more than 700 SCM professionals.

5.4.2 Sample size

As a result of the recruitment procedures outlined above in section 5.3.1, there were 278 responses from the study participants received, which corresponded to an overall response rate of around 40%, thus the overall sample size in this study was 278.

The minimum required sample size depends upon the type of the analysis undertaken with the data. As explained below, the conducted analysis of the obtained survey data was heavily based upon confirmatory factor analysis (CFA) and structural equation modeling (SEM). In this case, an approximate evaluation of the required minimum sample size to ensure statistically significant outcomes can be calculated using the common rule of thumb that approximately 5–10 observations are required per each item or variable (Barclay, Higgins & Thompson 1995; Nunnally, Bernstein & Berge 1967). For each categorical variable, the number of items used to evaluate the sample size is the number of categories less by 1 (the base category is not counted for this evaluation). Each numerical variable on the Likert scale is counted as one item.

The total number of items in the conducted survey was around 230. The required sample size enabling the consideration of all these items simultaneously in a CFA or SEM model would be around 1200, which significantly exceeds the available sample size of 278 participants. A different methodological design was therefore adopted, based on the following approximations enabling reasonable and reliable analyses of the available data:

- The major latent variables (factors) were identified and determined separately using CFA involving only relatively small groups of variables (survey items). The items belonging to each of the groups were identified based on:
    - literature sources using the same or similar items

- outcomes of the initial EFA; and
- trial and error approach to the grouping of the items in accordance with their perceived relevance to the considered latent variable (for more detail see below the description of the CFA method).

The available sample size of 278 participants was sufficient for the CFA modeling (and identification and characterisation of the corresponding latent variables) for groups of up to ~ 30 (or 60) survey items if about 10 (or 5) observations per one item are used as the criterion for the minimum sample size. The conducted CFA analysis in this study used only one model involving 38 items/relationships. All the other models involved less than 30 items/relationships. The available sample size of 278 participants was therefore conventionally sufficient for the reliable statistical analysis of the data and the considered latent variables. Further corroboration of statistical significance and reliability of the obtained results was obtained through the consideration of model fits (see below). The analysis of the six proposed hypotheses testing (Chapter 4) was conducted using SEM. The available sample size restricted the way the corresponding SEM models were developed. Where the sample size permitted, the factors (latent variables) were used together with the items constructing these factors. In most cases, however, the latent variables in the hypothesis models were used as real numerical variables characterised by their factor scores obtained as a result of the separate CFA models for each of this variable. In this approximation, each latent variable can be regarded as one item, and the total number of items/relationships in the considered models did not exceed 30. The available sample size of 278 was again sufficient for the conducted analyses.

5.4.3 Data collection using survey

As indicated in the previous section, the data for this research were collected using the survey questionnaire (Appendix 1), which was developed specifically for this study. The questionnaire validation was achieved by: (1) including the survey items adapted from previously developed and validated in literature sources; and (2) involving one other expert in the area of this thesis and survey design to further consider and validate the developed questionnaire. Fink (1985) explained the advantages and disadvantages of the online survey method. Advantages include the ability to reach the participants worldwide effortlessly, ease of follow-up reminders, and simplified data processing. Some of the disadvantages could include dependability on reliable internet services, software

compatibility, and possibility of survey request going into junk mail boxes. Fink also stated that the online survey method is an increasingly more common means of data collection. As the survey participants were in a different country, a face-to-face interview method was not considered.

Passmore, Dobbie, Parchman, and Tysinger (2002) compared the interview-based surveys and self-administered surveys and the author comprehensively covered all aspects of two different types of collecting data, as explained in the Table 5.2.

Table 5.2 Pros and cons of interview versus self-administered surveys

Interview Surveys	Self-administered Surveys
More expensive (due to personnel, training costs)	Less expensive
Require interviewer recruitment, training, and standardisation	No interviewers needed
Responses not private	Privacy conserved if survey is anonymous
Single administration	Multiple mailings/contacts
Clarification and explanation of items possible	No clarification possible
Few incorrectly completed surveys	Many incorrectly completed surveys
Higher response rate	Lower response rate
Interviewer bias	No interviewer bias

The survey-based technique was used in view of advantages such as cost-effectiveness, wide reach, and because the respondents' privacy was protected as the survey was conducted anonymously. The most important factor was that no interviewer bias was possible. The responses were in numeric form and software tools were used to interpret the results, which avoids the interviewer bias.

A pilot study was undertaken where the questionnaire was distributed to a small sample of potential participants and/or experts with a request to comment on:

- clarity of the items (Fink 2003)
- relevance of the items (Fink 2003)
- overall design of the entire questionnaire (Bryman & Bell 2015)
- time required for completing the questionnaire (Bryman & Bell 2015).

The study can be initiated with a sample survey to determine purposive sampling, based on the pilot study (Brown 2007). To undertake this preliminary evaluation via the pilot study, 10 participants were randomly selected from the first wave of survey answers received and

approached with a request to evaluate the questionnaire. The selection process and criteria for choosing these participants were the same as for the selection of participants for the main study (see below for more detail). The resultant response rate was 100%, that is, responses from all 10 participants were received. None of the received responses contained suggestions of any major corrections required to the questionnaire, and all 10 participants agreed that the entire questionnaire was adequate for the identification and evaluation of the causes and roots of success and failures of supply chain outsourcing. Only minor alterations were suggested by the preliminary study participants, mostly relating to clarity and length of the items, corrections to font size and line spacing. All the proposed corrections were considered and accommodated (if appropriate) into the final version of the survey questionnaire.

The final questionnaire was sub-divided into several sections containing a set of socioeconomic items, questions about participants' organisations, and several sections with the items specifically addressing SCO (supply chain outsourcing) and its success/failures (Appendix 1).

5.4.4 Scale development

To simplify the data analysis and completion of the survey, most of the questionnaire items were multiple-choice questions. Most of the items evaluating the variables associated with the SCO (supply chain outsourcing) success/failures requested the participants to evaluate their opinions on the Likert scale, 1 being the lowest ranking answer to 5 being the highest ranking answer.

There are two types of Likert formats, the first is known as positively worded (PW) format and the second one reverse-worded (RW) format. In general, the RW format is avoided to eliminate confusion among survey participants. The wisdom of using RW format is being questioned recently (Van Sonderen, Sanderman & Coyne 2013), hence, the proposed questionnaire was based on positively worded statements. While measuring a construct, correlation between pairs of items is often higher when they are worded in the same direction (Van Sonderen, Sanderman & Coyne 2013).

Questions known as opinion questions often make a statement and request the survey participants to provide their response of agreement or disagreement. This is usually done by ticking a box or circling a coded reply—this is a verbal scale, known as Likert scale

(Lancaster 2005). To make querying effective, the values submitted through the web survey should be numeric, wherever appropriate; the five-point Likert scale questions ranging from lowest ranking to highest ranking; and the survey participant should be given the option to provide a neutral answer (Baatard 2012).

Opinion-based questions started from Section III of the questionnaire; the following table explains the use of Likert scale from 1 to 5 against each question. There were two types of options given, the first option is 1 = *low importance* and 5 = *high importance* with 3 as *neutral*. The second option was to use 1 = *totally disagree* and 5 = *totally agree* and 3 = *neutral*. Detailed explanation is provided in Table 5.3.

Table 5.3 Likert scale used for opinion-based questions

Section	Question No.	Question	UOM	Scale				
III	*a*	Reason for logistic outsourcing	*Importance*	*Low*	*Slightly*	*Neutral*	*Moderate*	*Very Important*
III	*b*	Does your organization achieve the following objectives by outsourcing Logistics	*Importance*	*Low*	*Slightly*	*Neutral*	*Moderate*	*Very Important*
III	*c*	Problems encountered during logistic outsourcing	*Importance*	*Low*	*Slightly*	*Neutral*	*Moderate*	*Very Important*
III	*d*	Decision to in-source	*Importance*	*Low*	*Slightly*	*Neutral*	*Moderate*	*Very Important*
III	*e*	Criteria for selecting 3PL Service provider	*Importance*	*Low*	*Slightly*	*Neutral*	*Moderate*	*Very Important*
III	*f*	Project Management Implementation	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*g*	Relationship Management - Collaborative Relationship	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*h*	Performance Evaluation	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*i*	Process Integration	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*j*	Price and Reward Mechanism	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*k*	Joint participation approach	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*l*	Mutual Conflict Resolution	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*m*	Organisational Performance	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*
III	*n*	Outsourcing success	*Agree/Disagree*	*Totally Disagree*	*Disagree*	*Neutral*	*Agree*	*Totally Agree*

The constructs and items considered in the current research are listed hereunder:

1. Outsourcing strategy consisted of (1) economic factors = 7 items; (2) strategic factors consisted of three aspects, namely, accelerating business process re-engineering = 2 items, focus on core competence = 4 items, flexibility enhancement = 4 items; (3) environmental factor consisted of three items, IT development = 1 items, globalisation = 1 items and capability of supplier = 3 items

2. Problem encountered during logistic outsourcing included hindrance factors with 18 items

3. Decision to in-source contained insourcing reasons with 8 items

4. 3PL selection criteria included only criteria for selection of 3PL provider with 19 items

5. Project management included 10 items

6. Relationship mechanism contained collaborative relationship with 23 items

7. Joint participation contained 3 items

8. Performance evaluation comprised of strategic planning metrics = 7 items, order planning metrics = 6 items, supplier metrics = 6 items, production metrics = 5 items and delivery performance measure = 9 items

9. Shipper outsourcing objective contained 11 items

10. Organisational performance contained 6 items

11. Outsourcing success contained 9 items.

5.4.5 Item generation

The critical objective of item generation is to consider all potential items to be included in the questionnaire to cover all aspects of ideas and concepts for which the research is seeking answers to the research questions (Kirshner & Guyatt 1985). Items could be generated through literature reviews, in-depth interviews, through group discussions with like-minded individuals, or a combination of these methods, apart from customised items. Item generation should continue until no new items emerge for the relevant survey, the process is called “sampling to redundancy” (Burns et al. 2008). Items can be nominated by a rating method by experts until consensus is achieved and this process is known as the Delphi process (Ehrlich et al. 2006). The next step involves defining the constructs that are explored through the survey process (Passmore et al. 2002) and grouping the constructs into the format of a questionnaire.

The methodology adopted during development of the questionnaire is based on the fundamentals discussed above; all aspects were covered, items were generated through literature review and some of the items were customised for the survey. Furthermore, the questionnaire was built based on the methodology suggested by Ehrlich, Koch, Amin, Liewehr, Steinberg, Turner, and Blauvelt (2006) by positioning the questions on the vertical axis and answers sought on the horizontal axis. The questionnaire was designed based on a single construct articulated through a separate question. To avoid confusion, the question stem was fewer than 20 words, as suggested by Stone (1993). So that the survey participants could answer the questions with ease and clarity, every question explained the perspective from which the question should be addressed, as suggested by Woodward (1988). To encourage the respondents to initiate and complete the questionnaire, the question stems and responses were synthesised (McColl et al. 2001).

Diem (2004) explains that surveys are an effective method to collect data needed for research and evaluation, but he also believes that the method is often misused and abused. He clearly delineated the objective by saying the design of the survey is to accomplish its purpose and made 26 suggestions for an effective survey design. The current research instrument was based on the eight-step method suggested by Passmore, Dobbie, Parchman, and Tysinger (2002) as explained in Table 5.4.

Table 5.4 Steps in developing a survey

Step no.	Steps involved in developing survey
1	State the problem
2	Plan the project
3	State the research question
4	Review the literature
5	Develop/adapt survey items
6	Construct the survey
7	Pilot test the draft survey
8	Administer the survey

Source: Passmore et al. 2002

Table 5.5 Construct: Item and its source

Construct	Item	Literature Reference
Outsourcing reasons: economic factors	Improve profitability	Elms & Low 2013; Zeithaml, Berry & Parasuraman 1996
	Improve operating efficiency	Williams & Waller 2011
	Add value to the product	Prahalad & Hamel 2006; Whipple, Lynch, D. F. & Nyaga 2010
	Improve cash flow	Claver et al. 2002a
	Increase cost efficiency	Claver et al. 2002b
	Make capital funds more available for core area	Mothilal et al. 2012; Sahay & Mohan 2006
	Improve return on assets	Lynch 2004b
Outsourcing reasons: strategic	Improve performance	Chen, Goan & Huang 2011; Jayaram & Tan 2010; Solakivi, Töyli & Ojala 2013
	Increase organizational efficiency	Lynch 2004b
	Improve business focus	Prahalad & Hamel 2006
	Increase competitiveness	Hamel & Prahalad 1990
	Leverage the firm's skill and resources	Corsten & Kumar 2005; Quinn 2013
	Enhance customer satisfaction	Lorentz et al. 2011; McMullan 1996 Sahay & Mohan 2003; Stank et al. 2003
	Reduce constraints of organisation's own production	Customised
	Convert fixed costs to variable costs	Abdallah 2004
	Increase responsiveness to market change	Bottani & Rizzi 2006
	Reduce risk	Van der Valk & van Iwaarden 2011
Outsourcing reasons: environmental - business	To meet increase in demand for new IS and resource more efficiently and economically	Ngai, Cheng, & Ho 2004; Sheikh & Rana 2011
	To help companies gain global advantage	Spencer, Rogers & Daugherty 1994; Razzaque & Sheng 1998a
	To enable partnering to improve service quality	Aktas et al. 2011; Grover, Cheon & Teng 1996
	To improve customer service	Schmidt & Wilhelm 2000; Tompkins1999

Construct	Item	Literature Reference
3PL (Third-Party Logistics) selection criteria	To increase competitive advantage	Prahalad & Hamel 2006; Rumelt 1997
	Price of 3PL services	Smyrlis 2014
	Quality of tactical logistics services	Lynch 2004b
	Range of available value-added services	Rao & Young 1994; Whipple et al. 2010
	Global capabilities and reach and range of service	Dubey & Shah 2010
	Knowledge and advice on supply chain innovations and improvements	Capaldo 2007
	Availability of strategic logistics services	Lynch 2004b
	On-time shipment and deliveries	Bottani & Rizzi 2006; Sasikumar & Haq 2011
	Superior performance rates	Lynch 2004b
	Financial stability of 3PL	Lynch 2004b
	Creative management	Lynch 2004b
	Ability to deliver as promised	Lynch 2004b
	Availability of top management	Lynch 2004b
	Responsiveness to unforeseen occurrences	Wang 2009
	Meet performance and quality requirement before price discussion occurs	Customised
	Reputation of vendor	Lynch 2004b
	Willingness to use logistics manpower	Bourlakis et al. 2011
	Flexibility in operation and delivery	Bottani & Rizzi 2006; Rajesh, Ganesh & Pugazhendhi 2013
	E-commerce capabilities	Corsten & Kumar 2005; Lieb & Bentz 2004; Sahay & Mohan 2006
	Reduction in lead time	Bhatnagar & Viswanathan 2000; Meixell & Kenyon 2010
Governance: Relationship management – Collaborative relationship	The degree of trust between partner (3PL) and organisation (shipper) is essential for outsourcing success	Capaldo 2007; Lai, Tian &Huo 2012; Zhao et al. 2008
	Commitment is essential to describe good partnering relationship	Jap & Ganesan 2000; Zhao et al. 2008

Construct	Item	Literature Reference
	Openness between the parties is important to resolve conflict and discuss difficulty	Lambert, Emmelhainz & Gardner 1996
	Regular communication and sharing of information is central to an effective collaborative relationship	Barclay 1991; Hitt, Keats & DeMarie 1998; Whipple et al. 2010
	Well-understood goals and objectives and be willing to share them openly	Lynch 2004b
	Successful collaboration requires that 3PLs and shippers develop mechanism of shared risk and rewards	Lynch 2004b
	Trust between the 3PL and shipper	Moorman, Zaltman & Deshpande 1992; Svensson 2005
	Top management support	Lynch 2004b
	Adequate resources	Lynch 2004b
	A spirit of partnership between 3PL and shipper	Lambert et al. 1996; Wong & Karia 20102
	Detailed contract terms and conditions.	König & Caldwell 2015
Governance: Mutual Conflict Resolution	A suitable solution was developed that mitigated risk for both parties	Lynch 2004b; Song, Dyer & Thieme 2006
	The situation was resolved to the mutual satisfaction of Logistics Manager (LM) and the supplier	Lynch 2004b; Ndubisi 2011
	The ultimate solution to the situation was cost-effective to both parties	Customised
Performance evaluation: strategic planning metrics	Level of customer perceived value of product	Elmuti 2003
	Variance against budget	Claver et al. 2002a
	Information processing cost	Lynch 2004b
	Net profit vs productivity ratio	Customised
	Total cycle time	Lorentz et al. 2011
	Supply chain performance contributes to total cash flow time	Claver et al. 2002a
	Level of energy utilisation	Customised
Performance evaluation: order planning metrics	Customer query time	Gunasekaran, Patel & Tirtiroglu 2001
	Product development cycle time	Brewer & Speh 2000

Construct	Item	Literature Reference
	Accuracy of forecasting	Makridakis, Hibon & Moser 1979
	Planning process cycle time	Gunasekaran, Patel & McGaughey 2004
	Order entry methods	Keebler & Durtsche 2001a
	Human resource productivity	Lynch 2004b
Performance evaluation: supplier metrics	Supplier delivery performance	Bhatnagar & Viswanathan 2000
	Supplier lead time against industry norms	Customised
	Supplier pricing against market	Lynch 2004b
	Efficiency of purchase order cycle time	Customised
	Efficiency of cash flow method	Rajesh et al. 2013
	Supplier booking in procedures	Customised
Performance evaluation: production metrics	Percentage of defects	Green Jr, Whitten & Inman 2008
	Cost per operational hour	Cook & Bala 2007
	Capacity utilisation	Elmuti 2003
	Range of products and services	Lynch 2004b
	Utilisation of economic order quantity	Gunasekaran et al. 2004
Performance evaluation: delivery performance metrics	Quality of delivered goods	Gunasekaran et al. 2004
	On-time delivered goods	Bottani & Rizzi 2006
	Flexibility of service system to meet customer needs	Rajesh et al. 2013
	Effectiveness of enterprise distribution planning schedule	Customised
	Effectiveness of delivery invoice methods	Customised
	Number of failures delivery notes with invoices	Customised
	Percentage of urgent deliveries	Harland 1997
	Percentage of finished goods in transit	Gunasekaran et al. 2004
	Delivery reliable performance	Joong-Kun Cho et al. 2008
Outsourcing success	We have been able to refocus on core business	Prahalad & Hamel 2006

Construct	Item	Literature Reference
	We have enhanced our IT competency	Sheikh & Rana 2011
	We have increased access to skilled personnel	Cavinato 1999
	We have enhanced economies of scale in human resources	Lynch 2004b
	We have enhanced economies of scale in technological resources	Dubey & Shah 2010
	We have increased control of IS expenses	Fantasia 1993
	We have reduced the risk of technological obsolescence	Hitt et al. 1998
	We have increased access to key information technologies	Rajesh et al. 2013

5.5 Administering the Survey

For simplicity of completion, the survey questionnaire (Appendix 1) was placed on the World Wide Web powered by Google Forms. All identified potential participants were sent an email with the information about the study and a request to participate in the survey by visiting this website and completing the online questionnaire. If a potential participant did not respond and did not fill in the online questionnaire, he/she was approached again after two weeks and the questionnaire (Appendix 1) was resent as a reminder. To maintain the confidentiality of the survey participants, emails were allotted a unique identification number and that number was uploaded into the SPSS software and participant's email addresses were deleted from the survey participant's database after completion of the survey.

The questionnaire link was sent with a covering letter explaining the objectives of the research and assuring confidentiality. The covering letter creates the first impression about the intended survey. The letter should clearly state the objective of the survey and why potential respondents were selected (Dillman 2009). The questionnaire commenced with demographic questions to make the survey participant at ease answering the questions and then slowly ramped up the intensity of the questions.

In every approach requesting participation in the study, a potential participant was also provided with a covering letter entitled 'Information to Participants Involved in Research' and a consent form to participate. The survey participants were provided with the contact

details of the body approving and supervising the research – Victoria University Human Research Ethics Committee, Victoria University, Melbourne, Australia.

5.6 Ethical Approach

An ethical approach in data collection is fundamental to research excellence. As per the Victoria University requirement, it is mandatory to obtain ethics committee approval before conducting any survey. As a responsible surveyor, I applied to the Human Research Ethics Committee of Victoria University and written approval was granted on 9 September 2012. A copy of the approval is attached as Appendix 2.

All the participants surveyed were assured of data confidentiality and that their participation was anonymous.

Survey research is often regarded as an easy research approach. There are several research methods and it is easy to conduct a survey of poor quality, rather than one of high quality that delivers real value. Survey-based research was selected for the present research and, as it involves contact with people, utmost care has been taken before initiating the survey. Ethical behaviour is critical to survey-based research, both the surveyor and the supervisor must demonstrate ethical behaviour (Veal 2005).

5.7 Statistical Tools and Techniques

The statistical analyses in this thesis were conducted using the IBM SPSS and AMOS 24.0.0 statistical software package. This package was chosen based on its capabilities and simplicity in terms of statistical programming (as opposed to working with software interfaces), which enabled significantly more efficient analysis and optimisation of the CFA and SEM models and structures through the consideration and adjustments to obtained model fits and modification indices.

5.8 Preliminary Data Analysis

Preliminary data analysis included the respondents' demographic characteristics by: age, industry, sex of the participant, education level, experience in the current job, functional area, and organisational turnover. Furthermore, the following analyses were conducted:

1. Multivariate outliers analysis

2. Multivariate normality assessment
3. Comparing respondent's characteristics using one-way analysis of variance (ANOVA)
4. Exploratory factor analysis
5. Harman single factor analysis
6. Common latent factor analysis

5.8.1 Missing value assessment

In every research, there is the probability of missing or incomplete data being collected. This may occur for many reasons that include, but are not limited to, the following:

- respondents fail to respond (voluntarily or involuntarily)
- equipment/software or data collection mechanism malfunction
- participant may withdraw from the study before completion
- data entry errors can occur. (Baker & Edwards 2012, p. 426)

5.8.2 Common method bias (variance) analysis

Bagozzi, Yi and Phillips (1991, p. 4) define common method bias (CMB) as the "variance that is attributable to the measurement method rather than to the construct of interest". Richardson, Simmering and Sturman (2009, p. 765) define it as the "systematic error variance shared among variables measured with and introduced as a function of the same method and/or source".

The reason for focusing attention on this subject is that the researcher's conclusions are at risk since the conclusions regarding the model's relationships may be erroneous (i.e., the error is too large for the relationships to be valid). For example, systematic correlations introduce an alternative explanation for the observed correlations between measures. Furthermore, errors from the measurement instrument or method may have both random and systematic elements (Bagozzi et al. 1991).

5.8.3 Sources of common method variance

Reducing CMB in empirical studies begins with an understanding of its various potential sources. Several sources of CMB are listed below.

1. The use of a common source or rater (one source that provides both independent and dependent variables).

2. Self-reporting bias. Their positive or negative perspectives of the research subject can influence each response to varying degrees.

3. The survey instrument's design, complexity, ambiguity and scale format can influence the rater's responses.

4. The item's context (such as its position within the sequence of questions, its spatial relationship to other questions, and the number of questions) can affect the rater's responses based on its stimulus to the rater.

5. A rater's motivation to answer accurately can be impacted based on the survey instrument's characteristics, such as the rater's knowledge of the subject, their perceived ability to process and understand the subject, the length of the survey instrument and any inducements to respond impact their responses, including "Don't Know" or "Not Applicable" options if available.

5.8.4 Methods for assessment of common method bias: Harman Single Factor Analysis

This first technique (Harman 1960) uses EFA where all variables are loaded onto a single factor and this is constrained so that there is no rotation (Podsakoff et al. 2000). This new factor is typically not in the researcher's model; it is introduced solely for this analysis and then discarded. If the newly introduced common latent factor explains more than 50% of the variance, then CMB may be present. The Harman single factor technique has the benefit of simplicity, however, there are also multiple weaknesses. It does not statistically control for this type of variance. There are no specific guidelines on the amount of variation explained by this factor to determine, unequivocally, the existence of this variance. The customary heuristic is to set the threshold to 50%. The method is sensitive to the number of variables involved. Large models have a greater chance for multiple common method factors to exist. As the number of variables increases, this technique becomes less conservative.

5.8.5 Common latent factor

This second technique introduces a new latent variable in such a way that all manifest variables are related to it, those paths are constrained to be equal and the variance of the common factor is constrained to be 1. This is similar to the Harman single factor technique where all manifest variables are related to a single factor; however, the research model's latent factors and their relationships are kept in this analysis. The common variance is estimated as the square of the common factor of each path before standardisation. The common heuristic is to set the threshold to 50%. This technique allows for measurement error, focuses on the measures themselves, and does not require the researcher to identify and measure the specific factor responsible for common method effects.

5.8.6 EFA and CFA

As was explained in section 5.1, this study involved the exploratory, descriptive and explanatory research approaches to the collected data. Despite the conducted validation/evaluation procedures (section 5.2.1), and the fact that most of the questionnaire items were imported (with the appropriate modifications) into the survey from the previous studies (see the references in Appendix 1), the amalgamation of a large number of items from different sources could have potentially caused issues that had not been taken into account and addressed in the previous studies. Therefore, the exploratory research approach was adopted to confirm or otherwise the correctness of the previously proposed and used latent variables (factors) in the context of the developed survey and the intended audience of participants (within the Indian context of SCO).

In addition to EFA, as the preliminary (exploratory) analysis of the expected latent variables (factors or constructs), the internal consistency of between the measured variables (survey items) constituting a latent variable was also investigated by means of the Cronbach's alpha approach (Barclay et al. 1995). Cronbach's alpha typically increases with increasing intercorrelations between the tested items. Intercorrelations are generally larger where the items belong to the same construct. Therefore, Cronbach's alpha is widely used as a measure of internal consistency of a construct from the viewpoint of whether all its items can be reliably assumed to belong to the same construct. Conventionally, values of Cronbach's alpha above 0.9 are regarded as excellent, and as good if within the range $0.7 \leq \alpha < 0.9$ (George & Mallery 2003). It is also important, however, to use this rule of thumb with caution as Cronbach's alpha is typically sensitive to the number of items

involved in the construct (increasing the number of items results in increasing α; Cortina 1993).

In this thesis, Cronbach's alpha was used in two different ways. Firstly, α was used to evaluate the overall levels of internal consistency of the considered constructs at the stage of EFA. Secondly, Cronbach's alpha was also used to identify any items within an assumed construct that might not belong to this construct. To do this, the values of Cronbach's alpha for each selected construct with all the involved items suggested by EFA were calculated. Then one of the items was removed from the construct and the value of Cronbach's alpha calculated again. If the removed item is internally consistent with the construct (i.e., belongs to this construct or latent variable), then the value of Cronbach's alpha should reduce upon the removal of the item (Cortina 1993). If, however, the value of Cronbach's alpha increases upon removal of the considered item, then this item is internally inconsistent with the construct and is likely not to belong to the construct. All items for all considered constructs (latent variables or factors) were checked in this way for internal consistency, and any of those items whose removal caused increases of Cronbach's alphas were discarded from the constructs.

CFA is typically the second step after using EFA and the investigation of the internal consistency of the proposed constructs. It is typically used to confirm and further develop (improve) the latent variables as constructs of the involved measured variables (survey items). The CFA analysis involved the trial and error approach to the development of a suitable model describing the expected latent variables. The items that were indicated as belonging to a particular factor (based on the available literature and the conducted EFA) were included in the initial CFA model. The resultant model fit and goodness-of-fit (GOF) indices (Table 5.6) were used to determine if the developed CFA was statistically acceptable and significant. The modification indices were then used to introduce any required covariances between the variables to achieve the best possible model fit and GOF indices. No survey items (measured variables) were discarded at the stage of CFA from any of the latent variables.

One of the applicability conditions for the CFA analysis is that the dependent variables (survey items) must be distributed normally; however, this was not the case for the obtained survey items. Therefore, to address this issue, the asymptotic distribution-free

method (Browne 1984) for CFA was used instead, allowing the dependent variables to be not normally distributed.

The obtained factors (latent variables or constructs) characterised by their factor scores were then used as new variables for the subsequent SEM analyses. Therefore, the determination of factor scores was essential for the characterisation of these new variables. Factor scores are determined by the linear combinations of the measurable variables (survey items) constituting the factor. The coefficients in these linear combinations are given by the corresponding CFA variable loadings. For example, the environmental factor from the reasons for logistic outsourcing (Section III from Appendix 1) is likely to contain five different items from sub-section C1, C2 and C3. The conducted EFA and Cronbach's alpha analysis confirmed this expectation, and CFA determined the environmental factor with the factor score given by:

$$C_{env} = \frac{w_{env1}V_{env1} + w_{env2}V_{env2} + w_{env3}V_{env3} + w_{env4}V_{env4} + w_{env5}V_{env5}}{w_{env1} + w_{env2} + w_{env3} + w_{env4} + w_{env5}}, \quad (5.1)$$

where Venvj (j = 1,2,3,4,5) are the items (non-standardised variables) in sub-sections C1, C2 and C3 of Section III in Appendix 1:

> Venv1 ≡ s3c18 ("To meet increased demand for new IS and resource more efficiently and economically");
> Venv2 ≡ s3c19 ("To help companies gain global advantage");
> Venv3 ≡ s3c20 ("To enable partnering to improve service quality");
> Venv4 ≡ s3c21 ("To improve customer service");
> Venv5 ≡ s3c22 ("To enable partnering to improve service quality and customer service and increase competitive advantage");

and wenvj (j = 1,2,3,4,5) are their respective loadings in the considered environmental factor (latent variable). The factor scores for all other considered factors can be determined using similar equations with the corresponding measured variables (questionnaire items – Appendix 1). It is also useful to note that, if wenvj = 1 for all j = 1,2,3,4,5, Eq. (5.1) gives a simple average of all the items constituting the environmental factor.

5.9 SEM Analysis

Recently, SEM has become a popular methodology in business research because it allows complex analysis of a number of variables with clear visual presentation of the obtained outcomes. SEM is particularly useful when it comes to the consideration of complex data

with a large number of mutually dependant variables (Lomax & Schumacker 2012), which is characteristic for surveys and questionnaires. Its particular success and advantages originate from its capability to determine and characterise indirect effects caused by some independent variable onto a dependent variable through mediation of a third variable. This enables path analyses showing chains of variables through which causal effects may influence dependent variables and constructs.

The factor scores obtained using equations like Eq. (5.1) enabled the use of these factors as new variables in the SEM analyses aimed at the identification and quantification of the direct and indirect effects of different factors on success of the SCO. The outsourcing success factor (the last section in Appendix 1) was also determined as a latent variable whose factor score was determined using the equation similar to Eq. (5.1), but with the corresponding nine measured variables (Appendix 1) and their factor loadings obtained as a result of the conducted CFA.

Each of the six considered hypotheses (Chapter 4) was studied in detail by means of the SEM analysis. For each hypothesis, significant direct and indirect effects of all relevant factors on the dependent outsourcing success factor were determined and quantified through the corresponding regression coefficients. Some of the important measured variables (survey items) that did not enter with sufficient internal consistency into any of the identified factors were also used in the conducted SEM analyses related to the investigation of the proposed hypotheses. Where the sample size allowed, the dependent outsourcing success factor was used together with its nine measured variables (last section in Appendix 1). Where the considered sample size did not permit the consideration of the outsourcing success factor together with its nine measured variables (i.e., an acceptable model fit, and particularly the χ-square statistic, could not be obtained under the available modification indices), outsourcing success was used as a new variable characterised by its factor score (see Eq. (5.1)). Though this was certainly an approximation, it allowed the SEM analysis with good model fit and reliable determination of the direct and indirect impacts of the considered factors on outsourcing success. To further verify this approximation, both the approaches (with and without the involvement of the nine measured variables of the outsourcing success factor) were used for the conducted SEM analysis for hypotheses 1 and 4, for which the considered sample size allowed both these approaches. The comparison of the obtained outcomes demonstrated only insignificant

differences between the two approaches. This was an additional corroboration of the validity of the approximation where the determined latent variables were used as new real variables characterised by their factor scores.

Thus, the use of the latent variables with their factor scores as real variables in the SEM analyses was not only appropriate, but also offered significant benefits:

1. The number of the obtained latent variables (constructs or factors) was significantly smaller than the number of the survey items (Appendix 1), which made the conducted analyses much simpler and more reliable.

2. The use of the latent variables instead of the survey items improved the model fit and reduced the effects of any possible errors related to the selection and formulation of specific items and survey design.

3. The obtained latent variables serve as overarching quantities and better reflect the major issues associated with SCO and its success and failures, compared to the original survey items (Appendix 1) that are prone to misunderstanding and misinterpretation by the study participants.

The analysis of each of the six hypotheses was focused on the detailed understanding of the average (over the socioeconomic and organisational variables) impacts of the related factors on outsourcing success. The main focus was on this average analysis because it was understood to provide more general pictures associated with outsourcing success and/or failure over a range of industries and companies. Because of averaging of the outcomes over the existing categorical variables (Sections 1 and 2 in Appendix 1), use of SEM was possible and justified. As a result, the quantitative evaluation and determination of the model fits and GOF indices (table 5.6) for each considered hypothesis were allowed and conducted. This would not have been possible had the obtained outcomes been adjusted to the categorical socioeconomic variables (in the presence of categorical variables generalised SEM should have been used, which does not allow consideration and evaluation of the quantitative model fits and modification indices).

Table 5.6 Goodness-of-Fit Indices

Confirmatory Factor Analysis (CFA) (GOF measure)	Acceptable values	References
Chi-square CMIN	Not applicable	
Degree of freedom	Not applicable	
CMIN/DF	Chi-square/ df ≤5	Bentler 1989
P-value	p≤0.05	Hair et al. 2006
Root mean square residual (RMR)	No established thresholds (the smaller the better)	Hair et al. 2006
Goodness-of-fit (GOF)	≥ 0.90 (the higher the better)	Hair et al. 2006
Comparative fit index (CFI)	≥ 0.90	Hair et al. 2006
Root mean square error of approximate (RMSEA)	< 0.08	Hair et al. 2006
Normed fit index (NFI)	≥ 0.90	Hair et al. 2006
Incremental fit index (IFI)	≥ 0.90	Hair et al. 2006
Incremental fit index (IFI)	≥ 0.90	Hair et al. 2006

5.10 Conclusion

The chapter has explored the investigative methodology and justification employed for choosing different factors that are correlated to the investigation. This also comprises the choice of suitable investigative plans, information gathering methods and statistical methodologies and assessments that were executed for the data examination. The primary and secondary information were utilised in the investigation. The vital information gathering method employed in the investigative procedure was the questionnaire methodology to backup and affirm the quantitative results. SPSS (IBM) v.24 was employed for the data examination procedure so that quantitative information was examined and presented and further implemented both descriptive and inferential statistics. Several assessments and examination methods such as percentage analysis and chi-square test were used in the investigative procedure for examining information and studying the hypotheses.

It is apparent from the investigative method that the study procedure has employed a positivistic or interpretive investigative philosophy, deductive study method, and content analytic study plan. The reasons for adopting these methods have also been clarified. The information gathering procedure was based on a web-based survey method. The queries drafted and adopted hypotheses have been further described thoroughly in the investigative method. The references for the queries drafted for the survey questionnaire have been

further explained in this section. The results of the tools, when executed over the respondents, are stated in the subsequent section.

The 20th century ushered great technological advancements, enabling organisations and researchers to collect opinions in the form of data and conduct analysis to conclude the outcomes. This study is empirical research based on a survey method. The research success depends upon the effective research methodology as described in this chapter with its focus on the methods of data collection, sample size and survey method, and so forth. The data collected through the survey was used to conduct statistical analysis such as EFA, CFA, and SEM to test the hypotheses, which will be presented in chapters 6 and 7.

CHAPTER 6

PRELIMINARY DATA ANALYSIS

6.1 Introduction

This chapter presents the results and analysis of the survey data collected through the "Strategic Outsourcing of Supply Chain: The India model" questionnaire from various organisations in India. The data were analysed for sample size adequacy, demographic profile of respondents, missing value assessment, multivariate outlier assessment, and comparison of respondents' characteristics, non-response bias assessment, multivariate normality assessment, multicollinearity test, unidimensionality test and common method variance assessment. The prime object of this analysis is data cleansing. Furthermore, EFA was conducted for factor reduction. The software used for this analysis was SPSS (IBM Corporation, Version 24).

Using the descriptive statistics mode of SPSS, frequencies were calculated for the categorical variables. Reliability analysis was used to find out the reliability of the multi-item scale using Cronbach's alpha. Factor analysis was used to determine the underlying dimensions of multi-item measurement scales use and structural equation modeling (Efendigil et al. 2008) analysis was also performed.

6.2 Sample Size

The overall response to 702 invitations sent was 297, which was a 42% response rate. This was in line with the comparisons of response rates to paper-based and online surveys provided by Nulty (2008) that indicate online survey response rates range from 20 to 47%. The sample size considered after eliminating the missing values was 278. The sample size (n = 278) obtained for this study must be assessed for its representativeness of the population from which the sample was drawn. Apart from selecting the research topic and research design, an adequate sample is fundamental to creating credible research that could produce reliable analysis and reporting (Marshall et al. 2013).

6.3 Demographic Profile of Respondents

The data collected from 278 respondents were used in two sections with the first explaining the demographic categorisation and the second used to compare mean score of perceptions towards measurement items.

The respondents were categorised into seven demographic characteristics: type of industry, gender, age group, educational level, and experience in the organisation, functional area and job title. Summaries of these demographic characteristics are presented in Tables 6.1 to 6.6.

6.4 Missing Value Assessment

In every research, there is a great probability of missing/incomplete data collected. This could occur for many reasons that include, but are not limited to, the following (Baker & Edwards 2012):

- respondents fail to respond (voluntarily or involuntarily)
- equipment/software or data collection mechanism malfunction
- participant may withdraw from the study before completion
- data entry errors can occur.

Missing value assessment is the one of the critical roles in data management and cleansing. In the current survey, there were nine respondents who did not complete some items in the questionnaire or left 10 questions unanswered. This was detected during the process of data cleansing. The dataset considered for the analysis was complete in all respects. To rule out any missing values, Little's Missing Completely at Random (MCAR) Test was conducted in SPSS and the test revealed no missing values.

6.5 Multivariate Outliers

Multivariate outliers refer to the observation values that are different from a unique combination of measurement items or most of the whole dataset. In this research study, the standard score (z score) assessment technique was employed to assess the outliers and none of the items were less the -3 and 3 (Hair 2009). All observations were therefore used in further analysis.

6.6 Multivariate Normality Assessment

Multivariate normality of individual measurement items, as well as the combination of measurement items, must be normally distributed (Hooley & Hussey 1994). In this study, a Q-Q plot of each measurement item was generated, revealing that all data were scattered closely to a straight line—thus, the dataset was confirmed to be normally distributed. To further validate the normal distribution, the skewness and kurtosis test was conducted, and the test results were within the approved range of skewness (less than 3) and kurtosis (less than 10) (Kline 2015).

Table 6.1 Summary of respondents' demographic characteristics by type of industry and gender (N = 278)

Gender	Manufacturing		Service		Others		Total	
	n	***%***	***n***	***%***	***n***	***%***	***n***	***%***
Male	52	18.7%	157	56.5%	30	10.8%	239	86.0%
Female	9	3.2%	24	8.6%	6	2.2%	41	14.0%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

Table 6.1 shows that 21.9% of respondents worked in the manufacturing industry, with the remaining 65.1% and 13.0% employed by service and other industry, respectively. Study respondents were predominantly male (86%) versus 14% female.

Table 6.2 Summary of respondents' demographic characteristics by type of industry and age group (N = 278)

Age group	Manufacturing		Service		Others		Total	
	n	***%***	***n***	***%***	***n***	***%***	***n***	***%***
21–30	26	9.4%	95	34.2%	25	9.0%	146	52.5%
31–40	30	10.8%	65	23.4%	5	1.8%	100	36.0%
41–50	2	0.7%	13	4.7%	2	0.7%	17	6.1%
>50	3	1.1%	8	2.9%	4	1.4%	15	5.4%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

Table 6.2 indicates that respondents were classified into four groups according to their age, with 52.5% aged 21–30 years, 36.0% aged 31–40 years, 6.1% aged 41–50 years and 5.4% were >50 years.

Table 6.3 Summary of respondents' demographic characteristics by type of industry and education level (N = 278)

Education level	Manufacturing		Service		Others		Total	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Secondary school	1	0.4%	0	0.0%	0	0.0%	1	0.4%
High school	1	0.4%	2	0.7%	0	0.0%	3	1.1%
High Institute level	4	1.4%	3	1.1%	1	0.4%	8	2.9%
University level	20	7.2%	63	22.7%	17	6.1%	100	36.0%
Post-graduate level	35	12.6%	113	40.6%	18	6.5%	166	59.7%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

* High Institute = technical diploma and qualification before university degree.

Table 6.3 shows that the majority of the respondents held qualifications at post-graduate level (59.7%), followed by university level (36.0%), high institute level (2.9%), high school (1.0%) and secondary school (0.3%), respectively.

Table 6.4 Summary of respondents' demographic characteristics by type of industry and experience in the organisation (N = 278)

Experience in the organisation	Manufacturing		Service		Others		Total	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
< 2 years	19	6.8%	88	31.7%	23	8.3%	130	46.8%
< 4 years	21	7.6%	34	12.2%	2	0.7%	57	20.5%
< 6 years	10	3.6%	19	6.8%	3	1.1%	32	11.5%
< 8 years	3	1.1%	23	8.3%	2	0.7%	28	10.1%
> 8 years	8	2.9%	17	6.1%	6	2.2%	31	11.2%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

Table 6.4 indicates the number of years in the current organisation, rather than overall experience, with most of the respondents having experience in their organisation of <2 years (46.1%), <4 years (20.9%), <6 years (11.8%), >8 years (11.4%) and <8 years (9.8%).

Table 6.5 Summary of respondents' demographic characteristics by type of industry and functional area (N = 278)

	Manufacturing		Service		Others		Total	
Functional area	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Accounting	1	0.4%	0	0.0%	0	0.0%	1	0.4%
Finance	1	0.4%	3	1.1%	0	0.0%	4	1.4%
Marketing	15	5.4%	31	11.2%	3	1.1%	49	17.6%
Manufacturing	11	4.0%	4	1.4%	0	0.0%	15	5.4%
Research and development	0	0.0%	17	6.1%	2	0.7%	19	6.8%
Personnel	0	0.0%	0	0.0%	1	0.4%	1	0.4
Logistics and SCM	33	11.9%	113	40.6%	16	5.8%	162	58.3%
Information systems	0	0.0%	9	3.2%	0	0.0%	9	3.2%
Others	0	0.0%	4	1.4%	14	5.0%	18	6.5%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

As shown in Table 6.5, most of the respondents were working in the functional areas of logistics and SCM (58.3%), manufacturing (5.4%), research and development (6.8%), others (6.5%), manufacturing (5.4%), information systems (3.2%), finance (1.4%), respectively, with the fewest in accounting and personnel (0.4%).

Table 6.6 Summary of respondents' demographic characteristics by type of industry and job title (N = 278)

	Manufacturing		Service		Others		Total	
By job title	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Specialist	6	2.2%	49	17.6%	2	0.7%	57	20.5%
Manager	25	9.0%	48	17.3%	10	3.6%	83	29.9%
Team Leader	13	4.7%	29	10.4%	2	0.7%	44	15.8%
Director	5	1.8%	12	4.3%	0	0.0%	17	6.1%
Executive/VP	3	1.1%	14	5.0%	7	2.5%	24	8.6%
Others	9	3.2%	29	10.4%	15	5.4%	53	19.1%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

When the respondents reported their job title within their organisations most (29.9%) held the position of manager. Other distributions as shown in Table 6.6 reflect respondents' roles as specialist (20.5%), while 19.1% had other titles, 15.8% were handling the role of Team Leader, 8.6% worked as Executive/VP and 6.1% reported a role as Director, respectively.

Table 6.7 Summary of respondents based on industry and revenue value (N = 278)

Approximate sales volume (US$) – 2011*million	Type of Organisation							
	Manufacturing		Service		Others		Total	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
<$50m	14	5.0%	65	23.4%	9	3.2%	88	31.7%
$50m–$100m	15	5.4%	56	20.1%	8	2.9%	79	28.4%
$101m–2$50	16	5.8%	28	10.1%	5	1.8%	49	17.6%
$251m–$500m	10	3.6%	14	5.0%	10	3.6%	34	12.2%
>$500m	6	2.2%	18	6.5%	4	1.4%	28	10.1%
Total	61	21.9%	181	65.1%	36	12.9%	278	100.0%

In Table 6.7 the respondents' turnover according to the type of industry is presented. This turnover was categorised into five groups, of these, 31.7% were below US$50m; 28.4% were between US$50m to US$100m and 17.6% were between US$101m to US$250m. There were 12.2% whose turnover was between US$251m to US$500m and only 10.1% who had a turnover above US$500m. Out of all the respondents 21.9% were from the manufacturing industry and 65.1% from service industries.

Table 6.8 Summary of respondents' characteristics

Variable		Manufacturing		Service		Others		Total	
		N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Gender	*Male*	52	19%	157	56%	30	11%	239	86%
	Female	9	3%	24	9%	6	2%	39	14%
	Total	61	22%	181	65%	36	13%	278	100%
Age Group	*21-30*	26	9%	95	34%	25	9%	146	53%
	31-40	30	11%	65	23%	5	2%	100	36%
	41-50	2	1%	13	5%	2	1%	17	6%
	>50	3	1%	8	3%	4	1%	15	5%
	Total	61	22%	181	65%	36	13%	278	100%
Educational Level	*Secondary School*	1	0%	0	0%	0	0%	1	0%
	High School	1	0%	2	1%	0	0%	3	1%
	*High Institute**	4	1%	3	1%	1	0%	8	3%
	University	20	7%	63	23%	17	6%	100	36%
	Post Graduate	35	13%	113	41%	18	6%	166	60%
	Total	61	22%	181	65%	36	13%	278	100%
Experience in the Organisation	*<2 Years*	19	7%	88	32%	23	8%	130	47%
	<4 Years	21	8%	34	12%	2	1%	57	21%
	<6 Years	10	4%	19	7%	3	1%	32	12%
	<8 Years	3	1%	23	8%	2	1%	28	10%
	>8 Years	8	3%	17	6%	6	2%	31	11%
	Total	61	22%	181	65%	36	13%	278	100%
Job Title	*Specialist*	6	2%	49	18%	2	1%	57	21%
	Manager	25	9%	48	17%	10	4%	83	30%
	Team Leader	13	5%	29	10%	2	1%	44	16%
	Director	5	2%	12	4%	0	0%	17	6%
	Executive/VP	3	1%	14	5%	7	3%	24	9%
	Others	9	3%	29	10%	15	5%	53	19%
	Total	61	22%	181	65%	36	13%	278	100%
Approximate Sales Volume (US $) Y 2011 in Millions	*<$ 50 M*	14	5%	65	23%	9	3%	88	32%
	$50 - $100 M	15	5%	56	20%	8	3%	79	28%
	$101 - $250 M	16	6%	28	10%	5	2%	49	18%
	$251 - $ 500 M	10	4%	14	5%	10	4%	34	12%
	> $500 M	6	2%	18	6%	4	1%	28	10%
	Total	61	22%	181	65%	36	13%	278	100%

* High Institute – technical diploma and qualification before university degree.

6.7 Comparing Respondents' Characteristics

One-way analysis of variance (ANOVA) was employed to compare the perceptions of respondents towards the questionnaire (measurement items) whose demographic characteristics differed. If their attitudes were not affected by their demographic characteristics, the dataset can be seen as representative of the wider population from which the sample was drawn, and the entire sample can be used as one element in subsequent data analyses (Chen & Paulraj 2004).

Table 6.9 ANOVA for variables with gender

Variables	Gender		F-value	P- value
	Male	Female		
	Mean±SD			
Success of outsourcing	3.74±0.77	3.79±0.78	0.154	0.695
Collaborative approach	4.06±0.95	3.85±0.95	1.654	0.199
Joint participation	3.93±0.83	4.06±0.90	0.912	0.340
Mutual conflict resolution	3.84±0.68	3.81±0.58	0.056	0.813
Strategic planning metrics	3.28±0.88	3.81±0.58	0.003	0.956
Order planning metrics	3.34±1.02	3.42±1.07	0.227	0.634
Supplier metrics	3.50±0.93	3.75±0.82	2.554	0.111
Production metrics	3.48±0.92	3.41±0.97	0.242	0.623
Delivery performance measures	3.50±.090	3.59±0.95	0.338	0.561
Objective	3.80±0.81	3.80±0.86	0.001	0.975
Organisational performance	3.47±0.81	3.43±0.65	0.083	0.773
3PL service provider	3.58±.057	3.64±0.59	0.351	0.554
Project management implementation process	3.90±0.82	3.85±0.88	0.096	0.757
Economic factors	3.68±0.65	3.72±0.60	0.197	0.657
Strategic factors	3.56±0.75	3.62±0.69	0.256	0.613
Environmental factors	3.47±0.95	3.62±0.90	0.962	0.327

Table 6.9 clearly shows that all the variables of interest were not affected due to gender differences. This means that there is no significant difference between males and females in terms of variables identified in the study.

Table 6.10 ANOVA for variables for age group

	Age group (years)					
	21-30	**31-40**	**41-50**	**>50**	**F-value**	**P- value**
Variables	**Mean±SD**					
Success of outsourcing	3.73±0.66	3.76±0.92	3.64±0.86	3.96±0.26	0.548	0.650
Collaborative approach	4.06±0.95	3.99±1.02	4.08±1.01	4.02±0.65	0.141	0.935
Joint participation	3.91±0.81	3.98±0.90	3.80±0.97	4.27±0.19	1.120	0.341
Mutual conflict resolution	3.70±0.69	3.96±0.69	4.12±0.41	3.87±0.30	4.753	0.003**
Strategic planning metrics	3.16±0.79	3.41±0.97	3.52±1.03	3.16±0.48	2.451	0.064
Order planning metrics	3.18±1.01	3.54±1.02	3.58±1.13	3.20±0.77	3.089	0.027*
Supplier metrics	3.44±0.88	3.61±0.98	3.83±0.83	3.46±0.86	1.581	0.194
Production metrics	3.32±0.86	3.57±0.98	3.87±0.99	3.57±0.65	3.333	0.020*
Delivery performance measures	3.35±0.85	3.68±0.94	3.83±0.98	3.38±0.62	4.086	0.007**
Objective	3.86±0.64	3.66±1.00	4.16±0.82	3.65±0.58	3.095	0.027*
Organisational performance	3.26±0.71	3.72±0.82	3.73±0.81	3.27±0.67	8.881	0.000**
3PL service provider	3.62±0.55	3.58±0.62	3.41±0.55	3.64±0.49	.980	0.403
Project management implementation process	3.94±0.87	3.82±0.79	3.88±0.90	3.98±0.47	0.519	0.669
Economic factors	3.64±0.58	3.68±0.75	3.81±0.68	3.86±0.37	0.908	0.437
Strategic factors	3.49±0.68	3.58±0.81	3.81±0.78	3.91±0.50	2.454	0.063
Environmental factors	3.44±0.85	3.50±1.02	3.59±1.11	3.70±0.99	0.479	0.697

**p< 0.01, *p < 0.05

The data shown in Table 6.10 clearly indicates that some of the variables of interest were affected by age difference. From 16 variables, however, only six variables (37.5%) were found to be statistically significant across the genders. This means 62.5% of the variables did not show any difference across the genders.

Table 6.11 ANOVA for variables experience (years)

Variables	Experience (Years)					F-value	P-value
	<2 years	< 4 years	< 6 years	< 8 years	> 8 years		
	Mean±SD						
Success of outsourcing	3.85±0.68	3.43±0.97	3.85±0.57	3.82±0.65	3.73±0.84	3.598	0.007**
Collaborative approach	4.15±0.88	3.73±1.21	4.23±0.71	3.97±0.99	3.97±0.94	2.391	0.051*
Joint participation	4.04±0.80	3.68±1.01	4.10±0.62	3.86±0.77	3.96±0.86	2.404	0.050*
Mutual conflict resolution	3.83±0.71	3.78±0.73	3.88±0.56	3.77±0.64	3.99±0.51	0.662	0.619
Strategic planning metrics	3.32±0.92	3.05±0.90	3.59±0.56	3.14±0.74	3.34±0.94	2.437	0.047*
Order planning metrics	3.34±1.06	3.13±.1.02	3.81±0.82	3.22±0.87	3.40±1.10	2.739	0.029*
Supplier metrics	3.61±0.97	3.22±0.90	3.68±0.65	3.59±0.80	3.57±0.98	2.455	0.046*
Production metrics	3.51±0.96	3.18±0.93	3.79±0.75	3.37±0.92	3.56±0.77	2.905	0.022*
Delivery performance measures	3.53±0.93	3.23±0.92	3.86±0.71	3.64±0.84	3.49±0.87	2.962	0.020*
Objective	3.89±0.79	3.44±0.93	4.07±0.55	3.61±0.92	3.95±0.56	5.356	0.000**
Organisational performance	3.41±0.86	3.37±0.70	3.62±0.75	3.55±0.60	3.65±0.80	1.318	0.263
3PL service provider	3.65±0.47	3.36±0.70	3.75±0.47	3.63±0.57	3.55±0.68	3.711	0.006**
Project management implementation process	4.05±0.83	3.65±0.82	3.86±0.75	3.80±0.82	3.81±0.81	2.780	0.027*
Economic factors	3.74±0.63	3.38±0.71	3.90±0.50	3.65±0.51	3.80±0.65	5.168	0.000**
Strategic factors	3.65±0.74	3.21±0.76	3.72±0.68	3.58±0.50	3.73±0.74	5.021	0.001**
Environmental factors	3.62±0.89	3.01±1.04	3.62±0.81	3.60±0.74	3.61±1.02	5.289	0.000**

**P < 0.01, *P < 0.05

As shown in Table 6.11, most of the variables of interest were affected due to differences in the respondents' years of experience.

Table 6.12 ANOVA for variables with job position (title)

Variables	Job Position						F-value	P-value
	Specialist	Manager	Team Leader	Director	Executive/VP	Others		
	Mean±SD							
Success of outsourcing	3.90±0.83	3.63±0.94	3.76±0.64	3.68±0.63	3.66±0.68	3.83±0.52	1.105	0.358
Collaborative approach	4.24±1.07	3.89±1.10	4.02±0.80	4.14±0.77	4.00±1.03	4.03±0.71	1.034	0.398
Joint participation	3.97±0.91	3.81±0.96	4.05±0.76	3.63±0.91	3.95±0.81	4.18±0.50	2.024	0.075
Mutual conflict resolution	3.91±0.82	3.87±0.71	3.89±0.40	3.96±0.16	3.58±0.83	3.72±0.61	1.481	0.196
Strategic planning metrics	3.46 ±0.97	3.30±0.99	3.32±0.68	3.15±0.66	3.13±0.90	3.13±0.74	1.038	0.396
Order planning metrics	3.42±1.05	3.40±1.12	3.42±0.82	3.01±0.71	3.49±1.17	3.15±0.99	1.049	0.389
Supplier metrics	3.76±0.93	3.64±1.02	3.44±0.64	3.46±0.60	3.41±0.88	3.27±0.99	2.081	0.068
Production metrics	3.67±0.99	3.58±1.03	3.38±0.66	3.40±0.77	3.28±0.92	3.26±0.86	1.722	0.129
Delivery performance measures	3.62±0.95	3.62±1.03	3.46±0.64	3.25±0.81	3.51±0.84	3.33±0.85	1.213	0.303
Objective	4.01±0.84	3.75±0.91	3.64±0.80	3.72±0.40	0.83±1.04	3.80±0.53	1.313	0.258
OP	3.61±0.86	3.60±0.86	3.49±0.61	3.36±0.68	3.22±0.82	3.20±0.67	2.769	0.018*
3PL service provider	3.62±0.60	3.48±0.63	3.74±0.57	3.60±0.47	3.55±0.53	3.63±0.48	1.468	0.200
PMI process	3.98±0.95	3.90±0.84	3.76±0.73	4.04±0.61	3.70±0.85	3.94±0.78	0.820	0.536
Economic factors	3.89±0.72	3.65±0.71	3.66±0.55	3.62±0.55	3.61±0.58	3.59±0.54	1.638	0.150
Strategic factors	3.81±0.81	3.57±0.81	3.58±0.61	3.49±0.58	3.59±0.75	3.30±0.61	2.769	0.018*
Environmental factors	3.54±0.99	3.41±1.09	3.37±0.89	3.63±0.81	3.73±0.87	3.51±0.73	0.710	0.617

*OP = Organisational performance; PMI = Project management implementation, **p < 0.01, *p < 0.05

The ANOVA results of attitude versus measurement items are presented in Tables 6.9 to 6.12. The attitude of respondents towards supply chain factors was found to be significant if $p < 0.05$ and $p < 0.01$. It is denoted by * and ** in the tables.

6.8 Exploratory Factor Analysis

Exploratory factor analysis (EFA) is concerned with how many factors are necessary to explain the relations among a set of indicators representing a latent factor. Most researchers use EFA to interpret the constructs, rather than reducing the data (Conway & Huffcutt 2003).

6.8.1 EFA related to reasons for outsourcing: economic reasons

EFA was performed on seven items of economic reasons for outsourcing and the reported KMO measure of sampling adequacy was .917. Bartlett's test of sphericity rejects the null hypotheses that the correlation matrix is proportional to an identity matrix (χ^2 (21) = 1239.736, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the reasons for outsourcing scale. Table 1 reports the factors extracted, and the variance explained by each factor extracted, using the principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. One factor accounted for 61.841% of the total variability in the data. Figure 6.1 gives the scree plot of the EFA related to reasons for outsourcing scale. The scree plot also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.13 reports the factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table (Hair 2010).

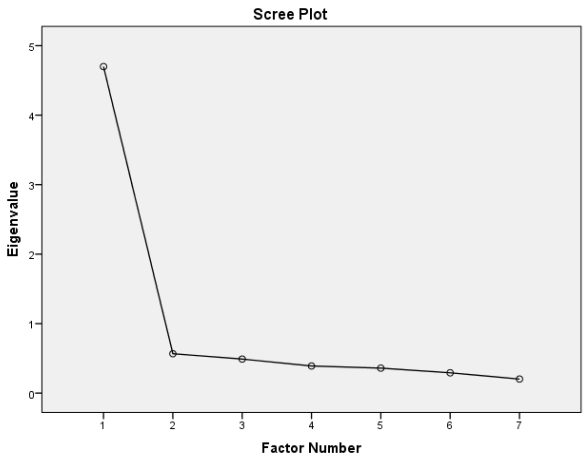

Figure 6.1 Scree plot for EFA for economic reasons for outsourcing

Table 6.13 Component matrix of EFA for economic reasons for outsourcing scale

Measure	Factor 1
Improve profitability	.703
Improve operating efficiency	.805
Add value to the product	.736
Improve cash flow	.883
Increase cost efficiency	.791
Make capital funds more available for core area	.829
Improve return on asset	.742

Extraction Method: Principal Axis Factoring. 1 factor extracted. 5 iterations required.

6.8.2 EFA related to reasons for outsourcing: strategic reasons

EFA was performed on six items of strategic reasons for outsourcing with a reported KMO measure of sampling adequacy being .947. Bartlett's test of sphericity rejects the null hypotheses that the correlation matrix is proportional to an identity matrix (χ^2 (45) = 2444.629, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the scale for reasons for outsourcing. Table 6.14 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. One factor accounted for 67.689% of the total variability in the data. Figure 6.2 gives the scree plot of the EFA for reasons for outsourcing scale. The scree plot also indicates three factor structures as the appropriate reduced dimension of the data. Table 2 reports the factor loadings for

different items. Only factor loadings > 0.40 in magnitude are reported in the table (Hair 2010).

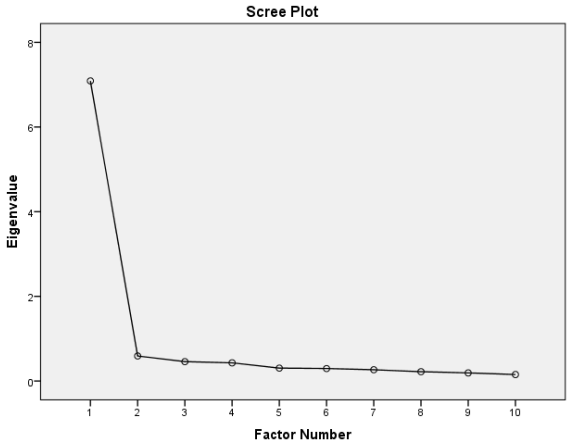

Figure 6.2 Scree plot for EFA for strategic reason for outsourcing

Table 6.14 Component matrix of EFA for economic reasons for outsourcing scale

Measure	Factor 1
Improve performance	.807
Increase organizational efficiency	.842
Improve business focus	.828
To increase competitive advantage	.880
Leverage the firm's skill and resources	.845
Enhance customer satisfaction	.762
Reduce constraints of organisation's own production	.807
Convert fixed costs to variable costs	.813
Increase responsiveness to market change	.834
Reduce risk	.803

Extraction Method: Principal Axis Factoring. 1 factor extracted and 4 iterations required.

6.8.3 EFA related to reasons for outsourcing: environmental reasons

EFA was performed on five items of environmental reasons for outsourcing with a reported KMO measure of sampling adequacy of .893. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (10) = 1248.129, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for reasons for outsourcing. Table 6.15 reports the

factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. One factor accounted for 76.543% of the total variability in the data. Figure 6.3 gives the scree plot of the EFA related to reasons for outsourcing scale. The scree plot also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.15 reports the factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table (Hair 2010).

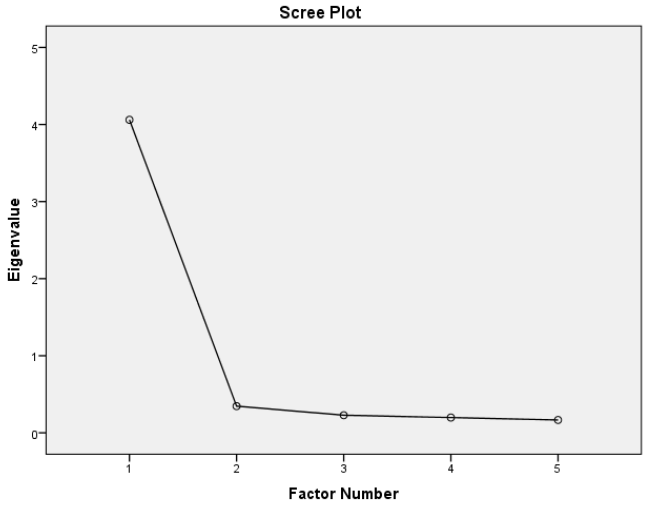

Figure 6.3 Scree plot for EFA for environmental reason for outsourcing

Table 6.15 Component matrix of EFA for environmental reason for outsourcing scale

Measure	Factor 1
To meet increase in demand for new IS and resource more efficiently and economically	.847
To help companies gain global advantage	.863
To enable partnering to improve service quality	.893
To improve customer service	.893
To enable partnering to improve service quality and customer service and increase competitive advantage	.878

Extraction Method: Principal Axis Factoring. 1 factor extracted and 5 iterations required.

6.8.4 EFA for 3 PL selection criteria

EFA was performed on 19 items of 3PL selection criteria and reported a KMO measure of sampling adequacy of .874. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (171) = 7348.712, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the scale 3PL selection criteria. Table 6.16 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered. Three factor structures are reported with these three factors accounting for 74.277% of the total variability in the data. Figure 6.4 gives the scree plot of the EFA for 3PL selection criteria. The scree plot also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.16 reports the rotated factor matrix reporting factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table.

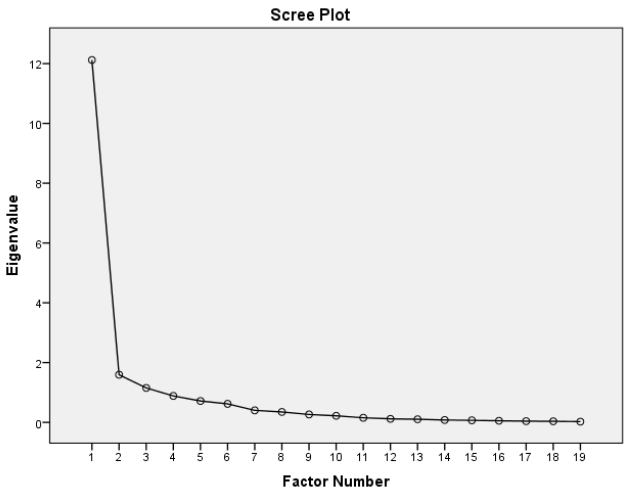

Figure 6.4 Scree plot for EFA for 3 PL selection criteria

Table 6.16 Component matrix of EFA for 3 PL selection criteria

Measure	Factor		
	1	2	3
Price of 3PL services	.796		
Quality of tactical logistics services	.806		
Range of available value-added services	.778	.401	
Global capabilities and reach and range of service	.829		
Knowledge and advice on supply chain innovations and improvements	.615	.564	
Availability of strategies logistics services	.837		
On-time shipment and deliveries	.838		
Superior performance rates	.690	-.512	
Financial stability of service provider	.784		
Creative management	.811	-.480	
Ability to deliver as promised	.872		
Availability of top management	.789		
Responsiveness to unforeseen occurrences	.818		
Meet performance and quality requirement before price discussion occurs	.844		
Reputation of 3PL party	.563		
Willingness to use logistics manpower	.827		
Flexibility in operation and delivery	.773		
E-commerce facility of service provider	.854		
Reduction in lead time	.822		

Extraction method: Principal Axis Factoring
3 factors extracted and 8 iterations required

6.8.5 EFA for collaborative approach

EFA was performed on 13 items of collaborative relationship and reported a KMO measure of sampling adequacy of .951. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (231) = 5946.980, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the collaborative relationship scale. Table 6.17 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered. A single factor structure is reported. Figure 6.5 gives the scree plot of the EFA for collaborative relationship and also indicates a single factor structure as appropriate from the data.

Table 6.17 reports the factor matrix reporting factor loadings for items for the single factor.

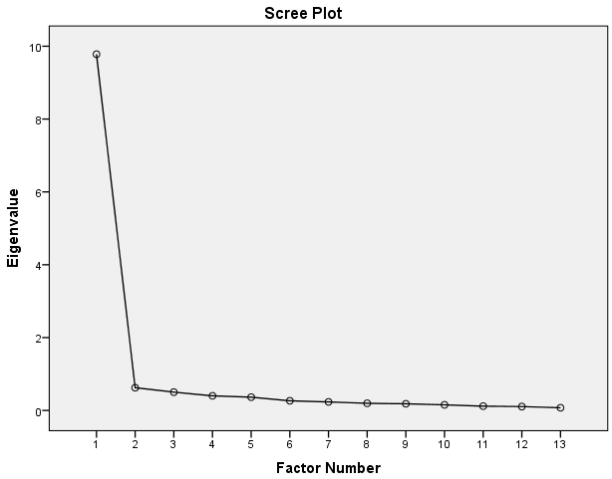

Figure 6.5 Scree plot for EFA for collaborative relationship scale

Table 6.17 Component matrix of EFA for collaborative relationship scale

Measure	Factor 1
The degree of trust between partner (3PL) and organisation	.808
Commitment is essential to describe good partnering relationship	.891
Openness between the parties is important to resolve conflict and discuss difficulty	.857
Regular communication and sharing of information is central to an effective collaborative relationship	.750
Well-understood goals and objectives and be willing to share them openly	.847
Successful collaboration requires that 3PLs and shippers develop mechanism of Shared risk and rewards	.827
Trust between the supplier and partner	.892
Top management support	.881
Adequate resources	.894
A spirit of partnership between client and vendor	.889
Well-engineered service-level agreement	.872
Strong joint client/vendor governance of the agreement	.859
Detailed contract terms and conditions	.843

Extraction Method: Principal Axis Factoring. 1 factor extracted. 3 iterations required.

6.8.6 EFA for mutual conflict resolution

EFA was performed on three items of the joint participation scale and reported a KMO measure of sampling adequacy of .726. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (3) = 327.990, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the mutual conflict resolution. Table 6.18 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered. A single factor structure is reported. Figure 6.6 gives the scree plot of the EFA for collaborative relationship and also indicates a single factor structure as appropriate for the data. Table 6 reports the factor matrix reporting factor loadings for items for the single factor.

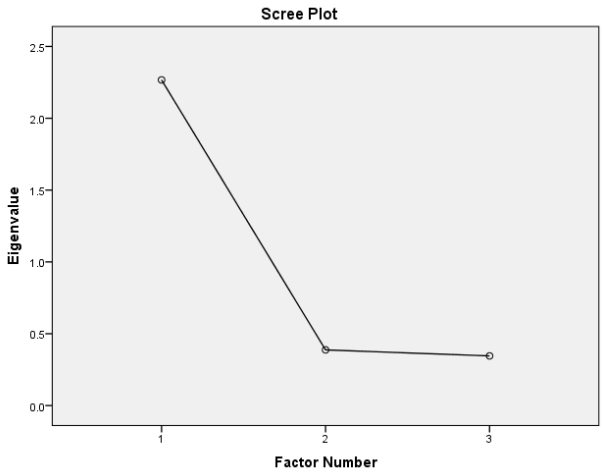

Figure 6.6 Scree plot for EFA for mutual conflict resolution

Table 6.18 Component matrix of EFA for mutual conflict resolution scale

Measure	Factor 1
Suitable solution was developed that mitigated risk for both parties	.820
Situations are resolved to mutual satisfaction of the LM and supplier	.776
The ultimate solution to the situation was cost-effective to both parties	.792

Extraction Method: Principal Axis Factoring. 1 factor extracted and 7 iterations required.

6.8.7 EFA for joint participation scale

EFA was performed on three items of mutual conflict scale and reported a KMO measure of sampling adequacy of .726. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (3) = 327.990, p < .001). These results indicate that EFA is appropriate for the correlation structure of the joint participation scale. Table 6.19 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered. A single factor structure is reported. Figure 6.7 gives the scree plot of the EFA for joint participation scale and also indicates a single factor structure as appropriate for the data. Table 6.19 reports the rotated factor matrix reporting factor loadings for items for the single factor.

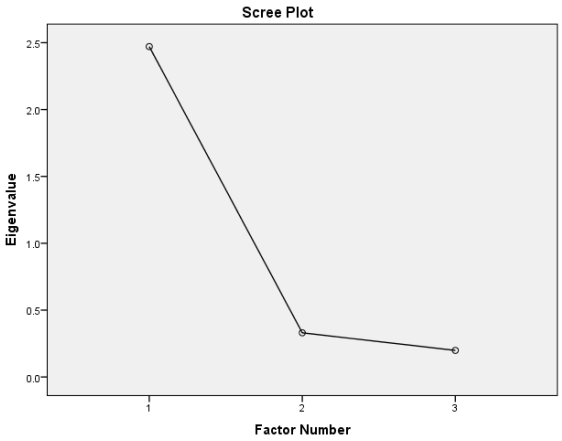

Figure 6.7 Scree plot for EFA for joint participation scale

Table 6.19 Component matrix of EFA for joint participation scale

Measure	Factor 1
The issue was addressed by both parties working together collaboratively	.787
Shipper and the 3PL engaged in joint problem-solving and shared responsibility	.913
Rather than working collaboratively, Logistics Manager (LM) solely determined and specified the supplier's approach for resolving the risk	.874

Extraction Method: Principal Axis Factoring. 1 factor extracted. 9 iterations required.

6.8.8 EFA for performance evaluation: strategic planning metrics

EFA was performed on seven items of strategic planning metrics of performance evaluation and reported a KMO measure of sampling adequacy of .897. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (21) = 1009.453, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for performance evaluation. Table 6.20 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. The first factor accounted for 54.179% of the total variability in the data. Figure 8 gives the scree plot of the EFA for performance evaluation scale and also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.20 reports the rotated factor matrix reporting factor loadings for items for different factors. Only factor loadings > 0.40 in magnitude are reported in the table.

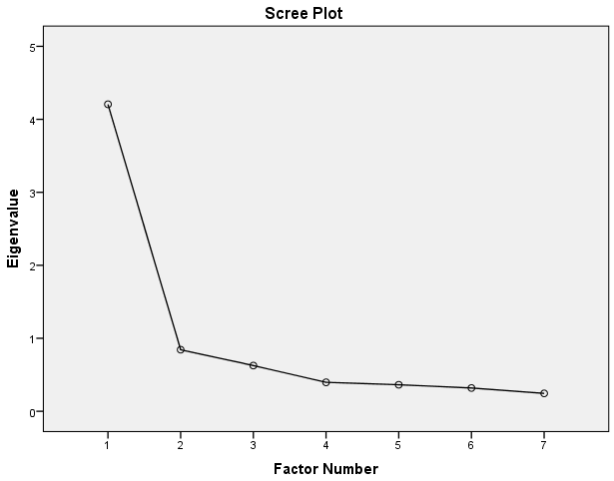

Figure 6.8 Scree plot for EFA for performance evaluation: strategic planning metrics scale

Table 6.20 Component matrix of EFA performance evaluation: strategic planning metrics scale

Measure	Factor 1
Level of customer perceived value of product	.740
Variance against budget	.744
Information processing cost	.889
Net profit vs productivity ratio	.701
Total cycle time	.748
Supply chain performance contributes to total	.802
Level of energy utilisation	.453

Extraction Method: Principal Axis Factoring. 1 factor extracted and 6 iterations required.

6.8.9 EFA for performance evaluation: order planning metrics scale

EFA was performed on six items of order planning metrics of performance evaluation and reported a KMO measure of sampling adequacy of .897. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (21) = 1009.453, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for performance evaluation. Table 6.21 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. The first factor accounted for 70.186% of the total variability in the data. Figure 9 gives the scree plot of the EFA for performance evaluation scale and also indicates three factor structures as appropriate for the data. Table 6.21 reports the rotated factor matrix reporting factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table.

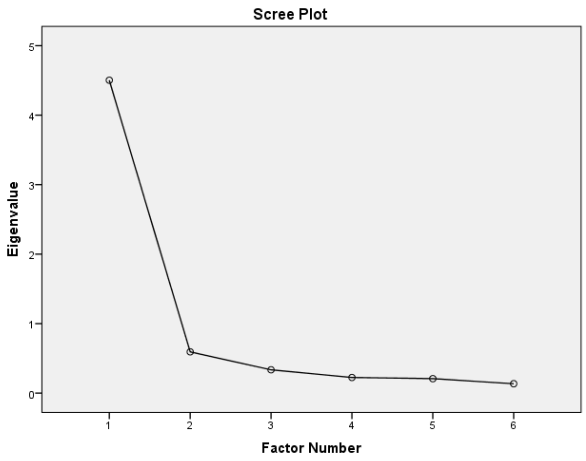

Figure 6.9 Scree plot for EFA for performance evaluation: order planning metrics scale

Table 6.21 Component matrix of EFA performance evaluation: order planning metrics scale

Measure	Factor 1
Customer query time	.790
Product development cycle time	.800
Accuracy of forecasting	.849
Planning process cycle time	.875
Order entry methods	.908
Human resource productivity	.797

Extraction Method: Principal Axis Factoring. 1 factor extracted and 5 iterations required.

6.8.10 EFA for performance evaluation: supplier metrics scale

EFA was performed on six items of supplier metrics of performance evaluation and reported a KMO measure of sampling adequacy of .839. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (15) = 1170.664, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for performance evaluation. Table 6.22 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. The first factor accounted for 63.329% of the total variability in the data. Figure 6.10 gives the scree plot of the

EFA for performance evaluation scale and also indicates three factor structures as appropriate for the data. Table 10 reports the rotated factor matrix reporting factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table.

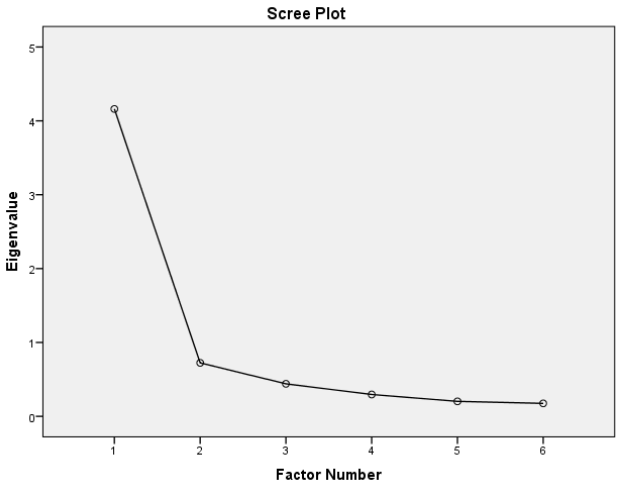

Figure 6.10 Scree plot for EFA for performance evaluation: supplier metrics scale

Table 6.22 Component matrix of EFA performance evaluation: supplier metrics scale

Measure	Factor 1
Supplier delivery performance	.733
Supplier lead time against industry norms	.786
Supplier pricing against market	.814
Efficiency of purchase order cycle time	.860
Efficiency of cash flow method	.770
Supplier booking in procedures	.806

Extraction Method: Principal Axis Factoring. 1 factor extracted and 5 iterations required.

6.8.11 EFA for performance evaluation: production metrics scale

EFA was performed on six items of supplier metrics of performance evaluation and reported a KMO measure of sampling adequacy of .850. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix

(χ^2 (10) = 884.120, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for performance evaluation. Table 6.23 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. The first factor accounted for 65.267% of the total variability in the data. Figure 6.11 gives the scree plot of the EFA for performance evaluation scale and also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.23 reports the rotated factor matrix reporting factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table.

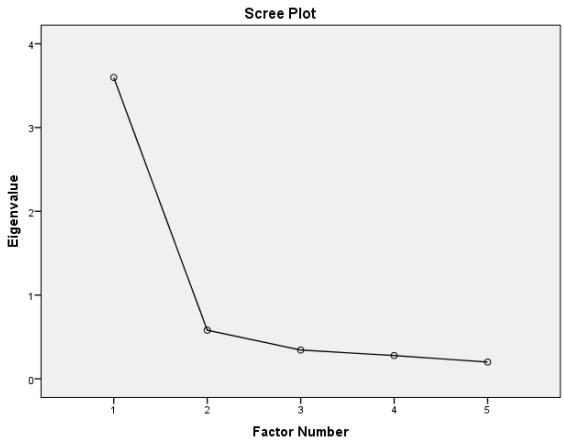

Figure 6.11 Scree plot for EFA for performance evaluation: production metrics scale

Table 6.23 Component matrix of EFA performance evaluation: production metrics scale

Measure	Factor 1
Percentage of defects	.682
Cost per operational hour	.802
Capacity utilisation	.862
Range of products and services	.817
Utilisation of economic order quantity	.862

Extraction Method: Principal Axis Factoring. 1 factor extracted and 5 iterations required.

6.8.12 EFA for performance evaluation: delivery performance metrics scale

EFA was performed on nine items of delivery performance metrics of performance evaluation and reported a KMO measure of sampling adequacy of .907. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (36) = 2244.233, p < .001). These results indicate that EFA is appropriate for the correlation structure of the scale for performance evaluation. Table 6.24 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered as the final set of factors forming the reduced factor structure. The first factor accounted for 65.958% of the total variability in the data. Figure 6.12 gives the scree plot of the EFA for performance evaluation scale and also indicates three factor structures as the appropriate reduced dimension of the data. Table 6.24 reports the rotated factor matrix reporting factor loadings for different items. Only factor loadings > 0.40 in magnitude are reported in the table.

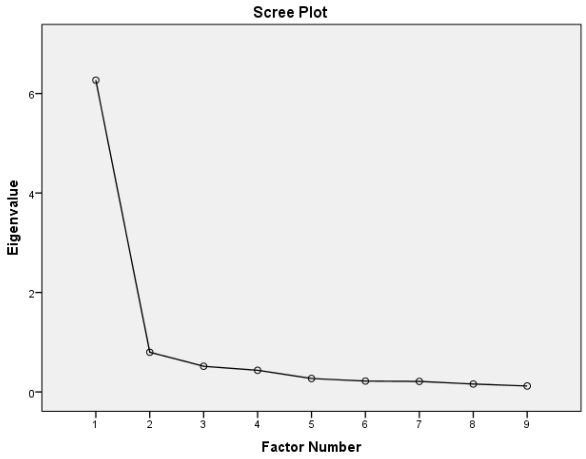

Figure 6.12 Scree plot for EFA for performance evaluation: delivery performance metrics scale

Table 6.24 Component matrix of EFA performance evaluation: delivery performance scale

Measure	Factor 1
Quality of delivered goods	.788
On-time delivered goods	.848
Flexibility of service system to meet customer needs	.845
Effectiveness of enterprise distribution planning schedule	.832
Effectiveness of delivery invoice methods	.796
Number of failures delivery notes invoices	.684
Percentage of urgent deliveries	.853
Percentage of finished goods in transit	.826
Delivery reliability performance	.824

Extraction Method: Principal Axis Factoring. 1 factor extracted and 4 iterations required.

6.8.13 EFA for organisational outsourcing success scale

EFA was performed on nine items of outsourcing success scale and reported a KMO measure of sampling adequacy of .924. Bartlett's test of sphericity rejects the null hypotheses that correlation matrix is proportional to an identity matrix (χ^2 (36) = 1803.487, $p < .001$). These results indicate that EFA is appropriate for the correlation structure of the outsourcing success scale. Table 6.25 reports the factors extracted, and the variance explained by each factor extracted, using principal axis factoring method with only those factors reporting eigenvalues >1 considered. A single factor structure is reported. Figure 6.13 gives the scree plot of the EFA for collaborative relationship and also indicates a single factor structure as the appropriate factor structure of the data. Table 6.25 reports the factor matrix reporting factor loadings for items for the single factor.

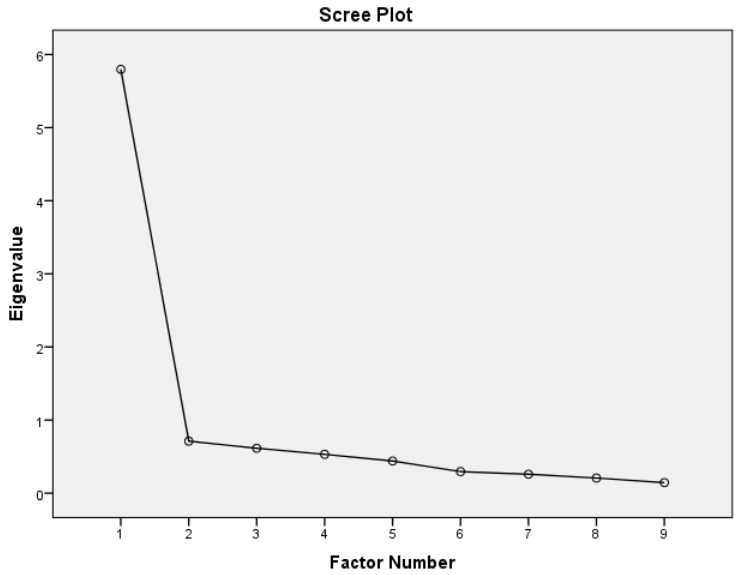

Figure 6.13 Scree plot for EFA for outsourcing success

Table 6.25 Component matrix of EFA for outsourcing success scale

Measure	Factor 1
We have been able to refocus on core business	.574
We have enhanced our IT competency	.865
We have increased access to skilled personnel	.861
We have enhanced economies of scale in human resources]	.901
We have enhanced economies of scale in technological resources	.741
We have increased control of IS expenses	.849
We have reduced the risk of technological obsolescence	.705
We have increased access to key information technologies	.755
We are satisfied with our overall benefits from outsourcing	.683

Extraction Method: Principal Axis Factoring.

1 factor extracted and 4 iterations required.

Table 6.26 Cronbach's alpha measurement for reliability of scales

Scale	Total items	Factors generated	Total variance explained	Cronbach's alpha
Reason for outsourcing – strategic factors (strategic)	10	1	0.044	0.954
Reason for outsourcing – environmental factors (environment)	5	1	0.013	0.942
Reason for outsourcing – economic factors (economic))	7	1	0.043	0.918
3 PL Selection (3PL)	19	3	0.068	0.967
Collaborative relationship	13	1	0.022	0.972
Joint participation	3	1	0.044	0.889
Mutual conflict resolution	3	1	0.004	0.837
Performance evaluation – order planning metrics	6	1	0.008	0.933
Performance evaluation – strategic planning metrics	7	1	0.014	0.883
Performance evaluation – delivery performance metrics	9	1	0.011	0.945
Performance evaluation – supplier metrics	6	1	0.019	0.911
Performance evaluation – production metrics	5	1	0.019	0.900
Outsourcing success	9		0.036	0.924

6.9 Common Method Bias (Variance) Analysis

Bagozzi et al. (1991, p. 426) define common method bias (CMB) as the "variance that is attributable to the measurement method rather than to the construct of interest". Richardson, Simmering, and Sturman (2009, p. 765) define it as the "systematic error variance shared among variables measured with and introduced as a function of the same method and/or source".

The reason for focusing attention on this subject is that the conclusions regarding the model's relationships may be erroneous (i.e., the error is too large for the relationships to be valid). For example, systematic correlations introduce an alternative explanation for the observed correlations between measures. Furthermore, errors from the measurement instrument or method may have both random and systematic elements (Bagozzi et al. 1991)

6.9.1 Sources of common method variance

Reducing CMB in empirical studies begins with an understanding of its various potential sources. Several sources of CMB are listed below.

1. The use of a common source or rater (one source that provides both independent and dependent variables).

2. Self-reporting bias where the positive or negative perspectives of the research subject can influence each response to varying degrees.

3. The survey instrument's design, complexity, ambiguity and scale format can influence the rater's responses.

4. The item's context (such as its position within the sequence of questions, its spatial relationship to other questions, and the number of questions) can affect the rater's responses based on its stimulus to the rater.

5. A rater's motivation to answer accurately can be impacted based on the survey instrument's characteristics such as the rater's knowledge of the subject, their perceived ability to process and understand the subject, the length of the survey instrument and any inducements to respond impact their responses, including "Don't Know" or "Not Applicable" options if available (Kitchenham & Pfleeger 2002).

6.9.2 Methods for assessment of CMB: Harman single factor analysis

This first technique (Harman 1960) uses exploratory factor analysis where all variables are loaded onto a single factor and is constrained so that there is no rotation (Podsakoff et al. 2000). This new factor is typically not in the researcher's model; it is introduced solely for this analysis and then discarded. If the newly introduced common latent factor explains more than 50% of the variance, then common method bias may be present. The Harman single factor technique has the benefit of simplicity; however, there are multiple weaknesses with this method. It does not statistically control for this type of variance. There are no specific guidelines on the amount of variation explained by this factor to unequivocally determine the existence of this variance. The customary heuristic is to set the threshold to 50%. The method is sensitive to the number of variables involved. Large models have a greater chance for multiple common method

factors to exist. As the number of variables increases, this technique becomes less conservative.

Table 6.27 Harman's single factor test: variance explained

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	45.436	44.545	44.545	44.893	44.013	44.013
2	7.310	7.166	51.711			
3	5.289	5.185	56.897			
4	4.806	4.711	61.608			
5	2.191	2.148	63.756			
6	1.902	1.865	65.621			
7	1.707	1.673	67.294			

6.9.3 Common latent factor

This second technique introduces a new latent variable in such a way that all manifest variables are related to it, those paths are constrained to equal and the variance of the common factor is constrained to 1. This is similar to the Harman single factor technique where all manifest variables are related to a single factor; however, the research model's latent factors and their relationships are kept in this analysis. The common variance is estimated as the square of the common factor of each path before standardisation. The common heuristic is to set the threshold to 50%. This technique allows for measurement error, focuses on the measures themselves, and does not require the researcher to identify and measure the specific factor responsible for common method effects.

6.9.4 Common method bias: common latent factor method

Figure 6.14 gives the fitted model in AMOS based on common latent factor (CLF) method. CLF represents the common latent factor drawn with regression weight constrained to equal for all the regression paths for set of exogenous variables. To establish that the dataset does not suffer from common method bias issue, two tests were conducted—one in AMOS and the other in SPSS. In AMOS, the model was run with CLF and without CLF and the difference between the standardised loading factors was < .2. The second method used SPSS; it was established that the total variance is less than 50%, this analysis establishes that the dataset is not suffering with the common method bias. The result showed that the variance was 44.013%, which is less than 50%.

To conduct the test, 102 factors were considered with the test result presented hereunder:

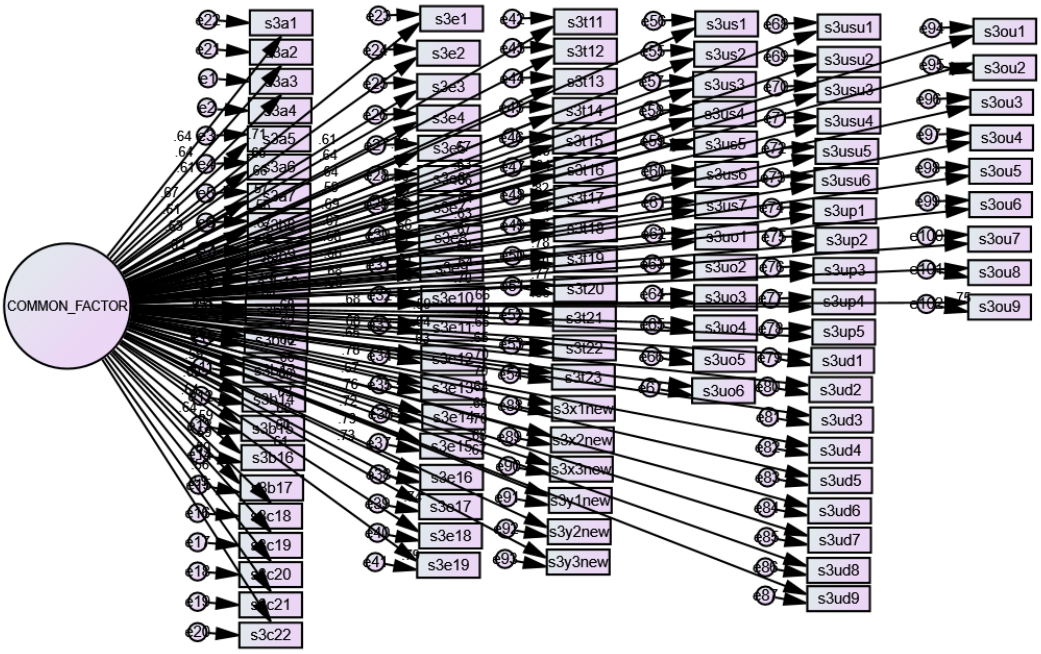

Figure 6.14 All-item CFA with common factor

In the CFA approach, all variables considered in the questionnaire were modelled as an indicator of a single factor that was assumed to have method effects. The goodness-of-fit of the single factor CFA is shown in Figure 6.14 and the results show high chi-square values with significant p-values. The key parameters did not meet the threshold values as shown below:

X^2 26300.797; p=.000; CMIN/DF=5.109; GFI=.229; AGFI=.213; TLI=.412; CFI=.413; RMSEA=.122. Hence, the common method bias is not an issue.

6.10 Conclusions

The preliminary objective of this chapter was to ensure data validity and acceptability before embarking on the CFA and SEM. Tests such as missing value assessment, multivariate outlier assessment, respondents' characteristics comparison, non-response bias assessment, multivariate normality assessment and common method variance tests

were conducted to ensure data integrity, data management, data exploration and cleaning purposes. Explanatory factor analysis was conducted to interpret the constructs before taking up the confirmatory factor analysis and path analysis. The next chapter deals with CFA, full measurement model, SEM and hypothesis testing.

CHAPTER 7

STRUCTURAL EQUATION MODELING ANALYSIS

7.1 Introduction

This chapter explains the detailed quantitative analysis of the survey data. It reports the measurement and structural model as a final test of hypotheses through their simultaneous causal influence on each other.

The full measurement model aims to present the measured variables to latent variables such as outsourcing reasons, 3PL selection criteria, governance mechanism, 3PL performance measurement metrics, and finally, the outsourcing success outcomes. All the latent variables are analysed to see how the fit indices support the theory. This analysis is conducted using confirmatory factor analysis via AMOS version 24. This work finally leads to structural equation modeling (SEM). SEM was evaluated using goodness-of-fit statistics explained in Chapter 5, Research Methodology. The best fit structural model was then used to test the hypotheses developed in Chapter 4. Finally, this chapter summarises the outcome of the quantitative analysis.

7.2 Descriptive Statistics

Descriptive statistics are numbers that are used to summarise and describe data. Here the word data refers to the information collected in the form of a web-based survey from participants in India. The variable that can be directly measured or observed is also known as manifest variable. Manifest variables are used in latent variable statistical model analysis, which tests the relationships between a set of manifest variables and a set of latent variables. The descriptive tests were conducted using IBM SPSS Version 24 with the results shown in Table 7.1.

The scale value of 1 indicates *low importance* and 5 represents the *high importance* to the manifest variable. Mean values of all the manifest variables had values below the midpoint (ranging from 3.025 to 4.331).

7.3 Measurement Models

As the data suitability was established for multivariate statistical analysis, SEM procedures were adapted for further analysis. The first step undertaken was the measurement model for each of the constructs. Confirmatory factor analysis (CFA) was performed following the exploratory factor analysis (EFA) undertaken in Chapter 6. To conduct EFA at least 100 samples were required to provide reasonable answers (Hair 2010). Furthermore, this number of samples helps avoid convergence problems with three or more indicators per construct. Each construct was tested separately for unidimensionality before testing them in a combined model. The conventional measurement theory assumes that the measurement of a construct is unidimensional (DeVellis 2012). CFA is used to assess the reliability and construct validity of the measurement model. This is done by first taking the measurement model of a study construct and its indicators. These measures are then compared with the acceptable cut-off values to provide evidence for reliability and validity of the measurement model. Reliability is a measure of the measurement design used to report consistent and highly correlated responses with repeated administration of the instrument. Validity is the ability of the scale to measure truly what it is supposed to measure (Hancock & Mueller 2001). The assessment of reliability and validity is explained below.

7.3.1 Construct reliability

Construct reliability is indicated by composite reliability (CR) and average variance extracted measures (AVE). Both CR and AVE lie between 0 and 1. A minimum value of 0.70 for CR and 0.50 (50%) for AVE is generally considered satisfactory cut-off values for evidence for internal consistency, which is a reflection of the reliability of the scale used to measure the construct.

Average Variance Extracted (AVE) is calculated by using the expression:

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

Composite reliability is calculated by using the expression:

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + (\sum_{i=1}^{n} \delta_i)}$$

where λ_i is the standardised factor loading for ith item in the factor and δi is the error variance for the ith item in the factor. As a widely accepted rule of thumb, factor loadings or squared standardised regression weights reported in CFA must be more than 0.50 for acceptance and AVE must be more than 0.50 for each construct. Additionally, construct reliability for each construct be must be 0.65 or more. Another technique that can be used to measure the construct reliability is the squared multiple correlations (SMC) pertaining to the measurement items. SMC refers to item reliability coefficients and is used to assess the reliability of each measurement item under each measurement dimensions. The SMC is calculated as the square of the measurement items' standardised loading values. For instance, the standardised loading of 0.8 would yield a SMC of 0.64. The SMC greater than 0.5 is deemed acceptable, although a SMC of 0.3 is used by some authors an indicator of acceptable measurement items (Holmes-Smith, Coote & Cunningham 2006).

7.3.2 Validity assessment

Validity testing is critical for determining the accuracy of a measure, ensuring that the measurement items are representing what they are intending to measure (Holmes-Smith, Coote & Cunningham 2006). CFA and SEM can be used for testing convergent validity and discriminant validity (Anderson & Gerbing 1988).

7.3.3 Convergent validity

Convergent validity aims to assess the consistency of the measurement items under each measurement construct. It intends to confirm that those measurement items are actually reflecting the latent constructs they are designed to measure. Factor loading is a critical consideration, as high factor loading on a latent factor indicates that the measurement items involved converge on a common latent factor. The standardised loading estimate could be used to assess this. The minimum cut-off value estimate for the standardised factor loading is 0.5 and those factor loadings should be significant at .05 level. Another technique used for assessing convergent validity can be determined by AVE measure. The dimensions or constructs would have construct validity when the value of CR is greater than the value of AVE (Kripanont 2007). According to Nunnally (1994), the value of AVE must be greater than 0.40 for satisfactory evidence for convergent validity.

7.3.4 Discriminant validity

Discriminant validity aims to confirm the uniqueness of measurement items, dimensions or constructs in the model in which they should be truly distinct from others (Hair 2010). Four distinct methods can be used for assessing discriminant validity. The first method is Pearson's correlation between measurement items using AMOS. It indicates that the measurement items under the same measurement dimension should be highly correlated, while also having low correlation with measurement items in other measurement dimensions. Similarly, the measurement dimensions under the same construct should be highly correlated, while having lower correlation with measurement dimensions in other constructs. In other words, the measurement items (or measurement dimensions) must cluster within their respective dimension (or construct) (Holmes-Smith et al. 2006).

The second method is covariance, employed to inspect the correlation between measurement dimensions or constructs rather than measurement items (observed variables). If the correlation between measurement dimensions or constructs in CFA is less than 0.9, then those constructs are unidimensional and are likely to have a problem with discriminant validity (Bagozzi et al. 1991; Kline 2011). The third method is the R squared correlation (R2) and AVE assessment. Here, R2 is the squared inter-construct correlation. As suggested by Fornell and Larcker (1981), measurement dimensions or constructs meet discriminant validity criterion when AVE is greater than R2.

7.3.5 Assessment of model fit

The measurement of good model fit for CFA and structural model can be performed by calculating three main types of indices, namely: incremental fit indices (NFI,) Comparative fit index (CFI) and TLI, absolute fit indices (chi-square, CMIN/df, GFI, RMSEA and PCLOSE), and parsimony fit indices (AGFI) (Hair 2010). The measurement model may, however, consist of measurement dimensions that contain only two measurement items. Fortunately, this incidence does not yield a substantial effect because the measurement items will be aggregated for the second-order structural modeling. Kline (2015) posited that if a standard model with two or more factors has at least two indicators per factor, the model is identified. Moreover, correlation of error terms may be employed when those measurement items are overlapped or correlated due to a common method of measurement. It does not, however, technically affect the

structural model because those measurement items will be aggregated before finding the best fit model (Byrne 2013a).

7.4 Measurement Model for Reasons for Outsourcing

The final measurement model for outsourcing reasons construct is presented in Figure 7.2. The standardised loading, composite reliability, Cronbach's alpha and AVE measures are presented in Table 7.1.

The economic dimension of outsourcing reasons is reflected by three measured items—s3a1, s3a5 and s3a6. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.64 < \beta < 0.88$, $p < .001$). It also reports evidence for construct validity with the CR value of 0.810 greater than the AVE measure of 0.592 (see Table 7.3). Moreover, they demonstrate discriminant validity as they are highly correlated to the economic construct as compared to other dimensions (correlation with other two dimensions varies between 0.771 and 0.909) (Table 7.2). Furthermore, the scale for economic dimension of outsourcing reasons construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.405 < SMC < 0.774$) (see Table 7.1). Additionally, Cronbach's alpha measure is 0.810 indicating high internal consistency of the economics dimension scale (see Table 7.3).

The strategic dimension of outsourcing reasons is reflected by the four measured items s3b11, s3b15, s3b16 and s3b17. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.80 < \beta < 0.87$, $p < .001$). It also reports evidence for construct validity with a CR 0.901 value of greater than the AVE measure of 0.694 (see Table 7.3). Moreover, they demonstrate discriminant validity as they are highly correlated to the strategic construct compared to other dimensions (correlation with other two dimensions varies between 0.756 and 0.909) (Table 7.2). Furthermore, the scale for the strategic dimension of outsourcing reasons construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.644 < SMC < 0.758$) (see Table 7.1). Cronbach's alpha measure is 0.877, thereby indicating high internal consistency of the strategic dimension scale (see Table 7.3).

The environmental dimension of outsourcing reasons is reflected by the four measured items s3c19, s3c20, s3c21 and s3c22. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.83 < \beta < 0.91$, $p < .001$). They also report evidence for construct validity with a value of composite reliability (CR) of 0.933 greater than the AVE measure of 0.777 (see Table 7.3). Moreover, they demonstrate discriminant validity as they are highly correlated to the environmental dimension compared to other dimensions (correlation with other two dimensions varies between 0.771 and 0.756) (Table 7.2). Furthermore, the scale for environmental dimension of outsourcing reasons construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.690 < SMC < 0.826$) (see Table 7.1). Additionally, Cronbach's alpha measure is 0.933 indicating the high internal consistency of environmental dimension scale (see Table 7.3). These numbers are drawn from Figure 7.1.

Table 7.1 Standardised loading, squared correlation and fit indices for outsourcing reasons construct

Item	Description	Standardised Loading	Squared Multiple Correlation	p
Dimension: Economic				
s3a1	Improve profitability	0.636	0.405	< .001
s3a5	Increase cost efficiency	0.772	0.596	< .001
s3a6	Make capital funds more available for core area	0.880	0.774	< .001
Dimension: Strategic				
s3b11	To increase competitive advantage	0.831	0.690	< .001
s3b15	Convert fixed costs to variable costs	0.828	0.685	< .001
s3b16	Increase responsiveness to market change	0.870	0.758	< .001
s3b17	Reduce risk	0.802	0.644	< .001
Dimension: Environmental				
S3c19	To help companies gain global advantage	0.830	0.690	
s3c20	To enable partnering to improve service quality	0.881	0.777	< .001
s3c21	To improve customer service	0.909	0.826	< .001
s3c22	To enable partnering to improve service quality and customer service and increase competitive advantage	0.904	0.817	< .001

Goodness-of-fit indices:
Chi-square = 106.058, *df* = 41, p=.000, Bollen-Stine Bootstrap – 0.10, CMIN/DF(<3) = 2.587, GFI(>.9) = .937, AGFI(>.9) = .898, TLI(>.95) = .964, CFI(>.9) = 973, RMSEA(<.08) = .076, PCLOSE=.009

Table 7.2 Correlations of subconstructs under outsourcing reasons construct

Subconstructs of outsourcing reasons	Economic	Strategic	Environmental
Economic	1.000	0.909	0.771
Strategic	0.909	1.000	0.756
Environmental	0.771	0.756	1.000

Table 7.3 Cronbach's alpha, composite reliability and average variance extracted measures for dimensions of outsourcing reasons construct

Dimension	Cronbach's alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Economic	0.810	0.810	0.592
Strategic	0.877	0.901	0.694
Environmental	0.933	0.933	0.777

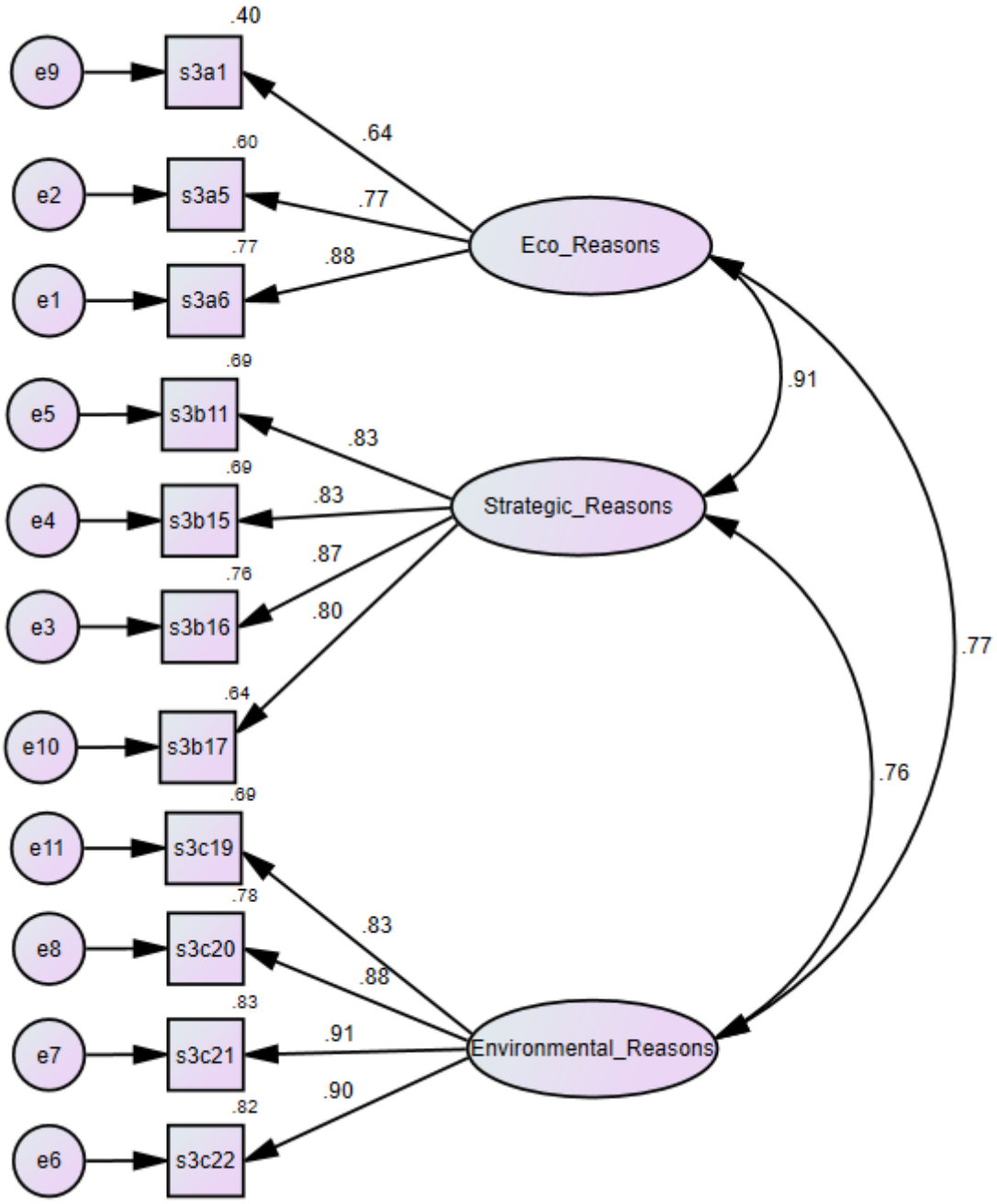

Figure 7.1 Measurement model with standardised regression weights for outsourcing reasons construct

7.5 Measurement Model for Governance Mechanism:

Figure 7.2 presents the final measurement model for project governance construct. The standardised loading, composite reliability, Cronbach's alpha and AVE measures are presented in Tables 7.4–7.6.

The collaborative dimensions of project governance is reflected by the five measured items of s3t11, s3t14, s3t15, s3t16 and s3t23. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.766 < \beta < 0.892$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.909 greater than the AVE measure of 0.667(see Table 7.6). Moreover, they demonstrate discriminant validity as they are highly correlated to the collaborative construct compared to other dimension (correlation with other dimensions stood at 0.613) (Table 7.5). Furthermore, the scale for collaborative dimensions of project governance construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.587 < SMC < 0.795$) (see Table 7.4). In addition, Cronbach's alpha measure is 0.906 indicating high internal consistency of the collaborative dimensions scale (see Table 7.6).

The mutual conflict dimensions of project governance are reflected by two measured items s3y1, and s3y2. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.729 < \beta < 0.874$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.785 greater than the AVE measure of 0.648 (see Table 7.6). Moreover, they demonstrate discriminant validity as they are highly correlated to the mutual conflict dimensions compared to other dimensions (correlation with other dimensions stood at 0.613) (Table 7.5). Furthermore, the scale for the mutual conflict dimensions of project governance construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.53 < SMC < 0.76$) (see Table 7.4). Cronbach's alpha measure is 0.776 thereby indicating high internal consistency of the mutual conflict dimensions' scale (see Table 7.6). The joint participation approach which was part of governance mechanism was eliminated through CFA analysis. These numbers are drawn from Figure 7.2.

Table 7.4 Standardised loading, squared correlation and fit indices for governance construct

Item	Description	Standardised Loading	Standard Multiple Correlation	p
Dimension: Collaborative				
s3t11	The degree of trust between partner (3PL) and organisation	0.766	0.587	<.001
s3t14	Regular communication and sharing of information is central to an effective collaborative relationship	0.766	0.587	<.001
s3t15	Well-understood goals and objectives and be willing to share them openly	0.892	0.795	<.001
s3t16	Successful collaboration requires that 3PLs and shippers develop mechanism of shared risk and rewards	0.831	0.691	<.001
s3t23	Detailed contract terms and conditions	0.822	0.675	<.001
Dimension: Mutual conflict				
s3y1	Suitable solutions are developed that mitigate risks for both parties	0.729	0.531	<.001
s3y2	Situations are resolved to mutual satisfaction of the LM and supplier	0.874	0.763	<.001
Goodness-of-fit indices:				
Chi-square = 19.122, *df* = 13. P = .119, CMIN / DF (< 3) = 1.471, GFI (> .9) = .982, AGFI = .961, TLI (>.95) = .991, CFI (>.9) = .994, PCLOSE = .606, RMSEA (<.08) = .041				

Table 7.5 Correlations of measurement items and subconstructs under outsourcing governance construct

Subconstructs of project Governance	Collaborative approach	Mutual conflict resolution
Collaborative approach	1.000	0.613
Mutual conflict resolution	0.613	1.000

Table 7.6 Cronbach's alpha, composite reliability and average variance extracted measures for dimensions of outsourcing governance construct

Dimension	Cronbach's alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Collaborative approach	0.906	0.909	0.667
Mutual conflict resolution	0.776	0.785	0.648

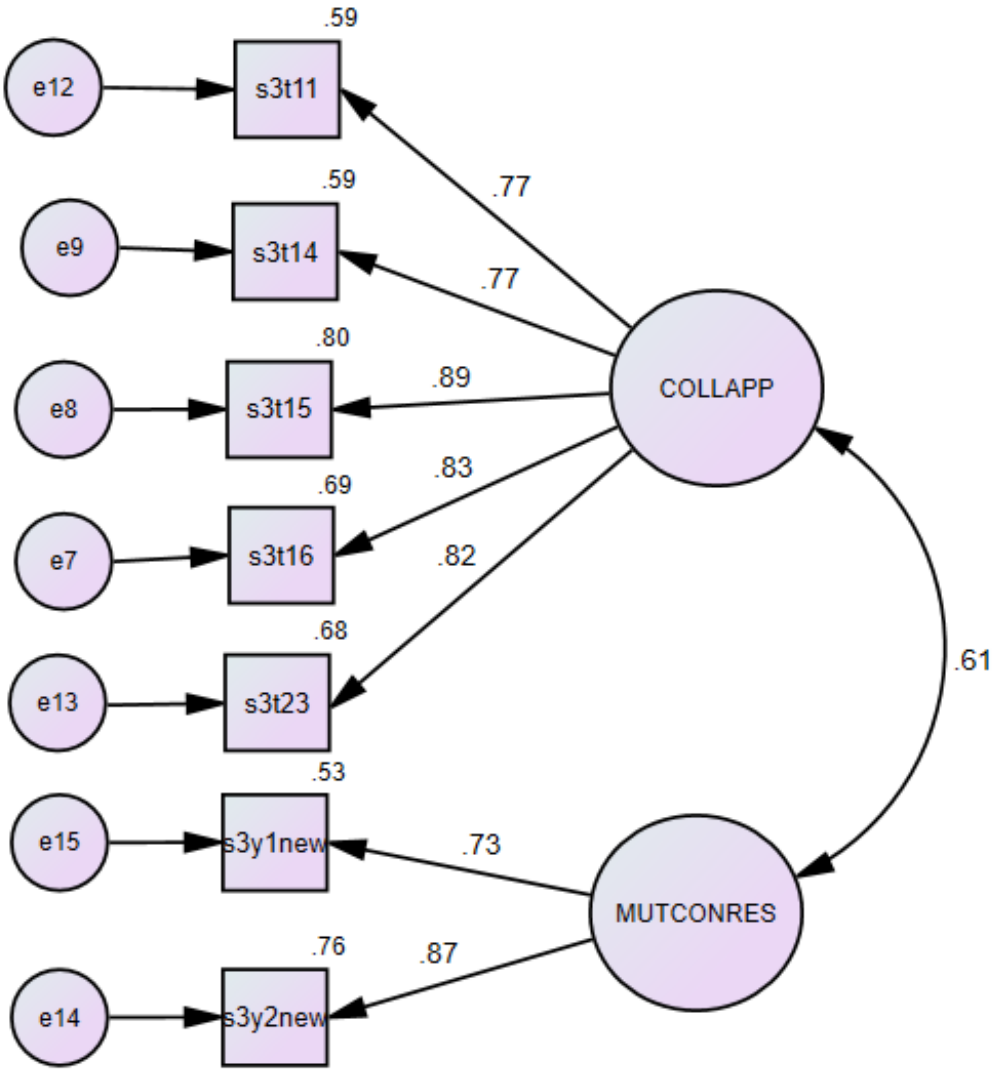

Figure 7.2 Measurement model with standardised regression weights for project governance construct

7.6 Measurement Model for Performance Measurement Construct

Figure 7.4 presents the final measurement model for the performance measurement construct. The standardised loading, composite reliability, Cronbach's alpha and AVE measures are presented in Table 7.9.

The strategic planning dimensions of performance measurement construct is reflected by the three measured items s3us2, s3us3 and s3us5. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.73 < \beta < 0.87$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.838 greater than the AVE measure of 0.634 (see Table 7.9). Moreover, they demonstrate discriminant validity as they are highly correlated to the strategic planning construct compared to other dimensions (correlation with other dimensions varies between 0.765 and 0.852) (Table 7.8). Furthermore, the scale for strategic planning dimensions of performance measurement construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.534 < SMC < 0.761$) (see Table 7.7). In addition, Cronbach's alpha measure is 0.831 indicating high internal consistency of the strategic planning dimensions' scale (see Table 7.9).

The order planning dimensions of performance measurement construct is reflected by the two measured items s3uo3, and s3uo4. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.86 < \beta < 0.88$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.860 greater than the AVE measure of 0.754 (see Table 7.9). Moreover, they demonstrate discriminant validity as they are highly correlated to the order planning construct compared to other dimensions (correlation with other dimensions varies between 0.705 and 0.805) (Table7. 8). Furthermore, the scale for order planning dimension of performance measurement construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.742 < SMC < 0.766$) (see Table 7.7). The Cronbach's alpha measure is 0.858 thereby indicating high internal consistency of the order planning dimension scale (see Table 7.9).

The supplier metrics dimension of performance measurement constructed is reflected by the two measured items s3usu3, and s3usu4. These observed items meet convergent

validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.86 < \beta < 0.87$, $p < .001$). They also report evidence for construct validity with composite reliability (CR) value of 0.856 greater than the AVE measure of 0.748 (see Table 7.9). Moreover, they demonstrate discriminant validity as they are highly correlated to the supplier metrics construct compared to other dimensions (correlation with other dimensions varies between 0.708 and 0.825) (Table 7.8). Furthermore, the scale for supplier metrics dimension of performance measurement construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.74 < SMC < 0.76$) (see Table 7.7). In addition, the Cronbach's alpha measure is 0.856 indicating high internal consistency of the supplier metrics dimension scale (see Table 7.9).

The production metrics dimension of performance measurement construct is reflected by the three measured items s3up3, s3up4 and s3up5. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.84 < \beta < 0.89$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.894 greater than the AVE measure of 0.738 (see Table7. 9). Moreover, they demonstrate discriminant validity as they are highly correlated to the production metrics construct compared to other dimensions (correlation with other dimensions varies between 0.705 and 0.901) (Table 7.8). Furthermore, the scale for production metrics dimension of performance measurement construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.703 < SMC < 0.786$) (see Table 7.7). Measured Cronbach's alpha measure is 0.895 indicating high internal consistency of the production metrics dimension scale (see Table 7.9).

The delivery performance dimension of performance measurement is reflected by the three measured items of s3ud1, s3ud3, and s3ud8. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.81 < \beta < 0.87$, $p < .001$). They also report evidence for construct validity with the composite reliability (CR) value of 0.871 greater than the AVE measure of 0.693 (see Table 7.9). Moreover, they demonstrate discriminant validity as they are highly correlated to the delivery performance construct compared to other dimensions (correlation with other dimensions varies between 0.708 and 0.901) (Table 7.8). Furthermore, the scale for delivery performance dimension of performance

measurement construct is reliable as SMC exceeds the minimum threshold value of 0.3 (0.660 < SMC < 0.749) (see Table 7.7). In addition, Cronbach's alpha measure is 0.871 indicating high internal consistency of the delivery performance dimension scale (see Table 7.9). These numbers are drawn from Figure 7.3.

Table 7.7 Standardised loading, squared correlation and fit indices for performance measurement construct

Item	Description	Standardised Loading	Standard Multiple Correlation	p
Dimension: Strategic planning				
s3us2	Variance against budget	0.780	0.609	<.001
s3us3	Information processing cost	0.872	0.761	<.001
s3us5	Total cycle time	0.731	0.534	<.001
Dimension: Order planning				
s3uo3	Accuracy of forecasting	0.862	0.742	<.001
s3uo4	Planning process cycle time	0.875	0.766	<.001
Dimension: Supplier metrics				
s3usu3	Supplier pricing against market	0.860	0.740	<.001
s3usu4	Efficiency of purchase order cycle time	0.870	0.757	<.001
Dimension: Production metrics				
s3up3	Capacity utilisation	0.886	0.786	<.001
s3up4	Range of products and services	0.852	0.725	<.001
s3up5	Utilisation of economic order quantity	0.838	0.703	<.001
Dimension: Delivery performance				
s3ud1	Quality of delivered goods	0.818	0.669	<.001
s3ud3	Flexibility of service system to meet customer needs	0.866	0.749	<.001
s3ud8	Percentage of finished goods in transit	0.812	0.660	<.001

Goodness-of-fit indices:
Chi – square = 114.332, df = 55. P = .000, Bollen-Stine bootstrap p = .060, CMIN / DF (< 3) = 2.079, GFI (> .9) = .944, AGFI (>.9) = .907, TLI (>.95) = .969, CFI (>.9) = .978, PCLOSE = .100, RMSEA (<.08) = .062

Bollen-Stine bootstrap x^2test was performed and the *p*-value was examined (Blunch 2012).

Table 7.8 Correlations of measurement items and subconstructs under performance measurement construct

Subconstructs of performance measurement	Strategic planning metrics	Order planning metrics	Supplier metrics	Production metrics	Delivery performance metrics
Strategic planning	1.00	0.805	0.765	0.852	0.837
Order planning	0.805	1.00	0.752	0.705	0.781
Supplier metrics	0.765	0.752	1.00	0.825	0.708
Production metrics	0.852	0.705	0.825	1.00	0.901
Delivery performance	0.837	0.781	0.708	0.901	1.00

Table 7.9 Cronbach's alpha, composite reliability and average variance extracted measures for dimensions of performance measurement construct

Construct	Cronbach's alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Strategic planning	0.831	0.838	0.634
Order planning	0.858	0.860	0.754
Supplier metrics	0.856	0.856	0.748
Production metrics	0.895	0.894	0.738
Delivery performance	0.871	0.871	0.693

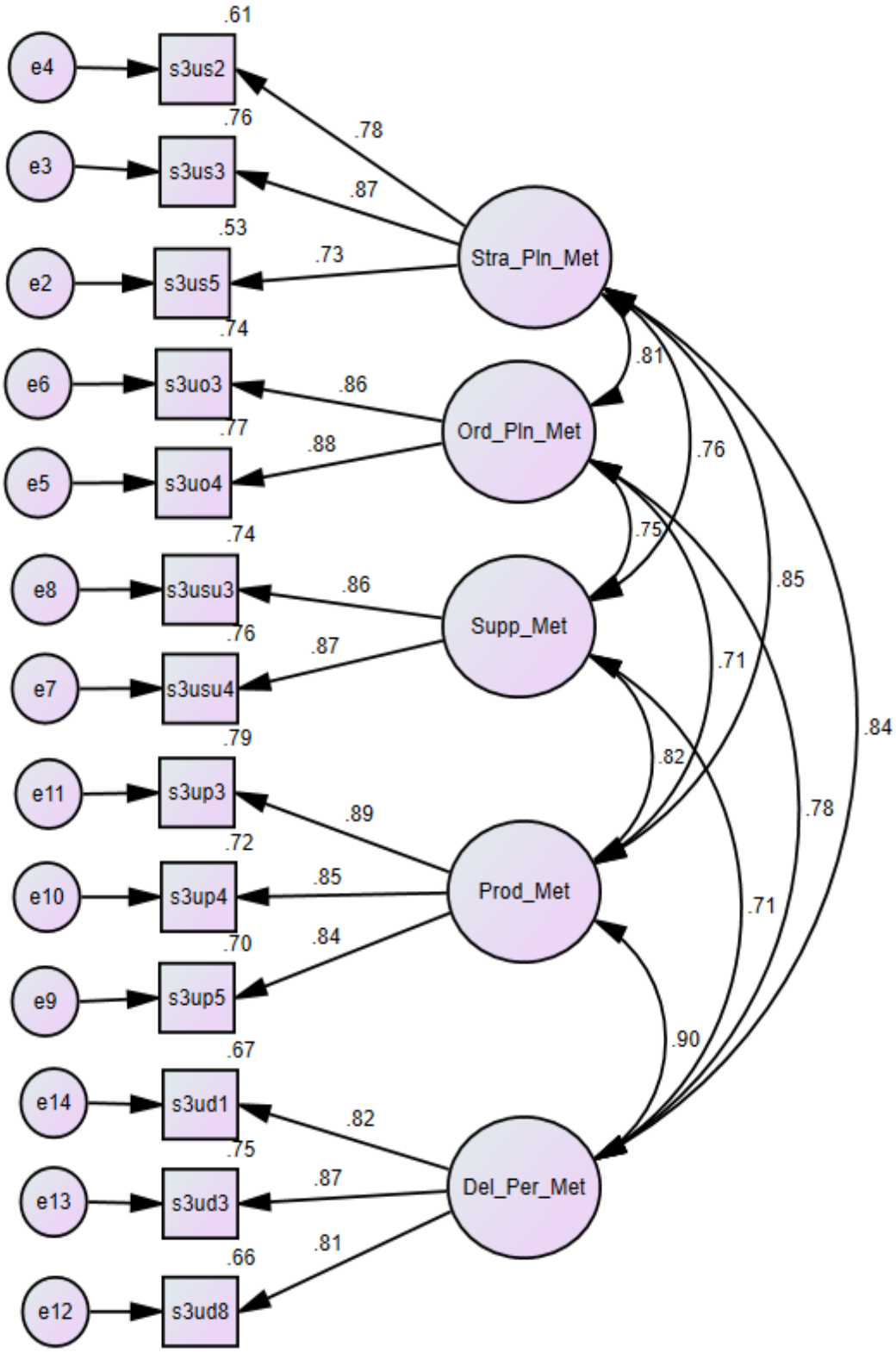

Figure 7.3 Measurement model with standardised regression weights for performance measurement construct

7.7 Measurement Model for 3PL Selection Criteria

Figure 7.5 presents the final measurement model for the 3PL Selection criteria construct. The standardised loading, composite reliability, Cronbach's alpha and AVE measures are presented in Table 7.10.

The 3PL selection criteria are reflected by five measured items (s3e1, s3e2, s3e5, s3e7 and s3e18). These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.490 < \beta < 0.851$, $p < .001$). Item s3e5 standard loading was less than .50; however, it was retained as this item was supported by the qualitative findings (Hair 2010).

The analysis also reports evidence for construct validity with the composite reliability (CR) value of 0.873 greater than the AVE measure of 0.586 (see Table 7.10). Furthermore, the scale for the 3PL selection criteria construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.240 < SMC < 0.724$) (see Table 7.10). Item s3e5 with SMC less than 0.30 was still retained because the congeneric measurement model provided satisfactory goodness-of-fit indices. The low value of SMC has no adverse effect on the model fit. In addition, the Cronbach's alpha measure is 0.855 indicating high internal consistency of 3PL selection constructs (see Table 7.10). These numbers are drawn from Figure 7.4.

Table 7.10 Standardised loading, squared correlation and fit indices for 3PL selection criteria construct

Item	Description	Standardised Loading	Standard Multiple Correlation	p
s3e1	Price of 3PL services	0.823	0.678	<.001
s3e2	Quality of tactical logistics services	0.851	0.724	<.001
s3e5	Knowledge and advice on supply chain innovations and improvements	0.490	0.240	<.001
s3e7	On-time shipment and deliveries	0.816	0.665	<.001
s3e18	E-commerce facility of service provider	0.789	0.623	<.001

Goodness-of-fit indices:

Chi-square = 3.978, *df* = 5. P = .553, CMIN/DF (< 3) = .796, GFI (> .9) = .994, AGFI = .983, TLI (>.95) = 1.003, CFI (>.9) = 1.003, PCLOSE = .826, RMSEA (<.08) = .000, Cronbach's alpha = .855, CR = 0.873 and AVE = 0.586

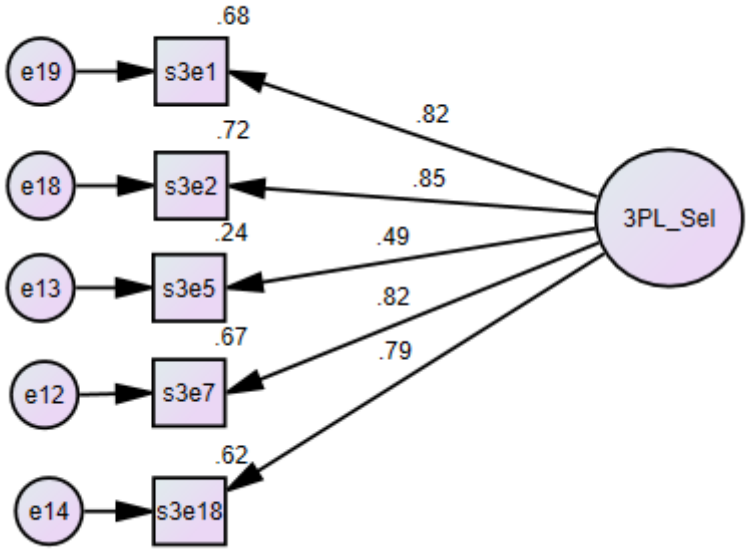

Figure 7.4 Measurement model with standardised regression weights for 3 PL selection criteria construct

7.8 Measurement Model for Outsourcing Success

Figure 7.6 presents the final measurement model for performance measurement construct. The standardised loading, squared correlation is presented in Table 7.11.

The outsourcing success construct is reflected by the seven measured items s3ou1, s3ou2, s3ou3, s3ou5, s3ou7, s3ou8 and s3ou9. These observed items meet convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.609 < \beta < 0.886$, $p < .001$). They also report evidence for construct validity with composite reliability (CR) value of 0.897 greater than the AVE measure of 0.558. Furthermore, the scale for outsourcing success construct is reliable as SMC exceeds the minimum threshold value of 0.3 ($0.371 < SMC < 0.785$) (see Table 7.11). The Cronbach's alpha measure is 0.889 indicating high internal consistency of the delivery performance dimension scale. These numbers are drawn from Figure 7.5

Table 7.11 Standardised loading, squared correlation and fit indices for outsourcing success construct

Item	Description	Standardised Loading	Standard Multiple Correlation	p
s3ou1	We have been able to refocus on core business	0.609	0.371	<.001
s3ou2	We have enhanced our IT competency	0.886	0.785	<.001
s3ou3	We have increased access to skilled personnel	0.858	0.735	<.001
s3ou5	We have enhanced economies of scale in technological resources	0.711	0.506	<.001
s3ou7	We have reduced the risk of technological obsolescence information technologies	0.693	0.481	<.001
s3ou8	We have increased access to key information technologies	0.756	0.572	<.001
s3ou9	We are satisfied with our overall benefits from outsourcing	0.675	0.456	<.001

Goodness-of-fit indices:

Chi – square = 20.713, *df* = 14. P = .109, CMIN / DF (< 3) = 1.479, GFI (> .9) = .980, AGFI = .960, TLI (>.95) = .990, CFI (>.9) = .993, PCLOSE = 0.607, RMSEA (<.08) = .042, Cronbach's alpha = 0.889, CR = 0.897 and AVE = 0.558.

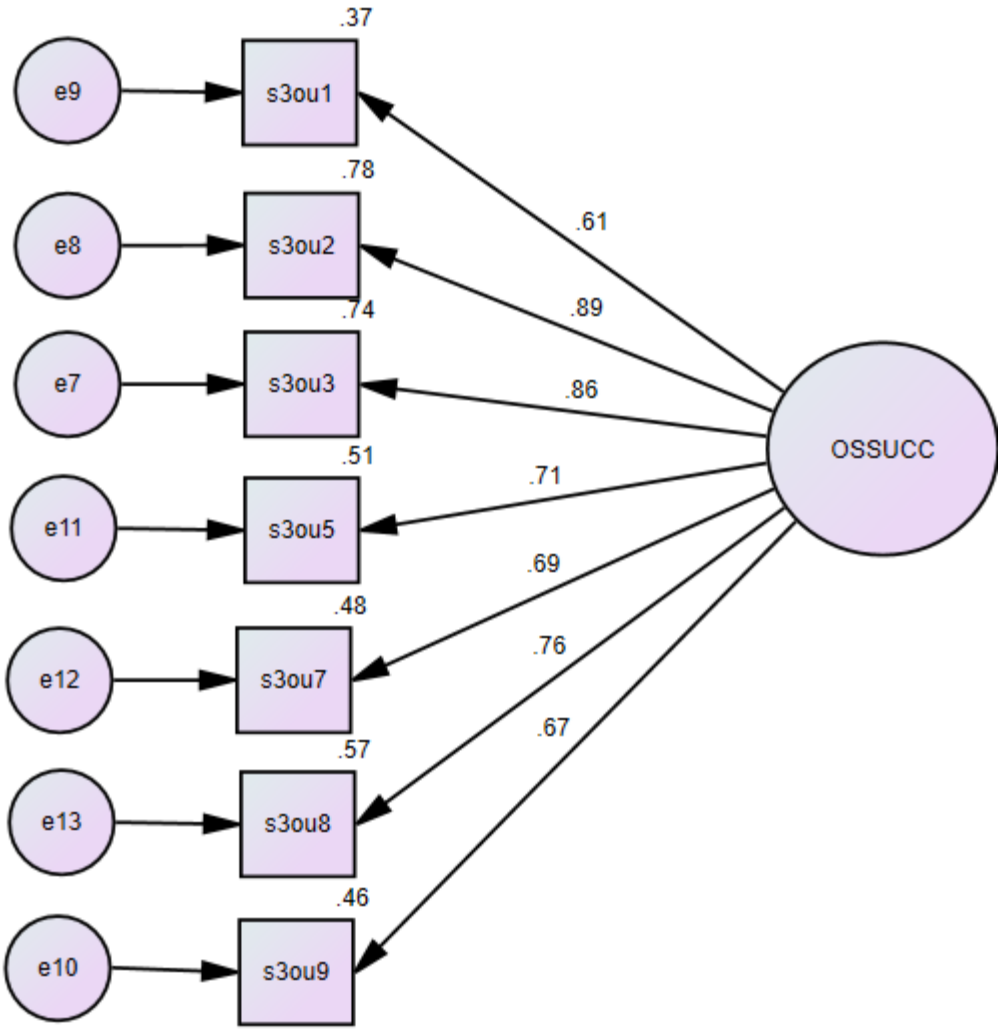

Figure 7.5 Measurement model with standardised regression weights for outsourcing success construct

7.9 Construct Validity Assessment

Awang (2012) explains that validity is the ability of the instrument to measure what it is supposed to measure for a latent construct, further suggesting that there are three types of validity tests that must be carried out for each measurement model. These three are discussed below.

Convergent validity: This validity is achieved when all items in a measurement model are statistically significant. It also can be tested through average variance extracted, also known as AVE, for every construct. The value of AVE should be 0.5 or higher for this

validity to achieve. Markos (2016) argues that within few points of "acceptable" (0.50) may not always be fatal.

Discriminant Validity: This validity indicates that the measurement model of a construct is free from redundant items (Awang 2012). Bertea and Zait (2011) suggested the chi-square difference test. Segars (1997) explained that the chi-square difference test allows the researchers to compare two models, one in which the constructs are correlated and, in the second model, in which they are not. When the test results are significant the constructs present discriminant validity.

Construct reliability assessment establishes the extent to which the said measurement model is measuring the intended latent constructs**.** Awang (2012) suggested the following two criteria for measuring the reliability for a measurement model.

Internal Reliability: This test explains how strong the measuring items are holding together in measuring respective construct. This reliability is achieved when the value of Cronbach's alpha exceeds 0.7 (calculated in SPSS).

Composite Reliability: This test indicates the reliability and internal consistency of a latent construct. If the value equals CR > 0.5 then this is considered to have achieved the composite reliability for a construct.

7.10 Full Measurement Model

The full measurement model can be developed using two theories, the first is known as aggregated approach, and second is known as partial aggregation approach. Bagozzi and Heatherton (1994) have described the total aggregation approach as a single composite variable made of the sum of all items measuring as a construct. Cattell and Burdsal Jr (1975) defined parceling as aggregating individual items into one or more "parcels" and using those parcels in data analysis instead of individual items. If a given scale consists of eight items, by parceling two or more items by aggregating then one composite score can be created (Matsunaga 2008). Matsunaga (2008) argues that parceling alleviates several psychometric problems (e.g. scale communality) and model fit issues (i.e. CFI, Chi-square and RMSEA). Further, he recommends that parceling should not be used in measurement model stage where model psychometric properties (e.g. validity and reliability) are crucial. This thesis has used partial aggregation for two latent constructs

(i.e., outsourcing reasons and 3PL performance measurement) with the other four constructs holding on to their items (refer Figure 7.6) in the full measurement model. A quick look at the chi-square, CFI and RMSEA values of the model (p. 150) provide a good model fit. Also, the parceling is used in the structural path model to establish the inter-construct relationship by minimising measurement error. The all items parceling up to first-order observed variables was performed before the model was analysed for their inter-construct relationship. Bandalos (2002) noticed in her simulation studies that item nonnormality (i.e., skewness of 5.0 and kurtosis of 25.0) became almost normal when parceled.

The consolidated measurement model using the partial aggregation approach was used in this research. The partial aggregation approach involves the aggregation of the items of each subconstruct of the overall construct, whereby each separate underlying factor is retained (Bagozzi & Heatherton 1994). This approach to the model is considered reliable and has less distraction from accumulated errors (Belter & Wu 1995).

Aggregation of data is considered due to a pragmatic approach and data-analytical considerations. The conceptual model is framed at the group level where the data collection is only feasible at an individual data point level. Under these circumstances, the a priori focus on group-level theory and the analysis might encourage automatic aggregation with consideration of the individual character of the measurement procedure. Data-analytical considerations outweigh the need for conceptual work on composition issues (Van Mierlo, Vermunt & Rutte 2009). In this model, all constructs with subconstructs and items were aggregated and constructs without any subconstructs were not aggregated.

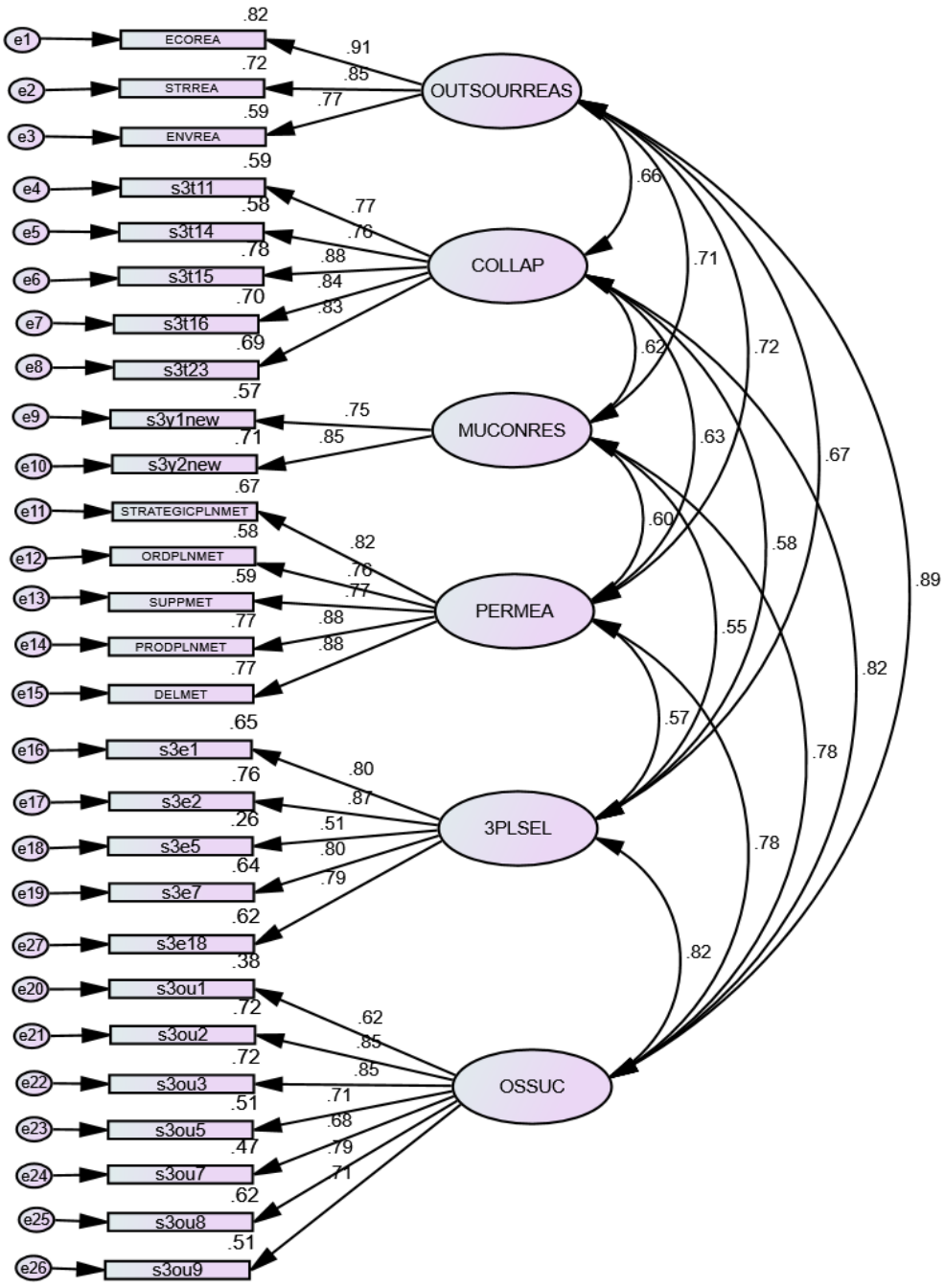

Figure 7.6 Full measurement model with standardised regression weights for measurement model

Goodness-of-fit indices:

Chi – square = 620.148, *df* = 309, P = .000, Bollen-Stine bootstrap p = .005, CMIN/DF (< 3) = 2.007, GFI (> .9) = .865, AGFI = .835, TLI (>.95) = .935, CFI (>.9) = .943, PCLOSE = .008, RMSEA (<.08) = .060

Table 7.12 reports the standardised loading, squared correlation for all the construct items in the final measurement model. The fitted full measurement model is given in

Figure 7.6. The reasons for outsourcing construct has economic, strategic and environmental dimensions. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.769 < \beta < 0.907$, $p < .001$). Moreover, they demonstrate discriminant validity as they are clustered into their respective construct (see Table 7.13) with correlation varying between 0.657 and 0.889. These measurement items are reliable as SMC exceeds the minimum threshold value of 0.3 ($0.6 < SMC < 0.8$) (see Table 7.12). They are also reliable as Cronbach's alpha measure is 0.879, composite reliability is 0.880, and AVE is 0.710 (see Table 7.14).

The governance mechanism has mutual conflict resolution and collaborative approach dimensions. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.753 < \beta < 0.881$, $p < .001$). Moreover, they demonstrate discriminant validity as they are clustered into their respective construct (see Table 7.13) with correlation varying between 0.578 and 0.825 (collaborative approach) and 0.549 and 0.776 (mutual conflict resolution). These measurement items are reliable as SMC exceeds the minimum threshold value of 0.3 ($0.6 < SMC < 0.8$) (see Table 7.12). They are also reliable as Cronbach's alpha measure is 0.892, composite reliability is 0.931, and AVE is 0.660 (see Table 7.14).

The performance measurement has delivery performance, production metrics, supplier metrics, order planning and strategic planning dimensions. These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.762 < \beta < 0.878$, $p < .001$. Moreover, they demonstrate discriminant validity as they are clustered into their respective construct (see Table 7.13) with correlation varying between 0.569 and 0.783. These measurement items are reliable as SMC exceeds the minimum threshold value of 0.3 ($0.6 < SMC < 0.8$) (see Table 7.12). They are also reliable as Cronbach's alpha measure is 0.910 composite reliability is 0.913 and AVE is 0.677 (see Table 7.14).

The 3PL selection construct has five items (s3e1, s3e2, s3e5, s3e7, and s3e18). These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 ($0.508 < \beta < 0.872$, $p < .001$. Moreover, they demonstrate discriminant validity as they are clustered into their respective construct (see Table 7.12) with correlation varying between 0.549 and 0.821

(see Table 7.13). These measurement items are reliable as SMC exceeds the minimum threshold value of 0.3 (0.3 < SMC < 0.8) (see Table 7.12). They are also reliable as Cronbach's alpha measure is 0.855, composite reliability is 0.873, and AVE is 0.585 (see Table 7.14).

Finally, outsourcing success construct has seven items (s3ou1, s3ou2, s3ou3, s3ou5, s3ou7, s3ou8, and s3ou9). These observed items meet the convergent validity criterion with all standardised loadings greater than the required threshold value of 0.50 (0.615 < β < 0.850, $p < .001$ (see Table 7.12). Moreover, they demonstrate discriminant validity as they are clustered into their respective construct (see Table 7.13) with correlation varying between 0.630 and 0.889. These measurement items are reliable as SMC exceeds the minimum threshold value of 0.3 (0.4 < SMC < 0.7) (see Table 7.12). They are also reliable as Cronbach's alpha measure is 0.889, composite reliability is 0.898, and AVE is 0.561 (see Table 7.14). These numbers are drawn from Figure 7.6

Table 7.12 Standardised loading, squared correlation and fit indices for full measurement model

Measurement dimension	Standardised loading	Squired multiple correlation	Mean	Standard deviation	p
Reasons for Outsourcing					
Environmental	0.769	0.592	3.419	1.145	<.001
Strategic	0.846	0.716	3.478	1.091	<.001
Economic	0.907	0.822	3.627	1.008	<.001
Governance					
Collaborative Approach - The degree of trust between partner (3PL) and organisation.	0.768	0.589	3.910	1.179	<.001
Collaborative Approach - Regular communication and sharing of information is central to an effective collaborative relationship.	0.763	0.582	4.169	1.179	<.001
Collaborative Approach - Well-understood goals and objectives and be willing to share them openly.	0.881	0.776	4.007	1.027	<.001
Collaborative Approach - Successful collaboration require that 3PLs and shippers develop mechanism of shared risk and rewards.	0.836	0.699	3.917	1.046	<.001
Collaborative Approach - Detailed contract terms and conditions.	0.832	0.692	4.198	1.137	<.001
Mutual Conflict Resolution - A suitable solution was developed that mitigated risk for both parties.	0.753	0.567	3.824	0.747	<.001
Mutual Conflict Resolution -LM and the supplier engaged in joint problem-solving and shared responsibility.	0.845	0.715	3.784	0.808	<.001

Table 7.12 Standardised loading, squared correlation and fit indices for full measurement model (continued)

Measurement dimensions	Standardised loading	Squired multiple correlation	Mean	Standard deviation	p
Performance Measurement					
Delivery Performance	0.876	0.767	3.525	0.952	<.001
Production Metrics	0.878	0.771	3.483	0.967	<.001
Supplier Metrics	0.771	0.594	3.550	1.012	<.001
Order Planning	0.762	0.580	3.322	1.109	<.001
Strategic Planning	0.820	0.673	3.264	0.866	<.001
3PL Selection					
Quality of tactical logistics services	0.804	0.647	3.845	0.867	<.001
Quality of tactical logistics services	0.872	0.761	4.173	1.088	<.001
Knowledge and advice on supply chain innovations and improvements	0.508	0.258	3.924	1.155	<.001
On-time shipment and deliveries	0.799	0.639	3.871	0.918	<.001
E-commerce facility of service provider	0.790	0.625	3.723	1.260	<.001
Outsourcing Success					
We have been able to refocus on core business	0.615	0.379	3.838	0.961	<.001
We have enhanced our IT competency	0.848	0.720	3.824	0.798	<.001
We have increased access to skilled personnel	0.850	0.723	3.853	0.869	<.001
We have enhanced economies of scale in technological resources	0.713	0.509	3.867	0.820	<.001
We have reduced the risk of technological obsolescence	0.685	0.469	3.712	0.948	<.001
We have increased access to key information technologies	0.787	0.620	3.691	0.914	<.001
We are satisfied with our overall benefits from outsourcing	0.712	0.507	3.719	1.111	<.001

Table 7.13 Correlations of subconstructs of research inter-correlation co-efficient of sub-constructs

Variables	Outsourcing Reasons	Governance Mechanism		Performance Measurement	3 PL Selection	Outsourcing Success
		Collaborative	MCR			
Outsourcing reasons	h1					
PG - collaborative	0.657	1				
PG – mutual conflict resolution	0.708	0.620	1			
Performance measurement	0.718	0.630	0.600	1		
3 PL selection	0.673	0.578	0.549	0.569	1	
Outsourcing success	0.889	0.630	0.776	0.783	0.821	1

Table 7.14 Validity and reliability test of research constructs

Variables	Cronbach's alpha (α)	Composite Reliability (CR)	Average variance Extracted (AVE)
Outsourcing Reasons	0.879	0.880	0.710
Governance Mechanism	0.892	0.931	0.660
Performance Measurement	0.910	0.913	0.677
3 PL Selection	0.855	0.873	0.585
Outsourcing Success	0.889	0.898	0.561

To confirm the discriminant validity, a nested model comparison method was carried out (Figure 7.7) as suggested by Bagozzi and Yi (1988). Table 7.15 shows the results of the nested SEM model comparisons. The comparison shows significant differences, indicating the presence of discriminant validity of the items.

The nested model was used to analyse for discriminant validity (results reported in Table 7.15 and Figure 7.7).

Table 7.15 Nested model comparisons for discriminant validity

Construct	X^2 Value	ΔX^2	*p*
OS - REASONS - COLB APPROACH	648.320	28.172	<0.0001
OS - REASONS - MCR	665.563	45.415	<0.0001
OS - REASONS - PERMEA	647.687	27.539	<0.0001
OS - REASONS - 3PL SEL	661.497	41.349	<0.0001
OS - REASONS - OS SUCCESS	644.403	24.255	<0.0001
COLBAPP - MCR	678.461	58.313	<0.0001
COLBAPP - PERMEA	658.397	38.249	<0.0001
COLBAPP - 3PL SEL	675.441	55.293	<0.0001
COLBAPP - OS SUCCESS	651.911	31.763	<0.0001
MCR - PERMEA	688.518	68.37	<0.0001
MCR - 3PL SEL	707.889	87.741	<0.0001
MCR - OS SUCCESS	683.606	63.458	<0.0001
PERMEA - 3PL SEL	682.858	62.71	<0.0001
PERMEA - OS SUCCESS	661.562	41.414	<0.0001
3PL SEL - OS SUCCESS	669.381	49.233	<0.0003

Note: ΔX^2= X^2 difference with the unconstrained model, p = Significance of the X^2 difference; df(1)

OS: Outsourcing Success; COLB: Collaborative; MCR: Mutual Conflict Resolution; SEL: Selection.

7.11 Descriptive Statistics

The descriptive statistics are numbers that are used to summarise and describe data. Here the word data refer to the information collected in the form of a web-based survey from participants in India. The variable that can be directly measured or observed is also known as the manifest variable. Manifest variables are used in latent variable statistical model analysis, which tests the relationships between a set of manifest variables and a set of latent variables. The descriptive test was conducted using IBM SPSS Version 24. The results are shown in Table 7.16.

The scale value of 1 indicates *low importance* and 5 represents the *high importance* to the manifest variable. Mean values of all the manifest variables had values below the midpoint (ranging from 3.025 to 4.331).

Table 7.16 Descriptive statistics of the sample

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Skewness		Kurtosis	
						Statistic	SE	Statistic	SE
Outsourcing Reasons - Economic Factor									
Improve profitability	s3a1	278	0	3.67	1.14	-0.58	0.15	-0.60	0.29
Improve operating efficiency	s3a2	278	0	3.80	1.12	-0.48	0.15	-0.97	0.29
Add value to the product	s3a3	278	0	3.45	1.10	-0.43	0.15	-0.61	0.29
Improve cash flow	s3a4	278	0	3.62	1.28	-0.75	0.15	-0.47	0.29
Increase Efficiency	s3a5	278	0	3.64	1.11	-0.32	0.15	-0.82	0.29
Make capital funds more available for core area	s3a6	278	0	3.56	1.30	-0.64	0.15	-0.61	0.29
Improve return on asset	s3a7	278	0	3.55	1.13	-0.32	0.15	-0.89	0.29
Outsourcing Reasons - Strategic Factor									
Improve performance	s3b8	278	0	3.53	1.18	-0.29	0.15	-0.95	0.29
To achieve Competitive advantage	s3b9	278	0	3.52	1.26	-0.57	0.15	-0.61	0.29
Improve Business focus	s3b10	278	0	3.55	1.14	-0.24	0.15	-1.03	0.29
To Increase competitive advantage	s3b11	278	0	3.59	1.18	-0.29	0.15	-1.14	0.29
Leverage the firm's skill and resources	s3b12	278	0	3.40	1.40	-0.53	0.15	-0.95	0.29
Enhance customer satisfaction	s3b13	278	0	3.56	1.15	-0.24	0.15	-1.09	0.29
Reduce constraints of organization's own production	s3b14	278	0	3.56	1.23	-0.31	0.15	-1.11	0.29
Convert fixed costs to variable costs	s3b15	278	0	3.31	1.25	-0.59	0.15	-0.66	0.29
Increase responsiveness to market change	s3b16	278	0	3.65	1.21	-0.39	0.15	-1.11	0.29
Reduce risk	s3b17	278	0	3.36	1.34	-0.34	0.15	-1.00	0.29
Outsourcing Reasons - Economic Factor									
To meet increase in demand for new IS and resource more efficiently and economically	s3c18	278	0	3.38	1.18	-0.21	0.15	-0.87	0.29
To help companies gain global advantage	s3c19	278	0	3.31	1.23	-0.15	0.15	-1.00	0.29
To enable partnering to improve service quality	s3c20	278	0	3.45	1.24	-0.28	0.15	-0.94	0.29
To improve Customer Service	s3c21	278	0	3.46	1.31	-0.44	0.15	-0.86	0.29
To enable partnering to improve service quality and customer service and increase competitive advantage	s3c22	278	0	3.45	1.25	-0.29	0.15	-0.98	0.29

Table 7.16 Descriptive statistics of the sample (continued)

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Statistic	SE	Statistic	SE
Criteria for selecting 3PL Service provider									
Price of 3PL services	s3e1	278	0	3.85	0.87	-1.20	0.15	1.76	0.29
Quality of tactical logistics services	s3e2	278	0	4.17	1.09	-1.43	0.15	1.53	0.29
Range of available value-added services	s3e3	278	0	3.77	0.97	-0.90	0.15	0.46	0.29
Global capabilities and reach and range of service	s3e4	278	0	4.02	1.32	-1.15	0.15	0.04	0.29
Knowledge and advice on supply chain innovations and improvements	s3e5	278	0	3.92	1.15	-1.11	0.15	0.53	0.29
Availability of strategies logistics services	s3e6	278	0	3.95	1.07	-1.20	0.15	1.17	0.29
On time shipment and deliveries	s3e7	278	0	3.87	0.92	-0.70	0.15	0.18	0.29
Superior Performance rates	s3e8	278	0	3.72	1.07	-0.22	0.15	-1.04	0.29
Financial stability of service provider	s3e9	278	0	4.02	1.10	-1.37	0.15	1.43	0.29
Creative management	s3e10	278	0	3.86	1.10	-0.61	0.15	-0.46	0.29
Ability to deliver as promised	s3e11	278	0	3.90	0.98	-0.76	0.15	-0.07	0.29
Availability of top management	s3e12	278	0	3.89	1.14	-0.69	0.15	-0.79	0.29
Responsiveness to unforeseen occurrences	s3e13	278	0	3.78	0.92	-1.07	0.15	1.40	0.29
Meet performance and quality requirement before price discussion occurs	s3e14	278	0	3.73	1.06	-1.05	0.15	0.61	0.29
Reputation of 3PL party	s3e15	278	0	3.59	0.99	-0.61	0.15	0.26	0.29
Willingness to use logistics manpower	s3e16	278	0	3.93	1.14	-1.24	0.15	0.91	0.29
Flexibility in operation and delivery	s3e17	278	0	3.72	0.97	-0.54	0.15	-0.07	0.29
E-commerce facility of service provider	s3e18	278	0	3.72	1.26	-0.58	0.15	-0.68	0.29
Reduction in lead time	s3e19	278	0	3.99	1.21	-1.08	0.15	0.18	0.29

Table 7.16 Descriptive statistics of the sample (continued)

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Statistic	SE	Statistic	SE
Collaborative Relationship									
The degree of trust between partner (3PL) and organization	s3t11	278	0	3.91	1.18	-1.08	0.15	0.37	0.29
Commitment is essential to describe good partnering relationship	s3t12	278	0	4.14	1.23	-1.41	0.15	0.89	0.29
Openness between the parties is important to resolve conflict and discuss difficulty	s3t13	278	0	3.95	1.14	-1.14	0.15	0.69	0.29
Regular communication and sharing of information is central to an effective collaborative relationship	s3t14	278	0	4.17	1.18	-1.34	0.15	0.76	0.29
Well understood goals and objectives and be willing to share them openly	s3t15	278	0	4.01	1.03	-1.00	0.15	0.40	0.29
Successful collaboration require that 3PLs and shippers develop mechanism of Shared risk and rewards	s3t16	278	0	3.92	1.05	-0.96	0.15	0.48	0.29
Trust between the supplier and partner	s3t17	278	0	4.18	1.12	-1.15	0.15	0.11	0.29
Top management support	s3t18	278	0	3.95	1.13	-1.03	0.15	0.29	0.29
Adequate resources	s3t19	278	0	3.89	1.07	-0.87	0.15	0.03	0.29
A spirit of partnership between client and vendor	s3t20	278	0	3.95	1.04	-0.86	0.15	0.11	0.29
Well engineered service level agreement	s3t21	278	0	4.18	1.05	-1.05	0.15	0.08	0.29
Strong joint client/vendor governance of the agreement	s3t22	278	0	3.99	1.04	-1.10	0.15	0.91	0.29
Detailed contract terms and conditions	s3t23	278	0	4.20	1.14	-1.24	0.15	0.46	0.29

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Statistic	SE	Statistic	SE
Mutual Conflict resolution									
A suitable solution was developed that mitigated risk for both parties	s3y1new	278	0	3.82	0.75	-0.80	0.15	0.78	0.29
LM (Logistics Manager) and the supplier engaged in joint problem solving and shared responsibility	s3y2new	278	0	3.78	0.81	-1.36	0.15	2.42	0.29
The ultimate solution to the situation was cost effective to both parties	s3y3new	278	0	3.87	0.83	-1.08	0.15	1.70	0.29

Table 7.16 Descriptive statistics of the sample (continued)

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Statistic	SE	Statistic	SE
Outsourcing Success									
We have been able to refocus on core business	s3ou1	278	0	3.84	0.96	-1.20	0.15	1.17	0.29
We have enhanced our IT competency	s3ou2	278	0	3.82	0.80	-1.26	0.15	1.48	0.29
We have increased access to skilled personnel	s3ou3	278	0	3.85	0.87	-1.17	0.15	1.26	0.29
We have enhanced economies of scale in human resources]	s3ou4	278	0	3.83	0.79	-1.11	0.15	1.32	0.29
We have enhanced economies of scale in technological resources	s3ou5	278	0	3.87	0.82	-1.06	0.15	1.30	0.29
We have increased control of IS expenses	s3ou6	278	0	3.72	0.90	-1.14	0.15	1.15	0.29
We have reduced the risk of technological obsolescence	s3ou7	278	0	3.71	0.95	-1.11	0.15	1.03	0.29
We have increased access to key information technologies	s3ou8	278	0	3.69	0.91	-1.09	0.15	1.00	0.29
We are satisfied with our overall benefits from outsourcing.	s3ou9	278	0	3.72	1.11	-1.40	0.15	1.36	0.29

Table 7.16 Descriptive statistics of the sample (continued)

DESCRIPTION	ITEM	N Valid	Missing	Mean	Std. Deviation	Statistic	SE	Statistic	SE
Performance Evaluation - Strategic Planning metrics									
Level of customer perceived value of product	s3us1	278	0	3.31	1.19	-0.20	0.15	-0.69	0.29
Variance against budget	s3us2	278	0	3.12	1.16	0.02	0.15	-0.90	0.29
Information processing cost	s3us3	278	0	3.34	1.04	-0.02	0.15	-0.52	0.29
Net profit vs. Productivity ratio	s3us4	278	0	3.42	1.09	-0.27	0.15	-0.58	0.29
Total cycle Time	s3us5	278	0	3.43	1.11	-0.19	0.15	-0.64	0.29
Supply chain performance contributes to total	s3us6	278	0	3.32	1.06	-0.14	0.15	-0.61	0.29
Level of energy utilization	s3us7	278	0	3.03	1.14	0.26	0.15	-0.58	0.29
Performance Evaluation - Order Planning Metrics									
Customer query time	s3uo1	278	0	3.22	1.18	-0.29	0.15	-0.74	0.29
Product development cycle time	s3uo2	278	0	3.40	1.12	-0.27	0.15	-0.74	0.29
Accuracy of forecasting	s3uo3	278	0	3.36	1.14	-0.35	0.15	-0.54	0.29
Planning process cycle time	s3uo4	278	0	3.28	1.23	-0.24	0.15	-0.79	0.29
Order entry methods	s3uo5	278	0	3.40	1.14	-0.34	0.15	-0.60	0.29
Human resource productivity	s3uo6	278	0	3.43	1.17	-0.26	0.15	-0.77	0.29
Performance Evaluation - Supplier Metrics									
supplier delivery performance	s3usu1	278	0	3.56	1.10	-0.17	0.15	-1.05	0.29
Supplier lead time against industry norms	s3usu2	278	0	3.56	1.21	-0.48	0.15	-0.77	0.29
Supplier pricing against market	s3usu3	278	0	3.54	1.06	-0.22	0.15	-0.84	0.29
Efficiency of purchase order cycle time	s3usu4	278	0	3.56	1.11	-0.47	0.15	-0.46	0.29
Efficiency of cash flow method	s3usu5	278	0	3.43	1.04	-0.24	0.15	-0.55	0.29
Supplier booking in procedures	s3usu6	278	0	3.53	1.07	-0.40	0.15	-0.58	0.29
Performance Evaluation - Production Metrics									
Percentage of defects	s3up1	278	0	3.34	1.19	-0.14	0.15	-0.95	0.29
Cost per operational hour	s3up2	278	0	3.56	1.05	-0.11	0.15	-1.04	0.29
Capacity utilization	s3up3	278	0	3.53	1.09	-0.35	0.15	-0.52	0.29
Range of products and services	s3up4	278	0	3.50	1.07	-0.08	0.15	-0.91	0.29
Utilisation of economic order quantity	s3up5	278	0	3.42	1.03	0.12	0.15	-0.95	0.29
Performance Evaluation - Delivery performance Metrics									
Quality of delivered goods	s3ud1	278	0	3.56	1.12	-0.23	0.15	-0.91	0.29
On time delivered goods	s3ud2	278	0	3.49	1.18	-0.14	0.15	-1.08	0.29
Flexibility of service system to meet customer needs	s3ud3	278	0	3.51	1.05	-0.26	0.15	-0.52	0.29
Effectiveness of enterprise distribution planning schedule	s3ud4	278	0	3.56	1.06	-0.33	0.15	-0.60	0.29
Effectiveness of delivery invoice methods	s3ud5	278	0	3.43	1.10	-0.07	0.15	-0.80	0.29
Number of failures delivery notes invoices	s3ud6	278	0	3.40	1.11	-0.08	0.15	-0.81	0.29
Percentage of urgent deliveries	s3ud7	278	0	3.58	1.03	-0.12	0.15	-0.95	0.29
Percentage of finished goods in transit	s3ud8	278	0	3.50	1.04	-0.12	0.15	-0.77	0.29
Delivery reliability performance	s3ud9	278	0	3.55	1.08	-0.12	0.15	-0.85	0.29

Of late, statistical parameters such as standard deviation and kurtosis as a function of scale are being used as the main way to explain statistical analysis (Cross, Collins, Hambly, Blake, Read, Sutorius, Mann, & Williams 2009). To summarise large amounts of information and to communicate statistical parameters as simply as possible, statistical parameters such as arithmetic mean, median, standard deviation, distribution in the form of skewness and kurtosis are being used (Lopes & Cross 2016). The recommended cut-off values for kurtosis was <8 and skewness <3 for normal distribution (Kline 2015).

7.12 Structural Model of Outsourcing Success

In the final measurement model of outsourcing reasons, governance mechanism, performance measurement and 3PL selection criteria were employed to generate the structural model. Byrne (2013a) suggested that the mean values of measurement items (observed variables) yielded by CFA could be used to develop the structural model. Structural equation modeling (SEM) is also known as path analysis with latent variables. The modeling is now popularly used for representing dependency relations in multivariate date in the behavioural social sciences (McDonald & Ho 2002).

7.12.1 Hypothesised structural model

Figure 7.7 gives the proposed structural model with estimated standardised factor loadings for each hypothesised path. All the measured items reported significant loadings at 0.001 to 0.05 level of significance. The analysis of the structural equation model resulted in chi-square = 122.484, *df* = 50, p = .000, Bollen-Stine bootstrap p = .091, CMIN/DF (< 3) = 2.45, GFI (> .9) = .932, AGFI = .896, TLI (>.95) = .961, CFI (>.9) = .970, NFI =.952, PCLOSE = .013, RMSEA (<.08) = .073; all the good fit indices were within the acceptable range. Thus, this structural model presented a good fit.

The results indicate a significant relationship between outsourcing reasons and governance in driving the outsourcing success. The outsourcing reasons account for 65% variance in governance mechanism (β= 0.871, p < .001). The outsourcing reasons accounts for 44% variance in 3PL selection (β= 0.664, p < .001) and 56% variance in 3PL performance measurement (β= 0.750, p < .001).

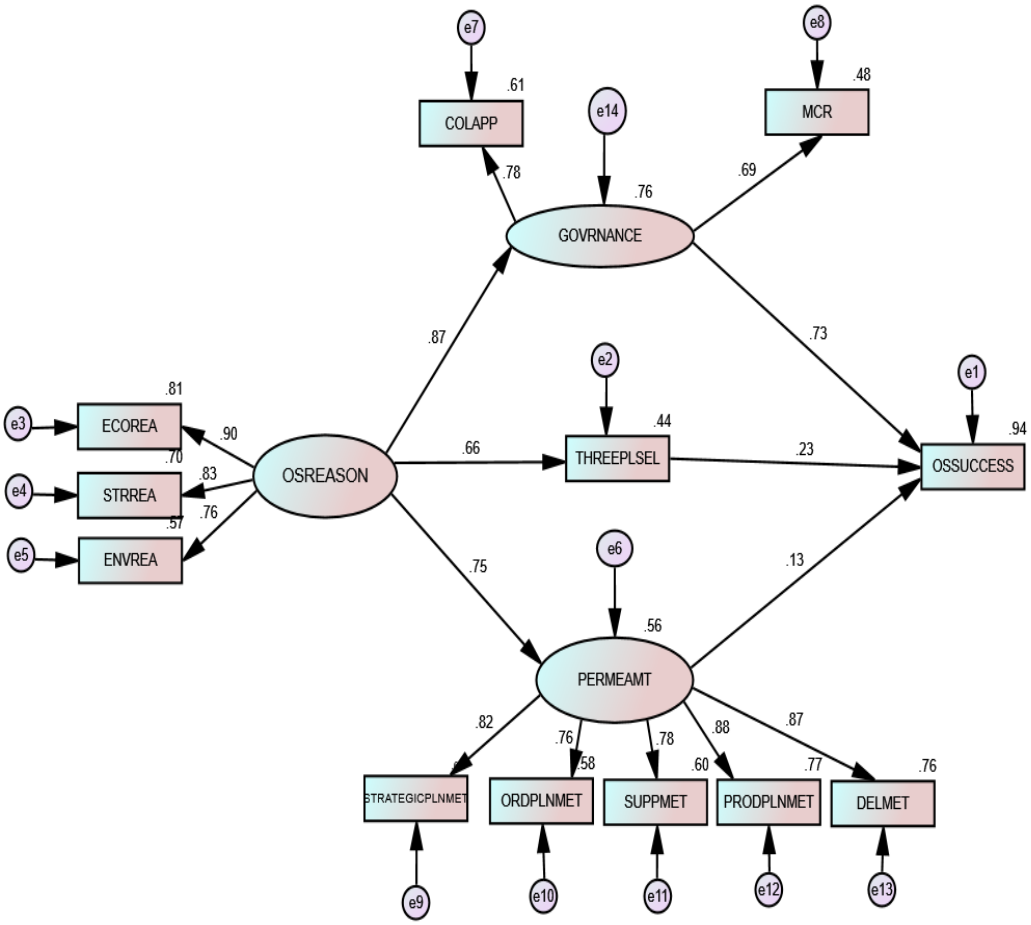

Figure 7.7 SEM Path Model

7.12.2 Competing model

In the presence of three mediating variables between outsourcing reasons and outsourcing success, the obvious question is whether the structural model presented in Figure 7.7 is the saturated one or it requires further specification. Therefore, a direct path is drawn between outsourcing reason and outsourcing success. The model in Figure 7.8 therefore offers an alternate or competing model to the base model. All the measured items reported significant loadings at 0.001 to 0.05 level of significance. The structural path model resulted in chi-square = 121706, *df* = 49, p = .000, Bollen-Stine bootstrap p = .091, CMIN / DF (< 3) = 2.484, GFI (> .9) = .932, AGFI = .892, TLI (>.95) = .960, CFI (>.9) = .970, NFI = .952, PCLOSE = .011, RMSEA (<.08) = .073, indicating all the goodness-of-fit indices were within the acceptable range. Thus, the competing model presented a good fit.

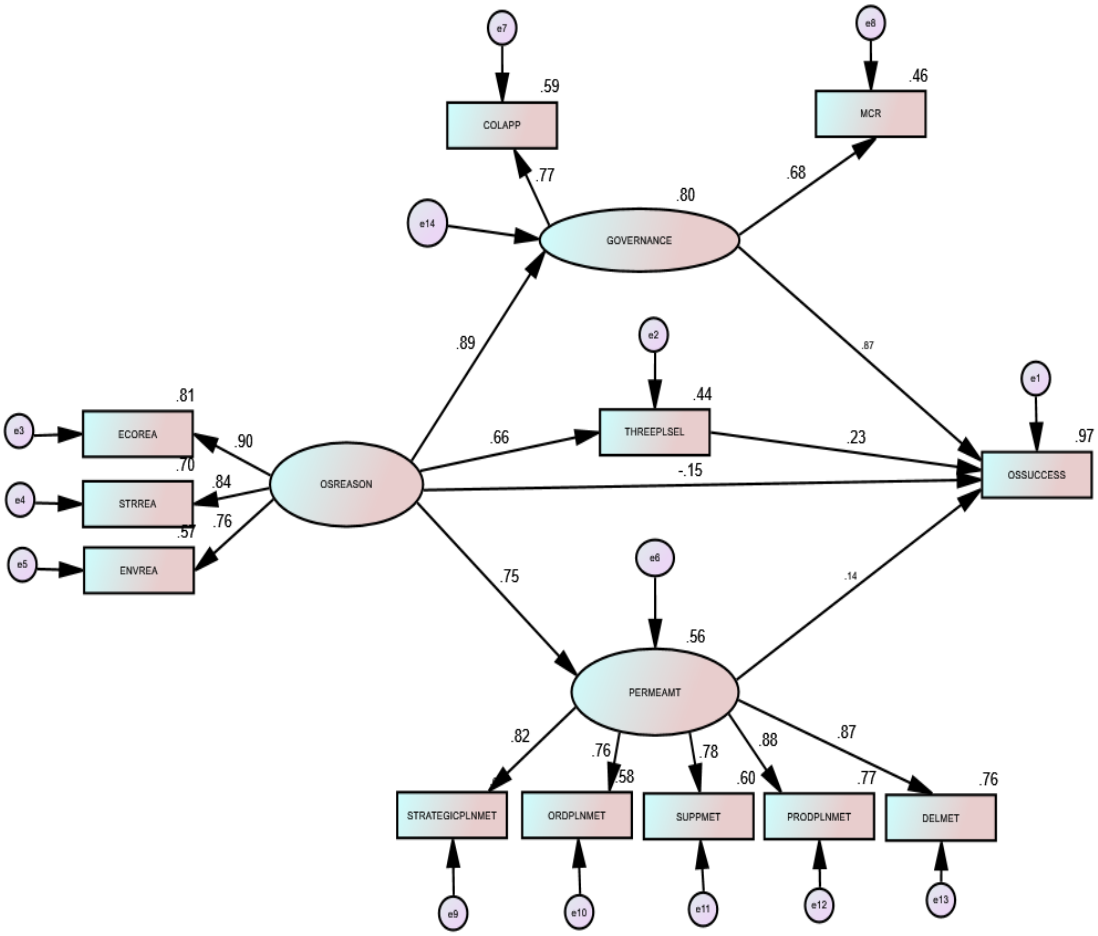

Figure 7.8 SEM competing model

7.13 Final (Best) Model

The base model and competing model offer two sets of parameter estimates. The sequential chi-square difference test (SCDT) is used to determine whether there is a significant difference in the nested models. The base model reports the chi-square measure as $\chi 2$ (50) = 122.48; whereas competing model reports the chi-square measure as $\chi 2$ (49) = 121.706. Question is do they have significant differences between them. The difference in two chi-squares for a unit difference in degrees of freedom is $\chi 2$ (1) = 0.611. This indicates that there is no significant difference (p>.05) in model discrepancy between the hypothesised model and competing model. The additional path from outsourcing reasons to outsourcing success worsens the model. Therefore, the base model in Figure 7.7 is the final accepted model.

7.14 Results of Hypothesis Testing

Hypotheses	Description	Std. β	*p*-Value	Result
H1	Logistics outsourcing reasons are positively associated with project governance mechanism.	0.871	<0.001	Supported
H2	Outsourcing reasons are positively associated with 3PL selection criteria.	0.664	<0.001	Supported
H3	Logistics outsourcing reasons are positively associated with 3PL performance measurement.	0.750	<0.001	Supported
H4	A collaborative approach and mutual conflict resolution as a governance mechanism is a positively associated with successful logistics outsourcing experience.	0.727	<0.001	Supported
H5	3PL selection criteria are positively associated with outsourcing success.	0.225	<0.001	Supported
H6	3PL performance measurement is positively associated with outsourcing success.	0.132	0.001	Supported

7.15 Conclusion

The research proposed a conceptual model of a network of relationships associated with the determinants of outsourcing success. Data were collected using a survey instrument developed and based on literature support to measure different study constructs. Confirmatory factor analysis was used to establish construct reliability and validity. Path analysis was used to test the hypothesised relationships in the structural model. As explained earlier, the analysis was divided into two parts, outsourcing reasons and its association with its process enablers named, governance mechanism, 3PL selection and performance measurement; and secondly, these outsourcing process enablers and their influence on outsourcing success. In summary, it is established that outsourcing reasons are achieving outsourcing success through the outsourcing process enablers named above.

Chapter 8 deals with the discussion about the results, theoretical implications and implications to practicing and consulting managers, the 3PL industry in India, public and private industries. Furthermore, it also deals with research limitations and opportunities for future research.

CHAPTER 8

DISCUSSION, IMPLICATIONS, CONCLUSION AND LIMITATIONS

8.1 Introduction

This study investigated strategic logistics outsourcing and has developed a framework for its success. The key enablers such as governance mechanism, 3PL selection criteria and performance measurement are incorporated in this model to show how the outsourced activities lead to its perceived success. These enablers facilitate the outsourcing process towards achieving the identified outcome, which in this study is outsourcing success.

In this era of business globalisation, organisations are increasingly looking for third-party help in accomplishing their non-core activities as a measure of cost saving. This strategy releases the businesses to focus more on their core competencies. Fawcett, Magnan and McCarter (2008) posit that supply chain management success amplifies with increased reliance on 3PL services and their strategic partnership. These alliances are formed as a result of organisational core competency assessment. Lynch (2004c) explains that outsourcing itself is not a strategy but only a vehicle to achieve the strategy. It is evident that an outsourcing initiative is a vehicle to transform supply chain management towards a successful outsourcing experience. This outsourcing strategy could include consideration of economic reasons, strategic reasons and environmental reasons. Lambert et al. (1996) believe that the partnership between shippers and 3PLs is a tailored business relationship banking on mutual trust, transparency and shared risk, and reward. Lambert et al. believe that this arrangement yields a competitive advantage that results in improved business performance as compared to shippers working without alliances.

India is no different to the outside world when it comes to outsourcing. Globalisation has a profound impact on supply chain outsourcing (Lemoine & Dagnæs 2003). The Press Trust of India (PTI), quoting from a report by research and consultancy firm RNCOS, related that the 3PL market size will reach around US$7.5b by 2019.[1] This is an indication of the growth of outsourcing success in India. There are three critical factors underpinning

[1] http://www.vccircle.com/news/infrastructure/2014/12/23/third-party-logistics-market-size-india-touch-75b-2019.

outsourcing success: the shippers are able to focus on core business activities; the access to IT capability; and availability of skilled personnel. This same report indicated that 77% of the shippers were totally satisfied with the overall benefits from outsourcing. Feedback from users of 3PL indicates there are indirect cost savings and competitive advantage for the organisations that emerge from the outsourcing mechanism. India's market size is estimated to be around US$19.8b, with a total logistics spend equivalent to US$283.6b (Armstrong & Associates 2016a). Reaching fourth position in the Asia-Pacific region India's logistics outsourcing industry is anticipated to grow at a very rapid pace. The alliances between the shippers and the 3PLs are becoming more and more of a necessity, rather than being seen as a fad. As per the LPI (Logistics Performance Index), India ranks at 53rd from 115 countries and scores 3.08 out of 5 as an efficient logistics system score (Ken 2015).

This final chapter is organised as follows. The first part of the discussion establishes the association between outsourcing reasons and the three enablers explained above. The second part addresses how effectively the three process enablers (e.g. governance mechanism, 3PL selection and performance measurement) deliver outsourcing success. It was hypothesised that outsourcing reasons and governance mechanism, 3PL selection and performance measurement were significantly and positively associated and that this helped achieving the success.

The chapter discusses theoretical contributions to the existing literature on outsourcing and draws on the practical implications of these findings for managers, industry and the public sector. Finally, the limitations of the study are outlined with suggestions for future research.

8.2 Association Between Outsourcing Reasons and Governance: Outsourcing Reasons and Performance Measurement, and Outsourcing Reasons and 3PL Selection

8.2.1 Outsourcing reasons

It was hypothesised that outsourcing reasons have a positive relationship with governance mechanism, 3PL selection, and performance measurement. Strategic logistics outsourcing is a by-product of a core competence strategy. A core competency is the process of creating product/service differentiation through intellectual uniqueness on which an

organisation wants to focus (Kid & Yazdanifard 2015). Thus, non-core activities are outsourced, giving way to core activities that take the centre stage. Outsourcing is not merely handing over the responsibility of executing the task to a third party. It is a structured collaborative process to deliver competitive differentiation, even in non-core activities handled by the third party who are considered as experts in handling these activities. If the starting point is to identify non-core activities and the reasons for outsourcing them, the end point is a measurable outcome that can be benchmarked against the best in the industry. It may not be out of place to remember the quote from Tom Landy (1924–2000), ranked as one of the greatest and most innovative coach in the football league history, "Setting a goal is not the main thing. It is deciding how you will go about achieving it and staying with that plan" (Brumfield 2013, p. 40).

The essence of the above quote pertinent to outsourcing process is that one should have a strategy that explains its purpose and expected outcome. Blurred vision and a lack of strategy and structured process can lead to a fatal failure of outsourcing. Ideally, the shipper company should be able to customise the reasons for outsourcing to have clarity on its expectations of outsourcing. The current study segmented the critical outsourcing reasons into three categories: first, the economic benefits of the outsourcing; second, the organisational strategy aligned to outsourcing outcome, and finally, dealing with business environmental reasons.

The economic reasons include the following items that were retained in the confirmatory factor analysis: improve profitability, increase cost efficiency, make capital funds more available for the core areas.

Due to financial volatility and business uncertainty, the focus of organisations lies heavily on improving profitability and returning handsome dividends to the shareholders. Organisations can achieve enhanced profitability by reducing costs, focusing on their core business, improving margins by reducing overheads and fixed costs, converting fixed costs to variable costs, and finally by improving operating profit after capital charge (OPACC). Improvement in OPACC can be achieved by reducing an organisation's working capital usage. Outsourcing the supply chain activities can significantly contribute towards the objective of improving profitability. Trehan (2012) explains that logistics capabilities have two different orientations; the first being supply chain-oriented, and the second one demand chain-oriented. He concludes that demand chain-oriented logistics capabilities

have a greater impact on a firm's profitability, further clarifying that large- to mid-sized organisations consider logistics as a strategic tool that can lead to enhanced profitability.

Using the working capital more effectively in core activities is likely to reduce the cost of operations considerably. Logistics consumes resources, infrastructure, asset investments such as warehouses, trucks, IT hardware and software, as well as people. The importance of technology is growing exponentially within supply chain operations. Brah and Ying Lim (2006) believe that technology enhances quality performance in logistics operations. The cost of technological innovation and investment is very high, thus increasing the cost of the product. Furthermore, today's customers are very demanding and they expect the shipper to provide a clear expected time of delivery within all other constraints. While technology helps in supply chain visibility, investment involves cost, effort and time, with no guarantee of achieving cost savings. By outsourcing the technology requirements as part of logistics outsourcing shippers can divert the capital to other core areas, while simultaneously reducing their dependence on in-house technology requirements, at least in the areas of supply chain operations. The traditional logistics activities such as transportation, storage, order fulfilment and IT support are today considered as non-core functions, with these activities having significant asset requirements and offering large cost savings through outsourcing. Historically, 3PLs delivered traditional logistics services; however, the increased volume and scope of services provided demand a coordinated effort from the 3PLs in the areas of supply chain. The company UPS claims that for their customers (shippers) they act as eyes and ears around the world (Zacharia, Sanders & Nix 2011). This effectively summarises that the 3PLs can mitigate business risks and reduce/avoid the capital deployment and thus effectively reduce the cost of capital.

The strategic reasons for outsourcing include four items retained through CFA analysis, increased competitive advantage, convert fixed costs to variable costs, increase responsiveness to market change, and reduced risk.

In today's competitive and dynamic market conditions, it is established that supply chains are competing against each other. It is absolutely necessary to be competitive and able to deliver products and services more efficiently compared to their competitors to grow the top-line revenue, at the same time delivering significant bottom-line results through added economic value. Top-line revenue growth will not ensure organisational continuity, but it

is absolutely necessary to deliver healthy profitability. In summary, competitiveness is all about creating value by focusing on the core competencies and delivering value through sustainable short-term and long-term growth and added economic value through profitability.

According to the Institute for Management Development, Switzerland (IMD), there are two dimensions of business competitiveness. The first deals with generic dimensions of the business and the second deals with intrinsic dimensions. They are uniquely different in nature as the generic deals with business practices the organisation may choose to adopt, while the second intrinsic dimension mostly deals with behaviours and practices that will enable the firm to sustain its performance over a longer term (Bris & Caballero 2014). An International Monetary Fund report from October 5, 2016,[2] has painted a gloomy picture of the global economy, indicating erosion of profitability, low growth and low interest rates, along with the inability of financial institutions to support growth. Under these circumstances, the need for enhanced organisational competitiveness has become a source of outsourcing strategy.

Competitive advantage comes from the uniqueness of the product or service delivered to the customers. The uniqueness could be through product innovation, made possible by focusing on core business or an innovative supply chain by outsourcing non-core activities to a specialist who can deliver unique value to the shipper. The competitive advantage is achieved by delivering the product to customers at a lower cost or through innovative customer experiences. Parashkevova (2007, p. 38) explains that "the lowering of operative costs by 15% may be reached in return for increasing the operative effectiveness, widening of the process and cutting delivery costs by means of outsourcing the logistics chain functions". Furthermore, he explains that by synchronisation of activities through seamless information flows, technology deployment leads to optimising operative costs through process integration, planning improvement and fulfilment of logistics costs through outsourcing. He also estimated that a reduction of variable capital by 30% can be achieved due to effective inventory management, as well as shrinking the order-to-money cycle time. Somuyuwa, Odepidan, and Dosunmu's (2016) study further supports that

[2] https://www.imf.org/external/pubs/ft/weo/2016/02/pdf/text.pdf

outsourcing logistics activities deliver the ability to control organisational costs, improve customer services and allow the organisation to focus on its core competencies.

Increasing operational efficiency also leads to increased cost efficiency. Businesses' operations can be divided into two cost segments—fixed costs and variable costs, which are linked to the highs and lows of operational load. By outsourcing the non-core activities to an external organisation (3PL in this case), the fixed costs can be converted into variable costs. The second benefit is the enhanced operations efficiency achieved as the mundane activities such as transportation, warehousing, value-add services—as well as some exceptionally strategic functions such as consultancy, distribution optimisation, business risk identification—can deliver improved efficiency levels once outsourced. This results in higher customer service excellence, which then contributes towards economic benefit to the organisation. Qureshi, Kumar, and Kumar (2007) explained that logistics outsourcing improved operational performance by optimising logistics costs, thereby enabling the shipper to demonstrate a competitive advantage.

Market conditions are changing rapidly, product proliferation is growing at an increasing rate, market boundaries are erased, and customer bases are spread across the world thanks to the impact of globalisation. For efficient business, organisational responsiveness has to be effective and supply chains have to be agile and lean. To achieve this requirement, it is no longer possible for any organisation to operate without alliance partners in the form of 3PLs. Sasananan et al. (2016) identified that speed of delivery, on-time delivery reliability, and responsiveness to targeted market and supply capabilities, including wide spread of distribution coverage, and total cost reduction are key parameters for identifying suitable 3PLs. This indicates the importance of responsiveness and flexibility to meet the global distribution challenges. Kyusya (2015) believes that logistics service providers are strategically selected to deliver flexibility and speed in delivering product differentiation. This explains the benefit of improved operational efficiency from the perspective of speed and flexibility, which is critical to today's business and can be very challenging for the shippers to achieve with their in-house capabilities.

Risk reduction is a common strategy and part of most business continuity plans. Business risk can arise due to variety of reasons and most of them are supply chain-related. The free flow of material can be affected by terrorism, shortages of raw materials and the increased distance between customer and the shipper, all of which will encourage organisations to

hold their inventory to avoid a loss of sale. Inventory holding could then lead to increased working capital and overall cost overheads, thus resulting in erosion of profitability. Outsourcing supply chain activities have introduced solutions such as JIT (just-in-time), cross-docking, VMI (vendor-managed inventory) and inventory financing. These are some of the solutions that can be delivered by the 3PLs to negate business risk. The outsourcing of supply chain activities is designed to optimise business performance within the value chain and deliver competitive advantage through cost, quality and innovation, thus ensuring business continuity and prosperity (Salanta, Ilies & Muresan 2012).

The third outsourcing reason is the environmental aspect and includes four items, all focusing on delivering a total customer experience. The four items that were identified through CFA analysis include, helping companies gain global advantage, partnering to improve service quality, improving customer service, and improving service quality through partnership. While these have similarities, they are unique in nature.

By closely examining the above four environmental reasons for outsourcing, it is clear that globalisation has made a deep impact on a country like India as global trade is growing. India is considered as the 18th largest export economy in the world and the 50th most complex economy, according to the Economic Complexity Index. India exported US$292b and imported US$421b, with its GDP in 2014 estimated at US$2.05t, according to the Observatory of Economic Complexity.[3] Service quality can be considerably improved through outsourcing and by entrusting the operations to professional 3PL companies. These 3PL companies have gained vast experience working worldwide and across different economies and industries, handling customers with care and respect and thereby improving service quality. This level of expertise enables organisations to achieve what is known as the total customer experience. In short, the total customer experience can be explained as the relationship a customer has with the shipper and includes all their interactions leading to a positive outcome. Singh's (2015) study revealed that service satisfaction was a major predictor of loyalty information in logistics outsourcing relationship arrangements.

Milind Shahane from DIESL, one of the Tata Group of companies and a leading service provider of integrated logistics solutions to several industries in India, explains that an

[3] http://atlas.media.mit.edu/en/profile/country/ind/

estimated 52% of logistics requirements of organisations are outsourced in India, and this number is still growing. He believes that the future of logistics lies in outsourcing (Buchh 2015), identifying the phenomenal growth recorded by e-commerce industry for 3PL industries in India. The e-commerce industries rest on the shoulders of logistics support, which provides arms and legs to the e-commerce infrastructure (Ken 2015). In particular, the Indian retail industry is growing very rapidly and is one of the fastest in the world. According to India Brand Equity Foundation, this industry is expected to grow to US$1.3t by 2020, with a compound annual growth rate of 16.7% during 2015–2020 (IBEF 2017). This rate of growth explains the future role of 3PL industry in India as the retail industry largely depends upon the 3PLs to service their orders. Products pass through intermediaries, distributors and retailers and finally the consumers in the retail supply chain. This process may vary depending upon circumstances, but the major portion of the operations are handled by 3PLs (Content 2015).

According to the report titled, *Indian logistics industry benchmarking study and analysis of outsourcing trends*, published by Frost & Sullivan Research Service, Indian companies have identified two main reasons to outsource, economic reasons and to focus on core business (Frost &Sullivan 2009). In addition, technology innovation and e-commerce growth seem to be the third reason for outsourcing in India due to 3PLs investing strongly in technology to improve service quality and customer service. DHL, a global market leader in 3PL logistics, alone has invested about €100m in India in the areas of infrastructure and technology. These investments include RFID technology for barcode scanning and fully secured warehouses equipped with CCTV, electronic access controls, intruder alarms and traffic management systems (Leong 2012). 3PLs are partnering with shippers to enhance customer service quality and deliver competitive advantage.

8.2.2 Outsourcing reasons and governance

The path analysis results show that outsourcing reasons and governance of the outsourced activities are significantly associated in driving the outsourcing success. The outsourcing reasons explain 75% of the variance in governance, and the regression weight for outsourcing reason in the prediction of governance is significantly high with β 0.871 at $p = 0.001$.

The role of outsourcing reasons in defining the way to outsourcing success was found to be significantly associated in the path analysis. Some of the many reasons for outsourcing in-

house functions to a 3PL service provider include, but are not limited to, transaction cost economics (TCE), strategic management, human resources management and logistics (Rajesh et al. 2013). These closely align with the current study, as explained above. TCE improves profitability, capital funds availability to core business activities, and its most critical objective is the conversion of fixed costs to variable costs. In relation to human resources, employees' behavioural intentions have a deep impact on customer service and customers' decisions to remain with the organisation or to defect (Zeithaml, Berry & Parasuraman 1996). Logistics can be broadly defined as 'time-related positioning of resources', meaning a focus on ensuring that people, material, operational capacity and information are in the right place at the right time, in the right quantity and quality and cost (Branch 2009). This objective closely aligns to the reasons for this study that include, increasing responsiveness to market change, increasing competitiveness and enhancing competitive advantage.

To achieve these strategic objectives, two aspects are critical in the form of governance: a collaborative approach and mutual conflict resolution. The items refined through the study's CFA analysis of collaborative approach include the degree of trust between partner (3PL) and shipper; the central role of regular communication and sharing of information being fundamental to an effective collaborative relationship; having well-understood goals and objectives, and being willing to share them openly. Additionally, 3PLs and shippers need to develop mechanisms of shared risk and rewards, as well as detailed contract terms and conditions. The basic objective of an integrated collaborative governance framework is to continuously adapt to the customer's requirement and environmental changes (König & Caldwell 2015). Strong and close collaborative governance with the 3PL is vital.

Participants perceived that relationships prosper with trust and transparency among the partners. Relational exchange theories advocate that trust is an effective monitoring and control mechanism for maintaining relationship commitment and cooperation and opportunism is discouraged (Zhao et al. 2008). In the absence of trust, the shipper and the 3PL have no information flowing between them and thus, this project 'blindness' could cause fatal damage to the outcome of the relationship in the form of unnecessary costs incurred in the process. Trust is the key element in the supply chain acting as an informal governance mechanism that facilitates inter-organisational coordination (Capaldo 2007). Capaldo and Giannoccaro (2015) emphatically explain that the presence of trust in supply

chain participating organisations means they tend to behave altruistically in the best interest of the supply chain. Jap and Ganesan (2000) believe that relationship norms improve commitment and dependence and long-term orientation. Trust and commitment play critical roles in minimising opportunism and paving the way for transparency in the relationship, which is a significant and valuable element for the longevity of relationships. Governance is fundamental to how companies engage and manage their relationships (Wallenburg & Raue 2011). Sharing the risk and the reward is another element of strong bonding between the 3PL and the shipper. Quoting from The American Institute of Certified Public Accountants (2014), business risk was classified into three categories (Oliveira & Di Serio 2014): business environment, business processes and organisational assets, and risk due to lack of quality information. By outsourcing the supply chain operations, organisations can effectively handle these risks. Quality of information shared between the shipper and supply chain partners is critical and calls for IT-driven information sharing and use of big data analytics, cloud computing and so forth.

When it comes to sharing the reward, the majority of the shippers follow the concept called gain share, which in simple terms means sharing the reward between the shipper and 3PL in the agreed format to establish partnership commitment (Lynch 2004b). Finally, a well-documented contract is likely to be essential and should cover the scope of the work, reward, risk-sharing, gain-sharing, key performance indicators (KPIs), conflict resolution mechanisms and finally, the project team and their roles and responsibilities. Some contracts even include the performance measurement criteria and the process of measurement. Colin et al. (2011) have explained that 3PL performance will be effective if they adapt to the shipper's requirements. These requirements are documented through the contract entered into by the shipper and 3PL. It was further explained that a successful outcome would eliminate the risk of contract termination. The relationship between the shipper and the 3PL is formalised into a contractual relationship to reduce the risk of failure (Sahay, Halldórsson & Skjøtt-Larsen 2006). Robinson (2013) explains that collaborative outsourcing can drive down costs in the short term and build smarter and stronger supply chains in the longer term.

The second element of governance mechanism is mutual conflict resolution and this includes two items refined through CFA analysis: first, suitable solutions are developed to mitigate the risk arising out of conflict, second, the shipper and 3PL collaborate to resolve

the issue. Healthy conflict is always good for a business relationship and organisations, however, conflicts arising out of project blindness are fatal. Verstrepen et al. (2009) emphasise that conflict resolutions and 3PL cooperation can be influenced by the governance mechanism. Furthermore, Schmoltzi (2016) observed that potential conflict is inherent in complex relationships. Conflict can be defined as disagreement between the parties involved; it arises due to friction and is often viewed as a negative development and there is a need to overcome issues amicably (Andrade, Plowman & Duchon 2008). Emotional intelligence plays a critical role in avoiding conflicts and disagreements among the parties. Conflict is an emotional reaction to the perceived disagreement and interference in the process of attaining the agreed goals (Barki & Hartwick 2004). Functional conflict in a healthy relationship is good, but dysfunctional conflict will have negative impacts on innovation (Wallenburg & Raue 2011).

The existing literature supports the view that conflict handling and conflict outcomes are strongly related, depending upon the choice of a cooperative or competitive approach to conflict resolution management (Song et al. 2000). The cooperation and collaboration play vital roles in resolving dysfunctional conflicts that emit negative impacts on the overall outcome and could lead to disastrous outcomes and defeat of the core objective of the process. An integrated conflict handling strategy is also known as win–win situation, collaboration, cooperation and positivity. This process results in satisfying both sides' needs and objectives to the greatest extent (Song et al. 2006).

This research finding closely aligns to what is established in the existing literature. India is a developing country and culturally different to other developed countries. In resolving conflicts, culture plays a key role. According to the Nobel prize winner Sen (2005), Indians are known to be more argumentative and dramatic. Indians believe in fatalism and this is fundamental to the Indian characteristic traits of the Indian culture of spirituality. Arguments can lead to confrontation, which ends with conflicts and negative outcomes. The concept of "Karma" and the belief of everything happening for a reason are significant in the decision-making process within Indian culture. Group-defined orientation and a strong sense of community among Indians influences decision-making with a greater emphasis on interpersonal contacts, avoidance of conflict and an indirect communication approach (Ndubisi 2011). Conflicts abound during implementation of business processes leading to problems arising due to people, processes, technology or contract. Conflict

resolution management is therefore a critical part of a governance plan, and a governance plan is the glue that holds outsourcing relationships together (Power 2006). The future of supply chain management therefore lies in collaboration (Cao & Zhang 2011), a governance framework can ensure outsourcing reasons are fulfilled.

A governance mechanism in the form of collaboration is critical to achieving targeted outsourcing reasons. The 3PL companies should be able to work collaboratively and be able to assess, analyse and deliver the shipper's organisational objectives, as well as meeting their corporate mission and policy goals and assuming accountability and ownership in meeting the objectives (Confederation of Indian Industry [CII] 2008). As part of a governance mechanism, conflict resolution plays a critical role in outsourcing. A 3PL's performance evaluation depends on organisational objectives. Logistics outsourcing requires trust. Ralph Waldo Emerson (an American essayist, lecturer, and poet who led the transcendentalist movement of the mid-19th century) is credited with saying, "Trust men and they will be true to you; treat them greatly and they will show themselves great" (in Guedens 2003, p. 44). Trust is the key element in the relationship between the shipper and the 3PL and both parties should collaborate and manage the relationship and maintain trust to succeed (Apple 2013). When trust is the key to success, the performance evaluation is at a macro level.

Bhavanani and Natyalayam (2012) explain that ancient Indian texts have prescribed four-step approaches to resolve any conflict, and he reiterates that each step needs to be applied consequently, only when the previous step fails. These steps are:

- *Sama* (persuasion) involving friendly persuasion and discussion
- *Dana* (benefits) if the persuasion fails, offer the benefits of the deal
- *Bheda* (consequences) this step involves articulating the disadvantages of not following the path of mutually amicable settlement and the serious consequences of not following mutual conflict resolution
- *Danda* (punishment) this is the last step signalling the failure of the conflict resolution process and implementing the consequences explained in the third step.

In summary, outsourcing reasons and a governance mechanism are closely associated and have a strong influence on the outsourcing outcome. Governance is perceived to play a critical role in transforming the reasons for outsourcing into positive results. Governance

can therefore be considered as the biggest enabler in achieving positive outcomes through outsourcing logistics operations in India.

8.2.3 Outsourcing reasons and 3PL selection criteria

The path analysis results show that outsourcing reasons and 3PL selection are significantly associated with each other. Outsourcing reasons explain 44% of variance in 3PL selection criteria, and the regression weight for outsourcing reasons in the prediction of 3PL selection criteria is significantly high with β 0.664 at $p = 0.001$.

When an organisation has many reasons for outsourcing, it looks at the 3PL's capabilities to be deployed in managing the operations to be outsourced. 3PLs are distinctly divided into two categories, asset-based 3PLs and non-asset-based 3PLs (Cain 2007). The shipper will select the appropriate 3PL based on this classification and their own requirements. It can therefore be established that there is a positive association between outsourcing reasons and 3PL selection criteria. Anderson et al. (2011) explain that shippers choose their service partners, such as 3PLs, based on their distinctive value proposition. The main reason being that shippers want a 3PL who can add value and provide competitive differentiation in the global market.

The 3PL selection is a complex process involving both tangible and intangible measures to qualify a suitable service provider, with the main criteria relating to customer orientation. Through CFA analysis, this study identified five distinctive criteria in selecting a 3PL in the Indian environment out of 19 measures posited. These criteria are pricing, quality of tactical services, knowledge and the ability to advise on supply chain innovation (value addition), on-time shipment delivery and e-commerce capabilities. It is apparent that all the identified criteria are critical to a successful outcome. Shippers are actively seeking collaborative partners (3PLs) with whom they can utilise joint skills and efforts to create value to the ultimate customer (Corsten & Kumar 2005). Market analysts are predicting that the 3PL market in India is expected to grow at a CAGR (compound annual growth rate) of 8.43% during 2014–2019. This implies the need for efficient and collaborative 3PL who can deliver targeted outcomes.

The participants studied perceived 3PL pricing as vital in their selection. One of the core objectives of outsourcing is to save costs and convert fixed costs to variable costs (Trunick 1989). Cost of service is also ranked as a top criterion in India from the research published

by Sasananan et al. (2016). The emerging trend in pricing is quite different to the conventional pricing model used by the 3PL. The shippers are now encouraging approaches such as an open book method, cost plus method, and activity-based costing to control the 3PL costs and tie the cost to the operations.

The logistics services provided by 3PLs may be classified as strategic, tactical and operational. Tactical supply chain decisions focus on adopting measures that will produce cost benefits for a company. Tactical decisions are made within the constraints of the overarching strategic supply chain decisions made by company management. The tactical-level services handle material flow management policies, assembly policies, inventory levels and lot sizes. As customer services reflect the order transformation to delivery, it is necessary to consider customer service as part of tactical service more broadly (Schmidt & Wilhelm 2000). Tactical activities can be defined as activities beyond mundane operational functions with the objective of delivering value-added services to the customer in order to achieve customer service

The role of a 3PL is transformed from being a service provider to becoming a supply chain partner. Shippers expect the 3PL companies to provide supply chain optimisation-related advice occasionally to shrink the product lead time, improve customer service, reach global customers and optimise the distribution network. Developments in value addition and supply chain innovation have introduced concepts such as VMI, cross-docking, in transit merge, inventory financing and postponement, among others. Delaying the product differentiation until the last minute gives the shippers the advantage to customise the product and enhance customer excellence. Browne, Allen, and Leonardi (2011) identified value-add services such as improved return logistics services and inventory control, product preparation as some of the areas where 3PLs can add value. These services are beyond the routine, transportation and warehousing services that are considered conventional services—the focus has shifted to value-add services by the 3PLs.

Revolutionary trends have been witnessed in the retail sector, which has a heavy reliance on 3PLs. The 3PLs are now expected to have e-commerce capabilities to serve their customer effectively. Integrated and effective supply chain management is critical for success in today's e-commerce enabled world (Joong-Kun Cho et al. 2008). Technology is another critical selection criterion for 3PLs. Sample participants in this study believe that shippers are defocusing on IT technology and instead focusing interest on core business

areas. This provides a wonderful opportunity to forge greater relationships through IT integration with the shipper.

A key emerging reason for outsourcing in recent years is IT and e-commerce. Chang and Graham (2012) suggest that an e-commerce strategy should support the corporate strategy while aligning with supply chain strategies. Langley and Capgemini (2016) report that information technology has become increasingly viewed as key to the success of 3PL operations and has also increased the role of technology personnel in the implementation stage of third-party relationships. Numerous studies have revealed the importance of integrated IT as core strength of a 3PL (Liu & Tyagi 2016). There has been consensus on the key drivers/objectives of logistics outsourcing and these include, but are not limited to, improving process responsiveness, increasing flexibility, enabling shipper to focus on core competence, enhancing customer service, improving process capability and cycle, and improving lead time, thus reducing the cost of operations (Rajesh et al. 2013).

Fitzgerald (2007, p. 1) identified six critical parameters for selecting suitable 3PLs and deviated from the conventional academia perspective by discussing issues more from an industry perspective through macro parameters—including cultural alignment as the first and critical criterion. He questions, "Does my company and the 3PL we will work with share the same values, such as ethics and responsibility; and can we understand and agree upon what the specific nature of the partnership arrangement will entail?" (2007, p. 1) The second aspect Fitzgerald addresses is the organisational infrastructure needed to handle the project. With today's globalisation and new technological innovations, it is absolutely necessary to have the right infrastructure to meet the deliverables—"If you source from India, for instance, does the 3PL have its own offices in the region to work with your suppliers?" The third criterion deals with IT capabilities, which he believes work hand-in-hand with organisational infrastructure. Real-time data sharing and seamless information flow through EDI, XML or web-based solutions are critical in addressing global logistical service challenges such as visibility, cross-docking support, forecasting and inventory replenishment and product cycle management. He asks, "How fast can the 3PL respond to IT requests?" The fourth criterion focuses on ease of doing business, suggesting that "A supply chain partnership will only be as good as the skills and cooperation its participants bring to it". Flexibility, a willingness to work together, and empowerment play vital roles in delivering an optimised value chain process.

The fifth measure raised by Fitzgerald explains the importance of measuring the performance through metrics, where he suggests "Cost is always important, as the success of any supply chain partnership ultimately relates back to customer satisfaction". The key KPIs to ascertain this aspect could include, on-time performance, damages, cost-per-touch, total landed costs and so forth. The final measure is all about partnership intangibles where he asserts that "It is vital that each partner fully understand the meaning of 'global collaboration'". He believes that value-added customer service-related items can be further enhanced if the shipper and the 3PL are able and willing to jointly invest in common success. All the above 3PL selection criteria identified by Fitzgerald (2007, p. 1) closely align with the research outcome, thus establishing research findings are aligned with industry expectations.

Alignment between outsourcing reasons and criteria for selection 3PL is very important and there are common, but different approaches, as discussed below.

- ***Add, do not subtract*** – a collaborative and configurable approach that delivers the benefits of talent, technology and procurement strategy.
- ***Insist and on grant talent*** – the purpose of outsourcing needed to deliver enhanced operational excellence; to achieve this objective the organisation needs experienced and innovative personnel.
- ***Look for best practice leaders –*** hunting for a global player with broad expertise and a formal process in implementing best practices.
- ***Seek a flexible, multimodal network –*** business is not just local, current needs require flexible and multimodal networks that are ideally non-asset-based.
- ***Gain access to technology –*** technology is the key element of logistics outsourcing where the best of class outsourcing solutions should include advanced TMS technology as part of its framework.
- ***Create a "collaborative community" –*** collaboration is the word often mentioned in outsourcing arrangements. Outsourcing success will deliver cost savings, but at the same time it will also bring knowledge and new ways of thinking to the organisation. The 3PL should build community innovation that includes internal staff, carriers, suppliers, vendors, customer and others who influence the organisational network.

- ***Financially strong and healthy provider –*** businesses are advised to never entrust the valuable supply chain to a provider who may not deliver; a financially healthy and stronger service provider is considered as a safe bet (Robinson 2013).

To achieve desired outcomes through logistics outsourcing, shippers have to engage a compatible service partner who can transform as a supply chain partner through the governance mechanism. This supply chain partner is a 3PL and the selection of a 3PL largely depends upon the outsourcing reasons and type of outsourcing. This study focuses on collaborative relationships where a 3PL transforms into a supply chain partner. The 3PL selection criteria identified are perceived as beneficial to outsourcing reasons. The next section will explore the association between outsourcing reasons and performance measurement.

8.2.4 Outsourcing reasons and performance measurement

The results of path analysis show that outsourcing reasons and performance measurement are positively associated with each other ($\beta = 0.750$, $p < 0.001$) with outsourcing reasons explaining 56% of variance in a governance mechanism.

This study finding clearly demonstrates that outsourcing reasons will have a positive influence on performance evaluation. Performance evaluation is the tool to measure the outcome of the outsourcing decision and the extent to which this outcome is aligned to the reasons. Hence, performance evaluation is an instrument to test the validity of outsourcing reasons.

It is necessary to therefore develop performance measures that keep the operations aligned to the outsourcing goals and that are likely to deliver outsourcing success. Lynch (2004c) believes that dealing with expectations or avoiding conflicts, having clarity and honesty are critical ingredients of successful outsourcing relationships. As long as the performance measures are documented and agreed with the 3PL, human emotion relation conflicts are eliminated. This study identified a variety of performance evaluation measures and grouped them under five distinct categories: strategic, order planning, supplier, production, and delivery metrics. Thirty-three measures were identified in the questionnaire and the model fit analysis conducted through CFA identified 13 measures. They are shown in Table 8.1.

Table 8.1 Performance measurement items identified through CFA analysis

Strategic planning metric	Order planning metrics	Supplier metrics	Production metrics	Delivery performance metrics
Variance against budget				
Information. processing cost				
Total cycle time				
	Accuracy of forecasting			
	Planning process cycle time			
		Supplier pricing against market		
		Efficiency of purchase order cycle time		
			Capacity utilisation	
			Range of products and services	
			Utilisation of economic order quantity	
				Quality of delivered goods
				Flexibility of service system to meet customer needs
				Percentage of finished goods in transit

Christopher (2000) succinctly described market conditions by commenting that supply chains compete among themselves, rather than the organisations by themselves. Performance measures play a vital role in helping organisations to understand the direction in which their business or relationship is heading. Australian scientists established that, “It proves that measurement is everything. At the quantum level, reality does not exist if you

are not looking at it" (Khakimov & Truscott 2015, p. 1). This revelation is in the field of physical sciences, however, it is also very relevant to business and outsourcing measures. Keebler and Durtsche (2001b) observe that the majority of companies ignore measuring the logistics performance and thus fail to realise their productivity and service potential, and the scope for improvement.

The key element to success in business is having financial discipline. Budget variance is the difference between budgeted costs vs actual expenses incurred. The cost-related objectives such as improving profitability, improving cash flows and improving efficiency (Claver et al. 2002; Gonzalez, Gasco & Llopis 2016) largely depend upon financial discipline. The shippers expect the 3PLs to be able provide the right technology solution and at the right cost and to be able to deliver systems to meet their needs (Rajesh et al. 2013). Globalisation means that customers are spread across the globe and it is paramount to reach them on-time and every time, and also as quickly as possible due to the amount of competition in the marketplace. This relates the inbound raw material as well as finished products. Reduction in cycle time and lead time was one of the measures reported by Bhatnagar and Viswanathan (2000). 3PL companies become increasingly valuable in the partnership by improving their reliability and speed of delivery (Wong & Karia 2010).

Planning accuracy and process lead time measurement are likely choices of study participants. The study conducted by D'Amato et al. (2015) revealed that a vast majority of respondents see value in the convergence of planning and execution activities by 3PLs. While such convergence will be a challenging task to 3PLs, its measurement is vital for successful integration. Planning is a critical element of logistics operations.

Outsourcing revolves around cost and cost benefits; hence, benchmarking the cost of a 3PL is a permanent fixture in any performance measurement model. There is very little literature available on how 3PL pricing should be measured. As the 3PL pricing is unique to the organisation, and related to the services hired, 3PLs are expected to develop a relevant measurement model. It took little time to recognise activity-based costing as an innovative and valuable costing methodology; however, it took more than 20 years to reach its full potential (Turney 1992). Papasotiriou (2012) identified 16 methods in his book, including an open book method as well as activity-based costing, which are most popular within the 3PL industry. The core objective should be to convert the fixed costs to variable costs, this is the fundamental objective of outsourcing.

Other performance measures recommended by this study included quality, flexibility and economy of scale (cost savings) and these were discussed indirectly in the abovementioned measures. Trust plays a vital role; there will be a willingness to collaborate with trusted partners because there is an expectation that neither will behave opportunistically (Lai, Tian, & Huo 2012).

Outsourcing reasons and performance measurement criteria are very closely associated variables that support outsourcing success. In other words, the objectives of outsourcing are measured through a performance evaluation process. Stank et al. (2003) investigated the relationship between service performance and outsourcing outcomes such as customer satisfaction, customer loyalty and market share, establishing that relational performance is an antecedent to operational and cost performance.

The next section explains the outsourcing context from an India perspective and how the three named enablers facilitate the shipper to achieve outsourcing success through effectively utilising these enablers.

8.3 Impact of Governance Mechanism, 3PL Selection Criteria and Performance Measurement on Outsourcing Success and These Enablers' Positive Association with Outsourcing Success

8.3.1 Outsourcing success

The reasons for outsourcing envisage the outsourcing outcome, but on their own, the reasons or objectives cannot achieve the targeted outcomes. By integrating the outsourcing reasons with the business enablers such as governance mechanism, 3PL selection and performance measurement the final outcome will be delivered. How these enablers contribute to the outsourcing success statistically is explained hereunder.

The current study establishes that governance ($\beta = 0.727$, $p < 0.001$), 3PL selection criteria ($\beta = 0.225$, $p < 0.001$) and performance measurement ($\beta = 0.132$, $p < 0.001$) have positive and significant effects on outsourcing success. Governance mechanism, 3PL selection and performance measurement together explain 94% variance in outsourcing success.

It has been established categorically that strategic logistics outsourcing is successful in India. Logistics outsourcing involves an external organisation completing a business process or functional transactions between a buyer and a supplier to save costs and

enhance service level, among other advantages (Aguezzoul 2014). When two parties are involved in achieving the common goal, the glue to keep the partners together is trust, joint participation and collaboration. Collaboration is a form of modern relationship used in inter-organisational alliances. The high level of integration involved allows partners to work more effectively and deliver successful outcomes (Nyaga et al. 2013; Wilding & Juriado 2004).

To explain the outsourcing success there were nine items listed in the original survey questionnaire. Through CFA analysis, however, seven items were identified as part of model fit. These items include: refocus on core business, enhanced IT competency, increased access to skilled personnel, enhanced economies of scale in technological resources, reduced risk of technological obsolescence, increased access to key information technologies, and satisfaction with overall benefits from outsourcing.

8.3.2 Influence of governance on outsourcing success

If the focus is shifted to governance factors and how they facilitate the outsourcing success, the right governance form for logistics outsourcing becomes crucial, as does a governance mechanism with the 3PL to exploit leveraging the development of logistics capabilities to achieve positive outcomes (Halldórsson et al. 2007). Part of the governance mechanism is trust; by sharing information associated with improvement to operational efficiency and profitability then outsourcing outcomes are enhanced and lead to better relationships, increased ideation and unique forms of collaboration (Williams & Waller 2011). Enhanced information exchange arrangements and better understanding of a governance mechanism should increase shippers' confidence in their ability to effectively engage in integration with 3PLs. The role of trust and its impact on supply chain performance is well established as trust directly contributes to outsourcing success. Dyer and Chu (2003) believe that trust will have an impact on transaction costs and economics. Trust plays a critical role in fostering and managing inter-organisational relationships by exchanging information and knowledge resources, which then results in joint learning processes and sharing costs, as well as discovering and exploring new opportunities with an impact on performance (Cai et al. 2013).

Supply chain success depends upon a well-communicated collaboration of upstream and downstream product and information flows where the service provider's support is critical. The key element of success is that all are striving for the same goal collaboratively

(Mintzberg et al. 1996). Trust among supply chain partners is critical in any collaboration and it can be defined from several perspectives: sociological, psychological and economical (Svensson 2005). Trust from a sociological perspective is "a willingness to rely on an exchange partner in who one has confidence" (Moorman et al. 1992, p. 82). Castaldo (2007) believes that trust in sociological theory means a reduction of social complexity. Augmented communication between internal and external stakeholders enables supply chain integration (Waters & Rinsler 2014) but over-communication implies dependence and can result in breaking of communication (Baron, Conway & Warnaby 2010). From a psychological perspective, trust can be defined as a state of perceived vulnerability or risk of an individual regarding the motives and perspective action of others on whom they depend (Kramer 1999). An economic perspective describes trust as reducing monitoring transaction costs.

MacCormack et al. (2007) have explained the difference between traditional outsourcing and global collaboration. Traditional outsourcing views cost reduction as a project goal, lower costs as a collaboration goal, technical expertise as a partner value, and finally the project type is viewed as maintenance, quality assurance and new features (services). Whereas global collaboration looks at collaboration from a different perspective, revenue generation is considered as a key project goal. Within collaboration, cost leadership, access to knowledge, access to intellectual property, faster time to market, access to new markets, build-to-revenue are considered as goals. Technical leadership, intellectual property, business knowledge, process leadership, on-demand scalability, market context and knowledge are considered as partner values. New product development, new market entry and new product versions are viewed as project types. A developing country like India should be aiming for global collaboration.

The next section reviews the 3PL selection impact on outsourcing success.

8.3.3 Impact of 3PL selection on outsourcing success

The outcome of outsourcing depends upon a variety of factors and dynamics. These factors include the type of activities outsourced, country, type of relationship established, outsourcing process structure, and performance evaluation. In addition, the critical factors are the reasons for outsourcing and a governance mechanism, with the business dynamics such as government regulations, tax system, cross-border restrictions, and the

infrastructure dominating Indian business environment. It is therefore a complex process to determine which factors contribute towards outsourcing success or failure.

The area of focus from factors identified above is 3PL selection and its role in outsourcing success. The 3PL is the carrier who transforms the organisation's strategy into outcomes; thus, the selection of a suitable 3PL plays a very important role. Whipple et al. (2010) believe that trust, relationship activities and communication lead to satisfaction with relationships and these are critical parameters within this study as it is based on strategic supply chain outsourcing—termed as a qualitative aspect and starting point. Value addition is also a critical part of developing competitive advantage, which then delivers positive outcomes. Whipple et al. (2010, p. 510) explained value creation as, "one method … to reduce costs in commercial exchange". It is critical that the 3PLs understand the right value creation or addition to the shipper so that they can deliver competitive advantage in the marketplace. Fine et al. (2002) explain that the "sweet spot" in a supply is where a significant amount of value is created through a set of activities. Cost reduction dominates the selection criteria either directly or indirectly as the primary selection factor.

Global reach is the second factor that will deliver top-line revenue and create an opportunity to improve the shipper's profitability. Elms and Low (2013) explained globalisation in simple words, stating their opinion that in the last three to four decades, governments and business organisations have developed far-reaching economic transformation, trade borders have been erased, and communication and transport technologies have improved in leaps and bounds. The proliferation of internationally integrated production arrangements is known as the global supply chain, which has transformed the economic and political landscape beyond one's imagination. Spencer, Rogers and Daugherty (1994) have identified global capabilities as one of the critical criterion to deliver desired outcomes.

Delivering performance is the key; the performance of a 3PL translates into outsourcing success or failure. Those 3PLS who provide strategic services and are typically non-asset-based always aim at enhancing the performance of the shipper by effective coordination of information flow and efficient management of network subcontractors (Van Hoek & Chong 2001). After delivering performance, in exchange the 3PLs expect an appropriate part of performance benefit such as gain share and increases in their profit margins (Lasch et al. 2012), this is considered as a fair and acceptable model.

Reduction in order cycle time is one more important selection criterion that directly translates to outsourcing success by maximising the customer's satisfaction. Owing to suppliers and their customers being spread across the world, the time to reach the customer is becoming a key differentiator. This is also considered as a key selection criterion (Spencer et al. 1994). Liu and Wang (2009) identified customer service, on-time shipments/deliveries and the ability to handle specific business requirements; with responsiveness and accessibility in case of urgency also identified as critical parts of 3PL selection that results in positive outsourcing outcomes.

Outsourcing success was defined as the implementation of factors used to achieve identified and agreed of goals of the organisation (Elmuti 2003). Even though cost savings may not be the dominating factor in the recent era, shippers believe that the cost of outsourcing was higher than the financial benefits gained. The financial benefits of logistics outsourcing are considered as "the tangible, measurable and hard dollar benefit to the company from outsourcing" (Hassan, Othman & Ismail 2016, p. 415). Focusing on the core activities of the business by outsourcing logistics activities results in minimisation of the capital base and enhances the return on investment (Quinn 2013). By collaboration between the shipper and the 3PL the shipper is enabled to produce greater business value (Makadok 2001) and this relational collaboration will help to develop a competitive advantage over a period of time (Rumelt 1997).

Outsourcing success is not a one-sided coin. It has two sides and the real outsourcing success benefits will accrue only when the shipper is honest, committed, and loyal. To make an outsourcing relationship successful it should be based on a keen sense of mutual trust and respect (Lynch 2004b). Finally, the arrangement should be a win–win outcome for both the parties and then it can be defined as true outsourcing success.

Intrieri (2013) explains three simple reasons that indirectly explain 3PL selection criteria. The first point is that someone can do a better job than the in-house staff due to economies of scale and supply chain expertise. The second point is sharing responsibility because in today's globalised environment the right kind of partners are needed to share the responsibility of reaching the customer and the 3PL relationship provides that help. The third is re-engineering the traditional distribution networks to improve service levels and customer satisfaction, and to shrink the lead time, thus delivering the competitive advantage. A former Vice-President of Supply Chain Operations from Coca-Cola, North

America once said, “If you are in supply chain management today, then complexity is a cancer you have to fight” (Gilmore 2008, p. 1). Global supply chains are complex in nature and value creation or addition by 3PLs generate an immense ability to be successful as a shipper. The right supply chain partner in the form of 3PL will dramatically enhance worldwide supply chain management outcomes (Fitzgerald 2007).

The next section examines the how outsourcing success is influenced by performance measurement.

8.3.4 Effect of performance measurement on outsourcing success

The structural analysis conducted in this study shows a positive relationship between performance evaluation and outsourcing success. Performance evaluation facilitates understanding of the extent of outsourcing success or failure and enables the improvements necessary to achieve targeted goals. All quantitative and qualitative measures identified as part of performance evaluation in the structural model reveal not only outsourcing success, but also how the outcomes are closely aligned to outsourcing reasons. It was established that outsourcing reasons and performance evaluation are positively associated and in turn influence outsourcing success. In recent times, the 3PL roles have changed drastically from mere movers of goods to strategic value-added entities (Jayaram & Tan 2010). It therefore becomes all the more important to evaluate their performance and translate them into successful or unsuccessful outcomes to enable continuous improvement.

Strategic alliances enable companies to work towards common goals, reduce conflicts, increase stability and efficiency, along with improved marketplace legitimacy (Cooper & Gardner 1993). The critical requirement of these strategic alliances is periodical performance measurement. In the business world, this is known as Quarterly Business Review (QBR) with the main objective of these reviews being to be competitive in the marketplace. To remain competitive in global markets it is critical to deliver efficient service driven by quality in response to the demands from different segments of the market (Vasiliauskas & Jakubauskas 2007).

When looking at performance measures they readily translate to outsourcing outcomes such as flexibility of service, order fulfilment accuracy, on-time delivery, and lead time reduction (Bottani & Rizzi 2006). If these measurements are analysed, they are not cost-

related measures, but all of them are delivering cost competitiveness to the global organisations. Langley and Capgemini's (2016) report indicated that 63% of clients and 73% of 3PLs agreed that "Dashboards" will help in understanding current progress and results of 3PL operations. Positive outcomes of outsourcing globally, as described by Langley and Capgemini (2015) in their report, included reduction of logistics costs by 9%, reduction of inventory costs by 5%, reduction logistics of fixed assets by 15%, order-fill rate improvement by 6% (66%), and order accuracy by 5% (66%). By analysing these figures, it appears that outsourcing success results are being reported; but a close look will reveal that they are also 3PL performance evaluation indicators that enable organisations to report successful outsourcing outcomes.

Keebler and Durtsche (2001b) reported four critical measures for the clients of the shipper and they include, on-time delivery, order-fill, invoice accuracy and order cycle time. Measures reported by Langley and Capgemini (2015), Keebler and Durtsche (2001b), and Bottani and Rizzi (2006) are closely aligned to outsourcing success. Priorities differ, however, based on the country and evolving stage of outsourcing.

During the roundtable discussion organised by SupplyChainBrain, the feedback received from shippers and 3PLs is summarised (Marlowe, Able & Lindeke 2011). The next phase of the 3PL and shipper relationship evolution would be embedding 3PL in the shipper's business. This is beyond the performance evaluation and the outcome of outsourcing. In today's outsourcing environment, it is believed that the day-to-day operations are mainly managed by 3PLs and that shippers are managing at a macro level, this shows the maturity level of outsourcing. The shipper envisages that some of the challenges ahead in the next five to ten years are to improve the outsourcing results and further incorporate partnerships with 3PLs for their joint benefits. The metrics and costs need continuous improvement. From the shipper's perspective, the results indicate outsourcing is successful, but the 3PLs are more interested in the long-term outcomes and what lies ahead, with the cost in terms of these relationships still unknown. This could determine how the 3PLs are measured. The 3PLs believe that they are pleased with the trust and commitment that has been developed and are also hopeful of seeing good results in future (Marlowe et al. 2011). The outsourcing success is beyond performance evaluation; the key to the success is embedding the service provider in the outsourcing relationship, which will deliver success as it becomes a joint effort.

Performance evaluation may not always result in successful outcomes. The purpose of measuring performance is to understand and analyse the outcome. Performance evaluation is a double-edged sword (Kizer & Kirsh 2012), it can deliver positive results or negative outcomes, but what is critical is measurable outcomes—whether they are good or bad. When the outsourcing outcomes are negative, it provides a great platform to analyse and understand what, why, and when it all went wrong.

8.4 Theoretical Implications

This study elaborates four critical aspects of strategic logistics outsourcing in the Indian context, namely: a statistically validated conceptual framework for outsourcing success in India; the process enablers; and the invaluable contributions of a governance mechanism. The results offer an application of conceptual framework-based study using SEM data analysis that is missing in earlier outsourcing research (Marasco 2008). The conventional research methods have focused on outsourcing success and its outcome, ignoring the process implications and their influence on the positive outcome. This research study delivers an invaluable contribution to the literature in the areas of process implications on the positive outcome of strategic logistics outsourcing.

The conceptual framework facilitates the goal of achieving strategic objectives. The data collected have been applied to the proposed conceptual framework, which helps the research in two ways, by giving a model to work with and in translating the model by applying the data collected and testing the evidence using the statistical tools such as CFA, EFA, and SEM. Petar (2014) explains that the conceptual framework places the strategy in the state of being completely functional as a possible solution to the business idea. Subsequently, the integration process is presented to academic and industry experts to validate the evidence of the process outcome. Traditionally, research in India has focused on two predominant aspects, outsourcing reasons and the outcome. The process to achieve success through a viable and structured process has not previously been defined, thus leaving a gap in the literature that inhibits practitioners following a process that assures success. This research addresses the gap by providing the defined process with statistical evidence to achieve outsourcing success.

The three process enablers are critical to the logistics outsourcing success, apart from well-documented outsourcing reasons—further classified into the three categories of strategic,

economic or environmental. A new competitive landscape is developing, forcing organisations (shippers) and government policymakers to carefully monitor rapid changes in communication systems, technology and transportation models that are threatening firms' competitiveness (Hitt, Keats & DeMarie 1998). Hung Lau and Zhang (2006) have explained that outsourcing organisations are achieving a competitive advantage by saving costs and improving their response to market demand. Clott (2004) echoed the same sentiments, along with Jennings (2002). Liu and Tyagi (2016) believe that outsourcing converts fixed costs to variable costs, thus shippers compete with less fixed costs and transform the organisation into one that is competitive in the global markets. The environmental reasons include gaining competitive advantage, improving service quality and enhanced customer service. Gumzej and Gajšek (2013) explain that quality of service (QoS) and trust between supply chain elements are vital for supply chain existence. In a competitive global market, customers are looking for their own satisfaction and their expectations include shippers delivering better and cheaper items, having shorter response times, more product options and finally higher service levels (Chow et al. 2008).

These findings of the current research will add a new dimension to the theoretical contribution to the existing literature and distinguishes India's preferences with other countries.

Drawing on the literature on supply chain management, 3PL, logistics outsourcing and governance, this study investigates the influence of collaborative relationships and mutual conflict resolution on strategic outsourcing success. While this research intended to measure outsourcing success in a strategic sense, the role of governance is crucial for monitoring activities over such a long term. The SEM path model presented in Chapter 7 (Figure 7.7) shows significant path coefficients, explaining a combined variance of 0.94 on outsourcing success. While relevant earlier studies highlight effective relationships, governance founded on trust, openness and information sharing in the context of supply chains (Schmoltzi & Wallenburg 2012), this research has established that the 3PL outsourcing success requires further investigation in relation to mutual conflict resolution and collaborative relationships in the context of India, where it retains many limitations. Wilding et al. (2012) describe governance in dynamic and unstable circumstances as risky, uncertain, and unpredictable especially during organisational change. People involvement, however, is the key to all success and it was established that human intervention is key to

dyadic relationship governance. With the increasing need for logistics outsourcing, it is imperative that governance enhances relationship management and helps in conflict resolution via participation of key personnel from all stakeholders. In the case of any unforeseen problems surfacing, signed-off contracts may not resolve the issue, instead, people would need to intervene and resolve the issues together (Greaver 1999). This study suggests collaborative relationships and conflict resolution as a governance mechanism are critical to achieving outsourcing success, which is essential in the Indian context. To compete in volatile market conditions, supply chain alliance partners are critical to retain in view of expanding markets and the enhanced requirement of resources and widespread clientele. Alliances thrive on a governance mechanism. Effective governance is very important between the shipper and the 3PL to achieve cost reduction and to improve performance benefits (Chen, Goan & Huang 2011; Jayaram & Tan 2010; Solakivi, Töyli & Ojala 2013).

Selecting the service provider is a complex process as the users' needs vary and service offerings are increasing on a day-to-day and region-to-region basis. Selecting an effective service provider who can align with the organisational goals and deliver targeted outcomes depends upon the tasks to be handled and thus the selection criteria increase due to the requirement customisation (Jharkharia & Shankar 2007). Globalisation has necessitated the need to offer value-adding tactical services, global reach and capabilities, as well as meeting the performance quality, and becoming a partner in gain share (i.e. a term used in logistics for sharing the cost savings due to continuous improvement), and improving the velocity to the market. These are the four critical selection criteria identified by this research.

The need for moving the product from point A to B in India will continue to exist and the movement of goods will continue to be outsourced. The new breed of service providers capable of investing in information technology, infrastructure and manpower to deliver tailor-made services will, however, be the need of the hour (Dubey & Shah 2010). Dubey and Shah's (2010) observation indicated that global logistics expenditure represents 13.7% of the world's gross domestic market, thus signifying the need for the service provider to have global reach capabilities. Current supply chains have become longer and more complex due to a booming global trade and thus fostering the need for better logistics in all corners of the world. The 3PLs across the world have to make acquisitions in the absence

of presence in the specific part of the world to fill out its offerings, both in terms of capabilities and geographic coverage (Foster & Armstrong 2004). Mothilal et al. (2012) believe that key success factors that could influence operational and financial performance are of utmost importance. Trust plays a vital role in a collaborative relationship and the positive relationship between trust and performance in supply chain across the world has been well documented (Capaldo 2014). The service provider should demonstrate trust and deliver performance before seeking financial compensation in a collaborative environment. It has been established that enhanced performance improvement is generated by trust (Laaksonen, Jarimo, & Kulmala 2009). Time compression within the supply chains would enable competitiveness to the advantage of all members in the chain. Reduction of lead time is undoubtedly a performance driver, it multiplies the impact of competitiveness when coupled with open information flow and could reflect greater effect on the supply chain. It is no longer sufficient for today's 3PLs to be a competent business in isolation, it is also necessary to be associated with a global supply chain to survive, and winning is just a secondary aspect (Villarreal & Salido 2009). The above research findings establish the criticality of the variables considered in this study in selecting the 3PL and these findings contribute to the existing literature.

The last, but not least, important independent variable considered for this research is performance evaluation criteria of a 3PL. Thirty-three items were considered as measures to assess the performance of the 3PL within the five different categories of strategic planning metrics, order planning metrics, supplier metrics, production metrics, and delivery performance metrics. The SEM analysis identified 13 KPIs to explain the outcome of outsourcing through 3PL performance evaluation. There is an abundance of data on 3PL selection criteria, but very little is found on performance evaluation. Performance measurement can be defined as a process of measuring and assessing the performance of a targeted service provider against defined objectives or goals through quantitative analysis techniques (Asthana et al. 2015). Performance measurement can be broadly categorised into two areas, the first one relates to effectiveness when dealing with meeting customers' requirements, and the second one explains how an organisation's resources are efficiently utilised to drive economic benefits (Asthana et al. 2015). Much of the existing research has focused on financial metrics such as revenue growth and profitability (Stank et al. 1999). This current research emphasises the importance of customer satisfaction, which is critical to business success in India.

This research is based on structural equation modeling used to estimate multiple correlations. Hox and Bechger (1998, p. 6) suggest that "the real strength of SEM (structural equation modeling) is that it enables the researcher to specify and estimate more complicated path models with intervening variables between the independent and dependent variables, and latent factors as well". SEM-driven analysis and reporting of results will be a new addition in the area of logistics outsourcing in India.

In summary, this research contributes to the body of knowledge of 3PL outsourcing three critical elements that are considered as gap in the existing literature. The first one deals with a statistically tested (e.g. SEM analysis) and a practical framework of logistics outsourcing. The second one deals with identifying process enablers (e.g. outsourcing reasons, governance mechanism, 3PL selection criteria, and 3PL performance measurement) engrained in the abovementioned tested structure. The third aspect deals with the impelling relationship of above-identified enablers on outsourcing success. These are three contributions to the literature as a new dimension.

8.5 Implications for Practicing Managers: 3PL Industry in India and Public and Private Enterprises

There are numerous investigations on logistics outsourcing establishing successful outcomes, such as cost reduction and improving responsiveness to market place. However, managing strategic logistics outsourcing involves huge business risk unless the outsourcing process is managed through a well-tested structured process that drives the outcome towards success.

This study deviates from the existing path and investigates how outsourcing enablers play a vital role in driving the success of outsourcing. The SEM tested structure with clear expectations of outsourcing and the three enablers collaborating with reasons will produce guaranteed outsourcing success and the proof is overwhelming and definitive. The starting point is the clarity about what is achievable in the form of outsourcing reasons and this differs from organisation to organisation. Customisation of outsourcing reasons is the critical first step of strategic logistics outsourcing process. This enables clarity to be established, not only for the shipper but also the 3PL, about the expected deliverables. This clarity allows conflicts to be avoided and becomes the foundation for developing trust and

collaboration in the relationship. The transparency in relationships about deliverables and supporting data leads to successful relationships.

In the modern era, every business relationship is driven by a contractual agreement. This study reveals that collaboration and trust are paramount, despite a written contract in the form of a governance mechanism. While there is plenty of research literature available regarding the selection of 3PLs, this study aligns closely with the ground-level realities of outsourcing requirements in India. It is essential that selection criteria are aligned to outsourcing targeted outcomes. While the emphasis of this study is governance, the three key elements of the suitability of a 3PL are trust, collaboration and flexibility.

Performance measurement is very popular process in the modern supply chain environment, however, it is critical that the measure developed is aligned to the outsourcing reasons. Measurement is not the end of the process for improving outsourcing outcome, analysis and driving the corrective actions to achieve the success are paramount.

Finally, outsourcing success is determined in two formats, the qualitative and the quantitative. The qualitative aspects, such as customer service, deliver future state results and the quantitative results, such as cost reduction, deliver effects on the current state. Both are important, and both are to be considered in defining the success of outsourcing. These findings will be distinctly valuable inputs to the practicing professionals in maximising the benefits of strategic logistics outsourcing decision.

Many supply chain professionals believe that the key advantage of an effective and lean supply chain is competitiveness and that profitability increases through managing internal processes and business processes effectively throughout the chain (Serve et al., 2002). The competitive advantage to the business is delivered through product differentiation and service excellence. If the logistics services were outsourced to a 3PL, then excellence is delivered through technologically advanced hardware and software and by providing supply chain visibility. Further, innovation plays a critical role in delivering improved services; this was highlighted in this research by identifying knowledge and advice on supply chain innovations and improvements as one of the criteria for selecting the 3PL.

India is a growing and globalised economy. The priorities of any organisation in a globalisation mode look beyond cost efficiencies. MacCormack et al. (2007) have explained the difference between traditional outsourcing and global collaboration. The

traditional outsourcing has cost reduction as project goal, lower costs as a collaboration goal, technical expertise as a partner value, and finally product type, quality assurance, maintenance and new features. Conversely, global collaboration looks at collaboration from a different perspective whereby revenue generation is considered as a project goal. Cost leadership, access to knowledge, access to intellectual property, faster time to market, access to new markets, build-to-revenue are considered as collaboration goals. Technical leadership, intellectual property, business knowledge, process leadership, on-demand scalability, market context and knowledge are considered as partner values. New product development, new market entry and new product versions are seen as project types. A developing country like India should be aiming at global collaboration. This research distinctly deviates from other findings with regard to outsourcing success factors by heavily advocating towards the core competency focus, skilled labour and information technology strength of a 3PL as success factors. The outcome of these research findings will be useful for supply chain professionals in India.

8.6 Limitations and Future Research Directions

"Perfection is not attainable, but if we chase perfection we can catch excellence"—this quote comes from Vince Lombardi, an American football player, coach, and executive in the National Football League (1913–1970) (in Byrnes & Baxter 2006, p. 35). The author of this research firmly believes in this phrase. Perfection is not attainable and thus there is scope to further expand the study reported in this thesis. This study focuses on the logistics outsourcing model used in India and has addressed all aspects required within the scope defined for the study. There are, however, three aspects that could make this study more comprehensive. This quote from Mark Twain Samuel Langhorne Clemens—better known by his pen name Mark Twain, an American writer, humourist, entrepreneur, publisher and lecturer (1835–1910)—"Continuous improvement is better than delayed perfection" (in Seekri 2011, p. 19) reinforces the need for identifying areas of improvement. The limitations of this study should provide scope for improvement by other researchers.

Reviews of outsourcing strategies should align with the business strategies. The first question to be raised is, will logistics be the key differentiator for the business and if so, should it be outsourced? (Saghiri et al. 2014). The first limitation for this research relates to the absence of a prescriptive process for outsourcing. By starting from the core competency strategy, which enables organisations to outsource logistics on a needs basis

and not as a matter of routine process improvement without understanding internal core strengths, logistics could be a core strength of the organisation. It is essential to identify the core competencies of the organisation. In summary, developing a comprehensive outsourcing strategy and aligning it with organisational goals needs to be a first step, before even thinking about outsourcing. This is a long and drawn-out process and organisations may not have the internal resources to develop this strategy. It would be necessary to go out and outsource external agency or experts, if necessary, to develop the organisational core competency strategy. This will facilitate the shipper in making sure that the decision of outsourcing is the right choice, based on organisational requirements, which in turn could produce positive outcomes, instead of staring at a fatal failure at the end of outsourcing process. A future study could start by identifying the need for logistics outsourcing, and end with the outcome of logistics outsourcing and measuring the gap between expectation and outcome. This could be described as a complete lifecycle of the logistics outsourcing process.

The second aspect is organisational performance growth due to outsourcing success and this could be an agenda item for future research. The impact of logistics outsourcing on an organisation's performance could be measured, apart from its outsourcing success. The impact could be on the organisational culture, resources, processes, IT infrastructure and finally, the customers.

The third aspect which needs to be considered involves the perspective of the 3PL industry, as well as comparing the views of shippers and 3PLs to come to a balanced and educated decision about the logistics outsourcing process to be followed and expected outcomes and the performance of measurement. This study reveals a one-sided version of outsourcing outcome in India from the shippers' perspective. If the 3PLs' views are considered, the findings could be different and intriguing but were not identified through this study. The 3PLs' views will definitely be a valuable contribution to the research literature as well as possibly contributing valuable inputs to the practicing managers and organisational strategists.

These three critical aspects remain unanswered in this research and need further exploration to develop a comprehensive process of strategic logistics outsourcing.

8.7 Future of Logistics Outsourcing

While delivering the keynote address at the 2008 Outsourcing World Summit, annual meeting of the International Association of Outsourcing Professionals, Corbett (2008) highlighted three aspects pertaining to the future of outsourcing. The future focus will be on the core capacity for change and growth, additionally, the business challenges over the next decade are going to be very different, unknown and complex. Organisations who weave a powerful network of global partners through outsourcing will be the winners.

Entering into the unknown world of challenges in a globalised economy that is economically volatile is intimidating to any organisation. By developing alliance partners, sharing risk, focusing on continuous improvement, having trusting relationships, using collaboration, and information sharing and value addition by the service providers the risks and the challenges will be considerably negated. Outsourcing is no longer means a subtracting process, the new approach is to add to the talent pool, scale technology to drive down costs, improve cost efficiencies and enhance customer satisfaction, all of which results in organisational growth.

8.8 Conclusion

This study in the India context views outsourcing across four different reasons for outsourcing, where success can be achieved through three enablers that are important to the success of strategic supply chain outsourcing in India. A very systematic collaborative process was developed to achieve outsourcing success that has a heavy emphasis placed on governance mechanism as this plays a critical role in every aspect. Traditionally, the research on outsourcing has been limited to reasons for outsourcing, functions outsourced and outcomes. There was no significant contribution to literature on how a relationship is established and how it thrives on collaboration and trust.

In summary, this research delivers clarity on deliverables by defining outsourcing reasons, a collaborative approach, and a conflict resolution process through a governance mechanism which are testament to this research. Finally, by measuring the performance, keeping the relationship honest and identifying the areas of improvement the failure of outsourcing initiatives can be avoided. This study may not be a prescriptive process for outsourcing in India, but it definitely contributes towards the successful outsourcing process in the India context. Furthermore, the collaborative approach delivers the

traditional outcome of cost savings in the short term and helps the shippers' organisations to build smarter and stronger and sustainable supply chains. The outsourcing process is a big gamble and has both known and unknown risks. A collaborative business approach mitigates that risk and delivers successful outcomes.

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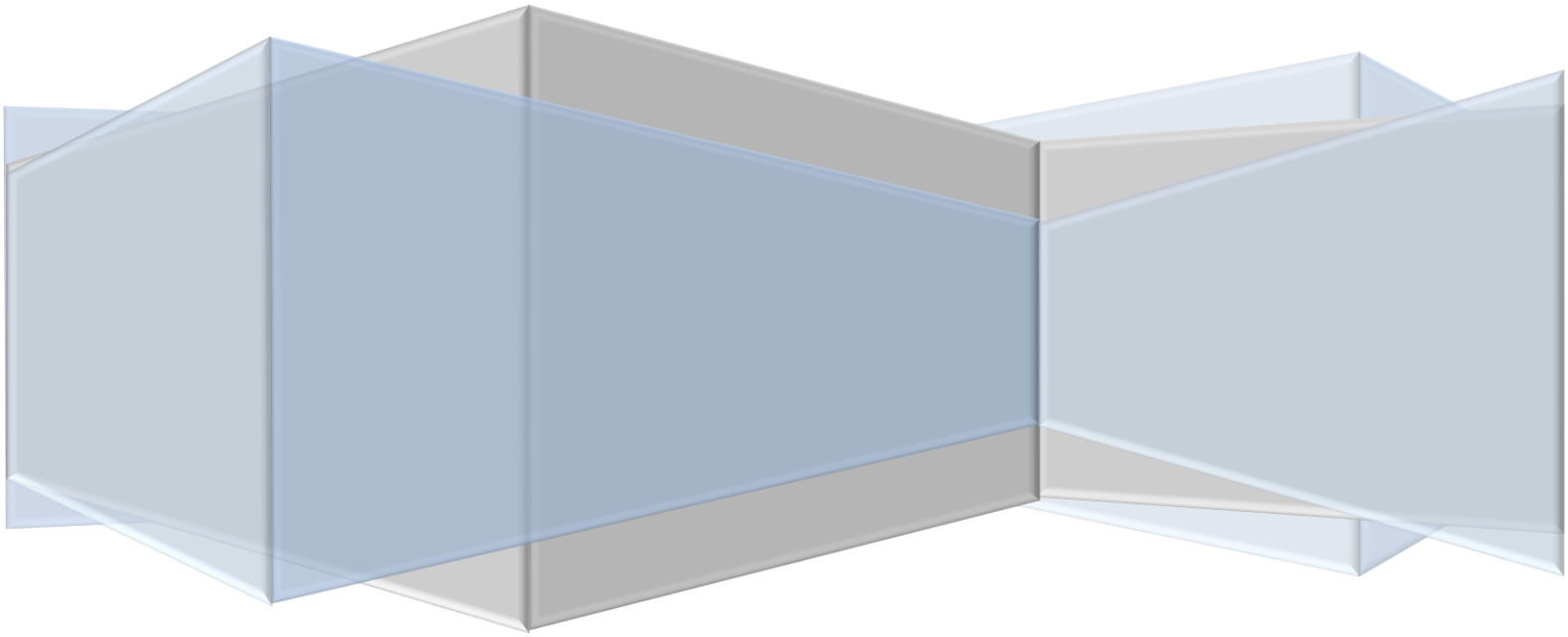
Appendices

Appendix 1 Supply Chain Outsourcing Survey Questionnaire

Logistics and Supply Chain Outsourcing Survey 2012

Indian Context



SURVEY ON: STRATEGIC OUTSOURCING OF SUPPLY CHAIN: THE INDIA MODEL

SELF-ADMINISTERED QUESTIONNAIRE

Internal ID Number: ☐☐☐☐☐☐ Date: D D M M Y Y ☐☐☐☐☐☐

Introduction: This survey is conducted to identify the critical success factors of logistics and supply chain outsourcing from an Indian Context.

SECTION –1: Personal Information

1. This part is general information about yourself and the organisation that you work for.

a. What is your gender? Male Fema☐ ☐

b. How old are you?

1	2	3	4	5
18-20	21-30	31-40	41-50	>50

c. What is your educational level?

1	2	3	4	5
Secondary School	High School	Graduate	Post Graduate	Post Graduate level

d. Type of organization: (For example – Service Organisation/Manufacturing/Trading, Consultancy etc.)_____

e. How long have you been working with this organisation?

1	2	3	4	5
< 2 years	< 4 years	< 6 years	< 8 years	>8 years

f. Functional area (Please choose one): ____

A. Accounting ☐ B. Finance C. Market☐ ☐
D. Manufacturing ☐ E. Research and Development ☐
F. Personnel ☐ G. Logistics and SCM ☐
H. Information Systems ☐ *I. Other (Please specify):* _____

g- Level of your position within your Organisation (Please choose one only)

A. Specialist	☐	B. Manager	☐
D. Team Leader	☐	E. Director	☐
F. Executive/VP	☐	*G. Others (Please specify):* _____	

SECTION –2: Organization Information

This part is general information about the organisation that you work for.

h - What is the total number of staff strength at your organization (Approximate)?

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
< 500	501-1,000	1,001-2,000	2,001-3,000	>3,000

i – What was 2011s approximate sales volume, in US dollars, for your business unit)?

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
< 50$ m	50-100$ m	101-250$ m	251-500$ m	>500$ m

j - Please indicate the percentage of total activities in each supply chain area that are currently outsourced?

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
0%	1-25%	26-50%	51-75%	>75%

k – How many people are employed in your current location?

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
<250	251-500	501-750	751-1,000	>1,001

l – How many people are deployed in supply chain function?

1	2	3	4	5
<10	11-20	21-40	40-80	>80

m – Describe the Industry type

A. Mechanical ☐ B. Energy products ☐ C.Farm products ☐
D. consumer &elect ☐ E. Mining and metals J.☐tile ☐
F. Automobile ☐ G. Construction ☐
H. Information Systems ☐ I. Other (Please specify*):* _____

n– Can you quantify the percentage of logistic function which is currently being outsourced by your company in the following table?

Outsourcing Logistics Services	% of functions being outsourced				
	10-25	25-50	50-75	75-100	NA
1. International Transportation					
2. Domestic Transportation					
3. Warehousing (pick & pack)					
4. Freight Forwarding					
5. Customs brokerage					
6. Reverse logistics					
7. Cross-docking					
8. Product labelling, knitting and packaging					
9. Transportation planning and management					
10. Inventory management					
11. Freight Bill auditing and payment					
12. IT services					
13. Order management					
14. Service parts logistics					
15. Customer service					
16. Supply chain consultancy					
17. Fleet management					
18. Lead logistics services/4PL					
19. Sustainability & green logistics					
20. Financial Services such as Inventory Financing					

SECTION III

a– Reason for logistic outsourcing (outsourcing objectives):

What importance did the following factors have for your supply chain organization's decision to pursue outsourcing? Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing

Reason for outsourcing	**Ranking (1= Lowest; 5=Highest)**
a. Economic Factors	
A1. Cost reduction	
1. Improve profitability	
2. Improve operating efficiency	
3. Add value to the product	
A2. Cost saving	
4. Improve cash flow	
5. Increase cost efficiency	
A3. Capital Investment Reduction	
6. Make capital funds more available for core area	
7. Improve return on asset	
b. Strategic Factors	
B1. Accelerating business process re-engineering	
8. Improve performance	
9. Increase Organizational efficiency	
B2. **Focus on core competence**	
10. Improve business focus	
11. To Increase competitive advantage	
12. Leverage the firm's skill and resources	
13. Enhance customer satisfaction	
B3. Flexibility enhancement	
14. Reduce constraints of organisation's own production	
15. Convert fixed costs to variable costs	
16. Increase responsiveness to market change	
17. Reduce risk	
c. Environmental factors	
C1. IT development	
18. To meet increase in demand for new IS and resource more efficiently and economically	
C2. Globalisation	
19. To help companies gain global advantage	
C2. Capability of supplier	
20. To enable partnering to improve service quality	
21. To improve customer service	
22. To enable partnering to improve service quality and customer service and increase competitive advantage	

b. Does your organization achieve the following objectives by outsourcing Logistics? Please score each of the objectives, on a scale of 0-5 (Always = 5, Very often = 4, Often =3, Sometimes = 2, Rarely = 1, Never = 0)

Objectives	**Score (0= Never; 5=Always)**
1. Company strategic goals	
2. Lower cost	
3. Focus on core activities	
4. Customer satisfaction	
5. Competitive advantage	
6. Quality and reliability	
7. Making new technology work to the advantage of the company	
8. Reducing the burden of legacy systems	
9. Allow major capital expenditure avoidance	
10. Access to state of the art technology	
11. Maintain sufficient flexibility to respond market conditions	

Please list any other objectives you consider for outsourcing logistics and supply chain activities? Also please score them on a scale of 0-5.

c– Problems encountered during logistic outsourcing:

The following statements are reasons associated with termination of contract. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing

Hindrance factors / Problems encountered in outsourcing	**Ranking (1= Lowest; 5=Highest)**
1. Negative impact on business strategy	
2. Escalating costs as business changes	
3. Loss of flexibility and control	
4. Service provider and concerns	
5. Loss of technical expertise	
6. Security and confidentiality risks	
7. Level of knowledge of outsourcing methodologies	
8. Lack of flexibility and ability to modify	
9. Cultural shift in switching from in-house work to working with outsource vendor	
10. Slow response time	
11. Reduced sale	
12. Irritated customer	
13. Cannot produce desired results	
14. Failure to recognise hidden costs of contract	

Hindrance factors / Problems encountered in outsourcing	Ranking (1= Lowest; 5=Highest)
15. Difficulty in obtaining organizational support	
16. Inadequate cost and benefit analysis system	
17. Uncertainty about the legal environment	
18. Poor quality and reliability	

d– Decision to in-source:

How important were the following factors to your decision to in-source after terminating the outsourcing contract?

Insourcing reasons	Ranking (1= Lowest; 5=Highest)
1. Improve customer service or customer experience	
2. Improve controls	
3. Reduce operating cost	
4. Access more flexible human resource models	
5. Desire to consolidate both assets and resources	
6. Gain competitive advantage	
7. Logistics is our core competency	
8. Gain tax advantage	

e- Criteria for selecting 3PL Service provider:

The following statements are reasons associated with logistics outsourcing. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing

Criteria for selecting 3 PL provider	Ranking (1= Lowest; 5=Highest)
1. Price of 3PL services	
2. Quality of tactical logistics services	
3. Range of available value-added services	
4. Global capabilities and reach and range of service	
5. Knowledge and advice on supply chain innovations and improvements	
6. Availability of strategies logistics services	
7. On-time shipment and deliveries	
8. Superior Performance rates	
9. Financial stability of service provider	
10. Creative management	
11. Ability to deliver as promised	
12. Availability of top management	

Criteria for selecting 3 PL provider	Ranking (1= Lowest; 5=Highest)
13. Responsiveness to unforeseen occurrences	
14. Meet performance and quality requirement before price discussion occurs	
15. Reputation of 3PL party	
16. Willingness to use logistics manpower	
17. Flexibility in operation and delivery	
18. E-commerce facility of service provider	
19. Reduction in lead time	

f– Project Management Implementation:

The following statements are related to project management implementation. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Project Management Implementation Process	TDA	DA	N	A	TA
1. Project management skills					
2. Satisfactory transition					
3. Knowledge based skills					
4. Clear project goals					
5. Continuous controlling of project results					
6. Ensuring of a continuous communication flow					
7. Preparation of a detailed project specification					
8. Quality of offshore employees					
9. Appropriate project team					
10. Standardized and documented process					

t– Relationship Management (Governance Mechanism):

The following statements are the factors that are critical for successful outsourcing relationship. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Collaborative Approach	**TDA**	**DA**	**N**	**A**	**TA**
1. The degree of trust between partner (3PL) and organisation					
2. Commitment is essential to describe good partnering relationship					
3. Openness between the parties is important to resolve conflict and discuss difficulty					
4. Regular communication and sharing of information is central to an effective collaborative relationship					
5. Well-understood goals and objectives and be willing to share them openly					
6. Successful collaboration requires that 3PLs and shippers develop mechanism of Shared risk and rewards					
7. Trust between the supplier and partner					
8. Top management support					
9. Adequate resources					
10. A spirit of partnership between client and vendor					
11. Well-engineered service-level agreement					
12. Strong joint client/vendor governance of the agreement					
13. Detailed contract terms and conditions					

u– Performance Evaluation – Outsourced Supply chain performance measurement

The following statements are associated with logistics outsourcing. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

	Performance metrics	TDA	DA	N	A	TA
a	**Strategic Planning metrics**					
	1. Level of customer perceived value of product					
	2. Variance against budget					
	3. Information processing cost					
	4. Net profit vs productivity ratio					
	5. Total cycle Time					
	6. Supply chain performance contributes to total					
	7. Level of energy utilisation					
b	**Order Planning Metrics**					
	1. Customer query time					
	2. Product development cycle time					
	3. Accuracy of forecasting					
	4. Planning process cycle time					
	5. Order entry methods					
	6. Human resource productivity					
	Supplier Metrics					
	1. Supplier delivery performance					
	2. Supplier lead time against industry norms					
	3. Supplier pricing against market					
	4. Efficiency of purchase order cycle time					
	5. Efficiency of cash flow method					
	6. Supplier booking in procedures					
	Production Metrics					
	1. Percentage of defects					
	2. Cost per operational hour					
	3. Capacity utilisation					
	4. Range of products and services					
	5. Utilisation of economic order quantity					
	Delivery performance Metrics					
	1. Quality of delivered goods					
	2. On-time delivered goods					
	3. Flexibility of service system to meet customer needs					
	4. Effectiveness of enterprise distribution planning schedule					

	Performance metrics	TDA	DA	N	A	TA
	5. Effectiveness of delivery invoice methods					
	6. Number of failures delivery notes invoices					
	7. Percentage of urgent deliveries					
	8. Percentage of finished goods in transit					
	9. Delivery reliability performance					

v– Process Integration

The following statements are related to level of process integration. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Process Integration	TDA	DA	N	A	TA
1. Inter-organizational logistics activities are closely coordinated					
2. Our logistics activities are well integrated with the logistics activities of our suppliers					
3. Our distribution, warehousing and transport processes are integrated with our suppliers' processes					
4. The materials flow between organizations is effective					

w– Relationship Management

The following statements are related to relationship management of shipper and 3PL. Rank the following based on the level of importance which your firm attributes towards implementation of logistics outsourcing (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Relationship Management	TDA	DA	N	A	TA
Price mechanism					
1. The customer makes reference to the market conditions in its efforts to make us improve our efficiency					

Relationship Management	TDA	DA	N	A	TA
2. The customer monitors the market to ensure that our prices are not higher compared to other suppliers					
3. The development in price - and market conditions determines whether we get future orders from the customer					
4. If other suppliers offer cheaper products, this customer would switch to another supplier					
Reward schemes					
1. The stronger party has established a system for rewarding cooperative efforts by the other party					
2. The weaker party knows that certain behaviours are rewarded by the other party					
3. One party actively tries to stimulate the other party to cooperate by rewarding such cooperation					
Solidarity norm.					
1. We emphasise the maintenance of this buyer-seller relationship					
2. In our contact with this customer we plan how this buyer-seller relationship might be further developed					
3. If a customer has problems, we are ready to help					

x. Joint participation approach [Governance Mechanism]

This section focuses on how joint participation between shipper and LSP (Logistics Service Provider). Please indicate the level of agreement with the following statements on your relationships with your 3PL. (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Joint participation approach	TDA	DA	N	A	TA
1. The issue was addressed by both parties working together collaboratively					
2. Shipper and the 3PL engaged in joint problem-solving and shared responsibility					
3. Rather than working collaboratively, Logistics Manager (LM) solely determined and specified the supplier's approach for resolving the risk					

y. Mutual Conflict Resolution [Governance Mechanism]

This section focuses on conflict resolution pattern between shipper and LSP (Logistics Service Provider). Please indicate the level of agreement with the following statements on your relationships with your 3PL (TDA - Totally Disagree; DA – Disagree; N – Neutral; A- Agree; TA – Totally Agree)

Mutual Conflict resolution	**TDA**	**DA**	**N**	**A**	**TA**
1. Suitable solution was developed that mitigated risk for both parties					
2. Situations are resolved to mutual satisfaction of the LM and supplier					
3. The ultimate solution to the situation was cost-effective to both parties					

z. Organizational performance

This section focuses on organizational performance. Please indicate the level of agreement with the following statements. (TDA - Totally Disagree; DA – Disagree; N – Neutral; A-Agree; TA – Totally Agree)

Organizational (business) Performance Growth	**TDA**	**DA**	**N**	**A**	**TA**
1. Market share Increased					
2. Profit Margin on sales Improved					
3. Improved ROI					
4. Growth in market share					
5. Growth in sales per employee					
6. Overall competitive position					

w. Outsourcing success

This section focuses on organizational performance. Please indicate the level of agreement with the following statements. (TDA - Totally Disagree; DA – Disagree; N – Neutral; A-Agree; TA – Totally Agree)

Success of outsourcing	**TDA**	**DA**	**N**	**A**	**TA**
1. We have been able to refocus on core business					
2. We have enhanced our IT competency					
3. We have increased access to skilled personnel					

Success of outsourcing	TDA	DA	N	A	TA
4. We have enhanced economies of scale in human resources]					
5. We have enhanced economies of scale in technological resources					
6. We have increased control of IS expenses					
We have reduced the risk of technological obsolescence					
7. We have increased access to key information technologies					
8. We are satisfied with our overall benefits from outsourcing					

THANK YOU SO MUCH FOR PARTICIPATING IN THIS SURVEY!

Appendix 2 Ethics Committee Approval

MEMO

TO	Professor Peng Shi Institute of Logistics and Supply chain Management Victoria University	DATE	9/10/2012
FROM	Dr Nick Billington Chair Faculty of Business and Law Human Research Ethics Committee		
SUBJECT	Ethics Application – HRETH 12/261		

Dear Professor Shi

Thank you for resubmitting your application for ethical approval of the project entitled:

HRETH 12/261 - Strategic Outsourcing of Supply chain: The India Model
(BLHREC 12/118)

The proposed research project has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)', by the Chair of the Business & Law Human Research Ethics Committee. Approval has been granted from 17th October 2012 to 16th October 2014.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date (by **17th October 2013**) or upon the completion of the project (if earlier). A report proforma may be downloaded from the VUHREC web site at: http://research.vu.edu.au/hrec.php

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Kind Regards,

Dr Nick Billington
Chair
Faculty of Business and Law Human Research Ethics Committee

Appendix 3 Information to participants involved in research

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled **Strategic Outsourcing of Supply Chain: The India Model**.

This project is being conducted by a student researcher **Vijayakumar Sangam** as part of a **PhD study** at Victoria University under the supervision of Professor Peng Shi from Institute of Logistics and Supply Chain Management.

Project explanation

Traditionally researchers focussed on overall outsourcing success/failure and the reasons. The overall outsourcing could also include transactional activities, also known as standalone activities. This is effectively disguising the overall performance of outsourcing and factors contributing to the success or failure. The focus of this research is to establish distinction between transactional outsourcing and strategic outsourcing and measure the success and failure rate and also establish reasons for outsourcing failure in case of strategic outsourcing and validate whether improved performance is the main driver for success.

What will I be asked to do?

The participants are expected to answer a survey consisting four parts (Company Information (without company name); Outsourcing importance, Drivers and Performance; Service Provider Choice and selection process and finally about Relationship Management). The survey is based on multi choice questions and it would take up to 20 minutes to complete the survey.

What will I gain from participating?

The survey participants will be provided with an Executive Summary of the findings once the Research is approved by the University.

How will the information I give be used?

The data provided by the participants will be analysed using PASW (previously SPSS) statistical analysis. The data analysis will undergo through non-response bias test, factor analysis, internal consistency and discriminant analysis as a pre-tests before moving towards hypothesis testing. Hierarchical regression analysis and path analysis using structural equation modeling will be used to test the hypothesis.

What are the potential risks of participating in this project?

None

How will this project be conducted?

This project will be based on Web Based multi choice survey.

Who is conducting the study?

Student of Institute of Logistics and Supply Chain Management, Victoria University.

Name: Vijayakumar Sangam; Phone No: +61410802444; e-mail: vijayakumar.sangam@live.vu.edu.au

Any queries about your participation in this project may be directed to the Chief Investigator listed above.
If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or phone (03) 9919 4148.