Information Content and Determinants of Timeliness of Financial Reporting of Manufacturing Firms in Indonesia

Evi Rahmawati
B.Sc. in Accounting (*University of Gadjah Mada*)
M.Acc. (*University of Melbourne*)

An independent thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

College of Business
Victoria University

December 2013

Abstract

One of the essential elements of adequate financial reporting is the provision of financial information that is relevant to its users in their decision-making. This financial information should be made available to users within a regulated short period after the end of the financial year. Agency theory suggests that shareholders require protection because management may not always act in the best interests of shareholders. Therefore, timely reporting is important in reducing information asymmetry between management and shareholders, and it may reduce leaks of financial information in an emerging market, such as in Indonesia's capital market.

The timeliness of the release of financial information may affect a decision maker's choice, and be used by the market to establish security prices. The importance of the timeliness of financial reporting motivates this study to examine whether timely financial reporting affects the information content of the annual reports of Indonesian manufacturing firms. With the expectation that timely reporting affects the level of information content, or the usefulness of the annual reports, this study examines the stock market reaction to the release of the annual reports, and whether it relates to the timeliness of the financial reporting in an emerging capital market, in this case, the Indonesian Stock Exchange. The univariate assessment of the information content, using all firms during the period 2003 to 2008 with a total of 568 firm-year observations, shows no significant difference in market reaction between timely reporting and late reporting of manufacturing firms in Indonesia. However, the results of a year-by-year analysis provide some evidence to support that the market reaction to timely reporting firms is different to the reaction to late reporting firms. Additionally, using multivariate analysis and controlling for firm size, profitability and firm leverage, this study demonstrates that the market reaction to the release of timely reporting is greater than the reaction to the late reporting of Indonesian listed manufacturing firms over the period 2003 to 2008.

This study also investigates factors influencing the timeliness of financial reporting in Indonesia. Specifically, the study examines how the determinants, such as firm characteristics (firm size, profitability, capital structure and complexity of operation), audit factors (audit firm

and audit opinion) and earnings quality affect the timeliness of the financial reporting of manufacturing firms in Indonesia. This study finds that firm size, capital structure, auditor opinion and earnings quality are associated with the timeliness of the financial reporting. This finding lends support to previous empirical studies that larger firms are associated with a shorter reporting time lag. Additionally, this study supports prior studies' findings that firms with an unqualified audit opinion have a shorter reporting time lag. This study also identifies that timely reporting firms have higher earnings quality than late reporting firms. Finally, the study finds that a firm's profitability, accounting complexity and the size of the audit firm are insignificant determinants of the timeliness of financial reporting in Indonesia, although other studies find these factors to be significant determinants of financial reporting in other countries.

Student Declaration

"I, Evi Rahmawati, declare that the PhD thesis entitled 'Information Content and Determinants of Timeliness of Financial Reporting of Manufacturing Firms in Indonesia' 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".

Evi Rahmawati Date: 25 January 2013

Acknowledgements

I would like to extend my thanks and sincere gratitude to Dr. Guneratne Wickremasinghe, my principal supervisor, and Dr. Stella Sofocleous, my former principal supervisor, for their invaluable guidance, assistance, comments and support throughout the period of my research study. I am also grateful to my associate supervisor Dr. Rafael Paguio for his useful suggestions on how to improve the final stages of this thesis. I wish to also acknowledge Professor Russell Craig, Professor Colin Clark, Professor Alan Farley and Professor Bob Clift for their generous mentor assistance, comments, and advice on this research study.

I would also like to acknowledge my appreciation of the financial support given by the Ministry of Education, Indonesia, PhD scholarship program. I am also grateful to Professor Bambang Cipto, Dasron Hamid, M.Sc., Dr. Nano Prawoto, Misbahul Anwar, M.Si, Dr. Ietje Nazaruddin and Ahim Abdurahim, M.Si from University Muhammadiyah of Yogyakarta, Indonesia for their support and encouragement motivating me to complete this study effectively. It is also an honour for me to thank Professor Zaki Baridwan, Professor Mas'ud Machfoedz, Dr. Supriyadi and Dr. Anggito Abimanyu from University of Gadjah Mada, for their support.

I would also like to thank all my friends and research colleagues, from University Muhammadiyah of Yogyakarta, University of Gadjah Mada, Victoria University, Monash University, RMIT University, Deakin University, La Trobe University, and University of Melbourne. I thank Ms. Lee Smith who edited the final draft of the thesis according to the Australian Standards for Editing Practise (Standards D and E).

I would like to thank my parents and family, Ibu Winarni, Professor Zaenal Bachrudin, Ibu Dri Murdjati, Bapak Suwarto, Simbah Ibu Waridah, Simbah Bapak Zamroni Kohari, Simbah Bapak-Ibu Siswodihardjo, Mas Nanang, Mas Herry, Mas Tono, Mas Agung, Mbak Silvy, Mbak Danik, Mbak Rine, Mbak Arin, Mbak Yuni, Erizal, Muliasari and Naufal Nurrohman, for their prayers and support.

Finally, I also wish to thank my husband, Dr. Singgih Wijayana, and my three children, Hanif Zuhdi Wijayana, Hanifah Nurrahmah Wijayana and Hafidz Muttaqin Wijayana for their love, prayers, patience and endless support. Alhamdulillahirabbil'alamin.

List of Publications and Awards

Accepted to present at the 47th British Accounting and Finance Association (BAFA) Annual Conference, April 2011, Aston Business School UK (Authors: Rahmawati, E. and Wickremasinghe, G.)

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Abreviations

FASB	Financial Accounting Standards Boards
GAAP	Generally Accepted Accounting Principles
IAI	*Ikatan Akuntansi Indonesia*
IAS	International Accounting Standards
IASB	International Accounting Standards Board
ICMD	Indonesian Capital Market Directory
ICMSA	Indonesian Capital Market Supervisory Agency
IDX	Indonesian Stock Exchange
IFRS	International Financial Reporting Standard
IHSG	*Index Harga Saham Gabungan*
ISMD	Indonesian Stock Market Directory
JCI	Jakarta Composite Index
KLSE	Kuala Lumpur Stock Exchange
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-operation and Development
RQ	Research Question
SAS	Statistical Analysis System
SEC	Securities and Exchange Commission
U.K.	United Kingdom
U.S.	United States
WRDS	Wharton Research Data Services

Chapter 1: Introduction

1.1 Introduction

This study investigates the timeliness of the financial reporting[1] of listed manufacturing firms and how this relates to the information content[2] of annual reports in an emerging capital market, the Indonesian Stock Exchange (IDX). The higher the information content of annual reports, the more useful will be the financial information. The usefulness of financial information is indicated by how the stock market reacts. The greater the stock market reaction around the timely releases of financial information,[3] the greater the usefulness of the annual reports. This study also examines the determinants of the timeliness of the financial reporting of public listed manufacturing firms in Indonesia.

The timeliness of financial reporting is an important characteristic of financial information usefulness. The timely release of annual reports to the public needs to be considered in order for the financial information to be relevant. In other words, annual reports need to be made

[1] Timeliness of reporting is defined as the reporting lag from the end of the financial year-end to the date of the release of the annual report to public. The objective of the timeliness of financial reporting is to provide financial information to users in a timely manner, based on the financial reporting regulation, after the firm's financial year-end.

[2] The information content of annual reports refers to whether the annual reports convey useful financial information to the stock market. The stock market reaction surrounding the release of financial information indicates the usefulness of the information. The term 'information content' has been used extensively in the accounting literature. According to Beaver (1981), studies in market research–based accounting refer to 'information content' as the statistical dependency between share prices and information variables. This is because share prices can be viewed as arising from an equilibrium process in which the price depends on the individual's endowments, tastes, beliefs and the time that the financial information occurs.

[3] Throughout this thesis (which this study uses event study methodology) the word "around" or "surrounding" is used (e.g. "the stock market reaction *around* the release of annual reports") to indicate the period immediately before, during and after the occurrence of the specified event (event date), which in this case the release date of the annual report. In the parlance of event study methodology, this particular period is known as an "event window."

available to decision makers before the financial information loses its capacity to influence economic decisions. Timeliness is considered as an enhancing characteristic of 'the relevance' qualitative characteristic of financial reporting as stated in the project update between the International Accounting Standard Board and the Financial Accounting Standards Board (FASB, 2009). One can also view the timeliness of financial reporting as a way to reduce information asymmetry between shareholders and management and minimise the risk of information spreading from other sources about a firm's financial health and performance in the market.

Timely financial reporting is an important device to mitigate insider trading, leaks, and rumours in emerging capital markets (Owusu-Ansah, 2000). Firms in emerging capital markets tend to divulge less information and to be slower to release their annual reports than firms in developed markets (Errunza and Losq, 1985). Since one of the important objectives of financial reporting is to provide information that will assist external users in decision making, this information will lose some of its economic value if it is not made available shortly after the end of the financial period. Investors and creditors should use current financial information when making predictions and decisions. To ensure the availability of current information, firms should therefore release financial information to the public as rapidly as possible.

Empirical research on the timeliness of financial reporting provides evidence of various factors affecting the time lag of financial reporting, that is, the number of days between the financial year-end and the date the annual reports are released to the public. These include factors such

as firm characteristics, audit factors, corporate governance factors and other various variables, which have been studied in developed and emerging countries such as Australia, Bahrain, Bangladesh, Canada, China, Egypt, France, India, Malaysia, New Zealand, Pakistan, United States (U.S.), United Kingdom (U.K.) and Zimbabwe.

The remainder of this chapter is organised as follows. The study's background and motivation are presented in Section 1.2, followed by the objectives and research questions in Section 1.3. An overview of the sample, data, and research methodology appears in Section 1.4. Section 1.5 presents a summary of the findings. The significance of this study and its contribution to the literature is discussed in Section 1.6. Section 1.7 concludes the chapter by describing the overall structure of the thesis and outlining the remaining chapters.

1.2 Background and Motivation

Stakeholders and regulatory bodies require access to high-quality financial information within a short time following a firm's financial year-end and publicly listed firms must complete their annual reports even faster and with more transparency. The timeliness of financial reporting has long been recognised as one of the most important elements contributing to the general-purpose of annual reports. It is also one of the most important components of relevancy and is an important feature of useful information. Therefore, financial information will not be useful to users in their decision-making unless it is made available in a timely manner.

Regulators of stock exchanges around the world, such as the U.S. Securities and Exchange Commission (SEC), require their country's publicly listed firms to promptly release their annual reports to the stock markets. For example, the SEC requires that listed firms file their annual 10-K reports by a specific deadline. If information is not available when it is needed, or only becomes available long after reported events, then it has no value for future action, it lacks relevance, and is thus of little or no use (FASB, 2009).

The principles of disclosure require a corporate governance framework to make timely and accurate disclosures of all material information regarding the corporation. The Organisation for Economic Co-operation and Development's (OECD) code on corporate governance also states that it is a basic shareholders right to receive relevant information from a corporation on a timely and regular basis (OECD, 2004).

In line with the increasing complexity of business operations and the growth of the investing community (national as well as international), investors demand increasingly relevant and timely information. The more promptly firms disclose annual reports, the more relevant the information is for users. Users need timely financial information to decide whether to commit or continue to commit their capital to a firm. Delays in disclosing financial information result in greater market inefficiency (Ismail and Chandler, 2004). The timely disclosure of information through audited annual reports plays an important role in reducing the asymmetric dissemination of financial information (Jaggi and Tsui, 1999).

Timely disclosures help attract capital and maintain investor confidence in the capital market, important factors for efficient capital market formation. A continuous flow of timely and accurate information in the secondary markets ensures efficient market operations and fully informed investment decision-making (Mahajan and Chander, 2008). So, timeliness is a necessary condition if the financial information in the annual reports are to be useful. As a result, most stock exchanges, including the London Stock Exchange and the New York Stock Exchange, demand that their listed firms promptly release audited annual reports to the markets. Empirical research on financial reporting timeliness has provided evidence that the degree of timeliness of information release has information content (Beaver, 1968) and affects security prices and firm value (Chambers and Penman, 1984; Givoly and Palmon, 1982; Kross and Schroeder, 1984; Schwartz and Soo, 1996).

Timely reporting affects the information content of annual reports. This study follows the information content literature of Ball and Brown (1968) and Beaver (1968) and the event study of Fama *et al.* (1969) to examine the usefulness of timely reporting. It provides empirical evidence to ascertain whether the timeliness of the release of accounting numbers provides information about a firm's wealth to the market (i.e., how the stock market reacts). Timelier reporting is associated with higher information content of annual reports, thus the more useful the annual reports for users (Givoly and Palmon, 1982). Givoly and Palmon (1982) find an association between the information content of earnings announcements and the timeliness of financial reporting in U.S. public listed firms. Ball and Brown (1968) have suggested that accounting information is reflected in security prices prior to the release of reports. Since other

sources of information allow the market to anticipate earnings reports, the variability of returns (amount of information) associated with earnings reports may be related to reporting lag. More specifically, longer reporting lags provide the opportunity for more of the report's information to be provided by other sources, either through investor search activity, through other firms' voluntary disclosures, or through predictions of earnings reports based on the earnings releases of earlier-reporting firms. Chambers and Penman (1984) suggest that later reports are associated with less price variability than earlier reports.

Prior studies on the association between firm characteristics, audit factors, and financial reporting timeliness have focused on the developed markets in North America (e.g., Ashton *et al.*, 1989); Bamber *et al.* (1993), Europe (e.g., Frost and Pownall, 1994; Soltani, 2002) and Oceania (e.g., Carslaw and Kaplan, 1991). However, the literature has recently begun to focus on emerging markets, including China (Haw *et al.*, 2003; Wang *et al.*, 2008), Bangladesh (Ahmed, 2003; Imam *et al.*, 2001; Karim *et al.*, 2006), Malaysia (Ismail and Chandler; Mahajan and Chander, 2008; Shukeri and Nelson, 2011; Yaacob and Che-Ahmad, 2012) and Bahrain (Al-Ajmi, 2008; Owusu-Ansah, 2000). As one of the emerging markets in South East Asia, Indonesia has characteristics that make its capital market an interesting case for investigation. For example, it is one of the largest recipients of foreign investment in the region.[4] The Indonesian economy generally seems to be volatile with respect to its relationship with the global economy and its internal political situation.

[4] Foreign direct investment annual inflows to Indonesia during 2007 to 2011 in USD billion are 6.9 (2007), 9.3 (2008), 4.9 (2009), 13.8 (2010), and 19.2 (2011) (OECD, 2012).

Timely reporting in emerging markets is of particular importance, since information in these markets is relatively scarce and has a longer financial reporting time lag (Errunza and Losq, 1985). Timely reporting enhances decision-making and reduces information asymmetry in such markets. Hence, research on the determinants of timely reporting may assist regulators in emerging capital markets to formulate better policies to enhance financial reporting practices. The number of days (mandated by regulatory bodies) allowed to lapse before annual reports must be released to the public varies across countries. For example, the regulatory deadlines for submitting annual reports after the fiscal year-end are 60 days in the United States, 90 days in Australia and Indonesia, 120 days in China and 180 days in India.

1.3 Objectives and Research Questions

This study aims to fill the gap in knowledge relating to the timeliness of financial reporting in Indonesian capital market studies. It examines whether financial reporting timeliness affects the information content of the annual reports of manufacturing firms. It also investigates how firm size, profitability, capital structure, operational complexity, audit factors, and earnings quality affect the financial reporting timeliness of manufacturing firms in Indonesia.

The specific aims of this research are, first, to analyse how the stock market reacts around the release of financial information (annual reports) in regard to the timeliness of the financial reporting of manufacturing firms in Indonesia and second, to analyse how variables such as firm size, profitability, capital structure, operational complexity, audit firm size, audit opinion, and earnings quality affect the financial reporting time lag. To achieve these two objectives,

this study examines how firm variables affect the financial reporting timeliness of manufacturing firms in Indonesia and how reporting timeliness affects shareholders wealth.[5] It focuses on the following research questions:

RQ1: Does the timeliness of the financial reporting of manufacturing firms in Indonesia affect the information content of annual reports (the stock market reaction around the release of annual reports)?

RQ2: How do firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality affect the timeliness of the financial reporting of manufacturing firms in Indonesia?

1.4 Overview of the Sample, Data, and Research Methodology

This study uses a sample of 157 manufacturing public firms in Indonesia over the period 2003–2008, with a total of unbalanced panel of 568 firm–year observations, to examine the hypotheses related to RQ1 and RQ2. The sample is selected based on the following criteria: first, manufacturing firms must be listed on the IDX during the period from January 2003 to December 2008. Second, the annual report filing dates must be available to determine the event date. Third, the annual report, financial accounts, and firm and audit data must be available for the entire sample period. Finally, the stock market data, including stock price and Indonesian

[5] Shareholder wealth is measured by the total market value of shares issued by a firm. Therefore, an increase (decrease) in a firm's share prices due to the release of financial statements is considered an increase (decrease) in shareholder wealth.

stock market indices, must be available during the sample period to determine market reaction around the date of release of the annual report.

The data for the empirical analysis are from the Indonesian Capital Market Directory (ICMD) from the Institute for Economic and Financial Research, the Indonesian Stock Market Database (ISMD) from Gadjah Mada University, the IDX website, Osiris, and the Datastream databases. The annual reports, annual report filing dates, and stock market information such as stock prices and stock market indices, are from the ICMD and the ISMD. The data to calculate the determinant variables are from the firms' annual reports that can also be obtained from the IDX website. This study also uses Osiris and the Datastream databases as complementary sources of financial information data. The types of data manually collected from the annual reports include the audit opinion, audit firm, number of branches and financial accounts data. Sections 3.2 and 3.3 of Chapter 3 present a detailed description of the data set, sample, and sample procedure.

To test its hypotheses this study measures timeliness in terms of the actual reporting time lag (ATL), [6] that is, the number of days between a firm's financial year-end and the date of the release of its annual report to the public, or the annual report filing date with the Indonesian Capital Market Supervisory Agency (ICMSA), as the main tests. To test the robustness of the

[6] Actual reporting time lag (ATL) is also interchangeably used as chronological time lag (CTL) in prior studies, such as Chambers and Penman (1984).

main results this study also uses dummy actual time lag (DATL), [7] unexpected time lag (UTL),[8] that is, whether this year's annual report filing date is expected to be early or late compared to last year's (Chambers and Penman, 1984), and dummy unexpected time lag (DUTL)[9] to measure timeliness.

Market reaction, as measured by abnormal returns, [10] indicates whether or not the annual reports have information content and thus convey useful information to investors. This study uses event study methodology[11] to investigate RQ1. This methodology is used to measure the abnormal returns earned by security holders surrounding the release of annual reports. This study uses univariate and multivariate tests to examine whether financial reporting timeliness affects the information content of annual reports. To investigate RQ1, this study uses univariate tests to compare the average abnormal returns and cumulative average abnormal returns surrounding the release of the annual reports of timely reporting and late reporting firms.[12] Multivariate regression analysis is used to investigate RQ1 to determine whether the financial

[7] Dummy of actual time lag (DATL) is a dummy variable which is coded 1 if the release of the firm's annual report is timely (firm's actual reporting time lag (ATL) is within the regulated deadline of 90days) and coded 0 if the release of the firm's annual report is late (firm's ATL is beyond 90 days).
[8] Unexpected Time Lag (UTL) is defined as the reporting lag relative to their expected dates of the release of the annual reports. A report is classified as timely if it is released before the date expected (last year's report released date, day and month) and classified as late if it released after the date expected (Chambers and Penman, 1984). UTL is measured by this year's ATL minus last year's ATL.
[9] Dummy of unexpected time lag (DUTL) is a dummy variable which is coded 1 if the firm's UTL is negative (the expected reporting time is early) and coded 0 if the firm's UTL is positive (the expected reporting time is late).
[10] An abnormal return is the difference between the actual return of a share and the expected return. Abnormal returns are sometimes triggered by specific events such as dividend announcements and earnings announcements.
[11] Event study methodology is used for investigating the relationship between changes in share prices and specific economic events such as the release of financial statements, earnings dividend, and mergers announcements.
[12] Timely and late reporting firms are classified based on whether the firm's reporting time lag (the number of days between financial year-end and the date of the annual report's release) comply with the regulation reporting time lag deadline of 90 days. If the firm's reporting time lag is within 90 days it is classified as a timely reporting firm and if the firm's reporting time lag is beyond 90 days then it is classified as a late reporting firm.

reporting timeliness is associated with the information content of the annual reports of manufacturing firms while controlling for firm size, profitability and leverage.

This study uses multivariate regression methodology to examine RQ2, which seeks to analyse the association between the determinant variables of the timeliness of financial reporting and the financial reporting of manufacturing firms in Indonesia. Timeliness reporting is measured by the ATL, that is, the length of time between the fiscal year-end and the release date of a firm's annual report to the public. The test variables are firm size (SIZE), profitability (PROF), capital structure (CAPS), operational complexity (COMPLEX), audit firm size (AUDFIRM), audit opinion (AUDOPINION), and earnings quality (EQ).

1.5 Summary of Findings

By examining a sample of manufacturing firms during the period 2003–2008, this study finds that the market reaction surrounding the release of annual reports (using 568 firm-year observations) is not significantly different between timely and late reporting firms. Nonetheless, the results of the univariate tests in the year-by-year sensitivity analysis show evidence of statistically significant differences between timely and late reporting firms. Further, the results of the multivariate analysis, using multiple regressions, show that the timeliness of the reporting of manufacturing firms in Indonesia is associated with the market reaction to the release of annual reports with controlling for firm size, profitability and leverage. Specifically, this study supports the notion that the timeliness of financial reporting affects the information

content of the annual reports of Indonesian manufacturing firms, consistent with Atiase *et al.* (1989), Chambers and Penman (1984) and Givoly and Palmon (1982).

This study also finds that firm size, capital structure, auditor opinion, and earnings quality are associated with reporting timeliness. A significant negative association between firm size and time lag is consistently supported by this study's results from the main tests and the results from the robustness tests. It indicates that larger firms have shorter reporting time lags, supporting the findings of major prior studies such as Davies and Whittred (1980), Dyer and McHugh (1975), Ismail and Chandler (2004) and Mahajan and Chander (2008).

Further, this study supports the idea that auditor opinion is a factor that affects the financial reporting timeliness of Indonesian manufacturing firms. This association has been explained in prior studies for Australian data (Whittred, 1980), New Zealand data (Carslaw and Kaplan, 1991) and the United States (Ashton *et al.*, 1987; Bamber *et al.*, 1993). In addition, this study finds a significant negative association between earnings quality and ATL. This indicates that firms with high earnings quality have a shorter reporting time lag and report their financial information in a more timely fashion, consistent with the findings of Chai and Tung (2002). Finally, this study concludes that profitability, firm's operational complexity, and audit firm size are not associated with the reporting timeliness of manufacturing firms in Indonesia.

1.6 Contributions

This study contributes to the financial reporting timeliness literature by providing empirical evidence of the influence of financial reporting timeliness on the information content of the annual reports of manufacturing firms in Indonesia during the period 2003–2008. Studies of financial reporting timeliness and its effects on security prices (Atiase *et al.*, 1989; Chambers and Penman, 1984; Givoly and Palmon, 1982) have focused on developed stock markets, such as in the United States. There is a gap in the literature with respect to how emerging countries' stock markets react to the financial reporting timeliness in manufacturing firms. To the best of my knowledge this study is the first study to examine the effect of timeliness of financial reporting on the information content of annual reports in an emerging market, as indicated by stock market reaction using event study methodology. This study contributes to the literature by showing the differences in stock market reaction surrounding the release of the annual reports of timely reporting and late reporting firms. This study also contributes to the literature by providing a multivariate analysis of the effect of timeliness of financial reporting on stock market reaction to the release of the annual report with controlling firm size, profitability and leverage in an emerging market.

Many studies on financial reporting timeliness have provided evidence as to how firm variables and audit factors influence the timeliness of financial reporting in different countries. This study contributes to the academic literature by providing evidence as to how firm variables affect reporting timeliness in Indonesian manufacturing firms. Although previous research has examined the determinants of financial reporting timeliness, there is a gap in the literature with

respect to how Indonesian publicly listed firms' characteristics, audit firms, audit opinions, and earnings quality factors affect financial reporting timeliness. To the best of my knowledge, this is the first study to comprehensively analyse empirical evidence of the influence of firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality on financial reporting timeliness in Indonesia. Manufacturing firms constitute the largest percentage of firms in Indonesia, and 48 per cent of all publicly listed firms. This study therefore, also contributes to the literature by analysing a specific sector, which is manufacturing firms, in Indonesia.

Finally, this study contributes to the academic literature by investigating the determinants by adding the test variable of earnings quality in influencing the timeliness of financial reporting. It specifically uses (Dechow and Dichev, 2002) methodology to measure earnings quality. To the best of my knowledge, this is the first study to use this methodology to examine the influence of earnings quality on financial reporting timeliness.

1.7 Thesis Structure

This section outlines the structure of this thesis. The first chapter, the Introduction, presents the specifications (background) and motivation that led to the identification of a research gap in the timeliness literature. It presents two research objectives and poses two research questions concerning the association of information content and timeliness and the determinants of timeliness in financial reporting. A discussion of this study's data, research methodology, contributions, and significance then follows.

Chapter 2 presents the theoretical background and a literature review pertaining to the two research questions. The chapter first reviews the theoretical background of studies regarding the association between the information content of financial information and reporting timeliness. The chapter then reviews prior studies that have examined financial reporting timeliness in the context of the study's motivation and the methodology used to examine market reaction to reporting timeliness.

Chapter 3 presents the research methodology used to investigate the timeliness of financial reporting. It begins by describing the sample and sample selection for both research questions. It also describes the period of interest, sample firms, data sources, and sample selection. The chapter then discusses the methodology for testing the hypotheses related to RQ1, covering four main areas: the event date and event window employed in this study and calculation of the daily and expected returns, daily abnormal returns, and cumulative abnormal returns.

The discussion of the research design to investigate hypotheses related to RQ2 covers two major topics: the model for examining the variables that influence financial reporting timeliness and the measurements of the dependent and independent variables. The last section presents robustness test analyses and summarises the research methodology chapter.

Chapter 4 presents the results from the empirical analysis of the hypotheses related to RQ1. It begins with a univariate analysis of the variables used to investigate the hypotheses. This is

followed by a presentation of the results and statistical significance tests in average abnormal returns and cumulative average abnormal returns around the release date of the annual reports between timely reporting and late reporting firms. The chapter then undertakes sensitivity analyses to examine the usefulness of financial information for timely reporting and late reporting firms, including a year-by-year comparison. The last section summarises the chapter.

Chapter 5 presents the results of multivariate regression testing of the second hypothesis of RQ1. It first presents the descriptive statistics for the dependent and independent variables, followed by correlation analyses of the independent variables. The next section analyses and discusses the results of testing the second hypothesis related to RQ1. This chapter also discusses the results of a variety of sensitivity analyses, including the use of alternative measures for the dependent and independent variables. The last section summarises the chapter.

Chapter 6 analyses the results of testing all the hypotheses related to RQ2. It first presents the descriptive statistics of all variables used to investigate RQ2, followed by correlation analyses of the independent variables. The next sections analyse the results and statistical significance tests for the seven hypotheses related to RQ2. The chapter then discusses the results of a variety of robustness tests, including the use of alternative measure of the dependent variable and alternative measure of the independent variable. The chapter concludes with a chapter summary.

The final chapter, Chapter 7, summarises all the previous chapters. It revisits the research questions and summarises the hypothesis development and methodology. The chapter then re-examines the research findings from prior chapters and presents the thesis's conclusions. The final section of this chapter discusses this study's limitations and offers suggestions for future research.

Chapter 2: Literature Review and Hypotheses Development: Information Content and Determinants of the Timeliness of Financial Reporting

2.1 Introduction

The previous chapter presented the background, motivation, and research questions of this study. This chapter reviews the literature related to this study and develops the hypotheses related to the first and second research questions, RQ1 and RQ2, respectively. This chapter is structured as follows. Section 2.2 reviews the theoretical background of timeliness of financial reporting, followed by, a review of empirical studies on the timeliness of financial reporting in emerging markets in Section 2.3. Section 2.4 reviews the regulatory framework of timely financial reporting in Indonesia. Section 2.5, reviews the academic literature and develops the hypotheses on financial reporting timeliness and the stock market reaction relating to RQ1: Does the financial reporting timeliness of manufacturing firms in Indonesia affect the information content of annual reports (the stock market reaction to the release of annual reports)? Section 2.6 reviews the empirical studies and develops the hypotheses on the determinants of reporting timeliness relating to RQ2: How do firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality explain differences in the financial reporting timeliness of manufacturing firms in Indonesia? This section then presents the study's hypotheses and develops them based on arguments in the literature review. Finally, Section 2.7 summarises the literature review and lists nine hypotheses, two related to RQ1 and seven hypotheses related to RQ2.

2.2 Timeliness of Financial Reporting

Agency theory suggests that shareholders require protection because management may not always act in the best interests of shareholders (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976). Agency theory begins with the assumption that people act in their own self-interest, and that, under normal conditions, the goals, interests and risks of the two actors (principal and agent) are not identical. Agency theory states that when a manager does not own 100 per cent of company stock, there will inevitably be a latent conflict between shareholders and managers. This leads to numerous agency problems, such as excess spending as a result of special privileges, suboptimal investment decisions, information asymmetry and finance purchasing (Jensen and Meckling, 1976).

One of the remedies for the agency problem is to implement good corporate governance practices. The Organisation for Economic Co-operation and Development (OECD) (2004) lists transparency as one element of good corporate governance. Reducing reporting lag is considered another component of good corporate governance practice to reduce agency problem (Blanchet, 2002; Kulzick, 2004; Prickett, 2002). This illustrates that timeliness of reporting is not just as a creditable practice in itself but required as a critical mechanism to ensure transparency between the management and other stakeholders in a firm. This is also an essential element of adequate disclosure to ensure that there is no information asymmetry. The information used by investors and creditors should be current at the time of making the predictions and decisions.

The timeliness of financial reporting is an important characteristic of usefulness of financial information. The timeliness of financial reports needs to be considered in order for them to be

relevant. Research on timeliness emphasises that annual reports need to be made available to decision makers before the financial information loses its capacity to influence economic decisions. It is not only necessary that users have financial information that is relevant to their predictions and decisions, but the information should also be current rather than relating only to prior periods. Theoretically, having information available to decision makers before it loses its capacity to influence investment decisions contributes to the prompt and efficient performance of stock market pricing and evaluation (Jaggi and Tsui, 1999). Timely reporting helps mitigate (or reduce the level of) insider trading, leaks and rumours in the market.

Givolvy and Palmon (1982) examine several other aspects of the timeliness of earnings announcements that have implications for regulatory actions. The results show a considerable shortening of reporting lag over the years. This implies that the assumption conveniently made in many 'event studies' that the announcement week or month is fixed over time is inappropriate and should be avoided as it tends to weaken the power of the tests. The reporting lag of individual companies appears to be more related to intra-industry patterns and tradition than company attributes. The ability of most companies to report ahead of the filing deadline, coupled with the finding that bad news tends to be delayed, might be considered when assessing the adequacy of the length of the current filing period Givoly and Palmon (1982).

Courtis (1976), Ashton et al. (1987), Ng and Tai (1994) and Ashton et al. (1989) argue that industry membership influences the reporting delay of the corporate reports of each member. Abdulla (1996) hypothesises that there are a number of plausible causes for this behaviour, including: the importance of the company in terms of its role in the economy; and the company's

importance relative to the other listed firms. Some industries are more regulated than others, thus companies belonging to these industries may respond differently when releasing information to stakeholders. Moreover, regulated industries are followed by different regulators who may differ in terms of expertise and effectiveness, which might affect the timeliness of the corporate reports of the companies they regulate and monitor (Al Ajmi, 2008).

The predominant focus of empirical timeliness studies has been on the developed markets in North America, for the United States (e.g.Ashton *et al.*, 1989; Ashton *et al.*, 1987; Atiase *et al.*, 1989; Bamber *et al.*, 1993; Behn *et al.*, 2006; Chambers and Penman, 1984; Ettredge *et al.*, 2006; Givoly and Palmon, 1982; Henderson and Kaplan, 2000), and for Canada (Ashton *et al.*, 1989; Kinney Jr and McDaniel, 1993; Knechel and Payne, 2001; Lee *et al.*, 2008; Newton and Ashton, 1989; Schwartz and Soo, 1996), Europe (Owusu-Ansah and Leventis, 2006; Soltani, 2002) and Australia (Brown *et al.*, 2011; Davies and Whittred, 1980). Several emerging markets have also been studied, including Bahrain (Abdulla, 1996; Al-Ajmi, 2008; Khasharmeh and Aljifri, 2010), Bangladesh (Ahmed, 2003; Imam *et al.*, 2001; Karim *et al.*, 2006), China (Haw *et al.*, 2003), Egypt (Afify, 2009; El-Banany, 2006; Mohamad, 1995), Greece (Leventis and Weetman, 2004; Leventis *et al.*, 2005; Owusu-Ansah and Leventis, 2006), Hong Kong (Jaggi and Tsui, 1999; Ng and Tai, 1994), Malaysia (Ahmad and Kamarudin, 2003), Pakistan (Hossain and Taylor, 1998), The United Arab Emirates (Khasharmeh and Aljifri, 2010), and Zimbabwe (Owusu-Ansah, 2000).

2.3 Financial Reporting Timeliness in Emerging Capital Markets

With the globalisation of trade and the recent growth of capital markets, a study of corporate timeliness in emerging nations has become increasingly relevant for international and domestic investors. But despite calls for additional research on reporting lag in different countries and different time periods, there is still space for more research on developing markets with additional explanatory factors that can explain the diverse mechanisms of financial reporting in heterogeneous economic landscapes (Ashton et al., 1989). The existing research on emerging economies demonstrates the need for a better understanding of corporate timeliness by undertaking individual, as well as comparative, studies in emerging economies.

In fact, it has been asserted that the provision of timely information in corporate reports in emerging markets is assigned greater importance because other non-financial statement sources—such as media releases, news conferences and financial analysts—are not well developed, and regulatory bodies are not as effective as in developed countries (Wallace, 1993). (Afify, 2009) has re-emphasised this situation by stating that there may be limited availability of financial information in developing countries beyond the financial statements, therefore, users rely significantly on the publication of the annual results of a company to make their financial decisions.

Owusu-Ansah (2000) argues that timely reporting is an important device to mitigate insider trading, leaks, and rumours in emerging capital markets. Recently there has been some extensive growth in studies on the reporting lag of corporate financial statements in the context of emerging economies, such as those of Abdulla (1996), Ahmed (2003), Afify (2009), Haw *et al.*

(2003), Imam *et al.* (2001), Karim *et al.* (2006), Leventis and Weetman (2004), and Owusu-Ansah (2000). Abdulla (1996) examines the relationship between corporate-specific attributes and audit delay for listed firms in Bahrain and reports that firm size and leverage are significant variables. Owusu-Ansah (2000), for Zimbabwe, employed size, leverage, profitability, the reporting of extraordinary items, financial year-end, operational complexity, and firm age as determinants of reporting lag. A two-stage multiple regression model identified size, profitability, and firm age as significant determinants of the reporting lags of 47 listed firms in Zimbabwe. Research in emerging economies has demonstrated the need to better understand corporate timeliness by undertaking individual as well as comparative studies in emerging economies.

Ahmed (2003) reports long delays in reporting to shareholders in three South Asian countries—India, Pakistan and Bangladesh. Ahmed uses a large sample of 558 company annual reports for the year 1997 to 1998, comprising 115 reports from Bangladesh, 226 reports from India and 217 reports from Pakistan. The study finds that the total lag between the financial year end and the annual general meeting is, on average, 220 days, 164 days and 179 days in Bangladesh, India and Pakistan, respectively. Karim *et al*. (2006) suggest that the audit delays in Bangladesh could be reduced by effective regulatory change. Ismail and Chandler (2004) examine the timeliness of quarterly financial reports published by companies listed on the Kuala Lumpur Stock Exchange (KLSE). In addition, they extend prior research by determining the association between timeliness and the company attributes of size, profitability, growth and capital structure. An analysis of 117 quarterly reports, ending on 30 September 2001, reveals that all companies except one reported within the allowable reporting lag of two months.

This study seeks to add to this growing body of literature on timely financial reporting in Indonesia, a vibrant and emerging capital market in South East Asia. It examines the issue of timely financial reporting by undertaking an analysis of corporate reporting lags with their effects and determinants by using a sample of manufacturing firms listed on the Indonesian Stock Exchange. The next section will elaborate specific contextual details pertaining to the Indonesian stock market and the regulations governing the release of annual reports.

2.4 Regulatory Framework of Timely Financial Reporting in Indonesia

This section presents Indonesia's regulatory and institutional setting related to the financial reporting timeliness of publicly listed firms in Indonesia. The presentation covers key institutions and their policies and regulations related to the timeliness of Indonesian firm's financial reporting. The discussion also includes an historical perspective of the Indonesian Securities and Exchange Commission's policy on financial reporting timeliness for Indonesian publicly listed firms. In addition, this section discusses the capital market in Indonesia, which potentially affects this study's research methodology.

The International Monetary Fund and other multilateral funding agencies, such as Asian Development Bank, consider the Indonesian capital market to be an emerging market. The Indonesian stock market began official operations in 1956 but it has not operated continuously and in the 1960s ceased trading due to political turmoil. It was not until the early 1990s that the number of firms listed in the Indonesian capital market – that is, the Jakarta Stock Exchange

(JSX) and the Surabaya Stock Exchange – surpassed 100. Since then, this number has increased and in December 2011 478 stock-issuing firms are listed on the IDX (Bapepam-LK, 2012).

In 1973 the Indonesian Institute of Accountants (IAI) published the first Indonesian accounting principles, *Prinsip Akuntansi Indonesia*. In 1984, the IAI slightly revised these principles to incorporate certain Indonesian business concepts. To secure the immediate release of information that might materially affect market activities and the prices of listed securities, the Indonesian regulatory sources impose a general requirement of timely reporting.

Figure 2.1 illustrates the key institutions in the Indonesian financial reporting framework. At the first level, the House of Representatives, or *Dewan Perwakilan Rakyat*, establishes Indonesia's highest level of law and regulation. The president and cabinet perform their executive functions based on these laws and regulations and are authorised to establish lower-level laws and regulations through government regulations (*Peraturan Pemerintah*), presidential decisions (*Keputusan President*), and ministerial decisions (*Keputusan Menteri*).

At the second level, the Indonesian Capital Market Supervisory Agency (ICMSA), or *Badan Pengawasan Pasar Modal (BAPEPAM)*, under the Department of Finance and the Minister of Finance, directly regulates the capital market. Law number eight, issued by the Minister of Finance in 1995, covers rules concerning the operation of the capital market in Indonesia and related governmental units. This law gives the ICMSA supervisory powers that enable it to issue rules and regulations concerning the capital market. The ICMSA has an interest in financial transparency and regulates the transparency of Indonesian public firms to protect the interests of

investors and other market participants. It establishes regulations governing corporate disclosure, particularly the form and content of annual reports for publicly traded firms.[13] The ICMSA's regulations include cross-references to the disclosure requirements of the Indonesian Accounting Standards, issued by the IAI. Thus, the regulations and requirements for publicly listed firms in Indonesia are issued by institutions at both the second and third levels, shown in Figure 2.1. The Indonesian Stock Exchange (IDX), formerly the JSX and Surabaya Stock Exchange, deals with corporate transparency regarding stock trading and market information. The hierarchy of regulations for public firms is as follows:

1. The ICMSA rules and regulations,
2. Accounting standards promulgated by the IAI,
3. IDX rules and regulations, and
4. Other generally accepted accounting principles, such as the International Financial Reporting Standards (IFRS).

At the fourth-level (see Figure 2.1), institutions such as the Federation of Financial Analysts, labour unions and other users of annual reports have the right to monitor and evaluate the existing regulations and influence the decision-making processes of parties in the first to third levels.

[13] The Directorate General of Taxation – another institution under the Department of Finance and the Minister of Finance – administers the taxation of Indonesian publicly listed firms. The Central Bank of Indonesia establishes banking rules and regulations for Indonesian banking and financial institutions. Government institutions such as the Ministry of Finance and the Ministry of Industry and Trade also have an interest in financial disclosure.

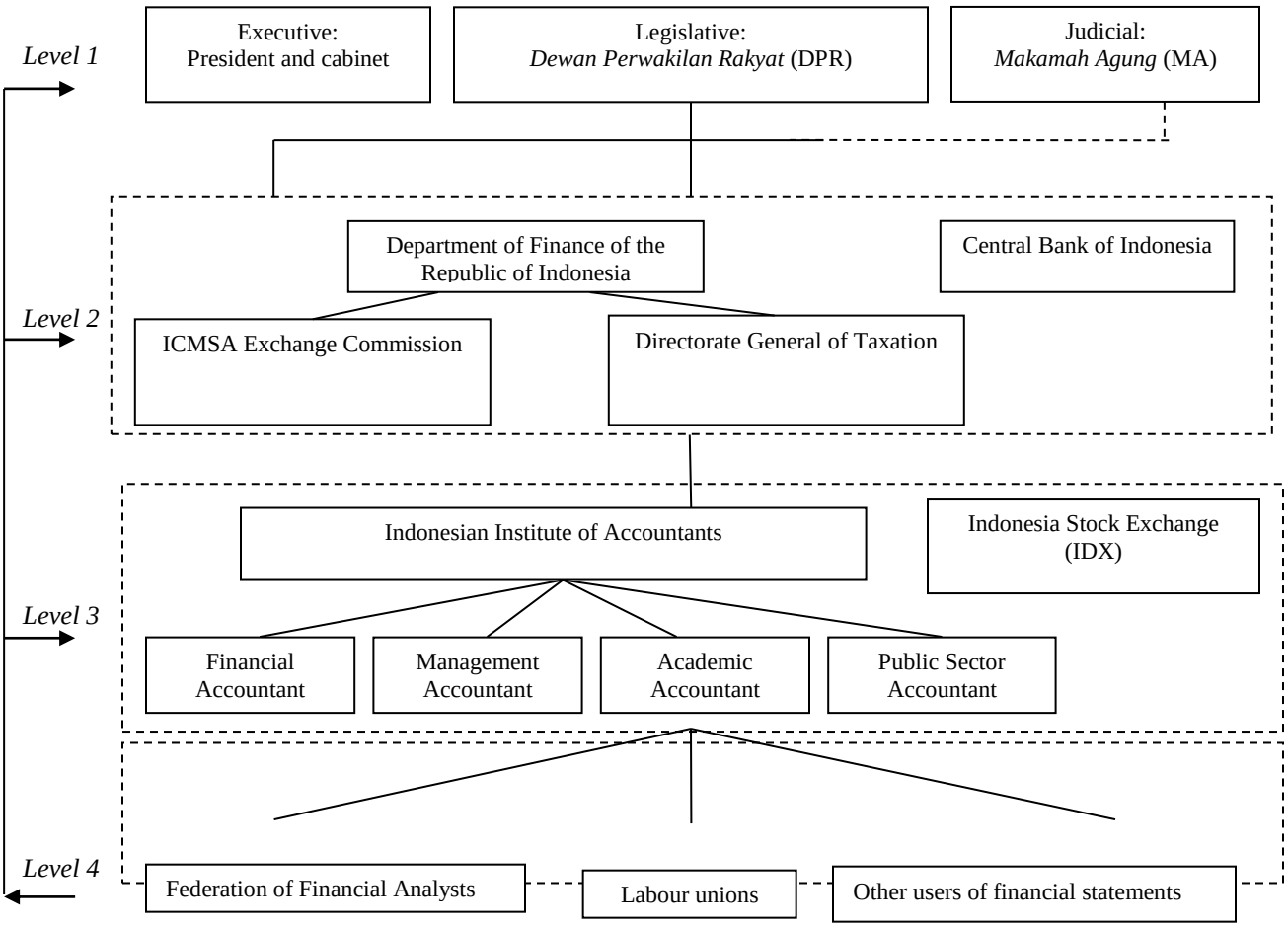

Figure 2.1. **Institutional framework governing financial reporting in Indonesia**

As the main institution regulating the capital market in Indonesia, the ICMSA has issued a number of regulations to support its supervisory role. Regulations relating to timely submissions to the ICMSA or the release of audited annual reports to the public include

- Kep-38/PM/1996, issued on 17 January 1996, concerning annual reporting;
- Kep-97/PM/1996, issued on 28 May 1996, concerning guidelines of financial statement presentation;

- Kep-86/PM/1996, issued on 24 January 1996, concerning the disclosure of information that must be announced to the public within 90 days of the financial year-end; and
- Kep-80/PM/1996, issued on 17 January 1996, concerning the Liability of Periodic Financial Statement Submission.

The above regulations were established to govern firms whose shares are listed on stock exchanges. Specifically, the regulation Kep-86/PM/1996 issued on 24 January 1996 regulates regarding financial reporting timeliness. Historically, the publication timeline of annual reports was 120 days after the end of the fiscal year, but as the need to provide more relevant financial information increased, the ICMSA shortened it in 1996 to 90 days.

Attempts to improve the financial disclosure of public firms would have greater effect if the rules and regulations promulgated by the ICMSA and IAI were improved. Due to the complex characteristics of financial disclosure, it is sometimes difficult to determine adherence to regulations. An attempt to improve the quality of accounting standards will improve the quality of financial information disclosure and reporting for public and private firms. Two organisations – the ICMSA and the IAI – are the bodies most responsible for financial information disclosure and reporting regulations. Cooperation between these two bodies is therefore necessary to improve financial information disclosure and reporting in Indonesia.

2.5 Reporting Timeliness and the Information Content of Annual Reports

This section presents three main discussions: firstly, a review of the information content of the financial reporting literature (capital market studies); secondly, a review of empirical studies on the effect of financial reporting timeliness on stock market reaction to the release of annual reports; and finally, presents the hypotheses development. The review of the literature in this section assists the development of the first and second hypotheses (H_1 and H_2) related to RQ1, that is, whether the timeliness of the financial reporting of manufacturing firms in Indonesia affects the information content of annual reports (stock market reaction to the release of the annual reports).

2.5.1 Information Content Literature

One of the factors that can affect the information content of the release of information is the capital market's expectations regarding the content and timing of the release (Foster, 1986). Theoretically, there is uncertainty regarding either the content or timing of firms' financial information releases. The greater the extent of uncertainty, the greater is the potential for any release of information to cause a revision of security prices. The theoretical background for information content studies is derived from the positive accounting literature. In particular, studies on the association between the capital market (equity value) and accounting information follow early seminal studies on information content (Ball and Brown, 1968; Beaver, 1968; Fama *et al.*, 1969).

This study follows the information content literature to examine the effect of timeliness of financial reporting on the information content of annual reports. Important developments in the

research on the information content of annual reports in the capital market have been derived from early concurrent studies in economics and finance, including positive economic theory (Friedman, 1953), the efficient markets hypothesis (Fama, 1965), and the capital asset pricing model (Lintner, 1965; Sharpe, 1964). These developments led to the seminal research of Ball and Brown (1968) and Beaver (1968) and the event study of Fama *et al.* (1969), which provide empirical evidence to ascertain whether accounting numbers contain or convey information about a firm's financial performance to the market.

Strong market reaction towards earnings announcements are indicated by high cumulative abnormal returns around the announcement date, indicating high information content in the earnings announcements. Timely financial reporting is suggested to be more useful in users' decision-making than is late financial reporting. The usefulness of annual reports is indicated by the degree of information contained and determined by the degree of market reaction. Hence, annual reports released earlier by their firms have higher information content than those released later (Chambers and Penman, 1984; Givoly and Palmon, 1982).

Ball and Brown (1968) and Beaver (1968) suggest that the usefulness of information contained in annual reports can be assessed by analysing changes in stock prices around earnings announcements. Their studies relied on efficient market hypothesis theories (Fama, 1965). In an efficient market, security prices adjust quickly and correctly to fully reflect new information (Brown and Warner, 1980; Fama, 1965; Lev, 1989). Consequently, the release of new information is reflected in changes in the variability of security prices over a short period around the event (Fama *et al.*, 1969; Kothari, 2001). These changes in the variability of security prices

provide evidence of the information's usefulness for investors (Ball and Brown, 1968; Beaver, 1968; Kothari, 2001; Lev, 1989).

Further, the release of earnings information conveys useful information and contributes to the determination of stock prices and provide evidence of the information's usefulness for investors (Ball and Brown, 1968; Beaver, 1968; Kothari, 2001; Lev, 1989). The information content literature has suggested that more informative accounting information is reflected in greater abnormal returns (Ball and Brown, 1968; Beaver *et al.*, 1980a). A larger market reaction around earnings announcements has been interpreted as indicating greater earnings usefulness (Francis *et al.*, 2002a; Lev, 1989). Lev (1989) noted that if the usefulness of earnings information is significant to investors, then earnings should exhibit considerable explanatory power with respect to price revisions around earnings announcements. Therefore, the information content of an annual report refers to whether the financial information is useful to the stock market.

In addition, Ball and Brown (1968) find evidence indicating that much accounting information is reflected in security prices prior to the release of an earnings report. Other sources of information allow the market to anticipate the earnings report, so that the variability of returns (amount of information) associated with it may be related to reporting time lag. More specifically, a longer reporting time lag allows for more information in the report to be supplied by other sources, through investor search activity, other firms' voluntary disclosures, or the predictions of the earnings report supplied by the earnings releases of earlier-reporting firms. This suggests that later reports are associated with less price variability than earlier reports (Atiase *et al.*, 1989; Chambers and Penman, 1984).

2.5.2 Empirical Evidence of the Effect of Reporting Timeliness on Stock Market Reaction

Empirical research on financial reporting timeliness provides evidence that the degree of timeliness of information release affects security prices and information content (Atiase *et al.*, 1989; Chambers and Penman, 1984; Givoly and Palmon, 1982; Kross and Schroeder, 1984; Zeghal, 1984). Longer financial reporting time lags provide investors with more opportunities to discover the firm's financial condition through intra-industry announcements (Foster, 1981), private searches or management forecasts (Foster, 1973; Patell, 1976; Penman, 1980). Consequently, one would expect to find an inverse relationship between the reporting time lag and the intensity of associated security price reactions.

Beaver (1968) provides empirical evidence on the information content of annual earnings announcements and suggests that investors may postpone their purchases and sales of securities until earnings reports are released. Delays in releasing annual reports are likely to increase the level of uncertainty associated with decisions that require the information contained in the annual reports (Givoly and Palmon, 1982). As a result, decisions may be non-optimal or delayed.

Based on a subsample of audited annual earnings announcements, Givoly and Palmon (1982) compare the price reactions associated with a portfolio of early disclosers, with those associated with a portfolio of late disclosers. Their results are dependent on the basis for classification as an early or late discloser. When this classification is based on the days between the fiscal year-end and the actual annual report announcement dates, as actual time lag (ATL), or chronological time lag, Givoly and Palmon (1982) find no significant difference between the magnitudes of the two portfolios' market activities during the announcement week. However, when the early/late

classification was based on the difference between the expected and actual announcement dates or unexpected reporting time lag (UTL),[14] Givoly and Palmon (1982) find that the stock market reaction is more intense for early disclosure relative to expectations for the late discloser portfolio.

Givoly and Palmon (1982) examine several aspects of the timeliness of earnings announcements that have implications for regulatory actions. The results show considerable shortening of the reporting lag over the years. This implies that the assumption conveniently made in many event studies that the announcement week or month is fixed over time, is inappropriate and tends to weaken the power of the tests. The reporting lag of individual firms appears to be more related to intra-industry patterns and tradition than to firm attributes. The ability of most firms to report ahead of the filing deadline, coupled with the finding that bad news tends to be delayed, should be considered when assessing the adequacy of the length of the current filing period (Givoly and Palmon, 1982).

Chambers and Penman (1984) find evidence of higher return variability associated with reports released earlier than expected relative to that associated with reports released on time or unexpectedly late. The authors also find that abnormal returns associated with the release of reports published earlier than expected are positive, on average, which suggests that firms publish reports early when they have good news. Abnormal returns associated with the release of reports published later than expected are negative, on average, which indicates that delayed

[14] Unexpected reporting time lag (UTL) is defined as the reporting lag relative to their expected dates of the release of the annual reports. A report is classified as timely if it is released before the date expected (last year's report released date, day and month) and classified as late if it released after the date expected (Chambers and Penman, 1984).

reports carry bad news. Additionally, the authors find that average abnormal returns on the expected date of release of reports that are unexpectedly late are negative, which indicates that investors interpret a failure to report on time as a forecast of bad news. However, Chambers and Penman (1984) find no significant association between actual chronological reporting lags and the variability of stock returns associated with interim and annual earnings releases.

Chambers and Penman (1984) investigate return variability in periods following reports to determine the persistence of the abnormal return variability observed at the time of the release of an earnings report. They find significant abnormal price variability in periods following the time of the release of the reports. Post-report return variability seems to be directly related to reporting lag time. Chambers and Penman (1984) observe unusually high stock return variability following unexpectedly early reports carrying good news and unexpectedly late reports carrying bad news, but not after early bad news reports or late good news reports.

Kross and Schroeder (1984) find an association between quarterly announcement timing (early or late) and the type of news (good or bad). They also find an association between stock returns and the time release of the quarterly earnings announcement date. Similarly, Beaver *et al.* (1979) report that stock returns are also associated with the magnitude of the earnings forecast error, because early (late) announcers could be releasing extremely good (bad) news. The abnormal returns of firms that announce early (late) are significantly higher (lower) than the abnormal returns of firms that announce late (early). This general result is consistent with previous research by Chambers and Penman (1984), Givoly and Palmon (1982), and Kross (1982); however, these previous studies did not completely control for potentially confounding factors

regarding the timing effect. After controlling for these factors, the timing effect persisted, regardless of whether the earnings announcement contained good news or bad news, was an annual or interim announcement, or was made by a large or small firm.

The financial information used by investors and creditors should be useful, current and relevant to their predictions and decisions. Zeghal (1984) finds accounting reports with shorter delays have higher information content than those with longer delays. At the time of release to the capital market, the effect of delays on information content seems to be more significant for interim reports than for annual reports. This may be explained by the major characteristics that differentiate the information contained in interim reports from that contained in annual reports and the differences in their role in investors' decision processes. While interim reports contain abstract, unaudited information that mainly helps investors update their expectations of a firm's annual earnings, annual reports contain much more extensive and audited information that mainly plays a confirmatory role in investors' predictions. It is because of these two different roles of accounting information, anticipatory and confirmatory, that delays in the release of accounting reports and consequently substitute information can affect the information content of these reports. In fact, it seems easier to substitute information in interim reports for anticipatory decisions than to substitute audited information in annual reports for confirmational decisions.

Atiase *et al.* (1989) suggest that by controlling firm size, the timeliness of financial reporting is associated with stock price reaction. The study finds longer chronological reporting time lags or actual reporting time lags are associated with less intensive security price reaction, as expected. That is, when firm size is controlled for, the extent of the market reaction is related to the entire

chronological lag from the fiscal year-end to the actual announcement date (Atiase *et al.*, 1989). This is true not only for the total chronological lag, but also for each of its two components, the expected and unexpected reporting time lags. This chronological time lag effect may be stronger for earnings announcements that convey bad news. Small firms' earnings announcements generate more intense security price reaction than do large firms' announcements (Atiase, 1985). One plausible reason why Chambers and Penman (1984) and Givoly and Palmon (1982) find an inverse relationship between the magnitude of the market reaction and the unexpected lag (but not the chronological time lag) is that the unexpected lag partly compensates for the omitted firm size variable. The expected lag is relatively longer for small firms. Controlling for differences in the expected lag therefore partially neutralises the confounding effect of firm size by shortening small firms' reporting lags relative to large firms' lags.

2.5.3 Hypothesis Development: The Effect of Reporting Timeliness on Stock Market Reaction

This section formulates the first and second hypotheses relating to stock market reaction to the timeliness of the reporting of manufacturing firms in Indonesia. Givoly and Palmon (1982) find that price reactions to early earnings announcements are significantly more pronounced than those to late announcements, which suggests a decrease in information content as reporting lag increases. Chambers and Penman (1984) suggest that firms that tend to release their annual reports earlier than the expected release date generate higher cumulative abnormal returns and those that tend to release their annual reports later than the expected date generate lower cumulative abnormal returns. Kross and Schroeder (1984) find that the timeliness of annual reports is relative to abnormal returns around the report release date and firms that release their

annual reports timelier generate higher cumulative abnormal returns than firms that engage in later releases.

The information content of annual reports is the degree to which the financial information conveys useful information to the stock market. The capital market's expectations regarding the content and timing of the release can affect the information content of the release of information (Foster, 1986). Theoretically, uncertainty affects either the content or the timing of firm financial information releases. The greater the uncertainty, the greater the potential for any release of information to cause a revision of security prices. Strong market reaction to earnings announcements are reflected by high cumulative abnormal returns around the announcement dates, which means the earnings announcements have high information content. Hence, annual reports that are released earlier have higher information content than those released later (Chambers and Penman, 1984; Givoly and Palmon, 1982). Accordingly, this study formulates the first hypothesis (H_1) related to RQ1:

H_1: The stock market reaction around the timely release of annual reports is significantly different from the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia.

Atiase *et al.* (1989) find that the timeliness of financial reporting is associated with stock price reaction by controlling firm size and profitability (good news or bad news). Furthermore, the results of Atiase *et al.* (1989) suggest that the type of news (good or bad) conveyed by earnings announcements affects the relationship between firm size and announcement timeliness. Relative

to large firms, small firms tend to report good news late; however, they tend to report bad news even later. The distribution of reporting lags in the U.S. reveals that most firms announce their annual earnings before the U.S. Securities and Exchange Commission (SEC) 10-K filing deadline (Atiase *et al.,* 1989). However, most large firms report well before this deadline, while many smaller firms report in the preceding two weeks. The SEC requirement is therefore more likely to be a binding constraint for smaller firms than for larger firms. In particular, firms that normally report earnings shortly before the SEC deadline are not likely to delay their announcements beyond this deadline simply because their earnings contain bad news. Such firms, most of which are small, therefore have greater opportunities to announce good news early than to delay reports of bad news. Hence, to capture the effect of the timeliness of financial reporting to the stock market reaction to the release of annual reports in an emerging market (Indonesian Stock Exchange) with controlling for firm size, profitability and leverage, the following hypothesis (H_2) related to RQ1 is developed:

H_2: The stock market reaction around the timely release of annual reports is greater than the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia while controlling for firm size, profitability and leverage.

2.6 Determinants of Financial Reporting Timeliness

This section reviews empirical studies and developed the hypotheses related to seven determinants of the timeliness of financial reporting (H_3 – H_9 related to RQ2): 1) firm size; 2) profitability; 3) capital structure; 4) operational complexity; 5) audit firm; 6) audit opinion; and 7) earnings quality.

2.6.1 Firm Size

Firm size has often been recognised as one of the important corporate attributes associated with financial reporting timeliness. It has been a major variable of interest in most timeliness reporting studies examining its association with financial information reporting delays. The notion that firm size is associated with financial reporting timeliness is supported by many arguments.

First, theoretically, the larger the firm, the greater the involvement of outside interests. Moreover, large firms have larger analyst followings. In addition, when larger firms are more visible, they have more external stakeholders and are more closely monitored by analysts. Large firms are also more visible than smaller firms and are subsequently more likely to adopt strategies to reduce regulatory intervention (Ismail and Chandler, 2004). The increase in outside interests may be countered by reducing any financial reporting time lag to quickly eliminate uncertainty in the market about firm performance (Davies and Whittred, 1980). Larger firms have more to lose from the negative signals provided by an unexpectedly long audit delay, which pressures the auditor to expedite the audit process, resulting in shorter reporting time lags.

Second, size has been associated with a higher demand for quality audited annual reports (Al-Ajmi, 2008). Al Ajmi (2008) examines the association of firm size with audit report lag and finds the larger the firm, the higher the demand for high-quality audits. Size has been associated with higher agency costs (Chow, 1982), which are mitigated by high audit quality. As a firm grows larger, duties must be delegated and reduced transparency leads to moral hazard risk and possible opportunistic behaviour. Moreover, large firms are more dependent on external financing and

therefore may be more sensitive to the needs of existing and potential investors who demand high-quality audited annual reports with a high-quality audit process. Such concerns will influence the time taken to release audited annual reports to the public (Al-Ajmi, 2008).

Third, larger firms are associated with greater resources than smaller firms, such as more advanced accounting information systems and greater technological development. These attributes should help larger firms ensure timelier reporting.

Fourth, Ismail and Chandler (2004) have argued that large firms are likely to have stronger internal controls, internal auditing, and greater accountability, all of which should make it easier to audit large numbers of transactions in a shorter time, thus leading to the quicker release of audited annual reports.

Finally, large firms possess greater resources to pay the higher audit fees charged by the Big Four audit firms and are thus better equipped to undertake audits within a shorter period. However, one can also argue that the larger the auditee, the easier it is for the auditor to achieve economies of scale when conducting an audit (Firth, 1985) and that any savings may be passed on to the client.

Previous empirical studies have found an inverse relationship between financial reporting timeliness and firm size (Al-Ajmi, 2008; Bamber *et al.*, 1993; Davies and Whittred, 1980; Givoly and Palmon, 1982; Ismail and Chandler, 2004; Newton and Ashton, 1989; Ng and Tai, 1994; Owusu-Ansah, 2000), while others find the association between timeliness and firm size to

be insignificant (e.g.,Ashton *et al.*, 1987; Courtis, 1976; Leventis and Weetman, 2004; Owusu-Ansah and Leventis, 2006; Simnett *et al.*, 1995). These results suggest that superior financial resources are not sufficient to process information faster, since the amount of information to be gathered is vast and can come from numerous divisions, branches, and subsidiaries.

Al-Ghanem and Hegazy (2011) find a significant negative association between firm size and audit delay. They added a new variable, liquidity, to analyze audit delay in the Kuwait stock market and find that one variable – firm size – significantly affected audit delay for 2006 and 2007. Liquidity and debt proportion significantly affected audit delay for 2006 only and audit type significantly affected audit delay for 2007 only. The findings also show a negative association between audit delay and firm size as measured by total assets. This result is similar to that obtained by several audit delay studies conducted in different countries (Carslaw and Kaplan, 1991; Gilling, 1977; Ng and Tai, 1994). Large firms that have a strong control system need less time for audits. Their accounts are usually more frequently subject to discretionary revisions, such that they audit their accounts more rapidly than smaller, lower-profile firms. In view of the above literature this study formulates the following hypothesis for the association between timeliness of financial reporting and firm size:

H_3: Firm size is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.6.2 Profitability

Profitability is expected to influence the timeliness of firm financial reporting. A firm's performance has a signalling effect on the market for corporate securities (Watts and Zimmerman, 1990). A rise in the market due to good news (positive performance) will raise the market value of outstanding equity shares and management and the opposite is true of a firm with bad news (negative performance). Therefore, it is reasonable to expect the management of a successful firm to report good news to the public on a timely basis (Mahajan and Chander, 2008).

Prior empirical findings suggest that firms with bad news, or that experienced losses, tend to delay reports longer than firms with good news (e.g., Al-Ajmi, 2008; Ashton *et al.*, 1989; Bowen *et al.*, 1992; Carslaw and Kaplan, 1991; Givoly and Palmon, 1982; Haw *et al.*, 2000; Ismail and Chandler, 2004; Mahajan and Chander, 2008; Owusu-Ansah, 2000). As determined by (Al-Ajmi, 2008), good and bad news are factors that determine both audit report time lags and financial reporting time lags. In addition, early publication signals positive news about firm performance (Al-Ajmi, 2008).

Bowen *et al.* (1992) and Haw *et al.* (2000) suggest that earnings announcements containing good news may be moved forward and that bad news tends to be delayed. The phenomenon of delayed bad news can also be explained in terms of 'stakeholder theory' (Haw *et al.*, 2000). Stakeholder theory suggests that in the absence of an opportunity to hide bad news because of mandatory disclosure requirements, managers have an incentive to delay its release (Watts and Zimmerman, 1990). By delaying bad news, management gives shareholders a 'silent signal' and the

opportunity to divest themselves of the firm's shares before the information reaches the market. Similarly, announcing good news early ensures that it will not be preempted by other sources (Ismail and Chandler, 2004; Mahajan and Chander, 2008). Another reason is that auditors take much more time to audit failing (high-risk) firms as a defence against potential future litigation (Owusu-Ansah, 2000).

However, some of the empirical evidence is mixed. Annaert *et al.* (2002), Davies and Whittred (1980), and Dyer and McHugh (1975) find no association between profitability and total reporting and no significant association between profitability and financial reporting time lag. Davies and Whittred (1980) extended the work of Dyer and McHugh (1975) and Whittred (1980) by adding three new variables – audit firm size, auditor change, and the presence of extraordinary items – to the conventional auditee attributes of size, profitability, and year-end dates. The authors find that small and large firms are significantly more timely reporters than moderate-sized firms. Contradicting Dyer and McHugh (1975), Davies and Whittred (1980) find that financial year-end has little effect on the total reporting lag, but find that relative profitability does not significantly explain reporting lag.

In an Australian study, Whittred and Zimmer (1984) investigate the ability of financial reporting delays to predict financial distress. By contrasting the lags of 37 matched pairs of failed and non-failed firms for five years prior to failure, they find that firms entering financial distress experience longer auditing lags at least three years prior to failure. In another study in the context of Australian firms, Simnett *et al.* (1995) report a steady increase in mean audit process delays during 1981–1989 and find that previous years' audit delays are the major explanatory variable

to explain current audit delay. This study also finds that audit delay is inversely related to profit (six of the eight years) and audit complexity, but directly related to qualified opinion (three latest years) and busy season year-ends (four of the eight years).

In a New Zealand study, Carslaw and Kaplan (1991) examine the effects of nine variables on audit delay by using the data from 245 and 246 listed firms for 1987 and 1988, respectively. Their results show that total assets and the net profit sign are significant in both years, while client industry, extraordinary items, firm ownership, and leverage are significant for a single year.

Givoly and Palmon (1982) analyse timeliness and the information content of annual reports and examine their relationship with certain corporate attributes. Using the relative measure of profitability and absolute and relative measures of timeliness, they tested Beaver's (1968) suggestion that good news is released promptly while bad news is systematically delayed. They find that reporting timeliness is associated with the information content of the annual reports. Ng and Tai (1994) examine the effect of firm-specific characteristics on audit delays in Hong Kong. Drawing mainly on the work of Ashton *et al.* (1989) and Carslaw and Kaplan (1991), the authors find that firm size and degree of diversification are significantly associated with audit delay in both 1991 and 1992 and that extraordinary items and financial year-ends are significant in one year only. Jaggi and Tsui (1999) extend the work of Ng and Tai (1994) by incorporating firm financial condition, ownership control, and audit firm technology. They obtain data from 393 firms listed on the Hong Kong Stock Exchange over a period of three years from 1991-1993. Their results show that firm size, firm financial condition, audit approach (degree of structure),

degree of diversification, and audit opinion are significant explanatory variables for audit delays in Hong Kong.

Abdulla (1996) finds a significant relationship between timeliness and firm size, profitability, and distributed dividends in Bahrain. Owusu-Ansah (2000) employs a two-stage least square regression model and finds that size, profitability, and firm age are significant determinants of the reporting lags of Zimbabwean listed firms.

Ahmed (2003) examines the reporting delays in India, Pakistan, and Bangladesh. The author uses a sample of 558 firm annual reports for the year 1997–1998, comprising 115 reports from Bangladesh, 226 reports from India, and 217 reports from Pakistan. The study finds that the total lags between the financial year-end and the annual general meeting were, on average, 220 days, 164 days, and 179 days in Bangladesh, India, and Pakistan, respectively. The author finds no association between corporate characteristics and timely reporting for Bangladesh. Al-Ghanem and Hegazy (2011) examine publicly listed firms in Kuwait and examine firm profitability as measured by changes in earnings per share. They also find no significant association between changes in earnings per share and audit or reporting delay

Ismail and Chandler (2004) examine the timeliness of quarterly financial reports published by firms listed on the Kuala Lumpur Stock Exchange (KLSE). In addition, they extended prior research by determining the association between timeliness and the firm attributes of size, profitability, growth, and capital structure. An analysis of 117 quarterly reports, ending on 30 September 2001, revealed that all firms except one reported within the allowable reporting lag of

two months. However, a large number of firms used most of the time given to announce their quarterly reports. The study provides evidence of a significant association between timeliness and firm profitability, growth, size, and leverage.

Major prior studies have found that a firm's financial performance is negatively associated with audit report time lag which impacts on the timeliness of the release of annual reports. Aktas and Kargin (2011), for example, find a statistically significant association between income and timely financial reporting of firms listed on the Istanbul Stock Exchange. Auditors can take longer to audit firms that have been incurring losses because of associated auditor business risk (Afify, 2009). Shukeri and Nelson (2011) studied the 300 largest firms listed on the KLSE for the year ending December 2009 and find that audit lag (reporting time lag) is significantly influenced by firm performance. Thus, the following hypothesis is developed:

H_4: Profitability is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.6.3 Capital Structure

Highly leveraged firms report faster than firms with less leverage. Based on agency theory, this view contends that higher monitoring costs are incurred by more highly leveraged firms. Since highly leveraged firms have an incentive to invest suboptimally, debt holders normally include clauses in their debt contracts that constrain the activities of management (Jensen and Meckling, 1976). One such clause is to require prompt and frequent disclosure so that debt holders can reassess the firm's long-term financial performance and position (Owusu-Ansah, 2000).

In contrast, Al-Ajmi (2008) finds that highly leveraged firms tend to delay publication of their annual reports, as well as have longer audit report time lags. Moreover, another view contends that highly leveraged firms report more slowly than less leveraged firms. Supporters of this view believe that a high ratio of debt to total assets increases the probability of failure (Carslaw and Kaplan, 1991; Owusu-Ansah, 2000), particularly when the general economy is poor. In a New Zealand study, Carslaw and Kaplan (1991) find a significant association between reporting time lag and leverage for a single year.

Al-Ghanem and Hegazy (2011) examine the proportion of debt as measured by the ratio of total debt to total assets. The ratio of debt to total assets is a signal of a firm's ability to meet maturing obligations; thus, like liquidity, it is an indicator of a firm's financial health. Prior studies have found a positive relationship between audit delay and the ratio of debt to total assets (Al-Ajmi, 2008; Boonlert-U-Thai *et al.*, 2002; Carslaw and Kaplan, 1991; Conover *et al.*, 2007; Owusu-Ansah, 2000). A high ratio of debt to total assets means a high risk of bankruptcy or management fraud, resulting in an increase in the time auditors need to complete their substantive tests of transactions and delaying reporting. Hence, the following hypothesis is developed:

H_5: Capital structure is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.6.4 Complexity of Firm Operations

The degree of complexity of a firm's operations is expected to influence reporting timeliness. Since the degree of operational complexity – which is determined by the number and locations of a firm's operating units (branches) and the diversification of its product lines and markets – likely affects the time required to complete an audit, it is expected to be positively related with audit delay and thus impact on the financial reporting timeliness. Ashton *et al.* (1987) find a significant positive relationship between operational complexity and reporting delay. However, other studies have found no significant association between the complexity of operations and financial reporting timeliness (Givoly and Palmon, 1982; Jaggi and Tsui, 1999; Owusu-Ansah, 2000). Aktas and Kargin (2011) find a significant impact of annual reports on the reporting timeliness of consolidated and non-consolidated firms listed on the Istanbul Stock Exchange. The following hypothesis is developed:

H_6: Operational complexity is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.6.5 Audit Firm

Consistent with prior research (e.g., Imam *et al.*, 2001; Ng and Tai, 1994), one can argue that larger audit firms (henceforth international audit firms) in emerging countries complete audits more quickly because they have greater staff resources and more experience in auditing listed firms. International audit firms may enjoy economies of scale in the provision of audit services and are more efficient in verifying accounts than smaller, domestic audit firms. In addition, larger firms are concerned with reputation loss from poor audit services and can therefore be

expected to spend more time ensuring that accounts are correct before expressing an opinion. Thus, the type of audit firm will impact on the time taken to release audited annual reports to the public.

Davies and Whittred (1980) further suggest considering such variables as extraordinary items, changes in accounting techniques, changes in auditors, audit firm size, and audit opinion. Courtis (1976) investigates the influence of four corporate attributes – corporate size, firm age, number of shareholders, and length of the annual report – on time lag in corporate report preparation and publication and find that firms comprising the shortest audit delay quartile report higher levels of income. Gilling (1977) concluded that audit delay is shorter for (a) firms with large auditors, (b) firms with overseas ownership, and (c) larger firms.

Studying the 1987 and 1988 annual reports of New Zealand listed firms, Carslaw and Kaplan (1991) extend prior research by adding two explanatory variables: owner-controlled versus manager-controlled firms and gearing. The nine explanatory variables used in their study, among other things, included firm size, industry classification, income sign, and extraordinary items. Two of the nine explanatory variables are statistically significant: corporate size (inversely related to audit delay) and the existence of loss (directly related to audit delay).

Newton and Ashton (1989) examine the association between audit delay and audit technology (structure). They find that audit firms using structured audit approaches tend to have longer mean delays than firms using unstructured or intermediate approaches, although structure explains a relatively small portion of the variance in delay. The results also indicate that unstructured audit

firms gained more clients from 1978 to 1982 than structured firms. The authors also discover that, on average, longer audit delays are associated with smaller clients, non-financial clients, and extraordinary items.

Audit technology refers to the structure of a firm's audit approach. Williams and Dirsmith (1988) use earnings announcement lag as a proxy for timeliness. They find that the clients of structured firms experience shorter earnings announcement lags than the clients of unstructured audit firms when earnings announcements are 'surprising'. Cushing and Loebbecke (1986) describe audit structure methodology as a systematic approach to auditing, characterised by a prescribed logical sequence of procedures, decisions, and documentation steps and a comprehensive, integrated set of audit policies and tools to assist auditors complete the audit.

Bamber *et al.* (1993) conclude that, on average, clients of structured audit firms experience longer total audit report lags; however, they are able to adapt more quickly to unanticipated events.

Kinney and McDaniel (1993) find that firms with declining earnings that report corrections of interim earnings that are initially overstated also tend to have significantly increased audit delays. Knechel and Payne (2001) also find that incremental audit effort, the use of less experienced audit staff, and the presence of contentious tax issues lead to longer audit report lags. On the other hand, the audit report lag is decreased by the potential synergistic relationship between management advisory services and audit services. Providing management advisory services results in knowledge spill over that can reduce audit delay (Knechel and Payne, 2001).

Imam *et al.* (2001) conduct a study of 115 firms listed on the Bangladesh Stock Exchange in 1998 and examine the association between audit time lag and an audit firm's links to international firms, a proxy for auditor quality. The authors find that audit firms associated with international firms have longer audit delays. This is likely due to the requirements placed on accounting firms by the Institute of Chartered Accountants of Bangladesh and the Securities and Exchange Commission to ensure full compliance with statutory requirements and local accounting practices (Imam *et al.*, 2001).

Larger audit firms tend to complete their audit work on time to maintain their reputation (Afify, 2009). They have more efficient audit teams, since they have more resources to train their staff, and also employ more powerful audit technologies that will reduce the time of the audit work (Owusu-Ansah and Leventis, 2006). Shukeri and Nelson (2011) examine the factors influencing audit report lag and its association with the size of audit firms (type of auditor) for publicly listed firms in Malaysia. They find that audit report time lag is significantly associated with the size of the auditor. Furthermore, Al-Ghanem and Hegazy (2011) find that audit firm type influences audit delays and the financial reporting timeliness of publicly listed firms in Kuwait.

Ahmad and Kamarudin (2003) have classified auditors into two groups: Big Four and non-Big Four. The Big Four audit firms refer to KPMG Peat Marwick, Ernst and Young, Pricewaterhouse Corporation and Deloitte and Touche. The Big four audit firms are assumed to be able to audit more efficiently and have greater flexibility in scheduling the audits so that they can be completed on time (Carslaw and Kaplan, 1991). Khasharmeh and Aljifri (2010) conclude that the

audit type appear to have strong influence on audit delay for firms in the United Arab Emirates. Thus, the following hypothesis will be tested to capture the effect of audit firm size (auditor type) on the timeliness of financial reporting in manufacturing firms in Indonesia:

H_7: Big Four/non-Big Four audit firms are associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.6.6 Audit Opinion

The presence of a qualified audit opinion is expected to be associated with a longer audit delay, since auditors are likely to be reluctant to issue a qualification and may spend more time attempting to resolve the items in question. Results supporting this association are provided by Whittred (1980) using Australian data, Carslaw and Kaplan (1991) using New Zealand data, and Ashton *et al.* (1989) and Bamber *et al.* (1993) using U.S. data. Ahmad and Kamarudin (2003) also find a significant association between audit opinion and timeliness for Malaysian firms.

Whittred (1980) replicated the work of Dyer and McHugh (1975) and find that the average reporting lag of Australian listed firms did not change significantly after a listing requirement revision was established allowing firms four months to submit audited accounts to the stock exchange. Whittred (1980) finds that qualified reports delay the release of annual reports and that this delay increases with the seriousness of the qualification. Davies and Whittred (1980) extended the studies of Dyer and McHugh (1975) and Whittred (1980) by adding three new variables – audit firm size, auditor change, and the presence of extraordinary items – to the conventional auditee attributes of size, profitability, and year-end dates. They find that small and

large firms are significantly more timely reporters than moderate-sized firms. Contrary to the results of Dyer and McHugh (1975), they find that financial year-ends have little effect on total reporting lag, but agreed that relative profitability does not significantly explain audit delay. Among the new variables, auditor size and extraordinary items are found to explain little variation in any of the defined lags, while auditor change significantly increases preliminary reporting lag, with little influence on other lags measured in the study.

Simnett *et al.* (1995) report a steady increase in mean audit delays in Australia over the period 1981–1989 and find that previous years' audit delays are the major explanatory variable for current delays. The study also finds that audit delay is inversely related to profit (six of the eight years) and audit complexity and is directly related to qualified opinion (three latest years) and busy season year-ends (four of the eight years). It did not find that firm size, leverage (except for one year), extraordinary items, or audit structure explain audit delay.

Ashton *et al.* (1987) investigate 14 corporate attributes and finds that audit delay is significantly longer for firms that receive qualified audit opinions; have an industrial classification, as opposed to a financial industry classification; are not publicly traded; have a fiscal year-end other than December; have poorer internal controls; employ less complex data processing technology; and perform a greater amount of audit work after the year-end.

Jaggi and Tsui (1999) find no significant influence on the nature of audit opinion to the audit report delay. In a Canadian study, Ashton *et al.* (1989) use eight auditor and client-specific variables to explain audit delay. Ashton *et al.* (1989) find that non-financial service firms that

report extraordinary items and losses and that receive qualified audit opinions have significantly longer delays.

A firm that receives an unqualified audit opinion is said to have proper management and an internal control system, thus reducing the time of the audit process and procedures (Soltani, 2002). Bamber *et al.* (1993) argued that qualified opinions are not likely to be issued until the auditor has spent considerable time and effort performing additional audit procedures. Moreover, firms always view audit qualified opinions as 'bad news' and may not promptly respond to auditor requests. This is a symptom of auditor–management conflict, which would also increase audit delays (Che-Ahmad and Abidin, 2008).

Shukeri and Nelson (2011) studied the 300 largest firms listed on the KLSE for the year ending 2009. Examining the association between audit report time lag and audit opinion, they find that audit report lag is significantly influenced by auditor type, audit opinion, and firm performance. Thus, the following hypothesis is developed:

H_8: Unqualified (qualified) audit opinion is associated with a shorter (longer) time lag of financial reporting of manufacturing firms in Indonesia.

2.6.7 Earnings Quality

Chai and Tung (2002) find that firms that release earnings reports later than expected engage in earnings management indicates the firms has low earnings quality.[15] Earnings management occurs when managers use judgment to alter annual reports either to mislead stakeholders about the firm's underlying economic performance or to influence contractual outcomes that depend on the reported accounting numbers (Schipper, 1989). Extensive research has identified various motives for earnings manipulation (Becker *et al.*, 1998; Dechow and Sloan, 1995; DeFond and Park, 1997). Previous research find that early earnings announcements are associated with good news and that reporting delays are associated with the market's anticipation of bad news. Givoly and Palmon (1982) determined that price reactions are more pronounced for early announcements than for late announcements. Managers may be attempting to affect planned stock sales or negotiate contracts in the best possible light prior to the disclosure of unexpected bad news.

Chai and Tung (2002) analysed two other managerial motives for delaying bad news. First, extra time is required to undo bad news through accruals manipulation. Second, management may deliberately delay bad news until other industry-wide bad news is released to justify the bad news and thus reduce potential reputational and litigation costs. Chai and Tung (2002) find an association between reporting time lag and earnings management which indicates firms' earnings quality. Late reporters employ income-decreasing accruals as a means of earnings manipulation to enhance future profits and bonuses. The longer the reporting lag, the greater the magnitude of

[15] A firm that has a low earnings quality indicates that the firm is engaged in high earnings management and firm which has a high earnings quality indicates that the firm is engaged in low earnings management (DeFond *et al.*, 2007; Leuz *et al.*, 2003).

discretionary accruals used by late reporters to store income-increasing accruals for subsequent periods.

Agency theory begins with the assumption that people act in their own self-interest and that, under normal conditions, the goals, interests, and risks of the principal and agent are not identical. Agency theory states that when management does not own 100 per cent of the firm stock, there will inevitably be latent conflict between stockholders and managers. This leads to numerous agency problems, such as excess spending as a result of special privileges, suboptimal investment decisions, information asymmetry, and finance purchasing (Jensen and Meckling, 1976). The implementation of good corporate governance practices is a remedy for agency problems. The Organisation for Economic Co-operation and Development (2004) lists transparency as an element of good corporate governance. Reducing reporting lag is considered another component of good corporate governance practices (Blanchet, 2002; Kulzick, 2004; Prickett, 2002). These practices aim to reduce agency problems. Hence, to capture the effect of firms' earnings quality on the timeliness of financial reporting, the following hypothesis is developed:

H_9: Earnings quality is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.

2.7 Chapter Summary

This chapter has examined the existing literature on financial reporting timeliness and its relationship to the information content of annual reports. The literature on the determinants of

financial reporting timeliness is also discussed. This discussion assisted the formulation of the nine hypotheses, two hypotheses relating to the first research question (RQ1) and seven hypotheses relating to the second research question (RQ2) in Section 1.3. Table 2.1 summarises these research questions and their respective hypotheses.

Table 2.1 Summary of research questions and related hypotheses

RQ1:	**Does the timeliness of financial reporting of manufacturing firms in Indonesia affect the information content of annual reports (the stock market reaction around the release of annual reports)?**
H_1:	*The stock market reaction around the timely release of annual reports is significantly different from the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia.*
H_2:	*The stock market reaction around the timely release of annual reports is greater than the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia while controlling for firm size, profitability and leverage.*
RQ2:	**How do firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality affect the timeliness of financial reporting of manufacturing firms in Indonesia?**
H_3:	*Firm size is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_4:	*Profitability is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_5:	*Capital structure is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_6:	*Operational complexity is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_7:	*Big Four/non-Big Four audit firms are associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_8:	*Audit opinion is associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*
H_9:	*Earnings quality is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.*

The next chapter, Chapter 3, presents the sample, data, and research methodology used to test these nine hypotheses.

Chapter 3: Sample, Data, and Research Methodology

3.1 Introduction

Chapter 2 presented a literature review and developed hypotheses related to the two research questions (RQ1 and RQ2) posed in this study. This chapter presents the sample, data, and research methodology to examine the hypotheses discussed in Chapter 2, and is structured as follows. Section 3.2 provides details on the sample, data sources, and sampling procedures employed to investigate the hypotheses. Section 3.3 discusses the measurements of financial reporting timeliness used in this study. This is followed by Sections 3.4 and 3.5 which present in-depth information about the methodologies used for testing the hypotheses.

Section 3.4 presents the research methodology for testing the two hypotheses related to RQ1. The first hypothesis (H_1) postulates that: the stock market reaction around the timely release of annual reports is significantly different from the market reaction to annual reports released late. The second hypothesis (H_2) postulates that: the stock market reaction around the timely release of annual reports is greater than the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia after controlling for firm size, profitability and leverage. In particular, this section discusses the event study methodology used to calculate market reaction, including the determination of the event date and event window used in this study (Section 3.4.1) and the calculation of daily abnormal returns (Section 3.4.2) and cumulative abnormal returns (Section 3.4.3). Section 3.4.4 discusses the methodology for the univariate and multivariate tests employed to examine H_1 and H_2.

Section 3.5 discusses the research methodology used to investigate the seven hypotheses (H_3–H_9) related to RQ2: How do the firm size (SIZE), profitability (PROF), capital structure (CAPS), operational complexity (COMPLEX), audit firm size (AUDFIRM), audit opinion (AUDOPINION), and earnings quality (EQ) explain differences in the financial reporting timeliness of manufacturing firms in Indonesia? This section also states the empirical model employed to examine the determinants of financial reporting timeliness (Section 3.5.1) and the variable measurements (Section 3.5.2). Finally, Section 3.6 summarises the chapter.

3.2 Sample and Data

The following subsections discuss the sample, sampling procedures, data, and data sources used in this study.

3.2.1 Sample

The sample for this study consists of 157 manufacturing firms listed on the Indonesian Stock Exchange (IDX), with a total of 568 firm–year observations over the period 2003–2008. Manufacturing firms are used for the sample in this study for the following reasons. Firstly, manufacturing firms comprise 48 per cent of all listed firms in the IDX, meaning that firms listed on the IDX are dominated by firms that are classified as manufacturing firms. Secondly, for comparability, generalizability, and better interpretation of the results, this study has elected to use only one type of industry, namely, the manufacturing industry. Some industries are more regulated than others and firms in these industries may therefore respond differently when releasing information to stakeholders (Abdulla, 1996). Moreover, regulated industries are

followed by different regulators which may differ within themselves in terms of expertise and effectiveness, which can affect the timeliness of the annual reports of the firms they regulate (Al-Ajmi, 2008). Ashton *et al.* (1989), Ng and Tai (1994), and Courtis (1976) have argued that industry membership influences the reporting delay of members' corporate reports. Abdulla (1996) hypothesised a number of causes for this behaviour, including a firm's importance in terms of its role in the economy and its importance relative to the other listed firms. Ahmad and Kamarudin (2003) and Courtis (1976) prove statistically that the nature of the industry influences the reporting lag.

3.2.2 Sampling Procedure

The sample in this study comprises listed manufacturing firms on the IDX during the period 2003–2008. The sample for testing the hypotheses is selected based on the following criteria:

1. The firms are listed on the IDX.
2. The firms are classified as being within the manufacturing industry;
3. The firms' annual reports are available;
4. The firms' annual report release dates to the public, or filing dates, are available to determine the event date (see Section 3.4.1 for definition);
5. Security price data are available to determine the market reaction around the release of the annual reports.

Table 3.1 summarises the sampling procedure. To be included in the analysis the population of firms must, firstly, be listed on the IDX. Secondly, firms must be categorised as manufacturing firms. Based on the Indonesian Capital Market Directory's (ICMD) industry and sub-industry

classification, twenty sub-industries are categorised as manufacturing firms, including producers of food and beverages, tobacco, textile mill products, lumber and wood products, paper and allied products, chemical and allied products, and adhesive products (see Appendix A). The different manufacturing processes and product life cycles of these different types of manufacturing industries are likely to affect financial reporting timeliness in different ways.

As reported in the ICMD, the total numbers of firms listed on the IDX as of 31 December were 322 in 2003, 322 in 2004, 323 in 2005, 331 in 2006, 343 in 2007, and 393 in 2008, for a total of 2,034 firm–year observations. The result of eliminating all non-manufacturing firms' observations from 2003 to 2008 is a total of 892 firm–year observations. The number of yearly observations, as of 31 December, was 157 in 2003, 146 in 2004, 146 in 2005, 141 in 2006, 151 in 2007, and 151 in 2008.

Thirdly, financial data, and audit information must be available. This information is collected from firms' annual reports. As mentioned earlier, the annual reports are manually downloaded and collected from several sources, such as the IDX, the ICMD, Osiris, the Datastream database, and firms' websites.

The fourth requirement for being included in the analysis relates to the availability of annual report release dates or annual report filling dates. The annual report release date is defined as the date when the annual report is released to the public by a firm for the very first time. It is normally publicly available on the date when the firm files its annual report to the Indonesian

Capital Market Supervisory Agency (ICMSA).[16] The annual report date is required in the analysis to calculate the actual reporting time lag (ATL), that is, the number of days between the financial year-end and the release of the annual report. The date of the release of the annual report is mainly obtained from the IDX database and the Indonesian Securities Market Database (ISMD). Eliminating from the analysis firms for which the annual report release dates are not available in either the IDX database or the ISMD database reduces the sample.

Finally, the availability of market data, that is, the security or share prices and market index must be available.[17] To obtain share prices data from the ISMD database, the list of ticker symbols or firm names along with event dates are required. The share prices and market index are downloaded from the database, based on the event date. Each firm must have at least 200 days of share prices and market index data to allow us to estimate expected return and calculate abnormal returns (see Section 3.4.2). Implementation of all the criteria to this point results in a data set with a total of 568 firm–year observations: 87 observations in 2003, 108 observations in 2004, 86 observations in 2005, 117 observations in 2006, 85 observations in 2007 and 85 observations in 2008. Our application of the above criteria to select the final sample is shown in Table 3.1.

[16] Also known as *Badan Pengawas Pasar Modal dan Lembaga Keuangan (BAPEPAM-LK).*
[17] The market index used in this study is the *Jakarta Composite Index*, that is, the *Indeks Harga Saham Gabungan (IHSG).*

Table 3.1 Sample selection

Criteria	**Number of Sample Firms**						
	2003	2004	2005	2006	2007	2008	Total
Sample for RQ1 and RQ2							
1. All firms listed on the IDX	322	322	323	331	343	393	2,034
2. Less firms not in the manufacturing industry	- 165	-176	-177	-190	-192	-242	-1142
Total listed manufacturing firms	**157**	**146**	**146**	**141**	**151**	**151**	**892**
3. Less firms without: annual report release dates, annual reports or specific financial account data, and stock market data	-70	-38	-60	-24	-66	-66	-324
Final sample for RQ1 and RQ2	**87**	**108**	**86**	**117**	**85**	**85**	**568**

3.2.3 Data and Data Sources

The main variables used in testing H_1 and H_2 related to RQ1 are the actual reporting time lag (ATL) and stock market reaction, measured by abnormal returns (AR) and cumulative abnormal returns (CAR) (refer to Section 3.4.2 and 3.4.3 for definition and calculation of AR and CAR). Calculation of the ATL, AR and CAR variables requires data such as the annual report filing dates, stock prices, returns, expected returns, and returns on market portfolio (index). Examination of H_3–H_9 related to RQ2 further requires firm data, financial account data, and audit data to calculate the variables of firm size (market capitalisation), profitability (the ratio of net income to total assets), capital structure (firm leverage, ratio of total debt to total assets), operational complexity (number of branches or subsidiaries), audit firm (Big-Four or Non Big-

Four audit firms), audit opinion (Unqualified opinion or other opinions), and earnings quality (accrual quality calculated using the Dechow and Dichev (2002) method).

This study relies on several databases as data sources. To allow the collection of more data observations and to verify the reliability of the data, all the databases were used, even if the same data were available in more than one database. The first database is the IDX database, which can be accessed online at http://www.idx.co.id. The data obtained from this database include annual report filing dates, fiscal year-end dates, annual reports, and listed firms codes, *Nomor Ticker Baru* (NTICKB). In addition, the IDX website also provides data for all firms listed on the IDX.

The second database is the ICMD, made available by the Institute for Economic and Financial Research. This database is used as a complementary source of annual report data because not all the annual reports used in the sample are available from the IDX database. The third database is the ISMD, maintained by the Faculty of Economics and Business at Gadjah Mada University. This is the main database providing the stock market data, such as share prices, dividends and returns of market portfolios (market index), used to analyse the effect of financial reporting timeliness on stock market reaction.

The fourth and fifth sources of data are the Osiris database from Bureau Van Dijk and the Datastream database from Thomson Reuters. This study uses these databases mainly to collect firm-specific data, financial accounting data, and audit data. If the annual reports are unavailable from the IDX website, they are manually downloaded from these databases. Lastly, the manufacturing firms' websites are used if the required data are not available elsewhere.

3.3 Measures of Timeliness

Timeliness is measured in terms of reporting time lag. In this study, the financial reporting time lag is the number of days between a firm's financial year-end and the date on which its annual reports are first published or released to the public. A firm is classified as reporting early or late based on the ICMSA regulation to submit an annual report within 90 days of the financial year's end. A firm is categorised as a timely reporter if it releases its annual report within 90 days or on the 90th day after the financial year-end. It is classified as a late reporter if it reports or releases its annual report more than 90 days after the financial year-end.

Following Atiase *et al.* (1989), Chambers and Penman (1984), and Dyer and McHugh (1975), this study uses actual reporting time lag (ATL) as the measure of timeliness of financial reporting, that is, the number of days from the firm's financial year-end to the first release of its annual report to the public or to the ICMSA. Following Bowen *et al.* (1992), this study also uses unexpected reporting time lag (UTL)[18] to measure timeliness of financial reporting, that is, the difference on the number of days between the current year's and the previous year's actual reporting time lags, to test the robustness of the results from the main tests. This study also conducts sensitivity analysis using dummy actual time lag (DATL)[19] and dummy unexpected time lag (DUTL)[20] to measure financial reporting timeliness.

[18] UTL is calculated by this year's actual reporting time lag (ATL) minus previous year's ATL.

[19] Dummy actual reporting time lag (DATL) is dummy variable for actual reporting time lag, coded as one if the the release of the annual report is timely or within 90 days after the financial year-end and zero otherwise.

[20] Dummy unexpected reporting time lag (DUTL) is a dummy variable for the UTL, coded as one if this current year's annual report release date (day and month) is earlier than, or equal to, the previous year's annual report release date, and zero otherwise.

3.4 Stock Market Reaction to Reporting Timeliness

This study uses event study methodology to assess RQ1**.** Event study methodology is a method of investigating the association between share prices and firm-specific economic events. The focus of event studies is on the behaviour of share prices, to test whether their behaviour is affected by the disclosure of firm-specific events (Strong, 1992). Ball and Brown (1968) and Beaver (1968) use event study methodology to examine security price performance before, during, and after earnings announcements. This study uses event study methodology to examine how stock prices change (how the stock market reacts) to the release of annual reports and its association with the timeliness of financial reporting. The stock market reaction is measured by the abnormal return, that is, the difference between the firm's actual return and its expected return, and cumulative abnormal returns around the release of the event date (Binder, 1998; Jain and Rezaee, 2006).[21]

The use of an appropriate calculation model to estimate expected returns is a concern in event study methodology. The literature suggests that abnormal returns around an event can be calculated using several different models (Strong, 1992), including the market model benchmark, mean-adjusted returns, market-adjusted returns, the capital asset pricing model, and the matched/control portfolio benchmark.

Prior studies suggest that methodology based on the market model works well in various conditions, such as with a small sample size, non-normality, and non-synchronous trading, for both monthly and daily security returns (Brown and Warner, 1980). Brown and Warner (1980)

[21] Refer to Sections 3.4.2 and 3.4.3 for how to calculate abnormal return and cumulative abnormal returns.

have noted that methodologies based on the ordinary least squares (OLS) market model and using standard parametric tests work better under a variety of conditions. Thus, this study uses the market model as the main model to calculate abnormal returns.

In calculating the expected returns using the market model, this study also uses a beta-adjusted model specifically designed for thin trading markets, such as the Indonesian capital market, developed by Scholes and Williams (1977) and Dimson (1979b). These betas are estimated using Equations (3.7) and (3.8), respectively. These methods are expected to produce a more powerful empirical test based on daily returns.

3.4.1 Event Date and Event Window

This study defines the event date as the date when annual reports are released to the public for the first time or the date when the annual reports are filed with the ICMSA. The event window in this study is extended over more than one day. The argument supporting an extended length of time relates to the uncertainty as to when financial information becomes available to users. Extending the event window to more than one day is required to capture the market reaction to the release of financial information (Armitage, 1995).

To accommodate this event window, this study uses daily abnormal returns from ten days before the event date to ten days after the event date. In addition to daily abnormal returns, this study also uses five-day ($CAR_{(-2,+2)}$), 15-day ($CAR_{(-7,+7)}$), 11-day ($CAR_{(0,+10)}$), and 21-day ($CAR_{(-10,+10)}$) cumulative abnormal returns (see Section 3.4.3). For the event window, ten days before and ten days after the event date is considered enough to reduce the potential for confounding events in

an emerging market, yet wide enough to capture the effects of information on share prices (Strong, 1992). The use of a shorter window – the five-day event window – is aimed at minimising the impact of other factors that may cause market reaction, ensuring that the abnormal returns are attributable to financial information only. This analysis over different lengths of event windows is also conducted to examine whether the results are driven by the choice of the event window and to eliminate potential effects from confounding events.[22]

Thompson *et al.* (1995) and Strong (1992) have noted the importance of precisely identifying the event date. It is important for at least three reasons (Bowman, 1983): firstly, the power of the tests is sensitive to the precision of event date identification; secondly, misidentification of the event date is likely to reduce the ability to observe security price movements; and finally, use of the correct date is necessary to effectively control potential problems presented by confounding events.

3.4.2 Calculating Abnormal Returns

To examine stock market reaction to financial information, this study first calculates abnormal returns[23] around the release of annual reports. A firm's abnormal return (AR_{it}) is the difference between the firm's actual return (R_{it}) and its expected return ($E(R_{it})$)[24] during the event window. The abnormal return is calculated as in Equation (3.1). To calculate firm's actual returns, this

[22] Potentially confounding events often occur during the release of financial information. They result from announcements that can potentially generate a market reaction, such as those relating to mergers or acquisitions, earnings, dividends, hiring a new chair or changing a key executive, the issuance of debt and equity, a major government contract, a new product, or filing legal concerns.

[23]Abnormal returns are sometimes triggered by "events." Events can include annual reports release, mergers, dividend announcements, firm earnings announcements, interest rate increases, lawsuits, etc. all which can contribute to an abnormal return.

[24] Various studies such as Binder (1998) refer to the expected return as the estimated return.

study uses logarithmic returns (see Equation (3.2)). Logarithmic returns are more likely to be normally distributed and conform to the assumptions of standard statistical technique (Strong, 1992).

The following equation calculates the abnormal return (AR_{it}):

$$AR_{it} = R_{it} - E(R_{it}) \tag{3.1}$$

where

AR_{it} = the abnormal return on security *i* for period *t;*

R_{it} = the actual return on security *i* for period *t*; and

$E(R_{it},)$ = the expected return on security *i* for period *t* , the expected return is calculated using Equation 3.4.

The firm's actual return (R_{it}) is calculated as

$$R_{it} = \ln((P_{it} + D_{it}) / P_{it-1}) \tag{3.2}$$

where

P_{it} = share price of security *i* at time *t*;

D_{it} = dividends paid on security *i* during period *t*;

P_{it-1} = share price on security *i* for period *t* – 1; and

ln = natural logarithm. [25]

This study uses the market model to determine the expected returns around the information events. Using a sample of daily share prices data from 2003 to 2008, this study estimates the parameters of the following market model for each share *i* in the sample using Equation (3.3).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (3.3)$$

where

R_{it} = the actual return on security *i* for period *t.* The actual return is calculated using Equation (3.3);

α_i = intercept of the market model;

β_i = beta for security *i;*

R_{mt} = return on the market portfolio (market index) for period *t.* The market return is calculated using Equation (3.5); and

ε_{it} = independently and identically distributed error term.

Each firm must have at least 200 days of share prices and market index data to allow us to estimate expected return. To prevent the event from influencing the normal performance model of parameter estimates (MacKinlay, 1997), share prices in the period ten days before and after the event window are excluded. This study uses betas adjusted according to Scholes and

[25] This study uses logarithm returns, since Strong (1992) suggests that they are analytically more traceable when linking sub-period returns to form returns over long intervals.

Williams (1977) and Dimson (1979a) method to calculate estimated returns.[26] Beta adjustments are used to observe the thin trading problem that occurs in emerging capital markets such as the IDX. After adjusting betas as above, the market model is used in this study to calculate expected returns.

The following equation calculates the expected return, $E(R_{it})$.

$$E(R_{it}) = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (3.4)$$

where

$E(R_{it})$ = expected return on security *i* for period *t;*

$\hat{\alpha}_i$ = estimated adjusted alpha (α_i) for security i[27];

$\hat{\beta}_i$ = estimated adjusted beta (β_i) for security i, using Scholes-Williams beta[28] (calculated using Equation 3.7) and Dimson beta[29] (calculated using Equation 3.8);

R_{it} = actual return on security *i* for period *t*;

α_i = intercept of the market model;

β_i = Scholes-Williams beta and Dimson beta for security *i*; and

R_{mt} = return on the market portfolio (market index) for period *t* (calculated using Equation 3.5).

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[26] Beta is estimated with beta adjusted by using a lagged market return model. This approach, introduced by Scholes and Williams (1977) and developed by Dimson (1979a), is expected to results in a more powerful empirical test based on daily returns. The 'intervalling effect' has been encountered in market model parameter estimations (Zeghal, 1984). There is a tendency for the explanatory power of the regression equation and the mean value of beta, estimated from indexes, to increase as the differentiating interval increases. Scholes and Williams (1977) show that, in the case of errors from non-synchronous securities trading, on average, the OLS estimators of the results are either very frequently or very infrequently asymptotically biased upward for alpha and downward for beta.

[27] Alpha adjusted is calculated as $\hat{\alpha}_i = \overline{R_i} - \hat{\beta}.\overline{R_m}$, where R_i is actual return and R_m is market return.

[28] Hereafter this study only mentions Scholes-Williams beta to refer to beta adjusted according to Scholes and Williams (1977).

[29] Hereafter this study only mentions Dimson beta to refer to beta adjusted according to Dimson (1979a).

The following equation calculates the return on market portfolio (market index):

R_{mt} = ln(Market index$_t$/Market index$_{t-1}$) (3.5)

The average abnormal return (AAR_t) is calculated as

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad (3.6)$$

where

AAR_t = average abnormal return;

N= sample firms; and

AR_{it} = abnormal returns for security *i* for period day *t*.

The Scholes-Williams beta (β_i) is calculated as

$$\beta_i = \frac{(\beta_i^{-1} + \beta_i^{0} + \beta_i^{+1})}{(1 + 2.\rho_{1m})} \quad (3.7)$$

where

β_i^{-1} = estimate of the parameter derived from the regression between the observed security return and the market index return with one lag,

β_i^{0} = estimate of the parameter derived from the regression between the observed security return and the market index return,

β_i^{+1} = estimate of the parameter derived from the regression between the observed security return and the market index return with one lead,

ρ_{1m} = first-order serial correlation coefficient of market returns.

The beta Dimson (β_i) is calculated as

$$\beta_i = \beta_i^{-3} + \beta_i^{-2} + \beta_i^{-1} + \beta_i^{0} + \beta_i^{+1} + \beta_i^{+2} + \beta_i^{+3} \quad (3.8)$$

where

β_i^{-3} = estimate of the parameter derived from the regression between the observed security return and the market index return with three lags;

β_i^{-2} = estimate of the parameter derived from the regression between the observed security return and the market index return with two lags;

β_i^{-1} = estimate of the parameter derived from the regression between the observed security return and the market index return with one lag;

β_i^{0} = estimate of the parameter derived from the regression between the observed security return and the market index return;

β_i^{+1} = estimate of the parameter derived from the regression between the observed security return and the market index return with one lead;

β_i^{+2} = estimate of the parameter derived from the regression between the observed security return and the market index return with two leads;

β_i^{+3} = estimate of the parameter derived from the regression between the observed security return and the market index return with three leads;

3.4.3 Calculating Cumulative Abnormal Returns

The cumulative abnormal returns for the five-day event window or CAR(-2,+2) are calculated from (Equation (3.9)) by summing firms' abnormal returns from day -2 to day +2 relative to the event day (day 0) over a five-day event window:

$$CAR_{it(-2,+2)} = AR_{-2i} + AR_{-1i} + AR_{0i} + AR_{+1i} + AR_{+2\ \ i} \quad (3.9)$$

where

$CAR_{it(-2,+2)}$ = cumulative abnormal returns for the five-day event window for firm *i* on period *t*;

AR_{-2i} = abnormal returns for day -2 relative to event date for security *i*;

AR_{-1i} = abnormal returns for day -1 relative to event date for security *i*;

AR_{0i} = abnormal returns for the event date for security *i*;

AR_{+1i} = abnormal returns for day +1 relative to event date for security *i*; and

AR_{+2i} = abnormal returns for day +2 relative to event date for security *i*.

The cumulative abnormal returns for the 15-day (CAR(-7,+7)), 11-day (CAR(0,+10)), and 21-day (CAR(-10,+10)) event windows are calculated similarly.

To test the significance of the stock market reaction surrounding the event date this study calculates the *t*-test for the cumulative abnormal returns using Equation (3.11). The average abnormal returns (AAR) value added together over t days gives the cumulative average abnormal return ($CAAR_T$) for day T.

$$CAAR_T = \sum_{i=1}^{T} AAR_t \tag{3.10}$$

To calculate the cumulative average abnormal return *t*-test, following Barber and Lyon (1997), this study employs the following equation:

$$t_{CAAR} = \frac{CAAR_T}{\sigma(CAR_{iT}) \div \sqrt{N}} \tag{3.11}$$

where

$CAAR_T$ = cumulative average abnormal returns for day *T*;

CAR_{iT} = cumulative abnormal returns for security *i* for day *T*; and

N = number of sample firms.

3.4.4 Methodology for Testing the Information Content of Annual Reports and Timeliness

3.4.4.1 Univariate analysis

To test H_1 this study uses univariate analysis. This study compares the cumulative abnormal returns around the release of the annual report between timely reporting and late reporting firms, using independent *t*-test. Significantly greater cumulative abnormal returns from firms that release their annual reports in a timely manner, rather than late, indicate that the stock market reaction is greater for timely reporting firms than for late reporting firms. Thus indicate that the information content of annual reports released in a timely manner is higher than in the reports of late reporting firms.

3.4.4.2 Multivariate analysis

To test H_2 this study performs pooled observation across firm-year analysis. The model is presented in Equation 3.12 – 3.15 and to capture the time effect, in Equation 3.16 – 3.19 include dummy time variables. In these multivariate regression models each firm in a specific year represent a single observation. The dependent variable is measured by the cumulative abnormal return around the release of the annual reports, $CAR_{(-2,+2)}$, $CAR_{(-7,+7)}$, $CAR_{(0,+10)}$ and $CAR_{(-10,+10)}$. The CAR event window is analysed over different lengths of event windows in order to examine whether the results are driven by the choice of the event window in capturing the effects of information on prices (Strong, 1992) and to eliminate potential effects from confounding events which minimise other factors that may cause market reaction. The test variable in the model is the timeliness variable and the control variables are firm size (SIZE), profitability (PROF) and leverage (LEV).

$$CAR_{it(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e \quad (3.12)$$

$$CAR_{it(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e \quad (3.13)$$

$$CAR_{it(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e \quad (3.14)$$

$$CAR_{it(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e \quad (3.15)$$

$$CAR_{it(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e \quad (3.16)$$

$$CAR_{it(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e \quad (3.17)$$

$$CAR_{it(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e \quad (3.18)$$

$$CAR_{it(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e \quad (3.19)$$

where

CAR_{it} (-2,+2) = cumulative abnormal return from day -2 to +2 relative to the event date for firm i for period t,

CAR_{it} (-7,+7) = cumulative abnormal return from day -7 to +7 relative to the event date for firm i for period t;

CAR_{it} (0,+10) = cumulative abnormal return from day 0 (the event date) to +10 relative to the event date for firm i for period t; and

CAR_{it} (-10,+10) = cumulative abnormal return from day -10 to +10 relative to the event date for firm i for period t.

The test variables are:

ATL_{it} = ATL as measured by the total number of days between the financial year-end and the annual report filing date for firm i for period t.

The control variables are:

$SIZE_{it}$ = firm size, measured by the natural logarithm of the firm's market capitalisation at the end of the financial year for firm i for period t;

$PROF_{it}$ = profitability, measured by return on assets and calculated as the ratio of total income to total assets for firm i for period t;

LEV_{it} = firm leverage, measured by the ratio of total debt to total assets for firm i for period t;

d_1 to d_5 = time dummy variable, where d1 equals one if the sample year is 2003 and zero otherwise, d2 equals one if the sample year is 2004 and zero otherwise, d3 equals one if the sample year is 2005 and zero otherwise, d4 equals one if the sample year is 2006 and zero otherwise, and d5 equals one if the sample year is 2007 and zero otherwise; and

e = error term.

3.5 Methodology for Analysing the Determinants of Reporting Timeliness

This section presents the methodology to examine hypotheses H_3–H_9, related to RQ2. It aims to examine whether firm characteristics and audit factors affect the timeliness of reporting of listed manufacturing firms in Indonesia. Seven explanatory variables – firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality – are expected to be associated with the timeliness of financial reporting. Statistical Analysis System (SAS) software version 9.2 is used in this study. The following section presents the multivariate regression models and measurement variables used to analyse these hypotheses. Section 3.4.1 discusses the multivariate regression model, followed by details and measurement of its variables in Section 3.4.2.

3.5.1 Empirical Models

To investigate H_3–H_9, this study performs a multivariate regression analysis. In this model (Equations (3.20) – (3.23)), the dependent variable is measured by the ATL and DATL. To test the robustness of the results, this study uses the UTL to measure the timeliness of financial reporting. The test variables in the model include firm size (SIZE), profitability (PROF), capital structure (CAPS), operational complexity (COMPLEX), audit firm (AUDFIRM), auditor opinion (AUDOPINION), and earnings quality (EQ).

To test the hypotheses, an OLS regression model is employed for pooled observations across firms during the period 2003–2008. One of the models includes relevant time-specific variables to avoid potential problems of omitted variables. The time dummy variables are designed to capture the specific effect over time for each observation.

The multivariate regression models without (Equations (3.20) and (3.22)) and with (Equations (3.21) and (3.23)) the time dummy variables (see Section 3.4.1.2) are as follows:

$$ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e \quad (3.20)$$

$$ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e \quad (3.21)$$

$$DATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e \quad (3.22)$$

$$DATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e \quad (3.23)$$

where

ATL_{it} = ATL as measured by the total number of days between the financial year-end and the annual report filing date for firm i for period t ;

$DATL_{it}$ = dummy ATL is one if the release of the annual report is timely and zero otherwise for firm i for period t;

$SIZE_{it}$ = firm size, measured by the natural logarithm of the firm's market capitalisation at the end of the financial year for firm i for period t;

$PROF_{it}$ = profitability, measured by return on assets and calculated as the ratio of total income to total assets for firm i for period t;

$CAPS_{it}$ = firm leverage, measured by the ratio of total debt to total assets for firm i for period t;

$COMPLEX_{it}$ = complexity of business operation measured by the number of business lines or number of branches for firm i for period t;

$AUDFIRM_{it}$ = audit firm, where Big 4 audit firms equal 1 and Non-Big 4 audit firms equal 0 for firm i for period t;

$AUDOPINION_{it}$ = audit opinion, where unqualified audit opinion equal 1 and otherwise equal 0 for firm i for period t;

EQ_{it}= earnings quality is measured using accrual quality (Dechow and Dichev, 2002) for firm i for period t, which is calculated from the standard deviation of residuals from firm-specific regressions of changes in working capital on past, present, and future operating cash flows (see Equation (3.24));

d_1 to d_5 = time dummy variable, where d1 equals one if the sample year is 2003 and zero otherwise, d2 equals one if the sample year is 2004 and zero otherwise, d3 equals one if the sample year is 2005 and zero otherwise, d4 equals one if the sample year is 2006 and zero otherwise, and d5 equals one if the sample year is 2007 and zero otherwise; and

e = error term.

3.5.2 Estimation Methods

Following prior studies including Ahmed (2003) and Al-Ajmi (2008), the primary estimation method of regression for Equations (3.20) and (3.21) are the Ordinary Least Squares (OLS) regression model. This study also uses the Logistic (Logit) regression model analysis because due to the binary nature of the dependent variable (dummy variable) for Equations (3.22) and (3.23). The dependent variable for these equations is the DATL.[30] Logistic regression model is used for predicting the outcome of a categorical dependent variable based on one or more predictor variables. To examine the robustness of the results this study also uses Panel regression analysis for Equations (3.20) and (3.21).[31] This study uses the SAS software version 9.2 to

[30] This study uses a dummy variable for actual reporting time lag (DATL) as the dependent variable to measure the timeliness of reporting. DATL is coded as one if the annual report release date is within 90 days after the financial year-end (classified as timely reporting) and zero otherwise.

[31] Panel regression is used because this study data observation has both cross-sectional and time series dimensions.

conduct the analysis to test the H_3-H_9 using OLS regression model, Logit regression model and Panel regression (fixed effect and random effect). [32]

3.5.3 Variable Measurement

3.5.1.1 Dependent variable.

This study measures timeliness in terms of the ATL, that is, the actual reporting time lag, which is the total number of days between a firm's year-end and the date the annual report is released to the public (annual report filing date). To determine the timeliness of financial reporting, firms are classified as timely reporting and late reporting firms. To measure timeliness reporting, this study uses a dummy variable that is coded as one if the firm reports with an ATL of 90 days[33] or less and zero if it reports with an ATL greater than 90 days. Following Chambers and Penman's (1984) robustness test, this study also uses the UTL[34] and a dummy UTL (DUTL)[35] as measures of financial reporting timeliness.

[32] Panel data models examine fixed and/or random effects of an entity (individual or subject) or time.
The core difference between fixed and random effect models lies in the role of dummy variables. If dummies are considered as a part of the intercept, this is a fixed effect model. A fixed group effect model examines group differences in intercepts, assuming the same slopes and constant variance across entities or subjects. Fixed effect models use a least squares dummy variable (LSDV) and within effect estimation methods. In a random effect model, the dummies act as an error term. A random effect model, by contrast, estimates variance components for groups (or times) and error, assuming the same intercept and slopes. It is a part of the errors and thus should not be correlated to any regressor; otherwise, a core OLS assumption is violated. The difference among groups (or time periods) lies in their variance of the error term, not in their intercepts. A random effect model is estimated by generalized least squares (GLS) when the matrix, a variance structure among groups, is known. The feasible generalized least squares (FGLS) method is used to estimate the variance structure when it is not known.
[33] The deadline for submitting annual reports to the ICMSA and for public release is 90 days after a firm's financial year-end date.
[34] UTL is the total number of days of the current year's ATL minus the previous year's ATL.
[35] DUTL is a dummy variable for UTL, coded as zero if the current year's annual report date is expected to be earlier than the previous year's and zero otherwise.

3.5.1.2 Test variables

Firm Size (SIZE)

The timeliness of financial reporting is a function of the reporting firm's size, as mentioned in Section 2.6.1 of Chapter 2. Following Mahajan and Chander (2008), this study uses the firm's market capitalisation at the end of the financial year to measure the firm's size. To examine the robustness of the results, following Al-Ajmi (2008), firm size is also measured by the natural logarithm of the total assets at the end of the financial year and the total number of employees (e.g., Davies and Whittred, 1980).

Profitability (PROF)

Profitability measures a firm's efficiency of operations (Owusu-Ansah, 2000) and is predicted to influence the firm's financial reporting timeliness. Previous empirical studies have used two different measures of profitability: changes in profitability (Givoly and Palmon, 1982; Haw, 2000) and levels of profitability (Abdulla, 1996; Courtis, 1976; Dyer and McHugh, 1975; Ismail and Chandler, 2004; Owusu-Ansah, 2000). Following Jaggi and Tsui (1999) and Al-Ajmi (2008), this study uses the firm's returns on total assets to measure profitability (PROF).

A firm's performance has a signalling effect on the markets for both corporate securities and corporate managerial skills (Fama, 1980; Watts and Zimmerman, 1986). For instance, a firm with good news (positive performance) is likely to experience a rise in the market value of its outstanding equity shares. The opposite is true for a firm with bad news (negative performance).

Therefore, it is reasonable to expect the management of a successful firm to report its good news to the public on a timely basis.

Following studies such as those of Al-Ajmi (2008), Dyer and McHugh (1975), Haw *et al.* (2000), and Owusu-Ansah (2000), this study measures profitability by returns to total assets. To test the robustness of the results, profitability is also measured by earnings per share (EPS) and dummy variable for profit and loss (PROFLOSS), coded one if profit and coded zero for loss.

Capital Structure (CAPS)

Following Carslaw and Kaplan (1991) and Owusu-Ansah (2000), this study measures the firm leverage, total debt to total assets, as the firm capital structure. It is expected that firm leverage is associated with the timeliness of financial reporting as discussed in Section 2.6.3 of Chapter 2.

Operational Complexity (COMPLEX)

Sengupta (2004) argues that accounting of multi-segment firms is complex and would result in reporting delays. Following Sengupta (2004) and Al-Ajmi (2008) this study measures the firm's operational complexity by the number of reportable segment (the number of firm's branches). COMPLEX is denoted by a dummy code variable. A firm with one branch or less is given a value of zero and a value of one otherwise.

Audit Firm Size (AUDFIRM)

Prior research on audit quality has suggested that large audit firms provide higher-quality audits (e.g.Ashbaugh and Warfield, 2003; DeAngelo, 1981; Leuz and Verrecchia, 2000). Watts and Zimmerman (1986) predict that large audit firms supply higher-quality audits due to greater monitoring abilities. These audit firms may also have more resources (Palmrose, 1986) and use more qualified staff (Chan *et al.*, 1993). Francis and Wilson (1988) suggest that audit firms invest in their brand name reputation to command fee levels. Such firms will then provide a high-quality audit to protect their brand name and future revenue (Palmrose, 1986). Large audit firms have also been found to be more independent (e.g.,Shockley, 1981), which suggests that they are less willing to negotiate audit matters with clients.

Moreover, Teoh and Wong (1993) find that firms audited by the Big Eight have higher earnings response coefficients; that is, investors find their announcements more convincing. Several empirical studies have found that firms report in a timely manner if their accounts are audited by one of the big firms (Abdulla, 1996; Krishnan, 2005; Owusu-Ansah and Leventis, 2006). However, Imam *et al.* (2001) report that accounting firms have longer audit delays in Bangladesh. This study considers Big Four and non-Big Four audit firms as an explanatory factor in the analysis of reporting timeliness determinants. Following Ahmad and Kamarudin (2003) this study classified the audit firm into two groups: Big Four and non-Big Four. The Big Four audit firms refer to KPMG Peat Marwick, Ernst and Young, Pricewaterhouse Corporation and Deloitte and Touche. The variable AUDFIRM is a dummy variable equal one if the auditor is a Big Four firm and zero otherwise.

Audit Opinion (AUDOPINION)

Following Ahmad and Kamarudin (2003), this study measures AUDOPINION using a dummy variable that equals one if the audit opinion is unqualified and zero otherwise. The presence of a qualified audit opinion is expected to be associated with a longer audit delay thus a longer reporting time lag since auditors are likely to be reluctant to issue a qualification and may spend more time attempting to resolve the items in question.

Earnings Quality (EQ)

This study measures earnings quality using accrual quality (Dechow and Dichev, 2002), which is calculated from the standard deviation of residuals from firm-specific regressions of changes in working capital on past, present, and future operating cash flows:

$$\Delta WC_t = \alpha_0 + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + e_t \quad (3.24)$$

where

ΔWC_t = change in working capital accruals of firm i for period t[36]

CFO_{t-1} = cash flow from operations of firm i for period t – 1

CFO_t = cash flow from operations of firm i for period t

[36] Following Richardson et al., 2005 the change in working capital accruals is calculated from the equation $\Delta WC = WC_t - WC_{t-1}$, where WC = current operating assets (COA) – current operating. In addition Dechow and Dichev (2002) also use the change in working capital accruals (ΔWC_t) is ΔAR + ΔInventory + ΔOther Current Assets – ΔAP – ΔTP – ΔOther Current Liabilities, where AR is accounts receivable, AP is accounts payable, and TP is taxes payable. liabilities (COL), COA = current assets – cash and short-term investments, and COL = current liabilities – debt in current liabilities.

CFO_{t+1} = cash flow from operations of firm i for period t + 1.

The residuals from the regression using Equation (3.24) (e_t) reflect the accruals that are unrelated to cash flow realisation.[37] To determine the residuals, Equation (3.25) includes yearly data over the estimation period together with the estimated intercept ($\hat{\alpha}_0$) and coefficients ($\hat{\alpha}_1$, $\hat{\alpha}_2$, and $\hat{\alpha}_3$):

$$e_t = \Delta WC_t - (\hat{\alpha}_0 + \hat{\alpha}_1 \underline{CFO}_{t-1} + \hat{\alpha}_2 CFO_t + \hat{\alpha}_3 CFO_{t+1}) \quad (3.25)$$

The standard deviation of the above residuals is a measure of accrual quality, where higher standard deviations indicate lower earnings quality (Dechow and Dichev, 2002).[38] To determine a firm's 2003 earnings quality, the 2003 standard deviation is calculated from the ten-year time-series residuals from 1993 to 2002 (e_{1993}, $e_{1994, \ldots}$, e_{2002}). Similarly, the 2004 standard deviation is calculated from the ten-year time-series residuals from 1994 to 2003 (e_{1994}, $e_{1995,\ldots}$, e_{2003}) to determine a firm's 2004 earnings quality and the same procedure is applied for the calculation of firm's 2005, 2006, 2007, and 2008 earnings quality.

The standard deviation represents the level of earnings of a single firm. Higher values of this measure indicate that, *ceteris paribus*, higher earnings management and therefore resulting in low-quality earnings. This value of the standard deviation is multiplied by -1 to indicate that higher values represent higher-quality earnings.

[37] This study uses ten years of data estimated for each firm, from t – 10 (i.e., 1993) to t = 0 (i.e., 2002).

[38] Different measures of earnings quality developed by previous studies include the predictability of future performance; earnings variability; accruals quality; the abnormal accruals component; and earnings persistence (Cohen, 2003; Schipper and Vincent, 2003).

3.6 Chapter Summary

This chapter presents the sample, data, and research methodology used to investigate RQ1 and RQ2. The information content of the annual report is measured by the stock market reaction, proxy by abnormal returns and cumulative abnormal returns, around the release of the annual report. Daily and cumulative abnormal returns are calculated to observe the market reaction, which is predicted to be significantly higher for timely reporting firms than for late reporting firms. This study uses the market model in calculating the abnormal returns around the release of annual reports with Scholes-Williams beta and Dimson beta employed to calculate the expected returns. Statistical Analysis System (SAS) software version 9.2 is used in this study. The methodology used to test H_1 is carried out, using univariate test (independent *t*-test), by comparing average daily and cumulative abnormal returns between timely reporting firms and late reporting firms. Multivariate OLS regression analysis and Panel regression analysis are used in testing H_2, whether the stock market reaction is associated with timeliness of financial reporting with controlling firm size, profitability and leverage.

In addition, this chapter presents the methodology used to test whether firm size, profitability, capital structure, operational complexity, audit firm, auditor opinion, and earnings quality are determinants of financial reporting timeliness of manufacturing firms in Indonesia. Multivariate OLS regression analysis and Logit regression analysis are used in testing H_3 – H_9. For the robustness test this study uses the Panel regression analysis as an alternative estimation method to test the hypotheses. The independent variables include the test variables of firm size (H_3), profitability (H_4), capital structure (H_5), operational complexity (H_6), audit firm size (H_7), auditor opinion (H_8), and earnings quality (H_9), as well as control variables, the time dummies. The

measurements for all variables, including alternative measures, are explained in this chapter. The next chapter presents and analyses the results from testing the hypotheses.

Chapter 4: Timeliness of Financial Reporting and Stock Market Reaction: Univariate Analysis

4.1 Introduction

The previous chapter discussed the research methodology employed to address the first and second hypotheses, (H_1 and H_2), related to this study's first research question (RQ1), and the third to ninth hypotheses, (H_3–H_9), related to the second research question (RQ2). This chapter presents and analyses the findings of testing H_1, which postulates that the stock market reaction around the timely release of annual report is significantly different from the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia.

To examine H_1 this study uses event study methodology and conducts two procedures. First, it calculates and tests the significance of average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) surrounding the release of annual reports (the event date), which is indicative of the stock market reaction towards the financial information released. Thus, the annual reports have information content if the stock market reacts to the release of the annual reports. Second, to test H_1 this study compares firm's abnormal returns (AR) and cumulative abnormal returns (CAR) surrounding the release of annual reports between timely reporting firms and late reporting firms.

Section 4.2 presents the significance test of stock market reaction surrounding the release of the annual reports of Indonesian manufacturing firms. Section 4.3 reviews the descriptive statistics

for the variables used to test H_1. Section 4.4 discusses the results of testing H_1. Section 4.5 presents a sensitivity analysis by comparing year-by-year analyses. Finally, Section 4.6 summarises the chapter.

4.2 Significance Test of Stock Market Reaction

This study tests the significance of average abnormal returns surrounding the release of the annual reports for all sample firms, including timely reporting and late reporting firms, during 2003–2008.[39] It tests the significance of cumulative average abnormal returns ten days before and ten days after the event date[40] using the *t*-test for calculating the significance of CAAR (see Equation (3.11) in Section 3.4.3 of Chapter 3). CAAR that are significantly different from zero during the event window suggest there is stock market reaction around the event (Binder, 1998; Campbell *et al.*, 1997; Kothari and Warner, 2004; MacKinlay, 1997). Such stock market reaction around the release of annual reports suggests that the financial information of Indonesian manufacturing firms provides useful information for investors.[41] Table 4.1 reports the results of testing the significance of CAAR surrounding the release of the annual reports of Indonesian manufacturing firms for 568 firm-year observations.

[39] A listed firm is classified as reporting timely or late based on the Indonesian Capital Market Supervisory Agency (ICMSA) regulation requiring submission of an annual report within 90 days of the financial year's end. Firms are classified as timely reporters if they release their annual report within 90 days or on the 90th day after the fiscal year-end. They are classified as late reporters if they report or release their annual report more than 90 days after the fiscal year-end.

[40] This study calculates the AAR across all firms and the cumulative AAR during the event window ten days before and ten days after the event date.

[41] Assuming that the annual reports of Indonesian manufacturing firms convey new financial information to investors and thus surprise the market, a market reaction around the event date is expected (Ball and Brown, 1968; Beaver, 1968; Brown and Warner, 1980; Fama, 1965; Fama *et al.*, 1969; Kothari, 2001; Lev, 1989). The AARs around the ten days before the event to ten days after the event are expected to be significantly different from zero (AAR or CAAR $\neq 0$).

Table 4.1 presents AARs and CAARs calculated using Scholes–Williams beta and Dimson beta for thin-trading. As shown in Table 4.1, the market reaction to the release of annual reports of all firms occur before (days -7, -6, and -5), on, and after (days +1 to +10) their release. The AARs are less significant before the release than after the release of annual reports and are significant at the 10% level on days -7, -6, and -5 and significant at the 5% level on days +2, +6, +7, +8, and +10. The AARs on the remaining days are significant at the 10% level. These results indicate that the market reacts to small amounts of information before the release of annual reports.[42] The surprise effects of financial information are mostly impounded after the release of the annual reports. These results can be interpreted as evidence that Indonesian manufacturing firms' annual reports are useful to investors.

Table 4.1 AAR and CAAR with Scholes–Williams beta (AAR_{SW} and $CAAR_{SW}$) and Dimson beta (AAR_D and $CAAR_D$)

Day t relative to event date	**AAR_{SW}**	**$CAAR_{SW}$**	***t*-value**	**AAR_D**	**$CAAR_D$**	***t*-value**
-10	0.0007	0.0007	0.4175	0.0002	0.0002	0.1152
-9	0.0041	0.0047	1.0264	0.0042	0.0044	0.9650
-8	-0.0012	0.0035	0.8147	-0.0016	0.0028	0.6684
-7	0.0023	0.0058	1.4697*	0.0021	0.0049	1.2437
-6	0.0007	0.0065	1.5899*	0.0005	0.0054	1.3032*
-5	-0.0012	0.0054	1.3682*	-0.0007	0.0046	1.1738
-4	-0.0007	0.0047	1.1596	-0.0004	0.0042	1.0389
-3	0.0001	0.0048	1.0384	0.0002	0.0044	0.9619

(table continues on following page)

[42] It is plausible that the financial information is leaked before arrival at the Indonesian Stock Exchange and is preempted by investors before its release.

Day t relative to event date	AAR_{SW}	$CAAR_{SW}$	*t*-value	AAR_{D}	$CAAR_{D}$	*t*-value
-2	0.0005	0.0053	1.0563	0.0004	0.0048	0.9769
-1	0.0003	0.0055	1.0377	0.0003	0.0051	0.9576
0	0.0032	0.0087	1.5385*	0.0029	0.0080	1.4119*
1	-0.0002	0.0086	1.4301*	-0.0003	0.0076	1.2799*
2	0.0026	0.0112	1.7491**	0.0026	0.0102	1.6135*
3	-0.0009	0.0103	1.5502*	-0.0010	0.0092	1.3993*
4	-0.0006	0.0097	1.3145*	-0.0004	0.0088	1.1956
5	0.0021	0.0118	1.5533*	0.0019	0.0108	1.4205*
6	0.0037	0.0155	2.0350**	0.0038	0.0146	1.9305**
7	-0.0023	0.0132	1.6979**	-0.0025	0.0121	1.5505*
8	-0.0004	0.0128	1.6521**	-0.0006	0.0114	1.4697*
9	-0.0003	0.0126	1.5848*	-0.0005	0.0109	1.3784*
10	0.0031	0.0157	1.9508**	0.0029	0.0138	1.7145**

Note: This table shows the average abnormal returns (AAR) of all firms on day *t* relative to the event date (*t* = 0), the date the annual report is released to the public. This table also shows the cumulative abnormal returns (CAAR) over periods of days relative to the event date (t = 0). The abnormal return (AR_{it}) of firm *i* at time *t* is the difference between the actual return (R_{it}) and the expected return or the predicted return based on the alpha-adjusted and beta-adjusted regression of the firm's returns on the market returns over a period of 200 days ending five days prior to the event window (ten days before and after relative to the event date):
AR_{it} = R_{it} – alpha adjusted – beta adjusted R_{mt}

The mean of N firms' ARs gives the AAR for each event day:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it}$$

The AARs are summed over t days to obtain the CAAR:

$$CAAR_T = \sum_{i=1}^{T} AAR_t$$

The *t*-value of the CAAR is calculated based on the cross-sectional standard deviation of individual firms' cumulative ARs (CAR), t is the number of days over which the returns are cumulated, and N is the number of sample firms:

$$t_{CAAR} = \frac{CAAR_T}{\sigma(CAR_{iT}) \div \sqrt{N}}$$

*Significant at the 10% level (*t*-value > 1.282, two-tailed test)
**Significant at the 5% level (*t*-value > 1.645, two-tailed test)
***Significant at the 1% level (*t*-value > 2.326, two-tailed test)

Figure 4.1 shows the trend analysis of the CAAR using the Scholes–Williams beta model for ten days before the event date, on the release date of the annual report, and ten days after the event date for all firms, timely firms and late reporting firms. The trend shows different patterns of market reaction for all firms, timely firms and late reporting firms.

Figure 4.1 Trend of CAAR using Scholes–Williams beta during ten days before and ten days after the event date for all firms, timely firms and late reporting firms

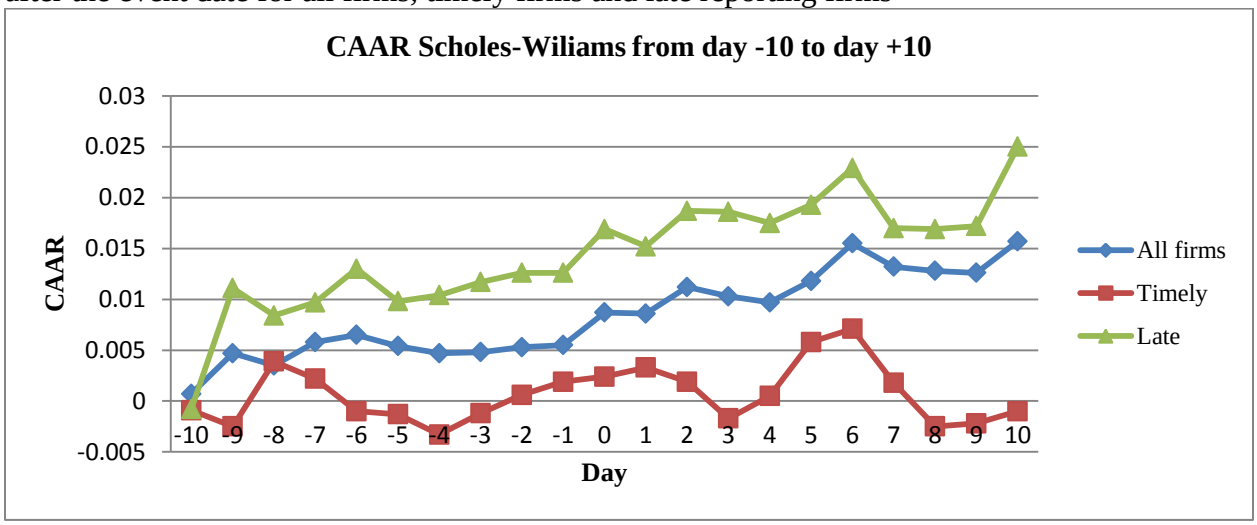
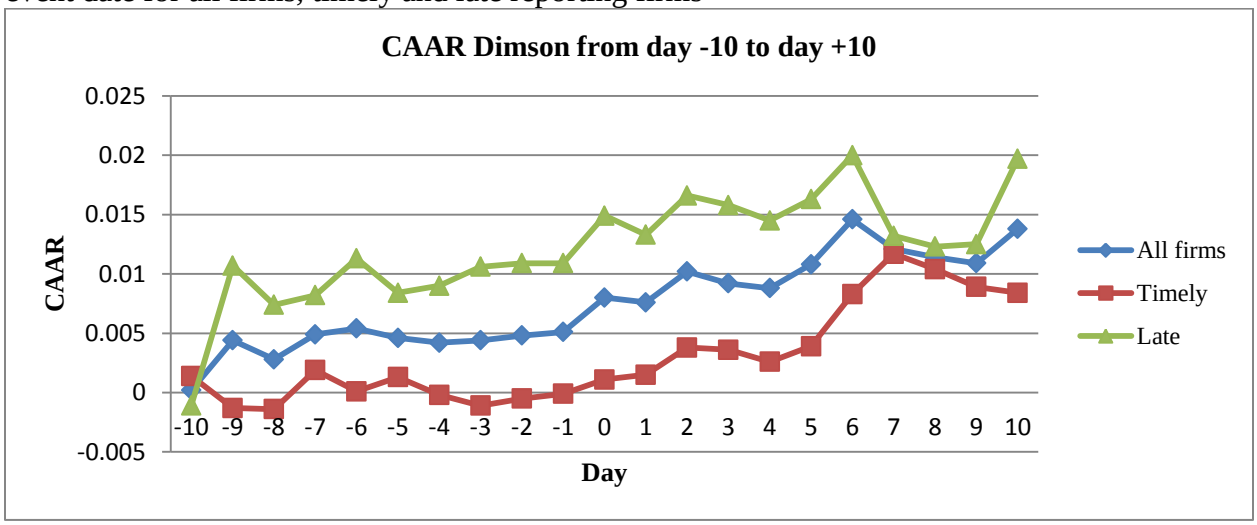


Figure 4.2 shows the trend analysis of CAAR using the Dimson model for ten days before the event date, on the date release of the annual report (the event date), and ten days after the event date for all firms, and for timely and late reporters. Different trends of CAAR between timely and late reporters indicate that the market reacts differently to the late and timely release of annual reports.

Figure 4.2. Trend of CAAR using Dimson beta during ten days before and ten days after the event date for all firms, timely and late reporting firms



4.3 Descriptive Statistics

This study uses an unbalanced sample of 568 firm–year observations representing 157 firms during the period 2003–2008. Table 4.2 presents the number of annual reports of manufacturing firms listed on the Indonesian Stock Exchange classified by timely or late reporting by their actual time lag (ATL) of financial reporting, during the period 2003–2008. Firms are classified as timely reporting or late reporting firms based on the regulatory annual report release deadline of 90 days from the financial year-end. There was an increase in the number of timely reporting firms from 2003 to 2004, followed by a decrease over the following years. The distribution of timely reporting firms, that is, manufacturing firms complying with the Indonesian Capital Market Supervisory Agency regarding the timely release of annual reports to the public, is as follows: 30 (35%) in 2003, 84 (78%) in 2004, 59 (69%) in 2005, 66 (57%) in 2006, 25 (30%) in 2007, 29 (33%) in 2008, and 293 (51%) overall over the period 2003–2008. The low percentage

of timely reporting firms indicates that many publicly listed firms in Indonesia are not complying with reporting regulations. Description.....Apendix B

Table 4.2 Number of timely reporting firms and late reporting firms during 2003–2008

Year	**Timely**		**Late**		**TOTAL**
	N	%	**N**	%	**N**
2003	30	35	57	65	87
2004	84	78	24	22	108
2005	59	69	27	31	86
2006	66	57	51	43	117
2007	25	30	60	70	85
2008	29	33	56	67	85
2003–2008	**293**	**51**	**275**	**49**	**568**

Table 4.3 summarises the descriptive statistics for the variables employed to test H_1, daily ARs and CARs, for all reporting firms (Panel A), timely reporting firms (Panel B), and late reporting firms (Panel C). For all firms, Panel A of Table 4.3 shows that the minimum values of across ARs two days before the event date to two days after (days -2, -1, 0, +1, +2) are negative, suggesting that the release of annual reports contains bad news for part of the sample. The minimum values of ARs for day -2 to day +2 are -0.1727, -0.3449, -0.3935, -0.8265 and -0.1794, respectively. The maximum values of AARs for day -2 to day +2 are 0.2686, 0.2839, 0.4085, 0.2998, and 0.3813, respectively. Both the minimum and maximum values across ARs on day -2 to day +2 have low variations, except for day +1 (-0.8265). The only negative value of the mean ARs occurs on day +1. The mean of CARs for the 5-, 15-, and 11-day event windows ($CAR_{(-2,+2)}$, $CAR_{(-7,+7)}$, and $CAR_{(0,+10)}$, respectively) are 0.054, 0.0095 and 0.0087, respectively. While the

maximum values of $CAR_{(-2,+2)}$, $CAR_{(-7,+7)}$, and $CAR_{(0,+10)}$ are similar, the minimum value of $CAR_{(-2,+2)}$, -0.5393, is much higher than for the other two CARs ($CAR_{(-7,+7)}$ = -1.6206 and $CAR_{(0,+10)}$ = -1.5022).

Panels B and C of Table 4.3 present the descriptive statistics for timely and late releases of annual reports. Given that timely information is more relevant, it is more useful to investors. Prior studies suggest that greater usefulness of financial information is indicated by a larger market reaction (abnormal returns) around its release (Francis *et al.*, 2002a; Lev, 1989). Among alternative measures of market reaction, the average daily abnormal returns for day -2 ($AR_{(-2)}$), day -1 ($AR_{(-1)}$), day +1 ($AR_{(+1)}$), and $CAR_{(-7,+7)}$ for timely firms indicate greater market reaction relative to that for late firms. The average daily abnormal returns for day 0 ($AR_{(0)}$), day +2 ($AR_{(+2)}$), $CAR_{(-2,+2)}$, and $CAR_{(0,+10)}$ for timely firms indicate lower market reaction relative to that for late firms.

Table 4.3 Descriptive statistics: AR and CAR using Dimson beta (AR_D and CAR_D) and Scholes-Williams beta (AR_{SW} and CAR_{SW}) around the timely release and late release of annual reports during 2003–2008

Using Dimson beta						**Using Scholes–Williams beta**				
Panel A: All Firms										
Variable	**N**	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**Variable**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
$\mathbf{AR_{D(-2)}}$	568	0.0005	0.0349	-0.1813	0.2718	$\mathbf{AR_{SW(-2)}}$	0.0005	0.0349	-0.1727	0.2686
$\mathbf{AR_{D(-1)}}$	568	0.0002	0.0473	-0.3442	0.2838	$\mathbf{AR_{SW(-1)}}$	0.0003	0.0470	-0.3449	0.2839
$\mathbf{AR_{D(0)}}$	568	0.0025	0.0527	-0.3934	0.4127	$\mathbf{AR_{SW(0)}}$	0.0028	0.0523	-0.3935	0.4085
$\mathbf{AR_{D(+1)}}$	568	-0.0006	0.0535	-0.8269	0.3006	$\mathbf{AR_{SW(+1)}}$	-0.0004	0.0532	-0.8265	0.2998
$\mathbf{AR_{D(+2)}}$	568	0.0028	0.0442	-0.1772	0.3822	$\mathbf{AR_{SW(+2)}}$	0.0029	0.0438	-0.1794	0.3813
$\mathbf{CAR_{D(-2,+2)}}$	568	0.0054	0.0978	-0.5294	0.8864	$\mathbf{CAR_{SW(-2,+2)}}$	0.0062	0.0963	-0.5393	0.8793

(table continues on following page)

	Using Dimson beta						Using Scholes–Williams beta			
$CAR_{D(-7,+7)}$	568	0.0095	0.1668	-1.6253	0.9747	**$CAR_{SW(-7,+7)}$**	0.0103	0.1666	-1.6206	0.9294
$CAR_{D(0,+10)}$	568	0.0087	0.1528	-1.5041	0.7527	**$CAR_{SW(0,+10)}$**	0.0104	0.1516	-1.5022	0.7603
Panel B: Timely Firms										
$AR_{D(-2)}$	293	0.0007	0.0316	-0.1047	0.2718	**$AR_{SW(-2)}$**	0.0002	0.0318	-0.1045	0.2686
$AR_{D(-1)}$	293	0.0004	0.0508	-0.3442	0.2838	**$AR_{SW(-1)}$**	0.0005	0.0500	-0.3449	0.2839
$AR_{D(0)}$	293	0.0012	0.0495	-0.3523	0.2894	**$AR_{SW(0)}$**	0.0015	0.0491	-0.3566	0.2970
$AR_{D(+1)}$	293	0.0004	0.0409	-0.2155	0.2906	**$AR_{SW(+1)}$**	0.0009	0.0399	-0.2134	0.2910
$AR_{D(+2)}$	293	0.0023	0.0437	-0.1772	0.3822	**$AR_{SW(+2)}$**	0.0024	0.0430	-0.1794	0.3813
$CAR_{D(-2,+2)}$	293	0.0050	0.0968	-0.3411	0.8864	**$CAR_{SW(-2,+2)}$**	0.0054	0.0941	-0.3349	0.8793
$CAR_{D(-7,+7)}$	293	0.0131	0.1470	-0.3825	0.9747	**$CAR_{SW(-7,+7)}$**	0.0119	0.1472	-0.4332	0.9294
$CAR_{D(0,+10)}$	293	0.0086	0.1267	-0.3103	0.6781	**$CAR_{SW(0,+10)}$**	0.0085	0.1252	-0.3110	0.6879
Panel C: Late Firms										
$AR_{D(-2)}$	275	0.0003	0.0381	-0.1813	0.1807	**$AR_{SW(-2)}$**	0.0008	0.0379	-0.1727	0.1791
$AR_{D(-1)}$	275	0.0000	0.0435	-0.2395	0.2206	**$AR_{SW(-1)}$**	0.0000	0.0436	-0.2338	0.2238
$AR_{D(0)}$	275	0.0040	0.0559	-0.3934	0.4127	**$AR_{SW(0)}$**	0.0043	0.0557	-0.3935	0.4085
$AR_{D(+1)}$	275	-0.0016	0.0644	-0.8269	0.3006	**$AR_{SW(+1)}$**	-0.0017	0.0644	-0.8265	0.2998
$AR_{D(+2)}$	275	0.0033	0.0447	-0.1752	0.3125	**$AR_{SW(+2)}$**	0.0035	0.0447	-0.1755	0.3249
$CAR_{D(-2,+2)}$	275	0.0059	0.0991	-0.5294	0.4695	**$CAR_{SW(-2,+2)}$**	0.0069	0.0988	-0.5393	0.4699
$CAR_{D(-7,+7)}$	275	0.0058	0.1858	-1.6253	0.6654	**$CAR_{SW(-7,+7)}$**	0.0085	0.1853	-1.6206	0.6717
$CAR_{D(0,+10)}$	275	0.0088	0.1765	-1.5041	0.7527	**$CAR_{SW(0,+10)}$**	0.0124	0.1755	-1.5022	0.7603

Note: $AR_{Dt=-2,-1,\ldots+2,}$ is the average daily abnormal return (AR) using Dimson beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $AR_{SWt=-2,-1,\ldots+2,}$ is the average daily abnormal return using Scholes-Williams beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $CAR_{D(-2,+2)}$ is the average of the five-day cumulative abnormal returns (CAR) of Dimson beta (from day -2 to day +2); $CAR_{D\ (-7,+7)}$ is the average of the 15-day CAR of Dimson beta (from day -7 to day +7); $CAR_{D\ (0,+10)}$ is the average of the 11-day CAR of Dimson beta (from the event date, day 0, to day +10); $CAR_{SW(-2,+2)}$ is the average of the five-day cumulative abnormal returns of Scholes-Williams beta (from day -2 to day +2); $CAR_{SW(-7,+7)}$ is the average of the 15-day CAR of Scholes-Williams beta (from day -7 to day +7); and $CAR_{SW(0,+10)}$ is the average of the 11-day CAR of Scholes-Williams beta (from the event date, day 0, to day +10).

4.4 Comparative Analysis between Timely and Late Financial Reporting

Since this study finds evidence of a market reaction to the release of annual reports of Indonesian manufacturing firms, this section now compares the ARs and CARs for the timely and late releases of annual reports. This comparison examines whether the information content of the

timely release of annual reports is more useful than the late release. Financial information with greater relevance is considered more useful to investors than less relevant information. To support H_1, the ARs and CARs of the timely release of annual reports must be significantly different than those of the late release.

The focus of testing H_1 is to compare the timely and late releases of the annual reports of Indonesian manufacturing firms, thus this study uses a univariate test (independent *t*-test) to compare the averages of timely and late ARs and CARs. These ARs and CARs are calculated for an unbalanced sample of 157 firms over six years (2003–2008), consisting of 568 observations: 293 timely and 275 late. To support that the prediction that the stock market reaction to the timely release of annual reports is significantly different than the stock market reaction to the late release of annual reports, the values of ARs and CARs between timely and late reporting firms must be significantly different. Table 4.4 compares ARs and CARs for timely and late releases of annual reports, calculated using Scholes-Williams beta and Dimson beta methodologies for the samples during 2003 – 2008.

In comparisons using all firms during the period 2003–2008, the result of the independent *t*-test shows no significance. Thus this study finds no significant difference between the market reaction for timely release of annual reports and late release of annual reports. None of the *t*-test results are significant indicating that the ARs and CARs surrounding the timely and late release of annual reports are not significantly different. This results show no evidence to support the first hypothesis. Nonetheless, this finding is consistent with Chambers and Penman (1984) which find that if timeliness is measured by its actual reporting time lag, no evidence is found that the

variability of share prices is different between timely reporting firms and late reporting firms. However, Chambers and Penman (1984) find that there is difference in the market reaction towards timeliness reporting if timeliness is measured according to the expected date of the release of annual reports. The expected date (day and month) is based on previous year annual reports released date. To test the robustness of the overall comparison results of the stock market reaction towards the release of annual reports between timely reporting and late reporting firms this study conducts year by year analysis. The results of the year by year comparison are discussed in the next section.

Table 4.4 Results of independent *t*-test comparisons AR and CAR between timely and late reporting firms with Scholes–Williams beta and Dimson beta, 2003–2008

Panel A: Scholes–Williams

	N	$AR_{SW(2)}$	$AR_{SW(-1)}$	$AR_{SW(0)}$	$AR_{SW(+1)}$	$AR_{SW(+2)}$	$CAR_{SW(-2,+2)}$	$CAR_{SW(-7,+7)}$	$CAR_{SW(0,+10)}$
Timely	293	0.0002	0.0005	0.0015	0.0009	0.0024	0.0054	0.0119	0.0085
Late	275	0.0008	0.0000	0.0043	-0.0017	0.0035	0.0069	0.0085	0.0124
***t*-test**		-0.23	0.11	-0.64	0.58	-0.29	-0.18	0.24	-0.3

Panel B: Dimson

	N	$AR_{D(2)}$	$AR_{D(-1)}$	$AR_{D(0)}$	$AR_{D(+1)}$	$AR_{D(+2)}$	$CAR_{D(-2,+2)}$	$CAR_{D(-7,+7)}$	$CAR_{D(0,+10)}$
Timely	293	0.0007	0.0004	0.0012	0.0004	0.0023	0.0050	0.0131	0.0086
Late	275	0.0003	0.0000	0.0040	-0.0016	0.0033	0.0059	0.0058	0.0088
***t*-test**		0.12	0.09	-0.63	0.43	-0.25	-0.12	0.52	-0.02

Note: $AR_{Dt=-2,-1,\ldots+2,}$ is the average daily abnormal return (AR) using Dimson beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $AR_{SWt=-2,-1,\ldots+2,}$ is the average daily abnormal return using Scholes-Williams beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $CAR_{D(-2,+2)}$ is the average of the five-day cumulative abnormal returns (CAR) of Dimson beta (from day -2 to day +2); $CAR_{D\ (-7,+7)}$ is the average of the 15-day CAR of Dimson beta (from day -7 to day +7); $CAR_{D\ (0,+10)}$ is the average of the 11-day CAR of Dimson beta (from the event date, day 0, to day +10); $CAR_{SW(-2,+2)}$ is the average of the five-day cumulative abnormal returns of Scholes-Williams beta (from day -2 to day +2); $CAR_{SW(-7,+7)}$ is the average of the 15-day CAR of Scholes-Williams beta (from day -7 to day +7); and $CAR_{SW(0,+10)}$ is the average of the 11-day CAR of Scholes-Williams beta (from the event date, day 0, to day +10).

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

4.5 Robustness Tests: Year-by-Year Comparison

Further analyses are conducted by examining yearly samples. From the yearly comparisons between timely and late ARs and CARs shown in Table 4.5, this study finds some evidence that market reaction to the timely release of annual reports is greater than that for late release of annual reports. These results include comparisons between $CAR_{(-7,+7)}$ and $CAR_{(0,+10)}$ in 2004, AR_0 and $CAR_{(0,+10)}$ in 2006, and AR_{-1} in 2007 and 2008, with ARs calculated using the beta-adjusted according to the Scholes–Williams method (see Panel A of Table 4.5). When ARs are calculated using Dimson beta (see Panel B of Table 4.5), it is evident that market reaction to the timely release of annual reports is greater than the market reaction to late release when comparing AR_{-2} in 2003, $CAR_{(-7,+7)}$, and $CAR_{(0,+10)}$ in 2004; AR_0 and $CAR_{(0,+10)}$ in 2006; AR_{-1} in 2007; and AR_{-1} in 2008. The remaining comparisons show insignificant differences. These results show that in year by year comparison the market reaction to the timely release of annual reports is significantly different than for the late release of annual reports. This finding is consistent with prior studies such as Givoly and Palmon (1982) and Kross and Schroeder (1984).

It is noted that the number of firms classified as timely reporting firms varies across years. As shown in Table 4.2 (Section 4.3) that in 2004, 2005 and 2006 the number of timely reporting firms has higher percentage (78%, 69%, and 57%, respectively) than late reporting firms (22%, 31%, and 43%, respectively). One plausible explanation for the above finding is that the variation of the number of timely reporting firms over the years may affect the significantly different in the market reaction towards the release of the annual reports between timely reporting and late reporting firms.

Another plausible explanation for the above results is that variables other than timeliness, such as firm size and firm performance, as indicated by market capitalisation and earnings figures, affect the usefulness of the annual reports of Indonesian manufacturing firms. The above univariate analyses may not capture these variables. The next chapter (Chapter 5) addresses this issue using multivariate analyses, where the models include actual reporting time lag as test variable and firm size, profitability, and leverage as control variables.

Table 4.5 Results of independent *t*-test of yearly comparisons between timely and late ARs and CARs Calculated Using Scholes–Williams Beta and Dimson Beta, 2003 - 2008

Panel A: Scholes–Williams

	N	$AR_{SW(2)}$	$AR_{SW(-1)}$	$AR_{SW(0)}$	$AR_{SW(+1)}$	$AR_{SW(+2)}$	$CAR_{SW(-2,+2)}$	$CAR_{SW(-7,+7)}$	$CAR_{SW(0,+10)}$
2003									
Timely	30	0.0053	0.0024	-0.0093	-0.0059	0.0069	-0.0007	-0.0311	-0.0335
Late	57	-0.0040	-0.0022	-0.0126	0.0005	0.0001	-0.0182	-0.0211	-0.0086
***t*-test**		1.66*	0.69	0.26	-0.96	1.18	1.01	-0.5	-1.13
2004									
Timely	84	-0.0064	-0.0033	0.0030	0.0075	0.0065	0.0074	0.0081	-0.0721
Late	24	-0.0100	-0.0021	0.0137	-0.0056	-0.0024	-0.0064	-0.1058	0.0322
***t*-test**		0.5	-0.14	-0.68	1.15	0.7	0.51	2.3**	2.27**
2005									
Timely	59	-0.0014	0.0031	0.0038	0.0004	-0.0011	0.0048	0.0155	0.0036
Late	27	-0.0133	0.0031	0.0105	-0.0022	-0.0093	-0.0113	0.0061	-0.0002
***t*-test**		1.65*	0	-0.72	0.52	0.96	0.79	0.35	-0.26

(table continues on following page)

Panel A: Scholes–Williams

	N	$AR_{SW(2)}$	$AR_{SW(-1)}$	$AR_{SW(0)}$	$AR_{SW(+1)}$	$AR_{SW(+2)}$	$CAR_{SW(-2,+2)}$	$CAR_{SW(-7,+7)}$	$CAR_{SW(0,+10)}$
2006									
Timely	66	0.0096	0.0048	-0.0052	-0.0014	0.0045	0.0122	0.0121	0.0457
Late	51	0.0064	-0.0045	0.0135	0.0103	-0.0002	0.0255	0.0369	0.0025
***t*-test**		0.43	1.28	-2.52**	-1.22	0.71	-0.85	-0.91	-1.8*
2007									
Timely	25	-0.0028	-0.0149	0.0123	0.0021	-0.0077	-0.0110	0.0157	0.0042
Late	59	0.0067	0.0115	0.0094	-0.0185	0.0156	0.0246	0.0211	-0.0041
***t*-test**		-1.01	-1.67*	0.2	0.87	-1.5	-1.21	-0.12	-0.31
2008									
Timely	29	-0.0018	0.0074	0.0094	-0.0062	-0.0026	0.0062	0.0564	0.0328
Late	58	0.0059	-0.0060	0.0008	0.0043	0.0064	0.0113	0.0482	0.0259
***t*-test**		-0.92	1.78*	0.91	-1.32	-1.15	-0.28	0.19	-0.32

Panel B: Dimson

	N	$AR_{D(2)}$	$AR_{D(-1)}$	$AR_{D(0)}$	$AR_{D(+1)}$	$AR_{D(+2)}$	$CAR_{D(-2,+2)}$	$CAR_{D(-7,+7)}$	$CAR_{D(0,+10)}$
2003									
Timely	30	0.0052	0.0021	-0.0090	-0.0076	0.0054	-0.0039	-0.0311	-0.0290
Late	57	-0.0047	-0.0024	-0.0121	0.0010	0.0005	-0.0177	-0.0179	-0.0072
***t*-test**		1.75*	0.63	0.24	-1.2	0.76	0.75	-0.63	-0.94
2004									
Timely	84	-0.0050	-0.0033	0.0018	0.0062	0.0063	0.0060	0.0106	0.0297
Late	24	-0.0094	-0.0022	0.0144	-0.0046	-0.0031	-0.0050	-0.1063	-0.0721
***t*-test**		0.64	-0.12	-0.81	0.91	0.75	0.39	2.37**	2.39**

(table continues on following page)

Panel B: Dimson

	N	$AR_{D(2)}$	$AR_{D(-1)}$	$AR_{D(0)}$	$AR_{D(+1)}$	$AR_{D(+2)}$	$CAR_{D(-2,+2)}$	$CAR_{D(-7,+7)}$	$CAR_{D(0,+10)}$
2005									
Timely	59	-0.0016	0.0031	0.0038	0.0003	-0.0008	0.0048	0.0164	0.0003
Late	27	-0.0162	0.0033	0.0109	-0.0012	-0.0084	-0.0116	-0.0024	0.0036
***t*-test**		2.05**	-0.01	-0.76	0.29	0.89	0.8	0.69	-0.12
2006									
Timely	66	0.0100	0.0044	-0.0050	-0.0013	0.0044	0.0125	0.0149	0.0057
Late	51	0.0062	-0.0052	0.0121	0.0095	-0.0015	0.0212	0.0329	0.0457
***t*-test**		0.50	1.32	-2.27**	-1.12	0.87	-0.55	-0.68	-1.51
2007									
Timely	25	-0.0027	-0.0141	0.0124	0.0023	-0.0071	-0.0092	0.0097	-0.0085
Late	59	0.0075	0.0123	0.0085	-0.0193	0.0151	0.0241	0.0176	0.0042
***t*-test**		-1.06	-1.66*	0.26	0.92	-1.45	-1.15	-0.17	-0.28
2008									
Timely	29	-0.0013	0.0073	0.0090	-0.0062	-0.0022	0.0065	0.0581	0.0244
Late	58	0.0045	-0.0063	0.0005	0.0049	0.0064	0.0100	0.0434	0.0328
***t*-test**		-0.7	1.82*	0.88	-1.41	-1.08	-0.19	0.34	-0.23

Note: $AR_{Dt=-2,-1,\ldots+2,}$ is the average daily abnormal return (AR) using Dimson beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $AR_{SWt=-2,-1,\ldots+2,}$ is the average daily abnormal return using Scholes-Williams beta for security i on day -2,-1… to day +2, respectively, relative to the event date; $CAR_{D(-2,+2)}$ is the average of the five-day cumulative abnormal returns (CAR) of Dimson beta (from day -2 to day +2); $CAR_{D\ (-7,+7)}$ is the average of the 15-day CAR of Dimson beta (from day -7 to day +7); $CAR_{D\ (0,+10)}$ is the average of the 11-day CAR of Dimson beta (from the event date, day 0, to day +10); $CAR_{SW(-2,+2)}$ is the average of the five-day cumulative abnormal returns of Scholes-Williams beta (from day -2 to day +2); $CAR_{SW(-7,+7)}$ is the average of the 15-day CAR of Scholes-Williams beta (from day -7 to day +7); and $CAR_{SW(0,+10)}$ is the average of the 11-day CAR of Scholes-Williams beta (from the event date, day 0, to day +10).

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

4.6 Chapter Summary

H_1 predicts that the market reaction to the timely release of annual reports is significantly different from that to the late release of annual reports. The analysis is performed by comparing the ARs and CARs of timely reporting and late reporting firms using the beta adjusted according to the Scholes–Williams model and the beta-adjusted according to Dimson model to determine the expected returns.

The comparison uses all firms during the period 2003–2008, with 568 observations, and finds no significant difference between the market reaction for the timely release and the late release of annual reports. However, the results are different when broken down into a year-by-year analysis. The results of year-by-year univariate analysis show some evidence to support H_1. From the test comparisons in each year during the period 2003-2008, the *t*-test results show a statistically significant difference between the market reaction to the timely release and the late release of annual reports.

The next chapter, Chapter 5, investigates H_2 related to RQ1 using a multivariate regression with control variables (firm size, profitability and leverage) considered to influence the market reaction to the timeliness of the financial reporting of Indonesian manufacturing firms.

Chapter 5: Timeliness of Financial Reporting and Information Content: Multivariate Analysis

5.1 Introduction

Chapter 4 discussed the empirical results of examining the first hypothesis (H_1) related to this study's first research question (RQ1) using univariate tests. The results of the univariate tests of yearly comparisons provide some evidence to support H_1, that is, that the market reaction surrounding the release of the annual reports of timely reporting firms is significantly different from those of late reporting firms. This chapter presents the findings of multivariate analysis to test the second hypothesis (H_2) related to RQ1, that is the information content of the annual reports is greater for timely reporting than for late reporting manufacturing firms in Indonesia, after controlling for the firm's size, profitability and leverage.

The descriptive statistics for the variables used in the analysis are discussed in Section 5.2. The correlation analysis for the independent variables is presented in Section 5.3.1. Section 5.3.2 presents the results of the multivariate regression analysis used to test the association between the information content of the annual reports and the timeliness of their release. Section 5.4 provides the robustness tests of the results for testing H_2. In particular, the above hypothesis is tested using alternative measures for the timeliness of reporting variable. Finally, Section 5.5 concludes this chapter by summarising the findings of testing H_2.

5.2 Descriptive Statistics

Table 5.1 presents the descriptive statistics for the variables employed in testing $H_{2.}$ The variables are: 1) cumulative abnormal return (CAR)[43] which is the measure of the stock market reaction - in this study CAR is calculated with Scholes-Williams beta (CAR_{SW}) and Dimson beta (CAR_D) for different event windows ($CAR_{SW(-2,+2)}$, $CAR_{SW(-7,+7),}$ $CAR_{SW(0,+10)}$, $CAR_{D(-2,+2)}$, $CAR_{D(-7,+7)}$ and $CAR_{D(0,+10)}$); 2) actual reporting time lag (ATL) which is the measure for the timeliness of financial reporting, that is, the actual number of days between financial year-end and the release of the annual reports; and 3) control variables which are firm size (SIZE) which proxied by the natural logarithm of firm's market capitalisation at the end of the financial year; profitability (PROF); leverage (LEV) proxied by the ratio of total debt to total assets; and a dummy variable for time effect.[44]

Greater values of CAR indicate greater stock market reaction around the release of the annual reports, and thus greater information content. As shown in Panel A of Table 5.1, the mean of CAR for all firms indicates that $CAR_{SW(0,+10)}$ has the highest value which is 0.0104. This indicates that the average market reaction is around 10 days after (t=+10) relative to the event date (t=0). The maximum values for $CAR_{SW(-2,+2)}$, $CAR_{SW(-7,+7),}$ $CAR_{SW(0,+10)}$, are 0.8793, 0.9294 and 0.7603, respectively. For the maximum value $CAR_{D(-2,+2)}$ $CAR_{D(-7,+7),}$ $CAR_{D(0,+10)}$, are 0.8864, 0.9747, and 0.7527, respectively. Panel A also shows that the mean ATL for all firms is 98 days, which exceeds the maximum allowed period of three months after the financial year-end. According to Panel A the minimum ATL is 28 days and the maximum ATL is 314 days.

[43] Cumulative abnormal returns (CAR) is the arithmetic additive abnormal returns of each of the days during the event window (Foster, 1986). Refer to Section 3.4.3 in Chapter 3.

[44] The time dummy variables (d_1-d_5) are coded as one, if the year sample is 2003, 2004 and so on, up to the year 2007, and otherwise are equal to zero.

Panel B and Panel C show the descriptive statistics for timely and late reporting firms. Panel B shows that the mean of values for $CAR_{SW(-7,+7)}$ and $CAR_{D(-7,+7)}$ for timely reporting firms are 0.0119 and 0.0131, respectively. These values are higher than the mean values for late reporting firms, as shown in Panel C, which for $CAR_{SW(-7,+7)}$ and $CAR_{D(-7,+7)}$ are 0.0085 and 0.0058, respectively. These indicate that the market reaction is greater for timely reporting firms than late reporting firms, measured by $CAR_{SW(-7,+7)}$ and $CAR_{D(-7,+7)}$.

The control variables are SIZE, PROF and LEV. The SIZE variable, is proxies by the firm's market capitalisation at the end of the financial year. As shown by the average SIZE, timely reporting firms exhibit a higher average market capitalisation (12.622) than late reporting firms (11.918) and all firms (12.247). This suggests that the reporting by larger firms is more timely than the reporting by smaller firms. The PROF variable is measured by the percentage of returns to total assets. It shows that the average for timely reporting firms (0.998) is higher than for late reporting firms (0.905), indicating that firms with 'good news' tend to have more timely reporting than firms with 'bad news' do. The CAPS variable indicates the capital structure of the firm as measured by the firm's leverage. The average of CAPS for late reporting firms in Panel C shows the highest percentage of leverage (0.628) compared to timely reporting firms (0.492) and all firms (0.564).

Table 5.1 Descriptive statistics of dependent and independent variables

	Dependent Variables						Independent Variables			
	$CAR_{SW(-2,+2)}$	$CAR_{SW(-7,+7)}$	$CAR_{SW(0,+10)}$	$CAR_{D(-2,+2)}$	$CAR_{D(-7,+7)}$	$CAR_{D(0,+10)}$	ATL	SIZE	PROF	LEV
Panel A: All firms										
N	568	568	568	568	568	568	568	568	568	568
Mean	0.0062	0.0103	0.0104	0.0054	0.0095	0.0087	98.00	12.25	0.94	0.56
SD	0.0963	0.1666	0.1516	0.0978	0.1668	0.1528	24.20	2.49	0.92	0.55
Min.	-0.5393	-1.6206	-1.5022	-0.5294	-1.6253	-1.5041	28.00	3.23	0.00	-0.46
Max.	0.8793	0.9294	0.7603	0.8864	0.9747	0.7527	314.00	18.52	9.08	4.63
Panel B: Timely Firms										
N	293	293	293	293	293	293	293	293	293	293
Mean	0.0054	0.0119	0.0085	0.005	0.0131	0.0086	87.21	12.62	0.99	0.49
SD	0.0941	0.1472	0.1252	0.0968	0.147	0.1267	9.77	2.39	0.79	0.37
Min.	-0.3349	-0.4332	-0.311	-0.3411	-0.3825	-0.3103	28.00	3.23	0.00	-0.30
Max.	0.8793	0.9294	0.6879	0.8864	0.9747	0.6781	160	18.52	5.315	2.34
Panel C: Late Firms										
N	275	275	275	275	275	275	275	275	275	275
Mean	0.0069	0.0085	0.0124	0.0059	0.0058	0.0088	108.99	11.92	0.90	0.62
SD	0.0988	0.1853	0.1755	0.0991	0.1858	0.1765	29.33	2.53	1.02	0.67
Min.	-0.5393	-1.6206	-1.5022	-0.5294	-1.6253	-1.5041	90	3.241	0.00	-0.46
Max.	0.4699	0.6717	0.7603	0.4695	0.6654	0.7527	314	17.9	9.08	4.63

Note: $CAR_{D(-2,+2)}$ is the average of the five-day cumulative abnormal returns (CAR) of Dimson beta (from day -2 to day +2); $CAR_{D\ (-7,+7)}$ is the average of the 15-day CAR of Dimson beta (from day -7 to day +7); $CAR_{D\ (0,+10)}$ is the average of the 11-day CAR of Dimson beta (from the event date, day 0, to day +10); $CAR_{SW(-2,+2)}$ is the average of the five-day cumulative abnormal returns of Scholes-Williams beta (from day -2 to day +2); $CAR_{SW(-7,+7)}$ is the average of the 15-day CAR of Scholes-Williams beta (from day -7 to day +7); $CAR_{SW(0,+10)}$ is the average of the 11-day CAR of Scholes-Williams beta (from the event date, day 0, to day +10); ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; and LEV = firm leverage, where LEV is the total debt to total assets.

The distribution of the ATL of the financial reporting of manufacturing firms in Indonesia during the period 2003–2008 is shown in Table 5.2. The mean of the ATL (in days) from 2003 to 2008 is 97, 99, 98, 98, 95, and 99, respectively. This indicates that during the period there has been no improvement in the average of the ATL of the reporting of Indonesian manufacturing firms, thus indicating low compliance with the financial reporting regulation. The minimums of ATL are 61 days in 2003, 70 days in 2004, 66 days in 2005, 59 days in 2006, 28 days in 2007 and 52 days in

2008. This shows that some of the Indonesian firms report within a very short period of time after the end of the financial year.

Table 5.2 Distribution of the ATL of the financial reporting for 2003–2008

Year	N	Mean	Std. Dev.	Min	Max
2003	87	97	19.94	61	182
2004	108	99	28.22	70	213
2005	86	98	28.54	66	314
2006	117	98	27.68	59	295
2007	85	95	19.77	28	200
2008	85	99	15.18	52	160
2003–2008	568	98	24.20	28	314

5.3 Correlation Analysis of Independent Variables

The Pearson correlation coefficients between the independent variables are shown in Table 5.3 to ensure that the regression models used do not suffer from a serious multicollinearity problem. Table 5.3 reports that none of the variables of interest are significantly correlated and thus no serious multicollinearity problems have occurred. No pair of variables is found to have a correlation coefficient exceeding 0.20. The problem exists if the independent variables are highly correlated with each other, that is, with correlation values exceeding 0.9 according to Tabachnick and Fidell (2007). The highest correlation is between the two variables ATL and SIZE which is 0.196. This suggests that multicollinearity is not a serious problem that would jeopardize the regression results (Tabachnick and Fidell, 2007).

Table 5.3 Pearson correlation coefficients between independent variables

Variable	ATL	SIZE	PROF	LEV
ATL	-	-0.1960	0.0004	0.0314
SIZE	-0.1960	-	-0.0780	-0.1380
PROF	0.0004	-0.0780	-	0.0540
LEV	0.0314	-0.1380	0.0540	-

Note: ATL = Actual Time Lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; and LEV = firm leverage, where LEV is measured by total debt to total assets.

5.4 Multivariate Regression Results and Analysis

This section discusses the multivariate regression results for testing H_2. Equations (3.7) – (3.14) (see Section 3.3.7.2) are estimated using pooled ordinary least squares (OLS). The five-, 11-, 15- and 21-day CARs are estimated using beta adjusted, with the model being estimated according to the Scholes–Williams beta and Dimson beta methods. These CARs are the dependent variable. The proxy for timeliness in the main test of this multivariate analysis models is the actual reporting time lag (ATL).

The results of the regression using CAR, which are calculated using the Scholes–Williams beta-method (CAR_{SW}), and where $CAR_{SW(+2,-2)}$, $CAR_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$ and $CAR_{SW(-10,+10)}$ are the dependent variables, are reported in Table 5.4. There are two key assumptions of the regression. First, the variance of the errors is constant across observations (homoscedastic). Residuals are plotted and no evidence of heteroscedasticity is found. Statistically significant evidence indicates the null hypothesis of no heteroscedasticity. Second, no evidence of multicollinearity is found in

the regression analysis. None of the variance inflation factors (VIF) exceeds five, suggesting that the regressions have high validity.

In Panel A of Table 5.4, where $CAR_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$ and $CAR_{SW(-10,+10)}$, are used as the dependent variables the *F*-statistics of the models shows overall significant at the 5% level (the *F*-statistics are 2.79, 2.09 and 2.49, respectively). The adjusted R^2 are 0.0189, 0.0108 and 0.0146, respectively. From the estimation using dummy time effects (see Panel B of Table 5.4) with $CAR_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$ and $CAR_{SW(-10,+10)}$ as the dependent variables, the *F*-statistics (2.75, 1.76 and 2.74, respectively) are significant at the 5% level, with adjusted R^2 values of 0.0405, 0.0167 and 0.0373, respectively. The adjusted R^2 is similar to previous studies using CAR as the dependent variable (e.g., Atiase *et al.*, 1989).

Table 5.4 Multivariate regression results with dependent variable: CAR with beta-adjusted Scholes–Williams (CAR_{SW}) and test variable: ATL,during 2003–2008

Panel A	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
Dependent	**$CAR_{SW(-2,+2)}$**		**$CAR_{SW(-7,+7)}$**		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0149	-0.4	0.1841	2.72***	0.1386	2.44**	0.1870	2.4**
ATL	0.0000	0.11	-0.0009	-2.19**	-0.0005	-1.44	-0.0008	-1.84*
SIZE	0.0009	0.45	-0.0083	-2.3**	-0.0073	-2.34**	-0.0097	-2.28**
PROF	0.0035	0.68	0.0130	1.37	0.0077	0.95	0.0099	0.89
LEV	-0.0022	-0.26	-0.0166	-1.07	-0.0155	-1.15	0.0185	1
	F-stat.	0.17	*F-stat.*	2.79**	*F-stat.*	2.09*	*F-stat.*	2.49**
	Adj R^2	0.009	Adj R^2	0.0189	Adj R^2	0.0108	Adj R^2	0.0146

(table continues on following page)

Panel B	**Model 5**		**Model 6**		**Model 7**		**Model 8**	
Dependent	$CAR_{SW(-2,+2)}$		$CAR_{SW(-7,+7)}$		$CAR_{SW(0,+10)}$		$CAR_{SW(-10,+10)}$	
Variables	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0134	-0.35	0.2336	3.34***	0.1560	2.62***	0.2365	2.93***
ATL	0.0000	0.2	-0.0009	-2.31**	-0.0005	-1.51	-0.0008	-1.87*
SIZE	0.0004	0.2	-0.0094	-2.61***	-0.0077	-2.49**	-0.0111	-2.62***
PROF	0.0058	1.09	0.0148	1.55	0.0106	1.28	0.0142	1.26
LEV	-0.0023	-0.27	-0.0125	-0.81	-0.0135	-0.99	0.0220	1.2
$\mathbf{d_1}$	-0.0121	-0.75	-0.0739	-2.53**	-0.0460	-1.76*	-0.1012	-2.85***
$\mathbf{d_2}$	-0.0236	-1.41	-0.0897	-2.96***	-0.0381	-1.4	-0.0886	-2.4**
$\mathbf{d_3}$	-0.0036	-0.21	-0.0268	-0.86	-0.0154	-0.55	-0.0471	-1.24
$\mathbf{d_4}$	0.0183	1.17	-0.0226	-0.8	0.0151	0.6	-0.0186	-0.55
$\mathbf{d_5}$	0.0167	1.07	-0.0163	-0.58	-0.0084	-0.36	-0.0056	-0.18
	F-stat.	1.11	*F-stat.*	2.75***	*F-stat.*	1.76*	*F-stat.*	2.74***
	Adj. R^2	0.0027	Adj. R^2	0.0405	Adj. R^2	0.0167	Adj. R^2	0.0373

Note: $CAR_{SW(-2,+2)}$ = CAR calculated using Scholes-Williams beta with event window from -2 to +2 relative to event date; $CAR_{SW(-7,+7)}$ = CAR calculated using Scholes-Williams beta with event window from -7 to +7 relative to event date; $CAR_{SW(0,+10)}$ = CAR calculated using Scholes-Williams beta with event window from event date to +10 relative to event date; $CAR_{SW(-10,+10)}$ = CAR calculated using Scholes-Williams beta with event window from -10 to +10 relative to event date; ATL = Actual Time Lag, where ATL is the number of days between financial year-end and the annual report release date; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{SW(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{SW(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{SW(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{SW(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 5: $CAR_{SW(-2,+2))} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{SW(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 7: $CAR_{SW(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 8: $CAR_{SW(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

H_2 predicts that the market reaction to the release of financial information is negatively associated with the time lag of financial reporting. Evidence of an association between ATL and $CAR_{SW(-7,+7)}$ is found in Table 5.4 (Panel A); the coefficient of the ATL shows a negative significant association at the 5% level (*t*-statistic = -2.19). Further, the regression using $CAR_{SW(-10,+10)}$ as the dependent variable shows a negative significant association between ATL and

$CAR_{SW(-10,+10)}$ at the 10 % level of significance (*t*-statistic = -1.84). In Table 5.4 (Panel B), the multivariate regression results with $CAR_{SW(-7,+7)}$ and $CAR_{SW(-10,+10)}$ as the dependent variables also show a negative significant association (*t*-statistics = -2.31 and -1.87, respectively) at the 5 and 10% levels. The results suggest that the market reaction to the release of the annual reports (around 10 days before and 10 days after the event date) is explained by the timeliness of the reporting of the manufacturing firms. A negative sign for the coefficient indicates that the market reaction to the release of the annual reports is greater for timely reporters (shorter ATL) than for late reporters (longer ATL).

The results of the regression using CAR, which are calculated with adjusting beta according to the Dimson method (CAR_D) are reported in Table 5.5. $CAR_D(+2,-2)$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ are used as the dependent variables. The regression models reported in Table 5.5 (Panel A) with $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables are significant at the 5% level (*F*-statistics = 3.32, 2.38 and 2.85, respectively), with adjusted R^2 of 0.0243, 0.0146 and 0.0181, respectively. For the estimations using dummy time effects reported in Table 5.5 (Panel B), with $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, the *F*-statistics (2.75, 1.87 and 2.77, respectively) are significant at the 1% and 5% levels, with adjusted Rs^2 of 0.0405, 0.0206 and 0.0379, respectively.

The evidence shows an association between ATL and $CAR_{D(-7,+7)}$, $CAR_D(0.+10)$ and $CAR_{D(-10,+10)}$ (see Panel A in Table 5.5). The coefficient of the ATL shows a negative significant association at the 5 % level, with $CAR_{D(-7,+7)}$ and $CAR_{D(-10,+10)}$ as dependent variables (*t*-statistics = -2.32 and -1.94, respectively), and at the 10 % level, with $CAR_{D(0,+10)}$ as the dependent variable

(*t*-statistic = -1.60). Further, Panel B in Table 5.2 presents the results of the regression using $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, showing a negative significant association between ATL and CAR_D. The coefficient of ATL is negative and shows statistically a significant association at the 5% level for $CAR_{D(-7,+7)}$ and $CAR_{D(-10,+10)}$ (*t*-statistics = -2.42 and -1.96, respectively), and at the 10% level for $CAR_{D(0,+10)}$ with *t*-statistic = -1.63. The results suggest that the market reaction to the release of the annual report (around 10 days before and 10 days after the event date) is explained by the timeliness of the reporting. A negative sign for the coefficient indicates the market reaction to the release of annual reports is greater for timely reporting than for late reporting. Thus, the results are consistent with the findings using CAR_{SW} as the dependent variable.

The above findings indicate that the information content of annual reports is influenced by the timeliness of reporting. This result is consistent with previous studies, such as Atiase *et al.* (1989), Chambers and Penman (1984), and Givoly and Palmon (1982), who support the direction of the association predicted in H_2. The results support the argument that the timeliness of financial reporting affects the information content of Indonesian manufacturing firms' annual reports.

Table 5.5 Multivariate regression analysis with dependent variable: CAR with beta-adjusted Dimson (CAR_D) and test variable: ATL, during 2003–2008

Panel A	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	$CAR_{D(-2,+2)}$		**$CAR_{D(-7,+7)}$**		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0123	-0.33	0.2047	3.03***	0.1651	2.66***	0.2110	2.74***
ATL	0.0000	0.09	-0.0009	-2.32**	-0.0006	-1.6*	-0.0008	-1.94**
SIZE	0.0007	0.35	-0.0095	-2.64***	-0.0086	-2.58***	-0.0112	-2.67***
PROF	0.0041	0.78	0.0127	1.34	0.0069	0.79	0.0085	0.77
LEV	-0.0037	-0.43	-0.0196	-1.27	-0.0168	-1.17	0.0148	0.81
	F-stat.	0.22	*F-stat.*	3.32***	*F-stat.*	2.38**	*F-stat.*	2.85***
	Adj. R^2	0.0085	Adj. R^2	0.0243	Adj. R^2	0.0146	Adj. R^2	0.0181
Panel B	**Model 5**		**Model 6**		**Model 7**		**Model 8**	
	$CAR_{D(-2,+2)}$		**$CAR_{D(-7,+7)}$**		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0118	-0.3	0.2495	3.56***	0.1799	2.78***	0.2565	3.2***
ATL	0.0000	0.19	-0.0009	-2.42**	-0.0006	-1.63*	-0.0009	-1.96**
SIZE	0.0002	0.11	-0.0104	-2.88***	-0.0091	-2.69***	-0.0125	-2.99***
PROF	0.0064	1.2	0.0147	1.53	0.0102	1.14	0.0130	1.16
LEV	-0.0039	-0.45	-0.0159	-1.03	-0.0150	-1.03	0.0181	0.99
d_1	-0.0106	-0.65	-0.0685	-2.35**	-0.0428	-1.57	-0.0961	-2.73***
d_2	-0.0231	-1.36	-0.0830	-2.74***	-0.0390	-1.38	-0.0826	-2.25**
d_3	-0.0045	-0.26	-0.0289	-0.92	-0.0154	-0.53	-0.0492	-1.31
d_4	0.0193	1.23	-0.0179	-0.64	0.0200	0.76	-0.0122	-0.36
d_5	0.0172	1.09	-0.0185	-0.66	-0.0061	-0.23	-0.0076	-0.24
	F-stat.	1.11	*F-stat.*	2.75***	*F-stat.*	1.87*	*F-stat.*	2.77***
	Adj. R^2	0.0026	Adj. R^2	0.0405	Adj. R^2	0.0206	Adj. R^2	0.0379

Note: $CAR_D(-2,+2)$ = CAR calculated using Dimson beta with event window from -2 to +2 relative to event date; $CAR_{D(-7,+7)}$ = CAR calculated using Dimson beta with event window from -7 to +7 relative to event date; $CAR_{D(0,+10)}$ = CAR calculated using Dimson beta with event window from event date to +10 relative to event date; $CAR_{D(-10,+10)}$ = CAR calculated using Dimson beta with event window from -10 to +10 relative to event date; ATL = Actual Time Lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{Dit(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 5: $CAR_{Dit(-2,+2))} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 7: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 8: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

It has been documented that the release of earnings information conveys useful information and contributes to the determination of stock prices (Ball and Brown, 1968; Beaver, 1968; DeFond *et al.*, 2007; Francis *et al.*, 2002a, 2002b). The information content literature suggests that more informative accounting information is reflected in greater AR (Ball and Brown, 1968; Beaver *et al.*, 1980a).

Whether annual reports convey useful information to the stock market depends on their information content. Two factors that may affect the information content of the release of information are the capital market's expectation of the content and timing of the release of the annual report (Foster, 1986). Theoretically, there will be uncertainty regarding the content or timing of firms' releases. The larger the extent of uncertainty, the greater the potential for any release of information to result in a revision of security prices. A high degree of market reaction towards earnings announcements is indicated by the high degree of CARs around the announcement date, which means that there is high information content within the earnings announcement. Hence, firms that release their annual reports earlier have higher information content than those that release annual reports later (Chambers and Penman, 1984).

This study's main finding that the negative association between various timeliness reporting and the stock market reaction is consistent with Atiase *et al.* (1989), Givoly and Palmon (1982), and Leventis and Weetman (2004). They suggest that the price reaction to the disclosure of early earnings announcements is significantly more pronounced than the reaction to late announcements, suggesting a decrease in the information content as the reporting lag increases. Chambers and Penman (1984) argued that firms that tend to release their annual reports earlier

than expected generate higher CARs, while those that release their annual reports later than expected generate lower CARs.

5.5 Robustness Tests

To check the robustness of the test results relating to H_2, sensitivity analyses are conducted. The robustness analysis presented in this section includes: 1) using alternative measures of the timeliness variable and 2) using an alternative estimation method, Panel regression. The use of alternative measures of the timeliness variable is discussed in Section 5.5.1 to 5.5.3, while Section 5.5.4 presents the Panel regression results.

5.5.1 Analysis Using Other Measures of the Timeliness: Dummy Variable for Actual Time Lag (DATL)

For the robustness tests this study uses a dummy variable for ATL (DATL) which is represented by a dichotomous variable that is coded 1 if the actual reporting date is within the period allowed by the Indonesian Capital Market Supervisory Agency (ICMSA) regulation, that is, the annual report is released before or on the deadline date for submission (90 days after the financial year-end), and 0 otherwise. The summary of regression results using DATL as the explanatory variable is presented in Table 5.6, with CAR_{SW} as the dependent variable. Table 5.7 presents the regression results using CAR_D as the dependent variable.

The results of the regression using CAR_{SW} as the dependent variable and DATL as the explanatory variable are presented in Table 5.6. According to the results there is no statistical evidence for an association between $CAR_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$ and $CAR_{SW(-10,+10)}$ and DATL in

all models. Further, the estimation results using the dummy time effect (see Table 5.6), with $CARD_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$ and $CAR_{SW(-10,+10)}$, the *F*-statistic is not statistically significant.

In this study, CARs calculated using the Dimson beta method are also used in the robustness analysis. Table 5.7 presents the regression results using CAR_D, $CAR_{D(+2,-2)}$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$, as the dependent variable. The regression models are reported in Table 5.7 (Panel A). In model 1 without the dummy time effect and with $CAR_{D(-7,+7)}$ as the dependent variable, the *F*-statistic that is significant at 10% (*F*-statistic is 2.15), with an adjusted R^2 of 0.0121. From the estimation using the dummy time effect as reported in Table 5.2 (Panel B), with $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, the *F*-statistics (2.48, 1.66 and 2.48, respectively) are significant at the 1% and 10% levels, with adjusted R^2s of 0.0345, 0.0156 and 0.032, respectively.

H_2 of RQ1 predicts that the market reaction to the release of financial information is negatively associated with the time lag of the financial reporting. Evidence of an association between the DATL and $CAR_{D(-7,+7)}$ is found in Table 5.7 (Panel B), where the coefficient of the DATL shows a negative significant association at the 10% level (*t*-statistic = -1.84). The results suggest that the market reaction to the release of the annual report (around seven days before and seven days after the event date) is explained by the timeliness of the reporting of the manufacturing firms. A negative sign for the coefficient indicates that the market reaction to the release of the financial report is greater for timely reporting (shorter ATL), than for late reporting. Nonetheless, the adjusted *R* square is very small; this indicates that the independent variables explain a very little variation of the dependent variable.

The above findings indicate that the information content of annual reports is affected by the timeliness of reporting. The results support the main findings and are consistent with previous studies such as that of Atiase *et al.* (1989) which support the direction of the association predicted in H_2.

Table 5.6 Multivariate regression results with dependent variable CAR with Scholes–Williams beta (CAR_{SW}) and test variable DATL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.0999	1.71*	0.0901	1.77*	0.0854	1.22
DATL	-0.0117	-0.65	-0.0046	-0.3	0.0008	0.04
SIZE	-0.0069	-1.92*	-0.0065	-2.1**	-0.0080	-1.9*
PROF	0.0126	1.32	0.0077	0.94	0.0101	0.9
LEV	-0.0155	-0.98	-0.0148	-1.09	0.0186	1
	F-stat.	1.65	*F-stat.*	1.57	*F-stat.*	1.64
	Adj. R^2	0.0069	Adj. R^2	0.0056	Adj. R^2	0.0063
	Model 4		**Model 5**		**Model 6**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.1866	2.87***	0.1160	2.05**	0.1728	2.24**
DATL	-0.0306	-1.59	-0.0097	-0.58	-0.0179	-0.79
SIZE	-0.0088	-2.44**	-0.0071	-2.3**	-0.0102	-2.4**
PROF	0.0145	1.51	0.0108	1.29	0.0143	1.27
LEV	-0.0099	-0.63	-0.0127	-0.93	0.0234	1.26
d_1	-0.0749	-2.57***	-0.0462	-1.77*	-0.1011	-2.85**
d_2	-0.1015	-3.19***	-0.0411	-1.44	-0.0943	-2.44**
d_3	-0.0409	-1.28	-0.0211	-0.75	-0.0571	-1.48
d_4	-0.0280	-0.98	0.0133	0.52	-0.0220	-0.63
d_5	-0.0094	-0.33	-0.0060	-0.25	-0.0014	-0.04
	F-stat.	2.45***	*F-stat.*	1.55	*F-stat.*	2.43***
	Adj. R^2	0.0337	Adj. R^2	0.0121	Adj. R^2	0.031

Note: $CAR_{SW(-7,+7)}$ = CAR calculated using Scholes-Williams beta with event window from -7 to +7 relative to event date; $CAR_{SW(0,+10)}$ = CAR calculated using Scholes-Williams beta with event window from event date to +10 relative to event date; $CAR_{SW(-10,+10)}$ = CAR calculated using Scholes-Williams beta with event window from -10 to +10 relative to event date; DATL = Dummy Actual Reporting Time Lag, DATL is dummy variable that is equal to one if the annual report release date is within 90 days after the financial year-end and zero otherwise; SIZE = firm size, where SIZE is the firm's market capitalization at the end of

(table continues on following page)

the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 5: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

Table 5.7 Multivariate regression results with dependent variable CAR with beta-adjusted Dimson (CAR_D) and test variable DATL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	t	*α*	t	*α*	t
Constant	0.1248	2.13**	0.1118	2.06**	0.1178	1.7*
DATL	-0.0172	-0.96	-0.0090	-0.54	-0.0059	-0.28
SIZE	-0.0081	-2.28**	-0.0077	-2.33**	-0.0097	-2.32**
PROF	0.0122	1.28	0.0068	0.77	0.0085	0.77
LEV	-0.0179	-1.14	-0.0161	-1.1	0.0156	0.84
	F-stat.	2.15*	*F-stat.*	1.78	*F-stat.*	1.92
	Adj. R^2	0.0121	Adj. R^2	0.0083	Adj. R^2	0.009
Panel B	**Model 4**		**Model 5**		**Model 6**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	t	*α*	t	*α*	t
Constant	0.2071	3.19***	0.1402	2.31**	0.2016	2.64***
DATL	-0.0354	-1.84*	-0.0151	-0.84	-0.0239	-1.06
SIZE	-0.0099	-2.74**	-0.0085	-2.53***	-0.0118	-2.8***
PROF	0.0144	1.5	0.0103	1.14	0.0130	1.16
LEV	-0.0128	-0.82	-0.0140	-0.95	0.0200	1.09
d_1	-0.0698	-2.39**	-0.0430	-1.58	-0.0963	-2.74***
d_2	-0.0970	-3.05***	-0.0443	-1.49	-0.0912	-2.38**
d_3	-0.0448	-1.4	-0.0230	-0.77	-0.0614	-1.61*
d_4	-0.0243	-0.85	0.0177	0.66	-0.0169	-0.49
d_5	-0.0110	-0.39	-0.0028	-0.11	-0.0030	-0.09
	F-stat.	2.48***	*F-stat.*	1.66*	*F-stat.*	2.48***
	Adj. R^2	0.0345	Adj. R^2	0.0156	Adj. R^2	0.032

Note: $CAR_{D(-7,+7)}$ = CAR calculated using Dimson beta with event window from -7 to +7 relative to event date; $CAR_{D(0,+10)}$ = CAR calculated using Dimson beta with event window from event date to +10 relative to event date; $CAR_{D(-10,+10)}$ = CAR calculated using Dimson beta with event window from -10 to +10 relative to

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event date; DATL = Dummy Actual Reporting Time Lag, DATL is dummy variable that is equal to one if the annual report release date is within 90 days after the financial year end and zero otherwise; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 5: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 DATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

5.5.2 Other Measure of the Timeliness Variable: Unexpected Time Lag (UTL)

Similar to Chambers and Penman (1984) and Atiase *et al.* (1989), this study uses an UTL as a measure of timely reporting. Following Bowen *et al.* (1992) and Ismail and Chandler (2004) UTL is measured by this year's actual reporting time lag minus the previous year's actual reporting time lag. In addition, this study uses a dummy variable for the UTL (DUTL) which is coded 1 if this year's annual report release date (day and month) is earlier than, or equal to, the previous year's annual report release date, and 0 otherwise.

The summary of regression results using a UTL as the test variable is presented in Table 5.8, using CAR_{SW} as a dependent variable without the time-effect dummy year (Models 1, 2 and 3) and with the time-effect dummy year (Models 4, 5 and 6). The regression model reported in Table 5.8 (Panel A), with $CAR_{SW(-10,+10)}$ as the dependent variable, is significant at the 10% level (*F*-statistic = 1.99), with an adjusted R^2 of 0.0097. For the estimation using the dummy time effect (see Panel B in Table 5.8), with $CAR_{SW(-7,+7)}$ and $CAR_{SW(-10,+10)}$ as the dependent variables, the *F*-statistics (2.28 and 2.51, respectively) are significant at the 5 and 1% levels, with adjusted

Table 5.8 Multivariate regression analysis with dependent variable CAR with Scholes–Williams beta (CAR_{SW}) and test variable UTL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	t	*α*	t	*α*	t
Constant	0.1776	1.54	0.1157	1.21	0.2246	1.73*
UTL	-0.0003	-0.95	-0.0001	-0.4	-0.0004	-1.17
SIZE	-0.0067	-1.91*	-0.0064	-2.1**	-0.0083	-1.99**
PROF	0.0131	1.37	0.0080	0.98	0.0107	0.96
LEV	-0.0169	-1.08	-0.0154	-1.14	0.0184	0.99
	F-stat.	1.77	*F-stat.*	1.59	*F-stat.*	1.99*
	Adj. R^2	0.0082	Adj. R^2	0.0058	Adj. R^2	0.0097
Panel B	**Model 4**		**Model 5**		**Model 6**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	t	*α*	t	*α*	t
Constant	0.2356	1.98**	0.1237	1.24	0.2681	1.99**
UTL	-0.0003	-1.05	-0.0001	-0.32	-0.0003	-1.11
SIZE	-0.0079	-2.22**	-0.0068	-2.23**	-0.0097	-2.33**
PROF	0.0151	1.57	0.0110	1.33	0.0151	1.34
LEV	-0.0132	-0.85	-0.0137	-1.01	0.0215	1.17
d_1	-0.0744	-2.55***	-0.0459	-1.76*	-0.1011	-2.85***
d_2	-0.0903	-2.95***	-0.0372	-1.36	-0.0900	-2.42**
d_3	-0.0340	-1.08	-0.0188	-0.67	-0.0550	-1.45
d_4	-0.0250	-0.87	0.0147	0.58	-0.0221	-0.64
d_5	-0.0151	-0.53	-0.0075	-0.32	-0.0075	-0.23
	F-stat.	2.28**	*F-stat.*	1.52	*F-stat.*	2.51***
	Adj. R^2	0.0299	Adj. R^2	0.0115	Adj. R^2	0.0324

Note: $CAR_{SW(-7,+7)}$ = CAR calculated using Scholes-Williams beta with event window from -7 to +7 relative to event date; $CAR_{SW(0,+10)}$ = CAR calculated using Scholes-Williams beta with event window from event date to +10 relative to event date; $CAR_{SW(-10,+10)}$ = CAR calculated using Scholes-Williams beta with event window from -10 to +10 relative to event date; UTL = Unexpected Reporting Time Lag, where UTL is this year's ATL minus last year's ATL; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 5: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

R^2s of 0.0299 and 0.0324, respectively. There is no evidence of an effect of the timeliness of financial reporting on the market reaction to release of annual reports when using UTL as the proxy of timeliness and CAR_{SW} as the dependent variable.

The results of the regressions using CAR, which are calculated using the beta-adjusted according to the Dimson beta method (CAR_D), $CAR_{D(-2,+2)}$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, are reported in Table 5.9. The regression models are reported in Panel A, with $CAR_{D(-7,+7)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, are significant at the 5% level (*F*-statistics are 2.44 and 2.69, respectively), with the adjusted R^2 of 0.0151 and 0.0164 respectively. For the estimation using the dummy time effect (see Panel B in Table 5.9), with $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, the *F*-statistics (2.36, 1.66 and 2.69, respectively) are statistically significant at the 1 and 10 % levels, with adjusted R^2 of 0.0318, 0.0157 and 0.0363, respectively.

H_2 of RQ1 predicts that the market reaction to the release of financial information is negatively associated with the time lag of financial reporting. Evidence of an association between UTL and $CAR_{D(-10,+10)}$ is found in Panel A of Table 5.9; the coefficient of the UTL shows a negative significant association at the 10% level (*t*-statistics = -1.76). Further, the results of the regression reported in Table 5.9 using $CAR_{D(-10,+10)}$ for Model 6 as the dependent variable also shows a negative significant association between UTL and CAR_D at the 10% level (*t*-statistic = -1.71). The results indicate that the market reaction to the release of the annual report (around 10 days before and 10 days after the event date) is explained by the timeliness of reporting of the manufacturing firms. A negative sign for the coefficient indicates that the market reaction to the

release of the annual reports is greater for timely reporting firms (shorter ATL), than for late reporting firms.

Table 5.9 Multivariate regression analysis with dependent variable CAR with Dimson beta (CAR_D) and test variable UTL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.2427	2.11**	0.1876	1.76*	0.3106	2.41**
UTL	-0.0004	-1.43	-0.0002	-0.96	-0.0005	-1.76*
SIZE	-0.0079	-2.25**	-0.0076	-2.34**	-0.0099	-2.4**
PROF	0.0130	1.36	0.0073	0.82	0.0097	0.88
LEV	-0.0200	-1.28	-0.0171	-1.19	0.0145	0.79
	F-stat.	2.44**	*F-stat.*	1.94*	*F-stat.*	2.69**
	Adj. R^2	0.0151	Adj. R^2	0.01	Adj. R^2	0.0164
Panel B	**Model 4**		**Model 5**		**Model 6**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.2985	2.51**	0.1931	1.74*	0.3547	2.66***
UTL	-0.0004	-1.54	-0.0002	-0.84	-0.0005	-1.71*
SIZE	-0.0089	-2.51**	-0.0081	-2.45**	-0.0111	-2.71***
PROF	0.0151	1.57	0.0106	1.18	0.0141	1.26
LEV	-0.0166	-1.07	-0.0155	-1.07	0.0175	0.96
d_1	-0.0694	-2.38**	-0.0430	-1.58	-0.0965	-2.75***
d_2	-0.0852	-2.78***	-0.0398	-1.39	-0.0863	-2.34**
d_3	-0.0377	-1.2	-0.0204	-0.69	-0.0591	-1.57
d_4	-0.0221	-0.77	0.0181	0.68	-0.0179	-0.53
d_5	-0.0188	-0.66	-0.0066	-0.25	-0.0121	-0.38
	F-stat.	2.36***	*F-stat.*	1.66*	*F-stat.*	2.69***
	Adj. R^2	0.0318	Adj. R^2	0.0157	Adj. R^2	0.0363

Note: $CAR_{D(-7,+7)}$ = CAR calculated using Dimson beta with event window from -7 to +7 relative to event date; $CAR_{D(0,+10)}$ = CAR calculated using Dimson beta with event window from event date to +10 relative to event date; $CAR_{D(-10,+10)}$ = CAR calculated using Dimson beta with event window from -10 to +10 relative to event date; UTL = Unexpected Reporting Time Lag, where UTL is this year's ATL minus last year's ATL; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

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Model 4: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$
Model 5: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$
Model 6: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$
*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

5.5.3 Other Measures of the Timeliness Variable: Dummy Unexpected Time Lag (DUTL)

This study also uses dummy variables for unexpected time lags (DUTL) coded one if the date of the release of the annual report for this year is expected earlier or equal to the previous year's release date, and coded zero otherwise. The results of the regression models are reported in Table 5.10 Panel A with $CAR_{SW(-7,+7)}$ as the dependent variable and DUTL as the test variable is well fitted at the 1% level of significance (*F*-statistic = 1.94) with an adjusted R^2 of 0.0099. From the estimations using dummy time effects as reported in Table 5.10 Panel B with $CAR_{SW(-7,+7)}$ and $CAR_{SW(-10,+10)}$ as the dependent variables, the *F*-statistics (2.53 and 2.39, respectively) is statistically significant at the 1% level with an adjusted R^2 of 0.0355 and 0.0301, respectively. The coefficient of DUTL in Model 4 of Table 5.10 is negative and statistically significant at the 10% level. This results indicates that there is evidence of an association between DUTL as the explanatory variable and $CAR_{SW(-7,+7)}$ as the dependent variable (*t*-statistic = -1.83). This suggests that the timeliness of reporting of manufacturing firms in Indonesia affects the market reaction to the release of the financial report. The information content of annual reports is greater for timely reporting firms than for late reporting firms.

Table 5.10 Multivariate regression analysis with dependent variable CAR with Scholes–Williams beta (CAR_{SW}) and test variable DUTL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.0886	1.82*	0.0847	2.04**	0.0896	1.57
DUTL	-0.0218	-1.24	-0.0083	-0.55	-0.0060	-0.29
SIZE	-0.0065	-1.84*	-0.0063	-2.07**	-0.0080	-1.93**
PROF	0.0127	1.33	0.0079	0.97	0.0101	0.9
LEV	-0.0149	-0.95	-0.0148	-1.09	0.0191	1.03
	F-stat.	1.94*	*F-stat.*	1.63	*F-stat.*	1.66
	Adj. R^2	0.0099	Adj. R^2	0.0062	Adj. R^2	0.0065
Panel B	**Model 4**		**Model 5**		**Model 6**	
	$CAR_{SW(-7,+7)}$		**$CAR_{SW(0,+10)}$**		**$CAR_{SW(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.1444	2.76***	0.1015	2.25**	0.1416	2.3**
DUTL	-0.0324	-1.8*	-0.0097	-0.62	-0.0108	-0.51
SIZE	-0.0077	-2.16**	-0.0067	-2.21**	-0.0094	-2.28**
PROF	0.0146	1.52	0.0109	1.32	0.0147	1.3
LEV	-0.0101	-0.65	-0.0129	-0.95	0.0225	1.21
d_1	-0.0764	-2.62***	-0.0466	-1.78*	-0.1011	-2.85***
d_2	-0.0998	-3.2***	-0.0403	-1.44	-0.0898	-2.36**
d_3	-0.0390	-1.24	-0.0204	-0.73	-0.0541	-1.41
d_4	-0.0299	-1.04	0.0130	0.51	-0.0206	-0.6
d_5	-0.0170	-0.6	-0.0089	-0.37	-0.0050	-0.15
	F-stat.	2.53***	*F-stat.*	1.55	*F-stat.*	2.39**
	Adj. R^2	0.0355	Adj. R^2	0.0122	Adj. R^2	0.0301

Note: $CAR_{SW(-7,+7)}$ = CAR calculated using Scholes-Williams beta with event window from -7 to +7 relative to event date; $CAR_{SW(0,+10)}$ = CAR calculated using Scholes-Williams beta with event window from event date to +10 relative to event date; $CAR_{SW(-10,+10)}$ = CAR calculated using Scholes-Williams beta with event window from -10 to +10 relative to event date; DUTL = Dummy Unexpected Time Lag, where DUTL is a dummy variable for UTL that equals one if this year's annual report release date (day and month) is earlier than last year's annual report release date and zero otherwise; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{SWit(-7,+7)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 5: $CAR_{SWit(0,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{SWit(-10,+10)} = \alpha_0 + \alpha_1 UTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

The results of the regression using CARs, which were calculated using beta adjusted according to Dimson (CAR_D), and $CAR_{D(-7,+7)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, are reported in Table 5.11. The regression models are reported in Panel A, with $CAR_{D(-7,+7)}$ and $CAR_{D(-10,+10)}$ as the dependent variables are significant at the 5 and 10% levels (*F*-statistics are 2.43 and 1.98, respectively), with adjusted R^2s of 0.0151 and 0.0097, respectively. For the estimation using the dummy time effect (see Panel B in Table 5.11) with $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ as the dependent variables, the *F*-statistics of 2.53, 1.66 and 2.42, respectively are highly statistically significant with *p*-values at the 1% level for Models 4 and 6, and *p*-values at the 10% level for Model 5.

The coefficient of the independent variable of DUTL in Model 4 of Table 5.11 (Panel B) has the appropriate expected sign at the 5% level of significance (*t*-statistic = -1.94), indicating that the time lag is negatively associated with the market reaction surrounding the release of the annual report. No evidence of an association between DUTL and $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$ is found.

The above findings indicate that the information content of annual reports is influenced by the timeliness of reporting in conditions where the test variable is DUTL and the market reaction is measured by $CAR_{D(-7,+7)}$. This result is consistent with previous studies such as those of Atiase *et al.* (1989), Chambers and Penman (1984), and Givoly and Palmon (1982), and it supports the direction of the association predicted by H_2.

Table 5.11 Multivariate regression analysis with dependent variable CAR with Dimson beta (CAR_D) and test variable DUTL

Panel A	**Model 1**		**Model 2**		**Model 3**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.1047	2.16**	0.1009	2.24**	0.1115	1.98**
DUTL	-0.0251	-1.43	-0.0125	-0.77	-0.0117	-0.57
SIZE	-0.0076	-2.15**	-0.0074	-2.27**	-0.0095	-2.3**
PROF	0.0124	1.3	0.0069	0.78	0.0088	0.79
LEV	-0.0177	-1.13	-0.0160	-1.1	0.0157	0.85
	F-stat.	2.43**	*F-stat.*	1.86	*F-stat.*	1.98*
	Adj. R^2	0.0151	Adj. R^2	0.0091	Adj. R^2	0.0097
Panel B	**Model 4**		**Model 5**		**Model 6**	
	$CAR_{D(-7,+7)}$		**$CAR_{D(0,+10)}$**		**$CAR_{D(-10,+10)}$**	
Variables	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.1566	2.99***	0.1182	2.42**	0.1612	2.64***
DUTL	-0.0351	-1.94**	-0.0143	-0.85	-0.0164	-0.78
SIZE	-0.0086	-2.42**	-0.0080	-2.4**	-0.0108	-2.62***
PROF	0.0144	1.5	0.0103	1.15	0.0135	1.2
LEV	-0.0133	-0.85	-0.0142	-0.97	0.0189	1.03
d_1	-0.0713	-2.44**	-0.0436	-1.6	-0.0965	-2.74***
d_2	-0.0940	-3.01***	-0.0428	-1.47	-0.0861	-2.28**
d_3	-0.0420	-1.33	-0.0217	-0.73	-0.0578	-1.52
d_4	-0.0259	-0.9	0.0172	**0.64	-0.0157	-0.46
d_5	-0.0194	-0.68	-0.0063	-0.24	-0.0083	-0.26
	F-stat.	2.53***	*F-stat.*	1.66	*F-stat.*	2.42***
	Adj. R^2	0.0355	Adj. R^2	0.0157	Adj. R^2	0.0307

Note: $CAR_{D(-7,+7)}$ = CAR calculated using Dimson beta with event window from -7 to +7 relative to event date; $CAR_{D(0,+10)}$ = CAR calculated using Dimson beta with event window from event date to +10 relative to event date; $CAR_{D(-10,+10)}$ = CAR calculated using Dimson beta with event window from -10 to +10 relative to event date; DUTL = Dummy Unexpected Time Lag, where DUTL is the dummy variable for UTL that equals one if this year's annual report release date (day and month) is earlier than last year's annual report release date and zero otherwise; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets; and d1-d5 = dummy variables equal one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 2: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 3: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Model 4: $CAR_{Dit(-7,+7)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 5: $CAR_{Dit(0,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

Model 6: $CAR_{Dit(-10,+10)} = \alpha_0 + \alpha_1 DUTL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + \alpha_5 d_1 + \alpha_6 d_2 + \alpha_7 d_3 + \alpha_8 d_4 + \alpha_9 d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

5.5.4 Panel Regression Analysis

This study uses panel data which have firm effects and time effects and can be analysed by fixed effect and random effect[45] using Panel regression analysis. SAS version 9.2 is used to run this Panel regression. The results of the Panel regressions, as shown in Tables 5.12 and 5.13, are consistent with the main findings that there is greater information content of annual reports for the timely reporting firms (shorter actual reporting time lag) than those for late reporting firms (longer actual reporting time lag).

The results of the Panel regressions using CAR with Scholes-Williams beta (CAR_{SW}) as the dependent variable are reported in Table 5.12. The results for Models 2, 3 and 4 (Panel A), using fixed effect estimation show negative statistically significant association between $CAR_{SW(-10,+10)}$, $CAR_{SW(-7,+7)}$ and $CAR_{SW(0,+10)}$ and ATL at 5% for Model 2 (*t*-statistic = -2.26) and 10% for Models 3 and 4 (*t*-statistics = -1.81 and -1.66, respectively). Furthermore, the results for the Panel regressions using random effect (Panel B) in Models 6, 7 and 8 also show a negative statistically significant association between $CAR_{SW(-10,+10)}$, $CAR_{SW(-7,+7)}$ and $CAR_{SW(0,+10)}$ and ATL at 5% for Models 6 and 7 (*t*-statistics = -2.21 and -2.24, respectively) and 10% for Model 8 (*t*-statistic = -1.86).

The above results imply that market reaction surrounding the release of annual reports is greater for timely reporting firms than for late reporting firms. These findings are consistent with the results from the main analysis using the multivariate OLS regressions (refer to Section 5.4).

[45] Refer to Section 3.5.2.

Table 5.12 Results of Panel regressions with dependent variable CAR using Scholes Williams beta

Panel A: Fixed Effect								
	Model 1 $CAR_{SW(-2,+2)}$		**Model 2** $CAR_{SW(-10,+10)}$		**Model 3** $CAR_{SW(-7,+7)}$		**Model 4** $CAR_{SW(0,+10)}$	
Variable	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.0610	0.55	0.5702	2.37**	0.3711	1.88*	0.4911	2.7***
ATL	0.0000	0.06	-0.0017	-2.26**	-0.0011	-1.81*	-0.0009	-1.66*
SIZE	-0.0061	-0.84	-0.0338	-2.16**	-0.0231	-1.8*	-0.0295	-2.49**
PROF	0.0071	0.83	0.0081	0.43	0.0044	0.28	0.0049	0.34
LEV	-0.0116	-0.85	-0.0110	-0.37	-0.0112	-0.46	-0.0200	-0.88
Panel B: Random Effect								
	Model 5 $CAR_{SW(-2,+2)}$		**Model 6** $CAR_{SW(-10,+10)}$		**Model 7** $CAR_{SW(-7,+7)}$		**Model 8** $CAR_{SW(0,+10)}$	
Variable	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0160	-0.41	0.2228	2.38**	0.1895	2.72***	0.1734	2.51**
ATL	0.0000	0.05	-0.0011	-2.21**	-0.0009	-2.24**	-0.0007	-1.86*
SIZE	0.0011	0.54	-0.0103	-1.99**	-0.0084	-2.26**	-0.0080	-2.08**
PROF	0.0032	0.58	0.0104	0.8	0.0125	1.26	0.0079	0.82
LEV	-0.0016	-0.17	0.0288	1.3	-0.0169	-1	-0.0178	-1.09

Note: $CAR_{SW(-2,+2)}$ = CAR calculated using Scholes-Williams beta with event window from -2 to +2 relative to event date; $CAR_{SW(-7,+7)}$ = CAR calculated using Scholes-Williams beta with event window from -7 to +7 relative to event date; $CAR_{SW(0,+10)}$ = CAR calculated using Scholes-Williams beta with event window from event date to +10 relative to event date; $CAR_{SW(-10,+10)}$ = CAR calculated using Scholes-Williams beta with event window from -10 to +10 relative to event date; ATL = Actual Time Lag, where ATL is the number of days between financial year-end and the annual report release date; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; and LEV = firm leverage, where LEV is measured by total debt to total assets.

Models 1and 5: $CAR_{SW(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 2 and 6: $CAR_{SW(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 3 and 7: $CAR_{SW(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 4 and 8: $CAR_{SW(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

The results of the Panel regressions using CAR with Dimson beta (CAR_D) as the dependent variable are reported in Table 5.13. The results for Models 2, 3 and 4 (Panel A) using fixed effect estimation show a negative statistically significant association between $CAR_{D(-10,+10)}$, $CAR_{D(-7,+7)}$ and $CAR_{D(0,+10)}$ and ATL at 5% for Model 2 and 3 (*t*-statistics = -2.5 and -2.03, respectively) and 10% for Model 4 (*t*-statistic = -1.86). Furthermore, the results for the Panel regressions using random effect (Panel B) in Models 6, 7 and 8 also show a negative statistically significant association between $CAR_{D(-10,+10)}$, $CAR_{D(-7,+7)}$ and $CAR_{D(0,+10)}$ and ATL at 5% for Models 6 and 7 (*t*-statistics = -2.28 and -2.27, respectively) and 10% for Model 8 (*t*-statistic = -1.91). The results suggest that the negative statistical significance confirms a negative association between actual reporting time lag and the information content of annual reports indicated by that the timely reporting firms (shorter ATL) have higher degree of market reaction around the release of annual reports than the reaction for late reporting firms. Given that ATL is negatively associated with CARs this study's findings support H_2.

Table 5.13 Results of Panel regression with dependent variable CAR using Dimson beta

Panel A: Fixed Effect								
	Model 1 $CAR_{D(-2,+2)}$		**Model 2** $CAR_{D(-10,+10)}$		**Model 3** $CAR_{D(-7,+7)}$		**Model 4** $CAR_{D(0,+10)}$	
Variable	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	0.0701	0.63	0.5931	2.46**	0.3950	1.99**	0.5073	2.77***
ATL	-0.0001	-0.18	-0.0019	-2.5**	-0.0013	-2.03**	-0.0011	-1.86*
SIZE	-0.0066	-0.91	-0.0360	-2.29**	-0.0250	-1.93*	-0.0306	-2.56**
PROF	0.0073	0.84	0.0061	0.32	0.0038	0.24	0.0043	0.3
LEV	-0.0115	-0.83	-0.0123	-0.41	-0.0117	-0.47	-0.0200	-0.88

(table continues on following page)

Panel B: Random Effect

	Model 5 $CAR_{D(-2,+2)}$		Model 6 $CAR_{D(-10,+10)}$		Model 7 $CAR_{D(-7,+7)}$		Model 8 $CAR_{D(0,+10)}$	
Variable	*α*	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	-0.0149	-0.38	0.2437	2.63***	0.2040	2.93***	0.1834	2.64***
ATL	0.0000	0.05	-0.0012	-2.28**	-0.0009	-2.27**	-0.0007	-1.91*
SIZE	0.0010	0.48	-0.0117	-2.31**	-0.0093	-2.51**	-0.0087	-2.26**
PROF	0.0039	0.7	0.0091	0.71	0.0121	1.22	0.0078	0.8
LEV	-0.0033	-0.34	0.0253	1.15	-0.0204	-1.19	-0.0193	-1.17

Note: $CAR_D(-2,+2)$ = CAR calculated using Dimson beta with event window from -2 to +2 relative to event date; $CAR_{D(-7,+7)}$ = CAR calculated using Dimson beta with event window from -7 to +7 relative to event date; $CAR_{D(0,+10)}$ = CAR calculated using Dimson beta with event window from event date to +10 relative to event date; $CAR_{D(-10,+10)}$ = CAR calculated using Dimson beta with event window from -10 to +10 relative to event date; ATL = Actual Time Lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; LEV = firm leverage, where LEV is measured by total debt to total assets

Models 1and 5: $CAR_{D(-2,+2)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 2 and 6: $CAR_{D(-10,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 3 and 7: $CAR_{D(-7,+7)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

Models 4 and 8: $CAR_{D(0,+10)} = \alpha_0 + \alpha_1 ATL_{it} + \alpha_2 SIZE_{it} + \alpha_3 PROF_{it} + \alpha_4 LEV_{it} + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

5.6 Chapter Summary

This chapter discusses the results of investigating H_2 which predicts that the market reaction to the release of annual reports is influenced by the timeliness of reporting of manufacturing firms, or that the timeliness of financial reporting affects the information content of the annual reports of Indonesian manufacturing firms. The analysis is performed using multivariate regressions with CARs for the dependent variable as the measure of the market's reaction. CARs are calculated using the Scholes–Williams beta and Dimson beta models (CAR_{SW} and CAR_D).

From the analysis using 568 firm-year observations, this study finds that the ATL is negatively significantly associated with $CAR_{SW(-7,+7)}$, $CAR_{SW(-10,+10)}$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$ and $CAR_{D(-10,+10)}$. This indicates that the timeliness of the financial reporting of manufacturing firms affects the information content of the annual reports, thus supporting H_2. Timely reporting firms have a greater market reaction, which indicates greater information content than late reporting firms.These results are further supported by the results from the analysis using the UTL and DUTL as other measures of timeliness, which find evidence of a significant association with CAR_{SW} and CAR_D.

Overall, the results of the multivariate OLS regression and the Panel regression analysis support H_2 in that the information content of the annual reports is greater for the timely reporting firms than the those for late reporting firms with controlling for firm size, profitability and leverage over the period 2003 to 2008. This finding is consistent with studies such as those of Atiase *et al.* (1989) and Leventis and Weetman (2004).

Chapter 6 presents the results of investigating RQ2, whether firm characteristics, audit factors and earnings quality explains variations in the timeliness of the financial reporting of manufacturing firms in Indonesia.

Chapter 6: An Empirical Analysis of the Determinants of the Timeliness of Financial Reporting

6.1 Introduction

The previous chapter presented the empirical results of examining the effect of the timeliness of the financial reporting of listed manufacturing firms in Indonesia on the information content of the annual reports. The multivariate tests for examining the effect of timely and late reporting on the market reaction surrounding the release of the annual reports support hypothesis two (H_2) related to Research Question 1 (RQ1). Thus, the market reaction is greater surrounding the timely release of annual reports than with the late release of reports. This chapter presents the empirical results of the multivariate analysis which tests Hypothesis 3 to Hypothesis 9 (H_3 - H_9) related to Research Question 2 (RQ2), that is, how the determinants affect the timeliness of the financial reporting of manufacturing firms in Indonesia. Specifically, this study examines whether larger firm size (H_3), higher profitability (H_4), lower leverage (H_5), lower complexity of operations (H_6), audit firm size (H_7), unqualified auditor opinion (H_8) and higher earnings quality (H_9) are associated with the timely financial reporting of manufacturing firms in Indonesia. Multivariate Ordinary Least Square (OLS), Logit model, and Panel regressions are performed to test the hypotheses.[46]

This chapter begins with a discussion of the descriptive statistics for the explanatory variables (Section 6.2). The correlation analysis for the independent variables appears in Section 6.3.1.

[46] OLS, Logit and Panel regression are the estimation methods used in this study (refer to Section 3.5.2 in Chapter 3).

The results of testing the hypotheses are discussed in Section 6.3.2. Section 6.4 presents the results of performing sensitivity analysis or robustness tests for testing the hypotheses related to RQ2. Section 6.5 concludes this chapter by summarising the findings of the hypotheses' tests.

6.2 Descriptive Statistics

Descriptive statistics are calculated for the dependent and independent variables employed to investigate H_3–H_9 related to RQ2 in order to obtain an overview of the nature of the data to be analysed. The descriptive statistics for the dependent time lag variable (ATL) were discussed in Section 5.2 and are briefly summarised here in Table 6.1. The results of the descriptive statistics for the independent variables are also presented in Table 6.1. The variables include firm size (SIZE), profitability (PROF), capital structure (CAPS), operational complexity (COMPLEX), audit firm size (AUDFIRM), audit opinion (AUDOPINION) and earnings quality (EQ).

This study uses an unbalanced sample with 568 observations that represent 157 firms during the period 2003 to 2008. The descriptive statistics for all firms are presented in Table 6.1 (Panel A). Table 6.1 also presents the descriptive statistics for timely reporting firms (Panel B) and late reporting firms (Panel C). The variables presented in Table 6.1 are those relating to actual time lag, firm characteristics, audit factors and earnings quality variables. For all firms, shown in Panel A, the average ATL (97.807) is higher than the average ATL of timely reporting firms shown in Panel B (87.211). Further, the average ATL of late reporting firms (108.993) in Panel C is higher than the ATL of the average of all reporting firms and timely reporting firms.

The SIZE variable is proxied by the firm's market capitalisation at the end of the financial year. As shown by the average SIZE, timely reporting firms exhibit a higher average market capitalisation (12.622) than late reporting firms (11.918) and all firms (12.247). This suggests that the reporting by larger firms is more timely than the reporting by smaller firms. The PROF variable is measured by the percentage of returns to total assets. It shows that the average for timely reporting firms (0.998) is higher than for late reporting firms (0.905), indicating that firms with 'good news' tend to have more timely reporting than firms with 'bad news' do. The CAPS variable indicates the capital structure of the firm as measured by the firm's leverage. The average of CAPS for late reporting firms in Panel C shows the highest percentage of leverage (0.628) compared to timely reporting firms (0.492) and all firms (0.564).

This study employs the COMPLEX variable, which is measured by a dummy variable for the number of branches. The average COMPLEX for late reporting firms (0.225) in Panel C is higher than the average COMPLEX for timely reporting firms (0.212) in Panel B. This indicates that late reporting firms have a higher average complexity of operations than timely reporting firms.

For the EQ variable in Table 6.1, the average for late reporting firms (-0.038) in Panel C is lower than that for timely reporting firms (-0.036). This indicates that firms with lower earnings quality tend to report later than firms with higher earnings quality, which is consistent with the findings of Chai and Tung (2002).

Table 6.1 Descriptive statistics of dependent and independent variables

	Dependent Variable	Independent Variables						
	ATL	**SIZE**	**PROF**	**CAPS**	**COMPLEX**	**AUDFIRM**	**AUD OPINION**	**EQ**
Panel A: All Firms								
N	568	568	568	568	568	568	568	568
Mean	97.81	12.247	0.949	0.564	0.219	0.378	0.959	-0.037
Std. Dev.	24.20	2.494	0.921	0.556	0.414	0.485	0.200	0.059
Minimum	28	3.230	0.000	-0.460	0	0	0	-0.359
Maximum	314	18.520	9.084	4.630	1	1	1	0
Panel B: Timely Firms								
N	293	293	293	293	293	293	293	293
Mean	87.21	12.622	0.998	0.492	0.212	0.379	0.995	-0.036
Std. Dev.	9.77	2.398	0.791	0.371	0.410	0.486	0.070	0.058
Minimum	28	3.230	0	-0.300	0	0	0	-0.300
Maximum	90	18.520	5.315	2.340	1	1	1	0
Panel C: Late Firms								
N	275	275	275	275	275	275	275	275
Mean	108.99	11.918	0.905	0.628	0.225	0.377	0.926	-0.038
Std. Dev.	29.34	2.535	1.022	0.672	0.419	0.486	0.262	0.060
Minimum	90	3.241	0	-0.460	0	0	0	-0.359
Maximum	314	17.902	9.084	4.630	1	1	1	0

Note: ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; and EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality multiplied by -1 to indicate that a high value represents a high quality of earnings.

6.3 Analysis of the Determinants of the Timeliness of Financial Reporting

6.3.1 Correlation Analysis

The Pearson correlation coefficients between the independent variables are presented in Table 6.2 to ensure that the regression models used do not suffer from a serious multicollinearity problem.

Table 6.2 Pearson correlation coefficients between independent variables

	SIZE	PROF	CAPS	COMPLEX	AUDFIRM	AUDOPINION	EQ
SIZE	-	-0.078	-0.138	0.194	0.159	0.019	-0.156
PROF	-0.078	-	0.054	-0.006	0.124	-0.031	0.091
CAPS	-0.138	0.054	-	0.027	-0.088	-0.085	-0.068
COMPLEX	0.194	-0.006	0.027	-	0.116	0.026	-0.277
AUDFIRM	0.159	0.124	-0.088	0.116	-	-0.052	0.020
AUDOPINION	0.019	-0.031	-0.085	0.026	-0.052	-	0.001
EQ	-0.156	0.091	-0.068	-0.277	0.020	0.001	-

Note: ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; and EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality multiplied by -1 to indicate that a high value represents a high quality of earnings.

The problem exists if the independent variables are highly correlated with each other (with correlation values exceeding 0.90 according to Tabachnick and Fidell (2007)). Table 6.2 reports that none of the variables of interest are significantly correlated. Therefore, no serious multicollinearity problems exist because no pair of variables is found to have a correlation

coefficient exceeding 0.20. The highest coefficient correlation is between SIZE and COMPLEX which is 0.194. This indicates that multicollinearity is not a serious problem that would jeopardize the regression results because the coefficients did not exceed the 0.9 rule of thumb (Tabachnick and Fidell, 2007).

6.3.2 Analysis of Regression Results

To examine the seven hypotheses related to RQ2, multivariate regression analysis is used using 568 firm-year observations during the period 2003–2008. The results of the regressions, estimated using ATL and DATL as the dependent variables, with and without the control variable of time dummy,[47] are reported in Table 6.3. One of the key assumptions of the regression is that the variance error is constant across observations (homoscedastic). Residuals are plotted and there is no evidence of heteroscedasticity. White's test (1980) accepts the null hypothesis of no heteroscedasticity with a statistical significance of 39.08 (*p*-value = 0.2154). To corroborate the results of correlation analysis VIF statistics are calculated for each model. None of the VIFs exceed five, which suggests that the regressions have high validity. To test the endogeneity, Hausman's test is used in this study to determine whether or not there is some omitted variable biased in the regression. The results of the Hausman's test accept the null hypothesis of no measurement error.[48]

[47] The time dummy variables are designed to capture the effect of the year by year from the period 2003-2008. The time dummy variable d_1 is coded as one if the sample year is 2003, and zero otherwise; the time dummy variable d_2 is coded as one if the sample year is 2004 and zero otherwise; the time dummy variable d_3 is coded as one if the sample year is 2005 and zero otherwise; the time dummy variable d_4 is coded as one if the sample year is 2006 and zero otherwise; and the time dummy variable d_5 is coded as one if the sample year is 2007 and zero otherwise.

[48] Variables in a regression can be endogenous for several reasons including omitted variable biased, measurement error and simultaneity (reverse causation).

The regression models with ATL and DATL as the dependent variables, with and without the year dummy control variable (Models 1 and 2), are significant at the 1 % level (*F*-statistics = 8.62 and 5.56, respectively), with an adjusted R^2 of 0.1111 and 0.1136 respectively. Further, from the estimation using Logit analysis (Models 3 and 4) with a DATL as the dependent variable, with and without the year dummy control variable, the likelihood ratio (LR) is significant at the 1% level (*LR* = 30.52 and 102.78, respectively). The overall explanatory power is not very high, consistent with prior studies such as Ashton *et al.* (1989) who report an adjusted R^2 of 0.088 to 0.1230 and Jaggi and Tsui (1999) who report adjusted R^2 of 0.1420 and 0.1440.

Table 6.3 Multivariate regression results, dependent variable: ATL and DATL

All Firms	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	OLS		**OLS**		**Logit**		**Logit**	
Variable	ATL		ATL		DATL		DATL	
	α	*t*	*α*	*t*	*α*	*Chi-square*	*α*	*Chi-square*
Constant	142.721	17.24***	145.864	16.66***	-4.038	11.248***	-5.405	16.874***
SIZE	-1.991	-4.3***	-1.969	-4.19***	0.120	6.927***	0.163	9.980***
PROF	-0.943	-0.78	-1.255	-1.03	0.155	2.001	0.087	0.474
CAPS	-2.071	-0.96	-1.684	-0.78	-0.333	2.340	-0.460	2.704*
COMPLEX	4.208	1.53	4.225	1.53	-0.328	1.651	-0.254	0.835
AUDFIRM	2.140	0.92	3.403	1.4	-0.122	0.324	-0.068	0.075
AUDOPINION	-24.326	-4.43***	-25.793	-4.59***	2.734	6.909***	2.881	6.886***
EQ	-0.380	-4.18***	-0.392	-4.28***	0.007	0.738	0.013	1.817
$\mathbf{d_1}$			-5.862	-1.43			0.452	1.227
$\mathbf{d_2}$			-4.723	-1.15			2.405	27.966***
$\mathbf{d_3}$			1.778	0.47			1.878	23.757***
$\mathbf{d_4}$			-1.653	-0.43			1.085	8.668***
$\mathbf{d_5}$			-5.013	-1.4			-0.177	0.237
	F-stat.	*8.62****	*F-stat.*	*5.56****	*Likelihood Ratio*	30.517	*Likelihood Ratio*	102.779
	Sig.	*<.0001*	*Sig.*	*<.0001*	*Sig.*	<.0001	*Sig.*	<.0001
	Adj. R^2	*0.1111*	*Adj. R^2*	*0.1136*				

(table continues on following page)

Note: ATL = actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; DATL = dummy variable of actual reporting time lag, coded as one if the annual report release date is within 90 days after the financial year-end (classified as timely reporting firms) and zero otherwise (late reporting firms); SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality; and d1-d5 = time dummy variables, coded as one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $ATL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + e$

Model 2: $ATL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + \alpha_8d_1 + \alpha_9d_2 + \alpha_{10}d_3 + \alpha_{11}d_4 + \alpha_{12}d_5 + e$

Model 3: $DATL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + e$

Model 4: $DATL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + \alpha_8d_1 + \alpha_9d_2 + \alpha_{10}d_3 + \alpha_{11}d_4 + \alpha_{12}d_5 + e$

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

6.3.2.1 Results for Firm Size Effect (H_3)

H_3 predicts that the time lag of reporting is negatively associated with firm size which is one of the determinants of the annual reports' timeliness of the financial reporting. The larger the firm size, the shorter the time lag of reporting. As discussed in Section 3.3, market capitalisation is used to proxy firm size. The results of the regressions, as shown in Table 6.3, using ATL as the dependent variable (Models 1 and 2) shows a negative and statistically significant association between SIZE and ATL at the 1% level (*t*-statistics = -4.30 and -4.19, respectively). Further, the result of the regression using DATL as the dependent variable (Models 3 and 4) consistently shows a negative association between firm size and the time lag of the reporting at the 1% level (Chisquares = 6.93 and 9.98, respectively). This result suggests that the time lag of financial reporting is explained by the firm's size, and suggests that annual reports are published in a timelier manner by larger firms than smaller firms.

A negative sign for the coefficient indicates that the time lag is shorter for larger firms than for smaller firms. The results are consistent with the literature e.g., Davies and Whittred (1980), Givoly and Palmon (1982), Ashton *et al.* (1989), Carslaw and Kaplan (1991), Bamber *et al.* (1993), Ng and Tai (1994), Jaggi and Tsui (1999), Owusu-Ansah (2000), Ismail and Chandler (2004), Leventis *et al.* (2005), Mahajan and Chander (2008) and Al-Ajmi (2008), and it supports the direction of the association predicted in H_3, as well as the argument that firm size affects the timeliness of the reporting of manufacturing firms.

There are many reasons why firm size is associated with the timeliness of financial reporting. First, large firms can eliminate uncertainty in the market with respect to firm performance, by reducing its reporting time lag (Davies and Whittred, 1980). Second, larger firms are often associated with greater resources and more advanced accounting information systems, and they are more technologically developed than smaller firms. These attributes should aid larger firms with timely reporting. It is argued that large firms are likely to have stronger internal controls, internal auditing and greater accountability, which should make it easier to audit a large number of transactions in a relatively shorter time. Third, there are economic reasons why large firms have incentives to opt for a shorter reporting lag; for example, large firms are more visible to the public (Ismail and Chandler, 2004).

6.3.2.2 Results for the Influence of Profitability (H_4)

With respect to hypothesis H_4, it is expected that the financial reporting time lag of manufacturing firms in Indonesia is negatively associated with firm profitability. The results of

the regressions using ATL as the dependent variable (Models 1 and 2) show that the coefficient of PROF is negative (*t*-statistics = -0.78 and -1.03, respectively) but not statistically significant. In addition, no evidence is found of a significant association between DATL and PROF (Models 3 and 4) in the regression results with DATL as the dependent variable (chi-squares = 2.002 and 0.475, respectively). This result does not support H_4; nonetheless, it is consistent with some of previous literature such as Dyer and McHugh (1975) and Davies and Whittred (1980) who report no association between profitability and total reporting time lag in Australia. Further, the above results are also consistent with Leventis *et al.* (2005), which find no association between profitability and audit report lag of listed firms in Athens stock exchange.

It is noted that the results of regressions using ATL as the dependent variable (Models 1 and 2) are consistent with the results of regressions using DATL as the dependent variable (Models 3 and 4). All results suggest no evidence of an association between the timeliness of financial reporting and profitability of Indonesian manufacturing firms.

6.3.2.3 Results for the Influence of the Firm Capital Structure (H_5)

H_5 predicts that the capital structure is positively associated with the financial reporting time lag of manufacturing firms in Indonesia. The results of the regressions show that the coefficient of CAPS is negative in all models (Models 1, 2, 3 and 4). There is no evidence of an association between reporting (ATL/DATL) and CAPS in Models 1 and 2 as the *t*-statistics are not statistically significant (*t*-statistics = -0.96, and -0.78, respectively). Nonetheless, in Model 4 there is evidence of an association between DATL and CAPS at the 10% level of significance (chi-square = 2.7041). Thus, there is some evidence of an association between firm capital

structure (CAPS), when leverage is used as the proxy, and the timeliness of financial reporting. In this study, the regression result (Model 4) shows some evidence to support H_5 of an association between DATL and CAPS. This finding gives some support to H_5—that highly leveraged firms report earlier than firms with less leverage. This finding is consistent with studies of Owusu-Ansah (2000), Ismail and Chandler (2004) and Al-Ajmi (2008).

Based on agency theory, higher monitoring costs are incurred by firms that are highly leveraged. As highly leveraged firms have incentives to invest sub-optimally, debt holders normally include clauses in debt contracts that constrain the activities of management (Jensen and Meckling, 1976). One such clause is to require prompt disclosure on a more frequent basis so that debt holders can reassess the long-term financial performance or position of the firm (Owusu-Ansah, 2000).

6.3.2.4 Results for the Influence of the Firm Complexity of Operation (H_6)

H_6 predicts that firm complexity of operations is positively associated with the financial reporting time lag of manufacturing firms in Indonesia. This study finds no evidence that timely reporting is associated with firms' complexity; the results show that the time lag is not statistically significantly associated with firm complexity of operations. This finding is consistent with Al-Ajmi (2008) who finds no association between accounting complexity and reporting delays.

It is expected that the degree of complexity of a firm's operations affects the timeliness of firm reporting. The degree of complexity, which depends on the number and locations of the firm's

operating units (branches) and the diversification of product lines and markets, is more likely to affect the time required by an auditor to complete an audit. Thus, a positive relationship between operational complexity and audit delay is expected. Ashton *et al.* (1987) find a significant positive relationship between operational complexity and reporting delay.

6.3.2.5 Results for the Influence of the Audit Firm (H_7)

H_7 predicts that the Big Four/non-Big Four audit firms are associated with the financial reporting time lag of manufacturing firms in Indonesia. The regression results of the four models in Table 6.3 show that the coefficient of AUDFIRM is positive but insignificant. No association is found between the Big Four and non-Big Four audit firms and the actual reporting time lag.

It is noted that this study's result is not consistent with major previous studies such as those of Imam *et al.* (2001), Ng and Tai (1994) and Carslaw and Kaplan (1991) who argue that larger audit firms (international audit firms) in emerging countries complete audits more quickly because they have greater staff resources and are better experienced in auditing listed firms. Further, international audit firms may enjoy economies of scale in the provision of audit services and are more efficient in verifying accounts compared with smaller domestic audit firms. In addition, larger firms are concerned with reputation loss from poor audit services and can therefore be expected to spend more time to ensure that accounts are in order before an audit opinion is expressed. Nonetheless, the above findings are consistent with a few prior studies such as Al-Ajmi (2008) who finds no association between auditor size (Big Four or Non Big Four) and the timeliness of financial reporting.

6.3.2.6 Results for the Influence of the Auditor Opinion (H_8)

H_8 predicts that audit opinion is associated with the financial reporting time lag of manufacturing firms in Indonesia. According to Table 6.3 the time lag of financial reporting is negatively associated with audit opinion. The results of regressions using Models 1, 2 and 4 show a negative association between ATL and AUDOPINION at 1% level of significance (*t*-statistics = -4.43 and -4.59, respectively).

These results suggest that the time lag of financial reporting of manufacturing firms in Indonesia is explained by the audit opinion, and that annual reports are released in a more timely way for firms that have unqualified audit opinions compared to those having qualified audit opinions or audit opinions other than unqualified opinions. This also indicate that the presence of a qualified audit opinion is associated with a longer reporting time lag, as auditors are likely to be reluctant to issue a qualification and may spend some time attempting to resolve the items subject to the qualification. This study finding is consistent with previous studies such as Whittred (1980), who uses Australian data, Carslaw and Kaplan (1991) use New Zealand data, and Ashton *et al.* (1987) and Bamber *et al.* (1993) who both use US data. Furthermore, this finding is consistent with Soltani (2002) who uses French data and the results of a Malaysian study by Shukeri and Nelson (2011).

6.3.2.7 Results for the Influence of Earnings Quality (H_9)

H_9 predicts that the financial reporting time lag is shorter for firms with higher earnings quality than for those with lower earnings quality. Evidence of an association between financial reporting time lag and a firm's earnings quality is found in the first and second models (Models 1

and 2). The results of the regressions using Models 1 and 2 show that there is a negative association between ATL and the EQ variable at the 1% level of significance (*t*-statistics = -4.18 and -4.28 respectively). The statistically negatively significant coefficient of EQ (-0.380) confirms a negative relation between a firm's individual earnings quality and the timeliness of the reporting of manufacturing firms in Indonesia. As indicated by the finding that firms with a shorter reporting time lag have higher earnings quality than firms with a longer reporting time lag, the results imply that the timeliness of financial reporting is explained by the various levels of earnings quality measured by accruals earnings quality according to the Dechow and Dichev (2002) method. It is noted that the regression results are not consistent using ATL and DATL as the dependent variables. The results of regression using Models 3 and 4 show that there is no evidence of an association between DATL and EQ.

The above findings suggest some evidence to support H_9 that the time lag of financial reporting is explained by the firms' earnings quality which is measured by the firm's accrual quality according to Dechow and Dichev (2002) method. Thus, the annual reports are released in a timelier manner for firms with higher earnings quality compared to those with lower earnings quality. These findings are consistent with Chai and Tung (2002), who find that there is an association between reporting time lag and earnings quality as indicated by the firm's earnings management. Late reporters employ income-decreasing accruals as a means of earnings manipulation to enhance future profits and bonuses. The longer the reporting lag, the greater the magnitude of discretionary accruals used by late reporters to store income-increasing accruals potential for subsequent periods (Chai and Tung, 2002). Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter annual

reports to either mislead stakeholders as to the underlying economic performance of the firm or to influence contractual outcomes that depend on reported accounting numbers (Schipper, 1989).

6.4 Robustness Tests

Robustness tests are conducted to check the sensitivity of the study's findings related to RQ2. The robustness analysis presented in this section includes: 1) using alternative measures of the dependent variable (Section 6.4.1); 2) using alternative measures of the firm size variable (Section 6.4.2); and 3) using alternative measures of the profitability variable (Section 6.4.3).

6.4.1 Other Measures of the Dependent Variable

Following Chambers and Penman (1984) and Atiase *et al.* (1989), this study also uses UTL (dependent variable) as a measure of the timeliness of financial reporting. UTL is defined as the difference between the current year's ATL and the previous year's ATL. This study also uses a DUTL as another measure of the dependent variable which is represented by a dummy variable which is coded one if the actual reporting date (day and month) is earlier than, or equal to, the previous reporting date, and zero otherwise, without the time effect dummy year (Models 1 and 3) and with the time effect dummy year (Models 2 and 4). The summary of the regression results using UTL and DUTL as the dependent variables is presented in Table 6.4.

The results of regressions using OLS estimation analysis with UTL as the dependent variable show that *F*-statistics are significant at the 5% (Model 1) and 1% levels (Model 2) (*F*-statistics are 2.23 and 5.56, respectively). Furthermore, the results of regression using Logit estimation analysis with DUTL as the dependent variable (Models 3 and 4) show that the Likelihood Ratio

(*LR*) is significant at the 5% level of significance for Model 3 (*LR* = 15.023 and 40.065, respectively). A significant association between only one factor variable, AUDOPINION, and UTL/DUTL appears in all four models. The UTL and DUTL in Models 1, 2, 3 and 4 are negatively significantly associated with AUDOPINION at the 1% level (*t*-statistics are -3.82 and -3.35, respectively; and Chi-squares = 7.534 and 5.996, respectively).

Table 6.4 Multivariate OLS and Logit regression results with dependent variables UTL and DUTL

All Firms	**Model 1 OLS**		**Model 2 OLS**		**Model 3 LOGIT**		**Model 4 LOGIT**	
Variable	Dependent: UTL		Dependent: UTL		Dependent: DUTL		Dependent: DUTL	
	α	*t*	*α*	*t*	*α*	*Chi-square*	*α*	*Chi-square*
Constant	37.555	3.15***	42.363	3.38***	-1.746	3.435*	-2.323	5.362**
SIZE	-0.303	-0.46	-0.161	-0.24	-0.010	0.055	-0.019	0.196
PROF	1.282	0.74	0.937	0.54	-0.053	0.243	-0.039	0.115
CAPS	-1.768	-0.57	-0.917	-0.3	-0.152	0.581	-0.248	1.164
COMPLEX	-0.122	-0.03	-0.551	-0.14	-0.334	1.789	-0.283	1.206
AUDFIRM	-1.008	-0.3	-2.067	-0.6	0.031	0.022	0.087	0.146
AUDOPINION	-30.230	-3.82***	-26.940	-3.35***	2.088	7.534***	1.916	5.996***
EQ	0.042	0.32	0.001	0	0.001	0.014	0.005	0.315
d_1			-4.362	-0.75			0.462	1.370
d_2			-12.980	-2.21**			1.710	18.0058***
d_3			-12.960	-2.4**			1.111	9.6261***
d_4			-11.570	-2.13**			1.087	9.147***
d_5			-15.110	-2.96***			1.091	10.2066***
	F-stat.	*2.23***	*F-stat.*	*2.32****	*Likelihood Ratio*	15.023	*Likelihood Ratio*	40.065
	Adj. R^2	*0.0198*	*Adj. R^2*	*0.0358*	*Sig.*	0.036	*Sig.*	<.0001

Note: UTL = Unexpected Reporting Time Lag, where UTL is this the current year's actual reporting time lag minus last's year actual reporting time lag; DUTL = Dummy of Unexpected Time Lag, where DUTL is dummy variable for UTL, coded as one if the current year's annual report release date (day and month) is earlier that last year's annual report release date and zero otherwise; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total

(table continues on following page)

assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality; and d_1-d_5 = time dummy variables, coded as one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $UTL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + e$

Model 2: $UTL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + \alpha_8d_1 + \alpha_9d_2 + \alpha_{10}d_3 + \alpha_{11}d_4 + \alpha_{12}d_5 + e$

Model 3: $DUTL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + e$

Model 4: $DUTL_{it}= \alpha_0 + \alpha_1SIZE_{it} + \alpha_2PROF_{it} + \alpha_3CAPS_{it} + \alpha_4COMPLEX_{it} + \alpha_5AUDFIRM_{it} + \alpha_6AUDOPINION_{it} + \alpha_7EQ_{it} + \alpha_8d_1 + \alpha_9d_2 + \alpha_{10}d_3 + \alpha_{11}d_4 + \alpha_{12}d_5 + e$

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

This result implies that firms with an unqualified audit opinion report in a more timely way than firms with an audit opinion other than unqualified. This result reinforces the main analysis (see Section 6.3.2.6) where the timeliness of financial reporting is related to audit opinion. This finding is consistent with Whittred (1980), who uses Australian data, Carslaw and Kaplan (1991) who use New Zealand data and Ashton *et al.* (1987) and Bamber *et al.* (1993) who both use US data. There is no evidence that the SIZE, PROF, COMPLEX, AUDFIRM and EQ are significantly associated with UTL or DUTL. The results, as shown in Table 6.4, also show that the time dummy variables of different years are statistically significant and indicate that the year analysis has an impact on the timeliness of the reporting of manufacturing firms in Indonesia.

6.4.2 Alternative Measures of Firm Size

In order to have a better understanding of the impact of firm size on timely reporting additional regression tests are conducted. The firm size of the independent variable is surrogated by alternative measures for robustness analysis. Previous studies such as Al-Ajmi (2008) used

alternative ways to measure firm size. These include the natural log of total assets at the end of the financial year and total number of employees. These proxies are used in the sensitivity analysis of this study to replace the market capitalisation in Equations (3.20) and (3.21) in Section 3.5.1. The regression results are presented in Table 6.5, with ATL as a dependent variable, and variations of firm size proxies. The results show that all *F*-statistics are significant at the 1 % level (*F*-statistics are 5.75, 3.95, 5.76 and 8.97, respectively). These findings are inconsistent with the main findings with no significant evidence is found for a relationship between firm size, proxies by the natural log of total assets and number of employees, and the timeliness of the financial reporting of manufacturing firms in Indonesia. Nonetheless, the regression results show evidence that the AUDOPINION and EQ independent variables are each significantly associated with the timeliness of financial reporting.

Table 6.5 Multivariate OLS regression results using alternative measure of independent variables (TA and EMPLOYEE) and ATL as dependent variable

	Model 1		**Model 2**		**Model 3**		**Model 4**	
	OLS		**OLS**		**OLS**		**OLS**	
Variable	***α***	***t***	***α***	***t***	***α***	***t***	***α***	***t***
Constant	123.144	9.03***	125.900	8.88***	118.400	19.27***	121.100	18.45***
TA	-0.363	-0.41	-0.357	-0.4				
EMPLOYEE					0.000	-0.44	0.000	-0.39
PROF	-0.415	-0.33	-0.808	-0.64	-0.435	-0.35	-0.837	-0.67
LEV	-0.558	-0.26	-0.187	-0.09	-0.597	-0.27	-0.232	-0.11
COMPLEX	2.725	0.94	2.772	0.96	2.504	0.9	2.553	0.91
AUDFIRM	1.077	0.45	2.098	0.83	1.055	0.44	2.029	0.81
AUDOPINION	-24.673	-4.36***	-25.630	-4.42***	-24.510	-4.36***	-25.420	-4.43***
EQ	-0.373	-3.98***	-0.383	-4.07***	-0.375	-4.03***	-0.385	-4.11***
d_1			-4.091	-0.98			-3.855	-0.93
d_2			-4.846	-1.15			-4.686	-1.12
d_3			2.615	0.68			2.756	0.72
d_4			-1.425	-0.37			-1.340	-0.35
d_5			-5.687	-1.56			-5.634	-1.55

(table continues on following page)

F-stat.	*5.75****	*F-stat.*	*3.95****	*F-stat.*	*5.76****	*F-stat.*	*8.97****
Sig.	*<.0001*	*Sig.*	*<.0001*	*Sig.*	*<.0001*	*Sig.*	*<.0001*
Adj. R^2	*0.0723*	*Adj. R^2*	*0.076*	*Adj. R^2*	*0.043*	*Adj. R^2*	*0.183*

Note: ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; CAPS = firm leverage, where CAPS is measured by the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; and EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality multiplied by -1 to indicate that a high value represents a high quality of earnings.

Model 1: $ATL_{it} = \alpha_0 + \alpha_1 TA_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 2: $ATL_{it} = \alpha_0 + \alpha_1 TA_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

Model 3: $ATL_{it} = \alpha_0 + \alpha_1 EMPLOYEE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 4: $ATL_{it} = \alpha_0 + \alpha_1 EMPLOYEE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

The regression results using DATL as a dependent variable and variations of proxies for firm size are presented in Table 6.6. The result of the regression using a DATL as the dependent variable shows no significant association between firm size measured by the natural log of total assets (TA) and DATL as the dependent variable. Nonetheless, the result in Models 3 and 4 show a significant association between firm size, proxied by the number of employees (EMPLOYEE) and DATL (Chi-Squares = 3.275 and 4.188, respectively). The result suggests that the time lag for financial reporting is explained by the firm's size if measured by the number of employees. This result is consistent with the main findings (refer to Section 6.3.2) that variation in firm size explains the timeliness of the financial reporting of manufacturing firms in Indonesia.

Table 6.6 Logit regression results using alternative measure of independent variables (TA and EMPLOYEE) and dependent variable DATL

All Firms	**Model 1 Logit**		**Model 2 Logit**		**Model 3 Logit**		**Model 4 Logit**	
Variable	**DATL**		**DATL**		**DATL**		**DATL**	
	α	*Chi-square*	*α*	*Chi-square*	*α*	*Chi-square*	*α*	*Chi-square*
Constant	-3.201	4.396**	-5.055	9.123***	-2.658	6.2869***	-3.416	9.126***
TA	0.047	0.349	0.125	2.012				
EMPLOYEE					0.000	3.275*	0.000	4.188**
PROF	0.125	1.199	0.037	0.095	0.108	0.918	0.039	0.106
LEV	-0.444	3.959*	-0.678	5.157**	-0.443	3.900*	-0.647	4.930
COMPLEX	-0.257	0.990	-0.204	0.532	-0.257	1.050	-0.159	0.338
AUDFIRM	-0.076	0.124	-0.047	0.035	-0.125	0.337	-0.051	0.043
AUDOPINION	2.773	7.0887***	2.930	7.1073***	2.803	7.252***	2.897	6.995***
EQ	0.007	0.612	0.010	1.225	0.006	0.569	0.011	1.412
d_1			0.433	1.112			0.345	0.717
d_2			2.459	28.803***			2.413	27.981***
d_3			1.836	22.856***			1.784	21.864***
d_4			1.103	9.001***			1.068	8.458***
d_5			-0.074	0.042			-0.106	0.085
	Likelihood Ratio	23.452	*Likelihood Ratio*	93.686	*Likelihood Ratio*	26.747	*Likelihood Ratio*	96.260
	Sig.	0.001	*Sig.*	<.0001	*Sig.*	0.000	*Sig.*	<.0001

Note: DATL = Dummy variable for Actual Reporting Time Lag, DATL is coded as one if the annual report release date is within 90 days after the financial year-end and zero otherwise; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality; and d1-d5 = time dummy variables, coded as one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $DATL_{it}= \alpha_0 + \alpha_1 TA_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 2: $DATL_{it}= \alpha_0 + \alpha_1 TA_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

Model 3: $DATL_{it}= \alpha_0 + \alpha_1 EMPLOYEE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 4: $DATL_{it}= \alpha_0 + \alpha_1 EMPLOYEE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

6.4.3 Alternative Measures of Profitability

The independent variable PROF is surrogated by alternative measures for robustness analysis. Previous studies have used alternative methods to measure a firm's good or bad news or profitability by using earnings per share (EPS) and sign of loss or profit (LOSSPROF) as proxies. EPS is firm's earnings per share at the end of the fiscal period. Following Boritz and Liu (2006) good news and bad news are proxied by a dummy variable of sign of earnings, coded one if the firm has positive earnings or profit and zero if the firm has negative earnings or loss. These proxies are used in the sensitivity analysis of this study to replace the return on total assets in Equations (3.20) and (3.21) (see Section 3.5.1).

The regression results in Table 6.7, using ATL as a dependent variable and variations of proxies for profitability show that all *F*-statistics are significant at the 1% level (*F*-statistics are 6.32, 3.10, 8.22 and 5.25, respectively).

The regression results in Table 6.7 for Models 1 and 2 show no evidence of an association between EPS and the reporting time lag (*t*-statistics = -0.13 and 0.24, respectively). For Models 3 and 4, the results, also show no significant association between ATL and LOSSPROF, with *t*-statistics = 0.96 and 1.10, respectively. These results suggest that the timeliness of the financial reporting of manufacturing firms in Indonesia is not explained by variation in firms' profitability, proxied by EPS and LOSSPROF. These findings are consistent with the results of this study's main analysis (refer to Section 6.3.2).

Table 6.7 Multivariate OLS regression results using alternative measure of independent variables (EPS and LOSSPROF) and dependent variable ATL

All Firms	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	OLS		**OLS**		**OLS**		**OLS**	
Variable	ATL		ATL		ATL		ATL	
	α	*t*	*α*	*t*	*α*	*t*	*α*	*t*
Constant	148.600	16.72***	151.800	16.59***	138.680	16.44***	142.380	16.08***
SIZE	-1.652	-3.59***	-1.710	-3.65***	-1.681	-3.56***	0.477	-3.51***
EPS	-0.073	-0.13	0.139	0.24				
LOSSPROF					2.639	0.96	3.077	1.1
CAPS	-1.404	-0.6	-0.871	-0.37	-2.197	-0.99	-1.913	-0.86
COMPLEX	4.739	1.82*	4.737	1.81*	1.849	0.67	1.796	0.65
AUDFIRM	0.422	0.18	1.339	0.54	0.869	0.38	2.362	0.98
AUDOPINION	-34.420	-5.3***	-35.380	-5.41***	-23.622	-4.25***	-25.443	-4.49***
EQ	-0.176	-1.68*	-0.186	-1.76*	-0.294	-3.17***	-0.304	-3.25***
d_1			-7.104	-1.69*			-1.919	-1.83*
d_2			-3.385	-0.81			-2.421	-1.44
d_3			-2.865	-0.77			4.589	0.2
d_4			0.670	0.19			6.477	-0.3
d_5			-5.694	-1.69*			3.268	-1.36
	F-stat.	*6.32***	*F-stat.*	*3.10***	*F-stat.*	*7.28***	*F-stat.*	*4.86***
	Adj. R^2	*0.1072*	*Adj. R^2*	*0.1117*	*Adj. R^2*	*0.0936*	*Adj. R^2*	*0.0981*

Note: ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; CAPS = firm leverage, where CAPS is measured by the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; and EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality multiplied by -1 to indicate that a high value represents a high quality of earnings.

Model 1: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 2: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

Model 3: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LOSSPROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 4: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LOSSPROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

The results of the regression in Table 6.8, using DATL as the dependent variable, show no evidence of a significant association between LOSSPROF and the timeliness of financial reporting. This result suggests that the time lag for financial reporting is not explained by firm profitability measured by the sign of loss or profit.

In addition, using DATL as the dependent variable shows a significant association between SIZE and timely reporting at the 1 and 10 % levels of significance (Chi-squares are 3.407, 5.885, 6.826 and 9.297, respectively). This result suggests that the time lag for financial reporting is explained by firm size. Thus, the timeliness of the release of the annual reports is associated with firm size.

Table 6.8 Logit regression results using alternative measure of independent variables (EPS and LOSSPROF) and dependent variable DATL

All Firms	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	LOGIT		**LOGIT**		**LOGIT**		**LOGIT**	
Variable	**DATL**		**DATL**		**DATL**		**DATL**	
	α	*Chi-square*	*α*	*Chi-square*	*α*	*Chi-square*	*α*	*Chi-square*
Constant	-16.741	0.001	-18.455	0.001	-3.987	10.704***	-5.282	15.446***
SIZE	0.097	3.407*	0.145	5.885**	0.122	6.8264***	0.161	9.2969***
EPS	0.074	1.423	0.053	0.547				
PROFLOSS					0.172	0.461	-0.072	0.062
CAPS	-0.308	1.172	-0.442	1.471	-0.356	2.408	-0.428	2.204
COMPLEX	-0.442	2.383	-0.438	1.984	-0.328	1.662	-0.254	0.839
AUDFIRM	0.156	0.355	0.254	0.728	-0.085	0.162	-0.043	0.030
AUDOPINION	15.495	0.001	15.822	0.001	2.776	7.075***	2.866	6.723***
EQ	0.002	0.048	0.000	0.000	0.009	1.074	0.013	1.743
d_1			0.614	1.539			0.450	1.213
d_2			2.531	18.614***			2.414	27.928***
d_3			2.179	21.226***			1.896	24.273***
d_4			1.006	5.748**			1.044	8.096***
d_5			0.056	0.019			-0.205	0.318
	Likelihood Ratio	24.709	*Likelihood Ratio*	76.344	*Likelihood Ratio*	28.975	*Likelihood Ratio*	102.378
	Sig.	0.001	*Sig.*	<.0001	*Sig.*	0.000	*Sig.*	<.0001

Note: : DATL = Dummy variable for Actual Reporting Time Lag, DATL is coded as one if the annual report release date is within 90 days after the financial year-end and zero otherwise; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is the net income to total assets; CAPS = firm leverage, where CAPS is the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = audit firm, where AUDFIRM is a dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = audit opinion, where AUDOPINION is a dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality; and d1-d5 = time dummy variables, coded as one if the year of the sample is 2003-2007, and zero otherwise.

Model 1: $DATL_{it}= \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 2: $DATL_{it}= \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

Model 3: $DATL_{it}= \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LOSSPROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 4: $DATL_{it}= \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LOSSPROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

6.4.4 Panel Regression Analysis

For sensitivity analysis this study also uses panel regressions with fixed effect and random effect for testing H_3 – H_9 related to RQ2. The statistical analysis system (SAS) software version 9.2 is used to run the Panel regressions in this study. Table 6.9 presents the results of the Panel regressions. The results using Panel regressions for Model 1 (Panel A) shows a negative statistically significant association between SIZE and ATL at the 1% level (*t*-statistic = -3.00). Further, Model 1 and Model 2 in Panel A also show a negative statistically significant association between AUDOPINION and ATL/UTL at the 1% level.

The result of the panel regression using random effects with ATL as the dependent variable (Model 1 in Panel B) shows a negative and statistically significant association between SIZE and ATL at the 1% level, a negative statistically significant association between AUDOPINION and ATL and also a negative statistically significant association between EQ and ATL at the 10 % level. Further, the result of the panel regression using UTL as the dependent variable (Model 2 in Panel B) consistently shows a negative statistically significant association between AUDOPINION and the time lag for reporting at the 1% level (*t*-statistic = 3.84). This result suggests that the time lag of financial reporting is explained by AUDOPINION.

The above findings indicate that the sensitivity analysis using Panel regressions with fixed and random effect are consistent with the findings of the main analysis in Section 6.3. Thus, the timeliness of financial reporting of manufacturing firms in Indonesia is explained by firm size, type of audit opinion and firm's earnings quality.

Table 6.9 Panel regression results using dependent variable: ATL and UTL

Panel A: Fixed effect				
	Model 1		**Model 2**	
	Dependent: ATL		**Dependent: UTL**	
Variable	*α*	*t*	*α*	*t*
Intercept	133.491	5.29***	-22.567	-0.5
SIZE	-3.976	-3.00***	1.338	0.57
PROF	1.279	0.82	-2.274	-0.82
CAPS	0.939	0.38	0.445	0.1
COMPLEX	0.000	0	0.000	0
AUDFIRM	0.834	0.24	1.818	0.29
AUDOPINION	-21.151	-3.44***	34.965	3.19***
EQ	-5.044	-1.31	9.215	1.34
Panel B: Random effect				
Variable	**Model 3**		**Model 4**	
	Dependent: ATL		**Dependent: UTL**	
	α	*t*	*α*	*t*
Intercept	147.671	12.11***	-56.498	-2.58***
SIZE	-2.915	-3.35***	1.466	0.94
PROF	1.141	0.86	-2.195	-0.96
CAPS	0.605	0.28	0.652	0.18
COMPLEX	3.690	0.45	2.004	0.13
AUDFIRM	0.217	0.08	1.879	0.4
AUDOPINION	-20.326	-3.98***	33.874	3.84***
EQ	-0.465	-1.65*	0.005	0.01

Note: ATL = Actual reporting time lag, where ATL is the number of days between the financial year-end and the annual report release date; UTL = Unexpected Reporting Time Lag, where UTL is this the current year's actual reporting time lag minus last's year actual reporting time lag; SIZE = firm size, where SIZE is the natural log of firm's market capitalization at the end of the financial year; PROF = firm profitability, where PROF is measured by the net income to total assets; CAPS = firm leverage, where CAPS is measured by the total debt to total assets; COMPLEX = complexity of firm's operation, where COMPLEX is measured by the number of branches using a dummy variable, coded as one if the firm has more than one branches and zero otherwise; AUDFIRM = dummy variable of audit firm, coded as one if the firm's annual report is audited by the Big Four audit firm and zero otherwise; and AUDOPINION = dummy variable of audit opinion, coded as one if the audited annual report has unqualified audit opinion and zero otherwise; and EQ = earnings quality, where EQ is the standard deviation of residuals calculated using Dechow and Dichev (2002) method of measuring earnings quality multiplied by -1 to indicate that a high value represents a high quality of earnings.

Model 1: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPROFPS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 2: $ATL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 EPROFS_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

(table continues on following page)

Model 3: $UTL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + e$

Model 4: $UTL_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 PROF_{it} + \alpha_3 CAPS_{it} + \alpha_4 COMPLEX_{it} + \alpha_5 AUDFIRM_{it} + \alpha_6 AUDOPINION_{it} + \alpha_7 EQ_{it} + \alpha_8 d_1 + \alpha_9 d_2 + \alpha_{10} d_3 + \alpha_{11} d_4 + \alpha_{12} d_5 + e$

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

6.5 Chapter Summary

This chapter presents the results of this study's examination of the determinant variables that affect the timeliness of the financial reporting of Indonesian manufacturing firms. Firm size, profitability, firm capital structure, complexity of operation, audit firm, audit opinion and earnings quality variables are expected to be factors that affect the timeliness of financial reporting.

This study uses multivariate regressions analysis with OLS, Logit model and Panel regression as estimation methods to test H_3 - H_9 related to RQ2. For the sensitivity analysis this study also used different proxies to measure the variables: timeliness of financial reporting; firm size; and profitability.

This study finds that firm size is a significant factor affecting the timeliness of financial reporting. A negative association between firm size and the timeliness of financial reporting in Indonesia is found, suggesting that larger manufacturing firms in Indonesia report in a more timely manner than do smaller firms. The regression results also show some evidence to support the hypothesis that capital structure, measured by firm's leverage, is associated with the timeliness of financial reporting.

The results also show that unqualified/qualified audit opinions are associated with the timeliness of the financial reporting of manufacturing firms in Indonesia. The study also finds that higher earnings quality is associated with a shorter time lag (timely reporting) in financial reporting. This suggests that firms with higher earnings quality release their annual reports earlier than firms with lower earnings quality. Finally, the study finds that a firm's profitability, operational complexity and audit firm size (audit type) are insignificant determinants of the timeliness of financial reporting in Indonesia, although other studies find these factors to be significant determinants of financial reporting in other countries.

Chapter 7: Summary and Conclusion

7.1 Introduction

This chapter summarises and concludes this study. Section 7.2 reviews the two research questions and their associated hypotheses, and their test results. Section 7.3 delineates this study's major contributions, followed by a discussion of the implications of the study's findings in Section 7.4. Section 7.5 discusses the study's limitations, followed by suggestions for future research in Section 7.6. Section 7.7 concludes this study.

7.2 Review of the Research Questions, Hypotheses, and Main Findings

The objectives of this study are twofold. The first is to assess how the Indonesian stock market reacts to both the timely and late release of annual reports by listed manufacturing firms. The second is to examine the determinants of stock market reaction to the release of annual reports and to examine the determinants of the timeliness of the financial reporting of manufacturing firms. The timeliness of financial reporting refers to the provision of financial information to users in a timely manner after a firm's financial year-end based on the financial reporting regulation in each country. To achieve the above objectives, this study formulates two research question motivated by existing research gaps uncovered in the literature survey of Chapter 2. The first research question (RQ1) of this study is whether the timeliness of the financial reporting of manufacturing firms in Indonesia affects the information content of their annual reports. The second research question (RQ2) asks how the seven determinants identified affect the timeliness of financial reporting, whether firm size, profitability, capital structure, operational complexity,

audit firm, audit opinion, and earnings quality explain differences in the timeliness of financial reporting of manufacturing firms in Indonesia. The following two subsections, Sections 7.2.1 and 7.2.2, summarise the hypotheses, methodology, and major findings related to each of the two research questions.

7.2.1 Research Question 1

The first research question this study investigates is whether the timely and late release of the annual reports by manufacturing firms in Indonesia affects the information content of these annual reports. The information content of annual reports is measured by how the stock market reacts to the release of the financial information (Beaver, 1968; Beaver *et al.*, 1980b; Biddle *et al.*, 1995; Cready and Mynatt, 1991). This was addressed by testing the first two hypotheses, H_1 and H_2. Using an unbalanced panel data totalling 568 unbalanced firm–year observations of manufacturing firms listed on the Indonesian capital market during the period 2003–2008, this study examines whether market reaction measured by abnormal returns (AR)[49] and cumulative average abnormal returns (CAR) around the release of annual reports differs significantly between timely reporting and late reporting firms. Event study methodology is used in this study to determine the stock market reaction toward the release of the annual reports (Ball and Brown, 1968; Binder, 1998; Bowman, 1983; Kothari and Warner, 2004; MacKinlay, 1997).

This study uses a univariate analysis comparing ARs and CARs between timely and later-reporting firms to test H_1, that is, whether the stock market reaction to the timely release of annual reports is significantly different from the reaction to the late release of annual reports.

[49] This study calculates abnormal return is based on daily stock returns (Brown and Warner, 1980).

Market models with beta adjusted according to the Scholes and Williams (1977) and Dimson (1979b) models are employed to calculate the abnormal returns.

The main *t*-test results show insignificant differences in market reaction between timely reporting and late reporting firms. Nonetheless, the robustness test of year-by-year analysis to investigate H_1 shows a statistically significant difference between stock market reaction in 2004, 2006, 2007, and 2008 between timely and late reporting firms. Therefore, the results of yearly analysis provide some evidence to support H_1.

The second hypothesis, H_2, predicts that stock market reaction around the release of annual reports is affected by the reporting timeliness of manufacturing firms after controlling for firm size, profitability and leverage. The analysis is performed using multivariate regressions with CARs with Scholes-Williams beta (CAR_{SW}) and CARs with Dimson beta (CAR_D), using various event windows ($CAR_{SW(-2,+2)}$, $CAR_{SW(-7,+7)}$, $CAR_{SW(0,+10)}$, $CAR_{SW(-10,+10)}$, $CAR_{D(-2,+2)}$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$, and $CAR_{D(-10,+10)}$) for the dependent variable as the measure of stock market reaction (Kothari, 2001).

From an analysis using 568 firm–year observations, this study finds that the actual reporting time lag (ATL), that is, the number of days between the date of the release of the annual reports and firm financial year-end, is significantly negatively associated with $CAR_{SW(-7,+7)}$, $CAR_{SW(-10,+10)}$, $CAR_{D(-7,+7)}$, $CAR_{D(0,+10)}$, and $CAR_{D(-10,+10)}$. These results indicate that the financial reporting timeliness of manufacturing firms affects the information content of their annual reports, supporting this study's second hypothesis. Timely firms generate greater market reaction,

indicating the greater information content of their annual reports compared to those of late reporting firms. Further, this result is supported by an analysis using alternative measures of timeliness. These alternative measures are: the dummy variable of actual reporting time lag (DATL) which is coded one if the firm's release date of its annual report is classified as timely and coded zero otherwise, unexpected reporting time lag (UTL) which is this year's actual reporting time lag minus the previous year's actual reporting time lag, and a dummy variable for UTL (DUTL) which is code one if the firm's release date (day and month) of its annual report this year is earlier than the previous year's release date of the report and coded zero otherwise.

Overall, this study concludes that the results of multivariate analysis provide evidence to support H_2 that the information content of annual reports is greater for timely reporting firms than for late reporting firms, with controlling firm size, profitability and leverage, of Indonesian manufacturing firms during 2003–2008. This study finding is consistent with that of Atiase *et al.* (1989). Table 7.1 summarises RQ1, associated hypotheses (H_1 and H_2), the testing procedure to test theses hypotheses and the findings.

Table 7.1 Summary for Research Question 1

RQ1: Does the timeliness of financial reporting of manufacturing firms in Indonesia affect the information content of annual reports (the stock market reaction around the release of annual reports)?		
Hypotheses	**Testing procedure**	**Findings**
H_1: The stock market reaction around the timely release of annual reports is significantly different from the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia.	H_1 is tested using independent *t*-test, comparing the stock market reaction to the release of annual reports between timely reporting firms and late reporting firms.	The results from the yearly analysis show some evidence to support H_1. The findings indicate that stock market reaction to the timely release of annual reports is significantly different from the reaction to the late release of annual report. Thus, H_1 is partially-supported.
H_2: The stock market reaction around the timely release of annual reports is greater than the stock market reaction around the late release of annual reports of manufacturing firms in Indonesia while controlling for firm size, profitability and leverage.	H_2 is tested using OLS multiple regression model for the main tests using Equations (3.12) - (3.19) (refer to Section 3.4.4 of Chapter 3). Panel regression model is used to test the robustness of the results.	The results from the main test and robustness test show evidence to support H_2. The findings indicate that stock market reaction around the timely release of annual reports is greater than the stock market reaction around the late release of annual reports with controlling for firm size, profitability and leverage. Thus, H_2 is well-supported.

7.2.2 Research Question 2

This study's second research question (RQ2) investigates whether firm characteristics and audit factors (i.e., firm size, profitability, capital structure, operational complexity, earnings quality, audit firms, and audit opinion) explain variations in the timeliness of the financial reporting of listed manufacturing firms in Indonesia. Multivariate regression, a Logit model and Panel regression model are implemented to test the hypotheses related to RQ2. These analyses are applied to an unbalanced panel of 157 manufacturing firms, totalling 568 firm–year observations.

The main findings are as follows. First, firm size is a significant factor influencing the financial reporting timeliness of manufacturing firms in Indonesia. This finding shows support for H_3 that larger firms release their annual reports in a more timely way than do smaller manufacturing firms in Indonesia, as evidenced by a statistically significant negative association between firm size and the timeliness of financial reporting, proxied by actual reporting time lag. Second, this study finds some evidence to support for H_5 that firm leverage is associated with the timeliness of the financial reporting. Third, firms with unqualified audit opinions tend to have a shorter actual reporting time lag than firms with opinions other than unqualified opinions. Evidence is found in this study to support H_8 shows a statistically significant association between auditor opinion and timeliness of financial reporting.

In addition, the fourth finding shows that earnings quality has statistically significant negative association with the timeliness of the financial reporting of manufacturing firms. The findings show that higher earnings quality is associated with a shorter actual reporting time lag, and thus support H_9.

Finally, this study finds no evidence of association between ATL and profitability. This study suggests that good or bad news concerning the firm's profitability does not affect the length of reporting time lag in Indonesia. Further, the regression results also show no evidence of association between ATL and operational complexity and the size of the audit firm. This indicates that a manufacturing firm's operational complexity and its auditor size do not explain variations in the timeliness of reporting in Indonesia. Thus this study does not support H_4, H_6 and H_7. Table 7.2 summarises RQ2, associated hypotheses ($H_3 – H_9$), the empirical testing procedure to test theses hypotheses and the findings.

Table 7.2 Summary of Research Question 2

RQ2: How do firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality affect the timeliness of financial reporting of manufacturing firms in Indonesia?		
Hypotheses	**Testing procedure**	**Findings**
H_3: Firm size is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_3 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show evidence to support H_3. The findings indicate that firm size is negatively significant associated with the timeliness of financial reporting. Thus, H_3 is well-supported.
H_4: Profitability is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_4 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show no evidence to support H_4. The findings indicate that profitability is not associated with the timeliness of financial reporting. Thus, H_4 is not supported.
H_5: Capital structure is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_5 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the logistic regression model show some evidence to support H_5. The findings indicate that firm leverage is negatively significant associated with the timeliness of financial reporting. Thus, H_5 is partially-supported.
H_6: Operational complexity is positively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_6 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show no evidence to support H_6. The findings indicate that firm's operational complexity is not associated with the timeliness of financial reporting. Thus, H_6 is not supported.
H_7: Big Four/non-Big Four audit firms are associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_7 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show no evidence to support H_7. The findings indicate that audit firm size (audit firm type) is not associated with the timeliness of financial reporting. Thus, H_7 is not supported.

(table continues on following page)

RQ2: How do firm size, profitability, capital structure, operational complexity, audit firm, audit opinion, and earnings quality affect the timeliness of financial reporting of manufacturing firms in Indonesia?		
Hypotheses	**Testing procedure**	**Findings**
H_8: Audit opinion is associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_8 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show evidence to support H_8. The findings indicate that audit opinion is significantly associated with the timeliness of financial reporting. Thus, H_8 is well-supported.
H_9: Earnings quality is negatively associated with the timeliness of financial reporting of manufacturing firms in Indonesia.	H_9 is tested using OLS regression model (Equations (3.20) and (3.21)) as the main test and Logistic regression model for Equations (3.22) and (3.23) (Section 3.51). Panel regression model is used to test the robustness of the main results.	The results from the main test and robustness test show evidence to support H_9. The findings indicate that earnings quality is negatively significant associated with the timeliness of financial reporting. Thus, H_9 is well-supported.

7.3 Academic Contribution

This study contributes to the literature in several ways. First, as far as could be ascertained, this is the first study to comprehensively study Indonesian financial reporting timeliness for listed manufacturing firms. The literature on financial reporting timeliness focuses mainly on developed markets; however, several recent studies focus on emerging markets. Second, this study contributes to the information content literature by examining the association between the information content of annual reports, measured by the stock market reaction to the release of the annual reports, and the timeliness of financial reporting. Although research has been undertaken to examine financial reporting timeliness, there is a gap in the literature with respect to how the stock market reacts to the reporting timeliness in an emerging market. To the best of my knowledge this study is the first study to examine how the timeliness of financial reporting affects the stock market reaction to the release of the annual reports of manufacturing firms in an emerging market such as Indonesian Stock Exchange (IDX).

Third, this study identifies the determinants of financial reporting timeliness, specifically for publicly-listed manufacturing firms in Indonesia. It extends prior studies by providing important empirical evidence regarding how firm's size, profitability, leverage, operational complexity, earnings quality and audit factors affect financial reporting timeliness. Specifically, to the best of my knowledge, this study is the first to examine how earnings quality, measured according to Dechow and Dichev's (2002) model, affects the financial reporting timeliness.

7.4 Implications

This study's findings have the following implications. Its empirical evidence for the effect of the reporting timeliness of manufacturing firms on stock market reaction to the release of annual reports has policy implication for regulatory stock market agency in Indonesia. This policy implication is important for assessing the financial reporting regulation, regulated by the Indonesian Capital Market Supervisory Agency (ICMSA), regarding the deadline for releasing annual reports to the public.

From a capital market perspective, this study provides evidence for the information content of annual reports, measured by the stock market reaction to the release of annual reports, when comparing between timely reporting and late reporting firms. The results of this study show that timely reporting firms generate greater stock market reaction to the release of their annual reports and thus greater information content, than do late reporting firms. Based on these results, this study suggests that timely financial reporting is more useful for users and therefore regulatory enforcement of the requirement that firms report on time should be strengthened. This study also

provides empirical evidence on timeliness reporting helpful to standard setters in determining the most appropriate time frames for submitting annual reports to ensure that these reports remain useful.

This study's findings show that the average overall time lag of financial reporting in Indonesia during the period 2003–2008 was 98 days which indicates that Indonesian firms, on average, are not complying with the deadline to submit to the ICMSA 90 days after the financial year-end. Regulators should enforce the 90-day period for the submission of annual reports by imposing strict sanctions or penalties on firms who do not comply with the regulation requirements.

This study's findings on the determinants of financial reporting timeliness in Indonesia may help shareholders and regulators to assess the impact of such variables (firm's characteristics, audit factors and earnings quality) on improving the timeliness of financial reporting in Indonesia. The results indicate that larger firms report timelier than smaller firms. This suggests that the reporting regulation regarding annual report release requirements within a limited period for larger firms could be different from the regulation for smaller firms. Users of annual reports also need to consider firm earnings quality when taking into account the financial reporting timeliness in their decision-making. Hence, timely reporting firms tend to have higher earnings quality than late reporting firms.

7.5 Limitations

The study is subject to the following limitations. The first limitation is that this study only examines the Indonesian manufacturing industry as, due to time limitations, it is not possible to

study more than one industry sector of all listed firms on the IDX. Although this limits the generalizability of this study's findings on the timeliness of reporting to all firms listed on the IDX, the manufacturing industry nevertheless comprises the major firms listed on the IDX.

The second limitation relates to the size of the sample. Compared to the population of all listed firm–year observations, the final sample for this study is relatively small (568 observations). The reason for this small sample is because of the availability of the data. The final limitation is that this study only uses annual reports for financial information, and these are only part of the information set available to users. There are other, internal financial information sources for firms that are not published or shared with interested parties, and these other sources could be tested or controlled as control variables.

7.6 Future Research

The results of this study as well as the limitations considered in Section 7.5 suggest several directions for future research. First, since this study focuses on manufacturing firms listed on the IDX and not on all listed firms, future research studies could examine the financial reporting timeliness of other industries listed on the IDX such as agriculture, banking, mining, telecommunications, insurance, travel, and other services. Ashton *et al.* (1989) and Ng and Tai (1994) find that industry membership influences the reporting delay of members' firm reports.

Second, further research could investigate other determinants of reporting timeliness in Indonesia. It could consider variables such as corporate governance (Al-Ajmi, 2008), extraordinary items (Owusu-Ansah, 2000), and family ownership (Jaggi and Tsui, 1999).

Third, this study documents the effect of timeliness of financial reporting on the information content of annual reports as measured by market reaction and determined by CAR. Future studies could examine the influence of timely reporting on market reaction surrounding the release of annual reports based on other measures of the stock market reaction such as based on trading volume.

Finally, other research directions in regard to financial reporting timeliness relate to the adoption of International Financial Reporting Standards (IFRS) which started in Indonesia in 2012. Future studies could investigate the influence of the harmonisation of accounting standards on timely reporting in Indonesia and differences in the timeliness of financial reporting before and after the adoption of IFRS.

7.7 Conclusion

The timeliness of financial reporting in emerging markets, such as the IDX, is crucial, since information in these markets is relatively limited and has a longer reporting time lag. Timely reporting enhances decision-making and reduces information asymmetry in emerging markets. Hence, exploring the information content and the determinants of timeliness of financial reporting should aid regulators of emerging capital markets in formulating new policies to improve market allocation efficiency (Owusu-Ansah and Leventis, 2006).

Using univariate tests, this study provides some evidence to support that the market reaction to the release of the annual reports is significantly different between timely reporting and late

reporting firms based on yearly analysis. Further, by using multivariate tests and controlling for some firm variables (i.e. firm size, profitability and leverage) this study also provides empirical evidence that the timeliness of the financial reporting of manufacturing firms in Indonesia is associated with market reaction around the release of the annual reports. This finding supports those of Atiase *et al.* (1989), Chambers and Penman (1984) and Givoly and Palmon (1982).

This study provides empirical evidence that firm size, auditor opinion, and earnings quality are statistically significantly associated with timeliness of financial reporting of Indonesian manufacturing firms. A statistically significant negative association between firm size and reporting time lag is consistently supported by this study's main and robustness tests. This finding indicates that larger firms have shorter reporting time lags, consistent with the findings of major prior studies (e.g., Davies and Whittred, 1980; Dyer and McHugh, 1975; Ismail and Chandler, 2004; Mahajan and Chander, 2008). Further, this study indicates that auditor opinion is a factor that affects the timeliness of the financial reporting of Indonesian manufacturing firms. This association is consistent with prior studies, such as those of Whittred (1980) for Australian data, Carslaw and Kaplan (1991) for New Zealand data, and Ashton *et al.* (1987) and Bamber *et al.* (1993) for U.S. data. This study also finds some evidence to support that firm capital structure (firm leverage) is associated with the timeliness of the financial reporting. Lastly, this study finds that the timeliness of financial reporting of Indonesian manufacturing firms is not associated with the firm profitability, operational complexity and the size of the audit firm (audit firm type).

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Appendix A

Manufacturing firms in Indonesia

Table A. 1 Table List of Manufacturing Firms Listed on Indonesian Stock Exchange as of December 2009.

Manufacturing		
1. Food and Beverages		
	***NTICKB* (Code)**	**Firm's Name**
1	ADES	Ades Alfindo Putrasetia Tbk
2	AQUA	Aqua Golden Mississippi Tbk
3	AISA	Asia Intiselera Tbk
4	CEKA	Cahaya Kalbar Tbk
5	DAVO	Davomas Abadi Tbk
6	DLTA	Delta Djakarta Tbk
7	FAST	Fast Food Indonesia Tbk
8	INDF	Indofood Sukses Makmur Tbk
9	MYOR	Mayora Indah Tbk
10	MWON	Miwon Indonesia Tbk
11	MLBI	Multi Bintang Indonesia Tbk
12	PTSP	Pioneerindo Gourmet International (d/h Putra Sejahtera Pioneerindo (CFC)) Tbk
13	PSDN	Prasidha Aneka Niaga Tbk
14	SHDA	Sari Husada Tbk
15	SKLT	Sekar Laut Tbk

16	STTP	Siantar TOP Tbk
17	SIPD	Sierad Produce Tbk
18	SMAR	Sinar Mas Agro Resources and Technology Corporation (SMART) Tbk
19	SUBA	Suba Indah Tbk
20	TBLA	Tunas Baru Lampung Tbk
21	ULTJ	Ultra Jaya Milk Industry and Trading Company Tbk

2. Tobacco Manufacturers

22	BATI	BAT Indonesia Tbk
23	GGRM	Gudang Garam Tbk
24	HMSP	H M Sampoerna Tbk

3. Textile mill Products

25	ARGO	Argo Pantes Tbk
26	CNTX	Century Textile Industry (Centex) Tbk
27	ERTX	Eratex Djaja Limited Tbk
28	HDTX	Panasia Indosyntec Tbk
29	PAFI	Panasia Filament Inti Tbk
30	RDTX	Roda Vivatex Tbk
31	SSTM	Sunson Textile Manufacture Tbk
32	TFCO	Teijin Indonesia Fiber Corporation (Tifico) Tbk
33	TEJA	Textile Manufacturing Company Jaya (Texmaco Jaya) Tbk

4. Apparel and Other Textile Products

34	MYTX	APAC Citra Centertex Tbk
35	DOID	Daeyu Orchid Indonesia Tbk
36	ESTI	Ever Shine Textile Industry Tbk
37	FMII	Fortune Mate Indonesia Tbk
38	GRIV	Great River International Tbk
39	MYRX	Hanson Industri Utama Tbk
40	INDR	Indorama Syntetics Tbk
41	KARW	Karwell Indonesia Tbk
42	GDWU	Kasogi International Tbk
43	PBRX	Pan Brothers Tex Tbk
44	BIMA	Primarindo Asia Infrastructure Tbk
45	RICY	Ricky Putra Globalindo Tbk
46	RYAN	Ryane Adibusana Tbk
47	SRSN	Sarasa Nugraha Tbk
48	BATA	Sepatu Bata Tbk
49	SIMM	Surya Intrindo Makmur Tbk
5. Lumber and Wood Products		
50	BRPT	Barito Pacific Timber Tbk
51	DSUC	Daya Sakti Unggul Corporation Tbk
52	SULI	Sumalindo Lestari Jaya Tbk
53	SUDI	Surya Dumai Industri Tbk
54	TIRT	Tirta Mahakam Plywood Industry Tbk
55	FASW	Fajar Surya Wisesa Tbk

56	INKP	Indah Kiat Pulp and Paper Corporation Tbk
57	TKIM	Pabrik Kertas Tjiwi Kimia Tbk
58	SPMA	Suparma Tbk
59	SAIP	Surabaya Agung Industry Pulp Tbk
7. Chemical and Allied Products		
60	AKRA	Aneka Kimia Raya Tbk
61	BUDI	Budi Acid Jaya Tbk
62	CLPI	Colorpak Indonesia Tbk
63	ETWA	Eterindo Wahanatama Tbk
64	LTLS	Lautan Luas Tbk
65	POLY	Polysindo Eka Perkasa Tbk
66	SOBI	Sorini Corporation Tbk
67	TPIA	Tri Polyta Indonesia Tbk
68	UNIC	Unggul Indah Cahaya Tbk
8. Adhesive		
69	DPNS	Duta Pertiwi Nusantara Tbk
70	EKAD	Ekadharma Tape Industries Tbk
71	INCI	Intan Wijaya Internasional Tbk
72	KKGI	Kurnia Kapuas Utama Glue IndustriesTbk
9. Plastics and Glass Products		
73	AKPI	Argha Karya Prima Industry Tbk
74	AMFG	Asahimas Flat Glass Co Ltd Tbk
75	APLI	Asiaplast Industries Tbk

76	BRNA	Berlina Co Ltd Tbk
77	DYNA	Dynaplast Tbk
78	FPNI	Fatrapolindo Nusa Industri Tbk
79	IGAR	Igarjaya Tbk
80	LMPI	Langgeng Makmur Plastik Industry Ltd Tbk
81	LAPD	Lapindo Packaging Tbk
82	PLAS	Plaspack Prima Industri Tbk
83	SIMA	Siwani Makmur Tbk
84	SMPL	Summiplast Interbenua Tbk
85	TRST	Trias Sentosa Tbk
86	UGAR	Wahana Jaya Perkasa Tbk
10. Cement		
87	INTP	Indocement Tunggal Perkasa Tbk
88	SMCB	Semen Cibinong Tbk
89	SMGR	Semen Gresik (Persero) Tbk
11. Metal and Allied Products		
90	ALKA	Alakasa Industrindo Tbk
91	ALMI	Alumindo Light Metal Industry Tbk
92	BTON	Betonjaya Manunggal Tbk
93	CTBN	Citra Tubindo Tbk
94	INAI	Indal Aluminium Industry Tbk
95	JKSW	Jakarta Kyoei Steel Works Ltd Tbk
96	JPRS	Jaya Pari Steel Tbk

97	LMSH	Lion Mesh Prima Tbk
98	LION	Lion Metal Works Tbk
99	PICO	Pelangi Indah Canindo Tbk
100	TBMS	Tembaga Mulia Semanan Tbk
101	TIRA	Tira Austenite Tbk
12. Fabricated Metal Products		
102	ITMA	Itamaraya Gold Industry Tbk
103	KICI	Kedaung Indah Cantik Tbk
104	KDSI	Kedawung Setia Industrial Tbk
13. Stone, Clay, Glass and Concrete Products		
105	ARNA	Arwana Citra Mulia Tbk
106	IKAI	Intikeramik Alamasri Industry Tbk
107	KIAS	Keramika Indonesia Assosiasi Tbk
108	MLIA	Mulia Industrindo Tbk
109	TOTO	Surya Toto Indonesia Tbk
14. Machinery		
110	KOMI	Komatsu Indonesia Tbk
111	TPEN	Texmaco Perkasa Enginering Tbk
15. Cable		
112	KBLI	GT Kabel Indonesia Tbk
113	JECC	Jembo Cable Company Tbk
114	KBLM	Kabelindo Murni Tbk
115	IKBI	Sumi Indo Kabel Tbk

116	SCCO	Supreme Cable Manufacturing Corporation (Sucaco) Tbk
117	VOKS	Voksel Electric Tbk
16. Electronic and Office Equipment		
118	ASGR	Astra Graphia Tbk
119	MTDL	Metrodata Electronics Tbk
120	MLPL	Multipolar Corporation Tbk
121	TRPK	Trafindo Perkasa Tbk
17. Automotive and Allied Products		
122	ACAP	Andhi Chandra Automotive Products Tbk
123	ASII	Astra International Tbk
124	AUTO	Astra Otoparts Tbk
125	BRAM	Branta Mulia Tbk
126	GJTL	Gajah Tunggal Tbk
127	GDYR	Goodyear Indonesia Tbk
128	ADMG	GT Petrochem Industries Tbk
129	HEXA	Hexindo Adiperkasa Tbk
130	IMAS	Indomobil Sukses International Tbk
131	INDS	Indospring Tbk
132	INTA	Intraco Penta Tbk
133	LPIN	Multi Prima Sejahtera Tbk
134	NIPS	Nipress Tbk
135	PRAS	Prima Alloy Steel Tbk
136	SUGI	Sugi Samapersada

137	SMSM	Selamat Sempurna Tbk
138	TURI	Tunas Ridean Tbk
139	UNTR	United Tractors Tbk
18. Photographic Equipment		
140	INTD	Inter Delta Tbk
141	MDRN	Modern Photo Film CompanyTbk
142	KONI	Perdana Bangun Pusaka Tbk
19. Pharmaceuticals		
143	BYSP	Bayer Indonesia Tbk
144	DNKS	Dankos Laboratories Tbk
145	DVLA	Darya-Varia Laboratoria Tbk
146	INAF	Indofarma Tbk
147	KLBF	Kalbe Farma Tbk
148	KAEF	Kimia Farma Tbk
149	MERK	Merck Indonesia Tbk
150	PYFA	Pyridam Farma Tbk
151	SCPI	Schering Plough Indonesia Tbk
152	SQBI	Squibb Indonesia Tbk
153	TSPC	Tempo Scan Pacific Tbk
20. Consumer Goods		
154	MRAT	Mustika Ratu Tbk
155	PGIN	Procter and Gambler Indonesia Tbk
156	TCID	Tancho Indonesia Tbk

157	UNVR	Unilever Indonesia Tbk

Appendix B

Actual Reporting Time Lag Profile of Indonesian Manufacturing Firms

The time lag profile of selected manufacturing firms in Indonesia during 2003–2008 is shown in Tables B.1. The summary statistics of 568 firms show that, from the interval of time lag for reporting, 213 firms (49 %) reported beyond the regulatory limit, which implies that the compliance rate is still low. Although 221 firms reported by the due date (90 days after financial year end), a large number of firms (50 %) took as long as they were allowed to submit their reports and only four firms (1 %) took less than two months to report.

Table B.1 Number of firms' annual reports during the interval of time lag for reporting, 2003–2008

Time lag (in days)	**Number of annual reports**	**Percentage**
0–60 days	4	1
61–90 days	289	50
91–120 days	246	40
>120 days	39	9
TOTAL	568	100

Appendix C

Assumption of Multiple Regressions

Diagnostic tests, based on pooled-OLS multiple regression, are calculated with each empirical multiple regression model for multicollinearity and heteroscedaticity.

Multicollinearity Test using Variance Inflation Factor (VIF)

The variation inflation factor is calculated as:

$$VIF = \frac{1}{1 + R^2}$$

where R^2 is from regressing each right hand side variables (i.e. repressors) on rest of the right hand side variables. The guidelines for the presence of multicollinearity is that the largest VIF is greater than 10. No calculated VIF is greater than 5 in any of the models.

Heteroscedaticity Test

Violation of homoscedasticity, which is known as heteroscedasticity, means a situation in which the variance of the dependent variable varies across the data. Putting the studentized residuals against the predicted dependent values and comparing them to null plots shows a consistent pattern if the variance is not constant. No evidence was found for hetroscedasticity in any of the models.

Appendix D

Example of Program used in Statistical Analysis System (SAS) version 9.2

D.1 Calculating Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR)

```
/*Year 2003 Merge data return with JCI (IHSG)*/
PROC SORT DATA=Master OUT=Master01;
BY date;
RUN;

PROC SORT DATA=Jci OUT=Jci_;
BY date;
RUN;

Data Indo03;
Merge Master01 Jci_;
By date;
Run;

PROC SORT DATA=Indo03 OUT=Indo031;
BY NTICKB date;
RUN;

Data Indo032;
Set Indo031;
if NTICKB=" " then delete;
run;

PROC SORT DATA=Indo032 OUT=Indo033;
BY NTICKB date;
RUN;


proc expand data=Indo033 out=LagJCI method = none;
by NTICKB;
convert JCI = Lag1_JCI  / transformout=(lag 1);
run;

/*Calculate return market*/
PROC SORT DATA=LagJCI out=Indo034;
BY NTICKB date;
RUN;
```

```
Data Indo035;
Set Indo034;
RM=log(JCI/Lag1_JCI);
run;

/*Lag Lead data return market*/

PROC SORT DATA=Indo035 out=Indo036;
BY NTICKB date;
RUN;

proc expand data=Indo036 out=Indo037 method = none;
by NTICKB;
convert RM = Lag1_RM  / transformout=(lag 3);
convert RM = Lag2_RM  / transformout=(lag 2);
convert RM = Lag3_RM  / transformout=(lag 1);
convert RM = Lead1_RM  / transformout=(lead 3);
convert RM = Lead2_RM  / transformout=(lead 2);
convert RM = Lead3_RM  / transformout=(lead 1);
convert RM;
run;


/*Separate data estimation 200 days data event period -10 0 +10 space 5 days from estimation*/
Data Indo038;
Set Indo037;
If TD_COUNT<=-216 or TD_COUNT>=11 then delete;
If TD_COUNT=-11 or TD_COUNT=-12 or TD_COUNT=-13 or TD_COUNT=-14 or
TD_COUNT=-15 then delete;
If TD_COUNT=-10 or TD_COUNT=-9 or TD_COUNT=-8 or TD_COUNT=-7 or
TD_COUNT=-6 or
TD_COUNT=-5 or TD_COUNT=-4 or TD_COUNT=-3 or TD_COUNT=-2 or TD_COUNT=-1
or TD_COUNT=0
or TD_COUNT=1 or TD_COUNT=2 or TD_COUNT=3 or TD_COUNT=4 or TD_COUNT=5
or TD_COUNT=6
or TD_COUNT=10 or TD_COUNT=9 or TD_COUNT=8 or TD_COUNT=7 then
ESTOREVT=1;
Else ESTOREVT=0;
Run;

Data ESTPER03;
Set Indo038;
if ESTOREVT=0 then output ESTPER03;
run;

Data EVTPER03;
```

```
Set Indo038;
if ESTOREVT=1 then output EVTPER03;
run;

Proc reg data=ESTPER03 outest=B0(rename=(intercept=alpha RM=BETA)
Keep = Ntickb intercept RM) noprint;
by Ntickb;
model Return = RM;
run;

Proc reg data=ESTPER03 outest=B1(rename=(intercept=alpha Lag1_RM=BETA1)
Keep = Ntickb intercept Lag1_RM) noprint;
by Ntickb;
model Return = Lag1_RM;
run;

Proc reg data=ESTPER03 outest=Blead1(rename=(intercept=alpha Lead1_RM=BETALead)
Keep = Ntickb intercept Lead1_RM) noprint;
by Ntickb;
model Return = Lead1_RM;
run;

Proc reg data=ESTPER03 outest=CorRM(rename=(intercept=alpha Lag1_RM=CorRm)
Keep = Ntickb intercept Lag1_RM) noprint;
by Ntickb;
model RM = Lag1_RM;
run;

Proc reg data=ESTPER03 outest=BDim(rename=(intercept=alpha RM=BETA0
Lag1_RM=BLag1 Lag2_RM=BLag2 Lag3_RM=BLag3 Lead1_RM=BLead1
Lead2_RM=BLead2 Lead3_RM=BLead3)
Keep = Ntickb intercept RM Lag1_RM Lag2_RM Lag3_RM Lead1_RM Lead2_RM
Lead3_RM) noprint;
by Ntickb;
model Return = RM Lag1_RM Lag2_RM Lag3_RM Lead1_RM Lead2_RM Lead3_RM;
run;

Data SumBdim;
Set Bdim;
SumBeta = BETA0 + BLag1 + BLag2 + BLag3 + BLead1 + BLead2 + BLead3;
by Ntickb;
Run;

Proc sort data=SumDim out=Sumdim1;
by NTICKB date;
run;
```

```
PROC MEANS DATA=estper03 NWAY;
  VAR rETURN;
  OUTPUT OUT=AVEr MEAN=aVER;
  BY NTICKB;
RUN;
PROC MEANS DATA=estper03 NWAY;
  VAR RM;
  OUTPUT OUT=AVERM MEAN=aVERM;
  BY NTICKB;
RUN;

Proc sort data=Evtper03 Out=Evtper03_;
by NTICKB;
run;

Proc sort data=B0 Out=B0_;
by NTICKB;
run;

Data Indo039;
Merge Evtper03_ B0_;
By NTICKB;
Run;

Proc sort data=B1 Out=B1_;
by NTICKB;
run;

Data Indo0310;
Merge Indo039 B1_;
By NTICKB;
Run;

Proc sort data=SumBdim Out=SumBdim_;
by NTICKB;
run;

Data Indo0311;
Merge Indo0310 SumBdim_;
By NTICKB;
Run;

Proc sort data=aver Out=aver_;
by NTICKB;
run;
```

```
Data Indo0313;
Merge Indo0312 aver_;
By NTICKB;
Run;

Proc sort data=averm Out=averm_;
by NTICKB;
run;

Data Indo0314;
Merge Indo0313 averm_;
By NTICKB;
Run;

Proc sort data=blead1 Out=blead1_;
by NTICKB;
run;

Data Indo0315;
Merge Indo0314 blead1_;
By NTICKB;
Run;

Proc sort data=corrm Out=corrm_;
by NTICKB;
run;

Data Indo0316;
Merge Indo0315 corrm_;
By NTICKB;
Run;

Data Indo0317;
Set Indo0316;
BSchsum = Beta + Beta1 + Betalead;
run;

Data Indo0318;
Set Indo0317;
DivSch = 1 + (2*Corrm);
run;

Data Indo0319;
Set Indo0318;
BetaSchW = BSchsum / DivSch;
```

```
run;

Data Indo0320;
Set Indo0319;
ASchW = AveR - (BetaSchW * AveRm);
run;

Data Indo0321;
Set Indo0320;
BetaDim = SumBeta;
run;

Data Indo0322;
Set Indo0321;
ADim = AveR - (BetaDIm * AveRm);
run;

Data Indo0323;
Set Indo0322;
EXRSchW = ASchW + BetaSchW * RM;
run;

Data Indo0324;
Set Indo0323;
EXRDim = ADim + BetaDim * RM;
run;

Data Indo0325;
Set Indo0324;
ABRTSchW = Return - EXRSchW;
run;

Data Indo0326;
Set Indo0325;
ABRTDim = Return - EXRDim;
run;

Proc reg data=ESTPER outest=B0ln(rename=(intercept=alpha Return_Market_ln=BETA)
Keep = Ntickb intercept Return_Market_ln) noprint;
by Ntickb;
model Return_ln = Return_Market_ln;
run;

Proc reg data=ESTPER outest=Blag1ln(rename=(intercept=alpha Lag1RM=BETA)
Keep = Ntickb intercept Lag1RM) noprint;
by Ntickb;
```

```
model Return_ln = Lag1RM;
run;


Proc reg data=ESTPER outest=Blead1ln(rename=(intercept=alpha Lead1RM=BETA)
Keep = Ntickb intercept Lead1RM) noprint;
by Ntickb;
model Return_ln = Lead1RM;
run;


Proc reg data=ESTPER outest=BDimln(rename=(intercept=alpha Return_Market_ln=BETA1
Lag1RM=BETA2 Lag2RM=BETA3 Lag3RM=BETA4 Lead1RM=BETA5 Lead2RM=BETA6
Lead3RM=BETA7)
Keep = Ntickb intercept Return_Market Lag1RM Lag2RM Lag3RM Lead1RM Lead2RM
Lead3RM) noprint;
by Ntickb;
model Return_ln = Return_Market_ln Lag1RM Lag2RM Lag3RM Lead1RM Lead2RM
Lead3RM;
run;


Data SumBdimln;
Set Bdimln;
SumBetaln = BETA1 + BETA2 + BETA3 + BETA4 + BETA5 + BETA6 + BETA7;
Run;


Proc reg data=ESTPER outest=CorRMln(rename=(intercept=alpha Lag1RM=BETA)
Keep = Ntickb intercept Lag1RM) noprint;
by Ntickb;
model Return_Market_ln = Lag1RM;
run;

Data AdBT;
Set In06;
If TD_COUNT<=-207 then delete;
If TD_COUNT=-5 or TD_COUNT=-4 then delete;
If TD_COUNT>=4 then delete;
If TD_COUNT=-3 or TD_COUNT=-2 or TD_COUNT=-1 or TD_COUNT=0 or TD_COUNT=1
or TD_COUNT=2 or TD_COUNT=3 then ESTOREVT=1;
Else ESTOREVT=0;
Run;


Data ESTPER EVTPER;
```

```
Set AdBT;
if ESTOREVT=0 then output ESTPER;
if ESTOREVT=1 then output EVTPER;
run;

Proc reg data=ESTPER outest=B0(rename=(intercept=alpha RetMarket=BETA)
Keep = Ntickb intercept RetMarket) noprint;
by Ntickb;
model Return = RetMarket;
run;

Proc reg data=ESTPER outest=B1(rename=(intercept=alpha Lag1RM=BETA)
Keep = Ntickb intercept Lag1RM) noprint;
by Ntickb;
model Return = Lag1RM;
run;

Proc reg data=ESTPER outest=Blead1(rename=(intercept=alpha Lead1RM=BETA)
Keep = Ntickb intercept Lead1RM) noprint;
by Ntickb;
model Return = Lead1RM;
run;

Proc reg data=ESTPER outest=BDim(rename=(intercept=alpha RetMarket=BETA1
Lag1RM=BETA2 Lag2RM=BETA3 Lag3RM=BETA4 Lead1RM=BETA5 Lead2RM=BETA6
Lead3RM=BETA7)
Keep = Ntickb intercept RetMarket Lag1RM Lag2RM Lag3RM Lead1RM Lead2RM Lead3RM)
noprint;
by Ntickb;
model Return = RetMarket Lag1RM Lag2RM Lag3RM Lead1RM Lead2RM Lead3RM;
run;

Data SumBdim;
Set Bdim;
SumBeta = BETA1 + BETA2 + BETA3 + BETA4 + BETA5 + BETA6 + BETA7;
Run;

Proc reg data=ESTPER outest=CorRM(rename=(intercept=alpha Lag1RM=BETA)
Keep = Ntickb intercept Lag1RM) noprint;
by Ntickb;
model RetMarket = Lag1RM;
run
Data AR2003;
Set Indo0325;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim Year;
Year=2003;
```

run;

Data AR2004;
Set Indo0425;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim year;
Year=**2004**;
run;

Data AR2005;
Set Indo0525;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim year;
Year=**2005**;
run;

Data AR2006;
Set Indo0625;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim year;
Year=**2006**;
run;

Data AR2007;
Set Indo0725;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim Year;
Year=**2007**;
run;

Data AR2008;
Set Indo0825;
Keep NTICKB Date Return Td_Count EXRSchW EXRDim ABRTSchW ABRTDim Year;
Year=**2008**;
run;

Proc sort data=AR2003 out=AR2003a;
by NTICKB Year;
run;

Proc sort data=AR2004 out=AR2004a;
by NTICKB Year;
run;

Proc sort data=AR2005 out=AR2005a;
by NTICKB Year;
run;

Proc sort data=AR2006 out=AR2006a;
by NTICKB Year;

```
run;

Proc sort data=AR2007 out=AR2007a;
by NTICKB Year;
run;

Proc sort data=AR2008 out=AR2008a;
by NTICKB Year;
run;

Data AR38;
Merge AR2003a AR2004a AR2005a AR2006a AR2007a AR2008a;
by NTICKB Year;
run;

Proc sort data=ar38 out=ar38a;
by td_count;
run;

PROC MEANS DATA=AR38a NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_SChw MEAN=AVER_AR_SChw;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR38a NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_Dim MEAN=AVER_AR_Dim;
  BY TD_COUNT;
RUN;
/*2003*/

Proc sort data=AR2003a out=AR2003b;
by td_count;
run;

PROC MEANS DATA=AR2003b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S03 MEAN=AVER_AR_S03;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2003b NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_D03 MEAN=AVER_AR_D03;
  BY TD_COUNT;
```

```
RUN;

/*2004*/
Proc sort data=AR2004a out=AR2004b;
by td_count;
run;
PROC MEANS DATA=AR2004b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S04 MEAN=AVER_AR_S04;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2004b NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_D04 MEAN=AVER_AR_D04;
  BY TD_COUNT;
RUN;

/*2005*/
Proc sort data=AR2005a out=AR2005b;
by td_count;
run;
PROC MEANS DATA=AR2005b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S05 MEAN=AVER_AR_S05;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2005b NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_D05 MEAN=AVER_AR_D05;
  BY TD_COUNT;
RUN;

/*2006*/
Proc sort data=AR2006a out=AR2006b;
by td_count;
run;
PROC MEANS DATA=AR2006b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S06 MEAN=AVER_AR_S06;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2006b NWAY;
  VAR ABRTDim;
```

```
  OUTPUT OUT=AV_AR_D06 MEAN=AVER_AR_D06;
  BY TD_COUNT;
RUN;

/*2007*/
Proc sort data=AR2007a out=AR2007b;
by td_count;
run;
PROC MEANS DATA=AR2007b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S07 MEAN=AVER_AR_S07;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2007b NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_D07 MEAN=AVER_AR_D07;
  BY TD_COUNT;
RUN;

/*2008*/
Proc sort data=AR2008a out=AR2008b;
by td_count;
run;
PROC MEANS DATA=AR2008b NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_S08 MEAN=AVER_AR_S08;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR2008b NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_D08 MEAN=AVER_AR_D08;
  BY TD_COUNT;
RUN;

Proc sort data=AR38a out=AR38b;
by NTICKB year;
run;

Data AR38c;
Set AR38b;
if td_count=-10 or td_count=-9 or td_count=-8 or td_count=-7 or td_count=-6 or td_count=-5 or
td_count=-4 or td_count=-3 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 then delete;
```

```
run;

PROC MEANS DATA=AR38c noprint;
  VAR ABRTDim;
  OUTPUT OUT=CAR5Dim SUM=Car5_Dim;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38c noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CAR5SchW SUM=Car5_SchW;
  BY Ntickb year;
RUN;


Data AR38CAR1;
Set AR38b;
if td_count=-9 or td_count=-8 or td_count=-7 or td_count=-6 or td_count=-5 or td_count=-4 or
td_count=-3 or td_count=-2 or td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR1 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim1 SUM=Car_Dim1;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR1 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW1 SUM=Car_SchW1;
  BY Ntickb year;
RUN;


Data AR38CAR2;
Set AR38b;
if td_count=-8 or td_count=-7 or td_count=-6 or td_count=-5 or td_count=-4 or td_count=-3 or
td_count=-2 or td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR2 noprint;
  VAR ABRTDim;
```

```
  OUTPUT OUT=CARDim2 SUM=Car_Dim2;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR2 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW2 SUM=Car_SchW2;
  BY Ntickb year;
RUN;

Data AR38CAR3;
Set AR38b;
if td_count=-7 or td_count=-6 or td_count=-5 or td_count=-4 or td_count=-3 or td_count=-2 or
td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR3 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim3 SUM=Car_Dim3;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR3 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW3 SUM=Car_SchW3;
  BY Ntickb year;
RUN;

Data AR38CAR4;
Set AR38b;
if td_count=-6 or td_count=-5 or td_count=-4 or td_count=-3 or td_count=-2 or td_count=-1 or
td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR4 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim4 SUM=Car_Dim4;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR4 noprint;
  VAR ABRTSchW;
```

```
  OUTPUT OUT=CARSchW4 SUM=Car_SchW4;
  BY Ntickb year;
RUN;


Data AR38CAR5;
Set AR38b;
if td_count=-5 or td_count=-4 or td_count=-3 or td_count=-2 or td_count=-1 or td_count=0 then
delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR5 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim5 SUM=Car_Dim5;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR5 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW5 SUM=Car_SchW5;
  BY Ntickb year;
RUN;


Data AR38CAR6;
Set AR38b;
if td_count=-4 or td_count=-3 or td_count=-2 or td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR6 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim6 SUM=Car_Dim6;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR6 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW6 SUM=Car_SchW6;
  BY Ntickb year;
RUN;
```

```
Data AR38CAR7;
Set AR38b;
if td_count=-3 or td_count=-2 or td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR7 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim7 SUM=Car_Dim7;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR7 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW7 SUM=Car_SchW7;
  BY Ntickb year;
RUN;


Data AR38CAR8;
Set AR38b;
if td_count=-2 or td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR8 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim8 SUM=Car_Dim8;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR8 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW8 SUM=Car_SchW8;
  BY Ntickb year;
RUN;

Data AR38CAR9;
Set AR38b;
if td_count=-1 or td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;
```

```
PROC MEANS DATA=AR38CAR9 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim9 SUM=Car_Dim9;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR9 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW9 SUM=Car_SchW9;
  BY Ntickb year;
RUN;


Data AR38CAR10;
Set AR38b;
if td_count=0 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR10 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim10 SUM=Car_Dim10;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR10 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW10 SUM=Car_SchW10;
  BY Ntickb year;
RUN;


Data AR38CAR11;
Set AR38b;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR11 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim11 SUM=Car_Dim11;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR11 noprint;
```

```
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW11 SUM=Car_SchW11;
  BY Ntickb year;
RUN;


Data AR38CAR12;
Set AR38b;
if td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or td_count=4 or
td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR12 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim12 SUM=Car_Dim12;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR12 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW12 SUM=Car_SchW12;
  BY Ntickb year;
RUN;


Data AR38CAR13;
Set AR38b;
if td_count=8 or td_count=7 or td_count=6 or td_count=5 or td_count=4 or td_count=3 or
td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR13 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim13 SUM=Car_Dim13;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR13 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW13 SUM=Car_SchW13;
  BY Ntickb year;
RUN;


Data AR38CAR14;
Set AR38b;
```

```
if td_count=7 or td_count=6 or td_count=5 or td_count=4 or td_count=3 or td_count=2 or
td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR14 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim14 SUM=Car_Dim14;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR14 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW14 SUM=Car_SchW14;
  BY Ntickb year;
RUN;


Data AR38CAR15;
Set AR38b;
if td_count=6 or td_count=5 or td_count=4 or td_count=3 or td_count=2 or td_count=1 then
delete;
run;

PROC MEANS DATA=AR38CAR15 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim15 SUM=Car_Dim15;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR15 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW15 SUM=Car_SchW15;
  BY Ntickb year;
RUN;


Data AR38CAR16;
Set AR38b;
if td_count=5 or td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR16 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim16 SUM=Car_Dim16;
  BY Ntickb year;
RUN;
```

```
PROC MEANS DATA=AR38CAR16 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW16 SUM=Car_SchW16;
  BY Ntickb year;
RUN;


Data AR38CAR17;
Set AR38b;
if td_count=4 or td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR17 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim17 SUM=Car_Dim17;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR17 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW17 SUM=Car_SchW17;
  BY Ntickb year;
RUN;


Data AR38CAR18;
Set AR38b;
if td_count=3 or td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR18 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim18 SUM=Car_Dim18;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR18 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW18 SUM=Car_SchW18;
  BY Ntickb year;
RUN;


Data AR38CAR19;
```

```
Set AR38b;
if td_count=2 or td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR19 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim19 SUM=Car_Dim19;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR19 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW19 SUM=Car_SchW19;
  BY Ntickb year;
RUN;


Data AR38CAR20;
Set AR38b;
if td_count=1 then delete;
run;

PROC MEANS DATA=AR38CAR20 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim20 SUM=Car_Dim20;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38CAR20 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW20 SUM=Car_SchW20;
  BY Ntickb year;
RUN;



Data AR38CAR21;
Set AR38b;
run;

PROC MEANS DATA=AR38CAR21 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CARDim21 SUM=Car_Dim21;
  BY Ntickb year;
RUN;
```

```
PROC MEANS DATA=AR38CAR21 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CARSchW21 SUM=Car_SchW21;
  BY Ntickb year;
RUN;


Data AR38d;
Set AR38b;
if td_count=-10 or td_count=-9 or td_count=-8 or td_count=-7 or td_count=-6 or td_count=-5 or
td_count=-4 or td_count=-3 or td_count=-2 then delete;
if td_count=10 or td_count=9 or td_count=8 or td_count=7 or td_count=6 or td_count=5 or
td_count=4 or td_count=3 or td_count=2 then delete;
run;

PROC MEANS DATA=AR38d noprint;
  VAR ABRTDim;
  OUTPUT OUT=CAR3Dim SUM=Car3_Dim;
  BY Ntickb year;
RUN;

PROC MEANS DATA=AR38d noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CAR3SchW SUM=Car3_SchW;
  BY Ntickb year;
RUN;



PROC MEANS DATA=CARDim1 noprint;
  VAR CAR_Dim1;
  OUTPUT OUT=SDCARDim1 STD=SDCar_Dim1;
 RUN;

PROC MEANS DATA=CARSchW1 noprint;
  VAR CAR_SchW1;
  OUTPUT OUT=SDCARSchW1 STD=SDCar_SchW1;
RUN;

PROC MEANS DATA=CARDim2 noprint;
  VAR CAR_Dim2;
  OUTPUT OUT=SDCARDim2 STD=SDCar_Dim2;
 RUN;

PROC MEANS DATA=CARSchW2 noprint;
  VAR CAR_SchW2;
```

```
  OUTPUT OUT=SDCARSchW2 STD=SDCar_SchW2;
RUN;

PROC MEANS DATA=CARDim3 noprint;
  VAR CAR_Dim3;
  OUTPUT OUT=SDCARDim3 STD=SDCar_Dim3;
 RUN;

PROC MEANS DATA=CARSchW3 noprint;
  VAR CAR_SchW3;
  OUTPUT OUT=SDCARSchW3 STD=SDCar_SchW3;
RUN;

PROC MEANS DATA=CARDim4 noprint;
  VAR CAR_Dim4;
  OUTPUT OUT=SDCARDim4 STD=SDCar_Dim4;
 RUN;

PROC MEANS DATA=CARSchW4 noprint;
  VAR CAR_SchW4;
  OUTPUT OUT=SDCARSchW4 STD=SDCar_SchW4;
RUN;


PROC MEANS DATA=CARDim5 noprint;
  VAR CAR_Dim5;
  OUTPUT OUT=SDCARDim5 STD=SDCar_Dim5;
 RUN;

PROC MEANS DATA=CARSchW5 noprint;
  VAR CAR_SchW5;
  OUTPUT OUT=SDCARSchW5 STD=SDCar_SchW5;
RUN;


PROC MEANS DATA=CARDim6 noprint;
  VAR CAR_Dim6;
  OUTPUT OUT=SDCARDim6 STD=SDCar_Dim6;
 RUN;

PROC MEANS DATA=CARSchW6 noprint;
  VAR CAR_SchW6;
  OUTPUT OUT=SDCARSchW6 STD=SDCar_SchW6;
RUN;

PROC MEANS DATA=CARDim7 noprint;
```

```
 VAR CAR_Dim7;
 OUTPUT OUT=SDCARDim7 STD=SDCar_Dim7;
RUN;

PROC MEANS DATA=CARSchW7 noprint;
 VAR CAR_SchW7;
 OUTPUT OUT=SDCARSchW7 STD=SDCar_SchW7;
RUN;


PROC MEANS DATA=CARDim8 noprint;
 VAR CAR_Dim8;
 OUTPUT OUT=SDCARDim8 STD=SDCar_Dim8;
RUN;

PROC MEANS DATA=CARSchW8 noprint;
 VAR CAR_SchW8;
 OUTPUT OUT=SDCARSchW8 STD=SDCar_SchW8;
RUN;


PROC MEANS DATA=CARDim9 noprint;
 VAR CAR_Dim9;
 OUTPUT OUT=SDCARDim9 STD=SDCar_Dim9;
RUN;

PROC MEANS DATA=CARSchW9 noprint;
 VAR CAR_SchW9;
 OUTPUT OUT=SDCARSchW9 STD=SDCar_SchW9;
RUN;


PROC MEANS DATA=CARDim10 noprint;
 VAR CAR_Dim10;
 OUTPUT OUT=SDCARDim10 STD=SDCar_Dim10;
RUN;

PROC MEANS DATA=CARSchW10 noprint;
 VAR CAR_SchW10;
 OUTPUT OUT=SDCARSchW10 STD=SDCar_SchW10;
RUN;


PROC MEANS DATA=CARDim11 noprint;
 VAR CAR_Dim11;
 OUTPUT OUT=SDCARDim11 STD=SDCar_Dim11;
```

```
 RUN;

PROC MEANS DATA=CARSchW11 noprint;
  VAR CAR_SchW11;
  OUTPUT OUT=SDCARSchW11 STD=SDCar_SchW11;
RUN;


PROC MEANS DATA=CARDim12 noprint;
  VAR CAR_Dim12;
  OUTPUT OUT=SDCARDim12 STD=SDCar_Dim12;
 RUN;

PROC MEANS DATA=CARSchW12 noprint;
  VAR CAR_SchW12;
  OUTPUT OUT=SDCARSchW12 STD=SDCar_SchW12;
RUN;


PROC MEANS DATA=CARDim13 noprint;
  VAR CAR_Dim13;
  OUTPUT OUT=SDCARDim13 STD=SDCar_Dim13;
 RUN;

PROC MEANS DATA=CARSchW13 noprint;
  VAR CAR_SchW13;
  OUTPUT OUT=SDCARSchW13 STD=SDCar_SchW13;
RUN;


PROC MEANS DATA=CARDim14 noprint;
  VAR CAR_Dim14;
  OUTPUT OUT=SDCARDim14 STD=SDCar_Dim14;
 RUN;

PROC MEANS DATA=CARSchW14 noprint;
  VAR CAR_SchW14;
  OUTPUT OUT=SDCARSchW14 STD=SDCar_SchW14;
RUN;


PROC MEANS DATA=CARDim15 noprint;
  VAR CAR_Dim15;
  OUTPUT OUT=SDCARDim15 STD=SDCar_Dim15;
 RUN;
```

```
PROC MEANS DATA=CARSchW15 noprint;
  VAR CAR_SchW15;
  OUTPUT OUT=SDCARSchW15 STD=SDCar_SchW15;
RUN;


PROC MEANS DATA=CARDim16 noprint;
  VAR CAR_Dim16;
  OUTPUT OUT=SDCARDim16 STD=SDCar_Dim16;
 RUN;

PROC MEANS DATA=CARSchW16 noprint;
  VAR CAR_SchW16;
  OUTPUT OUT=SDCARSchW16 STD=SDCar_SchW16;
RUN;


PROC MEANS DATA=CARDim17 noprint;
  VAR CAR_Dim17;
  OUTPUT OUT=SDCARDim17 STD=SDCar_Dim17;
 RUN;

PROC MEANS DATA=CARSchW17 noprint;
  VAR CAR_SchW17;
  OUTPUT OUT=SDCARSchW17 STD=SDCar_SchW17;
RUN;


PROC MEANS DATA=CARDim18 noprint;
  VAR CAR_Dim18;
  OUTPUT OUT=SDCARDim18 STD=SDCar_Dim18;
 RUN;

PROC MEANS DATA=CARSchW18 noprint;
  VAR CAR_SchW18;
  OUTPUT OUT=SDCARSchW18 STD=SDCar_SchW18;
RUN;



PROC MEANS DATA=CARDim19 noprint;
  VAR CAR_Dim19;
  OUTPUT OUT=SDCARDim19 STD=SDCar_Dim19;
 RUN;

PROC MEANS DATA=CARSchW19 noprint;
```

```
  VAR CAR_SchW19;
  OUTPUT OUT=SDCARSchW19 STD=SDCar_SchW19;
RUN;


PROC MEANS DATA=CARDim20 noprint;
  VAR CAR_Dim20;
  OUTPUT OUT=SDCARDim20 STD=SDCar_Dim20;
 RUN;

PROC MEANS DATA=CARSchW20 noprint;
  VAR CAR_SchW20;
  OUTPUT OUT=SDCARSchW20 STD=SDCar_SchW20;
RUN;


PROC MEANS DATA=CARDim21 noprint;
  VAR CAR_Dim21;
  OUTPUT OUT=SDCARDim21 STD=SDCar_Dim21;
 RUN;

PROC MEANS DATA=CARSchW21 noprint;
  VAR CAR_SchW21;
  OUTPUT OUT=SDCARSchW21 STD=SDCar_SchW21;
RUN;

Data STDDIM38;
Merge SDCARDIM1 SDCARDIM2 SDCARDIM3 SDCARDIM4 SDCARDIM5 SDCARDIM6
SDCARDIM7 SDCARDIM8 SDCARDIM9 SDCARDIM10 SDCARDIM11 SDCARDIM12
SDCARDIM13 SDCARDIM14 SDCARDIM15 SDCARDIM16 SDCARDIM17 SDCARDIM18
SDCARDIM19 SDCARDIM19 SDCARDIM20 SDCARDIM21;
run;


Data STDSCHW38;
Merge SDCARSCHW1 SDCARSCHW2 SDCARSCHW3 SDCARSCHW4 SDCARSCHW5
SDCARSCHW6 SDCARSCHW7 SDCARSCHW8 SDCARSCHW9 SDCARSCHW10
SDCARSCHW11 SDCARSCHW12 SDCARSCHW13 SDCARSCHW14 SDCARSCHW15
SDCARSCHW16 SDCARSCHW17 SDCARSCHW18 SDCARSCHW19 SDCARSCHW19
SDCARSCHW20 SDCARSCHW21;
run;


Data CAR_010_38;
```

```
Set AR38b;
if td_count=-10 or td_count=-9 or td_count=-8 or td_count=-7 or td_count=-6 or td_count=-5 or
td_count=-4 or td_count=-3 or td_count=-2 or td_count=-1 then delete;
run;

PROC MEANS DATA=CAR_010_38 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CAR_010_38Dim SUM=Car_010_38Dim;
  BY Ntickb year;
RUN;

PROC MEANS DATA=CAR_010_38 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CAR_010_38SchW SUM=Car_010_38SchW;
  BY Ntickb year;
RUN;

Proc Sort Data=CAR_010_38SchW out=CAR_010_38SchW_;
by Year;
run;

Proc Sort Data=CAR_010_38Dim out=CAR_010_38Dim_;
by Year;
run;


PROC MEANS DATA=CAR_010_38SCHW_ NWAY;
VAR Car_010_38SchW;
Output Out=Av_CAR_010_38SchW Mean=Av_CAR_010_38SchW;
By Year;
run;

PROC MEANS DATA=CAR_010_38DIM_ NWAY;
VAR Car_010_38DIM;
Output Out=Av_CAR_010_38DIM Mean=Av_CAR_010_38DIM;
By Year;
run;

PROC MEANS DATA=CAR_010_38SCHW_ NWAY;
VAR Car_010_38SchW;
Output Out=AllAv_CAR_010_38SchW Mean=AllAv_CAR_010_38SchW;
run;

PROC MEANS DATA=CAR_010_38DIM_ NWAY;
VAR Car_010_38DIM;
Output Out=AllAv_CAR_010_38DIM Mean=AllAv_CAR_010_38DIM;
```

```
run;


Data CAR_77_38;
Set AR38b;
if td_count=-10 or td_count=-9 or td_count=-8 then delete;
if td_count=10 or td_count=9 or td_count=8 then delete;
run;

PROC MEANS DATA=CAR_77_38 noprint;
  VAR ABRTDim;
  OUTPUT OUT=CAR_77_38Dim SUM=Car_77_38Dim;
  BY Ntickb year;
RUN;

PROC MEANS DATA=CAR_77_38 noprint;
  VAR ABRTSchW;
  OUTPUT OUT=CAR_77_38SchW SUM=Car_77_38SchW;
  BY Ntickb year;
RUN;

Proc Sort Data=CAR_77_38SchW out=CAR_77_38SchW_;
by Year;
run;

Proc Sort Data=CAR_77_38Dim out=CAR_77_38Dim_;
by Year;
run;


PROC MEANS DATA=CAR_77_38SCHW_ NWAY;
VAR Car_77_38SchW;
Output Out=Av_CAR_77_38SchW Mean=Av_CAR_77_38SchW;
By Year;
run;



PROC MEANS DATA=CAR_77_38DIM_ NWAY;
VAR Car_77_38DIM;
Output Out=Av_CAR_77_38DIM Mean=Av_CAR_77_38DIM;
By Year;
run;

PROC MEANS DATA=CAR_77_38SCHW_ NWAY;
VAR Car_77_38SchW;
```

```
Output Out=AllAv_CAR_77_38SchW Mean=AllAv_CAR_77_38SchW;
run;

PROC MEANS DATA=CAR_77_38DIM_ NWAY;
VAR Car_77_38DIM;
Output Out=AllAv_CAR_77_38DIM Mean=AllAv_CAR_77_38DIM;
run;



Proc sort data=masterone out=masterone_;
by NTICKB Year;
run;

Proc sort data=CAR_010_38SchW out=CAR_010_38SchW_1;
by NTICKB Year;
run;

Data MasterSchWone;
Merge masterone_ CAR_010_38SchW_1;
by NTICKB Year;
run;

Proc sort data=MasterSchWone out=masterOK;
by NTICKB Year;
run;

PROC REG DATA=masterOK;
MODEL CAR_010_38SchW = TIME_LAG LNST CAPS_ok PROFIT_ok/VIF;
RUN;



/*PROGRAM for dividing between group late and early*/

Proc sort data=ar38 out=ar38group;
by ntickb year;
run;

Proc sort data=master out=master38gp;
by ntickb year;
run;

Data AR38GP;
Merge master38gp ar38group;
by NTICKB Year;
```

```
run;

Proc sort data=AR38GP out=AR38GPOK;
by group ntickb;
run;

Data AR38GPOK_;
Set AR38GPOK;
if Group=" " then delete;
run;

Data AR38GPEarly;
Set AR38GPOK_;
if Group=2 then delete;
run;

Data AR38GPlate;
Set AR38GPOK_;
if Group=1 then delete;
run;

Proc sort data=AR38GPearly out=AR38GPEarlyOK;
by td_count;
run;

Proc sort data=AR38GPlate out=AR38GPlateOK;
by td_count;
run;


PROC MEANS DATA=AR38GPearlyok NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_SChw38GPE MEAN=AVER_AR_SChw38GPE;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR38GPEarlyOK NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_Dim38GPE MEAN=AVER_AR_Dim38GPE;
  BY TD_COUNT;
RUN;

PROC MEANS DATA=AR38GPlateok NWAY;
  VAR ABRTSchW;
  OUTPUT OUT=AV_AR_SChw38GPL MEAN=AVER_AR_SChw38GPL;
  BY TD_COUNT;
```

```
RUN;

PROC MEANS DATA=AR38GPLateOK NWAY;
  VAR ABRTDim;
  OUTPUT OUT=AV_AR_Dim38GPL MEAN=AVER_AR_Dim38GPL;
  BY TD_COUNT;
RUN;

PROC REG DATA=MasterOK;
MODEL ABS_CAR_Dimson = TIME_LAG LNST CAPS_ok PROFIT_ok/VIF;
by year group;
RUN;

PROC REG DATA=MasterOK;
MODEL ABS_CAR_Scholes = TIME_LAG LNST CAPS_ok PROFIT_ok/VIF;
by year group;
RUN;


proc univariate data=MasterOK normal;
 var TIME_LAG ABS_CAR_Dimson ABS_CAR_Scholes LNST CAPS_ok EARNEQTY EPS
PROFIT_OK PROF_OK COMPLEX AUDFIRM AUDOPINI LNSTD;
 run;


/*Year 2008 Merge data return with JCI (IHSG)*/
PROC SORT DATA=Master OUT=Master01;
BY date;
RUN;

PROC SORT DATA=Jci OUT=Jci_;
BY date;
RUN;

Data Indo08;
Merge Master01 Jci_;
By date;
Run;

PROC SORT DATA=Indo08 OUT=Indo081;
BY NTICKB date;
RUN;

Data Indo082;
Set Indo081;
if NTICKB=" " then delete;
```

```
run;

PROC SORT DATA=Indo082 OUT=Indo083;
BY NTICKB date;
RUN;


proc expand data=Indo083 out=LagJCI method = none;
by NTICKB;
convert JCI = Lag1_JCI  / transformout=(lag 1);
run;

/*Calculate return market*/
PROC SORT DATA=LagJCI out=Indo084;
BY NTICKB date;
RUN;


Data Indo085;
Set Indo084;
RM=log(JCI/Lag1_JCI);
run;

/*Lag Lead data return market*/

PROC SORT DATA=Indo085 out=Indo086;
BY NTICKB date;
RUN;

proc expand data=Indo086 out=Indo087 method = none;
by NTICKB;
convert RM = Lag1_RM  / transformout=(lag 3);
convert RM = Lag2_RM  / transformout=(lag 2);
convert RM = Lag3_RM  / transformout=(lag 1);
convert RM = Lead1_RM  / transformout=(lead 3);
convert RM = Lead2_RM  / transformout=(lead 2);
convert RM = Lead3_RM  / transformout=(lead 1);
convert RM;
run;


/*Separate data estimation 200 days data event period -10 0 +10 space 5 days from estimation*/
Data Indo088;
Set Indo087;
If TD_COUNT<=-216 or TD_COUNT>=11 then delete;
```

If TD_COUNT=**-11** or TD_COUNT=**-12** or TD_COUNT=**-13** or TD_COUNT=**-14** or TD_COUNT=**-15** then delete;
If TD_COUNT=**-10** or TD_COUNT=**-9** or TD_COUNT=**-8** or TD_COUNT=**-7** or TD_COUNT=**-6** or
TD_COUNT=**-5** or TD_COUNT=**-4** or TD_COUNT=**-3** or TD_COUNT=**-2** or TD_COUNT=**-1** or TD_COUNT=**0**
or TD_COUNT=**1** or TD_COUNT=**2** or TD_COUNT=**3** or TD_COUNT=**4** or TD_COUNT=**5** or TD_COUNT=**6**
or TD_COUNT=**10** or TD_COUNT=**9** or TD_COUNT=**8** or TD_COUNT=**7** then ESTOREVT=**1**;
Else ESTOREVT=**0**;
Run;

Data ESTPER08;
Set Indo088;
if ESTOREVT=**0** then output ESTPER08;
run;

Data EVTPER08;
Set Indo088;
if ESTOREVT=**1** then output EVTPER08;
run;

Proc reg data=ESTPER08 outest=B0(rename=(intercept=alpha RM=BETA)
Keep = Ntickb intercept RM) noprint;
by Ntickb;
model Return = RM;
run;

Proc reg data=ESTPER08 outest=B1(rename=(intercept=alpha Lag1_RM=BETA1)
Keep = Ntickb intercept Lag1_RM) noprint;
by Ntickb;
model Return = Lag1_RM;
run;

Proc reg data=ESTPER08 outest=Blead1(rename=(intercept=alpha Lead1_RM=BETALead)
Keep = Ntickb intercept Lead1_RM) noprint;
by Ntickb;
model Return = Lead1_RM;
run;

Proc reg data=ESTPER08 outest=CorRM(rename=(intercept=alpha Lag1_RM=CorRm)
Keep = Ntickb intercept Lag1_RM) noprint;
by Ntickb;

```
model RM = Lag1_RM;
run;

Proc reg data=ESTPER08 outest=BDim(rename=(intercept=alpha RM=BETA0
Lag1_RM=BLag1 Lag2_RM=BLag2 Lag3_RM=BLag3 Lead1_RM=BLead1
Lead2_RM=BLead2 Lead3_RM=BLead3)
Keep = Ntickb intercept RM Lag1_RM Lag2_RM Lag3_RM Lead1_RM Lead2_RM
Lead3_RM) noprint;
by Ntickb;
model Return = RM Lag1_RM Lag2_RM Lag3_RM Lead1_RM Lead2_RM Lead3_RM;
run;


Data SumBdim;
Set Bdim;
SumBeta = BETA0 + BLag1 + BLag2 + BLag3 + BLead1 + BLead2 + BLead3;
by Ntickb;
Run;


PROC MEANS DATA=Estper08 NWAY;
  VAR RETURN;
  OUTPUT OUT=AVER MEAN=AVER;
  BY NTICKB;
RUN;

PROC MEANS DATA=Estper08 NWAY;
  VAR RM;
  OUTPUT OUT=AVERM MEAN=AVERM;
  BY NTICKB;
RUN;

Proc sort data=Evtper08 Out=Evtper08_;
by NTICKB;
run;

Proc sort data=B0 Out=B0_;
by NTICKB;
run;

Data Indo089;
Merge Evtper08_ B0_;
By NTICKB;
Run;

Proc sort data=B1 Out=B1_;
```

```
by NTICKB;
run;

Data Indo0810;
Merge Indo089 B1_;
By NTICKB;
Run;

Proc sort data=SumBdim Out=SumBdim_;
by NTICKB;
run;

Data Indo0811;
Merge Indo0810 SumBdim_;
By NTICKB;
Run;

Proc sort data=Aver Out=Aver_;
by NTICKB;
run;

Data Indo0812;
Merge Indo0811 Aver_;
By NTICKB;
Run;


Proc sort data=Averm Out=Averm_;
by NTICKB;
run;

Data Indo0813;
Merge Indo0812 Averm_;
By NTICKB;
Run;

Proc sort data=Blead1 Out=Blead1_;
by NTICKB;
run;

Data Indo0814;
Merge Indo0813 Blead1_;
By NTICKB;
Run;

Proc sort data=Corrm Out=Corrm_;
```

```
by NTICKB;
run;

Data Indo0815;
Merge Indo0814 Corrm_;
By NTICKB;
Run;

Data Indo0816;
Set Indo0815;
BSchsum = Beta + Beta1 + Betalead;
run;

Data Indo0817;
Set Indo0816;
DivSch = 1 + (2*Corrm);
run;

Data Indo0818;
Set Indo0817;
BetaSchW = BSchsum / DivSch;
run;

Data Indo0819;
Set Indo0818;
ASchW = AveR - (BetaSchW * AveRm);
run;

Data Indo0820;
Set Indo0819;
BetaDim = SumBeta;
run;

Data Indo0821;
Set Indo0820;
ADim = Aver - (BetaDim * Averm);
run;

Data Indo0822;
Set Indo0821;
EXRSchW = ASchW + BetaSchW * RM;
run;

Data Indo0823;
Set Indo0822;
EXRDim = ADim + BetaDim * RM;
```

```
run;

Data Indo0824;
Set Indo0823;
ABRTSchW = Return - EXRSchW;
run;

Data Indo0825;
Set Indo0824;
ABRTDim = Return - EXRDim;
run;
test for Normality and heteroscedasticity

proc reg data=dataok1;
MODEL ABS_CAR_Dimson = TIME_LAG LNST CAPS PROF;
output out=CL20TLRes (keep= ABS_CAR_Dimson = TIME_LAG LNST CAPS PROF r fv)
residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;
```

D.2 Test for Homoscedasticity

```
proc reg data=dataok1;
MODEL ABS_CAR_Dimson = TIME_LAG LNST CAPS PROF;
```

```
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL ABS_CAR_Dimson = TIME_LAG LNST CAPS PROF/ spec;
run;
quit;
```

D.3 Descriptive Statistics

```
proc univariate data=dataok1 normal;
 var ABS_CAR_Dimson TIME_LAG LNST CAPS PROF;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var ABS_CAR_Dimson TIME_LAG LNST CAPS PROF;
run;
```

D.4 Correlation Test

```
proc corr data=dataok1;
 var ABS_CAR_Dimson TIME_LAG LNST CAPS PROF;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL ABS_CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ
PROF CAPS/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL ABS_CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ
PROF CAPS;
output out=CL20TLRes (keep= ABS_CAR_Dimson = TIME_LAG SIZE COMPLEX
AUDFIRM AUDOPINION EQ PROF CAPS r fv) residual=r predicted=fv;
run;
quit;
```

```
proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL ABS_CAR_Dimson = atl  size prof cAPS complex audfirm audopinion eq;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL ABS_CAR_Dimson = atl  size prof cAPS complex audfirm audopinion eq / spec;
run;
quit;


proc univariate data=dataok1 normal;
 var ABS_CAR_Dimson atl  size prof cAPS complex audfirm audopinion eq
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var ABS_CAR_Dimson atl  size prof cAPS complex audfirm audopinion eq;
 run;
PROF
proc corr data=dataok1;
```

```
 var ABS_CAR_Dimson TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ SIZE
COMPLEX AUDFIRM AUDOPINION EQ CAPS;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG LNST CAPS EarnDiff/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG LNST CAPS PROF;
output out=CL20TLRes (keep= ABS_CAR_Scholes = TIME_LAG LNST CAPS PROF r fv)
residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG LNST CAPS PROF;
plot r.*p.;
```

```
run;
quit;

proc reg data= dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG LNST CAPS PROF/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok1 normal;
 var ABS_CAR_Scholes TIME_LAG LNST CAPS PROF;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var ABS_CAR_Scholes TIME_LAG LNST CAPS PROF;
 run;
proc corr data=dataok1;
 var ABS_CAR_Scholes TIME_LAG LNST CAPS PROF;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ
PROF CAPS/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG SIZE PROF CAPS;
output out=CL20TLRes (keep= ABS_CAR_Scholes = TIME_LAG SIZE COMPLEX
AUDFIRM AUDOPINION EQ PROF CAPS r fv) residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;
```

```
goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ
PROF CAPS;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL ABS_CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ
PROF CAPS/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok1 normal;
 var ABS_CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var ABS_CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS;
 run;
proc corr data=dataok1;
 var ABS_CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS;
 run;
```

```
/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL CAR_Dimson = TIME_LAG LNST CAPS PROF/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL CAR_Dimson = TIME_LAG LNST CAPS PROF;
output out=CL20TLRes (keep= CAR_Dimson = TIME_LAG LNST CAPS PROF r fv)
residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL CAR_Dimson = TIME_LAG LNST CAPS PROF;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
```

```
MODEL CAR_Dimson = TIME_LAG LNST CAPS PROF/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok1 normal;
 var CAR_Dimson TIME_LAG LNST CAPS PROF;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var CAR_Dimson TIME_LAG LNST CAPS PROF;
 run;
proc corr data=dataok1;
 var CAR_Dimson TIME_LAG LNST CAPS PROF;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS;
output out=CL20TLRes (keep= ABS_CAR_Dimson = TIME_LAG SIZE COMPLEX
AUDFIRM AUDOPINION EQ PROF CAPS r fv) residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
```

```
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL CAR_Dimson = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok1 normal;
 var CAR_Dimson TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var CAR_Dimson TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 run;
proc corr data=dataok1;
 var CAR_Dimson TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL CAR_Scholes = TIME_LAG LNST CAPS PROF/VIF;
RUN;
```

```
/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL CAR_Scholes = TIME_LAG LNST CAPS PROF;
output out=CL20TLRes (keep= CAR_Scholes = TIME_LAG LNST CAPS PROF r fv)
residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=dataok1;
MODEL CAR_Scholes = TIME_LAG LNST CAPS PROF;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL CAR_Scholes = TIME_LAG LNST CAPS PROF/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/
```

```
proc univariate data=dataok1 normal;
 var CAR_Scholes TIME_LAG LNST CAPS PROF;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var CAR_Scholes TIME_LAG LNST CAPS PROF;
 run;
proc corr data=dataok1;
 var CAR_Scholes TIME_LAG LNST CAPS PROF;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=dataok1;
MODEL CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=dataok1;
MODEL CAR_Scholes = TIME_LAG size prof CAPS;
output out=CL20TLRes (keep= CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM
AUDOPINION EQ PROF CAPS r fv) residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
```

```
 qqplot r / normal(mu=est sigma=est);
run;


/*TEST homoscedastisity*/

proc reg data=dataok1;
MODEL CAR_Scholes = ATL size CAPS complex audfirm audopinion eq;
plot r.*p.;
run;
quit;

proc reg data= dataok1;
MODEL CAR_Scholes = TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF
CAPS/ spec;
run;
quit;

/* DESCRPTIVE STATISTICS*/

proc univariate data=dataok1 normal;
 var CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok1;
 var CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 run;
proc corr data=dataok1;
 var CAR_Scholes TIME_LAG SIZE COMPLEX AUDFIRM AUDOPINION EQ PROF CAPS;
 run;


/*INI PROGRAM UNTUK TEST main results*/
PROC REG DATA=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

/*INI PROGRAM UNTUK TEST NORMALITY OF RESIDUAL*/

proc reg data=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
output out=CL20TLRes (keep= TIMELAG LNSIZE PROF CAPS COMPLEX AUDFIRM
AUDOPINION EQ r fv) residual=r predicted=fv;
run;
quit;
```

```
proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


/*INI PROGRAM UNTUK TEST homoscedastisity*/

proc reg data=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
plot r.*p.;
run;
quit;

proc reg data= DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/ spec;
run;
quit;

/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok12 normal;
 var TIMELAG LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok12;
 var TIMELAG LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
 run;
```

```
proc corr data=dataok12;
 var TIMELAG LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
 run;


PROC REG DATA=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION
LNEQ/VIF;
RUN;

/*PROGRAM TEST NORMALITY OF RESIDUAL*/

proc reg data=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
output out=CL20TLRes (keep= TIMELAG LNSIZE PROF CAPS COMPLEX AUDFIRM
AUDOPINION LNEQ r fv) residual=r predicted=fv;
run;
quit;

proc kde data=CL20TLRes out=den;
var r;
run;

proc sort data=den;
  by r;
run;

goptions reset=all;
symbol1 c=blue i=join v=none height=1;
proc gplot data=den;
  plot density*r=1;
run;
quit;

goptions reset=all;
proc univariate data=CL20TLRes normal;
 var r;
 qqplot r / normal(mu=est sigma=est);
run;


proc reg data=DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
plot r.*p.;
run;
quit;
```

```
proc reg data= DATAOK12;
MODEL TIMELAG = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ/
spec;
run;
quit;


/*INI PROGRAM UNTUK TEST DESCRPTIVE STATISTICS*/

proc univariate data=dataok12 normal;
 var TIMELAG LNSIZE PROF LNEQ;
 qqplot r / normal(mu=est sigma=est);
run;

proc MEANS data=dataok12;
 var TIMELAG LNSIZE PROF CAPS LNEQ;
 run;
proc corr data=dataok12;
 var TIMELAG LNSIZE PROF CAPS LNEQ;
 run;
```

Appendix E

Example of Program used in Statistical Analysis System (SAS) version 9.2 for Multivariate OLS Regression Model, Logistic Regression Model and Panel Regression Using Statistical Analysis System (SAS) version 9.2

E.1 Multivariate Analysis - OLS regression model for testing Hypotheses

```
/*Regression using Time Lag main analysis*/

Proc sort data= master1 out= master_ok;
by ntickb year;
run;

PROC REG DATA=master_ok;
MODEL ATL= SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL =  SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2 D3 D4
D5/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL = SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL =  SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2 D3 D4
D5/VIF;
RUN;

Proc sort data= master1 out= master_ok;
by ntickb year;
run;

PROC REG DATA=master_ok;
MODEL ATL= TA PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL =  TA PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2 D3 D4
D5/VIF;
RUN;
```

```
PROC REG DATA=master_ok;
MODEL UTL = TA PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL =  TA PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2 D3 D4
D5/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL= EMPLOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL =  EM[LOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2
D3 D4 D5/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL = EMPLOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL =  EMPLOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2
D3 D4 D5/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL= SIZE LOSSPROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL ATL =  SIZE EPS CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2 D3 D4
D5/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL = SIZE EPS CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC REG DATA=master_ok;
MODEL UTL =  SIZE LOSSPROF CAPS COMPLEX AUDFIRM AUDOPINION EQ D1 D2
D3 D4 D5/VIF;
RUN;
```

E.2 Logistic Regression Model

```
Proc sort data= master out= master_;
by ntickb year;
run;

Proc MEANS data=master_;
var TimeLag Group ExpectedGroup Unexpected_Time_Lag LNSIZE EMPLOYEE TA PROF
LNEPS EPS LNEQPS CAPS COMPLEX AUDFIRM AUDOPINION EQ;
run;


Proc logistic data=master_;
model group = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
run;


Proc model data=master_;
endogenous Timelag;
Timelag = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
CAR1010Schw=Timelag LNSIZE PROF CAPS;
fit Timelag / OLS 2sls hausman;
instruments LNSIZE PROF CAPS;
run;

/*Run LOGIT as of 12 December 2012*/

Proc logistic data=master_;
model group = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
run;

Proc logistic data=master_;
MODEL Group= LNSIZE PROF CAPS COMPLEX AUDFIRM    AUDOPINION          LNEQ
D1 D2 D3 D4 D5;
run;

Proc logistic data=master_;
model ExpectedGroup = LNSIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
run;

Proc logistic data=master_;
MODEL ExpectedGroup = LNSIZE PROF CAPS COMPLEX AUDFIRMAUDOPINION
        LNEQ D1 D2 D3 D4 D5;
run;
```

```
Proc logistic data=master_;
model group = LNTA PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
run;

Proc logistic data=master_;
model group = EMPLOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
run;

Proc logistic data=master_;
model group = LNSIZE LNEPS CAPS COMPLEX AUDFIRM AUDOPINION LNEQ;
run;

Proc logistic data=master_;
MODEL Group= LNSIZE Dummy_Earnings CAPS COMPLEX AUDFIRM AUDOPINION
LNEQ;
run;

Proc logistic data=master_;
model group = LNTA PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ D1 D2 D3
D4 D5;
run;

Proc logistic data=master_;
model group = EMPLOYEE PROF CAPS COMPLEX AUDFIRM AUDOPINION LNEQ D1
D2 D3 D4 D5;
run;

Proc logistic data=master_;
model group = LNSIZE LNEPS CAPS COMPLEX AUDFIRM AUDOPINION LNEQ D1 D2
D3 D4 D5;
run;

Proc logistic data=master_;
MODEL Group= LNSIZE Dummy_Earnings CAPS COMPLEX AUDFIRM AUDOPINION
LNEQ D1 D2 D3 D4 D5;
run;

proc MEANS data=master_;
var TimeLag Group ExpectedGroup Unexpected_Time_Lag LNSIZE EMPLOYEE TA PROF
LNEPS EPS LNEQPS CAPS COMPLEX AUDFIRM AUDOPINION EQ;
run;
proc corr data=master_;
 var TimeLag Group ExpectedGroup Unexpected_Time_Lag LNSIZE EMPLOYEE TA PROF
LNEPS EPS LNEQPS CAPS COMPLEX AUDFIRM AUDOPINION EQ;
run;
```

```
Proc sort data= master_ out= master_group;
by ntickb group;
run;

proc MEANS data=master_group;
var TimeLag Unexpected_Time_Lag LNSIZE PROF CAPS CAR1010dim CAR1010Schw;
by group;
run;

proc MEANS data=master_;
var TimeLag Unexpected_Time_Lag LNSIZE PROF CAPS CAR1010dim CAR1010Schw;
run;
```

E.3 Panel Regression

```
Proc sort data= master out= master_ok;
by ntickb year;
run;

PROC panel DATA=master_ok;
MODEL ATL= SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ/VIF;
RUN;

PROC panel data = master_ok;
id ntickb year;
MODEL utl = SIZE PROF CAPS COMPLEX AUDFIRM AUDOPINION EQ;
RUN;
```