THE DETERMINANTS OF STICKY COST BEHAVIOR ON POLITICAL COSTS, AGENCY COSTS, AND CORPORATE GOVERNANCE PERSPECTIVES

NUCHJAREE PICHETKUN

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION
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Program	Business Administration
Dissertation Advisor	Associate Professor Panarat Panmanee, Ph.D.
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Academic Year	2012

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ABSTRACT

This study aimed to investigate the determinants of sticky cost behavior of Thai listed companies by using the structural equation modeling (SEM) approach. In order to obtain the good-fit cost behavior model, the AMOS (Analysis of Moment Structures) program was employed to construct the measurement models to confirm the latent variables of the sticky cost behavior model through the confirmatory factor analysis (CFA).

The results indicate that the measurement models were good-fit models. The exploratory factor analysis (EFA) and multiple regression analysis were utilized to specify the determinants of cost stickiness. The results show that adjustment costs and agency costs were positively associated with the degree of cost stickiness, whereas political costs and corporate governance were negatively associated with the degree of cost stickiness.

These findings will contribute to management for understanding cost behavior which is critical to managers for planning, controlling and reducing costs. In addition, the result of this study will also contribute to investors and financial analysts for understanding managers' behavior, which is useful information in making the investment decisions. However, it is not publicly disclosed.

Keywords: sticky cost behavior, asymmetrical cost behavior, adjustment costs, political costs, agency costs, corporate governance

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and beliefs, contains on material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my dissertation, when deposited in the university library, being available for loan and photocopying.

Nuchjaree Pichetkun

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Nuchjaree Pichetkun

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This dissertation is a report of the cost behavior study of Thai listed companies and the determinants of sticky cost behavior by using a structural equation modeling (SEM) approach. The study is based on financial reports of one hundred and sixty companies that were listed on the Stock Exchange of Thailand. The first chapter of the dissertation presents the background and states the problem, introduces the theoretical perspective, specifies the purpose of the study, and proposes research questions and hypotheses. The chapter concludes with the definition of terms, notes the significance of the findings for investors and managerial personnel as well as limitations of the study.

Background and Statement of the Problem

In the midst of an information-based global revolution, Thai companies are faced with the increase of global competition because of the decline of trade barriers and the rapid growth of economic interdependence. Those companies have been forced to produce high-quality products and services, and provide outstanding customer services at the lowest cost (Trairatvorakul, 2011a). To operate successfully, managers need information from management accounting which provides timely and relevant information for planning, controlling, decision making, and evaluating performance (Horngen, Datar, & Rajan, 2012).

The more the international competition increases, the more managers need cost management information. Managers are interested in estimating past cost-behavior patterns, since this information can help more accurate cost predictions concerning future cost for planning, and decisions. Cost behavior is the way that costs respond to change in activity and decision. An understanding of cost behavior is therefore critical for managers and accountants in providing and using information to make effective decisions (Maher, Stickney, & Weil, 2008).

From the management perspective, "…managers need to know how costs behave to make informed decision about products, to plan, and to evaluate performance…" (Lanen, Shannon, & Maher, 2011, p.51). The traditional model of cost behavior identifies the separation of cost into fixed and variable components. The variable costs change proportionately with changes in the activity volume, whereas the fixed costs remain unchanged as the volume changes within the relevant range (Hilton, Maher, & Selto, 2008). The recent empirical research discovered that some costs (e.g., selling, general, and administrative costs, cost of goods sold and total operating costs) are sticky or asymmetric; that is, costs increase more when activity rises than they decrease when activity falls by an equivalent amount (Anderson, Banker, & Janakiraman, 2003). Therefore, costs do not always increase or decrease proportionally with the changing of activities. In applying cost estimation methods that are based on the traditional model of cost behavior in cost analysis such as cost-volume-profit analysis, flexible budgeting, and cost-plus pricing, it is necessary to consider whether costs behave mechanistically or sticky (Maher et al., 2008).

Otherwise, managers may lose their firm's competitive advantage to rival companies which have more accurate information.

From the investors' perspective, as the published financial statements of a company are the results of the decisions made by managers, which are based on the determinants of cost behavior. Such information reveals the advantage of corporate governance and management behavior which cannot be observed directly. Moreover, financial information can affect the distribution of wealth among investors, other stakeholders, and management (Beaver, 1989).

Previous research has shown that there is a major controversy about the determinants of the phenomenon of cost stickiness. Anderson et al. (2003) stated that "…sticky costs occur because managers deliberately adjust the resources committed to activities…" (p. 47). They did not apply the agency theory for examining the reasons for sticky costs, even though they mentioned agency costs. Chen, Lu, and Sougiannis (2009) expanded the research of Anderson et al. (2003) and found cost asymmetry or cost stickiness increases with managerial empire building incentive due to the conflict of interest between managers and shareholders. However, Anderson and Lanen (2007) found weak evidence of sticky cost. They revised the estimated models of previous research and considered anew the foundational model of economic production. Their paper suggested that the problem is in the "…ambiguity about what defines managerial discretion (cost management) and how managerial discretion about redeploying verves releasing resources interacts with recording costs in the accounting system…" (p. 29).

Although, Anderson and Lanen (2007) critiqued the methods of prior research, they accepted the research questions, which have been encouraged in this field; for example, what explains cost behavior and the role of the management in controlling costs, are absolutely central to the field of management accounting. Furthermore, Dierynck and Renders (2009) studied the relationship between labor cost asymmetry and earnings management incentive and found that the degree of cost asymmetry of companies, which have incentive to mange earnings, is declining. As managers will take measures to manage costs and attain certain earnings targets, they may be more willing to cut labor costs when sales decrease or less willing to increase labor costs when sales increase. In summary, the academic research literature has not been able to provide strong evidence of the reasons of cost stickiness.

In addition, there are only a few empirical researches that provided evidence of the sticky cost behavior of Thai companies. To the knowledge of this researcher there are no results in recent literature regarding how both agency costs and political costs impact on cost stickiness. The aim of this study is to construct a model to perform a comprehensive investigation of sticky cost behavior. It fills a gap and attempts to contribute to the knowledge base by exploring and thereby developing a greater understanding of cost stickiness which is useful for not only managers but also accountants, investors, financial analysts and the other users of financial reports. These external users need information to assist them make investment and credit decisions.

From a methodological perspective, prior research used only multiple regression analysis to develop a sticky cost behavior model, which is a method for a single model;

there is one dependent variable and a number of independent variables. As there is a limitation of multiple regression analysis, this study utilized a new method called structural equation modeling (SEM). Smith and Langfield-Smith (2004) suggested that SEM offers advantages over multiple regression analysis. It is the analysis of sets of relations between observed variables and latent variables which cannot be measured directly. Therefore, this research utilized SEM with the AMOS program (Analysis of Moment Structures) to study the proxy of agency costs and other latent variables for searching the causes of sticky cost behavior. According to prior research, the most accounting and finance literature examined the agency cost measurement in addition to free cash flow such as an asset utilization ratio (for asset management quality) and discretionary expenditure ratio (for managerial extravagance) (Ang, Cole, & Lin, 2000; Singh & Wallance, 2003; Fleming, Heaney, & McCosker, 2005; Truong, 2006; Chen & Yur-Austin, 2007; Florackis, 2008; Gogineni, Linn, & Yadav, 2009; Henry, 2009). Measuring the latent variables (e.g., agency costs) from many observed variables may result in a multicollinearity problem. Factor analysis (that is one type of SEM) is an appropriate statistical technique for this study; it can reduce the number of variables by summarizing information contained in a large number of variables into a factor.

Theoretical Perspective

The theories which this study adopted are adjustment cost theory, agency theory and political process theory, which will be discussed briefly below.

Firstly, adjustment cost theory is an economic theory introduced by Lucas (1967). This theory can be used to predict the impact of economic changes on change in factors of production. Companies change their production factors more slowly than external shocks; they must incur adjustment costs which are inherent in adjusting the amount of the production factors. Adjustment costs are "…costs associated with changing factor demand that generate slow adjustment, or does stickiness arise from other aspects of a firm's behavior or market environment…" (Hamermesh & Pfann ,1996, p.1265). Earlier researchers suggested that adjustment costs may be the cause of cost stickiness. Adjustment costs have been widely studied in most previous empirical research on cost behavior, such as Anderson et al. (2003), Subramaniam and Weidenmier (2003), Medeiros and Costa (2004), Yang, Lee, and Park (2005), Anderson, Chen, and Young (2005), Banker and Chen (2006b), Banker, Ciftci, and Mashruwala (2008), and Balakrishnan and Gruca (2008). Lastly, Banker, Byzalov, and Plehn-Dujowich (2011) focused on adjustment costs in their framework and confirmed that adjustment costs is the main factor that leads to cost stickiness.

Secondly, agency theory was established by Jensen and Meckling (1976), and it was used to study management incentive. The agency theory is applied to explain the relationship and behavior between shareholders (principals) and managers (agents). They enter a contract in which shareholders assign authority and responsibility to managers and managers work on behalf of shareholders. The agreed contract, or incentive plan, motivates managers to behave in the way that is aligned with shareholders' interests. This theory assumes that managers are self-interested, bounded rational and risk-averse, however

managers may not make decisions in line with the best interests of the shareholders in mind. The agency theory focuses on the cost to shareholders caused by managers pursuing their own interests instead of the shareholders' interests, thus creating agency costs, which consist of both the financial costs incurred by shareholders to control the managers' actions, and the cost to the shareholders.

Besides the agency theory has been applied to explain the relationship and behavior between shareholders and managers, the political process theory was able to provide important variables in management decision regarding the discretionary expenditure items, for example selling and administrative costs or total operating costs. The political process is a competition among individuals for wealth transfers (Watts & Zimmerman, 1986) and there are two points of view for consideration. Firstly, government and regulatory agencies (external parties) have the power to transfer wealth from firms to other parties. Financial reports are one source of information that regulators can use to choose the industry or firm that will be singled out. Firms may attempt to affect such wealth redistribution via sticky costs to reduce political costs. Secondly, according to Foster (1986) who stated that "…financial statement numbers are often the basis by which wealth is distributed among various parties, for example, in profit sharing agreements with workers..." (p.140). There are also political costs among internal parties. The existing research has no evidence that political costs are significant variables in management decisions (or cost management) to maintain unutilized resources rather than adjust costs when sales revenue declines. Hence, it is important to investigate the causes of sticky cost behavior through the application of

both agency and political process theories, which are able to improve the design of the current research as well as be a remedy for the ambiguous managerial discretion.

Purposes of the Study

From the background research and theoretical perspective, this study on sticky cost behavior of Thai listed companies has six purposes, as follows:

1. To examine sticky costs behavior of Thai listed companies
2. To investigate the determinants of cost stickiness.
3. To determine whether cost stickiness has an association with adjustment costs.
4. To verify whether cost stickiness has an association with political costs.
5. To identify whether cost stickiness has an association with agency costs.
6. To investigate whether cost stickiness has an association with corporate governance.

Research Questions and Hypotheses

This research intends to provide empirical evidence of sticky cost behavior of Thai listed companies. In this quantitative study, it is hypothesized that Thai listed companies experience cost stickiness.

The empirical relations are:

Cost stickiness = f (Adjustment costs, Political costs, Agency costs, Corporate governance)

This study aims to answer research questions and test the following the hypotheses.

Research Question: 1. Is cost behavior of Thai listed companies sticky?

Research Hypothesis:

H1a: Cost behavior of Thai listed companies is sticky.

Research Question: 2. Is cost behavior still sticky, after controlling the economic variables?

Research Hypothesis:

H2a: Cost behavior is still sticky, after controlling the economic variables.

Research Question: 3. Do adjustment costs affect the degree of cost stickiness?

Research Hypothesis:

H3a: Adjustment costs affect the degree of cost stickiness in a positive direction.

Research Question: 4. Do political costs affect the degree of cost stickiness?

Research Hypothesis:

H4a: Political costs affect the degree of cost stickiness in a positive direction.

Research Question: 5. Do agency costs affect the degree of cost stickiness?

Research Hypothesis:

H5a: Agency costs affect the degree of cost stickiness in a positive direction.

Research Question: 6. Does corporate governance affect the degree of cost stickiness?

Research Hypothesis:

H6a: Corporate governance affects the degree of cost stickiness in a negative direction.

Definition of Terms

The definition of specific terms and phrases for purpose of this current research are as follows.

Adjustment Costs. Costs associated with making any changes. For example, one must consider adjustment costs for hiring a new employee, or the costs of lost production in the event of layoffs. All companies have adjustment costs, especially when they seek to achieve greater efficiency (Farlex Financial Dictionary).

Administrative Costs. Costs incurred for the firm as a whole, in contrast with specific functions such as manufacturing or selling; includes items such as salaries of top executives, general office rent, legal fees, and auditing free (Maher et al., 2008, p. 512).

Agency Costs. Costs that arise from the inefficiency of a relationship between an agent and a principal. In a publicly-traded company, agency costs may arise because the company's executives (the agents) may act in their own interest in a way that is detrimental to shareholders (the principals). For example, they may raise their own salaries to an unrealistic level. Agency costs are best reduced by providing appropriate incentives to align the interests of both agents and principals (Farlex Financial Dictionary).

Cost behavior. The functional relation between changes in activity and changes in cost ; for example : fixed versus variable cost (Maher et al., 2008, p. 528).

Cost driver. A variable, such as the level of activity or volume, which causally affects costs over a given time span (Horngren et al., 2012, p. 32).

Fixed costs. Costs remain unchanged in total as the volume of activity changes (Hilton et al., 2008, p. 54).

Political costs. Costs associated with the government expropriating wealth from companies and redistributing it to other parties in society (Foster, 1986, p. 37).

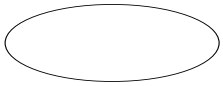
Sticky cost. Costs are sticky when the magnitude of the increase in costs associated with an increase in activity is greater than the magnitude of the decrease in costs associated with an equivalent decrease in activity (Anderson et al., 2003, p. 48).

Selling and administrative costs (SG&A costs). Costs not specifically identifiable with, or assigned to, production (Maher et al., 2008, p.588). SG&A costs consist of the combined payroll costs (salaries, commissions, and travel expenses of executives, sales people and employees), and advertising expenses.

Relevant range. The band of normal activity level or volume in which there is a specific relationship between the level of activity or volume and the cost in question (Horngren et al., 2012, p. 33).

Variable costs. Costs change in total in proportion to a change in the activity volume (Hilton et al., 2008, p. 54).

The geometric symbols for structural equation models (Byrne, 2010, p. 9)



A circle (or ellipse) represents unobserved latent factors.

A square (or rectangle) represents observed variables.

A single-headed arrow represents the impact of one variable on another.

A double-headed arrow represents covariances or correlations between pairs of variables.

ε represents measurement error for an observed variable.

Delimitation and Limitation of the Study

This research used the secondary data obtained from the financial reports of Thai listed companies during 2001-2009 that are available in the database of setsmart.com (see Appendix A). Other data was obtained from the website for the Stock Exchange of Thailand, or the company's own website. This study investigated only the behavior of selling and administrative costs (SG&A), cost of goods sold (COS) and total operating costs (TOP).

The samples of one hundred and sixty companies listed on the Stock Exchange of Thailand (see Appendix B) were selected. The study confined itself to purposive selection, and this procedure may decrease the generalization of the results.

Significance of the Study

A study of sticky cost behavior of Thai listed companies is important for several reasons.

1. The results of this research provided empirical evidence of sticky cost behavior of Thai listed companies. Understanding the causes of sticky cost behavior in turn assists managers and accountants to realistically estimate costs. With improved cost prediction Thai managers can make well-informed planning and control decision. If cost is predicted without considering sticky cost behavior, there will be either an underestimation or overestimation of costs in response to a change in activity.

2. The results of this research are used to support a positive accounting theory for explaining and predicting the behavior of managers by linking sticky cost behavior to the economic wealth transfer between managers and shareholders within the political process of the firm, along with the political process theory. This is pioneering research that used political costs as an important variable influencing the decisions of management through the phenomenon of cost stickiness.

3. This study contributed empirically to the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET) for concerning the regulation for corporate governance standards. There are a few studies that applied corporate governance

variables to be explanatory variables for cost stickiness research. These earlier results presented little evidence that corporate governance is able to reduce cost stickiness, this study supported this conclusion. Furthermore, most of the earlier studies applied each corporate governance variable individually (such as Ang et al., 2000; Singh & Wallance, 2003; Truong, 2006; Dittmar & Mahrt-Smith, 2007; Florackis, 2008; Jelinek & Stuerke, 2009; Chen & Chuang, 2009). In the econometric studies of corporate governance, the interrelationships between corporate governance variables were investigated. Endogeneity problems in corporate governance research are serious. To remedy these problems, this study used corporate governance indexes (CGI) as a proxy for corporate governance, which was developed by the National Corporate Governance of Thailand.

4. This study utilized new multivariable techniques (SEM) to examine the patterns of interrelationships between several constructs due to the fact that these latent variables cannot be measured or observed directly such as adjustment costs, political costs, and agency costs. This is a new method to investigate sticky cost behavior.

CHAPTER 2

LITERATURE REVIEW

The main purpose of this chapter is to provide a review of the literature that considers the key theoretical issues related to the research study proposal of sticky cost behavior and its determinants. This chapter starts with the background of the traditional cost behavior model and introduces the procedure to separate variable cost component. Then, discussing the theoretical concepts that guided this study is necessary to understand management's incentive. The first theoretical underpinning came out of the theory of adjustment costs, which argues that managers are hesitant about changing production factors when they are faced with shocks because of adjustment costs. The second theoretical reference was derived from agency theory, from an organizational perspective; agency theory postulates that managers make decisions with regard to their own interests instead of shareholders' interests. The third theoretical reference came from the political process theory, which argues that the behaviors of members of an organization are influenced by the political process. The literature of corporate governance is presented in next section.

Traditional Cost Behavior Model

In the traditional cost behavior model, management accountants create assumptions on cost behavior that the variation in the level of a single activity (the cost driver) is able to explain the variation in total costs and cost behavior is approximate by linear cost function

within the relevant range. That is variable costs vary in direct proportion to a change in activity, and that fixed costs remain constant throughout the relevant range. Hence, Costs are classified as variable and fixed with respect to a specific activity and for a given time period. It is consistent with economic cost theory which proposes that cost function is linear in the short run (the relevant range) and total cost can be described as two distinct components (Demski, 2008). They are variable cost that varies with revenues and fixed cost that does not varies with revenues. In addition, Horngren et al. (2012) stated that "…Surveys of practice repeatedly show that identifying a cost as variable or fixed provides valuable information for making many management decisions and is an important input when evaluating performance…" (p.30).

In the short-run, managers can only adjust some of resources, these resources are variable cost components whereas the resources that managers cannot adjust are fixed cost components. The accountants usually approximate short-run cost curve with a linear cost function as follows.

$$TC = F + V$$

$$TC = F + \nu S \quad (1)$$

From (1); $$F = TC - \nu S \quad (2)$$

Where:

TC = Total costs

F = Fixed costs

V = Variable costs

S = Sales (or Activity or Cost driver)

ν = Variable costs as a percentage of sales, that is, $V = \nu S$

White, Sondhi and Fried (2003) introduced the following procedure to estimate operating leverage when cost structure function is applied to real data.

1) Estimate Individual Components

The investigation of the total costs components provides an understanding of which costs are fixed and which are variable; then segregates the fixed cost component. This step simplifies the complex estimation procedure for the other cost components.

2) Use Regression Analysis to Estimate ν

The estimation of the variable costs components uses regression analysis with the following equation.

$$\text{Cost} = a + b\,(\text{Sales}) + e \qquad (3)$$

Where:

a = estimator of fixed cost components

b = estimator of variable cost components (ν)

e = the error term

This step runs the regression by using changes in cost rather than changes in sales to alleviate the autocorrelation problem. The intercept (a) would include changes in (fixed) costs due to factors rather than sales volume.

This procedure assumes that the cost structure function does not change over the time period examined. For checking this assumption, there is the estimate of a sequence of

v 's for the regression period. The v 's should exhibit no trend and should be consistent with the regression results. If the results do not display according to the assumption, the best estimation of v will be the estimate obtained from using the previous two years' data using the following equation (differential equation).

$$v = \frac{TC(year2) - TC(year1)}{S(year2) - S(year1)} \quad (4)$$

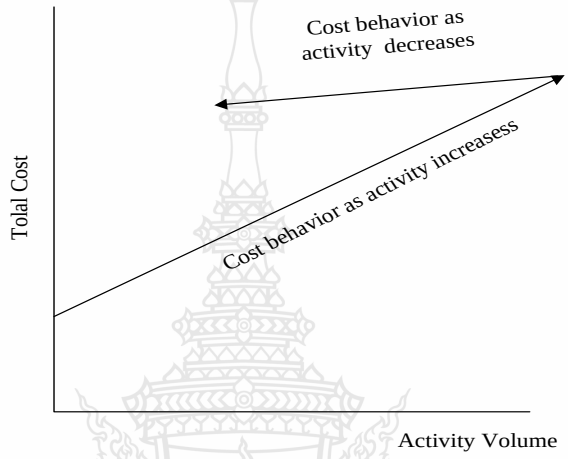
Since cost function always changes during the time period examined, the equation (4) is the best estimator of variable costs components. This study separated fixed components from total costs by applying the equation (4) and integrating it with the model of Balakrishnan, Labro, and Soderstrom (2010).

Empirical Evidence of Cost Behavior

Empirical research has found overhead costs are not proportional to overhead activities by using cross-sectional data from one hundred hospitals in Washington State at department level since 1989 and 1990 (Noreen & Soderstrom, 1994) and using panel data from one hundred and eight hospitals in Washington State during 1977-1992 (Noreen & Soderstrom, 1997). Consequently, Noreen and Soderstrom (1997) confirmed that costing systems which assume costs are proportional to activity will overstate relevant overhead costs for decision-making and performance evaluation purposes.

Anderson et al. (2003) introduced the concept of a sticky cost behavior. Figure 2-1 shows sticky cost behavior. They examined cost behavior by using selling, general, and administrative (SG&A) costs and sales revenue of 7,629 firms over a twenty

year period (during 1979-1998). They found that SG&A costs are sticky; SG&A costs increased 0.55% per 1% increase in sales revenue but decreased only 0.35% per 1% decrease in sales revenue.



Source: Maher, Stickney, and Weil, 2008: 160

Figure 2-1 Sticky Cost Behavior

Several research investigated cross-countries differences in sticky cost behavior. Medeiros and Costa (2004) studied the properties of sticky costs and the stickiness of SG&A costs in Brazilian companies and confirmed cost stickiness existed for Brazilian companies. Calleja, Steliaros, and Thomas (2006) used data for a sample of US, UK, French and German companies. Their results found costs are stickier for French and German companies than for US and UK companies due to differences in the corporate governance regimes across these four countries. Banker and Chen (2006a) analyzed a sample of nineteen OECD countries and recommended that labor market characteristics are significant factors for across-country variations in the degree of cost stickiness.

In Asian countries, Yang et al. (2005) inspected cost behavior of Korean general hospitals, and found that total costs, labor cost and administrative costs are sticky. The results provided strong support that the more hospitals have assets intensity or employees intensity, the more costs are sticky. Kuo (2007) found that SG&A costs of the Taiwanese computer electronic industry are sticky; costs increased 0.47% per 1% increase in sales revenue but decreased only 0.32% per 1% decrease in sales revenue. The cost stickiness was higher when the companies belong to related product diversification or their capacity utilization reaches more limits in computer electronic industry. Recent study on cost behavior of Japanese companies revealed that SG& A costs and cost of goods sold (COS) are sticky. SG&A costs and COS increase 0.60% and 0.96% per 1% increase in sales revenue respectively. However, SG&A costs and COS decrease only 0.42% and 0.90% per 1% decrease in sales revenue respectively (Yasukata & Kajiwara, 2008).

Previous research has attempted to identify the causes of cost stickiness (see Table 2.1), and has been centered on economic factors which make managers hesitate to reduce cost. In assessing the factors that lead to a reduction in the market demand, management considers measures of economic activity. A decline in demand is more likely to endure in periods of recession than in periods of economic growth. Anderson et al. (2003) used the percentage growth in real gross national product (GNP) as a measure of economic growth and found that the degree of cost stickiness is greater during a period of increased growth. The same results were found in previous research, Banker and Chen (2006a) included variable measuring the rate of macroeconomic growth (GDP) to study cost stickiness of nineteen OECD countries during 1996-2005.

Table 2.1 Summary of Variables in Cost Stickiness Research

Independent Variables or Control Variable	Authors
Employee intensity	Anderson, Banker, and Janakiraman(2003) Subramaniam and Weidenmier (2003) Medeiros and Costa (2004) Yang, Lee, and Park (2005) Anderson, Chen, and Young (2005) Banker and Chen (2006b) Banker, Ciftci, and Mashruwaly (2008) Balakrishnan and Gruca (2008) Banker, Byzalov, and Plehn-Dujowich (2011)
Asset intensity	Anderson, Banker, and Janakiraman (2003) Medeiros and Costa (2004) Yang, Lee, and Park (2005) Banker and Chen (2006b) Anderson and Lanen (2007) Banker, Ciftci, and Mashruwaly (2008) Banker, Byzalov, and Plehn-Dujowich (2011)
Economic growth	Anderson, Banker, and Janakiraman (2003) Banker and Chen (2006b) Anderson and Lanen (2007) Banker, Ciftci, and Mashruwaly (2008) Chen, Lu, and Sougiannis (2008) Banker, Byzalov, and Plehn-Dujowich (2011)
Corporate governance	Calleja, Steliaros, and Thomas (2006) Banker and Chen (2006b) Chen, Lu, and Sougiannis (2008)
Industry characteristics	Calleja, Steliaros, and Thomas (2006) Anderson and Lanen (2007)
Magnitude of the change in activity	Subramaniam and Weidenmier (2003) Balakrishnan, Petersen, and Soderstrom (2004) Calleja, Steliaros, and Thomas (2006)
Current capacity utilization*	Balakrishnan, Petersen, and Soderstrom (2004) Anderson, Chen and Young (2005)

Table 2.1 Summary of Variables in Cost Stickiness Research (Cont.)

Independent Variables or Control Variable	Authors
Fixed assets intensity	Subramaniam and Weidenmier (2003)
Inventory intensity	Subramaniam and Weidenmier (2003)
Interest ratio	Subramaniam and Weidenmier (2003)
Magnitude of the change in activity*	Balakrishnan, Petersen, and Soderstrom (2004)
Labour market characteristics	Banker and Chen (2006b)
Climatic conditions*	Bosch and Blandon (2007)
Market fluctuations*	Bosch and Blandon (2007)
Core service*	Balakrishnan and Gruca (2008)
Ownership types* Hospital's mission* Nature of resources*	Balakrishnan and Soderstrom (2008)
Perceived uncertainty Order backlog*	Banker, Ciftci, and Mashruwaly (2008)

* Variables which used in organizational level

Most empirical research presented the evidence of stickiness for costs in large samples of companies from multiple industries such as Anderson et al. (2003), Subramaniam and Weidenmier (2003), Medeiros and Costa (2004), Calleja et al. (2006), Banker and Chen (2006b) and Chen et al. (2008). On the other hand, research examining small samples of companies from single industry presented mixed results. Anderson et al. (2005) found that only operating costs are sticky and supported that cost stickiness is the result of rational

decisions by managers. Bosch and Blandon (2007) suggested fixed and variable costs are sticky for farms and cost stickiness is reduced with better managerial decision practices.

The study of operating costs of a hospital, Balakrishnan and Gruca (2008) found operating costs are sticky, and core service costs are stickier than other services costs. The results suggested that the variation in stickiness is due to variation in ownership. Nonetheless, Balakrishnan and Soderstrom (2008) provided limited evidence of cross-sectional variation in stickiness and failed to find evidence of differences in stickiness between patient care and service department costs for hospitals.

Subramaniam and Weidenmier (2003) explored how different industry may differentially affect the sticky cost behavior and found that manufacturing is the "stickiest" industry, while merchandising is the "least sticky" industry.

In summary, prior research has found that: 1) cost behavior is sticky in different countries; 2) economic growth is the determinant of cost stickiness. Based on the discussion of the traditional cost behavior model and empirical evidence of cost behavior, the following questions may be raised:

Q1: Is cost behavior of Thai listed companies sticky? and

Q2: Is cost behavior still sticky, after controlling the economic variables?

It is proposed that cost behavior of Thai listed companies is also sticky and cost behavior is still sticky, after controlling the economic variables. In accordance with these research questions, the study introduced the following hypotheses.

H1a: Cost behavior of Thai listed companies is sticky.

H2a: Cost behavior is still sticky, after controlling the economic variables.

Adjustment Cost Theory

The cost of adjustment theory was introduced by Lucas (1967). When a shock happens, a company cannot immediately change its factors of production without the cost of adjustment, that is changing the level of the production factors used is financially costly. Many researchers have adapted this concept to change circumstances such as changes of investment or capital (Mortensen, 1973; Epstien & Denny, 1986; Cooper & Haltiwanger, 2006; Groth & Khan, 2010), change of employment (Leitao, 2011; Nakamura, 1993) and changes of the level of inventories (Danziger, 2008).

Adjustment costs "…are implicit, in that they result in lost output and are thus not measured and reported on income and expenditure statement generated by firm's accounts…" (Hamermesh & Pfann, 1996, p. 1267). Labor adjustment costs are a result of changing the number of employees in the company, or costs related to the flow of employees for example search costs, cost of training, severance pay and overhead cost of maintaining. Capital adjustment costs are costs of changing the level of capital services such as in case of equipment capacity, adjustment costs are delivery and installing costs associated with purchasing new equipment, and disposal costs associated with its retirement. If managers need to increase or decrease committed resources, adjustment costs will be incurred, therefore managers may be hesitant about cutting resources when sales decline.

Previous research on cost stickiness used intensity of total assets and intensity of employees as proxies for adjustment costs. In addition, when operating activities rely more on assets and employee, adjustment costs are costly in case of demand decreasing. To

support this, all prior research indicated that cost stickiness is impacted by both intensity of assets and intensity of employees. (Anderson et al., 2003; Subramaniam & Weidenmier, 2003; Medeiros & Costa, 2004; Yang et al., 2005; Anderson et al., 2005)

Although, adjustment costs are not explicit monetary costs presented in financial reports, prior research utilized only the intensity of total assets and the number of employees as proxies of adjustment costs. This current study, however utilises three variables to measure adjustment costs -i.e. stock intensity, equity intensity, and capital intensity. They are measured from the book value of common stock, equity (or net assets) and fixed assets that are reported in the statement of financial position of the company.

In summary, prior research has found that adjustment costs influenced the degree of cost stickiness. Based on the discussion for adjustment costs, the following question is raised:

Q3: Do adjustment costs affect the degree of cost stickiness?

It is proposed that adjustment costs will moderate the extent of resources decreases for decreases in sales, so adjustment costs will influence the degree of cost stickiness. In accordance with this research question, the study introduced the following hypothesis.

H3a. Adjustment costs affect the degree of cost stickiness in a positive direction.

Political Process Theory

Political costs were added into the model as variables in order to account for their influence on sticky cost behavior. This study introduced the political process theory to expand the knowledge base about sticky cost behavior because "…society, politics and

economics are inseparable, and economic issues cannot meaningfully be investigated in the absence of considerations about the political, social and institutional framework in which the economic activity take place…"(Deegan & Unerman, 2011,p. 322).

Political process theory adopts the self-interest assumption that a politician endeavor to maximize their utility. Therefore, the political process is a competition for wealth transfer through governance service. Political costs are associated with the government expropriating wealth from companies and redistributing it to other parties in society (Foster, 1986). The corporations must incur the costs of coalescing into a lobbying group and becoming informed about how prospective government actions will affect them (Watts & Zimmerman, 1986). Political process theory proposes postulations about the use of accounting numbers in the political process; for example, politicians may use large reported earnings as evidence of monopoly. Consequently, the management of large companies may prefer to manage earning to optimal level by maintaining unutilized resources rather than adjust costs when sales revenue declines.

On the other hand, a profit-sharing agreement with employees always uses financial statement numbers as a basis for the profit-sharing plan (Foster, 1986). Management has the potential to affect their compensation by adjusting costs when sales revenue declines.

Empirical research suggested that political costs are important variables in the disclosure and accounting method decisions. Management will attempt to reduce political costs. Wong (1988) found that companies, with a higher effective tax rate, larger market concentration ratio and more capital intensive, volunteered to disclose current cost financial statements. This result supported that political costs influenced management's decision to

voluntary disclose. Further, political costs influenced managers' decision to disclose segment reports (Birt, Bilson, Smith, & Whaley, 2006) and corporate social responsibility (CSR) disclosures (Belkaoui & Karpik, 1989; Gamerschlag, Moller, & Verbeeten, 2010). In conclusion, companies disclosed this information to decrease or avoid political costs.

Additionally, political costs also influence the manager's choices of accounting policies. The political process theory explains that managers utilize accounting choices to decrease wealth transfers resulting from the regulatory process (Watts & Zimmerman, 1986; Grace & Leverty, 2010). Inoue and Thomas (1996) concluded that an effective tax rate significantly affects the managers' choices of accounting methods.

This study applied the political process theory to search for and identify the determinants of sticky cost behavior and utilized political costs as an independent variable. There are five variables that are used as a proxy for political costs (see Table 2.2).

1) Size

The investigators have used company size as a proxy for the company's political sensitivity and as an incentive for management to mange earnings. The larger a company is the more likely is the occurrence of wealth transfer, when compared to small company (Watts & Zimmerman, 1986; Kern & Morris, 1991; Lamm-Tennant & Rollins, 1994; Seay, Pitts, & Kamery, 2004). Hence, this study hypothesized that larger company experiences a higher degree of cost stickiness than a small company.

2) Risk

The political costs vary with the company's risk. The high-risk company is more likely to maintain costs when sales revenue declines. Beta of company's stock is a measure

of risk. (Peltzman, 1976; Zmijewski & Hagerman,1981; Watts & Zimmerman, 1986; Seay et al., 2004).

3) Capital intensity

The capital intensive company is subject to relatively more political costs and more cost stickiness. Wong (1988) and Belkaoui and Karpik (1989) measured political costs by capital intensity in their research.

4) Concentration

Concentration ratio is a measure of the degree of competition in an industry (Watts & Zimmerman, 1986; Wong ,1988; Godfrey & Jones,1999). The higher competition degree, the more likely the management is to stick costs to reduce political costs.

5) Tax ratio

Effective tax rate is a component of the political costs (Kern & Morris, 1991). Inoue and Thomas (1996) confirmed that taxation has significant an impact on managers' choice because the Japanese tax system is related to the financial reporting system.

Table 2.2 Summary of Political Cost Variables

Political Cost Variables	Authors
Size	Watts and Zimmerman (1986) Kern and Morris (1991) Lamm-Tennant and Rollins (1994) Seay, Pitts, and Kamery (2004)
Risk	Peltzman (1976) Zmijewski and Hagerman (1981) Watts and Zimmerman (1986) Seay, Pitts, and Kamery (2004)
Capital intensity	Wong (1988) Belkaoui and Karpik (1989)
Concentration	Watts and Zimmerman (1986) Wong (1988) Godfrey and Jones (1999)
Tax	Kern and Morris (1991) Inoue and Thomas (1996)

In sum, prior research has found that political costs are a major influence on managers, and their decision on disclosing information and choice of accounting methods. This study introduced political costs to investigate cost behavior; the following questions may be raised:

Q4: Do political costs affect the degree of cost stickiness?

It is proposed that political costs influence the degree of cost stickiness because management may maintain the company's earnings at an optimal level in order to reduce wealth transfers. In accordance with this research question, the study introduced the following hypothesis.

H4a: Political costs affect the degree of cost stickiness in a positive direction.

Agency Theory

Agency theory was developed by Jensen and Meckling (1976), and it was used to study the incentives of management. The characteristics of agency theory are summarized in Table 2.3. Agency theory is applied to explain the relationship and behavior between shareholders (principals) and managers (agents). They enter a contract in which the shareholders assign authority and responsibility to managers and managers work on behalf of the shareholders. The incentive plan, or contract, motivates the managers to behave in the way that is aligned with the shareholders' interests.

Agency theory assumes that managers are self-interested, bounded rational and risk-averse. Managers may not make decisions with the best interests of the shareholders in mind. Agency theory focuses on the agency costs to shareholders that arise from managers pursuing their own interests instead of the shareholders' interests or interests of the firm. These agency costs consist of both of the costs incurred by shareholders to control managers' actions and the costs to the shareholders if managers pursue their own interests that are not in the interests of shareholders. Methods of controlling the manager's action include auditing, monitoring measures, rewards and penalties to motivate managers to act in the best interests of the shareholders. When managers fail to make decisions with the best interests of the firm and company in mind this is considered as divergent behavior, such as empire building or shirking. Agency theory predicts that divergent behavior will occur if not constrained by corporate governance.

Table 2.3 The Characteristics of Agency Theory

Characteristics	Details of Characteristics
Key idea	Principal-agent relationships should reflect efficient organization of information and risk-bearing costs
Unit of analysis	Contract between principal and agent
Human assumptions	・Self-interest ・Bounded rationality ・Risk aversion
Organizational assumptions	・Partial goal conflict among participants ・Efficiency as the effectiveness criterion ・Information asymmetry between principal and agent
Information assumption	Information as a purchasable commodity
Contracting problems	・Agency (moral hazard and adverse selection) ・Risk sharing
Problem domain	Relationships in which the principal and agent have partly differing goals and risk preferences

Source: Eisenhardt, 1989: 59

Although Anderson et al. (2003) explained the impact of managers' decisions on cost behavior; few studies have explored the underlying theory affecting management decisions. Chen et al. (2008) and Banker et al. (2011) draw on agency theory, and used free cash flow to measure the degree of managers' empire-building incentives. The results found cost stickiness is greater in firm-years with higher free cash flows. Their results suggested that corporate governance can reduces cost stickiness. Furthermore, Banker et

al. (2008) examined the role of managers' optimism in managerial decisions regarding the capacity of activity resources that led to costs. Accordingly, exploring management decision processes and additional factors which affect cost behavior in each industry is important to better understand cost stickiness.

The majority of results implied that sticky costs occur when decisions by a manager arise with the adjustment of committed resources in response to a change in activities. Nevertheless, previous research on the cost stickiness phenomenon found only indirect evidence on the proposition that sticky cost behavior is the result of decisions made by management.

This study applied the agency theory because cost stickiness may stem from empire building incentives. Thus, this study used agency costs as an independent variable to explain sticky cost behavior and postulated that the company with higher agency costs has the higher degree of cost stickiness. The existing research has applied financial statement-based agency cost measures as follows.

1) Asset utilization ratio

This ratio acts as a proxy for management's efficiency in the use of assets which is measured by sales divided by total assets. This provides a measure of the effectiveness of company investment decisions and the ability of the company's management to direct assets to their most productive use. A company with lower asset utilization ratio is making non-optimal investment decisions, or using funds to purchase unproductive assets, thereby creating agency costs for shareholders. This is a variable used by Ang et al. (2000), Singh

and Wallance (2003) and McKnight and Weir (2009). A lower asset utilization ratio is a signal of agency misalignment and the existence of agency costs.

2) Discretionary expenditure ratio

This is a proxy for management's efficiency in perquisite consumption which is measured as selling and administrative expense divided by sales. This is variable was used by Ang et al. (2000), Singh and Wallance (2003), Truong (2006), Florackis (2008), Henry (2009) and Jelinek and Stuerke (2009). A higher discretionary expenditure ratio is an indicator of agency misalignment and the existence of agency costs.

3) Free cash flow (FCF)

FCF is involved in underinvestment which is measured as cash flow from operating activity minus dividend, divided by sales. A company with agency problems will have a high free cash flow. This variable was employed by Chen et al. (2008), Florackis (2008), Chae, Kim and Lee (2009), and Banker et al. (2011).

4) Tobin's Q

This factor is employed as a representation of managerial performance. The premise is that poorly-performing managers are more likely to make decisions that increase agency costs. The lower Tobin's Q ratio result indicates poor managerial performance and the existence of agency costs. This is similar to variables used by Lang, Stulz,and Walkling (1991), Dey (2008) and Heney (2009).

5) Size

Larger companies have a greater scale of operations, which provides greater opportunity and incentive for managers to shirk (Demsetz & Lehn, 1985). Hence, larger

companies will have higher agency conflicts. Similar to Dey (2008) and Birt, Bilson, Smith, and Whaley (2006), this variable was used to measure agency costs.

6) Leverage

It is probable that companies with greater leverage will have higher agency costs related to debt. The companies with a higher leverage ratio have a greater incentive to manage earnings so that they are protected against the adverse effects on their debt rating (Dey, 2008). This means that when leverage increases, agency costs of debt also increase (Jensen, 1986).

7) ROA (Return on Assets)

Earlier research utilized ROA as a proxy for firm performance, similar to Tobin's Q (Dey, 2008; Jelinek & Stuerke, 2009). The lower ROA indicates poor performance and agency problems.

According to existing studies, this research gathered these variables together in order to develop measurement model of agency costs (see Table 2.4). Based on the discussion of the degree of cost stickiness in context of the agency theory, the following question may be raised:

Q5: Do agency costs affect the degree of cost stickiness?

It is proposed that agency costs positively relate to the degree of cost stickiness. In accordance with this research question, the study introduced the following hypothesis.

H5a: Agency costs affect the degree of cost stickiness in a positive direction.

Table 2.4 Summary of Agency Cost Variables

Agency Cost Variables	Authors
Asset utilization ratio or Asset turnover	Ang, Cole and Lin (2000) Singh and Wallance (2003) Truong (2006) Florackis (2008) Jelinek and Stuerke (2009) Henry (2009)
Discretionary expenditure ratio	Ang, Cole and Lin (2000) Singh and Wallance (2003) Truong (2006) Florackis (2008) Jelinek and Stuerke (2009) Henry (2009)
Free cash flow	Florackis (2008) Dey (2008) Chae, Kim, and Lee (2009) Henry (2009)
Tobin's Q ratio	Dey (2008) Henry (2009)
Size	Demsetz and Lehn (1985) Birt, Bilson, Smith, and Whaley (2006) Dey (2008)
Leverage	Dey (2008) Jensen (1986).
ROA	Dey (2008) Jelinek and Stuerke (2009)

Corporate Governance

Corporate governance is one of the most commonly used phrases when a financial crisis occurred. Beginning with the East Asian financial crises during 1997-1998, the collapse of America's largest companies, such as Enron in 2001 and WorldCom in 2002, and the current American sub-prime crisis, weak corporate governance is mentioned as one of the possible causes of these crises.

Chavalit Thanachanan, chairman of Stock Exchange of Thailand said that "…In Thailand, recognition of the value of corporate governance was brought into sharp focus as a result of the 1997 economic crisis…

…good governance practices are what provide the moral and ethical framework that should underpin any business model to ensure its sustainability and to increase investor confidence…"

Definition of Corporate Governance

The term "corporate governance" has no single formal definition (Turner, 2009, p.5), and there are many definitions of corporate governance from the narrowest which is restricted to the relationship between a firm and its owner (shareholders). This is the "agency theory" (the traditional finance paradigm). Whereas the broadest definition describes the relationship between a firm and other "stakeholders", it is the "stakeholder theory". The definitions of corporate governance are different and are subject to the viewpoint of the individual researcher, practitioner or policy maker. Table 2.5 shows definitions of corporate governance in many perspectives.

For Thailand, the National Corporate Governance Committee of Thailand defines "Corporate governance as

- Relationship between the board of director of a company, its management team, its shareholders and other stakeholders in leading the company's direction and monitoring its operations.

- A structure and internal process ensuring that the board of directors evaluates the performance of management team transparently and effectively.

- A System having structure and process of leadership and corporate control to establish the transparent working environment, and to enhance the company's competitiveness to preserve capital and to increase shareholders' long-term value by taking into consideration; business ethics, the interests of other stakeholders and society."

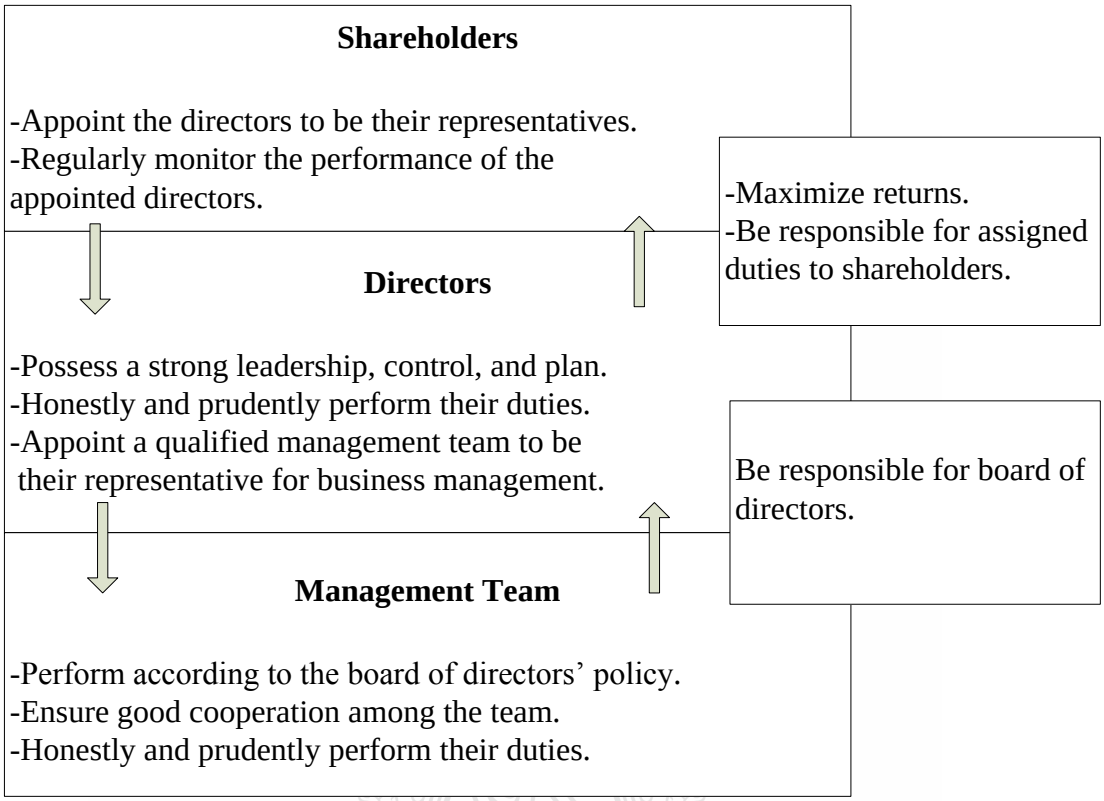
Figure 2-2 displays the relationship between the board of director of a company, its management team, and its shareholders.

In conclusion, there is no established academic definition of corporate governance, since it is difficult to find the words and phrases that capture the entire aspect of modern corporate life.

Table 2.5 Definition of Corporate Governance

Corporate governance is…	Authors
. . . the process of supervision and control intended to ensure that the company's management acts in accordance with the interests of shareholders.	Parkinson (1994)
. . . the governance role is not concerned with the running of the business of the company per se, but with giving overall direction to the enterprise, with overseeing and controlling the executive actions of management and with satisfying legitimate expectations of accountability and regulation by interests beyond the corporate boundaries.	Tricker (1984)
. . . the governance of an enterprise is the sum of those activities that make up the internal regulation of the business in compliance with the obligations placed on the firm by legislation, ownership and control. It incorporates the trusteeship of assets, their management and their deployment.	Cannon (1994)
. . . the relationship between shareholders and their companies and the way in which shareholders act to encourage best practice (e.g., by voting at AGMs and by regular meetings with companies' senior management). Increasingly, this includes shareholder 'activism' which involves a campaign by a shareholder or a group of shareholders to achieve change in companies.	The Corporate Governance Handbook (1996)
. . . the structures, process, cultures and systems that engender the successful operation of the organization.	Keasey and Wright (1993)
. . . the system by which companies are directed and controlled.	The Cadbury Report (1992)
. . . the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity.	Solomon and Solomon (2004)

Source: Adapt from Solomon & Solomon, 2004



Source: www.cgthailand.org

Figure 2-2 The Relationship between the Board of Director of a Company, Its Management Team, and Its Shareholders.

Benefit of Corporate Governance

The National Corporate Governance Committee of Thailand defines "Benefit of corporate governance as

-Increasing operational efficiency and effectiveness

Corporate governance is a tool to evaluate and monitor internal operations of a company. It helps creating, therefore, useful guidelines for improving its operation workflow.

-Enhancing competitiveness

An organization with good corporate governance is widely accept comparable to international standard and processes comparative advantage in term of strategic management.

-Enhancing stakeholders' confidence toward an organization

Corporate governance ensures the transparency of business management and avoids an opportunity of executives and management taking advantages for their own benefit. In other words, stakeholders would not take any risks to an organization without good corporate governance.

-Maximizing shareholders' value

Good corporate governance boosts shareholders' confidence to invest leading to increasing value of the company's shares in their portfolio."

Corporate governance is a major benefit to the company, especially to maximize company value. Therefore, many researchers have examined corporate governance's effects and have proven its benefit.

Corporate Governance Variables

Corporate governance issues arise from two situations, the first is the agency problems, or conflict of interest that is caused by the separation of ownership and control in modern organizations. The second is when there are incomplete contracts between management and shareholders (Hart, 1995). From an agency theory, Jensen and Meckling (1976) suggested that the zero agency–cost base case is the firm owned solely by a single

owner-manager. When a manager owns less than 100 percent of firm's equity, there is the potential of conflicts of interest between managers and shareholders. Moreover, there are agency costs from using an agent (e.g., when a manager will use the firm's resources for his personal benefit) and agency costs from mitigating the conflicts. Thus, the majority of corporate governance research examined whether corporate governance mechanisms can minimize the gap between managers' and shareholders' interests and the impact of corporate governance mechanisms on corporate performance. If corporate governance mechanisms can align managers' and shareholders' interests, then they should have a positive impact on the company's performance.

Jensen (1993) presented that there are four basic categories of corporate governance; legal and regulatory mechanisms, internal control mechanisms, internal control mechanisms, and product market competition. Internal control mechanisms consists of the firm's ownership structure, the board of directors, the executive compensation, and the firm's debt structure. These are the variables most frequently used academic research and in documents for public interest (see Table 2.6); For example Ang et al. (2000), Singh and Wallance (2003), Truong (2006), Florackis (2008), Jelinek and Stuerke (2009), and Chen and Chuang (2009). There are interactions between these variables, which contribute to serious endogeneity problems in corporate governance research (Bhagat & Jefferis, 2002).

Table 2.6 Summary of Corporate Governance Variables

Corporate Governance Variables	Authors
-Ownership structure -External monitoring by bank	Ang, Cole and Lin (2000)
-Managerial ownership -Outside block ownership -Board size and composition	Singh and Wallance (2003)
-Board characteristics -Corporate Ownership -Other governance mechanisms	Truong (2006)
39 variables using PCA to reduce into 14 governance factors	Larcker, Richardson, and Tuna (2007)
8 variables using PCA to reduce into 3 governance factors -Board independence factor -Board structure factor -Board activity factor	Kanagaretnam, Lobo, and Whalen (2007)
-Ownership structure -Board structure -Compensation structure -Capital structure	Florackis (2008)
22 governance variables using principal component analysis (PCA) to reduce into 7 governance factors	Dey (2008)
Structural governance index	Henry (2009)
Managerial equity ownership	Jelinek and Stuerke (2009)

Until recently, empirical research applied principal component analysis (PCA) to reduce endogeneity problems. Larcker, Richardson, and Tuna (2007) grouped thirty-nine variables into fourteen governance factors by using PCA and found governance factors are

related to future operating performance and excess stock returns. Kanagaretnam, Lobo, and Whalen (2007) used PCA to reduce eight variables into three governance factors and showed that good corporate governance can reduce information asymmetry around quarterly earnings announcements. Dey (2008) examined seven governance factors form twenty-two governance variables, and suggested the composition and functioning of the board, the independence of the auditor, and the equity-based compensation of directors are significantly associated with performance. However, these associates were found primarily only for companies with high agency conflicts.

The majority of previous research supported the finding that corporate governance lead to higher corporate performance. Ang et al. (2000) presented agency costs are higher when there is an external, rather than an internal firm manager and an increase in the number of non-manager shareholders. Agency costs are inversely related to the manager's ownership share and lower with greater monitoring by banks and other financial institutions. Singh and Wallance (2003) and Truong (2006) found that managerial ownership is positively related to asset utilization, but it is not related to discretionary expenses. However, Florackis (2008) pointed out that managerial ownership, managerial compensation and ownership concentration are strongly associated with agency costs, both asset utilization ratio and expenditure ratio.

Jelinek and Stuerke (2009) proposed that the relationship between agency costs and managerial equity ownership is nonlinear. The research reveals managerial equity ownership is positively associated with the return on assets and asset utilization, but negatively associated with the expense ratio.

In Thailand, the Thai Institute of Directors Association (IOD) has conducted the corporate governance report, which presented the results of the evaluation of corporate governance practices of Thai listed companies since 2001. The Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET) recognize the important of this study and have supported this project in the hope that corporate governance standards will be raised and benefit both the investors and companies. The current evaluation criteria are corporate governance indexes (CGI) or ratings, that are based on the components of the code of practice. Thai listed companies are evaluated according to one hundred and thirty-two criteria in the following five categories derived from the Organization for Economic Cooperation and Development (OECD) principles of corporate governance:

1. Rights of Shareholders
2. Equitable Treatment of Shareholders
3. Role of Stakeholders
4. Disclosure and Transparency
5. Board Responsibilities

Listed companies in Thailand are then categorized into the following six groups according to their corporate governance performance:

1. Excellent	CGI	=	5
2. Very Good	CGI	=	4
3. Good	CGI	=	3
4. Satisfactory	CGI	=	2
5. Pass	CGI	=	1

6. N/A

This study used CGI as a proxy for the corporate governance variable in order to correct the problem of endogeneity between corporate governance variables and provide empirical evidence for regulating corporate governance standards.

Empirical research of cost behavior which considered corporate governance, started with research by Calleja et al. (2006) and Banker and Chen (2006a). They found that the corporate governance system influences the degree of cost stickiness. Costs of companies that are subject to the code-law system of corporate governance are stickier than costs of companies which are subject to the common-law system of corporate governance. They did not add corporate governance as a variable into the cost behavior model. Lastly, Chen et al. (2008) and Banker et al. (2011) found cost asymmetry, or cost stickiness, increases with managerial empire building incentives due to the conflict of interest between managers and shareholders. Chen et al. (2008) suggested that good corporate governance can reduce cost stickiness by preventing managers' over-spending on selling, general and administrative costs (SG&A costs).

In summary, earlier research has found that corporate governance factors impact on cost stickiness. Based on the discussion of causes and consequences of the sticky cost behavior and empirical evidence of cost behavior, the following questions may be raised:

Q6: Does corporate governance affect the degree of cost stickiness?

It is proposed that there is a negative association between the strength of corporate governance and the degree of cost stickiness. In accordance with this research question, the study introduced the following hypothesis.

H6a: Corporate governance affects the degree of cost stickiness in a negative direction.

Summary

The research of Anderson et al. (2003) encouraged academic research in the area of cost behavior, especially in cost stickiness. The previous research indicated that many countries experience sticky cost behavior. Anderson and Lanen (2007) suggested that future research should include the theories of management decision making and cost management that are most consistent with observed cost behavior. Based on the review of the relevant literature, cost stickiness research is still academically, an unexplored area. In order to analyze sticky cost behavior of Thai companies, this research linked the variables that impact on the degree of cost stickiness such as economic growth and adjustment costs. In addition, Chen et al. (2008) concluded in their research that SG&A cost asymmetry arises from management's deliberate action, which explained by agency theory, and corporate governance has an impact on managers' decisions about discretionary costs. Furthermore, Watts and Zimmerman (1986) suggested in a positive accounting theory that internal political processes have an effect on the incentive of managers to choose accounting procedures. Managers may promote earnings to the optimal target for their own and shareholders' interests.

This study applied the previous findings to examine sticky cost behavior of Thai listed companies. As mentioned above, adjustment costs, political costs, agency costs, and corporate governance have influence on management incentives. Therefore, this study investigated the impacts of these variables on cost stickiness.

The main interest here is to determine whether cost behavior of Thai companies is sticky or asymmetric in the same manner as observed in the other countries. This study postulated that cost behavior is sticky because costs are the results of management decisions. It is also possible that the adjustment cost theory, political process theory, and agency theory are able to explain and predict the behavior of Thai managers.

In this review there was no investigation and study of the latent constructs for adjustment costs, political costs, and agency costs measured by multiple indicators. To address this issue, latent constructs for adjustment costs, political costs, and agency costs were developed and examined in this study using confirmatory factor analysis (CFA).

In addition, three models were applied for investigating sticky cost behavior.

1. ABJ model. Anderson, Banker, and Janakiraman (2003) developed a log model to investigate cost stickiness.

ABJ Model :

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \ln\left[\frac{S_{i,t}}{S_{i,t-1}}\right] + \beta_2 \ Dec\_D_{i,t}{}^{*} \ln\left[\frac{S_{i,t}}{S_{i,t-1}}\right] + \varepsilon_{i,t}$$

or

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{Sale Change} + \beta_2 \ Dec\_D_{i,t}{}^{*} \text{Sale Change} + \varepsilon_{i,t}$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$Dec\_D_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

$\ln [\frac{S_{i,t}}{S_{i,t-1}}]$ = Sale Change

Cost is sticky, when β_1 more than $\beta_1 + \beta_2$ or $\beta_2 < 0$

2. BLS 1 model. Balakrishnan, Labro, and Soderstrom (2010) used a simulated dataset and showed that ABJ model captures "mechanical" sticky cost behavior associated with committed fixed cost. In addition, Nasev (2009) identified that one of three major factors arising from the cost stickiness is the fixing of cost. Costs are fixed in the sense that they are occurred, although committed resources are not fully utilized when the level of activity declines (Banker & Hughes, 1994). Balakrishnan et al. (2010) proposed a model which removed committed fixed cost by using a percentage change in costs and sales.

BLS1 Model:

$$[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}] = \beta_0 + \beta_1 [\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}] + \beta_2 \text{Dec\_D}_{i,t} * [\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}] + \varepsilon_{i,t}$$

or

$$[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}] = \beta_0 + \beta_1 \text{Sale Change} + \beta_2 \text{Dec\_D}_{i,t} * \text{Sale Change} + \varepsilon_{i,t}$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$\text{Dec\_D}_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

$[\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}]$ = Sale Change

Cost is sticky, when β_1 more than $\beta_1 + \beta_2$ or $\beta_2 < 0$

3. BLS2 model. Balakrishnan, Labro, and Soderstrom (2010) also suggested a model that used lagged sales instead of lagged costs as a denominator of a dependent variable. This model used change in costs and sales that deflated by sales.

BLS2 Model:

$$\left[\frac{TC_{i,t}-TC_{i,t-1}}{S_{i,t-1}}\right]=\beta_0+\beta_1\left[\frac{S_{i,t}-S_{i,t-1}}{S_{i,t}}\right]+\beta_2\ \text{Dec\_D}_{i,t}*\left[\frac{S_{i,t}-S_{i,t-1}}{S_{i,t}}\right]+\varepsilon_{i,t}$$

or

$$\left[\frac{TC_{i,t}-TC_{i,t-1}}{S_{i,t-1}}\right]=\beta_0+\beta_1\ \text{Sale Change}+\beta_2\ \text{Dec\_D}_{i,t}*\ \text{Sale Change}+\varepsilon_{i,t}$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$\text{Dec\_D}_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

$\left[\frac{S_{i,t}-S_{i,t-1}}{S_{i,t}}\right]$ = Sale Change

Cost is sticky, when β_1 more than $\beta_1+\beta_2$ or $\beta_2 < 0$

However, the single cost driver used in prior studies, and this current study, is sales revenue which is the optimal cost driver. The reason is that regarding the optimal number and the selection of cost drivers must be balanced between the benefit of multiple cost drivers and the cost of data collection and processing associated with these drivers (Babad & Balachandran, 1993).

CHAPTER 3

RESEARCH METHODOLOGY

The purposes of this investigative and quantitative study were to identify the factors that affect cost behavior and contribute factors that impact on sticky cost behavior of Thai listed companies. The independent variables were derived from the adjustment cost theory, political process theory, and agency theory. The dependent variable was cost stickiness. This chapter presents the theoretical framework and describes the design of the research, as well as data processing and analysis.

Theoretical Framework

To better understand the determinants of sticky cost behavior or asymmetrical cost behavior, the theoretical framework was developed. There are both measurement model and structural models in this overall framework. The measurement model was proposed to investigate theoretical constructs, or latent variables, that cannot be observed directly. The relationships of observed and latent variables of adjustment costs, political costs and agency costs, were specified a priori, and described as implied conceptual models (see Figures 3-1). They are measurement models as analyzed in confirmatory factor analysis (CFA), which is Semi-SEM. Kline (2011) explained that "…The multiple-indicator approach to measurement of CFA represents literally half the basic rational of analyzing covariance structures in SEM - the analysis of structure model is the other half- so CFA is crucial technique…".

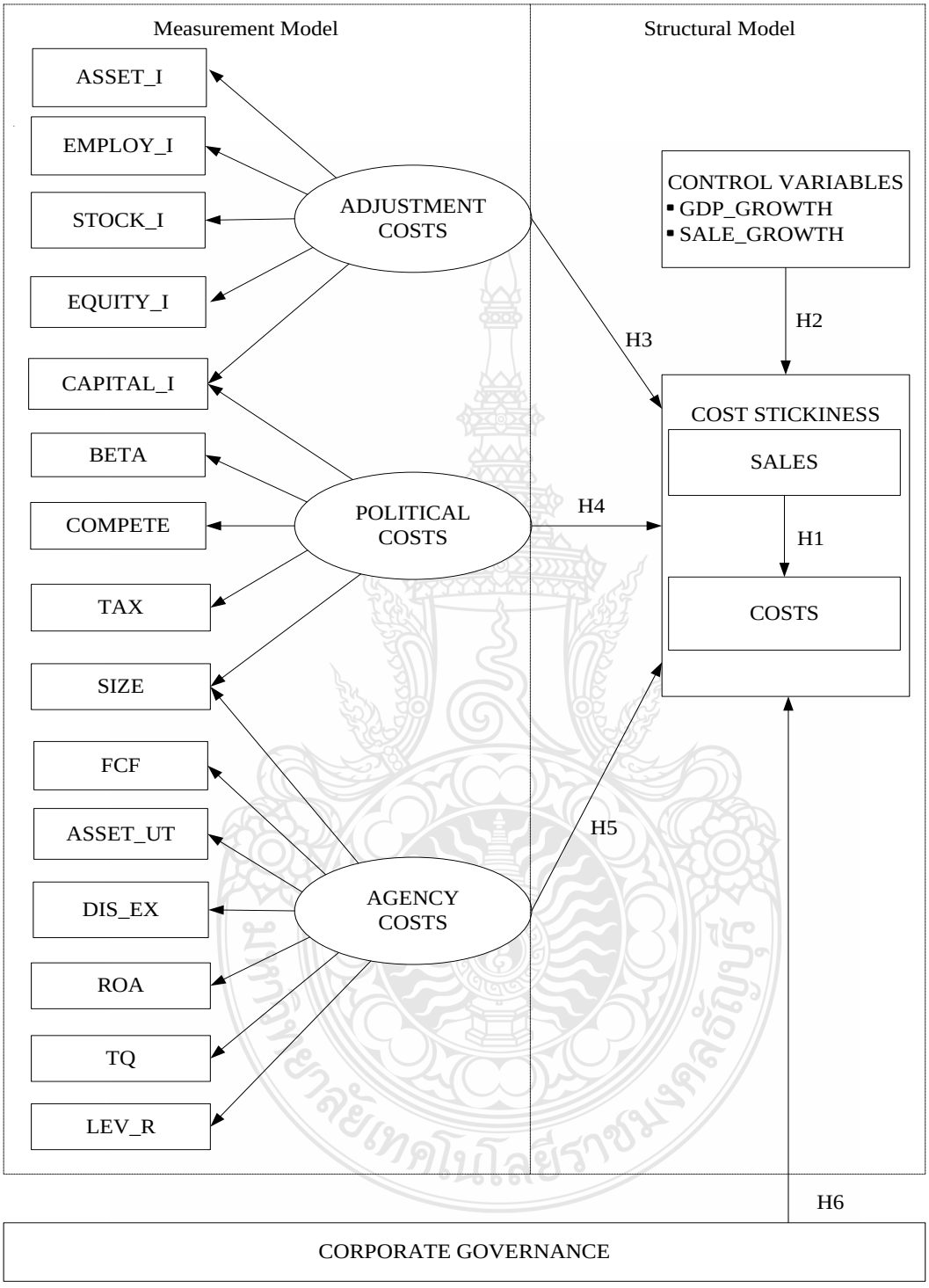


Figure 3-1 Theoretical Framework

Figure 3-1 shows theoretical framework of this research.

Where

ASSET_I	=	assets intensity
EMPLOY_I	=	employee intensity
STOCK_I	=	stock intensity
EQUITY_I	=	equity intensity
CAPITAL_I	=	capital intensity
BETA	=	risk
COMPETE	=	concentration ratio
TAX	=	tax ratio
SIZE	=	size
FCF	=	free cash flow
ASSET_UT	=	asset utilization ratio
DIS_EX	=	discretionary expense ratio
ROA	=	return on assets
TQ	=	Tobin's Q
LEV_R	=	leverage ratio
GDP_GROWTH	=	GDP growth
SALE_GROWTH	=	sale growth

Research Design

Selection of the Subjects

The target companies for this study were those listed on the Stock Exchange of Thailand. As of December 31, 2009 there were a total of four hundred and seventy-one companies, classified into eight categories by the Stock Exchange of Thailand (see Appendix A). This study used the purposive selection procedure to investigate the cost behavior of companies in seven industries, with the exception of the financials industry and property fund sector in property and construction industry, because of the unavailability of standardized financial reports. The analysis spanned nine years between 2001-2009. After eliminating companies with missing values of variables and with sales decreasing less than three years, the final sample comprised of one hundred and sixty companies (see Appendix B), with one thousand, two hundred and eighty company-year observations (from only eight years due to time lag). Table 3.1 shows the sample selection under consideration.

Table 3.1 Selection of Data

Total listed companies as of December 31, 2009		471	companies
Special industries			
-Financial industry	61		
-Property Fund	26	(87)	
		384	
Missing data and not calendar year		(71)	
		313	
Listed after 2001		(52)	
		261	
Sales decreasing < 3 years (during 2001-2009)		(101)	
		160	companies
Number of observations		1,280	observations

The number of observations, or subjects, used in this study was appropriate for multivariate analysis. There are twenty-one variables so the resulting subjects-to-variables ratio is more than twenty. The level of statistical significance (α) is 95%

Instrumentation and Materials

This study adapted the model of Anderson et al. (2003) which used selling, general, and administrative (SG&A) costs as a proxy for costs and sales revenue as a proxy for activity due to the paucity of cost and activity driver data. They used data on SG&A costs and sales revenue, since sale volume drives many of the components of SG&A costs (Cooper & Kaplan, as cited in Anderson et al., 2003). SG&A costs are significant costs for performing business which the manager should pay attention to control those (Chen et al., 2008). Furthermore, SG&A costs are often highly discretionary in nature which is a ripe target for cost reduction (White & Dieckman, 2005). However, this study used total operating costs (TOP) as the proxy for costs because of the different classifying items in financial reports. Banker et al. (2011) and Balakrishnan et al. (2010) also used total operating costs (TOP) as the proxy for costs. In additional, this study adapted two models of Balakrishnan et al. (2010), which removed committed fixed cost (BLS1 Model and BLS2 Model).

Variables in the Study

Literature reviews show that cost stickiness is influenced by factors other than activity change. For the investigation into the reasons for sticky cost behavior, this study

examined three latent variables (adjustment costs, political costs, and agency costs) by controlling the economic factors (Table 3.2).

Table 3.2 Variables and Measurement

Variables	Symbol	Measurement
Independent Variables		
-Adjustment Costs		
・Asset Intensity	ASSET_I	Total assets/Total sales
・Employee Intensity	EMPLOYEE_I	Number of employees/Total sales
・Stock Intensity	STOCK_I	Book value of common stocks/Total sales
・Equity Intensity	EQUITY_I	Equity/Total sales
・Capital Intensity	CAPITAL_I	Fixed assets/Total sales
- Political Costs		
・Capital Intensity	CAPITAL_I	Fixed assets/Total sales
・Risk	BETA	Beta of company ’s stock
・Concentration Ratio	COMPETE	% of total industry sales made by 8 largest companies in the industry
・Tax Ratio	TAX	Tax expense/Earnings before Tax
・Size	SIZE	Natural log of total assets
- Agency Costs		
・Size	SIZE	Natural log of total assets
・Free Cash Flow	FCF	(Cash flow from operating activity –Dividend) /Total assets
・Asset Utilization Ratio	ASSET_UT	Total sales/Total assets

Table 3.2 Variables and Measurement (cont.)

Variables	Symbol	Measurement
・Discretionary expense ratio	DIS_EX	SG&A costs/Total Sales
・Return on assets	ROA	EBIT/Total assets
・Tobin's Q	TQ	(Market capital + Long term debts)/Total assets
・Leverage ratio	LEV_R	Total debts/Total assets
-Corporate Governance		
・Corporate Governance Index	CGI	The Thai IOD's rating (1-5)
Control Variables		
・GDP Growth	GDP_GROWTH	Gross Domestic Product growth in year t
・Sales Growth	SALE_GROWTH	Sales growth of the industry of company i in year t
Dependent Variable		
- Cost Stickiness	STICKY	Difference between the change in costs for a 1-percent increase in sales and the change in costs for a 1-percent decrease in sales

Data Collection

A quantitative research method, based on secondary data, was applied in this analysis. The data on costs, sales revenue, assets, liabilities and equity was available in financial reports of Thai listed companies, which were available in the database of SEC. In addition, other data can be derived from SET and the companies' own websites. Fortunately, the companies' financial reports can also be accessed from SETSMART (SET Market Analysis and Reporting Tool), the web-based application from the SET.

Data Processing and Analysis

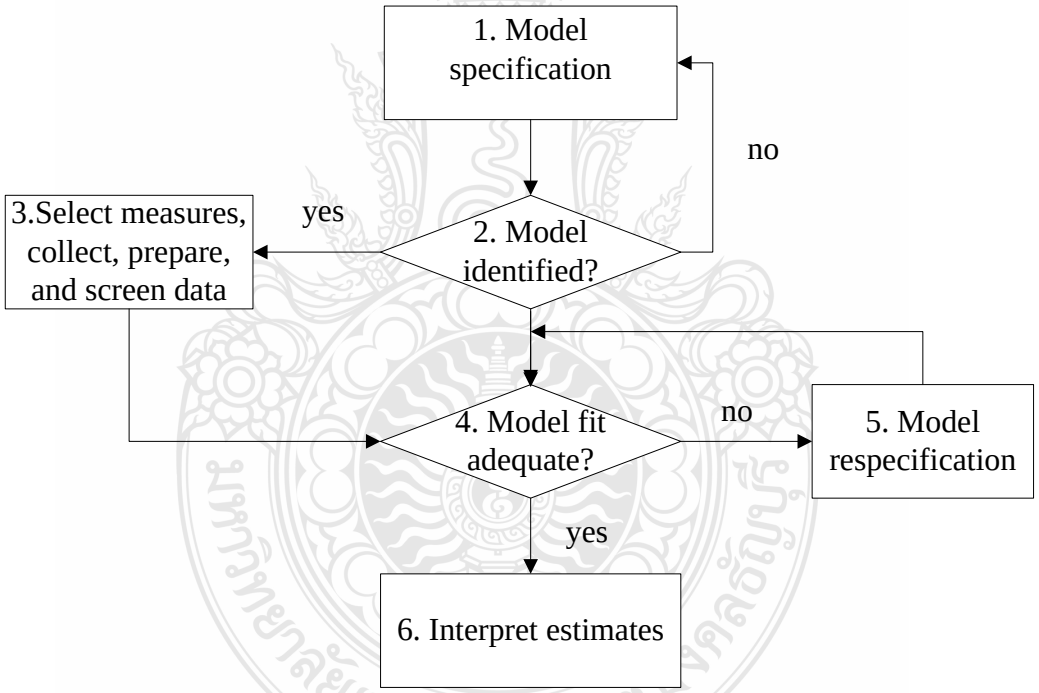
There were three stages of analysis in this study. The first stage is confirmatory factor analysis (CFA), to evaluate and optimize the priori measurement models for adequate model fit and validity. CFA is a type of structural equation modeling (SEM) which deals with measurement models. The measurement models represent the relationship between observed measures and latent variables. The measurement models for adjustment costs, political costs, and agency costs were evaluated and optimized separately. The second stage is exploratory factor analysis (EFA), to obtain a more parsimonious set of composite scores (i.e., factor scores) that are then used in subsequent analyses (e.g., regression) instead of the measured variable scores. The last stage is multiple regression analysis, to analyze the data for the purpose of answering the research questions.

Data was prepared and screened before being analyzed, because the majority of estimated methods in SEM make a specific distributional assumption about the data. Data-related problems can make the result biased and SEM computer programs failed to yield a logical solution (Kline, 2011). AMOS version 18 software was used to analyze the data for measurement models. In contrast, the structural model defines relations among latent variables. The software application used to organize and analyze the data for structural model was SPSS version 17.

The First Stage: Developing Measurement Models

Confirmatory Factor Analysis (CFA)

CFA specifies the "measurement models" delineating how measured variables reflect certain latent variables. Once these measurement models are deemed satisfactory, then the researcher can explore path models (called structural models*)* that link the latent variables. This section shall present and explain the six basic steps in the structural equation modeling (SEM) that were utilized in this study. A flowchart of these steps is displayed in figure 3-2.



Source: adapted from Kline, 2011: 92

Figure 3-2 Flowchart of the Basic Steps of SEM

1. Model Specification

SEM is a priori methodology. The hypothetical model based on extant theory and research was specified in advance. The analysis cannot take place until the proposed conceptual models of the relationships between the variables were defined (Kline, 2011). Figure 3-3 shows the measurement models based on prior research and theories of adjustment costs, political costs, and agency costs.

Model specification is the specification and formulating statements regarding a set of parameters, which are described as either free or fixed. Free parameters are estimated from the data, but fixed parameters are not estimated from the data and their value is fixed at zero. In a path diagram, free parameters are represented by an arrow from one variable to another, but fixed parameters are represented by the absence of an arrow. The index of model adequacy is indicated by the degree to which the pattern of free and fixed parameters are defined in a model, which is consistent with the pattern of variances and covariances from observed data (Hoyle, 1995).

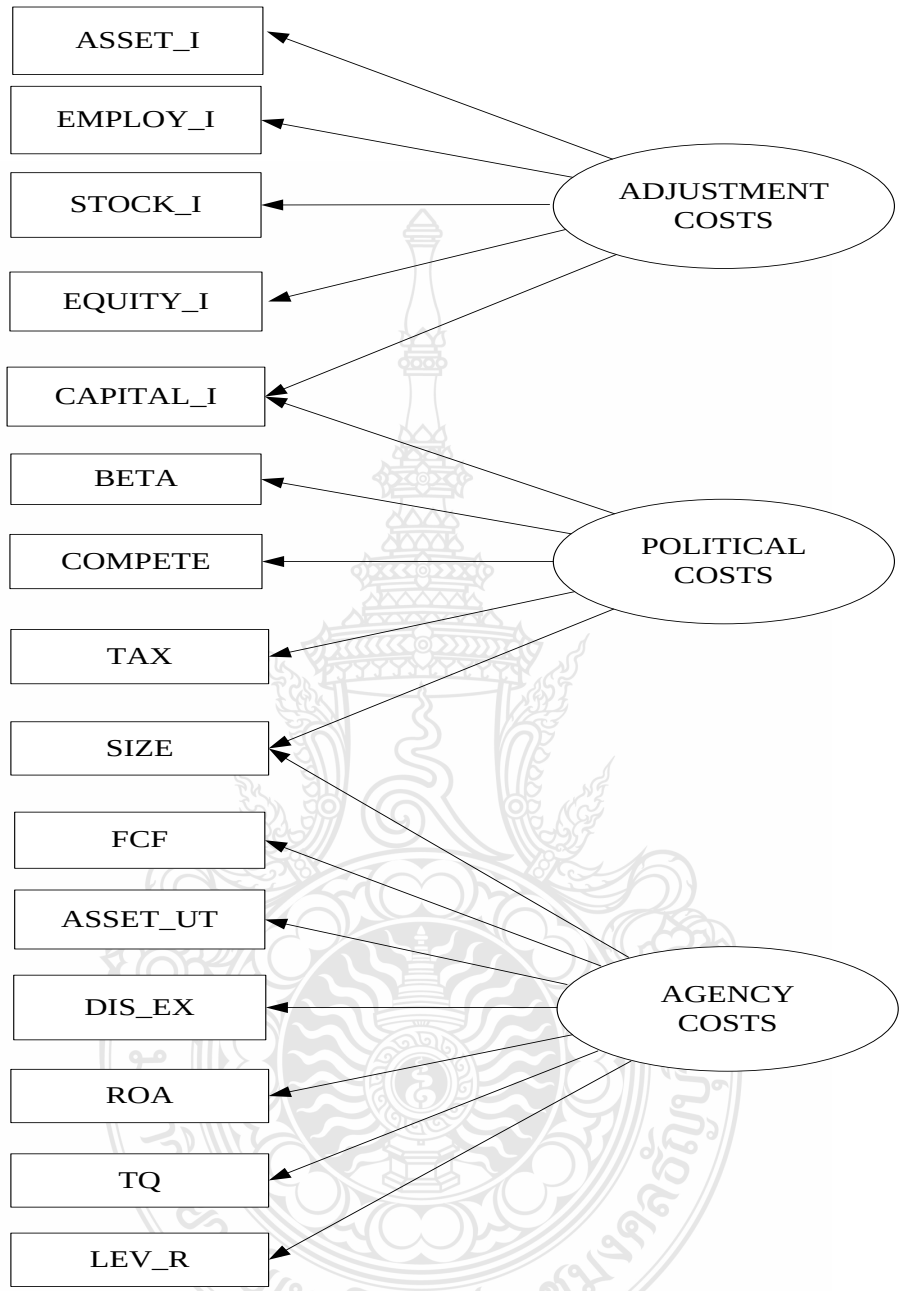


Figure 3-3 Measurement Models

2. Model Identification

Model identification is the considering of whether a unique set of model parameter estimates can be derived from the observed data. If a unique value of the model parameters can be found, the model is determined to be identified. Consequently, the parameters are decided to be estimable and so the model can be evaluated empirically. One of the requirements for identifying is that the model degree of freedom (df) must be more than zero.

Degree of freedom = number of variances and covariances – number of free parameters.

The number of variances and covariances = $\frac{p(p+1)}{2}$

Where p = number of observed variables in the model

If a value for one or more parameters can be acquired in multiple ways from observed data, the model is overidentified (i.e., df > 0). The model that has a positive degree of freedom allows for the rejection of the model thus rendering it of scientific use. The objective of SEM is to specify model and make it meet the criterion of overidentification.

If (for each parameter) a value can be obtained through only one manipulation of observed data, the model is just identified (i.e.,df = 0). The model that shows a zero degree of freedom is not scientifically interesting because it can never be rejected. Finally, the underidentified model (i.e., df < 0) cannot be estimated since a unique value cannot be obtained from the observed data (Hoyle, 1995; Byrne, 2010).

Considering the CFA model in Figure 3-3, Table 3.3 shows the identification of three measurement models which were overidentified.

Table 3.3 Model Identification

Model	p	No. of variances and covariances (A)	No. of free parameters (B)	df (A)-(B)	Identification
Adjustment costs	5	5(5+1)/2 = 15	10	5	Over
Political costs	5	5(5+1)/2 = 15	10	5	Over
Agency costs	7	7(7+1)/2 = 28	14	14	Over

3. Measure Selection and Data Collection

The preparation and screening of the collected data is of utmost importance because the used estimation methods make specific data distribution and data-related problems can cause illogical results from SEM computer programs (Kline, 2011).

3.1 Assessment of Outliers

There were a number of observations in this study that were assessed as outliers, which are the observations whose scores were different from all the others in a given set of data. Univariate outliners can be detected easily by examining frequency distribution (Kline, 2011). Therefore, the extreme observations were eliminated from the estimation by discarding an observation if it was either the highest or lowest 0.5% of its distribution, resulting in one hundred and forty-three observations being eliminated, thereby reducing the original one thousand, two hundred and eighty observations to a total of one thousand, one hundred and thirty-seven. Furthermore, multivariate outliers were

assessed; those that had extreme scores on two or more variables. An approach to the detection of multivariate outliers is considering the squared Mahalanobis distance (D^2) for each observation. This statistic indicates the distance in standard deviation units between a set of scores for one case and the sample means for all variables. An outlying observation will have a D^2 value that is distinct from all the other D^2value (Byrne, 2010). Appendix C exhibits minimal evidence for serious multivariate outliers in this study for transformed variables.

3.2 Assessment of Collinearity and Normality

The original data file should be screened for collinearity and normality. The collinearity can occur when separate variables measure the same thing. Tolerance and variance inflation factor (VIF) are statistics that can detect collinearity among three or more variables or multivariate collinearity. Kline (2011) recommended that a tolerance value less than 0.10 or VIF greater than 10.0 may indicate extreme multivariate collinearity. Table 3.4 reveals no item to be substantially multivariate collinearity (VIF = 1.0320 to 4.3860).

Multivariate normality is the most important assumption in SEM analysis and especially in use of AMOS (Arbuckle, 2007). Estimation in SEM with maximum likelihood assumes multivariate normality; this means that all univariate distributions are normal and each variable is normally distributed for each value of every other variable and all bivariate scatterplots are linear, and finally the distribution of residuals is homoscedastic (Kline, 2011). It is very difficult to assess all these aspects of multivariate normality. Fortunately, many cases of multivariate normality are detectable through the inspection of

univariate normality. Non-normal distribution is caused by skewness and kurtosis. Kline (2011) suggested that when the absolute value of skew index is greater than 3.0 it indicates extremely skewness, and when the absolute value of the kurtosis index is greater than 10.0 suggests that there is a problem; and when this value is greater than 20.0 it signifies that there is a serious problem. Table 3.4 reveals no item to be extremely skewness or kurtosis after data transformation (Skewness = -.693 to 2.204 and Kurtosis = .072 to 6.535). However, the maximum likelihood estimation, which is the estimation technique in AMOS, is robust against moderate violation of multivariate normality (Anderson & Garbing, 1988; Bentler & Chou, 1987).

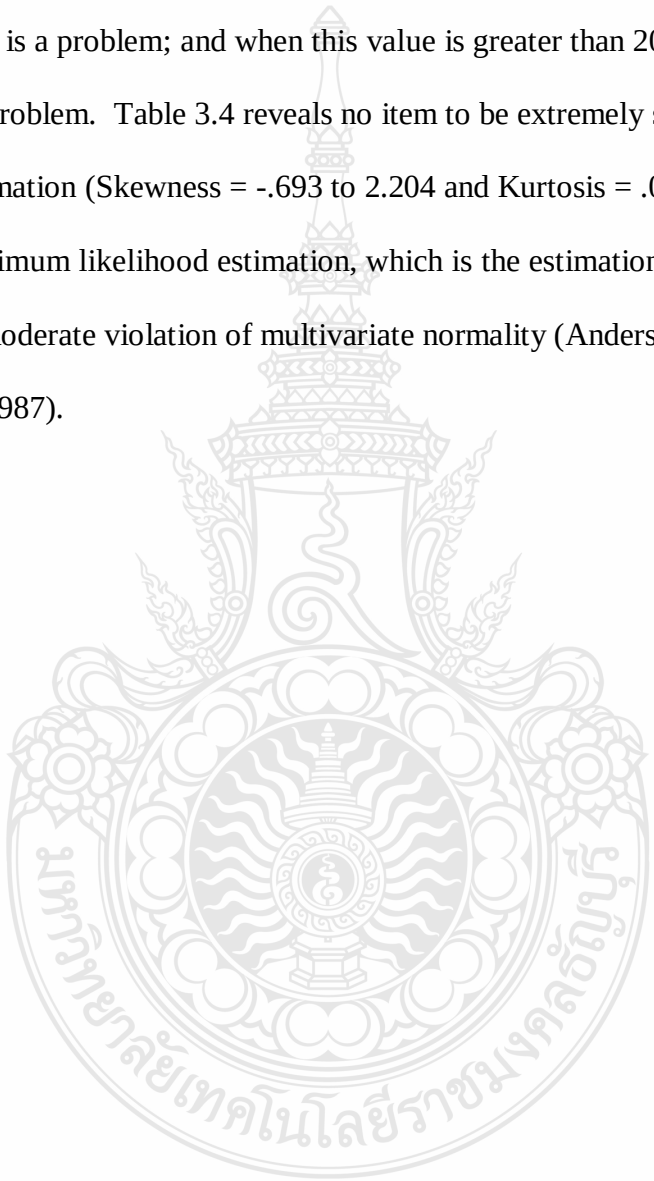


Table 3.4 Data Preparation and Screening

	Tolerance	Variance inflation factor (VIF)	Skewness	Kurtosis
ADJUSTMENT COSTS				
ASSET_I	.228	4.386	.768	.569
EMPLOY_I	.831	1.203	-.610	.072
CAPITAL_I	.631	1.585	.000	.581
EQUITY_I	.330	3.030	-.085	1.276
STOCK_I	.517	1.934	.160	.424
POLITICAL COSTS				
CAPITAL_I	.963	1.038	.000	.581
BETA	.770	1.299	.943	.293
COMPET	.945	1.058	1.033	2.875
TAX	.969	1.032	1.153	2.106
SIZE	.806	1.241	.603	.072
AGENCY COSTS				
SIZE	.811	1.233	.603	.072
FCF	.922	1.085	.118	2.253
ASSET_UT	.776	1.289	.983	1.293
DIS_EX	.774	1.292	1.516	2.603
ROA	.717	1.395	-.693	3.241
TQ	.806	1.241	2.204	6.535
LEV_R	.811	1.233	.603	1.594

4. Estimation and Evaluation

Model estimation is concerned with utilizing an SEM computer tool (i.e., AMOS) to calculate the estimates of free parameters from a set of observed data. The method used in AMOS is maximum likelihood estimation. It is an iterative method that involves a series of attempts to derive estimates of the free parameters that imply a covariance matrix like the observed covariance matrix (Hoyle, 1995). During the estimation process, iteration continues until the differences between corresponding values in the implied and observed matrices (a residual matrix) are minimal. Therefore, a main purpose of estimation is obtaining the closest-fitting statistical solution that can be determined; that is goodness of model fit.

After estimation process had been done, the models were evaluated, which comprises of the assessment of the model fit, path coefficients, and standard errors. Kline (2011) recommended four approximate fit indexes that are the most widely presented in the SEM literature. They are Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR).

In addition, the quality of the latent construct should be evaluated. This index indicates the internal consistency in a given set of observed variables. It is referred to as maximal reliability in the context of scale construction and as the measure of construct reliability (Hancock & Mueller, 2006).

$$\text{Construct reliability} = \frac{\sum_{i=1}^{k}\left(\frac{l^2}{1-l^2}\right)}{1+\ \sum_{i=1}^{k}\left(\frac{l^2}{1-l^2}\right)}$$

Where

l is standardized regression weight

$\sum$ is summation

Construct reliability measures convergent validity that is proportion of covariance in set of observed variables.

Table 3.5 summaries the criteria for evaluation model.

Table 3.5 Criteria for Evaluation Model

Four types assessment indicators		Index Referred to as	Fit standards and applicability
Assessment of the overall model fit	Chi-square test	χ^2 test	P > 0.05
		χ^2/df	<2 or <3
	Absolute Fit Index	GFI	>0.95
		AGFI	>0.90 or >0.80
		RMSEA	≤ 0.05 "good fit", 0.05-0.08 "not bad fit", 0.08-0.10 "moderate model" > 0.10 "bad fit"
		RMR	<0.05, the smaller it is, the better the fitness will be.
		ECVI	A good indicator for diagnosis of cross-validity of model, the smaller its value, the smaller the degree of volatility of model goodness-of-fit and the better the hypothetical model will be.
	Comparative Fit index	CFI	>0.90, indicating the degree of improvement of model compared with nothingness, suitable for small samples .
		NFI	>0.90, indicating the degree of improvement of model compared with nothingness.
		RFI	>0.90, when the data fully fit model, the value is 1.
	Parsimony Fit Measures	NCP	As close to 0 as possible, indicating the model has perfect goodness-of-fit, suitable for comparison between models.
		AIC	AIC value of hypothesized model should be smaller than that of saturated model and independent model.
	Hoelter's Critical N	CN	> 200 , sample size is adequate.
Measurement Model Assessment			The size of path coefficient is the basis of the assessment. All the standard path coefficients greater than 0.7 indicate the good measurement system.
Structural Equation Modeling Assessment			The ratio for each endogenous variable to be explained of variance by other variable (referred to as explanatory power)R^2 . The bigger each R^2 is ,the better. In general R^2 more than 0.03 indicate good explanatory power.
Reliability	Construct Reliability		>0.50

Source: Adapt from Hsu, Su,Kao, Shu,Lin, & Tseng, 2012: 4

5. Model Respecification

When the initial model is poor, a respecified model must be identified. Model respecification should be introduced to good fit by theoretical consideration rather than a statistical one (Kline, 2011). The results of this second model were evaluated after the initial model was respcified. This iterating processes continue until the model exhibits adequate fit.

6. Interpret Estimates

The final step is accurate and complete reporting on the parameter estimates. The result reports have a comment on the magnitudes and signs of the parameter estimates.

The Second Stage: Estimating Factor Scores

Exploratory Factor Analysis (EFA)

This study utilized factor analysis to summarize relationships between the variables in the form of a more parsimonious set of factor scores so that these factor scores can then be used in multiple regression analyses instead of the measured variable scores. Exploratory factor analysis (EFA) is the statistical method that can be used for exploring the relationships among measured variables and trying to determine whether these relationships can be summarized in a smaller number of latent constructs (Thompson, 2004). The software application used to analyze in this stage was SPSS version 17.0.

There are five steps for EFA, as follows (Vanichbuncha, 2010).

1. Use KMO (Kaiser-Meyer-Olkin) to check appropriation of data for EFA.

KMO	Recommendation
≥ 0.9	Marvelous
≥ 0.8	Meritorious
≥ 0.7	Middling
≥ 0.6	Mediocre
≥ 0.5	Miserable
< 0.5	Unacceptable

2. Select factor extraction method. This study used principal component analysis.

3. Consider number of factor. Using eigenvalues determine the appropriate number of factor.

4. Identify original variables for each factor. Factor loading is considered to select variables for each factor.

5. Rotate axis of factor. The most popular method is varimax used in this study.

In summary, the EFA extraction method used for this study is the principal component analysis. It was used to compute factor pattern coefficients. Factor rotation was performed by the varimax rotation method. Then the regression method was used to obtain factor scores. If there are multiple factors in one latent construct, factor scores will be weighted average with a percentage of variance.

The Final Stage: Constructing Structural Model of Cost Behavior

Multiple regression analysis

Multiple regression analysis was used to analyze the relationship among variables, especially causal relationship, such as when there is one dependent and two or more independent variables in multiple regression analysis. This study examined the conditions when the data was analyzed. There are four conditions about residual or error term (e), as follows (Vanichbuncha, 2010).

1. e is normal.
2. V(e) (= σ^2) is constant. If V(e) is not constant, Heteroscedastic problem will occur.
3. e_t and e_{t+1} are independent. As the data in this study is panel data, there are mixed between cross-sectional and time-series data, this condition is necessary. If e_t and e_{t+1} are not independent, an autocorrelation problem will occur. The Durbin-Watson formula was used to examine the problem, the resulting Durbin-Watson value, which is between 1 to 3, is practically implied that e_t and e_{t+1} are independent.
4. $X_1,\ldots\ldots,X_k$ is independent. If $X_1,\ldots\ldots,X_k$ is not independent, A multicollinearity problem will occur (X is independent variable). Tolerance and VIF (variance inflation factor) were used to detect multicollinearity. If the tolerance value closes to 1, then multicollinearity may be a serious problem. If

however the VIF value is more than 10, then multicollinearity may be influencing the least square estimate of regression coefficients.

Three models were used to investigate the conditions. Table 3.6 illustrates that residual terms of both the ABJ model and BLS1 model are normal while the residual term of BLS2 model is approximately normal. Residual terms of all models are constant, so they are homoscedasticity. All models have no autocorrelation and multicollinearity problems (Durbin-Watson < 3 and VIF < 10).

Table 3.6 Four Conditions about Residual or Error Term

Model	**Normality**	**Homoscedasticity**	**Autocorrelation**	**Multicollinearity**
	Skewness	V(e)	Durbin-Watson	VIF
ABJ Model	-.102	constant	2.330	1.184-2.846
BLS1 Model	1.131	constant	2.406	1.184-2.058
BLS2 Model	2.899	constant	2.457	1.184-2.058

After examining these conditions, the models of Anderson et al. (2003) and Balakrishnan et al. (2010) were employed to investigate cost stickiness.

Model (1) : The basic model was analyzed to answer research question 1 and to test hypothesis 1.

Q1 : Is cost behavior of Thai listed companies sticky?

$H1_0$: Cost behavior of Thai listed companies is not sticky.

$H1_a$: Cost behavior of Thai listed companies is sticky.

ABJ Model :

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$$

BLS1 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$$

BLS2 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$\text{Dec\_D}_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

Sale Change = $\ln\left[\frac{S_{i,t}}{S_{i,t-1}}\right]$ for ABJ Model

Sale Change = $\left[\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}\right]$ for BLS1 and BLS2 Model

Cost is sticky, when β_1 more than $\beta_1 + \beta_2$.

Hence, $H1_0$: $\beta_1 = \beta_2 = 0$

$H1_a$: $\beta_1 > \beta_1 + \beta_2$ **or** $\beta_2 < 0$

Model (2) : The basic model with the economic variables was analyzed to answer research question 2 and to test hypothesis 2.

Q2 : Is cost behavior sticky, after controlling the economic variables?

H 2_0: Cost behavior is not sticky, after controlling the economic variables.

H 2_a: Cost behavior is still sticky, after controlling the economic variables.

ABJ Model :

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{Sale Change} + \beta_2 \text{Dec\_D}_{i,t} * \text{Sale Change} + \beta_3 \text{GDP\_GROWTH} + \beta_4 \text{SALE\_GROWTH} + \varepsilon_{i,t}$$

BLS1 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{Sale Change} + \beta_2 \text{Dec\_D}_{i,t} * \text{Sale Change} + \beta_3 \text{GDP\_GROWTH} + \beta_4 \text{SALE\_GROWTH} + \varepsilon_{i,t}$$

BLS2 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1 \text{Sale Change} + \beta_2 \text{Dec\_D}_{i,t} * \text{Sale Change} + \beta_3 \text{GDP\_GROWTH} + \beta_4 \text{SALE\_GROWTH} + \varepsilon_i$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$\text{Dec\_D}_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

Sale Change = $\ln [\frac{S_{i,t}}{S_{i,t-1}}]$ for ABJ Model

Sale Change = $[\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}]$ for BLS1 and BLS2 Model

Cost is sticky, when β_1 more than $\beta_1 + \beta_2 + . \beta_3 + \beta_4$

Hence,

H_{20} : $\beta_i = 0$ i = 1,2,……..,4

H_{2a} : $\beta_1 > \beta_1 + \beta_2 + \beta_3 + \beta_4$

or $\beta_2 < 0$ **or** $\beta_3 < 0$ **or** $\beta_4 < 0$

Model (3) : The full model with all variables was analyzed to answer research question 3, 4,5 and to test hypothesis 3,4,5.

Q3: Do adjustment costs affect the degree of cost stickiness?

Q4: Do political costs affect the degree of cost stickiness?

Q5: Do agency costs affect the degree of cost stickiness?

$H3_0$: Adjustment costs do not affect the degree of cost stickiness in a positive direction.

$H3_a$: Adjustment costs affect the degree of cost stickiness in a positive direction.

$H4_0$: Political costs do not affect the degree of cost stickiness in a positive direction.

$H4_a$: Political costs affect the degree of cost stickiness in a positive direction.

$H5_0$: Agency costs do not affect the degree of cost stickiness in a positive direction.

$H5_a$: Agency costs affect the degree of cost stickiness in a positive direction.

ABJ Model :

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change}$$

$$+ \beta_3 \text{ GDP\_GROWTH} + \beta_4 \text{ SALE\_GROWTH} + \beta_5 \text{ ADJUSTMENT COSTS}$$

$$+ \beta_6 \text{ POLITICAL COSTS} + \beta_7 \text{ AGENCY COSTS} + \varepsilon_{i,t}$$

BLS1 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change}$$

$$+ \beta_3 \text{ GDP\_GROWTH} + \beta_4 \text{ SALE\_GROWTH} + \beta_5 \text{ ADJUSTMENT COSTS}$$

$$+ \beta_6 \text{ POLITICAL COSTS} + \beta_7 \text{ AGENCY COSTS} + \varepsilon_{i,t}$$

BLS2 Model:

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change}$$

$$+ \beta_3 \text{ GDP\_GROWTH} + \beta_4 \text{ SALE\_GROWTH} + \beta_5 \text{ ADJUSTMENT COSTS}$$

$$+ \beta_6 \text{ POLITICAL COSTS} + \beta_7 \text{ AGENCY COSTS} + \varepsilon_{i,t}$$

Where, for sample companies i, at year t

TC = Total operating costs

S = Total sales

$\text{Dec\_D}_{i,t}$ = 1 when sales have decreased from year t-1 to t, and 0 otherwise

Sale Change = $\ln\left[\frac{S_{i,t}}{S_{i,t-1}}\right]$ for ABJ Model

Sale Change = $\left[\frac{S_{i,t} - S_{i,t-1}}{S_{i,t}}\right]$ for BLS1 and BLS2 Model

Adjustment costs affect the degree of cost stickiness in a positive direction, when β_5 less than 0

Hence,

$\mathbf{H_{30}}$: $\beta_5 = 0$

$\mathbf{H_{3a}}$: $\beta_5 < 0$

The higher the political costs, the more likely the manager is to influence earnings. Political costs affect the degree of cost stickiness in a positive direction, when β_6 less than 0.

Hence,

$\mathbf{H_{40}}$: $\beta_6 = 0$

$\mathbf{H_{4a}}$: $\beta_6 < 0$

The higher the agency costs, the more likely the manager is to retain costs; that is the "stickier" cost behavior. Agency costs affect the degree of cost stickiness in a positive direction, when β_7 less than 0

Hence,

$\mathbf{H_{50}}$: $\beta_7 = 0$

$\mathbf{H_{5a}}$: $\beta_7 < 0$

ABJ Model, BlS1 Model and BLS2 Model: The observations were separated into weak corporate governance or good corporate governance. Then model (3) of three models were analyzed to answer research question 6 and to test hypothesis 6.

Q6: Does corporate governance affect the degree of cost stickiness?

$H6_0$: Corporate governance does not affect the degree of cost stickiness in a negative direction.

$H6_a$: Corporate governance affects the degree of cost stickiness in a negative direction.

The stronger the corporate governance, the more likely the manager is to utilize resources efficiently; that is the "less sticky" cost behavior.

β_{21} = degree of cost stickiness of weak corporate governance

β_{22} = degree of cost stickiness of strong corporate governance

Hence,

H_{60} : $\beta_{21} = 0$ **or** $\beta_{22} = 0$

H_{6a} : $\beta_{21} < 0$ and $\beta_{21} < \beta_{22}$

Robustness Test

The data in this study was panel data that repeated measurements at different points in time within the same company. Regression can capture both variations over the companies and variation over time, so panel-data methods are more sophisticated than cross-section-data method (Cameron & Trivedi, 2009). Since each additional time period of data is dependent on the previous period, the standard error of panel-data estimators

must be adjusted. The basic linear models for panel data are fixed-effects and random-effects models. The fixed-effects model removes the effect of time-invariant characteristics from independent variables therefore the net effects of them can be assessed while the random-effects model assumes that the variation across companies is random and uncorrelated with the independent variables included in the model. The Hausman test is required to decide between fixed or random effects (Green, 2008).

Although the results of multiple regression analysis did not find autocorrelation in this study, it utilized the linear model for panel data to confirm the hypotheses testing. The software application used to analyze the panel data was STATA version 11.

CHAPTER 4

RESEARCH RESULTS

This chapter describes the descriptive statistics of the research sample and the results from the confirmatory factor analysis (CFA) of the measurement models that is the first step of the structural equation model (SEM) analysis. This research can use only one step of SEM (or Semi-SEM) because the cost stickiness cannot be measured directly, which is represented by the coefficient (β_2) in the regression model. Hence, multiple regression analysis was used to analyze the structural model instead of the second step of SEM.

The first step of this analysis used CFA to confirm the measurement models of three latent (unobserved) variables within the AMOS program. The three latent variables are adjustment costs, political costs, and agency costs. The measurement models were verified to ensure that they fit to the data. The second step of this analysis used EFA, using principle components analysis (PCA) with varimax rotation. The final step of this analysis created the structure model by multiple regression analysis with SPSS program.

The Descriptive Statistic Summary

Table 4.1 provides the descriptive statistics for the variables extracted from both the financial reports and the reports of SET. As mentioned in chapter 3, this study eliminated the extreme observations and the number of observations, with the result that the initial one thousand, two hundred and eighty observations were reduced to one thousand, one hundred and thirty-seven. The mean and median of the most variables did not display

much difference between before and after adjustment. The variable that was dramatically changed, after dropping some outliners was STOCK_I. The mean of STOCK_I variable before adjustment was 0.8381 become 0.4161 with less standard deviation (from 9.26537 to 0.80393).

Table 4.1 Summary of Descriptive Statistic for Unadjusted and Adjusted Data of Variables

Variables	Unadjusted data(1280 observations)			Adjusted data (1137 observations)		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
PANEL A. Sale and Total Operating Costs						
ABJ MODEL						
TOPC	0.0408	0.0454	0.25986	0.0374	0.0431	0.21578
SALE_INC (Sale Change)	0.0392	0.0444	0.30005	0.0362	0.0378	0.22296
SALE_DEC (Dec_D*Sale Change)	-0.0589	0.0000	0.22836	-0.0565	0.0000	0.13927
BLS1 MODEL						
TOPC	0.0763	0.0465	0.30874	0.0623	0.0440	0.23789
SALE_INC (Sale Change)	0.0831	0.0454	0.36820	0.0624	0.0394	0.24205
SALE_DEC (Dec_D*Sale Change)	-0.0382	0.0000	0.23590	-0.0470	0.0000	0.10944
BLS2 MODEL						
TOPC	0.0638	0.0433	0.33335	0.0523	0.0382	0.24254
SALE_INC (Sale Change)	0.0831	0.0454	0.36820	0.0624	0.0394	0.24205
SALE_DEC (Dec_D*Sale Change)	-0.0382	0.0000	0.21359	-0.0470	0.0000	0.10944
PANEL B. Adjustment Costs						
ASSET_I	1.7077	1.1174	1.98640	1.5429	1.0977	1.38891
EMPLOY_I	0.0007	0.0005	0.00074	0.0007	0.0005	0.00066
STOCK_I	0.8381	0.2127	9.26537	0.4161	0.2071	0.80393
EQUITY_I	1.0523	0.6532	1.72773	0.9711	0.6597	1.14529
CAPITAL_I	0.7044	0.3635	1.46301	0.6085	0.3614	0.90310
PANEL C. Political Costs						
CAPITAL_I	0.7044	0.3635	1.46301	0.6085	0.3614	0.90310
BETA	0.5187	0.3800	0.52775	0.4784	0.3500	0.46029
COMPET	0.6799	0.6867	0.08592	0.6761	0.6867	0.08440
TAX	0.1353	0.0891	0.15220	0.1400	0.1053	0.14724
SIZE	14.8471	14.6617	1.34329	14.8153	14.6405	1.28000
PANEL D. Agency Costs						
SIZE	14.8471	14.6617	1.34329	14.8153	14.6405	1.28000
FCF	0.0483	0.0512	0.10982	0.0511	0.0525	0.09024
DIS_EX	0.1679	0.1285	0.22177	0.1574	0.1261	0.11246
ROA	0.0689	0.0732	0.09813	0.0724	0.0744	0.07989
TQ	0.8120	0.6298	0.89880	0.7655	0.6295	0.56333
LEV_R	0.4245	0.4039	0.25248	0.4022	0.3872	0.22439
PANEL E. Corporate Governance						
CGI	3.1250	4.0000	1.52846	3.1214	4.0000	1.51613
PANEL F. Control Variables						
GDP_GROWTH	0.0422	0.0509	0.02782	0.0426	0.0504	0.02756
SALE_GROWTH	0.1197	0.0961	0.21254	0.1190	0.0961	0.21486

Panel B, C, and D of Table 4.2 display the descriptive statistics of variables which are the proxy for adjustment costs, political costs, and agency costs after the transformation of the data. All of variable distributions were close to normal because the absolute value of skew index was less than 3.0, while the absolute value of kurtosis index was less than 10.0. As soon as the data had been prepared and screened, multivariate statistic analysis can be used in this study.

Table 4.2 Summary of Descriptive Statistic for Transformed Data of Variables

Variables	Transformed data(1137 observations)				
	Mean	Median	Standard Deviation	Skewness	kurtosis
PANEL B. Adjustment Costs					
ASSET_I	0.2001	0.0982	0.65596	0.768	0.569
EMPLOY_I	-7.8378	-7.6255	1.15290	-0.610	0.072
STOCK_I	-1.5694	-1.5672	1.17510	0.160	0.424
EQUITY_I	-0.4220	-0.4187	0.87750	-0.085	1.276
CAPITAL_I	-1.0429	-1.0167	1.02711	0.000	0.581
PANEL C. Political Costs					
CAPITAL_I	-1.0429	-1.0167	1.02711	0.000	0.581
BETA	0.4938	0.3600	0.46833	0.943	0.293
COMPET	0.6764	0.6867	0.08118	1.033	2.875
TAX	.14000	0.1053	0.14724	1.153	2.106
SIZE	14.8350	14.6573	1.28590	0.603	0.072
PANEL D. Agency Costs					
SIZE	14.8350	14.6573	1.28590	0.603	0.072
FCF	0.0521	0.0527	0.09263	0.118	2.253
DIS_EX	0.1592	0.1284	0.11220	1.516	2.603
ROA	0.0722	0.0740	0.07962	-0.693	3.241
TQ	0.7677	0.6267	0.57012	2.204	6.535
LEV_R	0.4128	0.3975	0.23382	0.603	1.594

Measurement Models

This is the first stage of analysis to establish the knowledge foundation about the implied measurement models for adjustment costs, political costs, and agency costs. The measurement models were tested by using confirmatory factor analysis (CFA).

Adjustment Cost Model

The final measurement model of adjustment costs was indicated by four observed variables (asset intensity, stock intensity, equity intensity, and capital intensity). Employee intensity was deleted from the model (p = .712, squared multiple correlation=.00). The AMOS output is in Appendix C. Figure 4-1 illustrates the final measurement model with standardized coefficients and squared multiple correlations.

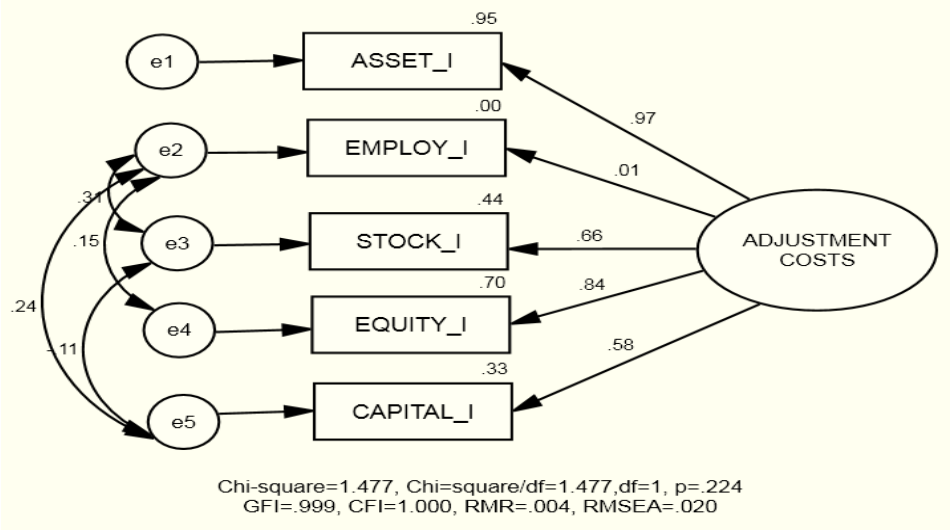


Figure 4-1 Final Measurement Model of Adjustment Costs

Measurement Model Fit: Measurement Model of adjustment costs is good fit. Table 4.3 shows the comparison of the adjustment cost model fit results with recommended values.

Quality of the Latent Construct: The variance of latent variable can be explained by observed variables 96%.

Table 4.3 CFA Results of Adjustment Cost Measurement Model

Model	χ^2/ df	p-value	GFI	CFI	RMSEA	CN	Construct Reliability
Adjustment Cost	1.477	.224	.999	1.000	.020	2955	.96
Recommended values	< 3	> .05	> .95	> .90	≤ .05	> 200	> .50

In summary, the result confirmed that adjustment costs can be measured by asset intensity, stock intensity, equity intensity, and capital intensity. These observed variables are presented in financial reports.

Political Cost Model

The final measurement model of political costs was indicated by five observed variables (capital intensity, risk, concentration ratio, tax ratio, and size). The AMOS output is in Appendix C. Figure 4-2 illustrates the final measurement model with standardized coefficients and squared multiple correlations.

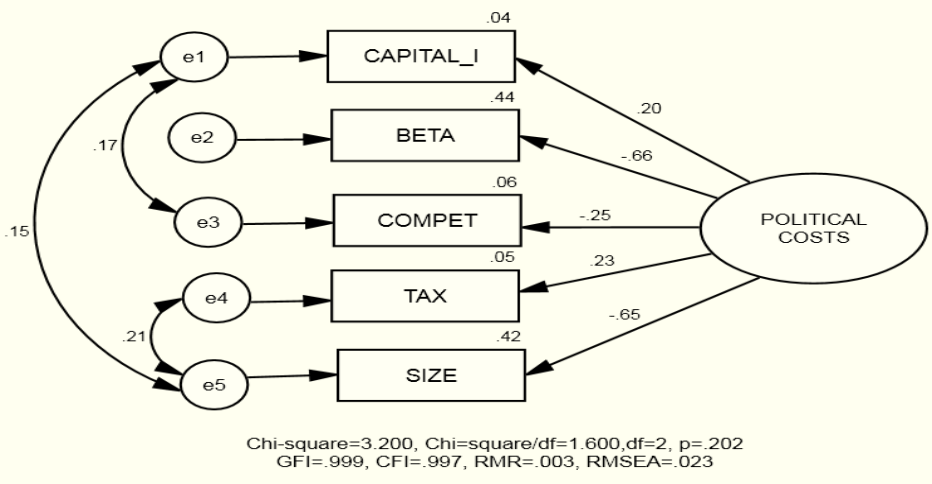


Figure 4-2 Final Measurement Model of Political Costs

Measurement Model Fit: Measurement Model of political costs is good fit because χ^2/ df statistic did not exceeded 3.0. Table 4.4 displays the comparison of the political cost model fit results with recommended values.

Quality of the Latent Construct: The variance of latent variable can be explained by observed variables 63%.

Table 4.4 CFA Results of Political Cost Measurement Model

Model	χ^2/ df	**p-value**	**GFI**	**CFI**	**RMSEA**	**CN**	**Construct Reliability**
Political Cost	1.600	.202	.999	.997	.003	2128	.63
Recommended values	< 3	> .05	> .95	> .90	≤ .05	> 200	> .50

In summary, the result confirmed that political costs can be measured by capital intensity, risk, concentration ratio, tax ratio, and size. These observed variables are presented in financial reports and reports of SET.

Agency Cost Model

The final measurement model of agency costs was indicated by six observed variables (size, free cash flow, discretionary expense ratio, ROA, Tobin's Q, and leverage ratio). The asset utilization ratio was deleted from the model in the initial step. The AMOS output is in Appendix C. Figure 4-3 illustrates the final measurement model with standardized coefficients and squared multiple correlations.

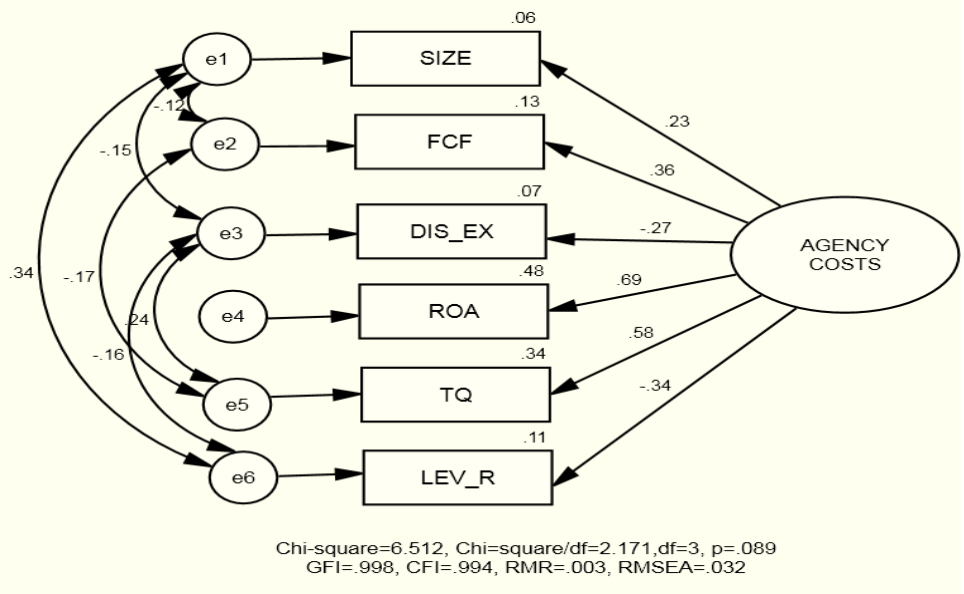


Figure 4-3 Final Measurement Model of Agency Costs

Measurement Model Fit: Measurement Model of agency costs is good fit. Table 4.5 exhibits the comparison of the agency cost model fit results with recommended values.

Quality of the Latent Construct: The variance of latent variable can be explained by observed variables 65%.

Table 4.5 CFA Results of Agency Cost Measurement Model

Model	χ^2/ df	p-value	GFI	CFI	RMSEA	CN	Construct Reliability
Agency Cost	2.171	.089	.998	.994	.032	1364	.65
Recommended values	< 3	> .05	> .95	> .90	≤ .05	> 200	> .50

In summary, the result confirmed that agency costs can be measured by size, free cash flow, discretionary expense ratio, ROA, Tobin's Q, and leverage ratio. These observed variables are presented in financial reports and reports of SET.

Factor Scores

This is the second stage of analysis to estimate factor scores. An exploratory factor analysis was performed on three constructs; adjustment costs, political costs, and agency costs.

Adjustment costs

The measurement model from CFA found that asset intensity, stock intensity, equity intensity, and capital intensity can be used to measure adjustment costs. The next step was the estimation of the factor scores.

Data is appropriate for EFA (KMO = .739). This analysis resulted in one factor with eigenvalues greater than one, explaining 67.98% of variance. (see Appendix D.)

Political costs

The measurement model from CFA found that capital intensity, risk, concentration ratio, tax ratio, and size can be used to measure political costs. The next step was the estimation of the factor scores.

Data is appropriate for EFA (KMO = .515). This analysis resulted in three factors with eigenvalues greater than .999, explaining 73.58% of variance (see Appendix D.). In this case, factor scores were weighted average with a percentage of variance.

Agency costs

The measurement model from CFA found that size, free cash flow, discretionary expense ratio, ROA, Tobin's Q, and leverage ratio can be used to measure agency costs. The next step was the estimation of the factor scores.

Data is appropriate for EFA (KMO = .545). This analysis resulted in two factors with eigenvalues greater than .997, explaining 67.84% of variance (see Appendix D.). In this case, factor scores were weighted average with a percentage of variance.

Structural Model of Sticky Cost Behavior

This is final stage of analysis to develop the cost sticky behavior model. The four conditions about residual or error term were investigated. Then the multiple regression analysis was used to formulate model according to Figure 4-4, Figure 4-5 and Figure 4-6.

ABJ MODEL

$$\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = -.019 + .954\,\text{Sale Change} - .097\ \text{Dec\_D}_{i,t}\text{* Sale Change}$$
$$+ .053\,\text{GDP\_GROWTH} + .068\,\text{POLITICAL COSTS}$$
$$- .059\,\text{AGENCY COSTS} + \varepsilon_{i,t}$$

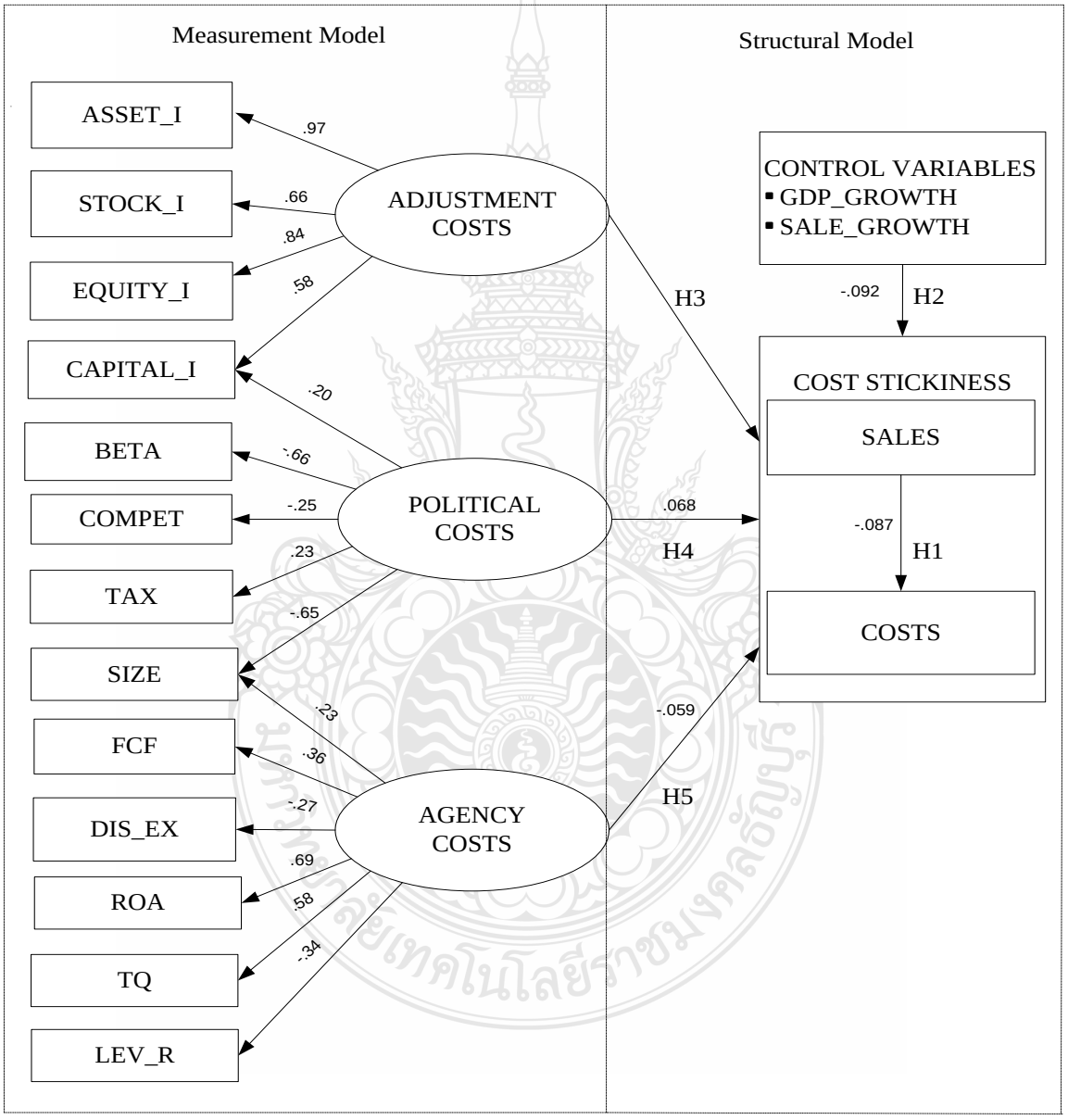


Figure 4-4 ABJ Model

BLS1 MODEL

$$\left[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}\right] = -.020 + .941 \text{ Sale Change} - .085 \text{ Dec\_D}_{i,t} * \text{ Sale Change}$$
$$+ .050 \text{ GDP\_GROWTH} + .075 \text{ POLITICAL COSTS}$$
$$- .073 \text{ AGENCY COSTS} + \varepsilon_{i,t}$$

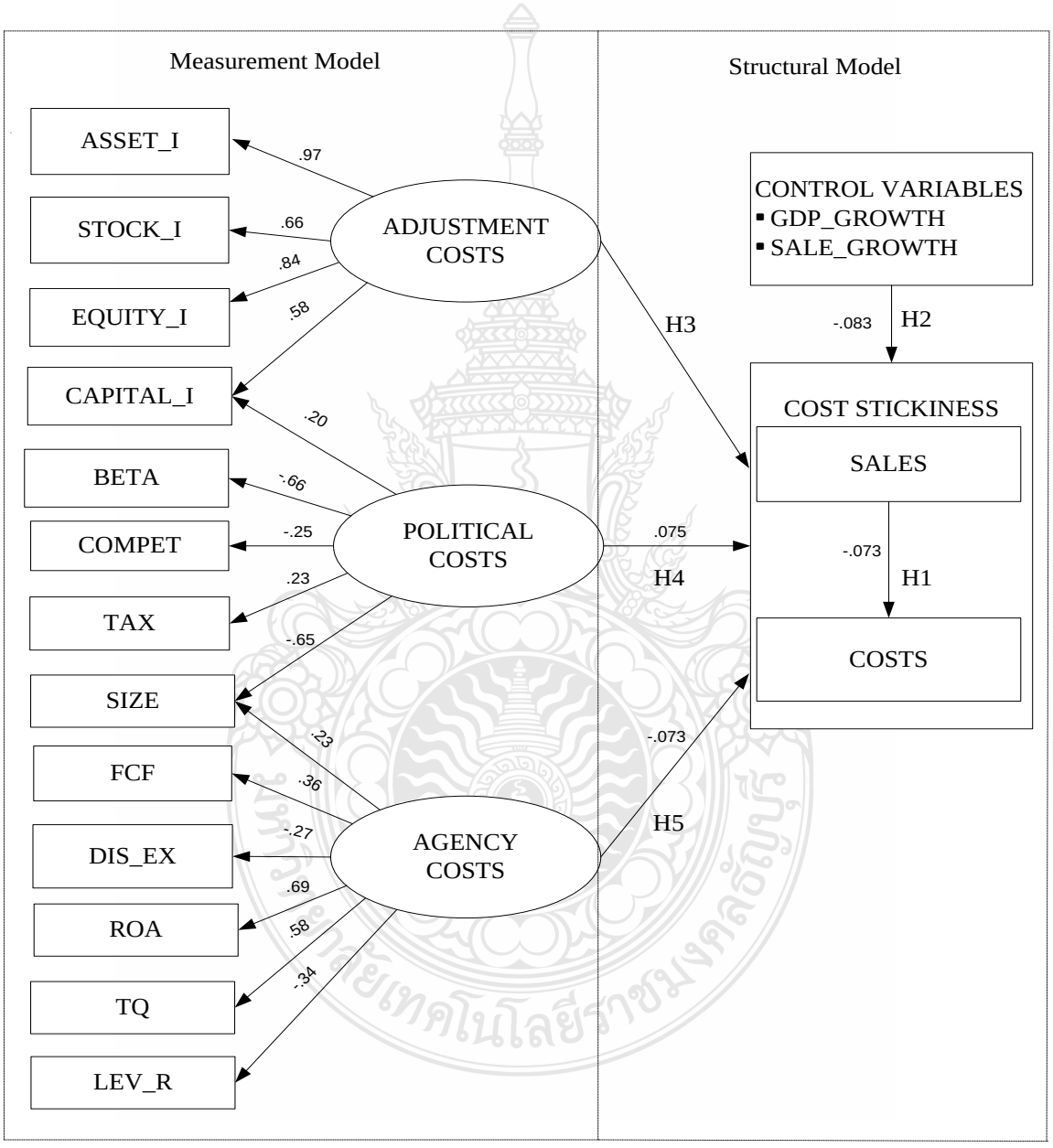


Figure 4-5 BLS1 Model

BLS2 MODEL

$$[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}] = -.026 + .882 \text{ Sale Change} - .074 \text{ Dec\_D}_{i,t} * \text{ Sale Change}$$
$$+ .048 \text{ GDP\_GROWTH} - .045 \text{ ADJUSTMENT COSTS}$$
$$+ .084 \text{ POLITICAL COSTS} - .088 \text{ AGENCY COSTS} + \varepsilon_{i,t}$$

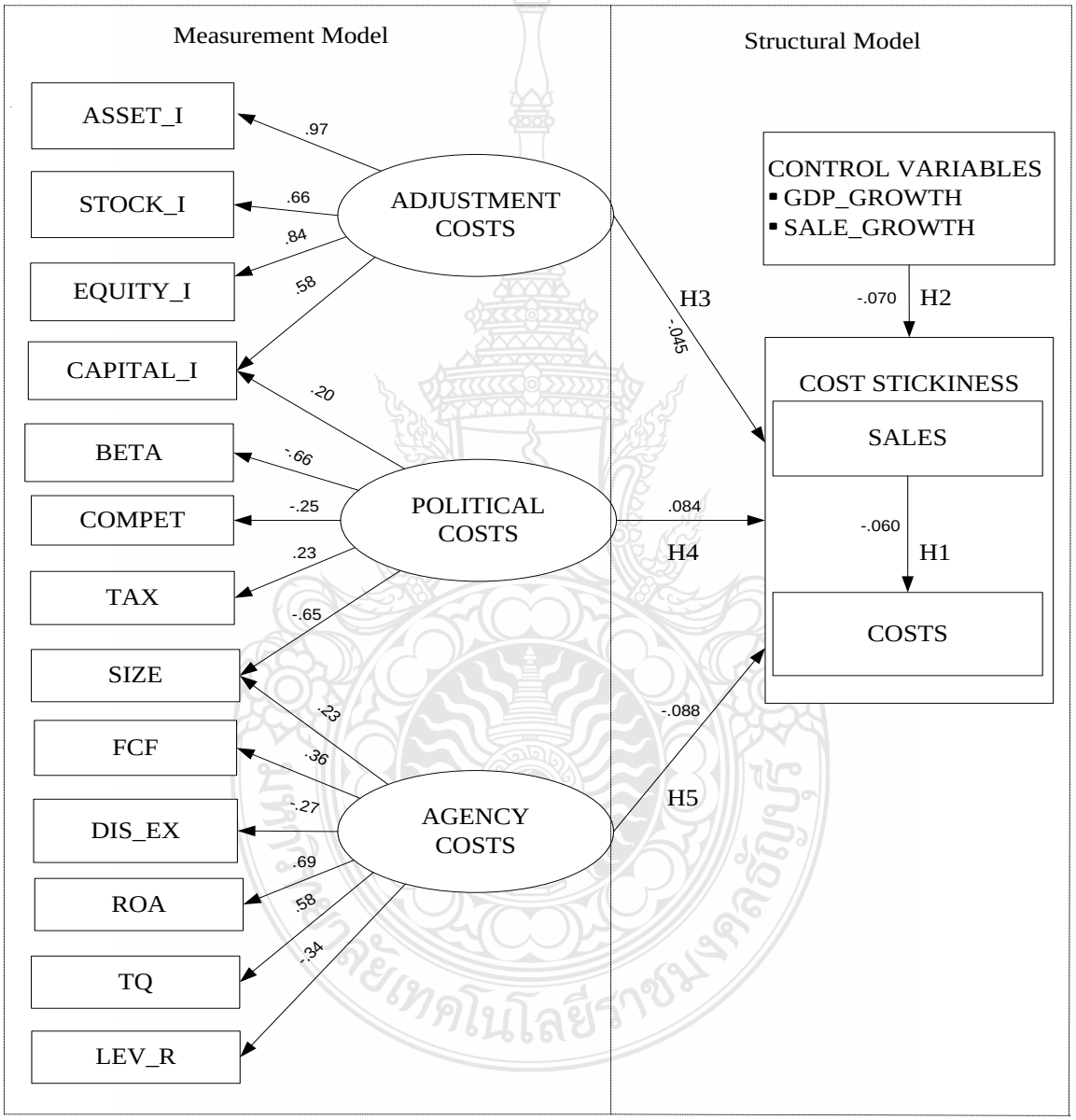


Figure 4-6 BLS2 Model

Hypotheses Testing

Research Question: 1**.** Is cost behavior of Thai listed companies sticky?

The purpose of question 1 was to explore cost behavior of Thai listed companies. Costs were separated into three categories; cost of goods sold, selling, general and administrative costs and total operating costs. The multiple regression analysis was applied to three models; ABJ model, BLS1 model, and BLS2 model. The results revealed that cost of goods sold behavior and selling, general and administrative costs behavior are not sticky, whereas total operating costs behavior is sticky. Total operating costs increased 0.88-0.96% per 1% increase in sales revenue but decreased only 0.82-.087% per 1% decrease in sales revenue. Evidence for this is in Table 4.6 that displays the regression analysis results of Model (1).

Research Hypothesis:

$H1_a$. Cost behavior of Thai listed companies is sticky.

Hypothesis 1a predicted that cost behavior of Thai listed companies is sticky. To test this hypothesis, change in cost was regressed on change in sale. A detail description of the finding is presented separately by type of cost as follows.

Cost of goods sold

The overall of three regression models were statistically significant ($F = 958.466$, $p<.001$; $F = 195.223$, $p<.001$; $F = 1891.029$, $p<.001$). As shown in Table 4.6, cost of goods sold behavior is not sticky for ABJ model and BLS1 model ($\beta_2 = -.024$, $p = .411$;

β_2 = -.033, p = .332). However, cost of goods sold is sticky for BLS2 model (β_2 = -.046, p < .05). Therefore, hypothesis 1a was not fully supported by the behavior of cost of goods sold.

Selling, general and administrative costs

Overall the three regression models were statistically significant (F = 133.776, p<.001; F = 83.969, p<.001; F = 83.919, p<.001). As shown in Table 4.6, selling, general and administrative costs are not sticky for all models (β_2 = -.023, p = .598; β_2 = .005, p = .887; β2 = .013, p = .720). Hence hypothesis 1a was not supported by the behavior of selling, general and administrative costs.

Total operating costs

All three regression models were statistically significant (F = 2222.402, p<.001; F = 2302.846, p<.001; F = 1406.103, p<.001). As shown in Table 4.6, total operating costs are sticky for all models (β_2= -.087, p<.001; β_2=-.073, p<.001; β_2=-.060, p<.01). Thereby, hypothesis 1a was supported by the behavior of total operating costs.

Table 4.6 Regression Analysis Results of Model (1)

ABJ Model : $\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$

BLS1 Model: $\left[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$

BLS2 Model: $\left[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1 \text{ Sale Change} + \beta_2 \text{ Dec\_D}_{i,t}\text{* Sale Change} + \varepsilon_{i,t}$

Cost of Goods sold	**ABJ Model**			**BLS 1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.005	0.737		.016	1.025		-.003	-0.733	
Sale Change	.812	27.429	***	.527	15.544	***	.906	48.011	***
Dec_D* Sale Change	-.024	-0.823		-.033	-0.970		-.046	-2.427	*
Adjusted R-Squared	62.80%			25.50%			76.90%		
Durbin-Watson	3.193			2.335			2.462		

Selling, general and administrative costs	**ABJ Model**			**BLS 1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	-.001	-0.168		.020	1.984	**	-.002	-1.388	
Sale Change	.455	10.418	***	.356	9.696	***	.350	9.548	***
Dec_D* Sale Change	-.023	-0.528		.005	0.142		.013	0.359	
Adjusted R-Squared	18.90%			12.70%			12.70%		
Durbin-Watson	2.081			2.044			2.028		

Total Operating Cost	**ABJ Model**			**BLS 1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.000	-0.202		.000	-0.220		-.006	-1.240	
Sale Change	.960	43.851	***	.942	53.912	***	.883	41.881	***
Dec_D* Sale Change	-.087	-3.971	***	-.073	-4.186	***	-.060	-2.868	**
Adjusted R-Squared	79.60%			80.20%			71.20%		
Durbin-Watson	2.341			2.416			2.464		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Since only total operating costs are sticky, this study emphasized the behavior of total operating costs to find out the determinants of cost stickiness. In addition, to expand the knowledge about sticky cost behavior of Thai listed companies, this study divided the observations into seven industries and analyzed each individually. From Table 4.7 it can be seen that services industry is the "stickiest" industry.

Table 4.7 Regression Analysis Results for Comparing Between Industries

1. Argo & Food Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.000	-0.041		.005	0.627		.002	0.251	
Sale Change	.990	22.475	***	.946	25.431	***	.961	27.266	***
Dec_D* Sale Change	-.088	-2.005	*	-.029	-0.774		-.041	-1.157	
Adjusted R-Squared	85.10%			85.70%			87.10%		
Durbin-Watson	2.560			2.591			2.546		
Number of Observations	193			193			193		
2. Consumer Products Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.001	0.233		.003	0.623		.001	0.209	
Sale Change	.925	15.346	***	.908	17.407	***	.864	15.081	***
Dec_D* Sale Change	.009	0.153		.028	0.532		.062	1.079	
Adjusted R-Squared	87.00%			86.80%			84.10%		
Durbin-Watson	2.568			2.633			2.500		
Number of Observations	185			185			185		
3. Industrials Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.006	0.640		.008	0.772		.010	0.964	
Sale Change	1.018	14.893	***	.974	17.359	***	.903	14.642	***
Dec_D* Sale Change	-.132	-1.934		-.101	-1.796		-.039	-0.626	
Adjusted R-Squared	81.40%			79.90%			75.80%		
Durbin-Watson	2.052			2.081			2.143		
Number of Observations	180			180			180		
4. Property & Construction Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.001	0.133		-.001	-0.095		.000	0.046	
Sale Change	.930	22.381	***	.949	28.516	***	.925	25.848	***
Dec_D* Sale Change	-.015	-0.358		-.046	-1.374		-.024	-0.659	
Adjusted R-Squared	84.30%			85.20%			82.90%		
Durbin-Watson	2.435			2.291			2.300		
Number of Observations	202			202			202		
5. Resources Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.017	1.020		.000	-.004		-.048	-1.763	
Sale Change	.966	16.671	***	.983	18.446	***	1.032	17.176	***
Dec_D* Sale Change	.005	0.092		-.034	-0.635		-.151	-2.509	*
Adjusted R-Squared	93.70%			92.70%			90.70%		
Durbin-Watson	2.290			2.549			2.382		
Number of Observations	39			39			39		
6. Services Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	-.005	-0.442		-.011	-0.941		-.034	-2.024	
Sale Change	.917	11.702	***	.885	14.014	***	.780	10.658	***
Dec_D* Sale Change	-.173	-2.210	*	-.196	-3.104	**	-.201	-2.753	**
Adjusted R-Squared	59.70%			56.20%			41.20%		
Durbin-Watson	2.298			2.541			2.499		
Number of Observations	241			241			241		
7. Technology Industry	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	.008	0.602		.010	0.766		.007	0.488	
Sale Change	.871	12.826	***	.892	16.160	***	.869	14.128	***
Dec_D* Sale Change	.021	0.315		.020	0.369		.019	0.310	
Adjusted R-Squared	78.00%			81.50%			77.00%		
Durbin-Watson	1.829			1.951			1.862		
Number of Observations	97			97			97		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Research Question: 2**.** Is cost behavior still sticky, after controlling the economic variables?

The purpose of question 2 was to confirm the behavior of total operating costs, after controlling the economic variables. Economic variables are GDP growth and sale growth. Overall the three regression models were statistically significant ($F = 1130.090$, $p<.001$; $F = 1168.763$, $p<.001$; $F = 711.547$, $p<.001$). As can see in Table 4.8, total operating costs are still sticky. This table displays the regression analysis results of Model (2).

Research Hypothesis:

$H2_a$. Cost behavior is still sticky, after controlling the economic variables.

Hypothesis 2a predicted that Cost behavior is still sticky, after controlling the economic variables. Hypothesis 2a was supported for all models ($\beta_2= -.092$, $p<.001$; $\beta_2= -.083$, $p<.001$; $\beta_2=-.070$, $p<.001$), as detailed in Table 4.8.

Table 4.8 Regression Analysis Results of Model (2)

ABJ Model : $\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change $+\beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+\varepsilon_i$

BLS1 Model: $\left[\frac{TC_{i,t}-TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change $+\beta_3$ GDP_GROWTH$+ \beta_4$ SALE_GROWTH $+\varepsilon_i$

BLS2 Model: $\left[\frac{TC_{i,t}-TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change $+\beta_3$ GDP_GROWTH$+ \beta_4$ SALE_GROWTH $+\varepsilon_i$

Total Operating Costs	**ABJ Model**			**BLS 1 Model**			**BLS 2 Model**		
	Coefficient	t-stat		Coefficient	t-stat		Coefficient	t-stat	
Intercept	-.019	-3.256		-.020	-3.179		-.026	-3.319	
Sale Change	.945	42.839	***	.932	52.957	***	.872	41.004	***
Dec_D* Sale Change	-.092	-4.214	***	-.083	-4.706	***	-.070	-3.293	***
(Dec_D* Sale Change *Variable)									
GDP_GROWTH 1	.053	3.548	***	.050	3.389	***	.049	2.761	**
SALE_GROWTH1	.012	0.823		.011	0.757		.015	0.897	
Adjusted R-Squared	79.90%			80.40%			71.40%		
Durbin-Watson	2.352			2.426			2.471		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Research Question: 3. Do adjustment costs affect the degree of cost stickiness?

The purpose of question 3 was to identify the determinants of sticky costs behavior of Thai listed companies. The multiple regression analysis was applied to three models; ABJ model, BLS1 model, and BLS2 model. All three regression models were statistically significant ($F = 654.256$, $p<.001$; $F = 680.449$, $p<.001$; $F = 414.529$, $p<.001$). The results indicated that adjustment costs affect the degree of cost stickiness.

Research Hypothesis:

$H3_a$. Adjustment costs affect the degree of cost stickiness in a positive direction.

Hypothesis 3a proposed that as adjustment costs were occurred there was a higher degree of cost stickiness. According to Table 4.9, hypothesis 3a was supported with statistical significance for BLS2 model (β_3 = -.045, p = .013). Hypothesis 3a was not supported for ABJ model (β_3 = -.020, p = .183) and BLS1 model (β_3 = -.020, p = .172).

Research Question: 4. Do political costs affect the degree of cost stickiness?

The purpose of question 4 was to examine the determinants of sticky costs behavior of Thai listed companies. The multiple regression analysis was applied to three models; ABJ model, BLS1 model, and BLS2 model, and all three regression models were statistically significant. The results shown in Table 4.9 demonstrate that political costs affect the degree of cost stickiness.

Research Hypothesis:

$H4_a$: Political costs affect the degree of cost stickiness in a positive direction.

Hypothesis 4a proposed that political costs will affect the degree of cost stickiness in a positive direction. Hypothesis 4a demonstrated that there was a strong effect that was statistically significant (β_4 = .068, p = .000; β_4 =.075, p = .000; β_4 =.084, p = .000), but indicated that political costs influence the degree of cost stickiness in a negative direction.

Research Question: 5. Do agency costs affect the degree of cost stickiness?

The purpose of question 5 was to investigate the determinants of sticky costs behavior of Thai listed companies. The multiple regression analysis was applied to three models; ABJ model, BLS1 model, and BLS2 model, and all three regression models were statistically significant. The results displayed in Table 4.9 indicated that agency costs affect the degree of cost stickiness.

Research Hypothesis:

H5: Agency costs affect the degree of cost stickiness in a positive direction.

Hypothesis 5a proposed that agency costs will affect the degree of cost stickiness. Hypothesis 5a was supported with statistically significant (β_5 = -.059, p = .002; β_5 =-.073, p = .000; β_5 = -.088, p=.000) and indicated that agency costs influence the degree of cost stickiness in a positive direction.

Table 4.9 Regression Analysis Results of Model (3)

ABJ Model : $\ln\left[\frac{TC_{i,t}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change
$+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS
$+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

BLS1 Model: $\left[\frac{TC_{i,t}-TC_{i,t-1}}{TC_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change
$+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS
$+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

BLS2 Model: $\left[\frac{TC_{i,t}-TC_{i,t-1}}{S_{i,t-1}}\right] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change
$+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS
$+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

	ABJ Model			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t	Sig	Coefficient	t	Sig	Coefficient	t	Sig
Intercept	-.019	-3.314		-.020	-3.239		-.026	-3.391	
Sale Change	.954	42.711	***	.941	53.093	***	.882	41.146	***
Dec_D* Sale Change	-.097	-4.457	***	-.085	-4.859	***	-.074	-3.502	**
GDP_GROWTH	.053	3.612	***	.050	3.456	***	-.045	-2.782	**
SALE_GROWTH	.006	.423		.005	.349		.010	.611	
ADJUSTMENT COSTS	-.020	-1.331		-.020	-1.366		-.045	-2.496	*
POLITICAL COSTS	.068	3.644	***	.075	4.061	***	.084	3.759	***
AGENCY COSTS	-.059	-3.107	***	-.073	-3.894	***	-.088	-3.914	***
Adjusted R-Squared	80.10%			80.70%			71.80%		
Durbin-Watson	2.330			2.406			2.457		
Number of Observations	1137			1137			1137		
Skewness	-.102			1.131			2.899		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Research Question: 6. Does corporate governance affect the degree of cost stickiness?

The purpose of question 6 was to explore the effect of corporate governance. The samples were divided into two groups; weak corporate governance and strong corporate governance based on corporate governance indexes (CGI). The multiple regression analysis was applied to three models; ABJ model, BLS1 model, and BLS2 model, and all three regression models were statistically significant. The results displayed in Table 4.10, Table 4.11, and Table 4.12 indicated that corporate governance affects the degree of cost stickiness.

Research Hypotheses:

$H6_a$: The higher corporate governance affects the degree of cost stickiness in a negative direction.

Hypothesis 6a predicted that corporate governance will affect the degree of cost stickiness. Hypothesis 6a was supported with statistically significant and indicated that corporate governance influences the degree of cost stickiness in a negative direction. The data analysis was considered as follows.

ABJ Model

Table 4.10 reveals that the weak corporate governance group had higher cost stickiness (β_2 = -.130, p =.001) while cost behavior of the strong corporate governance group is less sticky (β_2 = -.071, p < .01). The results indicated that the determinants of cost stickiness are political costs and agency costs (β_4 = .109, p <.000; β_5 = -.096, p =.001), when companies are weak in corporate governance.

Table 4.10 Regression Analysis Results of ABJ Model

ABJ Model : $\ln [\frac{TC_{i,t}}{TC_{i,t-1}}] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change
$+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS
$+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

	ABJ Model					
	Weak Corporate Governance (CGI<4)			Strong Corporate Governance (CGI≥4)		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	-.027	-2.738		-.013	-1.951	
Sale Change	.932	24.292	***	.966	37.031	***
Dec_D* Sale Change	-.130	-3.423	***	-.071	-2.819	**
GDP_GROWTH	.070	2.869	**	.045	2.551	*
SALE_GROWTH	.025	1.046		-.012	-.702	
ADJUSTMENT COSTS	-.055	-1.959		-.007	-.400	
POLITICAL COSTS	.109	3.624	***	.040	1.776	
AGENCY COSTS	-.096	-3.253	***	-.027	-1.181	
Adjusted R-Squared	74.50%			85.50%		
Durbin-Watson	2.368			2.203		
Number of Observations	530			607		
Skewness	-.087			-.038		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

BLS1 Model

Table 4.11 demonstrates that the weak corporate governance group had higher cost stickiness (β_2 = -.129, p < .001) while cost behavior of the strong corporate governance group is less sticky (β_3 = -.052, p<.01). The results indicated that the determinant of cost stickiness are political costs and agency costs (β_4 = .110, p <.001; β_5 = -.120, p <.001), when companies are weak in corporate governance.

Table 4.11 Regression Analysis Results of BLS1 Model

BLS1 Model: $[\frac{TC_{i,t} - TC_{i,t-1}}{TC_{i,t-1}}] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change $+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS $+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

	BLS1 Model					
	Weak Corporate Governance (CGI<4)			Strong Corporate Governance (CGI≥4)		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	-.032	-2.906		-.014	-1.879	
Sale Change	.928	30.194	***	.949	46.791	***
Dec_D* Sale Change	-.129	-4.168	***	-.052	-2.616	**
GDP_GROWTH	.062	2.540	**	.048	2.778	**
SALE_GROWTH	.025	1.089		-.016	-.965	
ADJUSTMENT COSTS	-.047	-1.707		-.012	-.707	
POLITICAL COSTS	.110	3.696	***	.041	1.896	
AGENCY COSTS	-.120	-4.144	***	-.024	-1.089	
Adjusted R-Squared	75.00%			86.00%		
Durbin-Watson	2.479			2.195		
Number of Observations	530			607		
Skewness	1.375			.088		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

BLS2 Model

Table 4.12 demonstrates that the weak corporate governance group had high cost stickiness (β_2 = -.144, p < .001) while cost behavior of the strong corporate governance group is not sticky. The results indicated that the determinant of cost stickiness is adjustment costs, political costs, and agency costs (β_3 = -.066, p <.05; β_4 = .115, p =.001; β_5 = -.141, p <.001), when companies are weak in corporate governance. However, adjustment costs still influence cost behavior of the strong corporate governance group.

Table 4.12 Regression Analysis Results of BLS2 Model

BLS2 Model: $[\frac{TC_{i,t} - TC_{i,t-1}}{S_{i,t-1}}] = \beta_0 + \beta_1$ Sale Change $+ \beta_2$ Dec_D$_{i,t}$* Sale Change $+ \beta_3$ GDP_GROWTH $+ \beta_4$ SALE_GROWTH $+ \beta_5$ ADJUSTMENT COSTS $+ \beta_6$ POLITICAL COSTS $+ \beta_7$ AGENCY COSTS $+ \varepsilon_{i,t}$

	BLS2 Model					
	Weak Corporate Governance (CGI<4)			Strong Corporate Governance (CGI≥4)		
	Coefficient	t-stat	Sig	Coefficient	t-stat	Sig
Intercept	-.046	-3.126		-.016	-2.215	
Sale Change	.881	24.276	***	.903	39.961	***
Dec_D* Sale Change	-.144	-3.937	***	-.023	-1.047	
GDP_GROWTH	.051	1.782		.059	3.102	**
SALE_GROWTH	.029	1.071		-.016	-.873	
ADJUSTMENT COSTS	-.066	-2.019	*	-.037	-2.006	*
POLITICAL COSTS	.115	3.277	***	.032	1.334	
AGENCY COSTS	-.141	-4.104	***	-.008	-.322	
Adjusted R-Squared	65.10%			82.60%		
Durbin-Watson	2.685			1.911		
Number of Observations	530			607		
Skewness	2.680			-1.878		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Robustness Tests

This study performed a robustness check in an attempt to confirm that cost behavior of Thai listed companies is sticky and to validate the determinants of cost stickiness. The STATA version 11 software was used to analyze this panel data.

ABJ model, BLS1model, and BLS2 model were replicated by using linear models for panel data that is fixed-effects and random-effects model (see Table 4.13, Table 4.14 and Table 4.15). As soon as these models have been carried out, the Hausman test was executed in order to test whether random-effects model is appropriate instead of fixed-effects model (Green, 2008). The results of the Hausman test indicated that fixed-effects models are appropriate for all of three models.

Table 4.13 Regression Analysis Results of ABJ Model: Random-effect and Fixed-effect

	ABJ Model Random-effects			**ABJ Model** Fixed-effects		
	Coefficient	t	Sig	Coefficient	t	Sig
Intercept	-.019	-3.31		-.027	-4.46	
Sale Change	.896	42.71	***	.939	38.43	***
Dec_D* Sale Change	-.148	-4.46	***	-.198	-5.07	***
GDP_GROWTH	.400	3.61	***	.482	4.20	***
SALE_GROWTH	.006	0.42		.009	0.53	
ADJUSTMENT COSTS	-.004	-1.33		-.011	-1.13	
POLITICAL COSTS	.024	3.64	**	.035	3.17	**
AGENCY COSTS	-.021	-3.11	**	-.112	-7.97	***
Adjusted R-Squared	80.22%			75.01%		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Table 4.14 Regression Analysis Results of BLS1 Model: Random-effects and Fixed-effects

	BlS1 Model Random-effects			**BLS1 Model** Fixed-effects		
	Coefficient	t	Sig	Coefficient	t	Sig
Intercept	-.020	-3.24		-.028	-4.20	
Sale Change	.908	53.09	***	.939	47.02	***
Dec_D* Sale Change	-.180	-4.86	***	-.207	-4.71	***
GDP_GROWTH	.417	3.46	***	.517	4.12	***
SALE_GROWTH	.006	0.35		-.007	-0.40	
ADJUSTMENT COSTS	-.005	-1.37		-.010	-0.99	
POLITICAL COSTS	.029	4.06	***	.037	3.05	**
AGENCY COSTS	-.028	-3.89	***	-.127	-8.28	***
Adjusted R-Squared	80.99%			75.58%		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Table 4.15 Regression Analysis Results of BLS2 Model: Random-effects and Fixed-effects

	BlS2 Model Random-effects			**BLS2 Model** Fixed-effects		
	Coefficient	t	Sig	Coefficient	t	Sig
Intercept	-.026	-3.39		-.035	-4.21	
Sale Change	.864	41.15	***	.888	36.14	***
Dec_D* Sale Change	-.159	-3.50	***	-.198	-3.67	***
GDP_GROWTH	.445	2.78	**	.530	3.43	***
SALE_GROWTH	.012	0.61		.012	0.56	
ADJUSTMENT COSTS	-.010	-2.50	*	-.019	-1.53	
POLITICAL COSTS	.033	3.76	***	.051	3.41	***
AGENCY COSTS	-.035	-3.91	***	-.139	-7.32	***
Adjusted R-Squared	71.99%			68.59%		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Panel A of Table 4.16 shows the results that did not consider the fixed effects as panel B displays the results that were considered the fixed effects. It is evident that β_2 coefficient is negative and statistical significant for all models. Therefore, these results have further strengthened the conviction that the cost behavior of Thai listed companies is sticky and the determinants of cost stickiness are adjustment costs, political costs, and agency costs.

Table 4.16 Regression Analysis Results of No Fixed-effects and Fixed-effects models

Model: Cost change = $\beta_0 + \beta_1$ Sale change+ β_2 Dec_$D_{i,t}$* Sale change
+ β_3 GDP_GROWTH + β_4 SALE_GROWTH + β_5 ADJUSTMENT COSTS
+ β_6 POLITICAL COSTS + β_7 AGENCY COSTS + $\varepsilon_{i,t}$

Panel A	**ABJ Model**			**BLS1 Model**			**BLS 2 Model**		
	Coefficient	t		Coefficient	t		Coefficient	t	
Intercept	-.019	-3.314		-.020	-3.239		-.026	-3.391	
Sale Change	.954	42.711	***	.941	53.093	***	.882	41.146	***
Dec_D* Sale Change	-.097	-4.457	***	-.085	-4.859	***	-.074	-3.502	***
GDP_GROWTH	.053	3.612	***	.050	3.456	***	.049	2.782	**
SALE_GROWTH	.006	0.432		.005	0.349		.010	0.611	
ADJUSTMENT COSTS	-.020	-1.331		-.020	-1.366		-.045	-2.496	*
POLITICAL COSTS	.068	3.644	***	.075	4.061	***	.084	3.759	***
AGENCY COSTS	-.059	-3.107	**	-.073	-3.894	***	-.088	-3.914	***
Adjusted R-Squared	80.10%			80.70%			71.80%		
Panel B	**ABJ Model** Fixed-effect			**BLS1 Model** Fixed-effect			**BLS 2 Model** Fixed-effect		
	Coefficient	t		Coefficient	t		Coefficient	t	
Intercept	-.027	-4.46		-.028	-4.20		-.035	-4.21	
Sale Change	.939	38.43	***	.939	47.02	***	.888	36.14	***
Dec_D* Sale Change	-.198	-5.07	***	-.207	-4.71	***	-.198	-3.67	***
GDP_GROWTH	.485	4.20	***	.517	4.12	***	.530	3.53	***
SALE_GROWTH	.009	0.53		.007	0.40		.012	0.56	
ADJUSTMENT COSTS	-.011	-1.13		-.010	-0.99		-.019	-1.53	
POLITICAL COSTS	.035	3.17	**	.037	3.05	**	.051	3.41	***
AGENCY COSTS	-.112	-7.97	***	-.128	-8.28	***	-.139	-7.32	***
Adjusted R-Squared	75.01%			75.58%			66.98%		
Panel C	**ABJ Model** Random-effect			**BLS1 Model** Random-effect			**BLS 2 Model** Random-effect		
	Coefficient	t		Coefficient	t		Coefficient	t	
Intercept	-.019	-3.31		-.020	-3.24		-.026	-3.39	
Sale Change	.896	42.71	***	.908	53.09	***	.864	41.15	***
Dec_D* Sale Change	-.148	-4.46	***	-.180	-4.86	***	-.159	-3.50	***
GDP_GROWTH	.400	3.61	***	.417	3.46	***	.412	2.78	**
SALE_GROWTH	.006	0.42		.006	0.35		.012	0.61	
ADJUSTMENT COSTS	-.004	-1.13		-.005	-1.37		-.010	-2.50	*
POLITICAL COSTS	.024	3.64	***	.029	4.06	***	.033	3.76	***
AGENCY COSTS	-.021	-3.11	**	-.028	-3.89	***	-.035	-3.91	***
Adjusted R-Squared	80.22%			80.84%			71.99%		

Note: *, **, *** represent significance levels of .05, .01 and .001 , respectively.

Summary

The analysis was comprised of three stages. The first stage consisted of a series of confirmatory factor analyses to assure that the measurement models had adequate fit to the data (e.g., adjustment cost model, political cost model, and agency cost model). All of measurement models demonstrated good fit and were supported for construct reliability. The second stage consisted of a series of exploratory factor analyses to acquire factor scores for the next stage. The factor scores of adjustment costs, political costs, and agency costs were able to capture information and explain 67.98% , 73.58%, and 67.84% of variance. The final stage consisted of constructing three structural models of cost behavior by multiple regression analysis. The overall models were supported with statistical significance .001 level.

Testing of the hypotheses revealed that all of six hypotheses were supported with statistical significance ranging from the .001 level to the .05 level. There was significant support for the stickiness of cost behavior in Thai listed companies, especially total operating costs. Agency costs, political costs, and corporate governance demonstrated a strong influence on cost stickiness. Adjustment costs exerted a mediate influence on cost stickiness. The details of these finding will be discussed further in chapter 5.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This final chapter of the dissertation restates the research questions and reviews the methods used in the study. The major sections of this chapter are conclusions and discussions of the findings, limitations of the study, and recommendations.

The current study is concerned with the following research questions:

1. Is the cost behavior of Thai listed companies sticky?
2. Is the cost behavior still sticky, after controlling the economic variables?
3. Do adjustment costs affect the degree of cost stickiness?
4. Do political costs affect the degree of cost stickiness?
5. Do agency costs affect the degree of cost stickiness?
6. Does corporate governance affect the degree of cost stickiness?

The research questions for the current study were utilized to develop the following six hypotheses:

H1a: The cost behavior of Thai listed companies is sticky.

H2a: The cost behavior is still sticky, after controlling the economic variables.

H3a: Adjustment costs affect the degree of cost stickiness in a positive direction.

H4a: Political costs affect the degree of cost stickiness in a positive direction.

H5a: Agency costs affect the degree of cost stickiness in a positive direction.

H6a: Corporate governance affects the degree of cost stickiness in a negative direction.

The hypotheses were tested using the structural models of sticky cost behavior from a set of quantitative statistical analysis. As explained in chapter 1, this study is based on financial reports of Thai listed companies to investigate sticky cost behavior and the determinants of sticky cost behavior. The study examined sticky cost behavior using a structural equation modeling (SEM) approach, a relatively new approach for sticky cost behavior research. The analysis utilized three sticky cost behavior models- i.e. ABJ model, BLS1 model, and BLS2 model. ABJ model is a log linear model which was developed by Anderson, Banker, and Janakiraman (2003). BLS1 model and BLS2 model were proposed by Balakrisman, Labro, and Soderstrom (2010). They are models which removed committed fixed costs, because BLS1 model used percentage change in costs and sales, while BLS2 model used change in costs and sales that deflated by sales.

In the first stage of analysis the measurement models of adjustment costs, political costs, and agency costs were developed and tested by confirmatory factor analysis (CFA). The second stage of analysis the more parsimonious set factor scores were estimated by exploratory factor analysis (EFA) and used in multiple regression analysis. The final stage of analysis the structural models of sticky cost behavior were constructed. In addition, fixed-effects models (linear models for panel data) were conducted and compared to the no fixed-effects models.

Conclusions

This study found that behavior of total operating costs was sticky for all models (ABJ model, BLS1 model, and BLS2 model). Total operating costs increased by around

0.93% per 1% increased in sale revenue, but decreased only 0.86% per 1% decreased in sale revenue. The results provided support for Hypothesis 1. However, the behavior of cost of goods sold and selling, general and administrative costs were not sticky.

Behavior of total operating costs was still sticky after controlling economic growth for all models. The results provided support for Hypothesis 2. Even though GDP growth had a significant influence on cost stickiness in a negative direction, cost behavior was still sticky and stickier than before controlling economic growth.

The only BLS2 model demonstrated the effect of adjustment costs on the degree of cost stickiness in a positive direction, while agency costs affected the degree of cost stickiness in a positive direction for all models. However, political costs and corporate governance affected the degree of cost stickiness in a negative direction. The findings provide support for Hypothesis 3, Hypothesis 5 and Hypothesis 6, but do not provide support for Hypothesis 4.

Discussions of the Finding

Sticky Cost Behavior of Thai Listed Companies

The results of the hypotheses testing for sticky cost behavior partially supported the existing literature. Behavior of cost of goods sold and selling, general and administrative costs were not sticky. These findings differed from the previous research by Anderson et al. (2003), Subramaniam and Weidenmier (2003), Medeiros and Costa (2004), Banker et al. (2008), Balakrishnan and Gruca (2008) and Banker et al. (2011). On the contrary, behavior of total operating costs was sticky. This finding provided support to prior research

(Anderson et al., 2003; Subramaniam & Weidenmier, 2003; Medeiros and Costa, 2004; Banker et al., 2008; Balakrishnan & Gruca, 2008). The difference in findings might be explained by variation in classification and reclassification of the items in financial reports. For example, doubtful debt accounts are selling, general and administrative costs, but are separated as significant items in some years or in some companies. This means that it did not have a consistent classification. Another possible explanation for this was that in emerging markets firms could not forecast accurate sales while costs were committed. These unfavorable variances from this expectation were pushed into cost of goods sold. However, some firms immediately recorded sales revenues when they received purchases orders and cash deposit. Thus, the degree of cost stickiness might depend on the firms' bargaining power over buyers or suppliers.

Additionally, this study investigated sticky cost behavior by categorizing samples into industries, and found that cost behavior of services industry was the "stickiest". This finding differed from previous research by Subramaniam and Weidenmier (2003), who reported that manufacturing is the "stickiest" due to its high levels of fixed assets and inventory. It was capital intensive sector. The difference might be explained by variance in the geographic region, type, and quality of services. Thai services industry consists of commerce, health care services, media and publishing, tourism and leisure, and transportation and logistics sectors. There was a number of skill labors in these sectors, as well as being labor intensive sectors.

In-depth interviews showed that a company's image is important. The companies cannot reduce a number of employees although sales decrease. They must maintain quality

of their services; for example, in the case of a premium airline. The front officers and skilled employees such as aviators, aircraft mechanics and crews were retained while sales decrease.

It was also consistent with the previous evidence that the firing costs for labor are higher than the hiring cost (Jaramillo, Schiantarelli, & Sembenelli, 1993; Pfann & Plam, 1993; Goux, Maurin, & Pauchet, 2001). This was supported by the Labour Protection Act B.E. 2541 (1998) which required that "Severance pay must be paid to an employee who his/her employment is terminated". An employee who has worked for an uninterrupted period of 10 years or more must receive payment of not less than his/her last rate of wages for 300 days. Furthermore, the Thai economic conditions reports of the Bank of Thailand (2001-2009) showed that the service sector has been affected by political uncertainty (such as the closure of airports in 2008), the unrest in the three southernmost provinces (during 2004-2009), the outbreak of avian flu in poultry (2004) and the natural disaster in six provinces (Phuket, Krabi, Ranong, Phangnga, Trang, and Satun) along the Andaman coast (Tsunami in 2004). Despite these unfavorable events, the value of exports of services, particularly tourism revenue, could rebound in a short time. Hence, managers might maintain labor when sales decreased.

Influence of Economic Growth

The time period of this study was 2001-2009. There were many critical events such as the uncertainties regarding the US-Iraq War, the outbreak of Severe Acute Respiratory Syndrome (SARS), high world oil prices, the US subprime, global economic downturn, and

global financial crisis. Thai companies were most severely affected by these global economic crises. The Thai economy had grown at the beginning of the study period, and then it slowed down from 2004. "In 2009, the overall economy contracted by 2.3 percent year-on-year, the first time in a decade, due to the global financial crisis which significant affected Thailand's major trading partner countries" (Bank of Thailand, 2009). Therefore, this study used economic growth as controlled variables in order to investigate only the effect of sale changes on the degree of cost stickiness.

Costs behavior was still sticky after controlling economic growth. The results reveal that they were not only economic variables but also other factors which affect the degree of cost stickiness. Several research studies supported the effects of economic growth on sticky cost behavior (Anderson et al., 2003; Banker & Chen, 2006b; Anderson & Lanen, 2007; Banker et al., 2008; Chen et al.,2008; Banker et al., 2011). The findings implied that the degree of cost stickiness was subjected to the deliberate resource adjustment decision made by managers.

Influence of Adjustment Costs

The results show the effects of adjustment costs on the degree of cost stickiness partially supported the findings in the existing literature (Anderson et al., 2003; Subramaniam & Weidenmier , 2003; Medeiros & Costa, 2004; Banker et al., 2008; Balakrishnan & Gruca, 2008; Chen et al., 2008). Only BLS2 model demonstrates that adjustment costs affected the degree of cost stickiness. The premise of adjustment cost theory, which managers will be hesitant about making the decision to decrease resources

when sales decrease, was confirmed by these findings. Additionally, the current findings also supported research by Banker et al. (2011) who studied with the Global Compustat data which included seventeen countries and found that, for most countries higher adjustment costs were associated with a significantly higher degree of cost stickiness.

Influence of Political Costs

The accounting research recognized the effects of financial reports on the distribution wealth and power in society (Deegan & Unerman, 2011). The political process theory proposed that management utilizes accounting choices to decrease wealth transfers resulting from the regulatory process (Watts & Zimmerman, 1986; Grace & Leverty, 2010). Empirical research suggested that political costs were important variables in disclosure decision and accounting method decision.

This study added political costs into the sticky cost behavior models as variables in order to account for their impacts on sticky cost behavior. It was assumed that political costs affected the degree of cost stickiness in a positive direction, whereas the result was found that political costs affected the degree of cost stickiness in a negative direction. The possible explanations for this finding might be that most of the previous studies were done in the US, where there are many choices for financial accounting standards, that are difference from the Thai financial accounting standards, which have only a few accounting choices. Political costs might affect in an adverse direction in the case of Thai companies.

Even though the results differed from the prior hypothesis, they demonstrate that political costs were related to the degree of cost stickiness. This provided further evidence

to support the accounting research which found that high political cost companies have a greater incentive to adjust accounting numbers and financial ratios to obtain the desired target (Seay et al., 2004).

Influence of Agency Costs

Agency costs showed significant effects on sticky cost behavior, and therefore provided support for the existing literature (Anderson et al., 2003; Banker et al., 2008; Chen et al., 2008; Banker et al., 2011). This result confirms the agency theory which proposed that managers might not behave in the way that aligned with shareholders' interests. Then, sticky costs might occur from the role of manager, in adjusting committed resources in response to a change in activities. The evidence from this study reveals that higher agency costs were associated with a significantly higher degree of cost stickiness.

Influence of Corporate Governance

As mentioned in the results, the samples were separated into two groups based on current corporate governance indexes (CGI). This study utilized CGI as a proxy of corporate governance. Even though CGI could not be a variable in the model, the findings were consistent with earlier studies (Chen et al., 2008). It proved that corporate governance could reduce agency costs and the degree of cost stickiness. Corporate governance made managers act that aligned with shareholders' interests rather than their own interests. In addition, the study confirmed that CGI, which are the current evaluation criteria of Thai

Institute of Directors Association, are practical indicators and able to be used as a corporate governance standard for Thai companies.

Limitations of the Study

It is important to understand the limitations of this research so that circumspection can be exercised when interpreting and referring to the results. To begin with new methodology was introduced in this study was only Semi-SEM, so indirect effects of the variables could not be examined. The measurement models of adjustment costs, political costs, and agency costs were constructed with confirmatory factor analysis (CFA). The all models were good fit, while construct reliability of political cost model was not high. It is recommended that in future studies, which utilize political costs as variables, should continue to develop an appropriate and reliable measurement model of political costs.

It is also important to recognize that the data set in this study was from an archived source. Data was collected from financial reports and documents of the Stock Exchange of Thailand and Thai Institute of Directors Association. Specifically, items in financial statements, their classification were not consistent among companies and across year to year. Collecting the data must be done with cautious consideration and judgment. Although the data used in this study was collected by accountants, there was the risk that some confounding effects might have been introduced into the models. Caution should be taken into deliberation when interpreting the results.

Recommendations

Recommendations for Chief Executive Officer (CEO)

To increase the potential for competition, Thai companies should have accounting systems that are consistent with international standards, transparent and verifiable (Trairatvorakul, 2011b). Information is therefore important. Management accounting is a part of the information system. The chief executive officers, or managers, need economic information in order to make decisions efficiently concerning the allocation of scarce economic resources (Atrill & McLaney, 2009). An understanding of cost behavior is critical to managers so that they can predict accurate future costs. The evidence from this study suggests that the total operating cost behavior is sticky. Knowing that cost behavior is sticky assists managers and accountants realize and to be careful when they apply the cost estimation method that is based on the traditional model of cost behavior in cost analysis.

Recommendations for Investors and financial analysts

Another factor that must be considered for understanding managers' behavior, the determinants of sticky cost behavior may reveal the behavior of managers which is not disclosed in published financial reports. This is material information for investors and financial analysts when they analyze financial statements. They can then make an informed decision so that they will receive high returns from their investment.

Recommendations for Government or Regulators

In this study, the political costs were shown to be associated with the degree of cost stickiness. The result implies that the government policies have an influence on cost behavior of companies. Hence, the government should consider policies and regulations in both macroeconomic and microeconomic perspectives. For example, the Thai Government expects to raise the daily minimum wage for employees nationwide to Bt300, or US$10 early next year ("Minimum Wage Ball in Govt Court," 2012). This study has highlighted that cost behavior of the service industry is "stickiest", thus by increasing the daily minimum wage will most likely have a strong impact on the survival of the service industry which has a number of skilled employees.

Recommendations for the Stock Exchange of Thailand

This study proved that good corporate governance can reduce agency costs. The Thai Institute of Directors Association (IOD) should encourage and invite companies to engage in the IOD's project which has reported the results of the evaluation of corporate governance practices of Thai listed companies since 2001. When a company has good corporate governance it also implies that corporate value will be increased.

Recommendations for Future Research

While this study served to answer some of questions for sticky cost behavior in regarding the context of adjustment costs, political costs, and agency costs, there are other questions that were not covered in this study. It is recommended that in future research

other variables that affect management decision such as life cycle of company, company's culture, company's strategy, leadership style, and environmental changes should also be considered.

A further important recommendation is the research model. Political process theory was incorporated into the model via political costs and was a major addition that has not been adequately addressed in the existing literature in regard to the effects it had on cost stickiness. In addition, the new method and alternative models were utilized to develop cost behavior models. Although the results of the models relations were mixed, there were a sufficient number of paths which had statistically significant interaction between constructs to support the complex relationships.

Additionally, the measurement model of latent variables should be strongly considered and improved for future research. This study is the first step for developing a measurement model in the study of cost behavior study; while the measurement model of political costs has a construct reliability of only 63% although it is a good fit statistically. Because political costs cannot observed directly, the design and development of a measurement model of political costs will be a challenge. Further research should examine new variables for the latent variable. For instance, employee intensity is measured from the number of employees, this may not be appropriate for the current economic condition, in which companies outsource work. The majority of employees come from outsourced companies.

This study utilized secondary data, collected from financial statements which is information provided for external users. The cost behavior models from this study are

original models which can be used for continuous research. If organizational, or inside data, can be collected, other interesting variables can be investigated such as research conducted by Balakrishnan et al. (2004), Anderson et al. (2005), Bosch and Blandon (2007), Balakrishnan and Gruca (2008), Balakrishnan and Soderstrom (2008) and Banker et al. (2008). The cost behavior models will be optimal, powerful and useful.

This study utilized merely Semi-SEM to construct sticky cost behavior model since cost stickiness cannot be measured directly. The current research by Weiss (2010) introduced the measurement method of cost stickiness by quarterly time frames. Future research should investigate and enhance the measurement of cost stickiness annual calculations. SEM will be powerful tool for studying sticky cost behavior because it is able to examine both direct and indirect effects.

Lastly, it is recommended that a confirmation of the findings of this study should also be conducted with non-listed companies, as additional research results that utilize different samples would validate that the results found here could then, possibly, be generalized and applied to all Thai companies.

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Appendix A

Total Listed Companies as of December 31, 2009 Classified by Industry Group

Total Listed Companies as of December 31, 2009 Classified by Industry Group

Industry Number	Sector Number	Industry/Sector	Symbol	Total Listed
1		**Agro & food Industry**	**ARGO**	**39**
	1	Agribusiness	ARGI	17
	12	Food & Beverage	FOOD	22
2		**Consumer products**	**CONSUMP**	**40**
	27	Fashion	FASHION	6
	15	Home & Office Product	HOME	24
	22	Personal Products &Pharmaceuticals	PERSON	10
3		**Financials**	**FINCIAL**	**61**
	2	Banking	BANK	17
	11	Finance & securities	FIN	12
	16	Insurance	INSUR	32
4		**Industrials**	**INDUS**	**69**
	29	Automotive	AUTO	19
	32	Industrial Materials &Machinery	IMM	23
	26	Paper & Printing Materials	PAPER	2
	4	Petrochemicals & Chemicals	PETRO	12
	21	Packaging	PKG	13

Industry Number	Sector Number	Industry/Sector	Symbol	Total Listed
5		**Property & construction**	**PROPCON**	**116**
	3	Construction Materials	CONMAT	31
	25	Property Development	PROP	59
	33	Property Fund	PFUND	26
6		**Resources**	**RESOURC**	**26**
	9	Energy & Utilities	ENERG	24
	20	Mining	MINE	2
7		**Services**	**SERVICE**	**82**
	5	Commerce	COMM	23
	13	Health Care Service	HELTH	13
	10	Media & Publishing	MEDIA	3
	24	Professional Services	PROF	14
	14	Tourism & Leisure	TOURISM	15
	28	Transportation & Logistics	TRANS	14
8		**Technology**	**TECH**	**38**
	8	Electronic Components	ETRON	11
	6	Information & Communication Technology	ICT	27
Total				**471**

Source : www.set.or.th

Appendix B
Samples in the Study

Samples in the Study

No.	Security Name	Company Name	URL
	Argo & Food Industry		
		Agribusiness	
1	ASIAN	ASIAN SEAFOODS COLDSTORAGE PUBLIC COMPANY LIMITED	www.asianseafoods.net
2	CFRESH	SEAFRESH INDUSTRY PUBLIC COMPANY LIMITED	www.seafresh.com
3	CHOTI	KIANG HUAT SEA GULL TRADING FROZEN FOOD PUBLIC CO., LTD.	www.kst-hatyai.com
4	CM	CHIANGMAI FROZEN FOODS PUBLIC COMPANY LIMITED	www.cmfrozen.com
5	CPI	CHUMPORN PALM OIL INDUSTRY PUBLIC COMPANY LIMITED	www.cpi-th.com
6	EE	ETERNAL ENERGY PUBLIC COMPANY LIMITED	www.eternalenergy.co.th
7	GFPT	GFPT PUBLIC COMPANY LIMITED	www.gfpt.co.th
8	LEE	LEE FEED MILL PUBLIC COMPANY LIMITED	www.leepattana.com
9	PPC	PAKFOOD PUBLIC COMPANY LIMITED	-
10	SSF	SURAPON FOODS PUBLIC COMPANY LIMITED	www.surapon.com
11	STA	SRI TRANG AGRO-INDUSTRY PUBLIC COMPANY LIMITED	www.sritranggroup.com
12	TLUXE	THAILUXE ENTERPRISES PUBLIC COMPANY LIMITED	www.thailuxe.com
13	TRS	TRANG SEAFOOD PRODUCTS PUBLIC COMPANY LIMITED	www.trstrang.com
14	TRUBB	THAI RUBBER LATEX CORPORATION (THAILAND) PUBLIC CO.,LTD.	www.thaitex.com
15	UPOIC	UNITED PALM OIL INDUSTRY PUBLIC COMPANY LIMITED	www.upoic.co.th
	Food & Beverages		
16	F&D	FOOD AND DRINKS PUBLIC COMPANY LIMITED	www.foodanddrinks.co.th
17	LST	LAM SOON (THAILAND) PUBLIC COMPANY LIMITED	www.lamsoon.co.th
18	MALEE	MALEE SAMPRAN PUBLIC COMPANY LIMITED	www.malee.co.th
19	PR	PRESIDENT RICE PRODUCTS PUBLIC COMPANY LIMITED	www.mama-ricenoodles.com
20	SFP	SIAM FOOD PRODUCTS PUBLIC COMPANY LIMITED	www.siamfood.co.th
21	SORKON	S.KHONKAEN FOOD INDUSTRY PUBLIC COMPANY LIMITED	www.sorkon.co.th
22	SSC	SERM SUK PUBLIC COMPANY LIMITED	www.sermsukplc.com
23	TC	TROPICAL CANNING (THAILAND) PUBLIC COMPANY LIMITED	www.tropical.co.th
24	TUF	THAI UNION FROZEN PRODUCTS PUBLIC COMPANY LIMITED	www.thaiuniongroup.com
25	TVO	THAI VEGETABLE OIL PUBLIC COMPANY LIMITED	www.tvothai.com
26	UFM	UNITED FLOUR MILL PUBLIC COMPANY LIMITED	www.ufm.co.th
	Consumer Products Industry		
	Fashion		
27	BATA	BATA SHOE OF THAILAND PUBLIC COMPANY LIMITED	www.bata.co.th
28	BNC	THE BANGKOK NYLON PUBLIC COMPANY LIMITED	www.bncsocks.com
29	BTNC	BOUTIQUE NEWCITY PUBLIC COMPANY LIMITED	www.btnc.co.th
30	CPH	CASTLE PEAK HOLDINGS PUBLIC COMPANY LIMITED	www.castlepeak.thailand.com
31	CPL	C.P.L. GROUP PUBLIC COMPANY LIMITED	www.cpl.co.th
32	ICC	I.C.C. INTERNATIONAL PUBLIC COMPANY LIMITED	www.icc.co.th
33	NC	NEWCITY (BANGKOK) PUBLIC COMPANY LIMITED	www.newcity.co.th
34	PAF	PAN ASIA FOOTWEAR PUBLIC COMPANY LIMITED	www.pan-ptr.com/paf
35	PG	PEOPLE'S GARMENT PUBLIC COMPANY LIMITED	www.pg.co.th

No.	Security Name	Company Name	URL
36	PRANDA	PRANDA JEWELRY PUBLIC COMPANY LIMITED	www.pranda.com
37	SAWANG	SAWANG EXPORT PUBLIC COMPANY LIMITED	-
38	SUC	SAHA-UNION PUBLIC COMPANY LIMITED	www.sahaunion.co.th
39	TNL	THANULUX PUBLIC COMPANY LIMITED	www.thanulux.com
40	TPCORP	TEXTILE PRESTIGE PUBLIC COMPANY LIMITED	www.tpc.co.th
41	TTI	THAI TEXTILE INDUSTRY PUBLIC COMPANY LIMITED	www.tti.co.th
42	TTTM	THAI TORAY TEXTILE MILLS PUBLIC COMPANY LIMITED	-
43	UT	UNION TEXTILE INDUSTRIES PUBLIC COMPANY LIMITED	www.sahaunion.co.th/ut
44	WACOAL	THAI WACOAL PUBLIC COMPANY LIMITED	www.wacoal.co.th
	Home & Office Products		
45	DTCI	D.T.C. INDUSTRIES PUBLIC COMPANY LIMITED	www.lancerpen.com
46	FANCY	FANCY WOOD INDUSTRIES PUBLIC COMPANY LIMITED	www.fancywood.th.com
47	IFEC	INTER FAR EAST ENGINEERING PUBLIC COMPANY LIMITED	www.ifec.co.th
48	MODERN	MODERNFORM GROUP PUBLIC COMPANY LIMITED	www.modernform.com
49	ROCK	ROCKWORTH PUBLIC COMPANY LIMITED	www.rockworth.com
50	SITHAI	SRITHAI SUPERWARE PUBLIC COMPANY LIMITED	www.srithaisuperware.com
	Personal Products & Pharmaceuticals		
51	JCT	JACK CHIA INDUSTRIES (THAILAND) PUBLIC COMPANY LIMITED	-
	Industrials Industry		
	Automative		
52	BAT-3K	THAI STORAGE BATTERY PUBLIC COMPANY LIMITED	www.3kbattery.com
53	KAMART	DISTAR ELECTRIC CORPORATION PUBLIC COMPANY LIMITED	www.distar.co.th
54	GYT	GOODYEAR (THAILAND) PUBLIC COMPANY LIMITED	www.goodyear.co.th
55	SMC	SMC MOTORS PUBLIC COMPANY LIMITED	www.smcpcl.co.th
56	SPG	THE SIAM PAN GROUP PUBLIC COMPANY LIMITED	www.siampangroup.com
57	SPSU	S.P. SUZUKI PUBLIC COMPANY LIMITED	www.spsuzuki.com
58	TNPC	THAI NAM PLASTIC PUBLIC COMPANY LIMITED	www.thainam.com
59	TRU	THAI RUNG UNION CAR PUBLIC COMPANY LIMITED	www.thairung.co.th
	Industrial Material & Machinery		
60	CTW	CHAROONG THAI WIRE & CABLE PUBLIC COMPANY LIMITED	www.ctw.co.th
61	FMT	FURUKAWA METAL (THAILAND) PUBLIC COMPANY LIMITED	-
62	KKC	KULTHORN KIRBY PUBLIC COMPANY LIMITED	-
63	PATKL	PATKOL PUBLIC COMPANY LIMITED	www.patkol.com
64	SSSC	SIAM STEEL SERVICE CENTER PUBLIC COMPANY LIMITED	www.ssscth.com
65	VARO	VAROPAKORN PUBLIC COMPANY LIMITED	-
	Packaging		
66	CSC	CROWN SEAL PUBLIC COMPANY LIMITED	www.crownseal.co.th
67	NEP	NEP REALTY AND INDUSTRY PUBLIC COMPANY LIMITED	www.nep.co.th
68	TCOAT	THAI COATING INDUSTRIAL PUBLIC COMPANY LIMITED	-
69	TFI	THAI FILM INDUSTRIES PUBLIC COMPANY LIMITED	www.thaifilmind.com
70	TMD	THAI METAL DRUM MANUFACTURING PUBLIC COMPANY LIMITED	www.thaimetaldrum.com
71	TOPP	THAI O.P.P. PUBLIC COMPANY LIMITED	www.topp.co.th
72	TPP	THAI PACKAGING & PRINTING PUBLIC COMPANY LIMITED	-

No.	Security Name	Company Name	URL
	Petrochemicals& Chenicals		
73	TCCC	THAI CENTRAL CHEMICAL PUBLIC COMPANY LIMITED	www.tcccthai.com
74	TPA	THAI POLY ACRYLIC PUBLIC COMPANY LIMITED	www.thaipolyacrylic.com
75	TPC	THAI PLASTIC AND CHEMICALS PUBLIC COMPANY LIMITED	www.thaiplastic.co.th
76	YCI	YONG THAI PUBLIC COMPANY LIMITED	-
	Property & Construction Industry		
	Construction Materials		
77	CEN	CAPITAL ENGINEERING NETWORK PUBLIC COMPANY LIMITED	
78	GEN	GENERAL ENGINEERING PUBLIC COMPANY LIMITED	www.gel.co.th
79	KWH	WIIK & HOEGLUND PUBLIC COMPANY LIMITED	www.wiik-hoeglund.com
80	RCI	THE ROYAL CERAMIC INDUSTRY PUBLIC COMPANY LIMITED	www.rci.co.th
81	SCC	THE SIAM CEMENT PUBLIC COMPANY LIMITED	www.siamcement.com
82	SCCC	SIAM CITY CEMENT PUBLIC COMPANY LIMITED	www.siamcitycement.com
83	SCP	SOUTHERN CONCRETE PILE PUBLIC COMPANY LIMITED	www.scp.co.th
84	STPI	STP&I PUBLIC COMPANY LIMITED	www.stpi.co.th
85	TASCO	TIPCO ASPHALT PUBLIC COMPANY LIMITED	www.tipcoasphalt.com
86	TCMC	THAILAND CARPET MANUFACTURING PUBLIC COMPANY LIMITED	www.taiping.co.th
87	TGCI	THAI-GERMAN CERAMIC INDUSTRY PUBLIC COMPANY LIMITED	www.tgci.co.th
88	TPIPL	TPI POLENE PUBLIC COMPANY LIMITED	www.tpipolene.com
89	UMI	THE UNION MOSAIC INDUSTRY PUBLIC COMPANY LIMITED	www.umi-tiles.com
	Property Development		
90	AP	ASIAN PROPERTY DEVELOPMENT PUBLIC COMPANY LIMITED	www.ap-thai.com
91	CK	CH. KARNCHANG PUBLIC COMPANY LIMITED	www.ch-karnchang.co.th
92	CNT	CHRISTIANI & NIELSEN (THAI) PUBLIC COMPANY LIMITED	www.cn-thai.co.th
93	EMC	EMC PUBLIC COMPANY LIMITED	www.emc.co.th
94	HEMRAJ	HEMARAJ LAND AND DEVELOPMENT PUBLIC COMPANY LIMITED	www.hemaraj.com
95	ITD	ITALIAN-THAI DEVELOPMENT PUBLIC COMPANY LIMITED	www.itd.co.th
96	LH	LAND AND HOUSES PUBLIC COMPANY LIMITED	www.lh.co.th
97	MK	M.K. REAL ESTATE DEVELOPMENT PUBLIC COMPANY LIMITED	www.mk.co.th
98	NOBLE	NOBLE DEVELOPMENT PUBLIC COMPANY LIMITED	www.noblehome.com
99	NWR	NAWARAT PATANAKARN PUBLIC COMPANY LIMITED	www.nawarat.co.th
100	PF	PROPERTY PERFECT PUBLIC COMPANY LIMITED	www.pf.co.th
101	QH	QUALITY HOUSES PUBLIC COMPANY LIMITED	www.qh.co.th
102	SAMCO	SAMMAKORN PUBLIC COMPANY LIMITED	www.sammakorn.co.th
103	SPALI	SUPALAI PUBLIC COMPANY LIMITED	www.supalai.com
104	STEC	SINO-THAI ENGINEERING AND CONSTRUCTION PUBLIC CO.,LTD.	www.stecon.co.th
105	TFD	THAI FACTORY DEVELOPMENT PUBLIC COMPANY LIMITED	www.tfd-factory.com

	Resources Industry		
	Energy & Utilities		
No.	**Security Name**	**Company Name**	**URL**
106	BAFS	BANGKOK AVIATION FUEL SERVICES PCL.	www.bafsthai.com
107	BCP	THE BANGCHAK PETROLEUM PUBLIC COMPANY LIMITED	www.bangchak.co.th
108	EGCO	ELECTRICITY GENERATING PUBLIC COMPANY LIMITED	www.egco.com
109	LANNA	THE LANNA RESOURCES PUBLIC COMPANY LIMITED	www.lannar.com
110	SUSCO	SIAM UNITED SERVICES PUBLIC COMPANY LIMITED	www.susco.co.th
111	TCC	THAI CAPITAL CORPORATION PUBLIC COMPANY LIMITED	www.thaiheat.com
	Mining		
112	PDI	PADAENG INDUSTRY PUBLIC COMPANY LIMITED	www.padaeng.com
	Services Industry		
	Commerce		
113	LOXLEY	LOXLEY PUBLIC COMPANY LIMITED	www.loxley.co.th
114	SINGER	SINGER THAILAND PUBLIC COMPANY LIMITED	www.singerthai.co.th
115	SPI	SAHA PATHANA INTER-HOLDING PUBLIC COMPANY LIMITED	www.spi.co.th
	Health Care Services		
116	AHC	AIKCHOL HOSPITAL PUBLIC COMPANY LIMITED	www.aikchol.com
117	CMR	CHIANG MAI RAM MEDICAL BUSINESS PUBLIC COMPANY LIMITED	
118	KDH	KRUNGDHON HOSPITAL PUBLIC COMPANY LIMITED	www.kdh.co.th
119	NEW	WATTANA KARNPAET PUBLIC COMPANY LIMITED	www.wattanahospital.com
120	SVH	SAMITIVEJ PUBLIC COMPANY LIMITED	www.samitivej.co.th
121	VIBHA	VIBHAVADI MEDICAL CENTER PUBLIC COMPANY LIMITED	www.vibhavadi.com
	Media & Publishing		
122	APRINT	AMARIN PRINTING AND PUBLISHING PUBLIC COMPANY LIMITED	www.amarin.co.th
123	FE	FAR EAST DDB PUBLIC COMPANY LIMITED	www.fareastddb.com
124	LIVE	LIVE INCORPORATION PUBLIC COMPANY LIMITED	www.live.co.th
125	MATI	MATICHON PUBLIC COMPANY LIMITED	www.matichon.co.th
126	NMG	NATION MULTIMEDIA GROUP PUBLIC COMPANY LIMITED	www.nationgroup.com
127	P-FCB	PRAKIT HOLDINGS PUBLIC COMPANY LIMITED	-
128	POST	THE POST PUBLISHING PUBLIC COMPANY LIMITED	www.bangkokpost.com
129	SPORT	SIAM SPORT SYNDICATE PUBLIC COMPANY LIMITED	www.siamsport.co.th/
130	TBSP	THAI BRITISH SECURITY PRINTING PUBLIC COMPANY LIMITED	www.tbsp.co.th
131	TONHUA	TONG HUA COMMUNICATIONS PUBLIC COMPANY LIMITED	-
132	WAVE	WAVE ENTERTAINMENT PUBLIC COMPANY LIMITED	
	Tourism & Leisure		
133	ASIA	ASIA HOTEL PUBLIC COMPANY LIMITED	www.asiahotel.co.th
134	CSR	CITY SPORTS AND RECREATION PUBLIC COMPANY LIMITED	
135	DTC	DUSIT THANI PUBLIC COMPANY LIMITED	www.dusit.com
136	ERW	THE ERAWAN GROUP PUBLIC COMPANY LIMITED	www.TheErawan.com
137	LRH	LAGUNA RESORTS & HOTELS PUBLIC COMPANY LIMITED	www.lagunaresorts.com
138	MANRIN	THE MANDARIN HOTEL PUBLIC COMPANY LIMITED	www.mandarin-bkk.com
139	OHTL	OHTL PUBLIC COMPANY LIMITED	www.mandarin-oriental.com

No.	Security Name	Company Name	URL
140	ROH	ROYAL ORCHID HOTEL (THAILAND) PUBLIC COMPANY LIMITED	
141	SHANG	SHANGRI-LA HOTEL PUBLIC COMPANY LIMITED	www.shangri-la.com
	Transportation & Logistics		
142	ASIMAR	ASIAN MARINE SERVICES PUBLIC COMPANY LIMITED	www.asimar.com
143	RCL	REGIONAL CONTAINER LINES PUBLIC COMPANY LIMITED	www.rclgroup.com
144	SST	SUB SRI THAI WAREHOUSE PUBLIC COMPANY LIMITED	www.subsrithai.co.th
145	TSTE	THAI SUGAR TERMINAL PUBLIC COMPANY LIMITED	www.TSTEGROUP.com
146	WIN	WYNCOAST INDUSTRIAL PARK PUBLIC COMPANY LIMITED	www.wyncoast.com
	Technology Industry		
		Electronic Components	
147	DELTA	DELTA ELECTRONICS (THAILAND) PUBLIC COMPANY LIMITED	www.deltathailand.com
148	DRACO	DRACO PCB PUBLIC COMPANY LIMITED	www.dracopcb.com
149	HANA	HANA MICROELECTRONICS PUBLIC COMPANY LIMITED	www.hanagroup.com
150	KCE	KCE ELECTRONICS PUBLIC COMPANY LIMITED	www.kcethai.in.th
151	SVI	SVI PUBLIC COMPANY LIMITED	www.svi.co.th
152	TEAM	TEAM PRECISION PUBLIC COMPANY LIMITED	www.teampcba.com
		Information & Communication Technology	
153	ADVANC	ADVANCED INFO SERVICE PUBLIC COMPANY LIMITED	www.ais.co.th
154	JAS	JASMINE INTERNATIONAL PUBLIC COMPANY LIMITED	www.jasmine.com
155	MSC	METRO SYSTEMS CORPORATION PUBLIC COMPANY LIMITED	www.metrosystems.co.th
156	SAMART	SAMART CORPORATION PUBLIC COMPANY LIMITED	www.samartcorp.com
157	SAMTEL	SAMART TELCOMS PUBLIC COMPANY LIMITED	www.samtel.com
158	INTUCH	SHIN CORPORATION PUBLIC COMPANY LIMITED	www.shincorp.com
159	SVOA	SVOA PUBLIC COMPANY LIMITED	www.svoa.co.th
160	TT&T	TT&T PUBLIC COMPANY LIMITED	www.ttt.co.th

Appendix C

AMOS Outputs of Confirmatory Factor Analysis

AMOS Outputs of Confirmatory Factor Analysis

Adjustment Cost Model

Maximum Likelihood Estimates

Regression Weights:

			Estimate	S.E.	C.R.	P	Label
ASSET_I	<---	ADJUST_COST	1.000				
EQUITY_I	<---	ADJUST_COST	1.151	.031	37.307	***	par_1
STOCK_I	<---	ADJUST_COST	1.220	.047	26.002	***	par_2
EMPLOY_I	<---	ADJUST_COST	.020	.055	.369	.712	par_3
CAPITAL_I	<---	ADJUST_COST	.931	.043	21.645	***	par_4

Standardized Regression Weights:

			Estimate
ASSET_I	<---	ADJUST_COST	.973
EQUITY_I	<---	ADJUST_COST	.837
STOCK_I	<---	ADJUST_COST	.663
EMPLOY_I	<---	ADJUST_COST	.011
CAPITAL_I	<---	ADJUST_COST	.579

Covariances:

			Estimate	S.E.	C.R.	P	Label
e2	<-->	e5	.228	.030	7.706	***	par_5
e2	<-->	e3	.318	.032	9.927	***	par_6
e2	<-->	e4	.082	.018	4.689	***	par_7
e3	<-->	e5	-.081	.023	-3.454	***	par_8

Correlations:

			Estimate
e2	<-->	e5	.237
e2	<-->	e3	.313
e2	<-->	e4	.149
e3	<-->	e5	-.110

Variances:

	Estimate	S.E.	C.R.	P	Label
ADJUST_COST	.407	.019	20.972	***	par_9
e1	.023	.007	3.137	.002	par_10
e2	1.328	.056	23.833	***	par_11
e3	.773	.035	22.268	***	par_12
e4	.230	.014	16.909	***	par_13
e5	.701	.031	22.955	***	par_14

Squared Multiple Correlations:

	Estimate
CAPITAL_I	.335
EQUITY_I	.701
STOCK_I	.439
EMPLOY_I	.000
ASSET_I	.947

Implied Covariances

	CAPITAL_I	EQUITY_I	STOCK_I	EMPLOY_I	ASSET_I
CAPITAL_I	1.054				
EQUITY_I	.436	.769			
STOCK_I	.381	.572	1.380		
EMPLOY_I	.236	.092	.328	1.328	
ASSET_I	.379	.469	.497	.008	.430

Implied Correlations

	CAPITAL_I	EQUITY_I	STOCK_I	EMPLOY_I	ASSET_I
CAPITAL_I	1.000				
EQUITY_I	.485	1.000			
STOCK_I	.316	.555	1.000		
EMPLOY_I	.199	.091	.242	1.000	
ASSET_I	.563	.815	.645	.011	1.000

Residual Covariances

	CAPITAL_I	EQUITY_I	STOCK_I	EMPLOY_I	ASSET_I
CAPITAL_I	.000				
EQUITY_I	-.011	.000			
STOCK_I	.000	.010	.000		
EMPLOY_I	-.004	.000	.003	.000	
ASSET_I	.001	.000	-.001	.000	.000

Standardized Residual Covariances

	CAPITAL_I	EQUITY_I	STOCK_I	EMPLOY_I	ASSET_I
CAPITAL_I	.000				
EQUITY_I	-.370	.000			
STOCK_I	.000	.276	.000		
EMPLOY_I	-.110	.007	.084	.003	
ASSET_I	.055	.000	-.041	-.001	.000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	14	1.477	1	.224	1.477
Saturated model	15	.000	0		
Independence model	5	2514.770	10	.000	251.477

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.004	.999	.992	.067
Saturated model	.000	1.000		
Independence model	.311	.538	.307	.359

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.999	.994	1.000	.998	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.100	.100	.100
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	.477	.000	8.180
Saturated model	.000	.000	.000
Independence model	2504.770	2343.570	2673.293

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.001	.000	.000	.007
Saturated model	.000	.000	.000	.000
Independence model	2.214	2.205	2.063	2.353

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.020	.000	.085	.683
Independence model	.470	.454	.485	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	29.477	29.626	99.983	113.983
Saturated model	30.000	30.159	105.542	120.542
Independence model	2524.770	2524.823	2549.951	2554.951

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.026	.026	.033	.026
Saturated model	.026	.026	.026	.027
Independence model	2.223	2.081	2.371	2.223

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	2955	5103
Independence model	9	11

Assessment of normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
CAPITAL_I	-4.404	2.489	.000	-.002	.573	3.943
EQUITY_I	-4.348	2.568	-.085	-1.169	1.265	8.706
STOCK_I	-5.371	2.771	.160	2.196	.417	2.873
EMPLOY_I	-11.717	-5.416	-.609	-8.383	.066	.457
ASSET_I	-1.306	2.618	.767	10.555	.561	3.862
Multivariate					10.821	21.806

Observations farthest from the centroid (Mahalanobis distance)

Observation number	Mahalanobis d-squared	p1	p2
461	43.093	.000	.000
127	41.290	.000	.000
131	37.800	.000	.000
647	33.782	.000	.000
754	33.135	.000	.000
475	30.186	.000	.000
670	25.546	.000	.000
512	23.852	.000	.000
648	21.560	.001	.000
755	21.530	.001	.000
130	21.125	.001	.000
772	20.740	.001	.000
129	20.710	.001	.000
883	20.683	.001	.000
572	20.615	.001	.000
694	20.523	.001	.000
128	20.231	.001	.000
710	19.451	.002	.000
138	19.303	.002	.000
756	19.142	.002	.000
693	18.622	.002	.000
656	18.531	.002	.000
709	18.459	.002	.000

Political Cost Model

Maximum Likelihood Estimates

Regression Weights:

			Estimate	S.E.	C.R.	P	Label
CAPITAL_I	<---	POLITICAL_COST	1.000				
SIZE	<---	POLITICAL_COST	-4.115	.949	-4.337	***	par_1
BETA	<---	POLITICAL_COST	-1.523	.435	-3.504	***	par_2
COMPET	<---	POLITICAL_COST	-.101	.030	-3.398	***	par_3
TAX	<---	POLITICAL_COST	.168	.049	3.453	***	par_6

Standardized Regression Weights:

			Estimate
CAPITAL_I	<---	POLITICAL_COST	.198
SIZE	<---	POLITICAL_COST	-.649
BETA	<---	POLITICAL_COST	-.660
COMPET	<---	POLITICAL_COST	-.253
TAX	<---	POLITICAL_COST	.231

Covariances:

			Estimate	S.E.	C.R.	P	Label
e5	<-->	e1	.149	.053	2.807	.005	par_4
e3	<-->	e1	.014	.003	5.328	***	par_5
e5	<-->	e4	.029	.007	4.090	***	par_7

Correlations:

			Estimate
e5	<-->	e1	.151
e3	<-->	e1	.174
e5	<-->	e4	.209

Variances:

	Estimate	S.E.	C.R.	P	Label
POLITICAL_COST	.041	.020	2.093	.036	par_8
e5	.958	.129	7.421	***	par_9
e3	.006	.000	22.878	***	par_10
e2	.124	.017	7.251	***	par_11
e1	1.012	.045	22.471	***	par_12
e4	.021	.001	22.142	***	par_13

Squared Multiple Correlations:

	Estimate
TAX	.053
CAPITAL_I	.039
BETA	.436
COMPET	.064
SIZE	.421

Implied Covariances

	TAX	CAPITAL_I	BETA	COMPET	SIZE
TAX	.022				
CAPITAL_I	.007	1.054			
BETA	-.011	-.063	.219		
COMPET	-.001	.010	.006	.007	
SIZE	.001	-.020	.258	.017	1.655

Implied Correlations

	TAX	CAPITAL_I	BETA	COMPET	SIZE
TAX	1.000				
CAPITAL_I	.046	1.000			
BETA	-.152	-.130	1.000		
COMPET	-.058	.115	.167	1.000	
SIZE	.005	-.016	.428	.164	1.000

Residual Covariances

	TAX	CAPITAL_I	BETA	COMPET	SIZE
TAX	.000				
CAPITAL_I	-.007	.001			
BETA	-.001	-.005	.000		
COMPET	.000	.000	.000	.000	
SIZE	-.001	-.008	-.002	.001	-.003

Standardized Residual Covariances

	TAX	CAPITAL_I	BETA	COMPET	SIZE
TAX	.000				
CAPITAL_I	-1.529	.012			
BETA	-.265	-.369	.000		
COMPET	-.267	.046	-.293	.000	
SIZE	-.179	-.211	-.123	.181	-.042

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	13	3.200	2	.202	1.600
Saturated model	15	.000	0		
Independence model	5	356.357	10	.000	35.636

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.003	.999	.992	.133
Saturated model	.000	1.000		
Independence model	.069	.893	.840	.596

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.991	.955	.997	.983	.997
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.200	.198	.199
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	1.200	.000	10.377
Saturated model	.000	.000	.000
Independence model	346.357	288.356	411.777

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.003	.001	.000	.009
Saturated model	.000	.000	.000	.000
Independence model	.314	.305	.254	.362

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.023	.000	.068	.802
Independence model	.175	.159	.190	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	29.200	29.338	94.670	107.670
Saturated model	30.000	30.159	105.542	120.542
Independence model	366.357	366.410	391.538	396.538

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.026	.025	.034	.026
Saturated model	.026	.026	.026	.027
Independence model	.322	.271	.380	.323

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	2128	3270
Independence model	59	74

Assessment of normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
TAX	.000	.919	1.152	15.852	2.092	14.396
CAPITAL_I	-4.404	2.489	.000	-.002	.573	3.943
BETA	-.470	2.310	.942	12.969	.287	1.973
COMPET	.546	.995	1.031	14.198	2.857	19.666
SIZE	11.944	19.278	.603	8.295	.066	.456
Multivariate					7.020	14.147

Observations farthest from the centroid (Mahalanobis distance)

Observation number	Mahalanobis d-squared	p1	p2
791	40.775	.000	.000
309	30.142	.000	.000
604	26.951	.000	.000
798	25.636	.000	.000
72	22.633	.000	.000
307	22.100	.001	.000
477	21.390	.001	.000
781	20.209	.001	.000
656	20.122	.001	.000
769	19.714	.001	.000
777	19.631	.001	.000
773	19.551	.002	.000
778	18.800	.002	.000
765	18.449	.002	.000
273	18.231	.003	.000
775	18.206	.003	.000
770	18.071	.003	.000
776	18.007	.003	.000
1040	17.865	.003	.000
774	17.499	.004	.000

Agency Cost Model

Maximum Likelihood Estimates

Regression Weights:

			Estimate	S.E.	C.R.	P	Label
SIZE	<---	AGENCY_COST	9.031	1.800	5.018	***	par_1
FCF	<---	AGENCY_COST	1.000				
DIS_EX	<---	AGENCY_COST	-.918	.169	-5.444	***	par_2
ROA	<---	AGENCY_COST	1.654	.227	7.288	***	par_3
TQ	<---	AGENCY_COST	9.908	1.252	7.916	***	par_4
LEV_R	<---	AGENCY_COST	-2.355	.365	-6.446	***	par_5

Standardized Regression Weights:

			Estimate
SIZE	<---	AGENCY_COST	.235
FCF	<---	AGENCY_COST	.360
DIS_EX	<---	AGENCY_COST	-.273
ROA	<---	AGENCY_COST	.693
TQ	<---	AGENCY_COST	.579
LEV_R	<---	AGENCY_COST	-.336

Covariances:

			Estimate	S.E.	C.R.	P	Label
e1	<-->	e3	-.020	.004	-4.416	***	par_6
e1	<-->	e2	-.013	.003	-3.761	***	par_7
e2	<-->	e5	-.007	.002	-3.953	***	par_8
e1	<-->	e6	.093	.009	10.346	***	par_9
e3	<-->	e5	.012	.002	5.963	***	par_10
e3	<-->	e6	-.004	.001	-4.811	***	par_11

Correlations:

			Estimate
e1	<-->	e3	-.147
e1	<-->	e2	-.122
e2	<-->	e5	-.174
e1	<-->	e6	.339
e3	<-->	e5	.243
e3	<-->	e6	-.161

Variances:

	Estimate	S.E.	C.R.	P	Label
AGENCY_COST	.001	.000	4.418	***	par_12
e1	1.553	.068	22.870	***	par_13
e2	.007	.000	20.740	***	par_14
e3	.012	.001	21.967	***	par_15
e4	.003	.000	10.541	***	par_16
e5	.216	.014	14.945	***	par_17
e6	.048	.002	22.113	***	par_18

Squared Multiple Correlations:

	Estimate
LEV_R	.113
TQ	.335
ROA	.480
DIS_EX	.074
FCF	.130
SIZE	.055

Implied Covariances

	LEV_R	TQ	ROA	DIS_EX	FCF	SIZE
LEV_R	.055					
TQ	-.026	.326				
ROA	-.004	.018	.006			
DIS_EX	-.001	.002	-.002	.013		
FCF	-.003	.004	.002	-.001	.009	
SIZE	.069	.099	.017	-.029	-.003	1.644

Implied Correlations

	LEV_R	TQ	ROA	DIS_EX	FCF	SIZE
LEV_R	1.000					
TQ	-.194	1.000				
ROA	-.233	.401	1.000			
DIS_EX	-.054	.033	-.189	1.000		
FCF	-.121	.076	.250	-.098	1.000	
SIZE	.232	.136	.163	-.202	-.026	1.000

Residual Covariances

	LEV_R	TQ	ROA	DIS_EX	FCF	SIZE
LEV_R	.000					
TQ	.003	-.001				
ROA	.000	.000	.000			
DIS_EX	.000	-.001	.000	.000		
FCF	-.001	.000	.000	.000	.000	
SIZE	.002	.013	.000	.000	-.003	.008

Standardized Residual Covariances

	LEV_R	TQ	ROA	DIS_EX	FCF	SIZE
LEV_R	.000					
TQ	.747	-.057				
ROA	.126	-.021	.000			
DIS_EX	.152	-.349	-.365	-.049		
FCF	-1.621	.219	-.073	1.498	.012	
SIZE	.189	.578	-.121	-.040	-.757	.118

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	18	6.512	3	.089	2.171
Saturated model	21	.000	0		
Independence model	6	611.794	15	.000	40.786

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.003	.998	.987	.143
Saturated model	.000	1.000		
Independence model	.031	.849	.789	.606

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.989	.947	.994	.971	.994
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.200	.198	.199
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	3.512	.000	15.015
Saturated model	.000	.000	.000
Independence model	596.794	519.588	681.407

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.006	.003	.000	.013
Saturated model	.000	.000	.000	.000
Independence model	.539	.525	.457	.600

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.032	.000	.066	.771
Independence model	.187	.175	.200	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	42.512	42.735	133.163	151.163
Saturated model	42.000	42.260	147.759	168.759
Independence model	623.794	623.869	654.011	660.011

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.037	.034	.048	.038
Saturated model	.037	.037	.037	.037
Independence model	.549	.481	.624	.549

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	1364	1980
Independence model	47	57

Assessment of normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
LEV_R	.005	2.057	.602	8.293	1.582	10.886
TQ	.063	4.219	2.201	30.303	6.501	44.745
ROA	-.336	.312	-.692	-9.532	3.222	22.174
DIS_EX	.021	.712	1.514	20.846	2.586	17.803
FCF	-.281	.524	.118	1.621	2.237	15.400
SIZE	11.944	19.278	.603	8.295	.066	.456
Multivariate					35.897	61.770

Observations farthest from the centroid (Mahalanobis distance)

Observation number	Mahalanobis d-squared	p1	p2
461	43.093	.000	.000
127	41.290	.000	.000
131	37.800	.000	.000
647	33.782	.000	.000
754	33.135	.000	.000
475	30.186	.000	.000
670	25.546	.000	.000
512	23.852	.000	.000
648	21.560	.001	.000
755	21.530	.001	.000
130	21.125	.001	.000
772	20.740	.001	.000
129	20.710	.001	.000
883	20.683	.001	.000

Appendix D

SPSS Outputs of Exploratory Factor Analysis

SPSS Outputs of Exploratory Factor Analysis

Adjustment Cost

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.739
Bartlett's Test of Sphericity	Approx. Chi-Square	2295.613
	df	6
	Sig.	.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.719	67.975	67.975	2.719	67.975	67.975
2	.693	17.316	85.291			
3	.422	10.559	95.850			
4	.166	4.150	100.000			

Extraction Method: Principal Component Analysis.

Political Cost

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.515
Bartlett's Test of Sphericity	Approx. Chi-Square	355.573
	df	10
	Sig.	.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.565	31.291	31.291	1.565	31.291	31.291	1.521	30.418	30.418
2	1.115	22.301	53.593	1.115	22.301	53.593	1.121	22.412	52.830
3	.999	19.990	73.582	.999	19.990	73.582	1.038	20.752	73.582
4	.791	15.825	89.407						
5	.530	10.593	100.000						

Extraction Method: Principal Component Analysis.

Agency Cost

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.545
Bartlett's Test of Sphericity	Approx. Chi-Square	610.269
	df	15
	Sig.	.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.708	28.459	28.459	1.708	28.459	28.459	1.521	25.345	25.345
2	1.366	22.764	51.223	1.366	22.764	51.223	1.358	22.633	47.978
3	.997	16.618	67.841	.997	16.618	67.841	1.192	19.863	67.841
4	.819	13.656	81.497						
5	.598	9.967	91.464						
6	.512	8.536	100.000						

Extraction Method: Principal Component Analysis.

VITA

Nuchjaree Pichetkun was born in Saraburi, Thailand on August 9, 1960. She received her Bachelor of Business Administration in Accounting (Second-Class Honors) in October 1982 from Thammasat University. She joined Capet King Co.,Ltd. as an accountant in 1982 and Electricity Generation Authority of Thailand as a foreign voucher officer in 1984. In January 1986, she completed her Master of Accountancy from Chulalongkorn University. She has been a lecturer of accounting department in Faculty of Business Administration, Rajamangala University of Technology Thanyaburi since 1986.