Performance Appraisal of SEA Emerging Market Conglomerates :

Effects of and Modifications to Downside Risk-Adjusted Measures

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Certification

I hereby certify that this dissertation research, presented to the Higher Degree Committee of Ritsumeikan Asia Pacific University (APU), is the result of my own work. The ideas presented are drawn from original research and the content, except as specifically stated in acknowledgements, appendices or bibliography are of my own making.

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List of Acronyms*

ASEAN	:	Association of South East Asian Nations
CAGR	:	Compounded Annual Growth Rate
CFA	:	Chartered Financial Analyst
DTV	:	Daily Traded Value
DMC	:	Daily Market Capitalization
ETF	:	Exchange Traded Fund
FTSE	:	Financial Times (Index company)
GDP	:	Gross Domestic Product
ID	:	Indonesia
IDR	:	Indonesian Rupiah (currency)
IDX	:	Indonesia Stock Exchange
LQ45	:	45 IDX Stocks Composite Index
MSCI	:	Morgan Stanley Composite (Index Company)
PH	:	Philippines
PSE	:	Philippine Stock Exchange
PSEi	:	Philippine Stock Exchange Index
PHP	:	Philippine Peso (currency)
SEA	:	South East Asia
SET	:	Stock Exchange of Thailand
SET50	:	Stock Exchange of Thailand 50 index
SRAP	:	Semideviation Risk-Adjusted Performance
TH	:	Thailand
THB	:	Thailand Baht (currency)
USD	:	United States Dollar (currency)

**excludes formula notation and equivalents (refer to Chapter 3: Data and Methodology)*

Abstract

Investing in conglomerate firms operating within the Association of South East Nations (ASEAN) region remains a relatively unchartered academic to`pic, despite several studies that argue in favor of their superior stock returns. These publicly-listed conglomerates are traded on the newly-established ASEAN Exchange, a capital market collaboration between member countries' stock exchanges. Much of performance evaluation tools applied to ASEAN Exchange equities work within a narrow unadjusted returns approach. Nevertheless, more sophisticated global investors are concerened with quantitative evidence that accounts for a balance between risk and returns. These include components relating to benchmarks, downside risk factors and time-varying periods that influence the performance outcomes. Via performance appraisal methods, this research attempts to validate the performance of ASEAN Exchange conglomerates, particularly for publicly-traded firms in Indonesia (ID), Philippines (PH) and Thailand (TH). In this regard, the study aims to compare risk-adjusted returns against downside risk factors in time-varying scenarios. It examines ranking effects between unadjusted, risk-adjusted and modified adjusted returns to determine an optimal measure. Finally, incorporating downside risk factors, it generates a revised risk-adjusted metric, Semideviation Risk-Adjusted Performance (SRAP), as an alternative performance appraisal metric for emerging markets economies in ASEAN. As a supplementary effort, it also explores relationships of determinants influencing the stock returns of the conglomerate cohort.

Using a combination of performance appraisal methods and emerging market comparisons, this study has come out with the following key findings. Firstly, the conglomerates outperformed benchmarks for the time-varying periods, but with lower overall unadjusted excess returns as compared with previous research. Secondly, applying risk-adjusted performance, the conglomerates continued to show higher excess returns across the country sample size as well as time-varying panel data. Performance rankings experienced wide shifts when comparing unadjusted returns to risk-adjusted and downside measures. Further, unlike what most empirical studies on emerging markets observe, results from both the regression and correlation analysis yielded no clear relationship between variables (such as downside factor, market size, debt levels) with average mean returns. Thirdly, based on empirical literature review and analysis of the congomerate sample, exising risk-adjusted measures can be further supplemented by SRAP. This is supported by established academic findings that argue for its usage for firms operating in emerging markets due to factors of significance, time-varying periods, and degree of integration. Likewise, SRAP returns have minimal effects on ranking compared to other risk-adjusted measures. Although there are indeed numerous methods existing, practitioners may consider exploring this intuitive SRAP model as an appropriate measure of risk-adjusted returns in emerging markets.

Keywords: Investing, ASEAN, performance appraisal, Conglomerates risk-adjusted returns, emerging markets, downside risk, semideviation, downside beta, Philippines equities, Indonesia equities, Thailand equities

Chapter 1

Introduction

1.1 Research Background

The past decade has seen global financial markets faced with economic downturns that prompted many investors to seek new channels to invest in. In order for investors to enhance their portfolio returns and stability, Bernstein (2001) recommends including international equity as part of an asset investment portfolio while Brinson, Hood & Beebower (1986, 1991) have shown that by diversifying investment holdings, risks in an asset portfolio can be effectively be minimized. As such, international investors have taken substantial interest in Asian markets, such as those economies in the South East Asian (SEA) region, attributable to the continous strengthening of capital flows and historical returns, as well as regional growth expecations. The Assocation of South East Asian Nations (ASEAN) Exchange, which represents the collaboration of six SEA capital market exchanges, has over 3,600 listed companies with a market capitalisation of US$2.1trillion, as of 2012. This market has been growing by 11% annually compared to the global equity market of 6%, based on the FTSE All-Shares Index, a benchmark that tracks ASEAN Exchange equity. Before investing in publicly-listed firms in the ASEAN Exchange, the investing public would likely require the most appropriate measure or metric for evaluating such diversified assets in a largely emerging market setting. Utilizing the method of *performance appraisal*, a few studies observe the outperformance

of historical stock returns, which argue in favor of investing in ASEAN Exchange-based Conglomerates. Performance appraisal is a component of a larger method called Performance Evaluation. This component finds its origins in statistical techniques, with the purpose of analyzing the economic returns of mutual funds (or a comparable investment portfolio or single asset), using risk and reward components. This research is about applying risk-adjusted performance appraisal metrics to evaluate such investments in SEA conglomerates (specifically from selected emerging markets of the ASEAN Exchange), carefully balancing academic theory and intuitive practitioner sensibilities. It takes its inspiration from the studies by Vijayaraghavan (2014) and Vestring et al. (2014) that revealed long-term equity investments in SEA conglomerates yielded superior annual return premiums against various stock index benchmarks. Further, Alles and Murray's (2013) finds that individual equities from emerging Asian markets capture varying premiums, depending on risk variable utilized. Nevertheless, investors may take caution: Lemeshko and Rejnuš (2015) apply performance appraisal metrics to emerging market equities and observed, that "local equity funds *do not* generate abnormal (superior) returns, but they may still exist."

As stated earlier, Performance Appraisal is a component of a larger method called Performance Evaluation. According to Bailey et al. (2007), the Chartered Financial Analyst (CFA) Insitute establishes three (3) levels of Performance Evaluation: Measurement, Attribution and Appraisal. Each of these levels shall be expounded on in the review of literature and past empirical research in Chapter 2, to further the rationale

of the research process of this study. These different ways are based on examinations that the investor public may come to encounter, with key examples given to highlight the SEA conglomerate context. They are as follows:

1) Measurement - As a component of Performance Evaluation, calculating an assets performance is the foundation of establishing the basic returns in percentage form. It is the first step in the performance evaluation process. It answers the rudimentary question of investors: What was the assets performance over a given period? For instance, Ooi and Liow's (2004) regional sector equity study, found Indonesian real estate stocks averaged a return of 18.76% for the period 1992-2002. These returns are the most fundamental gross record of the stock or funds' performance, with no consideration yet for taxes, benchmarks or other factors.

2) Attribution - The next critical question for the investor would be: Why did the asset produce such outcomes? The method of attribution was first posited by Fama (1972), under the context of the Capital Asset Pricing Model (CAPM). Investors and fund managers employ various forms of attribution, but maintain a common platform of using a designated benchmark of their choosing, usually an index that adequately reflects similar asset qualities. The benchmark return represents what the asset can effectively be compared against, an acceptable point of reference of judging its peformance. Bailey, Richards and Tierney (2007) defined it as a "collection of securities, risk factors or associated weights that represents persistent and prominent investment characteristics of an asset category."

Attribution thus involves quantiftying an assets higher-or-lower return variances (herein referred to as *differential returns*) from said benchmark. To illustrate, Vestring, Felenbok & Hardcastle (2014) studied 49 various SEA conglomerate firms, generating comparisons using Total Shareholder Returns (TSR) with average differential returns of 14% higher against the Morgan Stanley Composite (MSC) SEA Index, for a 10 year period. In this way, attribution supplies an informed review of a past period, by highlighting the diffential returns and their effect on return outcomes.

3) Appraisal - Finally, investors are concerened with quantitative evidence that accounts for the balance between risk and returns. The goal of performance appraisal is to gauge whether to retain or adjust existing invested assets, based on the value provided relative to the risks taken. There are two general types of risks that affect ex-post returns of an asset: standard deviation (representing total risk) and beta (representing market risk). For example, Vijayaraghavan (2014) examines SEA conglomerates' lower volatility based on a sampling of one conglomerate firm per SEA country, measuring returns and standard deviations (representing total risk) for 1, 3, 5, and 10 year periods. This study focuses on *performance appraisal* methods that explicitly reveal the volatility of returns, in order to capture and appraise risk-adjusted perofrmance metrics.

1.2 In Context: ASEAN Exchange and its Emerging Market Conglomerates

To reiterate, this research attempts to evaluate investments, via performance appraisal metrics, specifically of Conglomerates publicly traded on the ASEAN Exchange. A brief contextual summary of this Exchange and its originating organization is in order. GDP per capita in ASEAN has expanded in 2013 to US$2,765 from US$1,832 in 2009, according to the World Bank (2012). In addition, the same report states that ASEAN "goods imports declined by 3.8 % in the third quarter of 2014, driving the return to a positive goods trade balance." Household income is growing at a rapid pace, alongside many other indicators that point to an emerging class of consumers, given the improving income base. Given ASEANs economic engine, a move to link each countries' capital market exchanges was forthcoming. In 2011, ASEAN member countries commited to integrate their respective stock exchanges by 2015. Thus, the ASEAN Exchanges represents the collaboration of the different capital market exchanges of six SEA countries, namely: Malaysia (Bursa Malaysia), Vietnam (Hanoi Stock Exchange, HoChiMinh Exchange), Indonesia (Indonesia Stock Exchange), Philippines (The Philippine Exchange), Thailand (The Stock Exchange of Thailand) and Singapore (Singapore Stock Exchange). Its primary purpose is to promote the growth of the regions' capital market by opening up the various exchanges to more investors. The ASEAN Exchange has over 3,600 listed companies with a market capitalization of US$2.1trillion, as of 2012. Currently, the net market capitalization of the ASEAN Exchange stands at ~US$814 billion, removing debt instruments and using only shares

available on free float (ie. tradeable in public markets), as illustrated on the FTSE ASEAN All-Shares Index (2016) in Table 1.

Table 1: Net Market Capitalization, ASEAN Exchange, 2016

	FTSE ASEAN All-Share		
Country	No. of Cons	Net MCap (USDm)	Wgt %
Hong Kong	3	28,155	3.46
Indonesia	120	122,992	15.11
Malaysia	262	166,283	20.42
Philippines	69	83,898	10.30
Singapore	126	206,389	25.35
Thailand	240	186,566	22.91
Vietnam	252	19,954	2.45
Totals	**1072**	**814,236**	**100.00**

Source: FTSE ASEAN All-Share Index Report 2016

The ASEAN Trading Link was established to connect the securities markets and brokers to offer investors easier access to member markets. This effectively made the process seamless for investors to trade in other regional capital markets. Given the early stages of the ASEAN Exchange, several studies have captured the price dynamics, linkages and interdependencies of ASEAN equity markets even before the establishment of the Exchange. More contemporaray studies such as those of Worthington, Katsuura & Higgs (2003) examine the extent of linkages between ASEAN equity prices and world markets. Other findings, as of Ibrahim (2006), pursued the international interdependencies of equity prices, gauging the influence of other developed markets. However, this research will deviate from the existing literature concering linkages and causal relationships, in

order to pursue a practice-oriented appraisal of downside long-term returns of conglomerate firms. The purpose is to ascertain their historical performance and applicable metrics, which may be of interest to both investment analysts and index companies. The ASEAN Exchange can benefit from this by promoting the potential performance of ASEAN firms to a global investor audience, furnishing them with more relevant returns measures. The outcomes of this research apply risk-adjusted variables to the long-term returns analysis catering to the margin-seeking, long-position investor seeking diversifiable returns in emerging markets of the ASEAN Exchange.

1.3 Problem Statement

The trend of diversifying to international markets has intensified in recent decades given the unprecendent access to financial information, international banking and globalization. However, many investors remain unaware of the ways to factor in the risks involved in equity returns. With regard to industry practice, clients often only receive performance measurements such as average gross returns, with scant input on risk factors. Although some investment firms employ risk-adjusted metrics, many of them do not readily update their performance analysis of the equity universe in the region they cover. The usage of risk-adjusted metrics for academic research in the region is also relatively infrequent, in comparison with other developed regions. It seldom applies itself to pure equities, with most research focusing on other investment vehicles such as Mututal Funds, Exchange Traded Funds (ETFs), and Real Estate Investment Trusts (REITs). However, the metrics

often encountered in the academic world and the investor world are not always equivalent. The investor faces a myriad of approaches in finding out how a stock has performed, given a multitude of reported metrics that can be generated. In summary, this research would want to address the the limited coverage and risk/return perfromance evaluation of emerging market conglomerates in the ASEAN Exchange, particularly for publicly-traded firms in Indonesia (ID), Philippines (PH) and Thailand (TH). How can the conglomerates within the ASEAN Exchange be best assessed, in comparison with previous measures? How can index companies that monitor ASEAN markets adjust their reporting to include risk factors? What type of risk factor is suitable for the long-term investors with emerging market equities who are mindful of downside volatility? To overcome these challenges, the validity of risk-adjusted may greatly depend on the choice of approach in risk-adjusted applications.

1.4 Research Framework, Key Questions & Objectives

Given the prevailing methods in Perfomance Evaluation, investors and analysts appear to have challenges in adopting and implementing appropriate risk-adjusted measures to ASEAN Exchange publicly-traded firms, specifically emerging economy conglomerates. Moreover, the existing metrics used by previous studies would benefit from a refreshed perspective of theoretical and empirical arguments. The overarching goal of this research is to recommend an adjuct measure, called SRAP (Semideviation Risk-Adjusted Performance), drawn and adapted from the observations of previous models, in order to

apply it to the broader ASEAN Exchange market. There are a trio of principal research questions (RQ), with accompanying subordinate questions embedded in this research to attain this goal, as illustrated in the Research Framework shown in Figure 1. RQ# 1 **v**alidates if the SEA conglomerates' benchmark-beating phenomenon exists for the sample conglomerate firms. RQ#2 calls for risk-adjusted performance metrics and downside factors, to surface differentials against international and domestic benchmarks. The framework proceeds with RQ#3 by ranking the returns performance, comparing unadjusted TSR vs. risk-adjusted measures. Finally, the research culminates with an examination of an appopriate emerging market downside metric, accounting for the empirical research outcomes in conjunction with statistical findings.

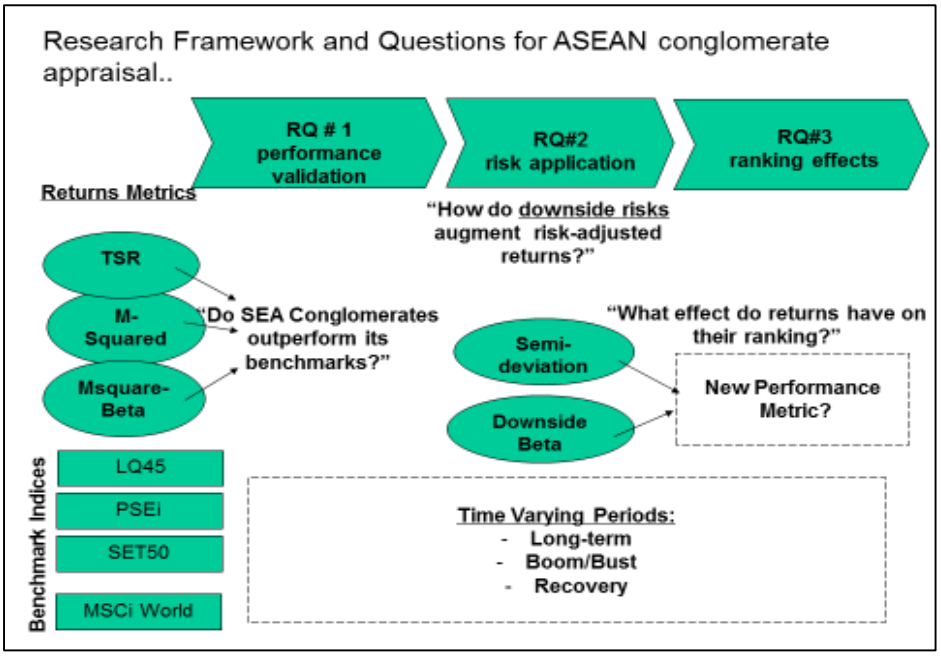


Figure 1: Research Framework for ASEAN Conglomerate Performance Appraisal

Thus, the research first aims to examine if the SEA conglomerates' benchmark-beating phenomenon exists for 24 publicly-traded SEA conglomerate firms (herein referred as *conglomerates*) using risk-adjusted performance metrics, spanning a 9-year period from January 2006 to January 2015. Secondly, as a representative of the SEA market, the conglomerates are compared against selected international and domestic, country-specific benchmark indices. Third, the research applies basic risk-adjusted measures, such as Sharpe and Treynor ratios, augmenting this with more recent metrics such as Risk-Adjusted Performance (herein referred as *M-squared*) and Market Risk-adjusted Performance (herein referred as *M-squared-for-Beta*). It will then proceed to ranking the returns performance, comparing unadjusted (herein referred as *Total Shareholder Returns* or TSR) vs. risk-adjusted measures. Fourth, modified risk-adjusted measures are applied using downside risk factors representing total risk (*semi-variation*) and market risk (*downside beta*) in time-varying circumstances. The analysis shall explore relationships between downside variables influencing the stock performance of the selected conglomerates cohort. The goals are less aligned to the singularly focused descriptive analysis nor tied to categorization and casual relationships. Rather, it aims to offer an alternative perspective for investors to consider risks, in relation to performance appraisal. Therefore, the goals translate themselves into subordinate research questions that will be tackled, as follows:

1) Have SEA conglomerates indeed outperformed their assigned benchmarks? What are the evaluation methods that can be incorporated in contemporary SEA conglomerate studies on stock performance? The subcomponents would be on:

Measurement – What are the alternative return measures and periods to utilize?

Attribution – Which benchmarks should be used, to ascertain the differential returns?

Appraisal – What are the basic risk-adjusted ratios when applying total and systemic risk factors?

2) What is the performance of ASEAN Exchange conglomerates when risk-adjusted metrics such as M-squared, in contrast to average returns yielded from Total Shareholder Return (TSR) measure? What is the impact on performance ranking amongst SEA conglomerates when risk-adjusted performance metrics are applied?

3) How can the M-squared model be further supplemented to reflect the interests of majority of investors with long-positions (ie. in expectation of positive price gains, as opposed to short-positions seeking downturns in prices)? Which downside risk factors are most appropriate to utilize for examining such stock returns?

4) Why would a SRAP metric be a favorable alternative to M-squared and M-Square-for-Beta? What is the impact of SRAP on performance ranking amongst SEA conglomerates?

1.5 Scope & Organization of the Study

This report proceeds with five more chapters, following this Introduction. **Chapter 2** supplies the literature review on the prevailing academic theories critical to investment performance evaluation. Here, the report recalls the definitions, rationale and relevance of fundamental empirical research on measurement, attribution and appraisal within the performance appraisal canon. It then describes the components and accompanying seminal work that reflect risk-adjusted measurements contained in the performance appraisal process. It includes factors and theories affecting the selection of appropriate benchmarks, alongside a tour of the changing definitions of risk and uncertainty in equity investing. It closes with a summary of studies on risk-adjusted returns conducted on various economic territories and financial assets. This chapter emphasizes the nascent heritage of performance appraisal for downside risk factors as well as SEA market coverage, in both the academic and practitioner spectrum. **Chapter 3** contains the research methodology and partitions the analysis approach based on each RQ. It provides details on data sourcing, screening, period coverage, performance evaluation analysis and statistical support, given the existing constraints outlined in Scope and Limitations. **Chapter 4** establishes the context of the conglomerates being studied, in relation to the ASEAN Exchange. This chapter provides a cascading rationale of the sample cohort by offering the characterstics and relevance of ASEAN markets, key country selection and conglomerates operating within its territories. It will also share results of a PH market sectoral comparison, to illustrate the researeh methodology in broad strokes, before diving into the regional markets and conglomerates. Finally, this chapter includes concise

profiles of each domestic benchmark index used from ID, PH and TH. This then leads to **Chapter 5**, which presents comprehensive empirical outcomes and investigations of conglomerate returns, validating each of the given research hypotheses. The analyses compares and contrasts metrics, such a TSR, risk-adjusted returns, and the recommended SRAP metric. The chapter also bolsters the argument on key factors influencing the application of downside risk variables, from multiple perspectives of risk and return. The new SRAP metric posits that the inclusion of downside risk can lead to improved monitoring in performance appraisals of future equity investments in emerging markets like those in the ASEAN Exchange. Enumerating the activities that embodying the research goals, this chapter will:

a) Compare risk-adjusted performance M-squared and M-squared-for-Beta against selected domestic and international equity benchmarks;
b) Analyze modified risk-adjusted measures applying downside risk factors in time-varying scenarios;
c) Emphasize ranking effects (Baigent, 2014) between unadjusted, risk-adjusted and modified adjusted returns to determine optimal measure;
d) Generate a revised risk-adjusted metric, SRAP, incorporating downside risk factors, and;
e) Explore relationships between defined variables as possible determining factors influencing the stock performance of conglomerates cohort

Chapter 6 supplies implications and recommendations regarding the implementation of the SRAP metric for analysts and institutions that serve the investor public. A conceptual performance appraisal framework is proposed in explaining how the SRAP is formulated. It also shows how it can work as an alternative to further improve investors' intuitive understanding of risk and return. In addition, topics to be embedded in Finance courses for undergraduate and graduate programs will be defined, illustrating the concept and practice of downside risks. This final chapter then concludes the study, providing future research implications and opportunities based on the outcomes and analysis.

1.6 Relevance & Limitations

This study can be considered one of the few risk-adjusted interepretations of SEA conglomerates that makes extensive use of a variety of risk measures: total, systemic, and downside risks. Thus, the objective of this study is to generate a new risk-adjusted metric, SRAP, using a fairly digestible set of time-varying performance data on IND, PH and TH conglomerates. The contribution of this study is a rigorous, but not unintelligible, evaluation of equity investments available in the ASEAN Exchange capital markets. It is aimed at three (3) defined audiences: academics, analysts and investors. For finance academics, it expands the existing research and instructional literature on performance appraisal, applying downside risks to specific ASEAN countries and sectors. In addition, it populates performance appraisal studies beyond funds, with sample from the universe of SEA equities. For investment analysts in the practioner field, it is envisioned that the research outcomes can contribute to institutions involved in Performance Evaluation

research such as the CFA Insitute, by extending the study of SEA-based firms. Further, it can augment the current metrics used by professional index companies to report fund performance in the ASEAN markets. A supplementary benificiary of this study are the analysts involved in performance evaluation of their clients' respective funds and asset holdings. Much of literature covers performance appraisal, but most analysts rarely incorporate downside risk measures in actual outcome reports to clients. This may be attributed to the challenges of educating both analyst and investor client towards the relevance of historical downside factors. In fact, the shortcoming may be from the education sector wherein it is rare to find textbooks or courses that have discussions on calculation or application to downside metrics, giving minimal help to the investor in understanding these measures in practice. This knowledge direcly relates to investment decisions as it helps both analyst and client investor further evaluate their performance to align to investment objectives. Lastly, investors will find the risk-adjusted metrics helpful in making well-informed, prudent decisions about investing in SEA conglomerates. It can be viewed as a guide for them, not merely as passive investors but as active owners who can nimbly adjust given the changing performance outcomes.

Some disclaimers worth raising before proceeding. First, this study has no aspirations to provide predictive theories nor add to the literature of determinants to stock returns. The content of this research remains in the domain of performance appraisal that examines ex-post outcomes only. The historical risk-adjusted performance generated by this research is not intended to predict future returns nor are the findings of this study intended

to be interpreted as cursory investment theory for portfolio construction. The research is cognizant of the constraints of relying on such theories, as Jensen (1967) revealingly comments that trading frameworks or theories do not necessarily yield superior profits when put into practice. In fact, Damodaran (2012) reviewed various determinant factors firmly embedded in popular investing philosophies, showing that strategies are not enduring, producing results for given circumstances only. It shall not cover topics that relate to future decisions using structured frameworks related to portfolio theory such as asset allocation, mean-variance, three-factor theory or cost of equity estimates. Neither will it be an analysis of the firm, and therefore shall exclude coverage of previous literature, data and analysis on conglomerate capital strucure, strategy, theory of the firm, or diversification theory. Second, risk-adjusted performance metrics are typically applied to mutual funds, ETFs and other similar portfolio of assets. In this study, it is applied to conglomerate stocks with the assumption of Smith & Schreiner (1965) that they are reasonably diversified, "proxy" portfolio of unrelated pure-play, single-sector firms. They may also represent a collection of vertically-integrated businesses that, may be affected by factor risks, much like mutual funds that address a particular sector. Third, the firms and sectors are evaluated within the sample being analyzed only and not meant to be a universal ranking measure. Other measures have been studied exhaustively, in a variety of contexts for international funds by Cumby and Glen (1990), Droms & Walker (1994), and Redman et al. (2000). For instance, Arugaslan, Edwards & Samant (2005, 2014) used M-squared for 5 & 10 year returns of 50 large US-based international mutual funds and S&P 500 sector Exchange Traded Funds (ETFs). Likewise, Estrada (2001)

made a compelling argument in favor of downside risks, using a set of 28 emerging markets. In contrast, the outcomes of this study are limited to conglomerates firms within the equity universe of emerging market members of ASEAN Exchange (IND, PH and TH). These country economies may not yet fully represent the entire breadth of SEA, as developed nations such as Singapore and Malaysia are yet to be included in the sample.

Chapter 2

Risk-Adjusted Performance Theoretical and Empirical Review

2.1 Introduction

This review will provide a concise orientation on key underlying concepts of performance appraisal, with a view of how risk-adjusted models are applied in various settings. It aims to emphasize the necessity of pursuing ASEAN-related equity performance analysis as a key ingredient of emerging market studies. Despite the mainstream theories and numerous studies that question classical finance theory, country-specific research (especially in ASEAN emerging markets) still has much room to expand. In addition, it is hypothesized that the perception of risk is frequently mismatched with the how risk is defined in academic theory. Using risk-adjusted returns performance appraisal, current literature addresses the intuitive, almost obvious fact that investors are more likely to be averse to downside losses rather than upside gains. This review of theoretical and empirical research of risk-adjusted performance shall follow a topical sequence, rather than a rigidly chronological one. Section 2.2 illustrates concepts of investment performance appraisal through a tour of its component/constructs and key variables. It will proceed with Section 2.3, rationalizing the variable selections (such as benchmarks, target rates and risk factors) to be utilized in this research, based on prior empirical studies. The review progresses by placing downside approaches in focus, to examine how financial academic and practioners have developed a more investor-relevant quantification of loss uncertainty. It will present arguments for and against the

predicatability and consistency of relationships between risk and returns through markets. Section 2.5 through 2.7 shall look at closely related studies on conducted in developed economies, emerging markets as well as sector-specific environments. It will conclude with a summary of key drivers that have guided, altered, validated and modified the approach and analysis of this research. Note that all mathematical formulas mentioned are centralized in the Research and Methodology of Chapter 4, for reference.

2.2 Performance Evaluation: Theory and Components

Investing is focused on a singular objective of generating value in monetary terms, given the risk constraints one operates under. The practice of the global investor involves decisions that revolve around quantifiable outcomes, allowing for review and analysis. Performance Evaluation is defined by Bailey, Richards and Tierney (2007) as the process of measuring and assessing the outcomes of investment decisions. According to Lawton and Jankowski (2009), performance evaluation is typically the domain of investment managers (in charge of investor assets) and fund owners (those with ownership claims to large investible assets). However, the tools of evaluation are within reach of individual investors, who are interested in understanding how their assets are performing. Given this, what are the main goals of performance evaluation for the individual investor, adapted from the incentives of investment managers and fund owners? Primarily, investors want to have full transparency regarding the returns generated by the assets invested, in orer to make better decisions about maintaining, liquidating or accumulating

their assets. Thus, the evaluation serves as a feedback and control loop for investor about their portfolio structure. Next, it gives a sense of guidance and discipline, thus enhancing outcomes based on targets and policies enforced. Finally, it tracks the sources of risks in investing, giving a better view of managing uncertainy more effectively in the future. Bailey et al. (2007) outline the spectrum of performance evaluation across three components of Measurement, Attribution and Appraisal. In the field of *Performance Measurement*, the question is: "What was the assets' performance?" Capturing the accurate returns with respect to the asset is the crucial first step in the entire evaluation process. It simply answers with a postive, negative or null numerical percentage figure that represents an outcome change of the assets' value from period to period. This treatment is evidenced, for instance, by Madhavan and Kiran's (2014) analyis of the top 10 publicly-listed Indian conglomerates, yielding average year-on-year returns of 38% and a 10-year compounded annual growth rate (CAGR) of 24%. The TSR key components here are absolute capital gains return, dividends and period. The fundamental concept of returns is discussed in the latter section 2.3.1 while the basic returns formula, incorporating each of these components, is covered in Chapter 3 on Methodology. Once the return value is revealed, the succeeding question would naturally lead to a tracking the source of such returns. *Performance Attribution* asks:"Why did the asset generate such a return?" The fundamental approach, introduced by Fama (1972), is to compare an assets' performance with a designated target return (a *benchmark* or *index*, terms used interchangeably for this research) and identify the sources of the differential returns that represent such out/underperformance. In effect, it quantifies excess returns, the difference

between mean return and the benchmark rate. As an example, Vestring, Felenbok & Hardcastle (2014) studied 49 various SEA conglomerate firms, generating comparisons using TSR with average differential returns of 14% higher against the Morgan Stanley Composite (MSCI) SEA Index, for a 10 year period. In this way, attribution supplies an informed review of a past period, by highlighting the diffential returns and their effect on return outcomes. The final component, *Performance Appraisal*, deals with the over or underperformance of the asset and its relation with risk factors, with the queries: "How much risk did the investor take?" and "How did these risk affect the assets' performance?" While the two earlier components provide the core information (returns, benchmarks, period, sources), ultimately the investor will be concerned about the amount of risk taken in order to achieve the outcomes. It is at this final phase that the investor can gauge the comprehensive elements that account for the investment performance. This research trains its sights on this particular step of Performance Appraisal, to apply to the conglomerate sample in order to ascertain its risk-to-reward outcomes. The next section walks through the concept of Performance Appraisal, defines its risk-adjusted metrics and discusses its basic elements, including a primer on benchmarks to support the concept of excess returns.

2.3 Performance Appraisal

Performance Appraisal finds its origins in statistical techniques with the purpose of analyzing mutual funds returns, using risk and reward components. Risk and return are two components of performance appraisal and it makes intuitive sense to assess returns incorporating the inherent risks. For returns, both practitioners and academics are keenly aware of excess returns derived from the attribution phase of performance evaluation. Recall, Fama (1972) first established quantifying excess returns by comparing an assets' returns with the returns of a designated benchmark, to serve as the target rate that reveals differential returns. Before moving on to risks, a brief understanding of the role of benchmarks is in order. A benchmark is commonly perceived as a point of reference, to measure or compare quality and value. In investing, a benchmark is utilized for that same purpose, identified by Bailey at al (2007) as a "collection of securities, risk factors, weights that represent the persistent and prominent investement characteristics of an asset category." Since this research defines the asset category being studied as ASEAN conglomerates, the selected benchmark should ideally be an equity index representating similar firms, size, trading volumes, and geographic operations in ASEAN. In practice, a benchmark index is designated based on an agreement between an investment manager and client investor, assuring that it fairly represents a proxy of the invested assets. Selecting and applying the appropriate index has been subject to vigorous debate. Since there may be no "perfect" benchmark, Rodman (2004) concludes that trade-offs are necessary in the index selection process. Gauthron (2014) believes in using "blended" benchmark, as he posits that single-index benchmarks are inadequate in capturing an

investments full qualites. However, this research agrees with the approach of Redman (2000), using a contrasting analysis between domestic and international indices to surface excess returns, thus providing an intuitive comparison rather than a blended index, that may immediately adhere to acceptable benchmark properties. According to Maginn et al. (2007), a benchmark should possess seven valid properties, that if lacking, would compromise the strenght of its utility as an evaluation tool. This research is in compliance with these properties, as the indices selected are:

- Specified in advance: The index this research uses is specified prior to the attribution and appraisal phases, and is duly disclosed in the methodology and results chapters. For the country samples, this research uses domestic indices – PSEi, SET50 and LQ45 -- to compare PH, TH and ID conglomerates, respectively. A global benchmark, the MSCI World Index, is used to provide an international perspective as to the return comparisons of the SEA conglomerate firms, from the view of a developed market investor.
- Appropriate: The benchmark is consistent with the domain coverage of the investable asset, here being publicly-listed SEA conglomerates of a given trade volume, size and firm characteristic. For example, the PSEi is composed of 30 constituents of the largest and most active common stocks listed in PH.
- Measurable: The return of the index is calculable on a frequent basis, thus this research does not rely on a customized portfolio index that may fail to update or remain relevant for given periods. Rather, it uses publicly-available benchmarks with daily tracking such as MSCI World Index and domestic equity indices.

- Unambiguous: The benchmark has the securities' identities and weights disclosed, such as the 50 TH firms listed on the SET50 or the 45 ID companies on the LQ4. The information, composition methodology and updated constituents of each index is available to the general public.
- Investable: The investor has an option to simply invest directly in the benchmark index, through mutual funds and other channels. For instance, the PSEi can be invested through retail funds such as PhilEquity PSE Index Fund, while Blackrock iShares sells an MSCI World Index ETF.
- Reflective of current investment opinions: Both the investor and the fund manager has current knowledge of the securities in the index, given the information from the previous five benchmark properties.
- Accountable: This property dictates that the user is aware and accepts accountability for the performance of the benchmark. For purposes of this research, this will apply upon usage of the index with an active investor client, who may or may not agree with the appropriateness of the selection. However, other professional investment firms utilize similar indices, serving a diverse set of investor needs and expectations.

Most practioner investment literature compares the return of funds against relevant benchmarks, but with vastly different risk comparatives. Comparing two similar assets on the basis of their *risk-adjusted* return, however, is an appropriate method. Risk-adjusted methods attempt to mitigate the intuitive fixation on average returns of an

invested asset, by incorporating the volatility of its returns. This method is grounded on the principle of investment theory and practice: investors are inherently risk-averse, thus demanding higher expected returns to compensate for increased risk. Capital Asset Pricing Model (CAPM), as introduced by Treynor (1961, 1962) and Sharpe (1964), built on the earlier work of Markowitz (1959) on diversification and modern portfolio theory. They suggest that risk depends on the context and circumstances surrounding the asset in question. CAPM, If the asset is considered in isolation, relative only to its historical performance returns behavior, then its *Total Risk* is most relevant as all risks have been priced into the value of the asset. If the asset is part of a diversified portfolio, then the *Systematic Risk* (or also called non-diversifiable risk) is used, as it compares the sensitivity of an asset's return to changes in the returns of the broader market. CAPM uses standard deviation of the asset as a measure of total risk and beta as a measure of systematic risk. For both risks, upside potential and downside loss are treated in the same fashion for asymmetrical return distributions. There are a few widely known measures that incorporate either of these risks into account: Ratios (Treynor, Sharpe and Jensen formulas) and Return equivalents (M-squared and M-squared for Beta). This research employs both measure approaches in its data analysis, with emphasis on percentage return equivalents. A complete formula-based description, including notation, can be found on the succeeding chapter. However, for easy reference, each formula per measure shall be mentioned in this literature review.

Treyor (1965) devised a "reward-to-volatility" ratio that calculated the performance of the fund by adjusting the excess returns (here, the difference between mean return and the risk-free rate) by a degree of market risk. This market (systematic) risk could be estimated through Beta, by regressing the portfolio returns on the benchmark index returns. A ubiquitous measure often seen in fund reports is a risk-adjusted return called the Sharpe Ratio, introduced by Sharpe (1966, 1994), computing the mean excess return and adjusting for standard deviation, representing the funds' total risk. The ratio, denoted as Si is derived by dividing the annual mean excess return ($\mu i - Rf$) by the standard deviation of returns (σi):

$$Si = \frac{\mu i - Rf}{\sigma i}$$

Jensen (1968) generated a method to determine if the excess returns' deviation (difference between the average return of the fund and that of the benchmark) was statistically significant. Measurement was further advanced by Modigliani & Modigliani (1997), with a risk-adjusted performance called M-squared. The concept of M-squared is to adjust the returns of the fund to match the volatility of a stockmarket index, then measure the returns on the risk-matched fund. The principal aim was to provide a more intuitively appealing risk measure for the average investor. M-squared (M^2) presents the absolute performance measure as a percentage, better understood by the investing public, rather than an abstact ratio. The formula utilizes the Sharpe Ratio and multiplies this by the standard deviation of a benchmark index (σm), and add the risk-free rate (Rf), as follows:

$$M^2 = \frac{\sigma m}{\sigma i}(\mu i - Rf) + Rf$$

A latter argument of Baigent (2014), concludes that M-squared ranking fund performance may remain unchanged even if a more efficient benchmark index is applied, preferring the use of Jensen's Alpha to provide universal ranking. Scholz & Wilkens (2005) follows the underlying logic of M-squared, but incorporates the funds' market (systematic) risk and return differentials. The idea is to evaluate funds on the basis of market risk that is identical with the benchmark. Here, the M-squared-for-Beta uses the Beta Coefficient (β) of the market index as a natural candidate, rather than total risk volatility of standard deviation, as illustrated in the formula:

$$M2\beta = \mu i + di\ (\mu i - Rf) \qquad \text{where: } di = \frac{1}{\beta i} - 1$$

The fundamental nature of these metrics has generated research interest, much in the way of revealing its weaknesses. Some observers believe that performance appraisal metrics may often be misapplied and frequently subject to manipulation. This was demonstrated by studies of Leland (1999) on Sharpe ratios applied to non-symmetrical returns. Lhabitant (2000) shows how derivatives using options can potentially boost metric outcomes. Thus, it seems that such performance metrics can only be estimated, with limits to accurate calculations existing only in theoretical scenarios. To counter such misapplications in the hedge fund practice, Ingersoll, Spiegel, Goetzmann and Welch (2007) show the substantial impact to typical risk-adjusted returns metrics. They continue

by presenting conditions by which manipulation-proof measures can exist. Nevertheless, this research believes that simple analytical tools, when used in basic long-position investing circumstances, can yield estimatable insights on past returns, with merit in improving an investors' management of assets.

2.4 Downside Risk: Definitions, Theory and Emprical Evidence

As mentioned, investors that are keen on evaluating equity perfomance in an emerging market such as SEA must not only measure its average and differential returns, but also apply appropriate risk factors. However, most investors associate risks with negative returns, generally those that are below their expectations. It is atypical for them to attribute risk with outstanding positive returns, above their expectations. Investors have been observed to be more affected by losses, based on updated studies on loss aversion behavioral theories of Novemsky and Kahneman (2005). It is for this reason, the perception of risk is frequently mismatched with the how risk is defined in academic theory. However, variance unrealistically defines positive gains as being equivalent to negative losses, rather than assuming investors' sensitivity to the downside. Morevoer, academic studies in finance have long suggested that the variance of returns should be placed in question, requiring reconsideration as a measure of risk given the investors' loss aversion.

Downside risk variables effectively separate return fluctuations into distinct properties: downside risk and upside potential. As a modified perspective, downside risk variables qualify dispersion only on the adverse side: underperforming a benchmark or a pre-specified target return. This makes it more appealing as a measure of risk as it explicitly represents the loss of capital. Typically, the target return thresholds are the risk-free rate, the mean return of the asset or the mean return of the benchmark index. Academics have long acknowledge the need for a "conditional return" approach, with two downside risk variables being noteworthy alternatives: Semi-deviation (in place of standard deviation, for total risk) and Downside Beat (instead of Beta, for systematic risk). *Semi-deviation* is defined by Investopedia (2015) as "a measure of dispersion for the values of a data set falling below the observed mean or target value. Semideviation is the square root of semivariance, which is found by averaging the deviations of observed values that have a result that is less than the mean". Thus, a semi-deviation would capture volatility only below a prescribed benchmark, either the mean return of an asset, risk-free rate, or 0. This research analysis applies the semideviation formula of Bawa and Lindenberg (1977), using a risk-free rate of each respective country as the fixed target return. It measures the volatility of an assets peformance (here, the average returns as μi) that is below chosen benchmark return. In this case, the benchmark return is the risk-free rate of the respective country. The formula is defined as:

$$\sum_{R_f} = \sqrt{(\frac{1}{T}) \cdot \sum_{t=1}^{T} \{Min\ (\mu i - R_f, 0\}^2}$$

As a pioneer in finance theory, even Markowitz (1959) declared that a semideviation may be preferrable for efficient porfolios than standard deviation. However, this measure was

never pursued further given the difficulty to obtain segregated fluctuations during that early period of finance research in the 1950's. Earlier literature of Hogan and Warren (1974) showed suggests that the fundamental CAPM structure can be retained when using semi-deviation (in place of standard deviation) for portfolio risk. In addition, Bawa and Lindenberg (1977) developed their Lower Partial Moments (LPM) model to merge with CAPM in order to capture the assymetry of returns. Here, they employ a risk-free rate as their arbitrary target return, similar to this research' formula. Financial literature offers more current empirical research using semi-deviation, such as Regan's (1993) analysis of pension fund managers, Kurgin's (2002) value investing application in emerging markets and Gordon's (2003) explanation of new risks for alternative investments. Beach (2006) uses downside risk principles to argue in favor of incorpating emerging market equities into an investors diversified portfolio. In follow-up study, Beach (2011) covers an expansive 44 country-level index study, decomposing variance and semivariance of asset returns, to explain the proportions of total risk, concluding that returns in the downside CAPM are higher (56%) than in the traditional CAPM (42%). Earlier, the Sharpe ratio was introduced implying the use of standard deviation as an assets' risk measure. However, this ratio suffers from the same criticism discussed regarding the weaknesses of standard deviation, in representing total risk. For downside, another ratio closely affiliated with Sharpe is the Sortino ratio, using semi-deviation in place of standard deviation as the denominator risk, based on the extensive work of Sortino and Satchell (2001). The Sortino ratio is at times deemed by practioner literature as providing vastly different ranking effects versus that of Sharpe ratios, as mentioned by Clash (1999) in a

Forbes article documenting the use by many fund managers of semideviation. On the other hand, Dugan (2005) urges caution when using both Sharpe and Sortino ratios, as they are subject to interpretative manipulation by hedge fund managers by using derivatives to pump up ratio outcomes with little actual performance improvement. As such, the use of Sortino is not included as part of this research on ASEAN conglomerates, but may be revisited as a future study on ratio comparatives for an extended sample size of firms within ASEAN.

Downside Beta attempts to quantify an alternative Systematic Risk comparing the sensitivity of an asset's conditional return to changes in the conditional returns of the broader market. Downside beta is defined by Kaplanski (2004) as uncertainy of potential for loss, which is a scaled amount an asset tends to move compared to a benchmark market index, calculated only on periods when the return against an arbitrary target rate is negative. It is identical to the original beta formula but substitutes average returns with conditional returns (basis a target rate), then estimates the slope of a regression without a constant between these returns. There are three dominant measures proposed in finance academic literature, each with specific target rate applications. Hogan and Warrren (1974) generated the intial version of downside beta by considering a riskless asset as an opportunity cost, thus defining the target rate as the risk-free rate. This is the most fundamental interpretation that has found support as explanatory of stock market returns, argued by time-varying studies by Tsai, Chen and Yang (2014), compared against other

downside beta formulas. It is also supported by the work of Galagedera (2006) on CAPM relationship, more effectively than succeeding downside beta versions. For these reasons, this research applies the Hogan/Warren downside beta version, by calculating the covariance of the excess of stock returns (Rt) against risk-free rate (R_f) and market returns (Rm) below risk-free rates, then dividing by the variance of only below risk-free arket returns:

$$\beta_{R_f}^{D} = \frac{Cov \_ \{ (\mathrm{Rt} - R_f) \cdot Min\ (\mathrm{Rm} - R_f, 0) \}}{Var \quad \{ Min\ (\mathrm{Rm} - R_f, 0) \}^{2}}$$

The next Downside Beta formula is from Harlow and Rao (1989), characterizing risk as below target rates of average equity market returns, instead of the risk-free rate as with Hogan/Warren. The Harlow/Rao version effectively calculates the covariance of returns against market mean index returns (μm) and mean returns of the asset (μi):

$$\beta_{Um}^{D} = \frac{Cov \quad \{ (Rt \ - \mu i,) \cdot Min\ (Rm - \mu m, 0) \}}{Var \quad \{ Min\ (\mathrm{Rm} - \mu m, 0) \}^{2}}$$

The third is from Estrada (2002) who defines a new measure of downside risk which only acknowledges the returns of the asset and its respective market index below their mean returns. Effectively, this is shown with a slight difference in the numerator using $Min\ (Rt - \mu i, 0)$, $\min\{\cdot,\cdot\}$ is minimum operator.

$$\beta_{Es}^{D} = \frac{Cov \quad \{ Min\ (Rt - \mu i, 0) \cdot Min\ (Rm \ - \mu m, 0) \}}{Var \quad \{ Min\ (Rm \ - \mu m, 0) \}^{2}}$$

However, he proceeds by suggesting that an identical target rate, such as a risk-free rate, would be more sensible to use rather than separate mean returns for asset and market. Previous studies have investigated the behavior and comparisons of Downside Beta with CAPM Beta. Based on the threshold of the risk-free rate (Rf), Price, Price and Nantell (1982) compared a sample of US securities to reveal pricing relationships with both mean-variance/semivariance. Price et al. (1982) shows that the downside beta is equal to the CAPM beta for average systematic risk assets. Further, the study also revealed that, for securities with high systematic risk, the downside beta comes out less than CAPM beta. In contrast, Nantell and Price (1979) reveal downside beta equal to the CAPM beta, when applying a bivariate distribution. Homaifar and Graddy (1990) empirical results used a target rate below the risk-free rate. Their outcomes corroborate Price et al. (1982) observation of low risk investible assets, wherein CAPM beta should be exceed downside beta. Selected studies investigate downside frameworks to check the performance of mean-variance CAPM and pricing models. Pedersen and Hwang (2003), based on UK equity sample data, conclude that a downside framework offers better explanatory power for security returns than CAPM beta. Nevertheless, they go on to claim that the proportion of equities benefiting from using the downside beta does not have the size or scale to generalize asset pricing models significantly. More recent studies bolster the argument favoring the use of downside systematic risks. Estrada (2002) uses empirical analysis from emerging markets to contrast with previous studies from developed markets of US and UK, revealing that downside beta performs better as a risk factor compared to CAPM beta. In addition, Tsai, Chen & Yang's (2013) findings on Harlow/Rao and

Hogan/Warren betas show that these specific downside betas bested the CAPM beta in explaining expected stock market returns.A final note on downside metrics: several textbook and article compilation sources mention downside risk variables, such as books by Maginn, Tuttle, McLeavey and Pinto (2007), Lawton and Jankowski (2009), and Reilly and Brown (2012). However, these do not discuss any calculation or application to cases, giving minimal help to the investor in understanding these measures in practice. It is for this reason that one of the subgoals of this research conclusions is to craft a basic curriculum outline on downside risk, that may be embedded in a graduate-level Finance elective course.

2.5 Studies in Risk-adjusted Returns

Much of practioner literature contain only mean TSRs for funds or individual equity assets. In contrast with academic research, the typical risk measurements reported are standard deviation, Sharpe and Jensen Ratios, counting as legitimate risk-adjusted measures on their own. Unfortunately, newer risk measures such as M-squared and M-squared-for-Beta are not as plentiful, giving investors scant guidance on selection criteria for a myriad of funds available globally. These Chapter sections on geographical market studies will cull from the considerable volume of performance appraisal studies to extract and highlight findings that are closely related to this papers' research goals on risk-adjusted returns. The emphasis shall be to spotlight parallels, in previous work showcasing : 1) fund performance behavior given a combination of findings of

persistence of returns, portfolio strategy comparisons, and market index benchmarking, and 2) territorial application (ie. specific geographic markets), within the sphere of newer risk-adjusted metrics, such as M-squared and M-squared-for-Beta.

2.5.1 Risk-Adjusted Returns in Developed Markets

International markets have been studied in a variety of contexts, using risk-adjusted measures. Most have concentrated efforts on funds such as mutual funds that invest in a diverse array of securities such as bonds, equities, commondities or indices, traded within mostly developed financial markets. Beginning with Friend, Brown, Herman and Vickers (1969), their study offered the intial debut of mutual fund performance analysis. Since then, empirical research has moved on to analyze fund behavior, exposing the absence (or presence) of persistence of returns, portfolio strategy comparisons, and market index benchmarking. For persistence of returns, the evidence leaves a definitive conclusion unsettled. Lehmann and Modest (1987) show the sensitivity to the specified benchmark variables affecting mutual fund performance based on multifactor models, demonstrating modest persistence of 130 mutual funds from 1975-1984. Using an eight-firm diversified portfolio as benchmark proxy, Grinblatt and Titman (1989b, 1992) tested 157 mutual funds from 1975-1984, indicated significantly positive risk-adjusted gross returns of selected funds. Ippolito (1989) concluded that mutual fund industry risk-adjusted returns, when removing fees and expenses, are comparable with index fund returns. Cumby and Glen (1990) measured international mutual funds, by employing the methodology

developed by Grinblatt and Titman (1989) for 15 U.S.-based internationally diversified funds, from 1982-1988. They compared the funds against MSCI U.S. Index, and MSCI World Index. Their evidence concluded the international funds outperformed the U.S. index to a certain degree but failed to overcome the returns of the World Index. Other noteworthy studies of Hendricks, Patel and Zeckhauser (1993) and Goetzmann and Ibbotson (1994) point towards documented persistence for different time periods and mutual fund sample sizes. Finally, Brown and Goetzmann (1995) supply evidence of relative risk-adjusted performance persistence exploring U.S. equity mutual fund data. The persistence was atttributed to funds that lagged, rather than outperformed, the S&P 500 index, within specific time-varying periods only. In contrast, Dunn and Theisen (1983) failed to find evidence of persistence, through measuring the consistency of investment manager returns of 201 insitutional porfolios for the period 1973-1982. In the arena of fixed income, Kritzman (1983) attempted to answer the same persistence phenomena and reached the same conclusion for 32 bond traders, given a 10-year period. Elton, Gruber and Rentzler (1990) exended this to examining 51 publicly traded commodity funds and found no persistence. Eun, Kolodny and Resnick (1991) used the Share Ratio to demonstrate the relative *underperformance* of international funds against a world index. They used three different indices to measure the comparative returns of the 19 U.S.-based international funds: S&P500 Index, MSCI World Index (identical to what this research employs as a global benchmark) and a self-constructed index of U.S. multinational companies. The U.S. market was trounced by most of the international funds, for 1977-1986, but was unable to beat the global index within the same period. To

bolster these conclusions further, Droms and Walker (1996) state two clear findings, using Sharpe, Treynor and Jensen ratios, for more than 30 funds over a six-year period from 1985-1990. First, international funds underperform U.S. –based (S&P500 index) and a selected global benchmark, MSCI Europe, Australia and Far East Index. Second, variables and factors that are speculated to affect performance are unrelated to fund returns. These were variables that commonly characterize funds such as portfolio turnover, asset size, fund size, and expense ratios. Bollen and Busse (2005) studied 230 mutual funds during 1985-1995 and conclude that outperformance is a temporary phenomenon, observable only through periodic evaluations several times a year. The division between persistent and not-persistent camps profoundly influenced the progress of this research, moving it to forego tackling the predictive potential of conglomerate returns with various financial and risk variables. In addition, the supplementary statistical analysis of this research leans toward the not-persistent behavior of ASEAN conglomerates, as presented in Chapter 5's results.

Note that the previous studies mentioned utilized single period time-frames (whether short or long term durations), so it is worthwhile to contrast this with time-varying versions. Redman, Gullett and Manakyan (2011) used time-varying periods (1985-1994, 1985-1989, and 1990-1994) to reveal a more nuanced, mixed set of international fund porfolio outcomes. For 1985-1994, the international portfolios beat the U. S. market, represented by the Vanguard Index 500 mutual fund using Sharpe and Treynor ratios. For 1985-1989, the same funds outperformed both the U. S. market and the domestic fund

portfolio. However, returns were lackluster during 1990-1994, declining below the designated index.

Mutual funds were not the only samples studied for risk-adjusted behavior. Huang and Guedj indicated (2009) the emergence of ETFs that have captivated the investor public, as a potential subsitute for the ubiquitous mutual fund. Arugaslan, Edwards & Samant (2005, 2014) were one of the first to use M-squared for 5 & 10 year returns of 50 large US-based international mutual funds and S&P 500 sector ETFs. Their study showed the identical fund performance ranking when using M-squared and Sharpe Ratios, given the total risk perspective. Their study also demonstrated the use of financial leverage and how it affects performance ranking. Conflicting ranking intepretations also exist between risk-adjusted metrics. Using M-squared and Jensens Alpha, Baigent's (2014) mutual fund ranking results illustrate the ranking effects through a 10-year (1986-1996) period return analysis of 6 U.S. based equity funds. He finds that rankings may not significantly alter its sequence even if a more efficient benchmark is discovered, due to M-squared absence of a benchmark return.

2.5.2 Risk-Adjusted Returns in Emerging Markets

Estrada (2001) examines 28 emerging market indices and confirms the results reported in several other studies, arguing the high volatility of emerging markets and its low correlation to the global market, using the MSCI All-Country World (MSCI ACWI) Index. A proponent of downside risk applications, much of the literature related to

Estrada's work was covered in the earlier section of this literature review. What is relevant is his similar views to earlier conclusive evidence that systematic risk measured by beta is not significantly related to stock returns, in emerging markets. The pioneering findings on this same conclusion were advanced by Erb, Harvey, and Viskanta (1996) and Bekaert, Erb, Harvey, and Viskanta (1997). Systematic risk (here represented by Beta) on its own never comes out significant when considered together with risk variables such as is total risk, size (measured by average market capitalization of sample), and downside risk. On the other hand, total risk (measured by standard deviation) and downside risk (measured by the semideviation) are deemed significant, when jointly considered with beta. In fact, total risk explains 30% of the variability of the return of the emerging market sample in his study. Beta's lack of explanatory power of systematic risk can be explained through findings on market intergation, variable inclusion and period application. For market integration, Bekaert (1995) argues that several barriers continue to persist in preventing emerging markets from being fully integrated. Others, such as Stulz (1999), believe that emerging markets are not fully integrated to the world market. He makes the case that beta may not be the appropriate measure of risk, given the impact of globalization on the cost of capital. This makes downside risk more consistent with emerging markets, given its characteristic of being partially-integrated. A decreasing the cost of capital by 0.05-0.75%, as observed by Bekaert and Harvey (2000), show as pertinent effects of emerging markets moving towards liberalization. Another reason would be due to a few missing relevant variables that may be determinants of stock returns. In addition to risk variables that Estrada (2006) employs, Asness, Liew, and

Stevens (1997) use book-to-market ratios and momentum that prove significantly related to stock returns in developed markets. This evidence is also reported with individual companies in emerging markets based on Rouwenhorst (1998). A final reason would be the lack of time-varying applications: average returns and systematic risk may be uncorrelated when applying them to long-term averages, but values may vary widely over different time periods. This can be gleaned from Redman, Gullett and Manakyan's (2000) more granular view of returns through various time periods. Using a value investing framework, Kurgin (2002) established the uses of semi-deviation and other risk-adjusted metrics in emerging markets, while Beach (2006) persuades with evidence of the viability of emerging market equities as a critical component in a diversified investment portfolio. As in global studies, a time-varying approach is relevant, basis Alles and Murray's (2013) findings of individual equities from emerging Asian markets, each capturing varying premiums depending on which downside variable is utilized. They separately examine conditional returns during peaks and valleys of selected periods, in order to identify risk and return relationships in relevant time-varying scenarios. Nevetheless. there are still limits to generalized returns performance, as Lemeshko and Rejnuš (2015) concludes of emerging markets. Applying Sharpe/Treynor/Jensen ratios and M-squared metrics, they observed that "local equity funds do not generate abnormal returns, but they still exist; …structured predominantly upon country evidence, thus limiting the possibility to derive some generalized conclusions." Their output evaluates absolute and relative risk-adjusted performance of equity mutual funds from 2000 to 2015, sampling a set of diverse economies from the Central and Eastern Europe, South Eastern Asia, Middle East and

North Africa, and BRIC (Brazil, Russia, India, China).

More recently, Yigit and Ozgur (2016) go through an exhaustive index return investigation of twenty-four emerging markets, alongside and twenty-eight developed economies. They reveal that investors are compensated after adjusting for total or downside risk, with almost all of the countries in the top quartile ranking originating from emerging market indices. This seems to hold much promise in favor of this research attempt at validating alternative risk variables (like downside beta) for firms in the emerging market space of ASEAN. The findings also point to a significant positive relationship between various reward-to-risk metrics and expected market returns, fortifiying the argument in favor of a possible predictive power of such a relationship.

2.5.3 Risk-Adjusted Returns in ASEAN Markets

Numerous studies related to ASEAN equities have captured the price dynamics, linkages and interdependencies of ASEAN equity markets. In parallel, a growing set of contemporaray research examined the extent of linkages between ASEAN equity prices and world markets. However, for purposed of this research, there is a scarcity of risk-adjusted performance studies for the ASEAN region, respective country coverage (ID, PH and TH) and conglomerate firms in the region. As such, only limited studies reflect similar risk-adjusted performance approaches and goals to the research at hand. In

addition, there also exists constraints on availability of English-language papers, related to the topic. Nevertheless, a few key studies emerged that revealed a rich set of 'catalyst' studies that inspired the writing of this research.

In a regional sector equity study, Ooi and Liow's (2004) research on for real estate stocks closely resembles this ASEAN conglomerate research for two reasons. First, it analyzes risk-adjusted returns for sector-specific firms operating in Asian markets, albeit with a mix of developed and emerging economies, to ascertain over or underpeformance. However, it finds no evidence of index-beating returns for listed real estate stocks traded in its country coverage of TH, ID, Malaysia, Hong Kong, Singapore, South Korea, and Taiwan. The empirical evidence of their work shows inconsistent risk-adjusted returns across the sample markets and over different periods. Second, their analysis tracks the relationship between risk-adjusted returns and financial variables as well as economic indicators, similar to the supplementary statistical analysis for this research on ASEAN Conglomerates. In their conclusion, they find a significant influence of key financial variables per firm (such as market-to-book value, dividend yield and market diversification) on the risk-adjusted returns of real estate stocks have in Asia. Other stated variables such as leverage (debt levels) and firm size, however, do not have any pronounced impact on their sample size risk-adjusted returns.

In contrast with Asian real estate stocks, recent performance apprasial studies argue in favor of investing in SEA conglomerates. The proceeding two studies are the inspiration

for the validation objectives of this research, by acting as catalysts to examine further the conglomerates' performance from a risk-adjusted view. Vijayaraghavan (2014) examines their lower volatility based on a sampling of one conglomerate firm per SEA country, measuring returns and correlations for 1, 3, 5, and 10 year periods. On one hand, this cursory sampling provides a quick snapshot of the regions major conglomerate players, representing a mixed bag of negative and positive returns against the S&P500 index benchmark. On the other hand, it lacks the rigor of a more comprehensive cohort to validate the performance of the conglomerates in the region. It also employ standard deviation as the singular risk variable to consider for its representative sample firms. Using a more expansive sample set, Vestring, Felenbok & Hardcastle (2014) studied 49 various SEA conglomerate firms, generating comparisons using TSR with average premiums of 14% over the MSCI SEA Index, for a 10 year period. Again, measuring the superiority of SEA conglomerates was not tackled beyond average returns against a benchmark, leaving an absence of risk measures to gauge their performances. From a purely alternative view point, Rothery (2014) recommends the investor rethink how to view conglomerates, as a comparable asset substitute for a mutual fund. He proceeds by proposing to view conglomerates as an easy way to boost diversification because the firm typically owns a collection of businesses, which makes them a proxy mutual fund. Further benefits of investing in conglomerates would be removing mutual fund annual fees entirely by buying stocks directly.

As mentioned earlier, there dearth of studies related to risk-adjusted performance is even more pronounced for the country coverage (ID, PH and TH), but a few key studies emerged utilizing respective country indices and domestic funds. Note that there is a constraint for english-language sources for the sample countries, especially for TH and ID, as majority of the already limited number of studies have no translated versions available. For TH, Soongswang and Sanohdontree (2011) studied TH mutual funds, using the typical risk-adjusted metrics of Sharpe, Treynor and Jensen ratios. They declare that, over the period of 2002-2007, TH mutual funds outperformed the SET50 market index. Koowattanatianchai & Prayarach (2016) provide evidence, through a Thailand-based equities sample, that the ASEAN linkage has made its capital markets less speculative. They note that as linking becomes more likely, investors tend to generate more conservative returns from such types of ASEAN-linked securities. For ID, Suryani and Herianti (2015) test the consistency of Sharpe, Treynor and Jensen ratios as viable metrics of risk-adjusted performance, through a portfolio approach to the LQ 45 Index from 2010-2014. The study concludes that the Treynor ratio demonsrates the most consistent result. For PH, a brief study of risk-adjusted performance by Wee Sit (2011) measured historical returns of Philippine fixed income mutual funds over a 1, 3, and 5-year horizon, justifying that fund managers are providing a reasonable premium for their investor clients. The current study of Pratyaska, Sayoc, Koga and Siy (2015) is the closest investigation into PH conglomerates, finding the realtionship between diversification and firm value. Their results suggest that for their sample of PH conglomerates, the often-observed diversification discount effect is offset by ownership structure characterstics such as

family-ownership and supermajority status. Unfortunately, for PH equities, there are currently no identifiable journal papers, article or publications, using risk-adjusted performance measures. As such, this research work on conglomerates endeavors to augment the nascent risk-adjusted analysis from the selected countries, seeing that the field is beginning to display signs of future potential for academic and practitioner literature on this topic.

2.6 Summary and Conclusions

Early and current literature of risk-adjusted measures lend clarity to the realistic goals set for this research. The relevant takeaways from the literature review relate to the scarcity of risk-adjusted research for ASEAN markets and the pragmatic, evidence-based approach to downside risk useful to the global equity investor. Emerging markets seems to hold much promise in favor of validating downside-treated returns for firms in the emerging market space of ASEAN. Given the lack of country-level equity research, it becomes difficult to adequately compare risk-adusted, downside returns of the ASEAN components of an investors' portfolio. Conceptually, downside risk has gained a reasonable degree of acknowledgement in academic and practitioner circles. However, there remains an absence of textbook-level instruction on the mechanical, calculation side of using downside risks. As an advocacy and awareness-building tool, perhaps a foray into establishing a basic instructional foundation of relevant downside risk-adjusted methods may be possible. In examining a reasonable model of analysis, it is now evident

that establishing fixed targets as benchmarkets would be more sensible to use rather than separate mean returns for asset and market. Morevoer, time-varying panel data offers robust views of risk-adjusted returns in changing circumstances, better than singular long-term periods. A comparative handling of excess returns against both domestic and global indices supplies immediate insights that would not tax the decision-making process of the average investor audience. Lastly, questions still linger on the division of opinion on the persistence of returns, prompting this research to forego emphasis on assigning linkages or causal relationships derived from long-term returns panel data of conglomerate firms.

Chapter 3

Data and Methodology

3.1 Revisiting the Framework

The overarching goal of this research is to generate a supplementary metric, **Semideviation Risk-Adjusted Performance (SRAP),** adapted from the observations of previous performance appraisal models, in order to apply it to industry usage when evaluating firms traded on the ASEAN Exchange. A detailed guide to the research framework is depicted in Figure 2, categorizing the activities based on constructs employed, methods applied and outcomes generated by the research.

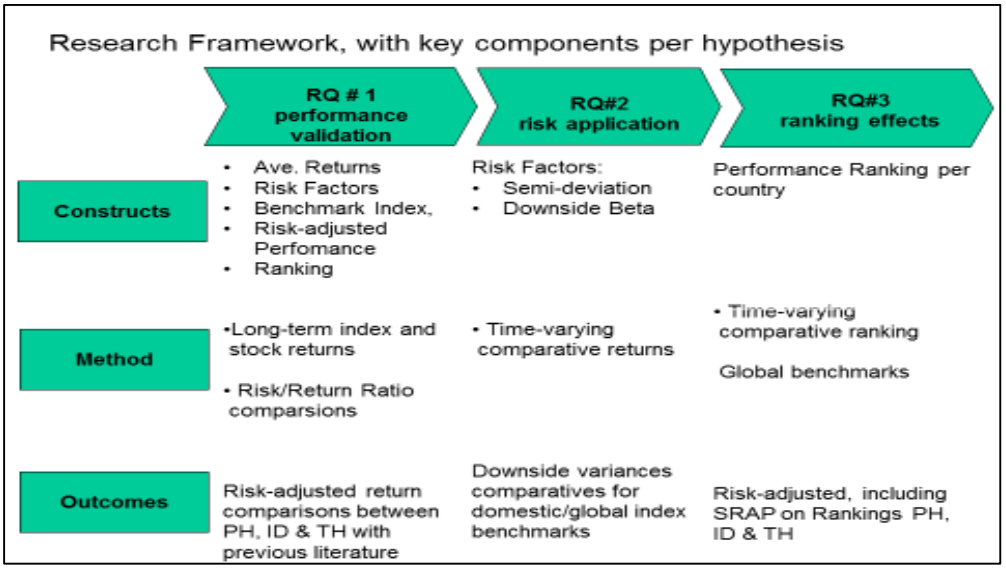


Figure 2: Activity Guide of Research Framework

The methodology begins by addressing RQ# 1 by **v**alidating if the SEA conglomerates' benchmark-beating phenomenon exists for the sample conglomerate firms. Over a 9-year

period, the research applies risk-adjusted performance metrics, generating differentials against selected international (MSCI World Index) and domestic, country-specific (LQ45, PSEi, SET50) benchmark indices. It will proceed to ranking the returns performance, comparing unadjusted TSR vs. risk-adjusted measures. Finally, a set of modified risk-adjusted measures are applied using downside risk factors representing total risk ("semi-variation") and market risk ("downside beta") to compare returns and ranking effects. The results interpret 9-year returns unless otherwise stated and are divided accordingly under the three hypotheses.

3.2 Risk-adjusted Performance Metrics

The research applies measures of Risk-Adjusted Performance (M-squared), Market Risk-Adjusted Performance (M-squared-for-Beta), their corresponding modified downside versions, and alongside Sharpe and Treynor ratios, to highlight both total and market risks. Table 2 serves as a guideline to the various performance metrics used in this study.

Table 2: Risk-adjusted Metrics Interpretation

Risk Metric Interpretation	Total (Diversifiable) Risk	Systematic (Undiversifiable) Risk
Excess return per unit of risk	Sharpe Ratio (Si)	Treynor Ratio (Ti)
Returns adjusted for risk (Normal)	Risk-Adjusted Performance (RAP) or M-Squared (M^2)	Market Risk-Adjusted Performance (MRAP) or M-Squared-Beta ($M^2\beta$)
Excess return between risk-adjusted asset and index (Normal)	Differential RAP (DRAP) or Differential M^2 (DM^2)	Differential MRAP (DMRAP) or Differential $M^2\beta$ ($DM^2\beta$)
Returns adjusted for risk (Downside)	RAP*d* or M-Squared (M^2d)	MRAP*d* or $M^2\beta d$
Excess return between risk-adjusted asset and index (Downside)	DRAP*d* or DM^2d	DMRAP*d* or $DM^2\beta d$

3.3 Selection of SEA Conglomerates Sample Firms

The sample used in this study consists of 8 publicly-traded conglomerate firms each from ID, PH and TH for a total of 24 sample firms, for a nine (9) year period from 2006 to 2015. Daily stock prices for conglomerate firms and the benchmark indices – Philippine Stock Exchange index (PSEi), Stock Exchange of Thailand 50 Index (SET50), Jakarta Stock Exchange LQ45 Index (LQ45) and Morgan Stanley Capital International World Index (MSCI or MSCI World Index), were obtained from databases of CapitalIQ, the Philippine Stock Exchange website (www.pse.com.ph), PSE Edge (www.edge.pse.com.ph), the Stock Exchange of Thailand website (www.set.or.th/en), and the Indonesia Stock Exchange (www.idx.co.id). Firms are classified as Conglomerates if they are made up of two or more different subsidiary firms, with separate sources of revenue, operating in unrelated or vertically-integrated industries, falling under one corporate/holdings entity. To be included in the sample, a conglomerate should meet four criteria related to stock information. First, it should have stock prices at end of December 2005 until end December 2015. This is to ensure there is consistent price data across the performance period of 9 years. Accordingly, the study includes time-varying analysis of a 6-year period (from January 2010- December 2015) and 3-year period (from January 2006 - January 2009) to highlight effects of the boom-bust cycle to the performance metrics. Second, it should have an average total market capitalization of >USD900 mil by 2015, to exclude conglomerates in the early stages of consolidation and asset accumulation. This specified firm size also falls just below the minimum of a US mid-cap stock, keeping within the radar of international investors. Third, it should have

a reasonable average daily trading value (DTV) of >USD 100,000 with not more than two missing monthly stock returns during the period from January 2006 to end December 2015. This assures the liquidity and tradability of the firms' stock in the PH, TH and ID equity markets. Last, the firms must belong to the conglomerate or holdings sector of each respective country exchange. They may be either diversified or vertically-integrated conglomerates with key domestic operations in the country of their listing. Under these research data requirements, the number of firms in the final sample fell to 8 firms each for PH, TH and ID. Refer to Tables 3 through 5 for a tabulated data set of the sample firms. Of the sample set, only Lopez Holdings Inc. (LPZ) and Berli Jucker Public Co. Ltd. (BJC) are not included as part of the PSEi and SET50 local benchmark constituents, respectively. Concise company profiles of the selected conglomerates, quoted directly from CapitalIQ, are available in Appendices 1 through 3, as reference.

Table 3: PH Conglomerate Firms and PSEi benchmark

Conglomerate Firm	**Symbol**	**Market Cap***	**DTV****	**Industry**
Aboitiz Equity Ventures, Inc.	AEV	6,825.8	1.95	Diversified
Alliance Global Group, Inc.	AGI	3,464.4	1.85	Diversified
Ayala Corporation	AC	9,933.8	4.18	Diversified
DMCI Holdings, Inc.	DMC	3,885.7	1.46	Diversified
JG Summit Holdings, Inc.	JGS	11,134.3	2.64	Diversified
Lopez Holdings Corporation	LPZ	643.7	0.53	Diversified
LT Group, Inc.	LTG	3,391.8	1.67	Diversified
SM Investment Corporation	SM	14,637.1	6.04	Diversified
Benchmark: Phil Stock Exchange Index	PSEi	171, 951.5	111.11	

*Market Capitalization, as of end of December 2015, in USD mil

**Daily Traded Value, average of latest 2 months in 2015, in USD mil

Source: S&P Capital IQ, pse.com.ph

Table 4: TH Conglomerate Firms and SET50 benchmark

Conglomerate Firm	Symbol	Market Cap*	DTV**	Industry
Berli Jucker Public Co. Ltd.	BJC	1,644.0	0.66	Diversified
BTS Group Holdings Public Co. Ltd.	BTS	3,153.7	9.51	Diversified
Charoen Pokphand Foods Public Co. Ltd.	CPF	4,156.0	15.9	Branded Food/Commodities
Intouch Holdings Public Company Limited	INTUCH	5,905.6	20.1	Telecom/Media/IT
Minor International PCL	MINT	4,514.8	8.20	Property/Retail Brands
PTT Public Company Limited	PTT	20,405.2	55.6	Oil & Gas
The Siam Cement Public Company Limited	SCC	15,069.2	23.2	Cement, Chemicals
TPI Polene Public Company Limited	TPIPL	1,307.1	18.5	Chemicals
Benchmark : Stock Exch of Thailand 50	SET50	232,933.0	686.0	

*Market Capitalization, as of end of November 2015, in USD mil
**Daily Traded Value, average of latest 12 months, in USD mil
Source: S&P Capital IQ, www.set.or.th/en

Table 5: ID Conglomerate Firms and LQ45 benchmark

Conglomerate Firm	Symbol	Market Cap*	DTV**	Industry
PT. AKR Corporindo Tbk.	AKRA	2,040.1	3.53	Chemicals/Petroleum
PT. Astra International Tbk.	ASII	17,488.9	16.3	Diversified
PT. Global Mediacom Tbk.	BMTR	1,110.9	1.2	Media/Communication
PT Charoen Pokphand Indonesia Tbk.	CPIN	3,069.7	1.57	Branded Food/Commodities
PT. Ciputra Development Tbk.	CTRA	1,611.6	1.25	Property, Real Estate
PT Indofood Sukses Makmur Tbk.	INDF	3,271.6	4.74	Branded Food/Commodities
PT. Kalbe Farma Tbk.	KLBF	4,455.0	5.23	Pharmaceuticals
PT Lippo Karawaci Tbk.	LPKR	1,696.9	6.18	Property, Real Estate
Benchmark :Jakarta Composite Index	JKSE	331,822.3	319.9	

*Market Capitalization, as of end of December 2015, in USD mil
**Daily Traded Value, average of 12 months in 2015, in USD mil
Source: S&P Capital IQ, www.idx.co.id

3.4 Formula Notation & Definitions

The study uses the following notation for applicable formulas:

μi = Annual mean return of asset i (conglomerate firm)

μm = Annual mean return of respective market index benchmark, see section 3.5.2

Rt = Returns of asset i

Rm = Returns of market index

βi = Market risk of asset *i*

σi = Standard deviation of the returns of asset *i*

σm = Standard deviation of the returns of market index

Rf = Risk-free rate (respective T-Bill Ave. for each country), see section 3.5.1

Pb = Opening (Beginning) Share Price

Pe = Closing (Ending) Share Price

D = Average Dividend Yield

The unadjusted, basic return measure utilized in the SEA Conglomerate study of Vestring et al. (2014) is the Total Shareholders Return (TSR). It measures full returns earned by an investment over the period of ownership, including any dividend cashflows paid during that period. Despite its intuitive nature, this return measure does not incorporate

any degree of risk factors. TSR is calculated by adding the average dividend yield (D) for the period to the price appreciation rate for the same period:

$$TSR = \frac{\mathrm{Pe}-\mathrm{Pb}}{\mathrm{Pb}} + D$$

For **total risk measures**, the Sharpe ratio has broad acceptance in both academic and practitioner usage, with standard deviation of returns as the risk metric of investment hazard. However, the Sharpe calculation produces an abstract ratio that has limited use for the average investor when investigating risk and returns. The ratio is derived by dividing the annual mean excess return by the standard deviation of returns:

$$Si = \frac{\mu\mathrm{i}-\mathrm{Rf}}{\sigma\mathrm{i}}$$

The M-squared measure translates this into basis points, thus providing a more intuitively understood percentage measure of investment risk. The formula is to multiply the Sharpe Ratio by the standard deviation of a benchmark index, and add the risk-free rate:

$$M^2 = \frac{\sigma\mathrm{m}}{\sigma\mathrm{i}}(\mu i - Rf) + Rf$$

To understand the volatility of assets above and below the mean, standard deviation is used for both Si and M^2. In addition, the study also explores the *downside volatility*, that is volatility below the benchmark return. Referred to as the semideviation, this metric measures the volatility of certain asset's performance that is below chosen benchmark return. In this case, the benchmark return is the risk-free rate of the respective country. The formula is defined as:

$$\sum_{R_f} = \sqrt{(\frac{1}{T}) \cdot \sum_{t=1}^{T} \{Min\,(\mathrm{Rt} - R_f, 0\}^2}$$

Following with **market risk measures**, the 9-year *beta* is obtained by taking the covariance of daily returns of asset i and daily returns of the market index, dividing this by the variance of the market index daily returns:

$$Bi = \frac{\mathrm{covar(Rt,Rm)}}{\mathrm{var(Rm)}}$$

The Treynor ratio differs from the Sharpe ratio through its choice of beta, instead of standard deviation, as the volatility risk measure. Market risk measures are relevant to funds that contain a variety of other assets beyond just the analyzed asset. The unsystematic risk is mitigated through diversification (through conglomerates' various investments in single-sector firms) and thus may be disregarded. The Treynor ratio divides the annual mean excess return of the asset by its beta:

$$Ti = \frac{\mu i - Rf}{\beta i}$$

Aside from the aforementioned beta, the study also looked into downside beta. This represents deviations below benchmark returns, the periods of losses that investors typically associate risk with. Therefore, downside beta is used to assess risk in the relative downside potential. There are three (3) types of downside beta with respect to benchmark returns: mean, risk-free rate, and zero (0). To look into the performance of SEA conglomerates during different period of economics, this research uses the Hogan/Warren downside beta with respect to risk-free rate:

$$\beta_{R_f}^{D} = \frac{Cov \quad \{(\mathrm{Rt} - R_f, 0) \cdot Min\ (\mathrm{Rm} - R_f, 0)\}}{Var \quad \{Min\ (\mathrm{Rm} - R_f, 0)\}^{2}}$$

Treynor shares the disadvantage of Sharpe's abstraction, both lack guidance on basis points interpretation, or return differentials. To interpret the market risk impact as basis points, the Market Risk-Adjusted Performance (or M-squared-for-Beta) follows the lead of M-squared, with the objective of comparing assets on the basis of identical market risk. In this case, the benchmark here would be the market index beta of βm = 1, wherein the evaluated assets are (de)levered in order to match this factor. M-squared-for-Beta is computed by multiplying the (de-)levered factor (di) by the annual mean excess return, then adding the assets annual mean return:

$$M2\beta = \mu i + di\ (\mu i - Rf) \qquad \text{where: } di = \frac{1}{\beta i} - 1$$

The factor di is derived to adjust an assets systematic risk, such that if βi<1, it corresponds to a loan at the risk-free rate, amounting to a fraction di, in order to increase the investment in the assets. Conversely, if βi>1, then a sale of a fraction of di of the asset, then investing proceeds at the risk-free rate. Concluding with differential measures, the research applies a simple subtraction formula to surface any excess returns, in the form of basis points. An asset outperforms the market index whenever the differentials are positive, indicating excess risk-adjusted returns over the benchmark. For total risk, the Differential M-squared is calculated by subtracting the M-squared asset returns by the M-squared market index returns:

$$DM^2 = M_i^2 - M_m^2$$

Likewise, the Differential M-squared-for-Beta is calculated by subtracting its risk-adjusted asset returns by M-squared-for-Beta market index returns:

$$DM^2\beta = M^2\beta_i - M^2\beta_{m\backslash}$$

3.5 Other Methodology Components

3.5.1 Key Variables

Daily logarithmic returns computed from daily price data were used to compute for the average quarterly mean TSR and risk variables for the period covered. Standard deviation is used to estimate total risk, while Beta is the proxy for market (systematic) risk. For the modified risk-adjusted performance metrics, the risk-free rate is subtracted from the daily logarithmic returns to calculate the modified daily returns and only negative returns are retained. Otherwise, a zero value is substituted for positive returns. The *risk-free rates* applied are as follows:

- for PH conglomerates = 3.22%, the 11-year annual average rate of the 91, 182 and 364-day PH Treasury bills, sourced from the Central Bank of the Philippines (BSP).
- for TH conglomerates = 3.78%, the 11-year average rate of all maturities of TH treasury bills, obtained from the Thailand Treasury.
- for ID conglomerates = 8.29%, the average rate of all maturities of ID government bonds, obtained from http://www.investing.com/rates-bonds/.

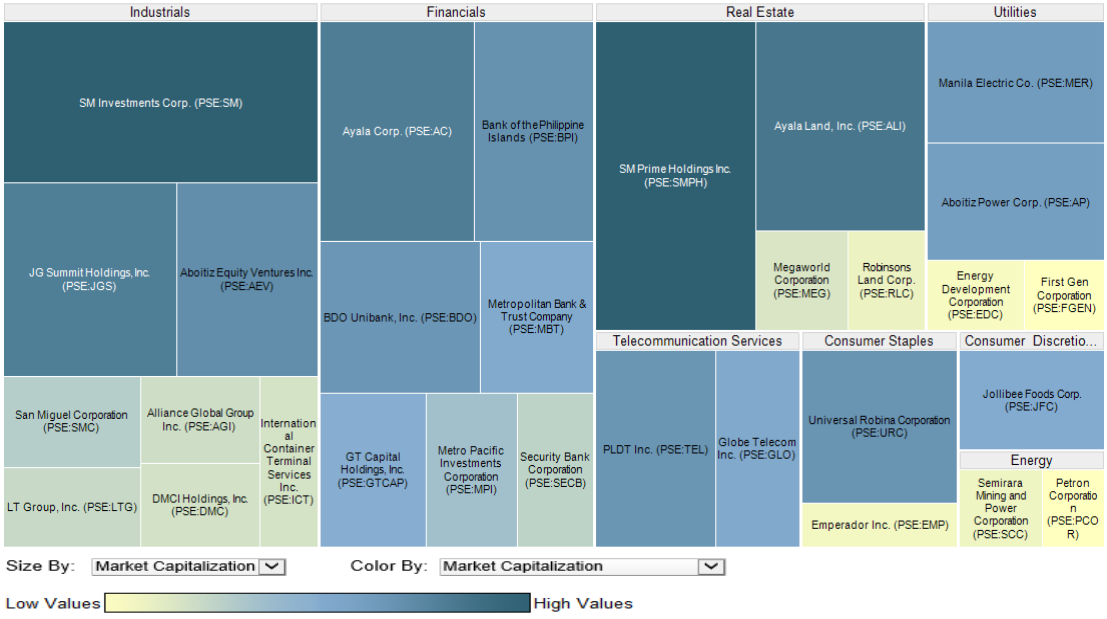
The analysis and outcomes are derived from a long-term 9-year period, generating 37 distinct data points per each firm and the assigned benchmark index. Similar to the approach of Redman (2000), the research uses domestic *benchmarks* – PSEi, SET50 and

LQ45, to compare PH, TH and ID conglomerates, respectively. This is in accordance with industry practice of financial institutions, to make the research results readily comparable with published practitioner literature. To understand more about the indices utilized, refer to section 3.5.2 for index profiles for each country. A global benchmark, the MSCI World Index, is used to provide an international perspective as to the return comparisons of the SEA conglomerate firms, from the view of a developed market investor. MSCI World Index is a broad global equity benchmark across developed markets countries, but does not represent any exposure to emerging markets.

3.5.2 Benchmarks : Profiles of Country Equity Indices

For ID-based equities, the research uses LQ45, a stockmarket index composed of 45 firms listed on the Indonesian Stock Exchange (IDX). The index measures the relative changes in the free float-adjusted market capitalization of 45 firms included in a list of the top 60 companies, within a 12 month period, with the highest market capitalization. Within that same period, firms should also fulfill the criteria of being part of the top 60 companies with the highest transaction values. The firms included in the LQ45 must be a listed company in the Indonesia Stock Exchange for at least 3 months and maintain durable financial qualities, prospects of growth, high transaction values and frequency. For bencharking PH-based equities, the PSEi is used as it is composed of 30 constituents listed on the Philippine Stock Exchange. The index measures the relative changes in the free float-adjusted market capitalization of the largest and most active common stocks

listed at the Philippine Stock Exchange. It serves as the benchmark for measuring the performance of the country's stock market. It is made up of a fixed basket of common stocks that represents the general movement of the Philippine stock market. Based on the infographic on Figure 3, the index composition and relative market capitalization size reveals the significant positions of PH Conglomerates (here categorized under "industrial" sector).



Source: S&P Capital IQ, www.pse.com.ph

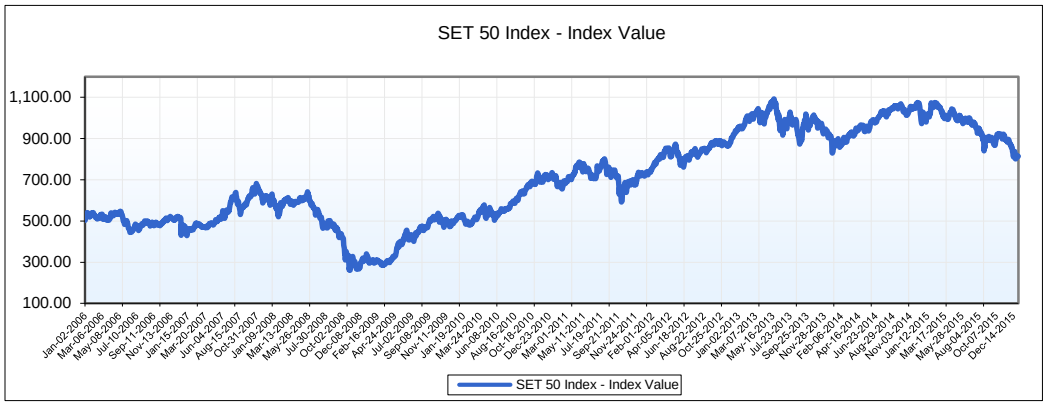
Figure 3: PSE Index Composition Based on Market Capitalization, 2015

As of December 16, 2015, the PSEi closed at 6,952.08, which is a 3.85% decline from the recorded closing level of 2014 at 7,230.57, as shown in Figure 4. The market's decline was affected by global market volatility.

Source: S&P Capital IQ, www.pse.com.ph

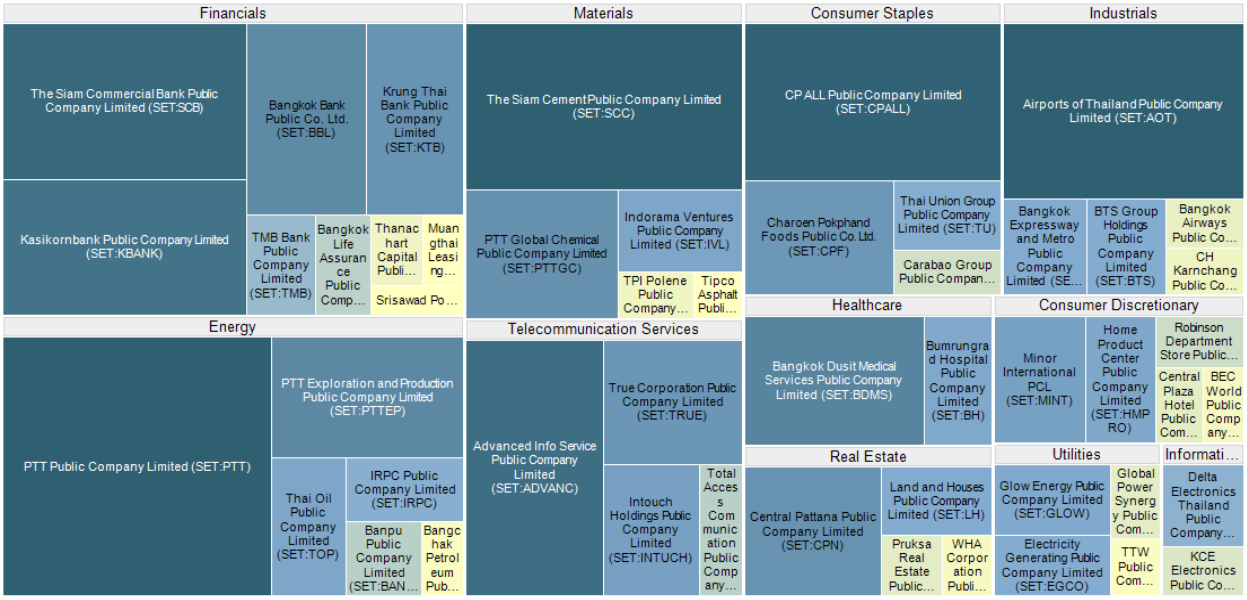
Figure 4: PSEi 9-year Value Chart (2006-2015)

For TH-based conglomerate sample set, the research benchmarks against the SET 50 Index, composed of 50 constituents listed on the Stock Exchange of Thailand. It is a market capitalization-weighted price index, which excludes companies whose stocks have been suspended for more than one year. The SET 50 Index value has been fairly congruent with most ASEAN markets trends, over the past 9 years as in Figure 5. Much like their PH counterparts, TH conglomerates cover a significant market capitalization position amongst the index, with mixed representation across business sector classifications, depicted in the inforgraphic on Figure 7.



Source: S&P Capital IQ, www.set.or.th/en

Figure 5: SET Index 9-year Value Chart (2006-2015)



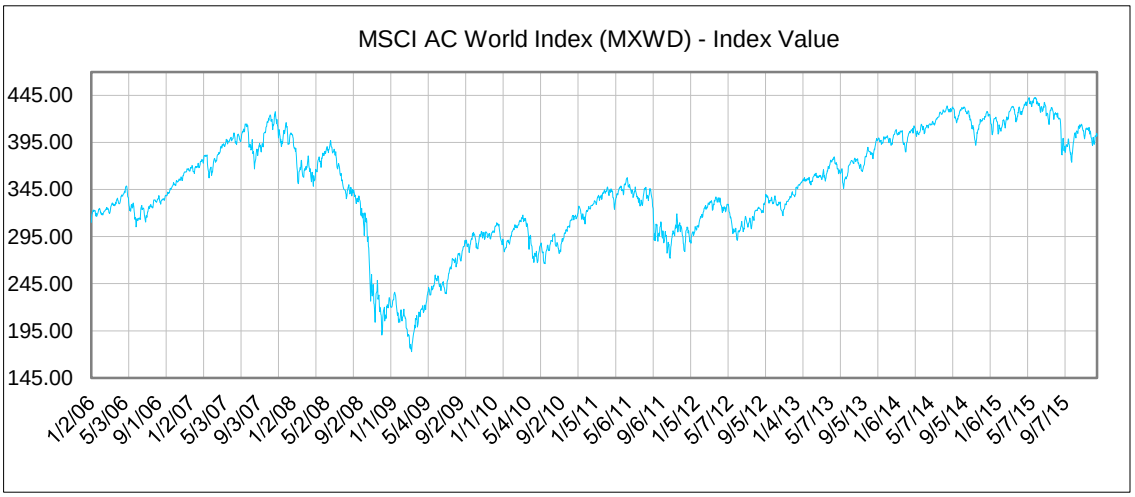
Source: S&P Capital IQ, www.set.or.th/en

Figure 6: SET50 Index Composition Based on Market Capitalization, 2015

3.5.3 Time-varying Periods

In addition to the 9-year (January 2006- January 2015) *long-term period*, the research also applies risk-adjusted performance metrics to time-varying analysis, highlight results of a global economy during a *recessionary recovery* timeframe (a 6-year period from January 2010 – December 2015) and a brief *boom-bust cycle* (3-year period from January 2006- January 2009). The objective of adapting a time-varying approach is to provide clarity in positing a possible consistency of conglomerate risk-adjusted returns, through varying circumstances within a fixed long-term span of time. How does one reflect the behavior of the economy? The stock market has been viewed by some as an indicator of the economy, as evidenced by a casual review by Duca (2007) of developed market economies stock market prices aganist GDP revealing a tendency to move together over time. Three seminal economic theories suggests strong links between economic activity and security prices. Tobin (1969) posits that when share prices are high, the value of the firm relative to the replacement cost of its stock of capital (Tobin's Q) is also high. As a consequence, there is an anticipated increased capital expenditure leading to higher economic output. Modigliani's (1971) proposition is the wealth impact improved stock prices have on consumption. Finally, Kiyotaki and Moore (1997) expound on earlier work of Bernanke and Gertler (1989) on a "financial accelerator" that focuses on the impact that stock values could have on a companys balance sheets. Characteristics of particular economic period behavior may be observed through the chart movement of an index that best represents the global stock market, and thus reflects the overall conditions of the

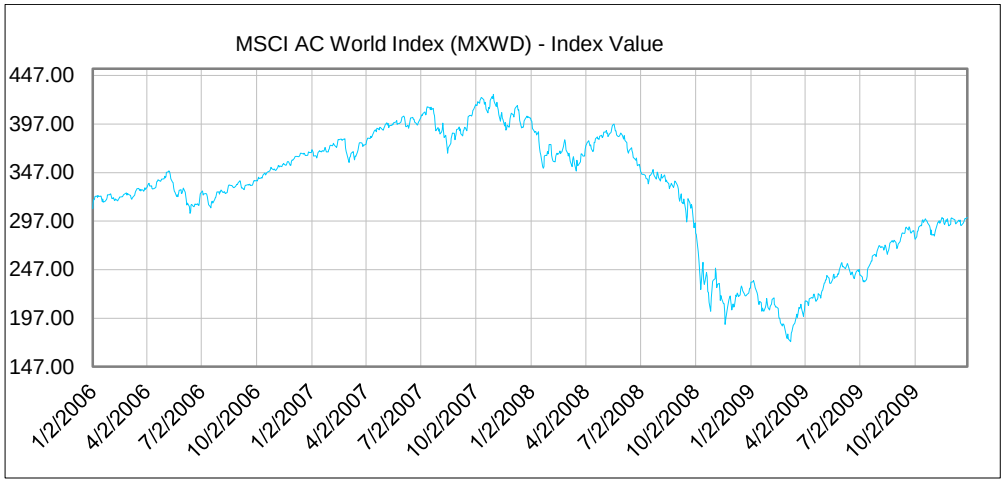
economy, through time. This research used the MSCI AC World Index, which captures all sources of equity returns from a selection of 23 developed and 23 emerging markets. The pronounced *long-term period* are evident from the 9 years of 2006-2015 of the MSCI AC World Index shown on Figure 7. For this time period, an extended set of trends can be observed beginning with an astronomic 100 point index rise from 2016 to the tail-end of 2017. This signals the peak of global equity valuations, right before the financial crisis brought about by the sub-prime mortgages in the U.S. market. This crisis phenomenon is reflected by the market precipitous drop to an index level of 160, representing nearly 61% reduction in value from its peak at end 2007. The market recovery is illustrated by the gradual progression to a 300 index level average. With the market effectively doubling from its low in March 2009, the index base begins to rise to the 400 level by mid-2014 and sustains a sideways trend throughout 2015.



Source: S&P Capital IQ, MSCI index report 2015

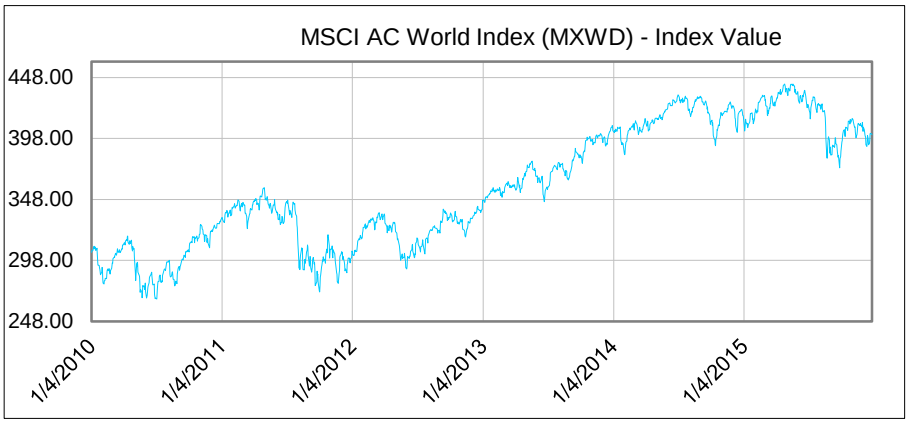
Figure 7: Long-term Global Equities (2006-2015)

Next, the research attempts to generate comparable risk-adjusted returns for the sample conglomerates, given a *"boom-bust period.* This is be narrowing the period field to 2006-2009, as shown in Figure 8 an isolated period window characterizing bullish market excuberance followed by a bearish outcome. For the final set of time-varying analysis, the research used a *market recovery (or recession recovery)* period, represented by years 2010-2015 in Figure 9, wherein global markets have expressed a thorough recovery as index figures have climbed to new peaks.



Source: S&P Capital IQ, MSCI index report 2015

Figure 8: Boom-Bust Cycle of Global Equities (2006-2009)



Source: S&P Capital IQ, MSCI index report 2015

Figure 9: Market Recovery, Global Equities (2010-2015)

3.6 Supplementary Statistical Research

Aside from the main research goals, the study also attempted to analyze the strength of the relationship between key financial ratios and risk factors with the conglomerate stocks' returns. Although relationships and causality are peripheral to this research, a cursory correlation and regression analysis was conducted in order to provide a supplement launch point for future research. For the regression analysis, the simple and multiple regressions were used to calculate two sets of results, each with 9-, 3- and 6-year time periods. The same set of data was also used for the correlation analysis. Seven variables were fielded : beta, downside beta, total risk (standard deviation), downside total risk (semideviation), debt to capital ratio, size (market capitalization), and price to book value. Generating the first four variables are identical to the main research methodology. To reiterate, beta used for this study is the covariance of monthly returns

of each of the conglomerates and the monthly returns of the market index, divided by the variance of the market index monthly returns. The downside beta on the other hand follows the above formula while considering only the covariance only of monthly returns performing below the risk-free rate. The total risk is the standard deviation of monthly returns while downside total risk is the standard deviation of monthly returns performing below the risk-free rate. The downside total risk is the standard deviation of monthly returns while downside total risk is the standard deviation of monthly returns performing below the risk-free rate; also known as semideviation. The final three firm-related variables need elaboration, they are:

Size is the market capitalization value per month of each conglomerates, calculated by multiplying a firms' end of month share price by number of its outstanding shares. *MC* is the market capitalization, *N* is the number of shares outstanding, and *P* is the closing price per share. MC is employed to see if growth in size is a determinant of conglomerate returns.

$$MC = P \times N$$

Debt to capital ratio is computed by dividing the firms' total long-term debt by the shareholders (market value) equity plus long-term debt. Here, the analysis looks into how

well a conglomerate manages its long-term liabilities, in order to capture any relationship with return outcomes.

$$\text{Debt-to-Capital Ratio} = \frac{\text{Debt}}{\text{Shareholders' Equity} + \text{Debt}}$$

Price-to-book value is the ratio that represents market capitalization value divided by its book value. The P/BV ratio aims to categorize the conglomerate within the value spectrum: a higher ratio equates to an overvalued firm while a lower ratio defines a undervalued firm. Thus, the analysis asks if there is a relationship between under/overvalued status and returns.

$$\text{P/B ratio} = \frac{\text{Market Capitalization}}{\text{Total Book Value}}$$

Chapter 4

In Context: The ASEAN Exchanges and Conglomerates

4.1 Logic of Selecting ASEAN Equity Markets

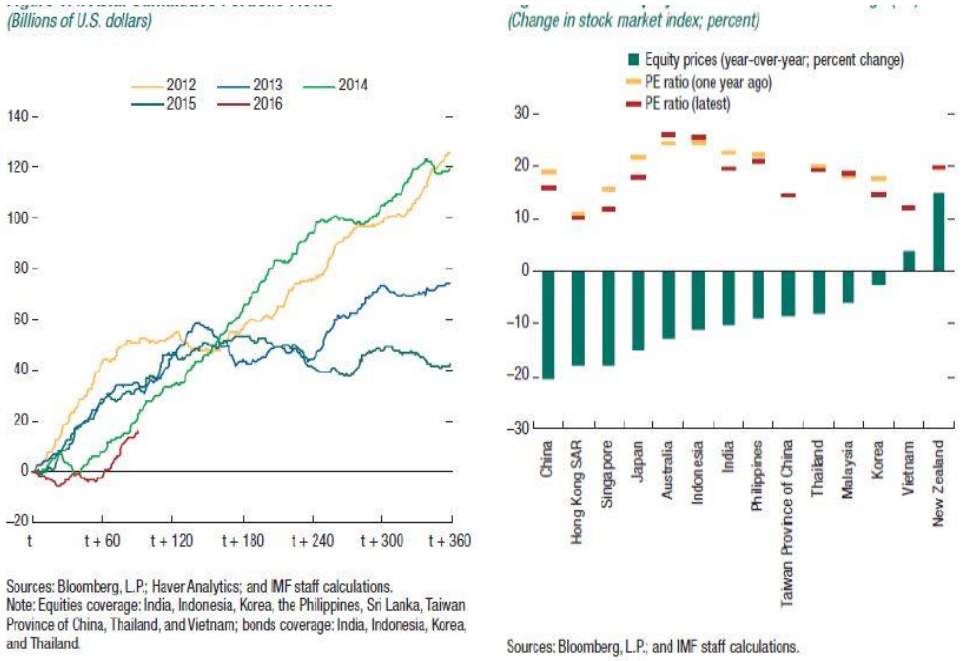
In selecting ASEAN emerging markets for this research, the catalyst is the substantial interest from international investors based on these cascading factors: 1) Asian markets capital flows and historical returns, 2) Asia-Pacific regional growth expecations, and 3) Emerging markets composition within the ASEAN region. International investments have bolstered portfolios, showing an increasing interest in Asia and its emerging markets. Asia has been attracting enormous **capital inflows** compared to other emerging market regions. Raju & Khanapuri (2009) supply evidence that the average gross capital flows of $67.54 billion to the Asian region have surpassed the Latin American market ($20 billion) and the European and CIS markets ($9.19 billion). As early as a decade ago in 2006, the International Monetary Fund (2007) had recorded this as $143.79 billion for Asia, compared to a paltry $3.01 billion for Latin America and Europe and CIS with $43.9 billion. ASEAN member countries with burgeoning operations throughout the region, supplies the impetus for closer examination of long-term stock market performance of their respective operating firms.

A key influence dictating the importance of emerging markets in fortiftying international portfolios is their potential to yield **excess returns**, as revealed by past performance observations by Bekaert, Erb, Harvey, and Viskanta (1998). In addition, evidence from Peter and Kannan (2007) argue that emerging markets have offered returns surpassing the average performance of global developed markets. Running alongside the returns rationale is the relative isolation of emerging markets from developed economies, thus promoting diversification of the same asset class of equities. This phenomenon was defined by Harvey (1994), Cha and Cheung (1998) as the markets' segmentation property. Gunduz and Omran (2001), Neaime (2002), and Lin and Wu (2006) continue by stating that markets are identified as "segmented when their returns are not affected by factors other than domestic ones." Segmentation property satisfies the classic portfolio diversification theory of Markowitz (1952) which states that, in order to achieve risk-adjusted overperformance, a portofolio must contain a mix of asset that have low or negative correlation with other assets. Ultimately, the expectation is that emerging market assets provide either superior risk-adjusted returns, a diversification effect to the investors portfolio or both. The findings on segmentation attribute "excessive regulations that restrict larger volumes of economic activities to domestic (emerging market) territories," as stated by Raju & Khanapuri (2009). That said, such restrictions do not sustain themselves for the long-term. Even emerging markets are likely to expand their economic activities beyond their borders. So, as these emerging economies establish stronger trade ties with other economies (whether emerging or developed), international factors take a more profound influence in determining their market returns, as studied by

Dekker, Sen, and Young (2000), Forbes and Chinn (2003). For emerging market countries, the economic turmoil and market confusion have given birth to a renewed regionalism, according to Worthington, Katsuura, and Higgs (2003), as a means to acquiring economic targets.

Asian regional market performance has bumped up the **expectations** for the coming years, creating a volatile, yet compelling area of investment. The projected 2016 and 2017 growth by the International Monetary Fund (2015) for the Asia-Pacific (APAC) Region is a robust 5.3%. This is tempered very minimally from the the 2015 growth of 5.4%, but more optimistic than the projected 2016 global growth rate of 3.2%. The region will continue to be adversely affected by challenges of a weakening global recovery, tighter global financial conditions, China's rebalancing, and low level of oil prices. Despite these factors, the region is expected to grow due to strong domestic demand (given low commodity prices for importers and higher disposable income), progress on trade agreements within the region, and anticipated stronger growth of China. The APAC region is against a backdrop of weakening global recovery. Developed markets like the Euro area and China, and emerging markets like Brazil and Russia continues to have slow economic growth if not a recession. Negative outlook on these countries are brought about by low commodity prices and high political uncertainty. The continuing trend of tighter fiscal policy not just in the US but in other developed countries remains. This uncertainty regarding the tightening of fiscal policy in developed markets has already encouraged capital outflows from emerging markets in the Asia-Pacific (APAC) region. Capital inflows in 2015

amounted to approximately 40 billion USD only compared to approximately 120 billion USD in 2014, according to Bloomberg (2016) information in Figure 10. In 2016, the level of capital inflows so far has been below what has previously been experienced during the last 5 years. As a result of the reduced capital inflow, most stock markets in the region have experienced a decline over the past year.

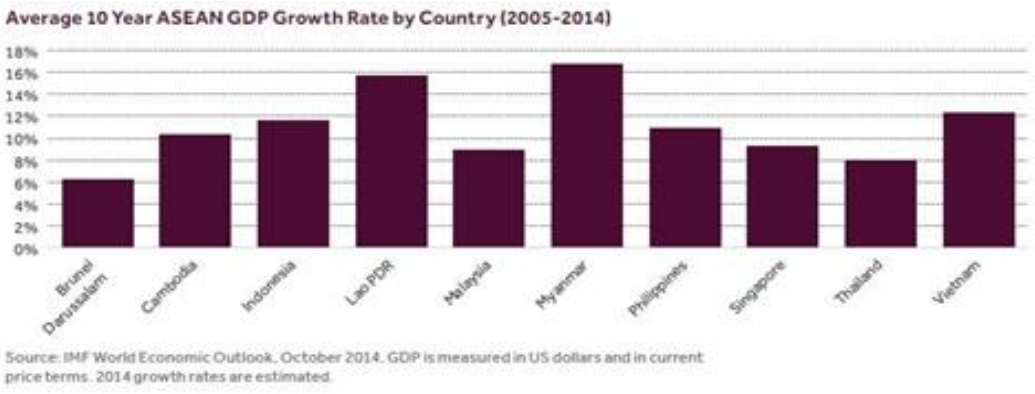


Source: Bloomberg, Haver Analytics and IMF, 2015

Figure 10: Capital Inflows to APAC, selected countries (2012-2016 comparisons)

Another factor adversely affecting APAC markets, at least in the short term, is the economic transition of China. China's switch from an economy driven by exports to one driven by domestic consumption is expected to make China's growth more sustainable in the medium to long-term. In the short-term however, the slowdown in China's economy

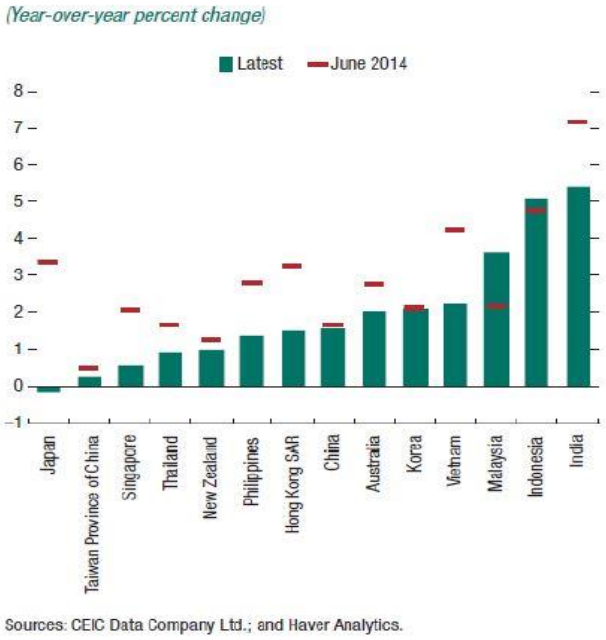
due to the transition is affecting the whole region, especially the countries with strong trade ties with China. Lastly, low oil prices continue to affect markets across the region as oil and energy companies experience a decline in share price. An agreement between the members of the Organization of the Petroleum Exporting Countries (OPEC) regarding an output freeze could make the situation better but no such agreement has been reached to date. Despite the challenges above, the outlook for the region is positive for several reasons. First, growth in the countries in the region is expected to be fueled by domestic demand, paired with inter/intra-regional trade. Based on CEIC (2016) research, retail sales in China and the ASEAN region have been relatively high. Looking at ASEAN, the IMF (2015) reports phenomenal economic growth rates from 2005-2014, with ASEAN member states recording a 6-16% CAGR in gross domestic product (GDP), refering to Figure 11. ASEANs economic integration efforts and regional trade openness has created >10% per annum in trade value growth between 2006-2012, with total trade value at US$1,224 billion in 2005 ballooning to US$2,476 billion in 2012.



Source: IMF World Economic Outlook, 2014

Figure 11: ASEAN GDP Growth per Country (10 years)

The regional stock markets of SEA countries reflect this optimism in the first quarter of 2016. The TH benchmark for instance grew by 9.29% after the first quarter of 2016; ID grew by 5.39%; PH by 4.46%; and Malaysia by 1.48%. Lower commodity prices in the region also contributes to the positive outlook on domestic demand. Inflation in fact has been controlled to within -1% to 3% for most countries, as document by CEIC (2016) in Figure 12, over the years of 2014-2015.

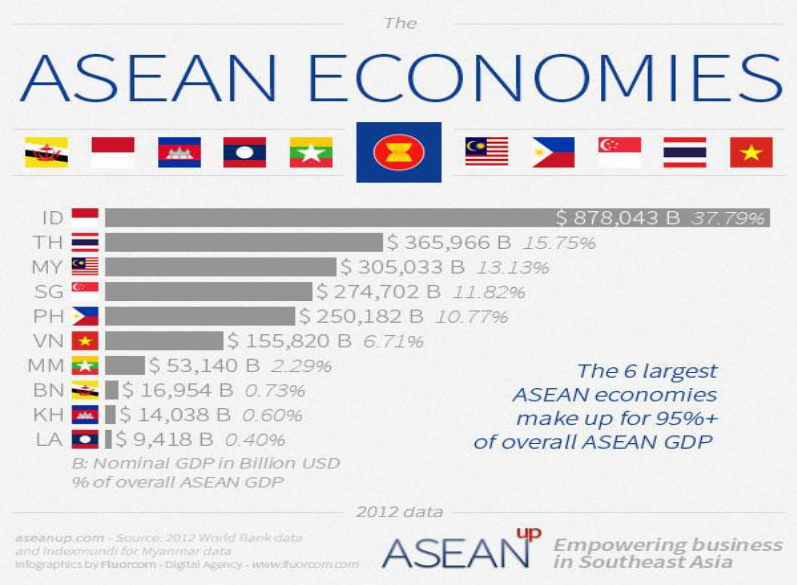


Source: CEIC and Haver Analytics, 2016

Figure 12: APAC countries inflation 2014-2015 YoY change

Finally, the logic of selecting particular ASEAN markets asks: "Why focus on PH TH and IND, instead of the entire ASEAN market?" There are three (3) cardinal reasons for hinging this research on those particular markets. First, it is the authors interest to **concentrate on the space of developing/emerging markets**, rather than mature,

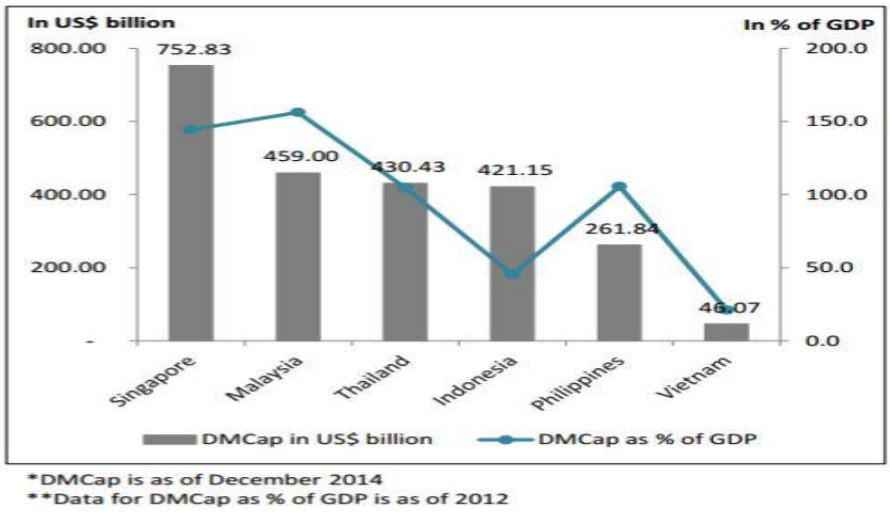
developed economies such as Singapore and Malaysia. The volatility and growth of developing economies have more peculiar trajectories compared with ASEANs developed nations, embeddding an impression of higher risk. This impression is what the research intends to bring to light, using relevant risk-adjusted metrics. Second, it is favorable to cover more ground by leveraging on specific market leaders. Conceding to current trends of overall GDP contribution, ID covers 37.79% of total ASEAN Nominal GDP while TH 15.75%, as of 2012, as gleaned from Figure 13. Clearly, these two countries dominate the ASEAN economic landscape, making the research outcome encompass a more influential canvass of investments.



Source: **www.aseanexchnanges.org**

Figure 13: Asian GDP Comparisons (2012)

As recent as 2014, ID and THs stock markets already commanded a significant USD852 billion chunk of the total ASEAN Daily Market Capitalization (DMC), according to the World Exchanges Federation (2015). PH, on the other hand, serves as a comparative median (based on GDP of the grouping), although smaller in nominal GDP of USD250 bil and a growing USD 262 bil stock market capitalization, as seen on Figure 14.



Source: World Exchanges Federation 2015

Figure 14: ASEAN Member Countries Daily Market Capitalization in 2014

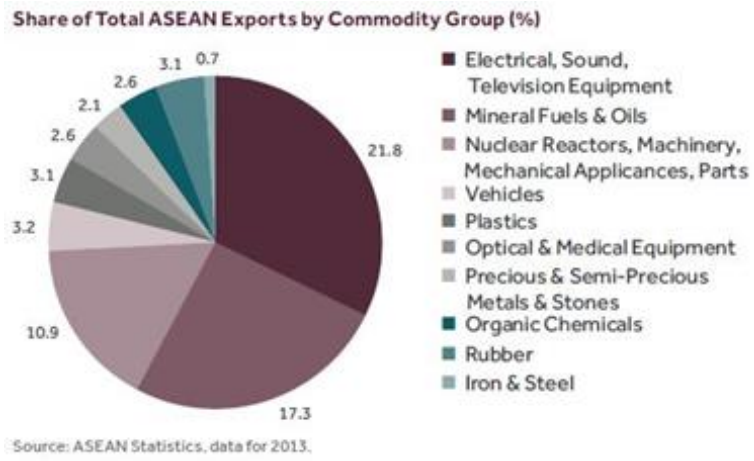
PH is still a significant space, engulfing about 10% of total ASEAN GDP, equaling the collective GDP of the five laggard member countries. All three countries reflect its leadership based on GDP and DMC, relative to its other ASEAN emerging economy neighbors The third and most personal reason is that the author has been actively invested in all territories of the research for close to decade since venturing into international equities. Thus, for the author the rationale of selecting these three countries is that it provides a stimulating intellectual analysis of familiar markets, a purposeful comparative

study using the most valid performance measurement tools available, as well as a deep-dive into conglomerates that command the respective countries' economies.

4.2 Association of Southeast Asian Nations (ASEAN) & Its Economic Charter

The Association of Southeast Asian Nations (ASEAN) is a regional grouping of ten member countries, namely Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. It was founded on August 8, 1967 in Bangkok, Thailand, with the signing of the ASEAN Declaration (widely known as the Bangkok Declaration). Its formation grew out of the need to advance the political, security and economic cooperation within region of 600+ million people, representing a GDP of roughly $2.8 trillion as of 2014. In 2007, the ASEAN Charter was adopted as a constitutional document, as a masterplan built on three Community branches: Political-Security, Socio-Cultural and Economic. ASEAN's political impact is tempered by its lack of consistency: its struggling strategic vision, somewhat divergent national priorities, and often transitional leadership roles. On the security end, ASEANs biggest challenge is mustering a unified and singular response to China's maritime claims in the South China Sea. In addtion, ASEAN is critical to the United States' strategic politcal and military rebalance in Asia. The developments on the economic front are the focus of interest of this research, in context to the performance evaluation of conglomerates in the region. Quoting directly from the ASEAN Economic Community (AEC) Charter, this has four pillars and was established to further the member countries' aims to achieve the

following: "(1) the creation of a single market with the free flow of goods, services, investment, and skilled labor; (2) fair economic competition; (3) sustainable and equitable economic development; and (4) further integrating ASEAN into the global economy." The World Bank (2012) reports that GDP per capita in the ASEAN has grown to US$2,765 in 2013 from US$1,832 in 2009. In addition, the same report states that ASEAN "goods imports declined by 3.8 % in the third quarter of 2014, driving the return to a positive goods trade balance. With a growth rate of 5.3 percent, ASEAN has a household income accelerating at a rapid pace towards US$10,000, making it the 3rd largest in the world by 2018, based on Asian Development Bank (2015) reports. The IMF (2015) reports phenomenal economic growth rates from 2005-2014, with ASEAN member states recording a 6-16% CAGR in GDP. In addition, ASEAN prioritized economic integration in selected sectors, in Figure 15, of rubber, automotives, agriculture products, apparel, tourism, electronics, and textiles.



Source: ASEAN Annual Report 2013

Figure 15: ASEAN Export Components 2013

The economic integration efforts of ASEAN have realized a >10% per annum in trade value growth between 2006-2012 due to the numerous free-trade agreements with other economies. Likewise, this openness has created with total trade value at US$1,224 billion in 2005 ballooning to US$2,476 billion in 2012. Research firm Frost & Sullivan's (2013) estimates that for the automotive market, ASEAN would rank number 3 as it becomes a big player globally by 2018. The Economist Intelligence Unit (2012) regards ASEAN having the 3rd largest in number of flights globally, for both domestic and international travel. As a destination-region for tourism, it was the fastest growing in the world, based on findings of the Pacific Asia Travel Association (2014), with interconnectivity of the member countries at 50% of arrivals from other ASEAN member citizens. Further, the connectivity is evident as ASEAN countries rank among the world's most connected nations, with the second-largest community of global Facebook users, behind the US, according to the consulting firm Mckinsey & Co. (2014). In healthcare, Pacific Bridge Medical (2013) claims that ASEAN's medical device market is ready to double to US$9 billion by 2019, from US$4.6 billion in 2013. Experts such as Soestrano (2007) believe that the AEC will intensify economic integration, radically changing the landscape of its political governance and economic performance. Given ASEANs economic realities and commitments, a move to link each countries' capital market exchanges was forthcoming, in order to support AECs goal to further integrating ASEAN into the global equity markets.

4.3 The ASEAN Exchanges: Composition, Indices and Recent Studies

In 2011, ASEAN member countries made a commitment to integrating their stock exchanges by 2015. Thus, the ASEAN Exchanges represents the collaboration of the different capital market exchanges of six South East Asian countries, namely: Malaysia (Bursa Malaysia), Vietnam (Hanoi Stock Exchange, HoChiMinh Exchange), Indonesia (Indonesia Stock Exchange), Philippines (The Philippine Stock Exchange), Thailand (The Stock Exchange of Thailand) and Singapore (Singapore Exchange). Currently, the ASEAN Exchanges has over 3,600 listed companies with a net market capitalization that stands at ~US$915 billion, removing debt instruments and using only shares available on free float (ie. tradeable in public markets), as illustrated on the FTSE ASEAN All-Shares Index (2016) in Figure 16.

	FTSE/ASEAN 40			FTSE ASEAN All-Share			FTSE ASEAN Stars		
Country	No. of Cons	Net MCap (USDm)	Wgt %	No. of Cons	Net MCap (USDm)	Wgt %	No. of Cons	Net MCap (USDm)	Wgt %
Hong Kong	-	-	-	3	32,892	3.59	3	32,892	4.74
Indonesia	7	64,236	18.48	133	127,930	13.97	30	103,210	14.87
Malaysia	12	89,566	25.77	280	195,486	21.35	30	140,313	20.21
Philippines	2	12,822	3.69	70	92,159	10.06	30	79,300	11.42
Singapore	11	128,890	37.09	181	244,933	26.74	27	182,690	26.32
Thailand	8	52,038	14.97	228	207,008	22.60	30	146,986	21.17
Vietnam	-	-	-	230	15,426	1.68	30	8,791	1.27
Totals	40	347,551	100.00	1125	915,834	100.00	180	694,182	100.00

Source: FTSE ASEAN Index 2016

Figure 16: Estimated ASEAN Exchange Capitalization 2016

Its primary purpose is to promote the growth of the regions' capital market by opening up the various exchanges to more investors. The FTSE ASEAN All-Shares Index provides international and local investors with a benchmark of performance representing

the leading ASEAN Exchanges members: Bursa Malaysia, Hanoi Stock Exchange, HoChiMinh Stock Exchange, Indonesia Stock Exchange (IDX), The Philippine Stock Exchange (PSE), Singapore Stock Exchange (SGX), and The Stock Exchange of Thailand (SET). This index represents ~90% of the investable market capitalization.

The first step in the realization of an operating ASEAN Exchange was the ASEAN Trading Link, a gateway for securities brokers to offer investors easier access to connected exchanges. It was established to connect the securities markets of the ASEAN exchanges, making the process for investors to trade in other ASEAN capital markets as seamless as trading in their own domestic market. Next, market providers and financial institutions began establishing ASEAN-centric indices to track the performance of ASEAN publicly-listed firms. In recent developments related to the ASEAN Exchanges, two ASEAN equity indices were established that are published on a periodic basis. The first is the FTSE/ASEAN All-Share Index, the regional benchmark index, that represens 95% of the investable market capitalisation. The second is the FTSE/ASEAN 40 Index, covering the top 40 constituents from FTSE/ASEAN index, ranked by market capitalisation. The FTSE/ASEAN 40 Index is a tradable index, with similar transactional characteristics as some of the ETFs that rely on the similar territories. Another index frequently referenced is the ASEAN Stars, a selection of the ASEAN Top ranked stocks (by market capitalization and liquidity). The purpose of this index is for investors to easily identify blue chip companies on each exchange, as it represents the most tradeable companies of each exchange. However, for purposes of this research, the benchmarks

applied shall be domestic indices relevant to each country. On the one hand, these indices are a key component in examining ASEAN-centric stock performance and may be a pragmatic benchmark based on its composition. On the other hand, the ASEAN indices are noteworthy as the country composition could skew representation: FTSE/ASEAN All-Share Index includes non-ASEAN members such as Hong Kong while FTSE/ASEAN 40 Index excludes Vietnam, a key ASEAN country member.

To reiterate the premise on benchmarking in Chapter 2, past empirical measures would argue in favor of the use of domestic, country-bound indices that aptly underpin the geographic risks imbedded in stock selection performance when comparing with a reasonable index. Domestic, country-based indices are profiled in the Data and Methodology chapter, for reference. From the perspective of the research goals, the aims are to surface the documented comparative outperformance from a global and domestic vantage point. Some may object that the sample set of conglomerates should be distinctly an ASEAN comparison. This research maintains its coverage of validating previous performance from a global and domestic viewpoints, not from a regional country-vs-country view. This research does concede that the ASEAN indices mentioned here may be applied for future studies to highlight country comparisons within the region, rather than against global benchmarks. Given the early stages of the ASEAN Exchange, several studies have captured the price dynamics, linkages and interdependencies of ASEAN equity markets even before the establishment of the Exchange. Looking into price

linkages, Roca, Selvanathan & Shepherd (1998) discovered significant linkages in the short-term for their sample of ASEAN nations. More contemporaray studies examine the extent of linkages between ASEAN equity prices and world markets. Worthington, Katsuura & Higgs (2003) find evidence for significant causal linkages between Asian developed markets (Hong Kong, Japan and Singapore) and SEA emerging markets (Indonesia, Malaysia, the Philippines, and Thailand). Their work, utilizing periods surrounding the 1997 Asian financial crisis, suggests that lower causal relationships between the developed and emerging equity markets may offer opportunities for portfolio diversification for international investors. Ibrahim (2006) pursued the international interdependencies of equity prices, stating that the US market has a more dominant influence than the Japanese market in the ASEAN markets. On market downturns, the evidence from his work strongly suggests significant responses of the ASEAN markets to the US market. In contrast, positive changes in both US and Japanese indices do not seem to impact significantly on the ASEAN equities. Similar to Worthington et al., Royfaizal & Lee (2009) found that, using three sub-periods (covering pre-, during and post-Asian 1997 crisis), ASEAN and US stock markets are interdependent during crisis and post-crisis periods. More recently, Koowattanatianchai & Prayarach (2016) provide evidence, through a Thailand-based equities sample, that the ASEAN linkage has made its capital markets less speculative. They note that as linking becomes more likely, investors tend to generate more conservative returns from such types of ASEAN-linked securities. What are possible research opportunities going forward? One obvious research piece that would attract

attention of both investment analysts and index companies would be a long-term returns analysis of ASEAN Exchange traded firms, to ascertain their historical performance. This would aid the Exchange in promoting the potential performance of ASEAN firms to a global investor audience, by furnishing relevant returns metrics. Another possible research can focus on applying risk-adjusted variables to the long-term returns analysis. This would cater to the margin-seeking, long position investor seeking diversifiable returns in emerging markets of the ASEAN Exchange. A final probable research theme would be to validate the risks involved when defining "speculative" behavior due to ASEAN Exchange firms' integration effects, as Koowattanatianchai & Prayarach (2016) suggests for TH equities. This research work aims to satisfy the first two opportunities, by applying its analysis and recommendations to key ASEAN equity markets. Perhaps a separate paper emanating from this research could tackle the third theme in the near future.

4.4 ASEAN Conglomerate Focus

This research focuses on ASEAN conglomerates in PH, IND and TH, as opposed to pure play, single segment companies or other key market sectors. What is the rationale behind the interest in ASEAN conglomerates? Several key studies of Vijayaraghavan (2014) and Vestring et al. (2014) reveal long-term equity investments in SEA conglomerates yielded superior annual return premiums against various stock index benchmarks. Not limited to academic papers, the investing industry has taken notice of SEA Conglomerate thru

periodic research by private banking institutions and other similar investment analyst pieces. Most have dealt with highly diversified firms, and others have incorporated vertically intergrated companies (firms that have interrelated ownership of operations across the value chain of activities for a single sector). Before venturing forward, a couple of definitions are needed, in order to lend clarity to the corporate entity being studied. A conglomerate, sometimes called holding firm, is described by Ramachandran, Manikandan, and Pant (2013) as a "network of independent companies, held together by a core owner," wherein independent companies (subsidiaries) are involved in diverse fields of business. Weston and Mansinghka (1971) adopt a more acquistion-led definition, stating that conglomerates are those that "entered into a broad program of diversification achieved to a substantial degree by external mergers and acquisitions rather than by internal development." Both definitions hinge on business diversification, which to a large extent personifies majority of the conglomerates in the emerging markets, especially in Asia. It is claimed that growth and success of conglomerates in emerging markets is due to these network of independently grouped firms taking advantage of the institutional gaps in respective countries. The conglomerate structure in operating diverse firms are considered outdated in the developed markets, but in emerging markets like Asia these general holding firms continue to perform strongly. Conglomerates' revenues in these countries demonstrated impressive growth even in a global economic slowdown environmnent. For example, growth in 5 years 2007-2011 was recorded at over 23% a year in China and India, and 11% in South Korea, as reported by Ramachandran et al. (2013). Furthermore, conglomerates accounted for 20-45 of the 50 biggest companies in

China, South Korea, and India, respectively. Similarly, ASEAN conglomerates command a substantial share of capitalization in their respective markets. Francisco (2016) studied 58 top firms within SEA and found that conglomerates and their affiliates continue to thrive in their respective geographies, outperforming non-affiliated, pure-play firms both in Return On Assets and revenue growth. The succeeding section of this chapter augments these current observations by illustrating it through a brief PH Conglomerate research piece.

4.5 PH Holdings Sector: A Preview of the Risk-Adjusted Comparative Framework

This illustrative research presents its findings on the PH Holdings Sector for two reasons: to fortify the case for ASEAN market behavior (both superior stock performance and capital concentration) and to provide cursory exposure to the research framework used for the larger sample firms in Chapter 5. This brief set of findings comparing sectors within the PH market only, applying the comparative performance framework. The empirical findings show that the PH Sectors (including Holdings Sector) with stellar unadjusted returns may not be as highly ranked once a degree of embedded risk has been factored in. It is noteworthy that only PH market has a Conglomerate Sector (Holdings Sector) classification, while IND and TH do not partitition publicly-listed firms in like manner. For future research, it may be worth exploring IND and TH markets, by segregating respective conglomerates into a hypothetical sector, as comparison.

4.5.1 Profile of PH Benchmark Index and Holdings Sector

For bencharking PH-based conglomerates, the PSEi is used as it is composed of 30 constituents listed on the PSE. The index measures the relative changes in the free float-adjusted market capitalization of the largest and most active common stocks listed at the PSE. It serves as the benchmark for measuring the performance of the country's stock market. It is made up of a fixed basket of common stocks that represents the general movement of the PSE. In spite of losing a total of 278.49 points at the close of 2015, the PSEi was still awarded the second-best performing index in ASEAN. Added to the returns performance, PSEi has been constantly pushing to implement world-class standards of disclosure and corporate governance among its listed companies. Though the 2015 closing of the stock market was low, the PSEi is expected to climb back to the 7,500 level for 2016. Investors are still confident that the PH can capture global economic opportunities and deliver value for both local and foreign institutional investors. However, the 7,500 level is a conservative estimate, as there is volatility and uncertainty surrounding the country. The PSEi will feel adverse effects from the global economic movements, especially China's economic slowdown, and the recent increase in US Federal Reserve's interest rate. At the beginning of 2016, the PSEi opened the trading year by stumbling more than a hundred points, amid the crash of China's stock market. Due to the global market volatility caused by that even, the PSEi reached a low at 6,084 in January. However, by the end of the first quarter of 2016, the market showed an improvement of 310.22 points or 4.46%, closing at 7,262.30 points. This is also an

improvement of 4.5% from the 2015 first quarter close. Even though the Philippine market went through a rollercoaster first quarter, by March, the PSEi has been able to make a rebound. It has attracted a new round of net foreign investor inflows, which helped to reverse the losses that occurred earlier in 2016. Overall, the PH market is still expected to climb and recover this year with expectations backed by stable domestic growth prospects. PH Conglomerates maintain a major presence in the country with the Holding Firms Sector representing up 37.43% of the PSEi, as of the end of April 2015, referring to Figure 17. Out of the 30 publicly-listed companies in the PSEi, 10 of these are holding firms. Majority of PH conglomerates serve as holding companies for the diverse commerical interests of affluent business families in the country.

Source: PSE Wesbite : www.pse.com.ph 2015

Figure 17: : PSEi sectoral weighted % value representation, as of end April 2015

These families (such as the Ayalas, Aboitiz, Gokongwei, Lopez, Sy, Ty families) have ensured professionalism in their respective companies by incorporating a management layer for executive stewardship. This helps the conglomerates strategize, identify

opportunities for further growth and diversification, while still staying true to their specific goals and corporate identity. The growth however of these conglomerates is highly dependent on the performance of their subsidiaries.

4.5.2 Summary of PH Sectoral Study Results

For this PH Holdings Sector case, the results interpret 10-year returns, divided into two sections: Sectors and Conglomerates. Each section demonstrates the comparative ranking, when applying basic returns and risk-adjusted performance measurements. For a 10-year period 2005-2015, the results using basic, unadjusted returns reveal that the PH Conglomerate sector exceeds the benchmark while maintaining tight correlations with the index PSEi. However, when applying risk-adjusted metrics, it finds that the Conglomerate sector underperformed both the index and selected sectors. Based on the study, it generates the returns yielded on PH-based sectors and Conglomerate firms, given the same degree of prevailing risk in the domestic benchmark, PSEi. The empirical findings show that the Sectors with stellar unadjusted returns may not be as highly ranked once a degree of embedded risk has been factored in. In contrast, some sectors that generate inferior unadjusted returns, may demonstrate more compelling outcomes once their low risk is factored in their performance. Rankings of sectors tend to be similar across various return measures due to a tighter range of standard deviation and betas amongst sectors. The sectors used as comparative indices to the Conglomerate (HLDG) sector are: Financial (FIN), Mining & Oil (M&O), Property (PROP), Services (SERV)

and Industrial (IND). Table 3 reports the sectoral comparisons using basic, unadjusted returns, along with their market index correlations. The sectors are ranked in descending order based on TSR and annual mean returns. The sector with the highest TSR is Mining & Oil with a TSR of 32.21%, equivalent to 16.89% premium against the benchmark PSEi TSR. The closest correlations to the PSEi are the Conglomerate and Property sectors with $\rho M = 0.99$ while the furthest would be the Service sector at $\rho M = 0.91$. Further, Table 6 shows the annual mean returns (derived from monthly logarithmic returns across 10-years) with identical ranking but lower reported excess returns than TSR.

Table 6: 10-year (2005-2015) Sector Returns vs PSEi Benchmark

Sectors	ρM	TSR	TSR'	μ	$\mu - \mu_m$
PSEi	1.00	15.32%	0.00%	15.80%	0.00%
MINI	0.92	32.21%	16.89%	26.05%	10.25%
IND	0.95	27.94%	12.62%	20.66%	4.86%
HLDG	0.99	22.84%	7.52%	17.51%	1.71%
PROP	0.99	20.80%	5.48%	14.66%	-1.14%
FIN	0.98	19.86%	4.54%	12.72%	-3.08%
SERV	0.91	19.25%	3.93%	9.42%	-6.38%
Average	0.96	23.81%	8.49%	16.84%	1.04%

Source: authors analysis

The results using basic return measures validate the recent research, at a country level, regarding SEA conglomerate performance. The Conglomerate sector ranks third among all sectors, garnering a 7.52% TSR premium and 1.71% annual excess returns, while maintaing close correlations to the benchmark. Table 7 identifies the M-squared measures for 6 sectors, with their total risk, excess returns and Sharpe ratios. The risk-free rate is

estimated at 3.22%, with PSEi total risk at σ = 19.58%. The sectors are ranked in descending order, with the highest M-squared of 16.57% generated by the Industrial sector. The Conglomerate sector posts an M-squared of 12.72%, compared with its unadjusted return measure of 17.51%. In comparison to basic return metrics, the Conglomerate sector does not beat the index using total risk-adjusted measures, with its DM^2 = -3.08%. Differential M-squared ranking indicates that only one sector (Industrial) has returns (adjusted for total risk) that exceed the benchmark.

Table 7: 10-year (2005-2015) M-Squared and Sharpe Ratios per Sector vs PSEi

Sectors	μ	σ	$\mu - Rf$	Si	M^2	DM^2
PSEi	15.80%	19.58%	12.58%	0.64	15.80%	-
IND	20.66%	25.59%	17.44%	0.68	16.57%	0.77%
MINI	26.05%	37.84%	22.84%	0.60	15.04%	-0.76%
HLDG	17.51%	29.46%	14.30%	0.49	12.72%	-3.08%
PROP	14.66%	27.39%	11.44%	0.42	11.40%	-4.40%
FIN	12.72%	24.36%	9.50%	0.39	10.86%	-4.94%
SERV	9.42%	21.23%	6.20%	0.29	8.94%	-6.86%
Average	16.84%	27.65%	13.62%	0.48	12.59%	-3.21%

Source: authors analysis

The Industrial sector reflects a 0.77% Differential M-squared, while the other 5 sectors are in negative territory against benchmark. This is due to the total risk average for all sectors of 27.65%, reflecting volatility exceeding that of the PSEi standard deviation. Moreover, Table 7 provides the numerical values of the Sharpe measure, with identical sector rankings as M-squared. The Conglomerate sector has a lower Sharpe ratio of 0.49 against the PSEi of 0.64, due to its high total risk of σ = 29.46%.

Table 8 reports the values of M-Squared-for-Beta and Treynor ratios, with the Conglomerate sector observed to have the highest systematic risk ($\beta = 1.26$). The sectors are ranked in descending order, with Mining & Oil sector the highest M-squared-for-Beta of 23.99% and Service Sector the lowest at 9.81%. The Conglomerate sector yields a $DM^2\beta$= -1.25%, underperforming the benchmark index using market risk-adjusted measures.

Table 8: 10-year (2005-2015) M2forBeta and Treynor Ratios per Sector vs PSEi

Sectors	μ	β	$\mu - Rf$	Ti	d	$M^2\beta$	$DM^2\beta$
PSEi	15.80%	1.00	12.58%	0.13	-	15.80%	
MINI	26.05%	1.10	22.84%	0.21	(0.09)	23.99%	8.19%
IND	20.66%	0.96	17.44%	0.18	0.04	21.41%	5.61%
HLDG	17.51%	1.26	14.30%	0.11	(0.21)	14.55%	-1.25%
PROP	14.66%	1.23	11.44%	0.09	(0.19)	12.48%	-3.32%
FIN	12.72%	1.03	9.50%	0.09	(0.03)	12.41%	-3.39%
SERV	9.42%	0.94	6.20%	0.07	0.06	9.81%	-5.99%
Average	16.84%	1.09	13.62%	0.13	(0.07)	15.78%	-0.02%

Source: authors analysis

Only the Mining & Oil and Industrial sectors beat the index with a differential of 8.19% and 5.61%, respectively. The Treynor ranking in Table 8 reflect the same two sectors as having the highest excess returns for every unit of systematic risk. Sector beta has an average of 1.09 and range of 0.94-1.26. Thus, Treynor measures present duplicate sector rankings as M-squared-for-beta, using Beta as market risk proxy.

Table 9 compares the rankings of sectors, using the various returns measures. For unadjusted returns, the rankings are identical for TSR and annual mean returns. However, only half of the sectors outperformed the PSEi when using annual mean returns exclusively. M-squared risk-adjusted rankings suggest a more rigorous hurdle, with only one sector beating the benchmark. Both risk-adjusted returns equate to near-duplicate rankings, with the Mining & Oil sector switching top spots with Industrial sector.

Table 9: 10-year (2005-2015) Sector Ranking (unadjused and risk-adjusted)

	unadjusted		risk- adjusted	
Sectors	**TSR'**	$\mu - \mu_m$	**DM^2**	**$DM^2\beta$**
MINI	1	1	2	1
IND	2	2	1	2
HLDG	3	3	3	3
PROP	4	4	4	4
FIN	5	5	5	5
SERV	6	6	6	6

underperformed the PSEi benchmark

Source: Authors analysis

Only the Industrial sector has returns that exceed the benchmark, for both total and market risks. The Conglomerate sector consistently ranks 3rd, failing to achieve the same benchmark-beating metrics when adjusted for total and market risk. The three bottom ranked sectors (Property, Financial and Service) consistently underperform the index for unadjusted annual mean returns and risk-adjusted returns. Rankings of sectors tend to be similar across various return measures due to a tighter range of standard deviation (low of 21.23% to a high of 37.89%) and betas (low of 0.94 to high of 1.26) amongst sectors.

Chapter 5

Research Results: ASEAN Conglomerate Risk-Adjusted Outcomes

5.1 Introduction

The outcomes of this research ascertains SEA Conglomerates historical returns performance, of which may be of interest to both investors, analysts and index companies operating in the ASEAN Exchange. The methodology generates results that interpret 9-year returns (unless otherwise stated, in time-varying periods) and are divided accordingly under three hypotheses. In reviewing the research framework, the results and initial findings are summarized in Figure 18.

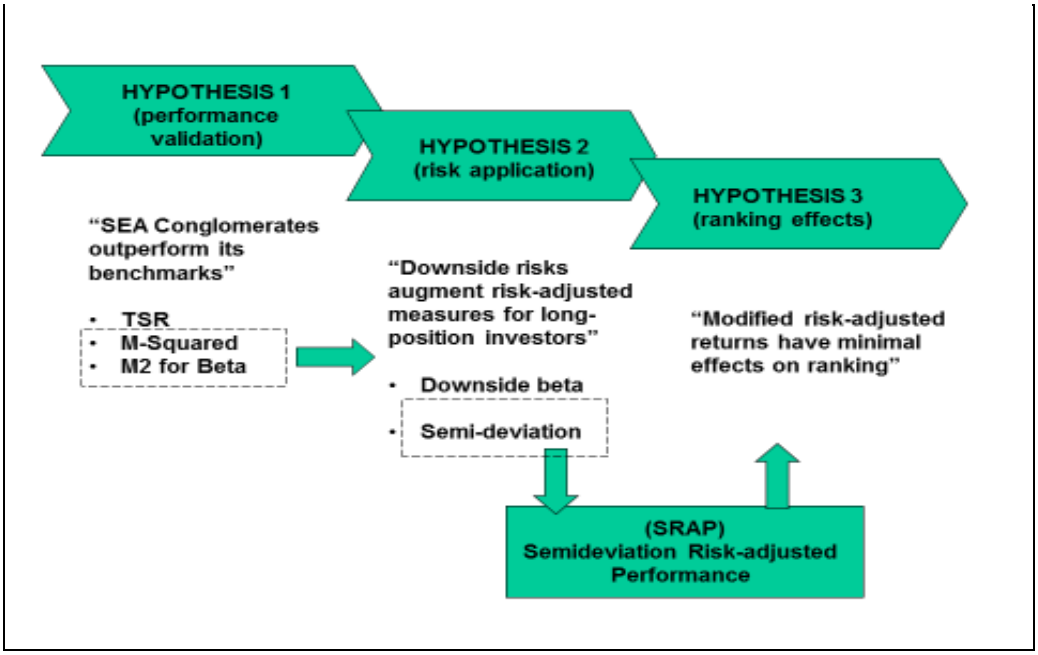


Figure 18: Results and Outcomes Diagram

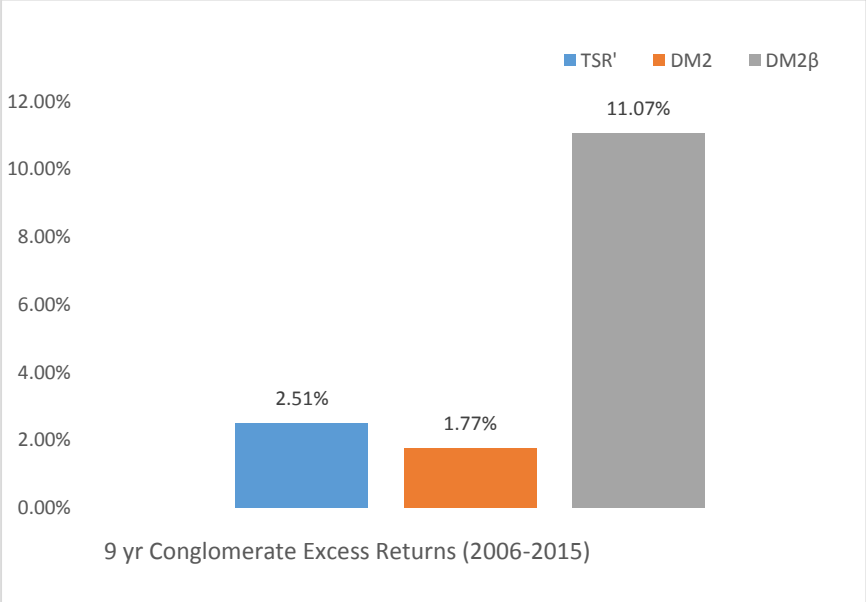
First, SEA Conglomerates historically outperform benchmarks for specified mid-to-long term periods, validating earlier literature pointing towards similar conclusions. Second, using M-Squared-for-Beta is deemed most applicable to represent risk-adjusted measures, appropriate for investors interested in a wide variety of assets, comparing with the volatility of the representative market index. M-Squared-for-Beta consistently and closely tracks the TSR, unlike the random variances of M-squared. However, when applying downside risks, semideviation is deemed more consistent in observed excess return comparison across all time-varying periods. Thus, the research explores how M-squared metric can be further supplemented to reflect the adversity to loss volatility, by arguing in favor of a newly modified metric dubbed Semideviation Risk-Adjusted Performance (SRAP). Third, SRAP returns have minimal effects on ranking, speculating that the SRAP metric may be a favorable alternative to M-squared and M-Square-for-Beta. Moreover, a scatterplot of comparative returns suggests that Normal measures (based on bi-directional volatility) represent lower returns per unit of risk when contrasted with downside beta risk-adjusted returns, but remain similar with SRAP outcomes**.** Beyond the hypotheses, a supplementary statistical study was conducted yielding regression and correlations with low R-squares, with some F-significance values greater than 5%, indicating little or no relationship between risk factors and specified firm-specific financial characteristics in the SEA conglomerate sample. Although this is not the focus of the research, the intention was to provide a catalyst for future, near-term follow-up panel study of determinants to conglomerate returns.

5.2 Observation to RQ # 1: SEA conglomerates historically outperform benchmarks for specified mid-to-long term periods

Earlier literature mentions the relative outperformance of SEA Conglomerates against global counterparts and various relevant indices. The results seek to validate the claimed return premiums in Asian emerging markets by Alles and Murray (2013), Lemeshko and Rejnuš (2015), as well as the superior long-term return performance of SEA Conglomerates supported by Vijayaraghavan (2014) and Vestring et al. (2014). The results answers the question: What is the performance of ASEAN Exchange conglomerates when risk-adjusted metrics such as M-squared are used, in contrast to average returns yielded from TSR? This research finds that SEA conglomerates do indeed satisfy the performance results alluded to, given time-varying provisions. TSR generates a surplus of 2.51% on average in excess of the country indices for the research sample. In other words, a dollar invested in these SEA conglomerates for a 9-year period covering 2006-2015 would have yielded the investor 251 basis points above the collective country index returns achieved. In effect, the findings concur with past research of average premiums (for the larger SEA market) of 14% over the MSCI SEA Index. As stated, all three performance metrics demonstrate that SEA Conglomerate sample firms on average outperform their benchmarks. On a risk-adjusted basis, the Differential M-squared-for-Beta ($DM^2\beta$) showed higher excess return at 11.07%, or 9.30% higher as compared to the Differential M-squared (DM^2), and more than four times greater than the TSR premium. The abnormal magnitude of $DM^2\beta$ merits validation, although it generally corresponds to

those found in the per time-varying period outcomes of the research. Figure 19 shows comparisons of excess returns over the 9-year period from 2006-2015.

Performance Metric	Excess Return
TSR'	2.51%
DM^2	1.77%
$DM^2\beta$	11.07%



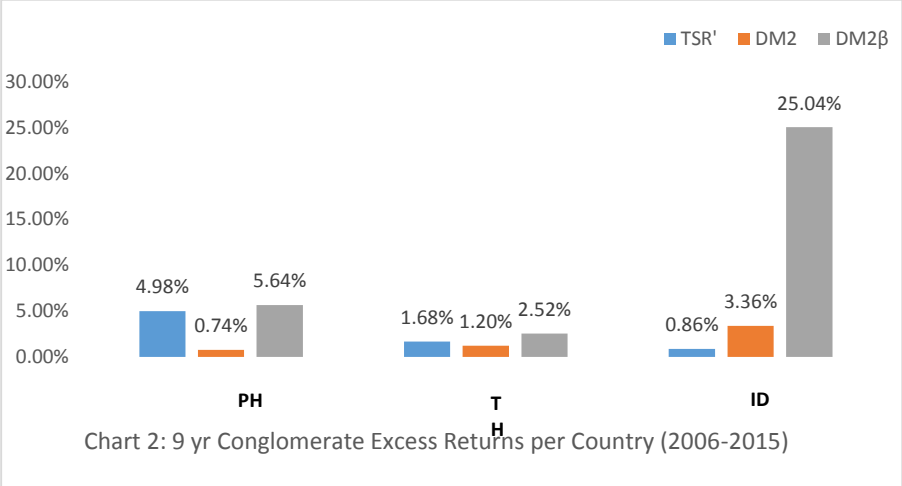
Source: Authors analysis

Figure 19: 9-year Conglomerate Average Excess Returns (2006-2015)

Similar to the aggregate results, TSR and $DM^2\beta$ consistently showed higher excess returns (with particular exemptions revealed later in selected time-varying periods) as compared to the DM^2 which uses total risk as the risk measure. This is largely due to the relatively low range of bi-directional market volatility, as measured in Beta, affecting the returns, as referenced in Appendix 6, ID Performance Appraisal Summary. Notice the wide variance in IDs $DM^2\beta$ of over 24% against TSR, denoting that ID conglomerates

have low correlations with the LQ45 index. In contrast, PH and TH have relatively tight correlations with their respective indices, thus featuring a closer outcome versus their TSRs (each with less that 1% difference). Figure 20 shows these comparative excess returns over the 9-year period from 2006-2015 on a per country basis.

	Excess return		
Performance Metric	**Philippines**	**Thailand**	**Indonesia**
TSR'	4.98%	1.68%	0.86%
DM^2	0.74%	1.20%	3.36%
$DM^2\beta$	5.64%	2.52%	25.04%



Source: Authors analysis

Figure 20: 9-year Conglomerate Average Excess Returns per Country (2006-2015)

The next set of results show the excess returns across three different time periods: a) 9-year returns (Jan 2006- Jan 2015) to reflect long-term economic cycles, b) 3-year returns (Jan 2006- Jan 2009) to exhibit the effects of a market recession and c) 6-year returns (Jan 2010- Dec2015) to represent economic and capital markets' recovery. Across

different time periods, SEA conglomerates on average outperformed their local benchmarks even during the recession period. Consistent with the results shown in the previous tables and charts, TSR' and $DM^2\beta$ are higher than DM^2. On the other hand, DM^2 using total risk portrayed near to nil excess returns. As seen in Figure 21, PH conglomerates outperformed their benchmark across all periods and performance metrics. Likewise, TH conglomerates also outperformed the SET50 benchmark under all three measures over the 9-year period (2006-2015). The same results can be observed over the 6-year period (2010-2015) with TH conglomerates outperforming the local benchmark. Meanwhile, for the 3-year period (2006-2009), TH conglomerates underperformed the local benchmark by 1.99% based on $DM^2\beta$. Indonesia conglomerates also outperformed the LQ45 benchmark across the 9-year and 3-year periods. However, it underperformed its benchmark in the 6-year period by 0.16% based on excess TSR.

	Time Period		
Performance Metric	**2006-2015**	**2006-2009**	**2010-2015**
All Countries			
TSR'	2.51%	2.54%	2.49%
DM^2	1.77%	0.56%	2.42%
$DM^2\beta$	11.07%	25.02%	3.51%
Philippines			
TSR'	4.98%	3.90%	5.57%
DM^2	0.74%	0.58%	0.83%
$DM^2\beta$	5.64%	13.59%	1.33%
Thailand			
TSR'	1.68%	0.99%	2.05%
DM^2	1.20%	0.19%	1.75%

$DM^2\beta$	2.52%	-1.99%	4.97%
Indonesia			
TSR'	0.86%	2.74%	-0.16%
DM^2	3.36%	0.90%	4.69%
$DM^2\beta$	25.04%	63.47%	4.22%

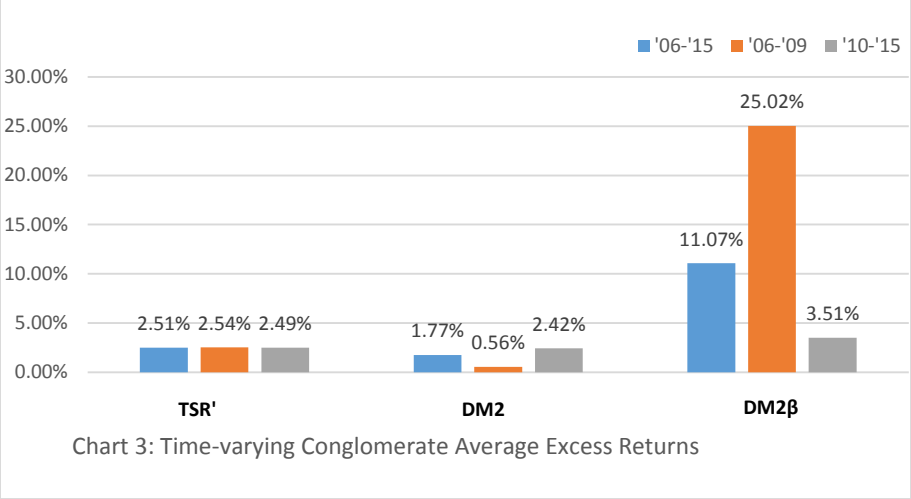


Chart 3: Time-varying Conglomerate Average Excess Returns

Source: Authors analysis

Figure 21: Time-varying Conglomerate Average Excess Returns

It is noteworthy that across time-varying circumstances, SEA conglomerates are able to maintain an average 2.50% excess return above collective country indices. This is testament to the durability and consistency of these firms in the ASEAN region. However, it appears anomalous that the sample firms achieved a $DM^2\beta$ of 25.02% for the turbulent boom-bust period of 2006-2009, attributable to the astonomical 63.47% of ID. This again is generated by the low beta of the ID conglomerates sample, see Appendix 6. Of the 27 performance measures recorded for three countries and three time-varying periods, $DM^2\beta$ reflects a more optimistic quantified risk-adjusted metric. This runs parallel with findings

of Scholz & Wilkens' (2005) MRAP metric, identical to $DM^2\beta$, that was perceived as more suitable for investors who invest in many different assets, similar to the target audience of this research. However, there are three observed exceptions to $DM^2\beta$s dominance : TH's 2006-2009 -1.99% lackluster performance against its benchmark, PH 2010-2015 outstanding 5.57% against its 1.33% $DM^2\beta$ and ID in 2010-2015 where DM^2 has a slight edge of 0.47% over $DM^2\beta$. In summary, given typical risk-adjusted returns it is deemed realistic to place $M^2\beta$ as the first alternative to TSR, over M^2.

5.3 Observation to RQ# 2: Semideviation appears to be an appropriate downside risk factor for conglomerates in SEA emerging markets

As earlier outlined in Chapter 3, risk-adjusted performance is derived from standard deviation and beta, which are bi-directional in nature thus treating fluctuations above and below the mean in the same way as a measure of risk. Meanwhile, fluctuations below the mean is the risk that needs to be mitigated. In order to capture that fluctuation, a modified risk-adjusted measures are necessary by using semideviation. Therefore, the analysis of returns based on standard deviation and beta are referred to as "Normal," while it is labelled "Downside" (marked with *d* suffix) when semideviation and dowside beta are used to analyze the returns. In Normal performance metrics, both DM^2 and $DM^2\beta$ demonstrated that SEA conglomerates outperformed their local benchmarks. However, Downside performance metrics for DM^2 metrics showed a 1.5x higher result than the Normal counterpart. Meanwhile the downside performance metrics in $DM^2\beta d$

underperformed the benchmarks, with notable difference of -13.83%. The difference for the DM^2*d* on the other hand is only at 1.02%. Long-term 9-year average excess return comparisons between Normal risk-adjusted performance metrics and Downside risk-adjusted performance metrics are shown in Figure 22.

Performance Metrics	Normal	Downside (*d*)
DM^2	1.77%	2.79%
DM^{2}β	11.07%	-2.76%

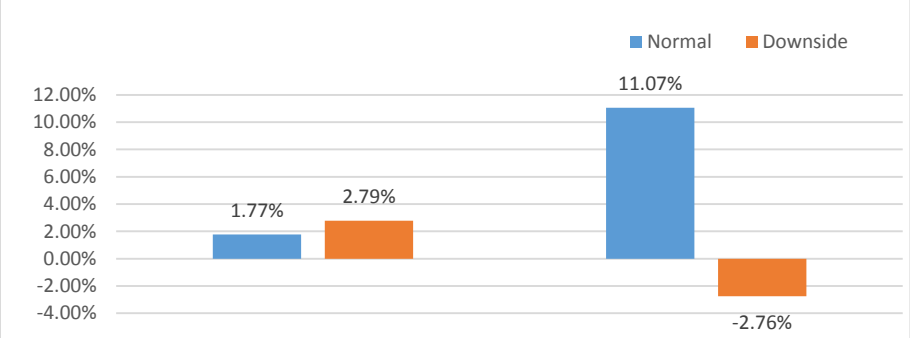


Chart 4: 9 yr Conglomerate Average Normal and Downside Excess Returns (2006-2015)

Hurdles: PSEi = 3.32%; SET50 = 2.16%; JKSE = 3.77%

Source: Authors analysis

Figure 22: 9-yr Conglomerate Normal and Downside Excess Returns (2006-2015*)*

The same results can be observed in Figure 23 which depicts the 9-year average excess return comparisons between Normal and Downside on a per country basis. In PH, DM^2*d* and DM^{2}β*d* showed higher performance when compared to the DM^2 and DM^{2}β. Meanwhile, TH showed significant discrepancies wherein the DM^{2}β*d* indicated

underperformance of -24.93%, while the DM^2*d* showed excess returns of 3.01%, or a difference of 27.94%. As for ID, the DM^2 and DM^2 *d* were not too far different, but the DM^{2}β*d* was 22.1% lower than DM^{2}β.

	Philippines		Thailand		Indonesia	
Performance Metric	**Normal**	**Downside (*d*)**	**Normal**	**Downside (*d*)**	**Normal**	**Downside (*d*)**
DM^2	0.74%	1.87%	1.20%	3.01%	3.36%	3.50%
DM^{2}β	5.64%	13.71%	2.52%	-24.93%	25.04%	2.94%

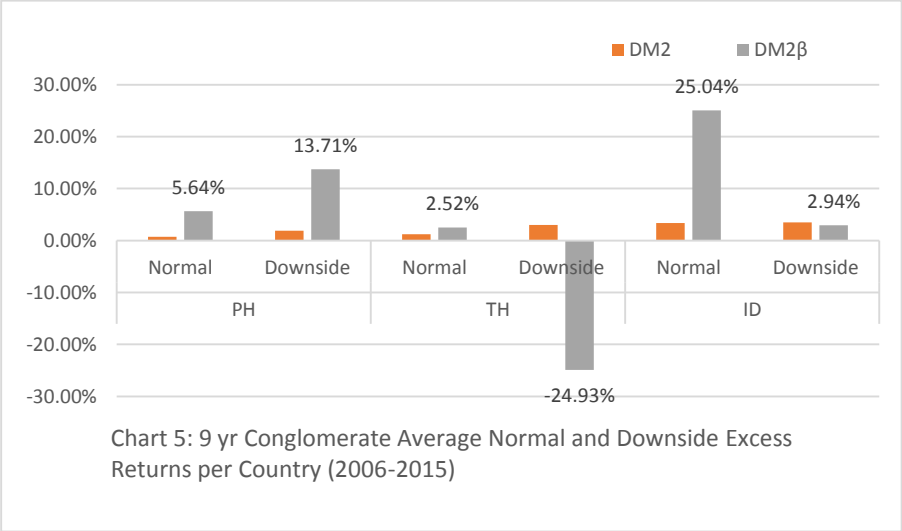


Chart 5: 9 yr Conglomerate Average Normal and Downside Excess Returns per Country (2006-2015)

Source: Authors analysis

Figure 23: 9-year Conglomerate Average Normal and Downside Excess Returns per Country (2006-2015)

Figure 24 shows the time-varying Normal vs Downside comparisons. On average, the DM^2*d* performance showed higher excess returns against DM^2 across all three periods. Meanwhile, DM^{2}β*d* is inconsistent with no apparent trend when comparing with its DM^{2}β counterpart over the 9-year and 3-year periods. The comparative results here are scattered with no clear pattern, as evidenced by wide variances such as 2006-2009 generating

25.02% $DM^2\beta$ vs -20.70% for $DM^2\beta d$. Observed also are polarized differences per country with PH demonstrating consistent superiority of $DM^2\beta d$ while TH and ID showing mixed results throughout.

	2006-2015		2006-2009		2010-2015	
Performance Metric	**Normal**	**Downside (*d*)**	**Normal**	**Downside (*d*)**	**Normal**	**Downside (*d*)**
All Countries						
DM^2	1.77%	2.79%	0.56%	2.64%	2.42%	2.87%
$DM^2\beta$	11.07%	-2.76%	25.02%	-20.70%	3.51%	6.96%
Philippines						
DM^2	0.74%	1.87%	0.58%	2.13%	0.83%	1.73%
$DM^2\beta$	5.64%	13.71%	13.59%	20.90%	1.33%	9.82%
Thailand						
DM^2	1.20%	3.01%	0.19%	4.57%	1.75%	2.16%
$DM^2\beta$	2.52%	-24.93%	-1.99%	-83.30%	4.97%	6.68%
Indonesia						
DM^2	3.36%	3.50%	0.90%	1.24%	4.69%	4.72%
$DM^2\beta$	25.04%	2.94%	63.47%	0.30%	4.22%	4.37%

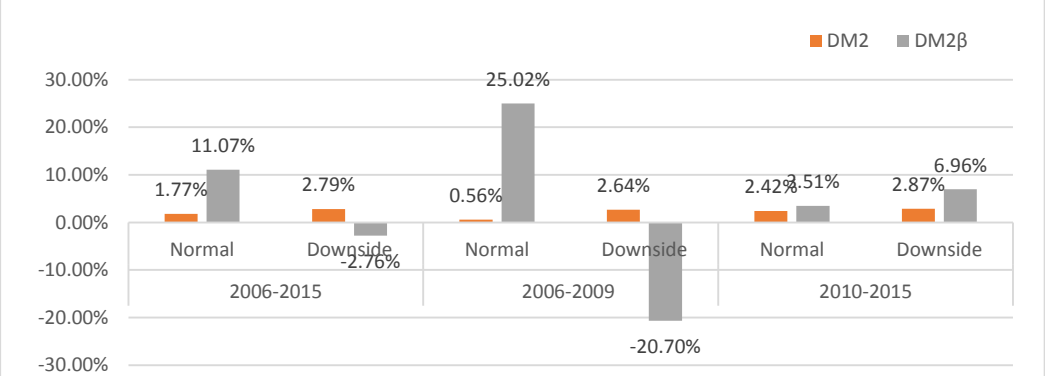
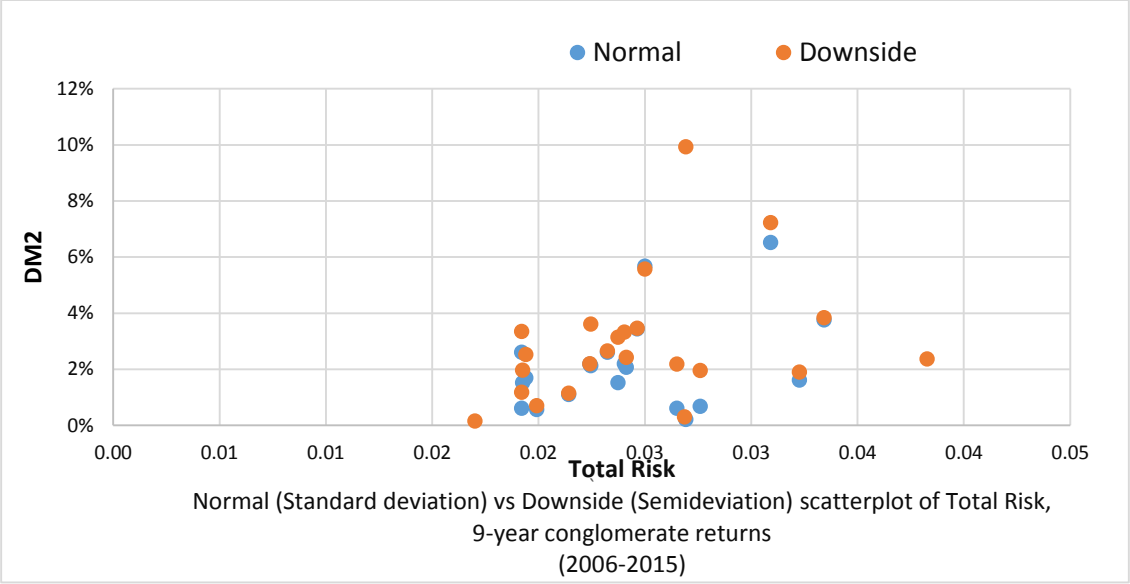


Chart 6 : Time-varying Conglomerate Average Normal and Downside Excess Returns

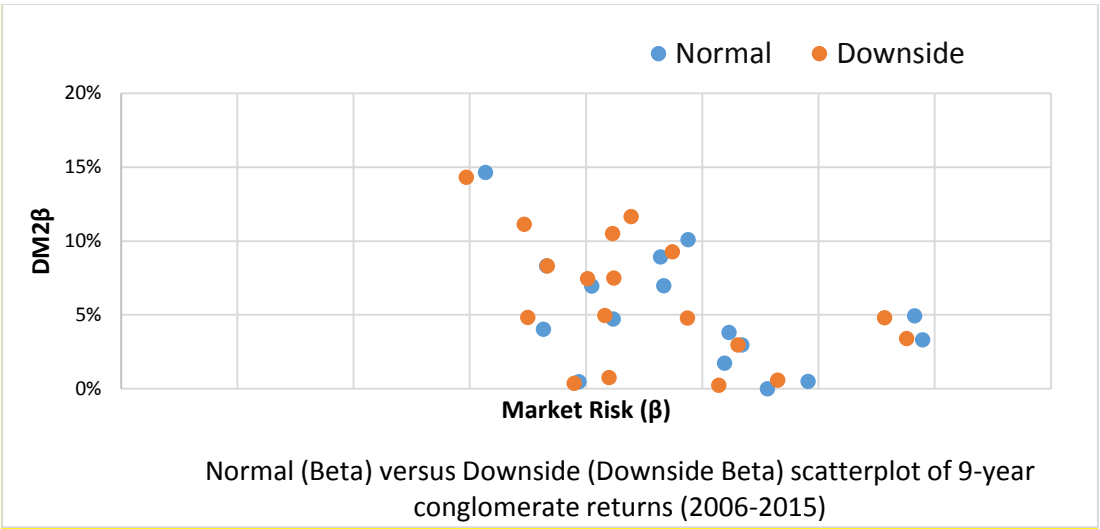
Source: Authors analysis

Figure 24: Time-varying Conglomerate Average RAP and MRAP Excess Returns

Presented in Figure 25 are the scatterplot graphs of excess returns comparing their Normal and Downside counterparts. In both charts, the Normal and Downside measures are closely clustered and interspersed with each other. However, for Market Risk beta slightly fall to the right of Downside measures. This suggests that the Normal measures represent lower returns per unit of risk, based on bi-directional volatility.



Normal (Standard deviation) vs Downside (Semideviation) scatterplot of Total Risk, 9-year conglomerate returns (2006-2015)



Normal (Beta) versus Downside (Downside Beta) scatterplot of 9-year conglomerate returns (2006-2015)

Figure 25: Total and Market Risks, Normal vs. Downside Comparisons

5.4 Observation to RQ# 3: Semi-deviation risks have minimal ranking effects

Unadjusted versus risk-adjusted returns (including SRAP) are presented in Table 10 with the ranking of the 24 conglomerates according to differentials vs index. On an unadjusted excess return basis, seven conglomerates, LPKR, KLBF, ASII, INDF, PTT, BMTR and SCC, underperformed the benchmark. Wide shifts in rankings are observed from TSR' to other return measures, with LTG falling the most at 19, 17 and 9 places down when using the $DM^2\beta$, DM^2 and DM^2d metrics, respectively. JGS and LPZ dropped down 12 places for DM^2. BTS, TPIPL and AKRA declined 11 places for $DM^2\beta d$. Both KLBF and INDF climbed 15 places up under the DM^2 metric and ASII which moved up 18 and 16 places per DM^2 and DM^2d were the highest gainers.

Table 10: 9-year Combined Conglomerate Excess Return Ranking (2006-2015)

Country	Conglomerate	Unadjusted TSR'	Normal (DM^2)	SRAP (DM^2d)	Normal ($DM^2\beta$)	Downside($DM^2\beta d$)
PH	AC	16	23	24	18	20
PH	AEV	6	11	11	8	8
PH	AGI	15	24	22	15	7
PH	DMC	3	7	8	4	4
PH	JGS	2	14	9	2	10
PH	LPZ	5	17	15	5	6
PH	LTG	4	21	13	23	1
PH	SM	12	18	19	12	14
TH	BJC	7	9	5	3	3
TH	BTS	13	20	1	21	24
TH	CPF	9	5	7	11	12
TH	INTUCH	17	13	16	6	5
TH	MINT	11	10	12	22	17
TH	PTT	20	19	21	16	18

Country	Conglomerate	Unadjusted TSR'	Normal (DM^2)	SRAP (DM^2d)	Normal ($DM^2\beta$)	Downside($DM^2\beta d$)
TH	SCC	18	22	23	20	22
TH	TPIPL	10	16	17	19	21
ID	AKRA	8	2	3	17	19
ID	ASII	22	4	6	13	15
ID	BMTR	19	12	18	7	9
ID	CPIN	1	1	2	1	2
ID	CTRA	14	3	4	9	13
ID	INDF	21	6	10	14	16
ID	KLBF	23	8	14	10	11
ID	LPKR	24	15	20	24	23

Numbers in red underperformed the benchmark

Numbers shaded indicates shift in rankings from Normal Excess Return

Source: Authors analysis

Focusing on Total Risk versus Market Risk, there are also substantial fluctuations in rankings between DM^2 and $DM^2\beta$ wherein JGS and LPZ moved up 12 ranks higher whereas AKRA plunged 15 places. Meanwhile for DM^2d and $DM^2\beta$d, AGI ascended the greatest by 15 ranks higher whereas BTS plummeted the most by 23 places down. In examining Normal versus Downside outcomes, four conglomerates performed worse than the benchmark under DM^2 but this was reduced to only one firm under DM^2d. In contrast to the DM^2 results, AGI, SCC and LTG all have excess returns under DM^2d. There is more consistency with the $DM^2\beta d$ results as only LTG and MINT fell out of the original six conglomerates that underperformed the benchmark under the $DM^2\beta$. There are significant movements in ranking between the Normal and Downside versions. Under DM^2d, BTS increased the highest at 19 ranks up while BMTR and KLBF declined the greatest at 6 ranks down from DM^2. For $DM^2\beta d$, LTG mounted the greatest at 22 ranks higher and JGS fell the furthest at 8 ranks lower from $DM^2\beta$. On a per country basis, the

same results can be observed from shifts in ranking using the same comparisons outlined above though the changes are much lesser because of the smaller number of firms that are ranked against each other. However, rankings for Indonesia conglomerates are relatively more consistent as compared to Philippine and Thailand conglomerates (see Appendix 3).

Table 11 presents ranking comparisons between use of local benchmarks, PSEi, SET50 and JKSE, and the international benchmark, MSCI World Index. There is significant inconsistency as to the conglomerates that are in the negative territory when using international benchmarks as compared to local benchmarks. For DM^2 and DM^2d, all conglomerates performed better than the international index. However, per the local benchmarks, about 4 firms for DM^2 and 1 firm for DM^2d underperformed. Meanwhile, there are significant differences for $DM^2\beta$ – 6 for local vs 9 for international benchmark underperformers. Meanwhile, both local and international benchmarks showed 4 underperformers for $DM^2\beta d$. For $DM^2\beta$ and MRAP $DM^2\beta d$ performance metrics using the international benchmark, KLBF, BMTR, LPKR and CPIN consistently performed worse than MSCI. There is relatively no variability in ranking between local and international benchmarks for the unadjusted return metric as compared to risk-adjusted metrics. The biggest change in ranking can be observed for SCC (20 ranks up for DM^2 and 1 rank down for DM^2d), TPIPL (15 ranks higher for DM^2 and 2 ranks lower for DM^2d), LPKR (5 ranks up for DM^2 and 8 ranks up for DM^2d), CPF and MINT (both at 14 ranks lower for DM^2 and 8 ranks lower for DM^2d).

Table 11: 9-year Combined Conglomerate Excess Return Ranking with Local vs International Benchmark Comparisons (2006-2015)

	Unadjusted TSR'		Normal (DM^2)		SRAP (DM^2d)		Normal ($DM^2\beta$)		D'side ($DM^2\beta d$)	
Firm	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**
AC	16	16	23	22	24	22	18	1	20	18
AEV	6	6	11	14	11	11	8	22	8	7
AGI	15	15	24	20	22	21	15	20	7	6
DMC	3	3	7	11	8	7	4	18	4	4
JGS	2	2	14	13	9	8	2	6	10	9
LPZ	5	5	17	16	15	14	5	4	6	5
LTG	4	4	21	21	13	13	23	16	1	1
SM	12	12	18	17	19	17	12	21	14	11
BJC	7	7	9	12	5	10	3	10	3	14
BTS	13	13	20	15	1	16	21	13	24	13
CPF	9	9	5	19	7	15	11	14	12	15
INTUCH	17	17	13	23	16	18	6	15	5	17
MINT	11	11	10	24	12	20	22	12	17	19
PTT	20	20	19	18	21	23	16	3	18	20
SCC	18	18	22	2	23	24	20	2	22	16
TPIPL	10	10	16	1	17	19	19	11	21	2
AKRA	8	8	2	4	3	2	17	8	19	10
ASII	22	22	4	6	6	4	13	7	15	8
BMTR	19	19	12	9	18	9	7	23	9	23
CPIN	1	1	1	3	2	1	1	17	2	21
CTRA	14	14	3	5	4	3	9	5	13	3
INDF	21	21	6	8	10	6	14	9	16	12
KLBF	23	23	8	7	14	5	10	24	11	24
LPKR	24	24	15	10	20	12	24	19	23	22

Numbers in red underperformed the benchmark
Numbers shaded indicates shift in rankings from excess return metrics using local benchmarks
Source: Authors analysis

There are more prevalent changes in rankings that can be observed for $DM^2\beta$ and $DM^2\beta d$. These movements can be noted in TPIPL (8 ranks up for $DM^2\beta$ and 19 ranks up for $DM^2\beta d$), SCC (ranks 18 higher for $DM^2\beta$ and 6 ranks higher for $DM^2\beta d$), CPIN (ranks 16 lower for $DM^2\beta$ and 19 ranks lower for $DM^2\beta d$) and BMTR (ranks 16 lower for $DM^2\beta$ and 14 ranks lower for $DM^2\beta d$). The ranking results tend to be more consistent when conglomerate firms are ranked on a per country basis. There is no variability in rankings for TSR' when either the local or international benchmark is used. The greatest change that can be observed were INTUCH (6 ranks lower for $DM^2\beta$ and 4 places down for $DM^2\beta d$) and BMTR (5 ranks lower for both $DM^2\beta$ and $DM^2\beta d$), MINT (5 ranks lower for DM^2 and 2 places down for $DM^2 d$) and CPF (5 ranks lower for DM^2 and 1 rank up for $DM^2 d$). However, discrepancies for conglomerates that are in the negative territory are similar to earlier observations, as highlighted in Table 12.

Table 12: 9-year Per Country Conglomerate Excess Return Ranking with Local vs International Benchmark Comparisons (2006-2015)

	Unadjusted TSR'		Normal (DM^2)		Downside ($DM^2 d$)		Normal ($DM^2\beta$)		Downside ($DM^2\beta d$)	
Conglomerate	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**	**Local**	**Int'l**
Philippines										
AC	8	8	7	8	8	8	7	1	8	8
AEV	5	5	2	3	3	3	4	8	5	5
AGI	7	7	8	6	7	7	6	6	4	4
DMC	2	2	1	1	1	1	2	5	2	2
JGS	1	1	3	2	2	2	1	3	6	6
LPZ	4	4	4	4	5	5	3	2	3	3
LTG	3	3	6	7	4	4	8	4	1	1
SM	6	6	5	5	6	6	5	7	7	7

Thailand										
BJC	1	1	2	3	2	1	1	3	1	3
BTS	5	5	7	4	1	3	7	6	8	2
CPF	2	2	1	6	3	2	3	7	3	4
INTUCH	6	6	4	7	5	4	2	8	2	6
MINT	4	4	3	8	4	6	8	5	4	7
PTT	8	8	6	5	7	7	4	2	5	8
SCC	7	7	8	2	8	8	6	1	7	5
TPIPL	3	3	5	1	6	5	5	4	6	1
Indonesia										
AKRA	2	2	2	2	2	2	7	3	7	3
ASII	6	6	4	4	4	4	5	2	5	2
BMTR	4	4	7	7	7	7	2	7	2	7
CPIN	1	1	1	1	1	1	1	5	1	5
CTRA	3	3	3	3	3	3	3	1	4	1
INDF	5	5	5	6	5	6	6	4	6	4
KLBF	7	7	6	5	6	5	4	8	3	8
LPKR	8	8	8	8	8	8	8	6	8	6

Numbers in red underperformed the benchmark
Numbers shaded indicates shift in rankings from excess return metrics using local benchmarks
Source: Authors analysis

5.5 Supplementary Research : Statistical Outcomes and Relationships

The initial purpose of the supplementary regression and correlation analysis was to reveal possible explanatory variables for TSR of the ASEAN conglomerate sample. This was to explore possible relationships with commonly used financial metrics that may influence TSR. As the research progressed, it appeared that there was little or no relationship between the selected variables with long-term returns. This was the first phase of the statistical analysis. By the second phase of the statistical analysis, a comparative review of similar emerging market studies was conducted. What this later analysis revealed were

similarities with Estrada's (2001) findings on 28 emerging markets. A brief comparison showed that downside risk (semi-deviation) with respect to risk-free rate appears to have a degree of reasonable correlation to TSR as well as decent R-squared outcomes across varying periods. This led the research to scrutinize the existing risk-adjusted return metrics, to ascertain whether a semi-deviation would best fit the ASEAN conglomerates. A detailed explanation is available in section 5.6.

Overall, the results from the first phase of both the regression and correlation analysis looked discouraging since all regression and correlation analysis yielded low R-squares and had some F-significance values greater than 5%. While few variables yielded correlation coefficients as high as 99%, these values are no longer meaningful as those variables are obviously related variables such as Beta index with downside beta and total risk with downside total risk. As such, it appears that variables that were speculated to affect performance were unrelated to conglomerate returns. Similar to Droms and Walker's (1996) mutual fund study, the common variables for conglomerates (market size, debt-to-capital etc) fail to provide any clear relationship with returns. Nevertheless, since the study only utilized a limited number of companies in the analysis, a rerun of the analysis with more than 24 companies in the sample size might give better results. Thus, the challenges of rerunning a larger ASEAN-wide sample of firms may be forthcoming.

5.5.1 Methodology for Initial Statistical Run

The sample used in this study consists of the same 24 publicly-traded conglomerate firms in the returns analysis. The monthly returns for each of the conglomerates were gathered for periods of 9 (Jan 2006 – Jan 2015), 3 (Jan 2006 – Jan 2009) and 6 (Jan 2010 – Dec 2015) years. The study utilized seven factors : market risk (beta), downside beta, total risk (standard deviation), downside total risk (semideviation), debt-to-capital ratio, size (market capitalization), and price-to-book value. The above data were gathered solely from Capital IQ. Correlation and regression analyses were utilized to analyze the strength of the relationship between each of the factors and historical stocks' returns. For the regression analysis, the simple and multiple regressions were used to calculate two sets of results, each with 9-, 6- and 3-year time periods. The same set of data was also used for the correlation analysis. As reference, Tables 13 through 15 on the following pages show the summary of data used for the analyses. Using this data, the research generated a simple linear regression model relating to mean returns of the ASEAN conglomerates to each of the seven variables considered. In formula, this would be:

$$\mu i = Y_0 + Y_1 \, Vi + Xi$$

where μi and V_i represent mean return and risk variable, while Y_0 and Y_1 are coefficients to be estimated. X_i is the error term, and i ASEAN conglomerate. For the multiple regression analysis, $MR = Y_0 + Y_1 \, Vi + Y_2 \, V_{2+\ldots} \, Y_8 \, V_8 + Xi$ applies, where Vi is the conglomerate mean TSR.

Table 13: Summary of Data, 9-year Period

9-year Period								
	TSR	βi	$\beta_{R_f}^{d}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
AC	0.04	1.11	1.03	0.0192	0.0173	11.41	0.28	2.24
AEV	0.09	0.81	0.73	0.0194	0.0170	11.25	0.24	2.41
AGI	0.05	1.04	0.95	0.0269	0.0226	11.09	0.25	1.62
DMC	0.11	0.98	0.88	0.0240	0.0199	10.98	0.18	2.61
JGS	0.12	0.90	0.80	0.0237	0.0198	11.31	0.37	1.34
LPZ	0.10	0.93	0.85	0.0265	0.0217	10.33	0.53	0.94
LTG	0.10	0.29	0.32	0.0383	0.0260	10.82	0.23	2.22
SM	0.06	1.05	0.97	0.0192	0.0173	11.60	0.26	2.59
BJC	0.01	0.63	0.59	0.0225	0.0191	10.42	0.16	3.08
BTS	0.02	0.72	0.64	0.0269	0.0192	10.38	0.10	1.62
CPF	0.09	0.73	0.70	0.0192	0.0177	11.03	0.29	1.79
INTUCH	0.05	0.73	0.69	0.0193	0.0174	11.12	0.06	6.12
MINT	0.06	0.90	0.84	0.0241	0.0219	10.75	0.20	3.93
PTT	0.04	1.18	1.13	0.0199	0.0185	11.91	0.30	1.70
SCC	0.06	0.87	0.86	0.0170	0.0161	11.55	0.25	3.09
TPIPL	0.03	1.12	1.06	0.0276	0.0235	10.35	0.13	0.45
AKRA	0.12	0.79	0.78	0.0250	0.0244	12.88	0.12	2.98
ASII	0.07	1.38	1.35	0.0246	0.0239	14.24	0.09	3.60
BMTR	0.08	0.93	0.85	0.0323	0.0284	13.08	0.22	1.88
CPIN	0.18	1.27	1.23	0.0309	0.0288	13.18	0.14	4.71
CTRA	0.10	1.37	1.31	0.0334	0.0315	12.88	0.08	1.78
INDF	0.07	1.07	1.06	0.0232	0.0230	13.53	0.20	2.59
KLBF	0.07	0.85	0.83	0.0224	0.0214	13.42	0.01	5.62
LPKR	0.04	0.87	0.86	0.0214	0.0209	13.19	0.22	2.22

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

Table 14: Summary of Data, 3-year Period

3-year Period								
	TSR	βi	$\beta_{R_f}^{d}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
AC	0.01	1.17	1.03	0.0246	0.0209	11.22	0.22	2.07
AEV	0.06	0.56	0.52	0.0200	0.0179	10.59	0.22	1.22
AGI	-0.01	0.90	0.77	0.0373	0.0284	10.54	0.24	1.00
DMC	0.13	0.79	0.71	0.0303	0.0230	10.22	0.23	1.22
JGS	0.11	0.56	0.50	0.0273	0.0220	10.74	0.56	0.73
LPZ	0.18	1.16	1.03	0.0369	0.0281	10.10	0.36	1.50
LTG	0.03	0.10	0.13	0.0534	0.0351	10.06	0.29	2.26
SM	0.05	0.91	0.84	0.0225	0.0197	11.26	0.27	2.07
BJC	-0.01	0.29	0.31	0.0184	0.0163	9.90	0.25	0.87
BTS	0.02	0.91	0.76	0.0436	0.0247	9.60	0.00	1.60
CPF	0.02	0.47	0.46	0.0177	0.0162	10.54	0.33	0.82
INTUCH	0.05	0.60	0.54	0.0236	0.0198	10.89	0.10	2.01
MINT	0.10	0.89	0.81	0.0284	0.0246	10.58	0.16	3.99
PTT	0.02	1.25	1.16	0.0257	0.0228	11.84	0.26	2.04
SCC	0.05	0.76	0.74	0.0194	0.0177	11.35	0.30	2.84
TPIPL	0.04	1.05	0.99	0.0340	0.0278	10.16	0.00	0.33
AKRA	0.14	0.56	0.54	0.0284	0.0270	12.46	0.13	2.13
ASII	0.13	1.25	1.18	0.0313	0.0296	13.90	0.11	2.85
BMTR	0.01	0.80	0.72	0.0357	0.0304	12.83	0.31	1.67
CPIN	0.29	0.87	0.88	0.0346	0.0307	12.34	0.31	1.90
CTRA	0.06	1.17	1.13	0.0376	0.0350	12.58	0.05	1.26
INDF	0.15	1.18	1.16	0.0298	0.0293	13.21	0.25	2.46
KLBF	0.04	0.56	0.54	0.0248	0.0224	12.98	0.01	3.09
LPKR	0.04	0.42	0.42	0.0164	0.0155	13.02	0.21	2.75

TSR = Total shareholder's return; βi = market risk (Beta); $\beta_{Rf}{}^{d}$ = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

Table 15: Summary of Data, 6-year Period

6-year Period								
	TSR	βi	$\beta_{R_f}^{D}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
AC	0.06	1.08	1.03	0.0163	0.0154	11.49	0.32	2.33
AEV	0.10	0.95	0.85	0.0191	0.0165	11.41	0.26	3.06
AGI	0.08	1.11	1.05	0.0212	0.0195	11.24	0.26	1.96
DMC	0.10	1.08	0.97	0.0206	0.0183	11.14	0.15	3.36
JGS	0.12	1.08	0.97	0.0218	0.0185	11.45	0.27	1.67
LPZ	0.05	0.80	0.74	0.0209	0.0183	10.41	0.62	0.64
LTG	0.13	0.40	0.42	0.0301	0.0211	10.98	0.20	2.20
SM	0.06	1.12	1.05	0.0174	0.0160	11.71	0.26	2.63
BJC	0.02	0.81	0.75	0.0247	0.0206	10.71	0.11	4.28
BTS	0.02	0.61	0.58	0.0179	0.0163	10.80	0.15	1.63
CPF	0.12	0.87	0.83	0.0200	0.0186	11.30	0.27	2.32
INTUCH	0.06	0.80	0.78	0.0169	0.0161	11.24	0.04	8.35
MINT	0.04	0.91	0.86	0.0218	0.0204	10.85	0.22	3.89
PTT	0.05	1.15	1.11	0.0168	0.0161	11.94	0.32	1.52
SCC	0.07	0.93	0.92	0.0157	0.0151	11.66	0.22	3.22
TPIPL	0.02	1.16	1.10	0.0242	0.0212	10.46	0.19	0.52
AKRA	0.11	0.91	0.91	0.0232	0.0230	13.11	0.11	3.44
ASII	0.04	1.45	1.44	0.0210	0.0209	14.42	0.08	4.00
BMTR	0.11	1.01	0.92	0.0304	0.0273	13.22	0.17	1.99
CPIN	0.12	1.48	1.43	0.0289	0.0278	13.63	0.04	6.24
CTRA	0.12	1.47	1.41	0.0312	0.0296	13.05	0.10	2.06
INDF	0.03	1.01	1.01	0.0197	0.0196	13.71	0.18	2.66
KLBF	0.08	1.00	0.99	0.0211	0.0209	13.66	0.00	6.99
LPKR	0.04	1.10	1.10	0.0241	0.0239	13.28	0.23	1.93

TSR = Total shareholder's return; βi = market risk (Beta); $\beta_{Rf}{}^{d}$ = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

5.5.2 Regression Analysis

The simple regression analysis resulted to p-values and F significance greater than 5%. For the multiple regression analysis, only the debt/capital ratio variable yielded the p-value of less 5% which implies having the variable a significant contributor for the variance of the total returns and is thus strongly correlated to it. The r-squared values for the 9-, 3- and 6-year periods are relatively high with values ranging from 35% to 47% implying a somewhat high correlation of the variables with the total returns. The F significance values however for the 9-, 3- and 6-year periods are at 11%, 33% and 33%, respectively. Tables 16 and 17 imply a somewhat coincidental relationship between the variables to the total returns and cannot strongly support an existing correlation despite relatively high R-squared values.

Table 16: Simple Regression Results

	P-Values			F-Significance			R-Squared		
	9-year	3-year	6-year	9-year	3-year	6-year	9-year	3-year	6-year
βi	0.50	0.25	0.80	0.50	0.25	0.80	0.02	0.06	0.00
$\beta_{R_f}^{d}$	0.45	0.17	0.89	0.45	0.17	0.89	0.03	0.09	0.00
σi	0.08	0.49	0.03	0.08	0.49	0.03	0.13	0.02	0.20
Σ_{R_f}	0.02	0.09	0.08	0.02	0.09	0.08	0.22	0.12	0.14
Mcap	0.13	0.20	0.44	0.13	0.20	0.44	0.10	0.07	0.03
DCR	0.68	0.35	0.58	0.68	0.35	0.58	0.01	0.04	0.01
PBV	0.44	0.48	0.71	0.44	0.48	0.71	0.03	0.02	0.01

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

Table 17: Multiple Regressions Results

	P-Values			F-Significance			R-Squared		
	9-year	**3-year**	**6-year**	**9-year**	**3-year**	**6-year**	**9-year**	**3-year**	**6-year**
βi	0.64	0.37	0.17	0.11	0.33	0.33	0.47	0.35	0.36
$\beta_{R_f}^{d}$	0.64	0.35	0.19	0.11	0.33	0.33	0.47	0.35	0.36
σi	0.98	0.71	0.15	0.11	0.33	0.33	0.47	0.35	0.36
Σ_{R_f}	0.38	0.50	0.36	0.11	0.33	0.33	0.47	0.35	0.36
Mcap	0.68	0.66	0.19	0.11	0.33	0.33	0.47	0.35	0.36
DCR	0.03	0.18	0.59	0.11	0.33	0.33	0.47	0.35	0.36
PBV	0.06	0.47	0.43	0.11	0.33	0.33	0.47	0.35	0.36

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

5.5.3 Correlation Analysis

The 9-year period correlation analysis resulted to correlation coefficients ranging from -2% to 99%. Only the total risk variable has a correlation coefficient of less than 5% (absolute 2%). From the values on Table 18, beta index and downside beta index are very much strongly correlated evidenced from the very high correlation coefficient of 99%. On the other hand, it appears size (market cap) is correlated with beta index, downside beta index and downside total risk as evidenced from its relatively high correlation coefficients. The correlation of the size with beta index and downside beta index is obvious since the two variables are strongly correlated as previously mentioned.

Table 18: Correlation Results, 9-year

9-year								
	TSR	βi	$\beta_{R_f}^{d}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
TSR	1.000							
βi	0.146	1.000						
$\beta_{R_f}^{d}$	0.160	0.990	1.000					
σi	0.365	-0.038	-0.025	1.000				
Σ_{R_f}	0.473	0.305	0.342	0.867	1.000			
Mcap	0.317	0.480	0.556	0.086	0.464	1.000		
DCR	0.090	-0.082	-0.135	-0.139	-0.280	-0.385	1.000	
PBV	0.166	-0.068	-0.017	-0.214	-0.054	0.349	-0.580	1.000

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

Unlike the results of correlation for the 9-year period, the results for the 3-year period showed relatively lower correlations. Correlation coefficients ranged from -20% to 99%. Factors such as the beta index and the total risk reflected a strong correlation with their downside equivalents evidenced by high correlation coefficients greater than 85%.

Table 19: Correlation Results, 3-year

3-year								
	TSR	βi	$\beta_{R_f}^{d}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
TSR	1.000							
βi	0.242	1.000						
$\beta_{R_f}^{d}$	0.292	0.991	1.000					
σi	0.148	0.146	0.124	1.000				
Σ_{R_f}	0.349	0.342	0.364	0.868	1.000			
Mcap	0.270	0.274	0.347	-0.163	0.224	1.000		
DCR	0.200	-0.209	-0.206	-0.129	-0.147	-0.149	1.000	
PBV	0.151	0.067	0.095	-0.095	0.008	0.476	-0.200	1.000

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

Correlation from the 6-year period showed somewhat the same trends as the 9-year period with the exception of negative correlations from size and debt-capital. Correlation coefficients ranged from -39% to 99%. There is a somewhat relatively strong negative correlation between size (market cap) and debt/capital ratio as well as between debt/capital ratio and price-to-book value. This is quite reasonable since an increase in debt proportion will mean a decrease in the market value of the firm and thus should result in lower PBV. This could also imply that the firm gets undervalued because the firm's decrease in market value did not result in a commensurate decrease in the book value of the firm.

Table 20: Correlation Results, 6-year

6-year								
	TSR	βi	$\beta_{R_f}^{d}$	σi	Σ_{R_f}	**Mcap**	**DCR**	**PBV**
TSR	1.000							
βi	0.055	1.000						
$\beta_{R_f}^{d}$	0.029	0.990	1.000					
σi	0.452	0.154	0.157	1.000				
Σ_{R_f}	0.369	0.428	0.445	0.908	1.000			
Mcap	0.165	0.571	0.639	0.276	0.546	1.000		
DCR	-0.120	-0.211	-0.252	-0.276	-0.388	-0.489	1.000	
PBV	0.080	0.062	0.093	-0.072	0.046	0.307	-0.678	1.000

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate; Mcap = market size (log of market capitalization); DCR = debt-to-capital ratio, PBV = price to book value

5.6 Discussion

There appears to be a lack of consensus regarding the "ideal" risk to apply for performance appraisal. This is not entirely surprising as all risk variables, whether total or systematic (and their downside versions) have their shortcomings based on

circumstances. Ultimately, investors look for a reasonable, easy-to-grasp risk measures that generate data to make efficient decisions; that is, decisions that have a degree of consistency with their perception of risk, given their investing goals. Thus, this research recommends the relevant utility of DM^2d, herein dubbed *Semideviation Risk-Adjusted Performance* (SRAP), due to the results of this research' comparative returns and statistical outcomes. Referring to the concept framework equation in Figure 26, SRAP parallels M-squared by simply using semideviation (with respect to the prevailing risk-free rate) in place of standard deviation. Other studies pursue mean returns or 0 as benchmark returns to qualify semideviation. This research maintains using the Risk-free rate as the generic hurdle return, assuming the use of leverage and/or the view of opportunity cost of the investor.

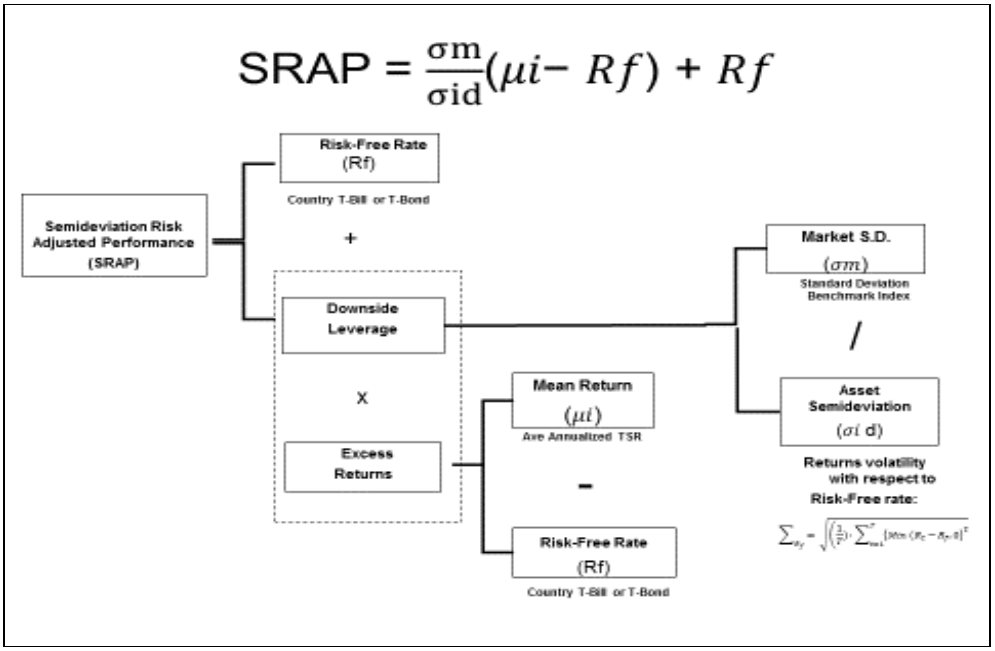


Figure 26: Semideviation Concept Formula Framework

The plausibility of a SRAP approach for performance appraisal can be supported by examining similarities of the statistical outcomes and Estrada's (2001) downside findings on 28 emerging markets from 1988-1998 and 27 ASEAN Conglomerates from 2005-2015, as shown on Table 21. First, using semideviation appears to have a degree of reasonable correlation to TSR across varying periods, at about 0.47-0.48. This highlights previous observations on the close relationship between emerging market mean returns and semideviation (with respect to the mean) for a long-term period. A second similarity would be the decent R-squared outcomes for semideviation, although markedly lower that standard deviation. This also shows that systematic risk (beta) is not significantly related to TSR. In contrast, total risk (standard deviation) and downside risk (semideviation) do come out significant when jointly considered with systematic risk. In Chapter 6, the conclusions shall elaborate on other contributing factors revealed by academic studies that support this approach such as significance, and time-varying results and partial integration.

Table 21: ASEAN Conglomerate vs. Estrada Emerging Market Comparatives

	Correlation with TSR		P-values		R-Squared	
	ASEAN	Estrada	ASEAN	Estrada	ASEAN	Estrada
βi	0.14	0.32	0.50	0.09	0.02	0.07
$\beta_{R_f}^{d}$	0.16	0.42	0.45	0.03	0.03	0.14
σi	0.36	0.56	0.08	0.00	0.13	0.29
Σ_{R_f}	0.47	0.48	0.02	0.01	0.22	0.20

ASEAN (27 ASEAN Conglomerates from 2005-2015), Estrada (28 emerging markets from 1988-1998)

TSR = Total shareholder's return; βi = market risk (Beta); β_{Rf}^{d} = downside beta relative to risk free rate; σi = total risk; Σ_{R_f} = downside risk, semi-deviation with respect to risk-free rate

Source: Authors analysis, comparison with Estrada (2002)

The SRAP uses semi-deviation, thus is more of an extension of Modigliani & Modigliani's (1997) M-squared metric, rather than Estrada's (2001) Beta. The research has expressed its preference using semi-deviation (as total risk proxy) as it is a better fit with emerging markets like ASEAN, rather than Beta (which applies more to developed markets). Arguably, the asset being measured by SRAP (and other performance appraisal metrics) is the conglomerate return. Thus, the downside variations are risks to the investor while the market index' behavior is merely a benchmark. Notice that the semi-deviation is applied only to the variations of the asset (here being the ASEAN Conglomerate), while the market index remains using standard deviation. Equalizing the market index by using semi-deviation has no significance to investors as they are not invested in the market itself. The investor merely needs a practical, loss-aversion approach to compare to the actual fluctuations against his asset, basis the leverage factor. Recall that the leverage factor ($\frac{\sigma m}{\sigma i}$) represents a comparison with the asset risk (here, the semideviation of returns) with the market index risk (using total risk). If, for example, the leverage factor equates to < 1, this implies that the ASEAN conglomerate is riskier than the index. The investor must consider selling a portion of the asset holdings and invest it in a risk-free asset such as the country Treasury bills. However, if the leverage factor reveals itself as > 1, it implies less risk on the ASEAN conglomerate, leading the investor to either hold onto the position or investing further. Neverthless, future research can test and contrast SRAP and possible modifications in the market index, using semideviation risks.

Chapter 6

Conclusions and Concept Recommendations

6.1 Summary of Key Findings

The research examined the performance of SEA Conglomerates that are publicly-traded in the ASEAN Exchange and its impact on current risk-adjusted methods, aiming at exploring several hypotheses that could help explain a more appropriate equity performance measure. Through an established performance appraisal approach, the present study generated a new metric, SRAP, to fortify the monitoring undertaken by both investors and managers handling their funds. In this sense, this study augmented the widespread understanding of risk-adjusted returns, by incorporating the relevant downside factors and isolating semideviation as the relevant risk measure for emerging SEA markets. Using SRAP as a risk-adjusted historical performance measure may be of interest to both investment analysts and index companies. The ASEAN Exchange may include this as a dashboard metric when promoting the potential performance of ASEAN firms to investor audiences, those with SEA-based (using domestic indices as benchmarks) and global (using MSCI AWI index or other equivalents) outlooks. The outcomes of this research apply risk-adjusted variables to the long-term returns analysis catering to the margin-seeking, long position investor seeking

diversifiable returns in emerging markets of the ASEAN Exchange. Rather than pursuing a predective, determinant-led objective, the research has undertaken a more readily digestible measure to ensure adoptability and practicality of the returns apprasial given the barriers mentioned. The SRAP metric consistently conforms to generally accepted performance appraisal principles related to returns measurement, risk factors, and benchmark standards. The goals achieved in this study addressed the research questions, as follows:

1) Have SEA conglomerates indeed outperformed their assigned benchmarks? What are the evaluation methods that can be incorporated in contemporary SEA conglomerate studies on stock performance?

The conglomerates in ID, PH, and TH outperformed benchmarks for the specified long-term and time-varying periods. In accordance with Alles and Murray (2013), Lemeshko and Rejnuš (2015), the research concurs with the observed emerging market phenomenon of above-index premiums. The methodology employed a variety of returns such as TSR, Sharpe, Treynor and other risk-adjusted metrics, within time-varying periods that defined a long-term trend, a boom-bust cycle and a market recovery. To ascertain the differential returns, the logic of domestic indices (LQ45, PSEi, SET50) paired with a global benchmark (MSCI AWI) revealed the premiums yielded by the sample conglomerates. This research reports a TSR surplus of 2.51% on average in excess of the country indices,

for the 9-year period of the research sample. This validates the outperformance of SEA Conglomerates, with lower overall excess returns as compared with findings of Vijayaraghavan (2014) at an astronomical 80% average premium, against the S&P500 index as benchmark. The rationale behind using this index is that no current benchmark exists that tracks the performance of conglomerates, as claimed in her study. Additionally, S&P500 can be regarded as a conglomerate/diversified representation, with exposure to diverse businesses with country-wise equity investment data indicating the U.S. as the the preferred market for non-domestic SEA equity investments. This research, however, disagrees with the application of the benchmark, finding it more relevant to measure against domestic indices as well as a global one, an argument clarified in the methodology chapter. Moreover, while this research uses a 24 conglomerate sample, Vijayaraghavan only applies her thesis to 7 firms, each representing a SEA country. Closer to this would be Vestring et al. (2014) whose study had a 49 firm sample of SEA Conglomerates that yielded a 14% average premium, using MSCI SEA Index as a benchmark. Again, this validates the outperformance but the the wide margin difference (14.00% vs 2.51%) can be attributed to benchmark decisions (MSCI SEA vs. country-indices).

2) What is the performance of ASEAN Exchange conglomerates when risk-adjusted metrics such as M-squared, in contrast to average returns yielded from Total Shareholder Return (TSR) measure? What is the impact on performance ranking amongst SEA conglomerates when risk-adjusted performance metrics are applied?

On a risk-adjusted basis, the $DM^2\beta$ showed higher excess returns at 11.07%, or 9.30% higher as compared to the DM^2, and more than four times greater than the TSR premium. The evidence of $M^2\beta$ prominence against TSR is found across country sample size as well as time-varying panel data. Results likewise consistently reveal TSR' and $DM^2\beta$ are higher than DM^2. Barring a few exceptions, $DM^2\beta$ reflects a more optimistic quantified risk-adjusted metric using normal risk factor treatment. This runs parallel with findings of Scholz & Wilkens' (2005) MRAP metric, identical to $DM^2\beta$, that was perceived as more suitable for investors who invest in many different assets, similar to the target audience of this research. Rankings experienced wide shifts when comparing TSR' to other return measures, with substantial fluctuations within rankings between DM^2 and $DM^2\beta$. However, on a per country basis, rankings for ID conglomerates are relatively more consistent as compared to PH and TH conglomerates. Upon applying international benchmark, there was little observed ranking variability against the local indices for TSR as compared with risk-adjusted metrics. There is significant inconsistency as to the conglomerates that are in the negative territory when using international benchmarks as compared to local benchmarks.

3) How can the M-squared Model be further supplemented to reflect the interests of majority of investors with long-positions (ie. in expectation of positive price gains, as opposed to short-positions seeking downturns in prices)? Which downside risk factors are most appropriate to utilize for examining emerging market stock returns in SEA?

It would be challenging to recommend a singular risk that applies to all investor circumstances. Given the large volume of literature covering risk variables, it is clear that the consensus is constantly shifting when applying total or systematic (and their downside versions) risks, each with their own strenghts and shortcomings. Scholz and Wilkens (2005, 2006) state that "the M-squared-for-Beta is suitable for investors who invest in many different assets," with the assumption that decisions complies with their perception of risk as well as how they invest (ie. specific situations call for specific metrics). In most cases, investors are comfortable with risk measures that generate data catering to more efficient, long-position decision-making. This research implies that the M-squared Model can be further supplemented by SRAP (using downside semideviation risk) based on the results of empirical comparative returns and analysis for the congomerate sample. For the long-term period, SRAP (as represented by DM^2d) generated a 1.5x higher result than when using normal standard deviation measures. However, $DM^2\beta d$ underperformed the benchmarks, with a notable variance of -13.83%, with the difference for the DM^2d at only at 1.02%. On a per country basis, all three territories reported a higher SRAP comparer to Normal risk measures. Using downside beta, $DM^2\beta d$ showed significant discrepancies while SRAP continued to show excess returns or parity with DM^2. Time-varying Normal vs Downside comparisons showed higher DM^2d returns against DM^2 across all three periods while $DM^2\beta d$ remained inconsistent with no apparent trend.

Beyond empirical arguments in the last chapter, the research posits that the application of SRAP, rather than $M^2\beta d$, is supported by established academic findings that argue for usage for pure-play (ie. single business) firms traded in the ASEAN Exchange, as well. These factors are: significance, time-varying periods, and degree of integration of emerging markets. Estrada (2001) reports total risk (alongside downside risk measured by the semideviation) with respect to the mean is significant when jointly considered with beta. However, when beta is considered together with other risk variables, it never comes out significant. For time-varying periods, he posits that returns and betas may be uncorrelated if using long-term averages but their given different economic period circumstances, values change widely over time. In fact, earlier finance theory already alluded to this in relation to efficient portfolios, as Markowitz' (1959) felt that semideviation was "somewhat preferable to that of standard deviation." Investment and strategy metrics such as cost of equity are properly measured by beta in developed markets that are fully integrated. Conversely, beta appears to lack explanatory power in fully segmented markets, which relies on standard deviation. Recall that most emerging markets are partially integrated, implied by Bekaert (1995) and Stulz (1995), in which case beta may not be the most appropriate measure of risk. They distinguish barriers to the integration of emerging markets that can be observed in the past economic histories of ID, PH and TH. Added to this is the limited size of stock markets that some of the other smaller ASEAN members suffer from. This is precisely the case with the downside risk (ie. Semideviation) estimates, consistent with partially-integrated emerging markets.

4) What is the impact of SRAP on performance ranking amongst SEA conglomerates? Why would a SRAP metric be a favorable alternative to M-squared and M-Square-for-Beta, for ASEAN emerging markets?

In examining Normal versus Downside ranking outcomes, four conglomerates performed worse than the benchmark under DM^2 but this was reduced to only one firm under DM^2d (identical to SRAP). Thus, SRAP returns have minimal effects on ranking compared to its bi-directional volatlity counterpart, for either total or systematic risk. SRAP is an apt candidate to be adopted by both industry and academe, based on several concluding advantages. First, it is theoretically sound as it relies on firm footing of previous downside beta/semideviation studies using a fixed target, here being the risk-free rate (Rf). As repeatedly mentioned, investors are not averse to volatility; what they are averse to are losses represented by *downside* volatility. It also argues the closer relevance to comparing market volatility, which is a concern of both global and domestic investors when benchmarking with a market index. The research results also point towards the relatively consistent performance in comparison to TSR across all time-varying periods using SRAP. Second, it is easy to implement as it relies on similar factors of other risk-adjusted formulas, especially since SRAP simply modifies the commonly understood standard deviation. SRAPs use of semideviation is fairly intuitive and straightforward, as it is not burdened by numerous 'versions' as with downside beta (with 3 or more types in academic literature). Third, it reflects risks consistent with partially-integrated emerging markets (as represented by the SEA economies in the sample) which make it more

appropriate than those based on systematic risk. Fourth, benchmark targets are easily replaceable. In the event that the risk-free rate does not satisfy the investors risk appetite, it can simply be replaced by another target, either a mean of an index, a personalized historical portfolio return or even 0. Last, it can be applied to firm level total risk, thus possibly affecting cost of capital estimates, especially for partially-intergrated emerging market conglomerates. Yet, there are weaknesses to mechanically applying the metric, without concern for effectiveness or relevance. SRAP suffers from failing to capture correlation risk, as with m-squared. Muralidhar (2000) believes m-squared may be used incorrectly in evaluating against a benchmark, making it less effective. More importantly, as ASEAN countries mature into developed economies with more intergrated linkages, metrics with correlations to markets would reveal more consistent data. But risk, naturally, greatly depends on the vantage point of the asset owner. So, for the given short to mid-term, SRAP remains useful for economies in ASEAN classified as emerging markets.

6.2 Implications to Performance Appraisal in Industy and Academe

Identifying an appropriate measure of risk in emerging markets is a continuing progression. Several methods have been actively implemented while many more will be proposed but await acceptance by the investing public. Given the simplicity of downside concepts, practitioners may soon acknowledge an intuitive model that will become the appropriate measure of risk-adjusted returns in emerging markets. The criticality of capital gains within the broader context of their portfolio of assets means the relevance

of monitoring returns has been highly dependent on the availability of reports from their fund managers and investment analysts. Like other participants in the investing spectrum, fund managers and index companies face challenges in adopting new appraisal tools in pursuit of advocating a specific asset, such as SEA Conglomerates, to their investor clients. There are two main implication to adopting new metrics with downside approaches: Industry, that are largely operational in nature; and Academic, covering mostly technical matters. The following section provides recommendations to respond to these implications, as follows:

(1) Industry – Often, investment reports produced by financial institutions employ the common performance evaluation and appraisal metrics, but rarely provide deeper analysis. This wide acceptance and usage of average returns is precisely what dampens potential exploration of new metrics. Finance professionals and investors have likely been exposed to principles of downside risks, but may shun its usage due to confusion over the variety of measures available, especially those pertaining to downside beta. This suggests that index companies consider augmenting their returns analysis to include risk-adjusted returns. Effectively, if index companies (those that provide benchmarks for investor consumption) embrace new metrics, this would propogate a fair amount of investor proficiency, regarding risk-adjusted measures. Next, corporate planning and strategy departments of emerging market firms are affected when examining downside options for calculating their internal cost of equity. An alternative estimation could profoundly

affect the cost of capital of ASEAN Exchange firms, crucial to their corporate planning duties.

(2) Academic – The risk orientation of investors are hinged on the understanding how risk is quantified and how it is relevant to their long-positions. Linking this to the first challenge, the lack of educational or instructional material on downside risk-adjusted returns (as compared to typical performance evaluation tools) should be addressed. Thus, these technical barriers can be hurdled by having downside risk topics incorporated into finance textbooks and course outlines, as well as theory development within classroom bounds. These recommendations are aimed at reorienting the academic to adjust to investors' risk perspectives.

These implications do not mean that academics and practitioners never intuitively think of risks in such applications. It merely means that they have not been explicitly taught and that deficiencies of applying downside risks make it easy to neglect it as an essential idea in thinking about investors' loss-aversion mentality. There are a lot of opportunities, especially evident in many proceedings from finance journals that have emphasized the benefits of utilizing downside risk factors. This research hopes that the teaching material becomes part of the typical finance curriculum. Why has the investment profession not intergrated downside risks, a fairly well-thought out concept, in their performance reporting? One reason is surely the pervasive neglect given the dominance of widely used statistical tools of standard deviation and beta at graduate business schools. The

prevalance of CAPM since the 1960's also presents other sorts of opposition that have minimized the impact of downside application. However, downside concepts are often simple and not a distant revision of traditional finance theory, once they are pointed out. In fact, it simply requires an adjustment of panel data on equity return variances (ie. normal vs downside) as well as an orientation of contemporary downside studies in emerging/developed markets. Yet this research hopes that downside measures like SRAP will gain the appreciation and implementation of the industry.

6.3 Industry Implications

There are three remarks this research makes on implications on the industry, affecting dyamics between index companies, investment analysts, client investors and corporate strategy departments. First, index companies such as FTSE rarely include risk-adjusted returns as part of their periodic reporting. Consequently, investors have little knowledge regarding new metrics that would enhance their understanding of how risk impacts their assets. This study believes that index companies have a stake in influencing the use of risk-adusted returns. They can market their index as a benchmark in a more sophisticated manner by providing the simple risk-adusted tools for asset managers of financial institutions. This way, the industry gains better exposure to risk factors relevant to a market that is a blend of emerging/developed economies, such as the FTSE ASEAN All-Shares Index. Specifically, the ASEAN Exchange can benefit from this by promoting the ASEAN-based indices to a global investor audience, given that FTSE/ASEAN 40 Index or ASEAN Stars Index are used as benchmarks by many ETFs such as GLOBAL X FTSE

ASEAN 40 ETF, CIMB FTSE ASEAN 40, and CIMB FTSE ASEAN 40 to name a few. The second point is that the downside risk classifications are really rather simple and intutive, naturally falling under the available skills of investment analysts. In order to choose the appropriate risk measure, the equity analysts need to know if a downside beta or semideviation adheres to the circumstances of the invested assets (ie. emerging or developed market, diversified or pureplay firms etc). They also need to know if the investor fully comprehends risks that are inherent in such assets. Instead of supplying average returns, perhaps ineffectively communicating only a narrow view of performance, analysts can provide strategies to assist the client investors to broaden their understanding of equity-related risks. This, of course, requires a degree of advocacy and education which is tackled in the next section, on academic implications. The third point on industry implications is the proper estimation of cost of equity for ASEAN Exchange firms. This affects the cost of capital, that is vital to a firms' corporate planning duties: that of critical analyses of project evaluation, capital structure planning and valuation. Certain models are adaptable to calculate a firms' cost of equity. In effect, downside risk measures are proxies for familiar risks expressed by CAPM (in this case, beta). Using semideviation, a firms' cost of equity is dependent on its own stocks' downside volatility compared to that of the market. This model was proposed for emerging markets by Godfrey and Espinosa (1996) and is applicable to ID, PH and TH, among the SEA economies. With downside beta, the alternate option of calculating the cost of equity is using risk that is dependent on the downside potential as against that of the market. This would be applicable to developed economies within SEA such as Singapore and Hong

Kong. Using a downside perspective can have substantial effects, as Estrada (2006) observes a 1.5-6.1% higher cost of equity than traditional CAPM for large US firms when using downside factors. Given this, it may be of interest to corporate planning departments of SEA firms to evaluate their own cost of equity, to assess if indeed there is a need to raise their hurdle rates.

6.4 Academic Implications

In Chapter 2, this research claimed that although downside risk has been acknowledged in academic and practitioner circles, there is a lack of textbook guidance and case study instruction covering the topic in most schools. The academic implications (with its apparent deficit of teaching material/s and courses on downside topics) are a consequence of risk concepts that should be reexamined to fit investor loss aversion. In effect, this research presents two categories requiring attention, related to academic course design for downside risk. First is *course instruction intergration,* aimed at teaching the topic in a prototype graduate-level Finance elective course, including suggestions for possible topic insertions in the CFA Program Curriculum. The second is *course research focus*, adapted from Carlile and Christensens'(2005) proposal of improving existing theories by identifying anomalies through a deductive course architecture, effectively expanding teaching materials and sources.

6.4.1 Course Instruction Integration

Much of finance courses on performance evaluation remain entrenched in the foundations of investment portfolio management. Further issues related to risk-adjusted returns are tackled by finance and investment journals. However, much of university courses and textbooks rarely focus on downside concepts, preferring to maintain an arms length distance with its calculation and applications. Washer and Johnson (2013) mentions the cursory acknowledgement of downside concepts, wherein the "shortcoming is common in textbooks….the student/practitioner is given little help in the application of these measures." This research firmly believes that downside concepts, such as SRAP, are useful measures for both investors and advisors. As such, a focused integration into finance courses, directed towards a more explicit application is warranted. In this section of the chapter, the conclusions describe the congruence of downside concepts with finance/investing electives at the graduate level.

This study suggests that downside concepts are *congruent with finance courses*, covering topics such as risk factors and performance evaluation. Finance courses in both undergraduate and graduate levels rests largely on classic CAPM and efficient market frontier theories. For example, an introduction to risk via beta lays the foundation in calculating the cost of equity of firms, for introductory finance courses. This foundation endures throughout several elective courses that tackle corporate valuation, financial advisory and wealth management. In addition, portfolio management courses feature risk-adjusted ratios such as Sharpe, Treynor and Jensen when comparing fund performance.

There are several possible insertion points of downside concepts for commonly taught finance courses. For fundamentals of finance management, a concept introduction to downside beta can be offered as an alternative for Capital Budgeting topics, related to cost of equity calculations. The basic equations and spreadsheet exercises for semivariance and downside beta can then be augmented in elective courses. This study recommends utilizing the step-wise statistical approach of Estrada (2006), but applying to ASEAN equity data. Corporate valuation electives can benefit by incorporating downside beta to cost of equity to supply a modified version for weighted average cost of capital (WACC). SRAP can be embedded in portfolio management, by including it as risk factor option in performance appraisal of funds or stand-alone equities. The suggested sample syllabus in the latter part of this section attempts to craft a tangible set of sessions for a generic investment management class. As link to practitioners, a certification body such as CFA can include literature and instructionals on downside risk as part of their exam curriculum in order to expose financial professionals further. This incorporated into the CFA (2014) annually revised Program Curriculum textbooks, particularly for volumes covering quantitative methods (volume 1), portfolio management (volume 4) and equity investment valuation (volume 5). Also, an advocacy campaign through similar financial certification brands would require close partnerships with university programs and financial training courses. The appropriate teaching methods are needed to blend academic methodology with practitioner/investor intuition. Graduate management education typically conduct their classes either lecture-based or case-based. The downside concepts are readily adaptable to these methods, using existing

methods and real-time emerging market panel data samples. However, other methods such as group lab work, spreadsheet drills, and competition-style applications may enhance learning and absorption.

6.4.2 Course Research Focus

The experience of many academics seems to suggest a clear division between teaching classes and research output. Many seem to be unable to blend both, as theory building appears to be a totally separate discipline. However, it is possible that research can arise from course development and teaching. Carlile and Christensen (2005) describe two commom circumstances that can be paired with the appropriate learning approach, in order to yield relevant research output. First would be an inductive approach to the topic, if the body of theory has yet to be established. The second, which this research subscribes to, would be deductive, if a theory has already emerged. With either circumstance, using classes to harness the time and talents of the students is a worthwhile endeavor. In using deductive approaches, theory improvement would be the goal of the course. Descriptive exercises can be used to define the prevaling theories of downside risks, by categorizing its components through cases featuring selected firms (or markets). As the class progresses, it can emphasize particular circumstances, such as SEA emerging markets with improving linkages or isolated economic trends affecting global markets. Here, causality should be highlighted, particularly on determinants of asset returns such as downside factors and firm characteristics. This would establish the normative theories and add to the growing literature related to emerging market risk-adjusted metrics and

downside factors. Thus, teaching how to use measures in tandem with the theory behind it could possibly to surface any anomalies that exist. These anomalies would be catalysts for prospective studies from this course research endeavor, as explained in the next section.

6.5 Future Research Opportunities

Referring to Chapter 1 on the limitations of the study, there are several topical directions for future research. Risk factors are bound by economic contexts differing across developed or emerging markets. In this line, prospecitve studies can be conducted in covering the entire ASEAN Exchange member countries, using the same research framework, to estimate the likelihood of arriving at different conclusions regarding the larger membership body. It can also reinforce some of the conclusions, by finding similarities between both developed (Singapore and Malaysia) and emerging economies (Vietnam, Laos, and Cambodia). This would promote a potential revisit of reporting policies and formats of FTSE index (or other similar ASEAN Exchange related index). Over the mid-term, this framework could also be used in future studies as a starting point for panel data generation, to determine outcomes for four topics worth exploring: an ASEAN-wide returns analysis, a Sortino ratio evaluation study, a validation of Downside Beta's explanatory power and an exploration of conglomerates as alternatives to funds/ETFs. For ASEAN-wide analysis, researchers can provide updated prices and returns on a periodic basis, for the benefit of investors looking to evaluate a larger panel data of all ASEAN market equities. In fact, a review of ASEAN indices greatly influences

ETFs and mutual funds that base their benchmark tracking on FTSE/ASEAN 40 Index or ASEAN Stars Index, encompassing regional ETFs and funds earlier mentioned. In addition, new research applying various benchmarks such as FTSE ASEAN All-Shares can aid in discovering parallels or divergences when comparing against global or domestic indices. This kind of research would contribute to the currently limited amount of studies related to risk-adjusted returns of ASEAN equities. The second possible research areas would be performance comparisons using other risk-adjusted measures such as Sortino ratio. This would benefit further discussions related to the observations of Clash (1999) on ranking effects versus that of Sharpe ratios, and Dugan (2005) on interpretative manipulation of ratios. A third opportunity: researchers can conduct an investigation to validate if the downside framework better explains equity returns than CAPM beta in ASEAN economies. Recall that Estrada (2002), Pedersen et al. (2003) and Tsai et al. (2013) conclude that their findings on beta show that downside beta (and its variants) outperformed the CAPM beta in explaining expected stock market returns, both in developed and emerging markets. So, this future research may be support the strength of downside betas explanatory power. Lastly, it may be of interest to revisit Rothery's (2014) claim that directly investing in Conglomerates can be a valuable substitute for ETFs, especially for savvy investors looking to lower investment fees. By generating a comparative returns research, this new study could assist in confirming the net performance between ASEAN conglomerates and regional ETFs. This way, the investor and academic audience gains a perspective of the advantages of conglomerate investing as an alternative to ETFs, given its diversification characteristics but without

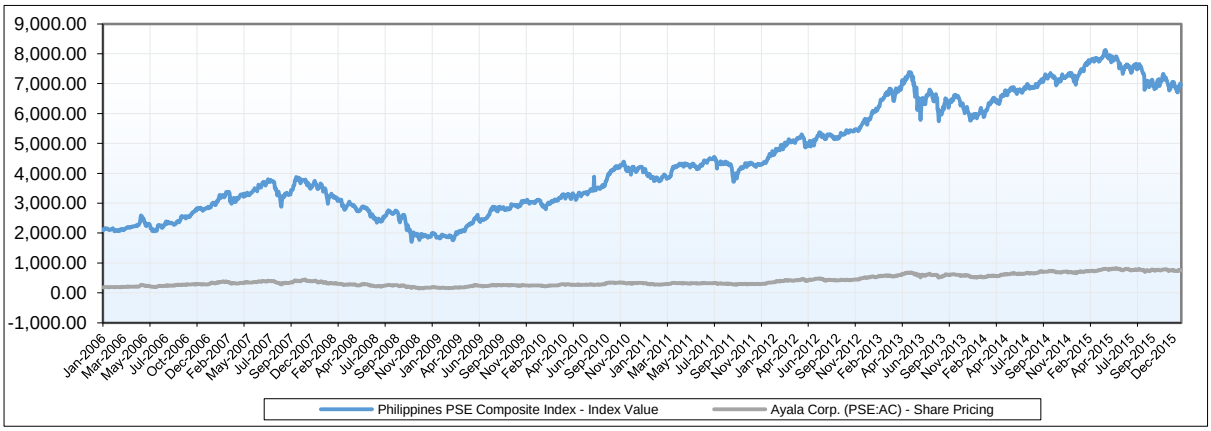
accompanying fund management fees. Ultimately, all these speculative future studies are aligned with the overarching goal of providing relevant, timely and useful risk-adjusted performance appraisal information for the investor to make optimal decisions regarding ASEAN-related equity assets.

Appendix 1 : Profiles of Philippines Conglomerates*

1.1 Ayala Corp. (PSE:AC)

Business Description

Ayala Corporation engages in the real estate, financial services, telecommunications, water, electronics manufacturing services, automotive, power generation, transport infrastructure, business process outsourcing, education, and healthcare businesses in the Philippines and internationally. The company's Real Estate and Hotels segment plans, develops, sells, and leases residential and commercial communities; manages land bank; and operates hotel, cinema, and theater. Its Financial Services and Insurance segment provides banking services; corporate, consumer, mortgage, and agri-business loans; leasing; payment services; asset management; trust and investment services; life, non-life, pre-need, and reinsurance services; Internet banking; online stock trading; corporate finance and consulting services; foreign exchange and securities dealing; and safety deposit facilities. The company's Telecommunications segment offers digital wireless communications; broadband Internet and wireline voice and data communication services; and carrier services. Its Water Distribution and Used Water Services segment manages, operates, repairs, decommissions, and refurbishes fixed and movable assets required to provide water delivery, sewerage, and sanitation services. The company's Electronics segment offers electronics manufacturing services; and power semiconductor assembly and test services. Its Information Technology and BPO Services segment offers venture capital for technology businesses; content for wireless services; electronic commerce; technology infrastructure sales and technology services; and onshore and offshore outsourcing services. The company's Automotive and Others segment manufactures, distributes, sells, repairs, and services for passenger cars and commercial vehicles, as well as offers agri-business, education and health, and air-chartered services. Ayala Corporation was founded in 1834 and is based in Makati City, the Philippines.

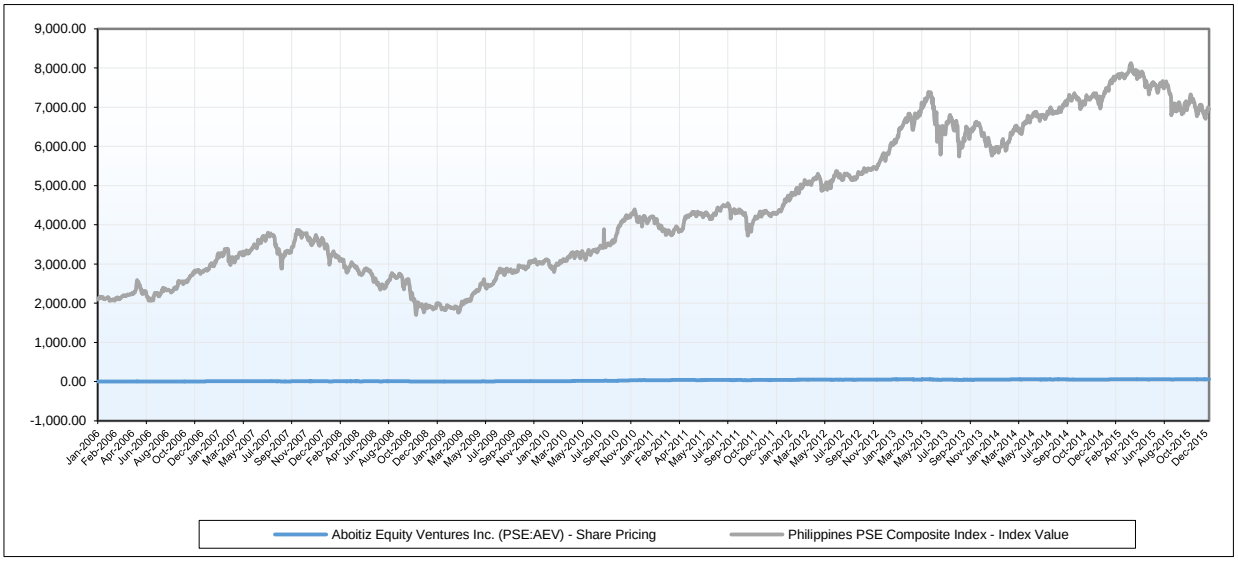


* Source: CapitalIQ website. Note that for all profiles, data is quoted directly from website content.

1.2 Aboitiz Equity Ventures Inc. (PSE:AEV)

Business Description

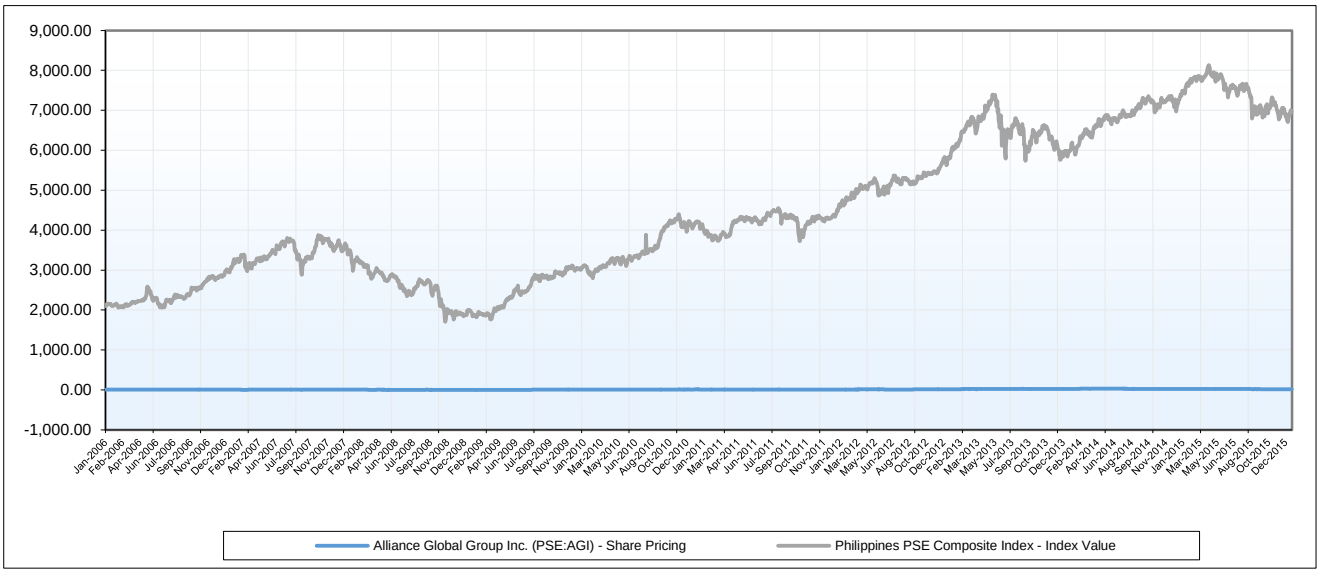
Aboitiz Equity Ventures, Inc., through its subsidiaries, engages in the power generation and distribution; financial services; food manufacturing; real estate; and infrastructure businesses in the Philippines. Its Power segment is involved in the generation, distribution, and retail of electricity through hydro, geothermal, solar, coal-fired, oil, and wind power plants; and ownership and operation of power distribution utilities. The company's Financial Services segment provides various banking products and services, such as deposit and related services; corporate and middle market lending; consumer finance loans, including mortgage, auto loans, and credit cards; and investment, treasury, capital market, trust and fund management, remittance, cash management, and electronic banking services. Its Food Manufacturing segment engages in the manufacture and sale of wheat flour and its by-products; and produces animal feed and breeds swine. The company's Real Estate segment is involved in the leasing of commercial and office buildings; design and development of distinct communities for residential, industrial, and commercial use; property management activities; ownership and operation of an industrial park; and distribution of water. The company also produces liquid bio-methane fuel from organic wastes, as well as provides corporate aircraft and support services. The company was formerly known as Cebu Pan Asian Holdings, Inc. and changed its name to Aboitiz Equity Ventures, Inc. in December 1993. The company was incorporated in 1989 and is headquartered in Taguig, the Philippines.



1.3 Alliance Global Group Inc. (PSE:AGI)

Business Description

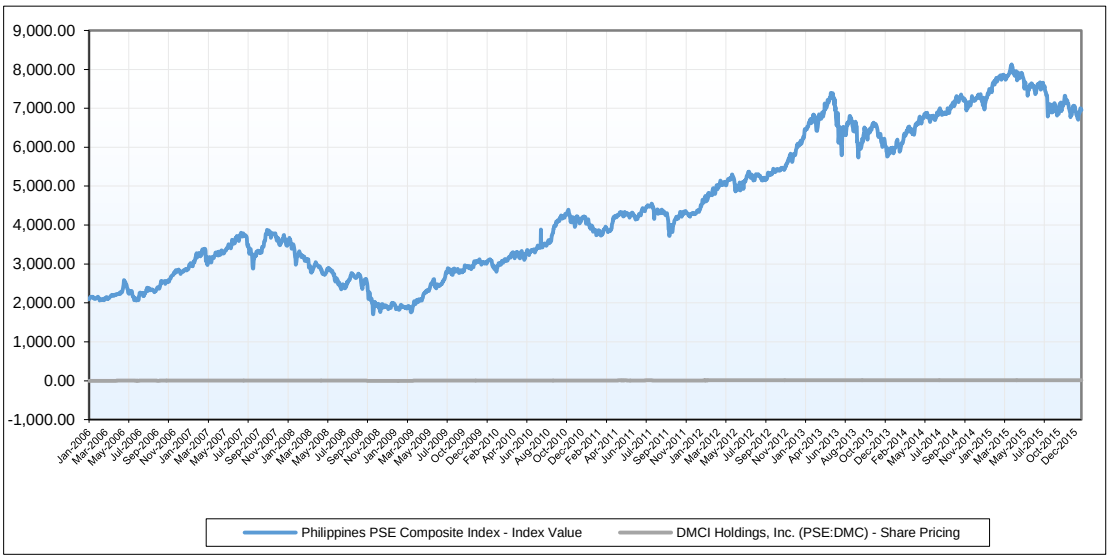
Alliance Global Group, Inc., through its subsidiaries, engages in real estate development, tourism-entertainment and gaming, food and beverage, and quick service restaurant businesses in the Philippines. The company operates through Megaworld, Travellers, GADC, and Emperador segments. It is involved in the development of various properties, including residential condominium units, subdivision lots, and office and retail space projects, as well as integrated tourism estates and resorts, leisure-related properties, and mixed used towers; leasing of properties; and operation of hotels. The company also engages in tourism-oriented businesses that consist of entertainment, hospitality and leisure, and gaming, as well as operates resorts. In addition, it operates franchised McDonald's restaurants in the Philippines. Further, the company manufactures and distributes distilled spirits under the Emperador Brandy, Generoso Brandy, and BaR brand names, as well as under the Emperador Deluxe brand; and glass containers. Additionally, it manufactures and sells fresh-fried potato snack products, such as shoestring potatoes, ketchup fries, less salt, sea salt and vinegar, and other potato snacks under the Pik-Nik name. The company was incorporated in 1993 and is based in Quezon City, the Philippines.



1.4 DMCI Holdings, Inc. (PSE:DMC)

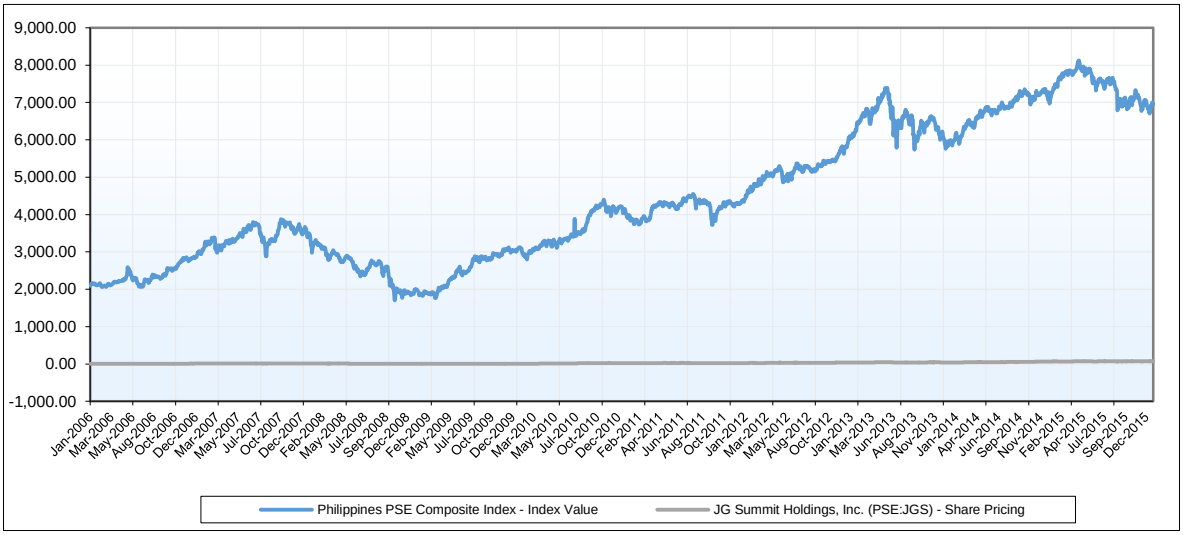
Business Description

DMCI Holdings, Inc., through its subsidiaries, engages in general construction, mining, power generation, infrastructure, real estate development, water concessionaire, and manufacturing businesses in the Philippines. It operates through seven business units: Construction, Coal Mining, Nickel Mining, Real Estate, On-Grid Power, Off-Grid Power, and Water. The company constructs various projects comprising chapels and residences, multi-storey hotels and condominiums, irrigation dams, concrete bridges, power transmission lines, industrial plants, theaters, and large commercial complexes. It is also involved in the construction component businesses, such as production and trading of concrete products, and electrical and foundation works; projects and infrastructure development; development of mid-income residential properties under the DMCI Homes brand name; and exploration, mining, and development of coal resources on Semirara Island in Caluya, Antique. In addition, the company engages in the design, construction, investment, and operation of power plants; open pit extraction of nickel, chromite, and iron laterite in the municipalities of Santa Cruz and Candelaria in Zambales; manufacture of steel wire and cement products; and provision of water distribution and sewer services. DMCI Holdings, Inc. was incorporated in 1995 and is based in Makati City, the Philippines. DMCI Holdings, Inc. is a subsidiary of Dacon Corporation.



1.5 JG Summit Holdings, Inc. (PSE:JGS)

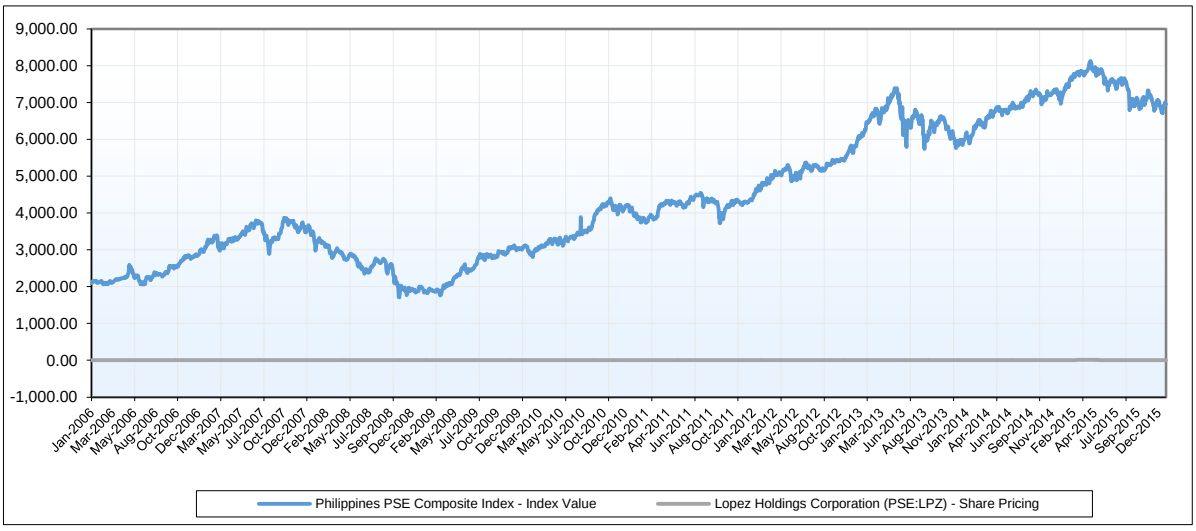
Business Description
JG Summit Holdings, Inc. engages in branded consumer foods, agro-industrial and commodity food products, real property development, hotels, banking and financial services, telecommunications, petrochemicals, air transportation, and power distribution businesses. Its Foods, Agro-Industrial, and Commodities segment manufactures snack foods, granulated coffee and pre-mixed coffee, chocolates, candies, biscuits, instant noodles, ice cream and frozen novelties, pasta and tomato-based products, and canned beans. This segment is also involved in raising hogs and chickens; manufacture and distribution of animal feeds, corn products, and vegetable oil; synthesis of veterinary compound; sugar milling and refining; and flour milling. The company's Air Transportation segment provides air transport services for passengers and cargoes. Its Real Estate and Hotels segment is involved in the ownership, development, leasing, and management of shopping malls and retail developments; ownership and operation of hotels in the Philippines; development, sale, and leasing of office condominium space in office buildings and high rise residential condominiums; development of land into residential subdivisions; sale of subdivision lots and residential houses; and the provision of customer financing. The company's Petrochemicals segment manufactures polyethylene and polypropylene, polymer grade ethylene and propylene, partially hydrogenated pyrolysis gasoline, and pyrolysis fuel oil. Its Banking segment offers commercial banking services, including deposit-taking, lending, foreign exchange dealing, and fund transfers or remittance servicing.. It operates in the Philippines, Thailand, Malaysia, Indonesia, China, Hong Kong, Singapore, and Vietnam.



1.6 Lopez Holdings Corporation (PSE:LPZ)

Business Description

Lopez Holdings Corporation primarily engages in the power generation business in the Philippines. The company operates through Power Generation, Real Estate Development, Manufacturing, and Construction and Other Services segments. It generates electricity from geothermal, solar, and hydro sources. It is also involved in television and radio broadcasting; cable and direct-to-home television satellite distribution; provision of telecommunications services, including local exchange, domestic long distance, international long distance, data services, and managed services; movie production; audio recording and distribution; video/audio post production; and film distribution, as well as merchandising, Internet and mobile services, and publishing activities. In addition, the company manufactures electrical and electronic components; develops and leases residential and commercial real estate properties; and sells industrial lots and ready-built factories. Further, it offers oil transportation, securities transfer, and financing services, as well as construction services. The company was formerly known as Benpres Holdings Corporation and changed its name to Lopez Holdings Corporation in June 2010. Lopez Holdings Corporation was incorporated in 1993 and is based in Pasig City, the Philippines. Lopez Holdings Corporation is a subsidiary of Lopez, Inc.



1.7 LT Group, Inc. (PSE:LTG)

Business Description

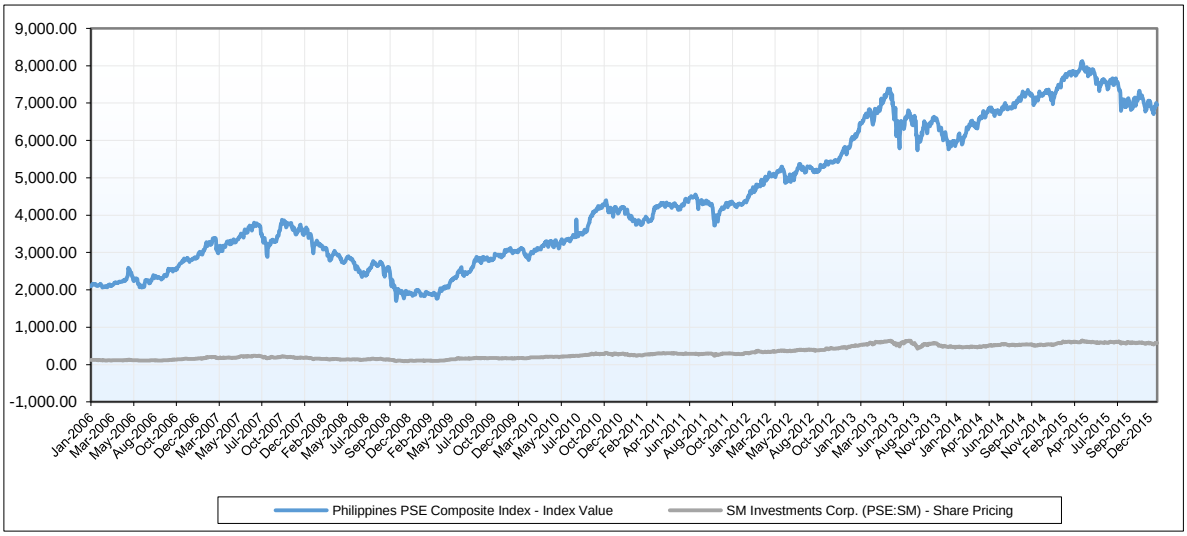
LT Group, Inc. engages in banking, beverages, distilled spirits, tobacco, and property development businesses in the Philippines and internationally. The company's Banking segment provides various banking and financial services to corporate, middle-market, small medium enterprise, and retail customers; and to the Philippine national government, national government agencies, local government units, and government-owned and controlled corporations. This segment offers deposits, loans, trade finance, foreign exchange dealings, bills discounting, investment banking, fund transfers/remittance, asset management, treasury, trust, retail banking, and other financial services. It operates through a head office and 665 branches/offices in the Philippines; and 77 branches, representative offices, remittance centers, and subsidiaries internationally. The company's Distilled Spirits segment manufactures, bottles, imports, purchases, and sells rum, gin, brandy, vodka, whiskey, cocktails, and other liquor products, as well as related equipment, materials, and supplies for the manufacture of distilled spirits. Its Beverage segment produces and sells energy drinks, beer, alcopop, bottled water, soymilk, carbonated soft drinks, ready-to-drink ice tea, coconut water, and yogurt; and produces glass bottles. The company's Tobacco segment produces cigarettes, casings, tobacco, packaging, labels, and filters. Its Property Development segment owns, develops, leases, and manages residential properties, including housing projects, commercial, industrial, urban, and other real properties; and acquires, purchases, develops, and sells subdivision lots. LT Group, Inc. sells its beverages and distilled spirits through distributors.

Stock Quote and Chart (Currency: PHP)

1.8 SM Investments Corp. (PSE:SM)

Business Description

SM Investments Corporation engages in the property, retail, and financial services and other businesses in the Philippines. The Property segment is involved in the mall, residential, and commercial development, as well as the operation of hotels and convention centers. It develops, conducts, operates, and maintains commercial shopping centers, as well as conducts, operates, and maintains shopping center spaces, amusement centers, or cinema theaters within the shopping centers. This segment also develops and transforms residential, commercial, entertainment, and tourism districts. As of December 31, 2015, the company operated 56 malls in the Philippines with a total gross floor area of 7.3 million square meters; and 6 malls in China with a total gross floor area of 0.9 million square meters. The retail segment is involved in the retail/wholesale trading of merchandise, such as dry goods, wearing apparels, food, and other merchandise. This segment operated 310 stores, including 53 SM Stores, 45 SM Supermarkets, 136 SaveMore stores, 44 SM Hypermarkets, and 32 WalterMart stores. The Financial Services and Others segment engages in asset management and capital investments, as well as provision of financial services. It provides lending products and services, including corporate, middle market, SME, and consumer lending; deposit-taking; foreign exchange; brokering; trust and investments; credit cards; corporate cash management and remittances; leasing and financing; investment banking; private banking; rural banking; bancassurance; and insurance brokerage and stock brokerage services. This segment operates approximately 1,000 branches and 3,000 ATMs. This segment is also involved in the copper and nickel exploration and mining activities. SM Investments Corporation was incorporated in 1960 and is based in Pasay, the Philippines.

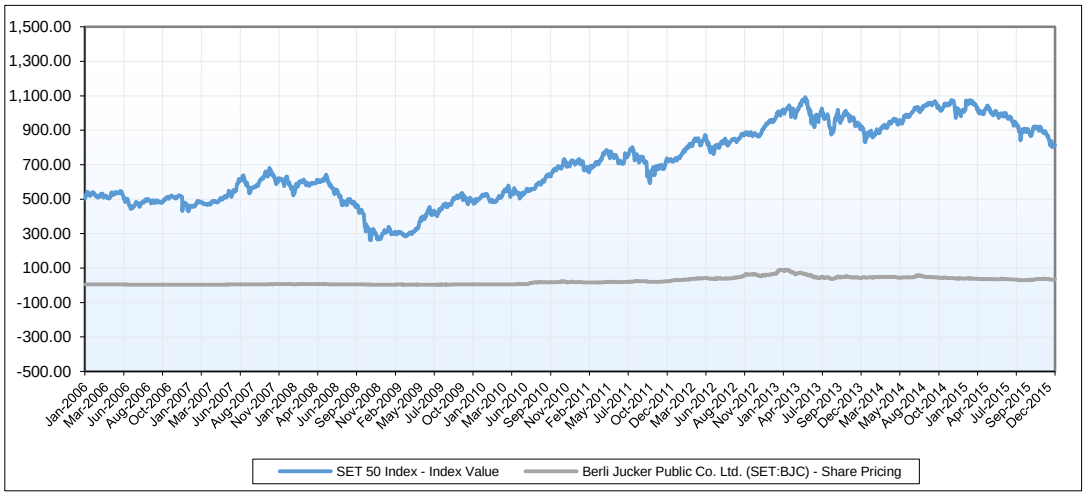


Appendix 2 : Profiles of Thailand Conglomerates*

2.1 Berli Jucker Public Co. Ltd. (SET:BJC)

Business Description

Berli Jucker Public Company Limited manufactures, distributes, and services in the areas of packaging, consumer, healthcare, and technical supply chain businesses in Thailand. It is involved in manufacturing, marketing, and distribution of glass containers, aluminum cans, and rigid plastic containers; and consumer products, including tissue papers, soaps, shampoos, cosmetics, snack foods, beverage, and confectionery. The company also provides customs clearing, warehousing, transportation, and distribution services. In addition, it imports and distributes various products comprising industrial chemicals, food ingredients, pharmaceuticals, imaging products, and hospital supplies in the fields of endocrinology, nephrology, orthopedic, cardiology, hematology, neurology, surgery, etc. Further, the company designs, supplies, and assemblies automation and control systems, industrial equipment, logistics and warehouse equipment, and galvanized steel towers for power transmission lines. Additionally, it sells construction materials; provides information technology services; retails books and magazines; manufactures and distributes yogurt and milk products; and manufactures soybean, as well as offers consultant services in product analysis and collecting data.

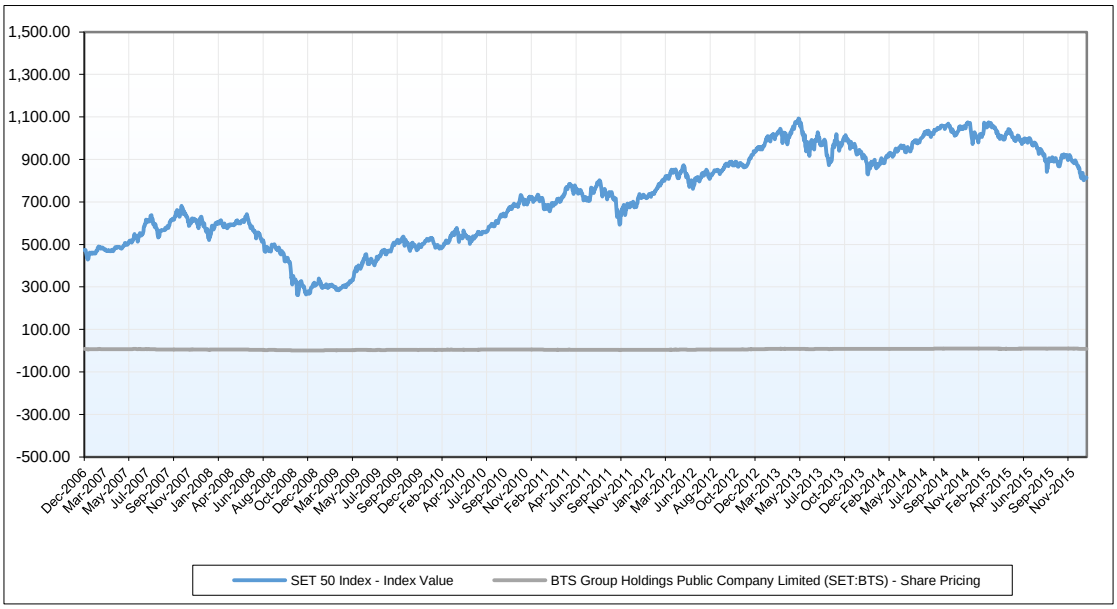


* Source: CapitalIQ website. Note that for all profiles, data is quoted directly from website content.

2.2 BTS Group Holdings Public Company Limited (SET:BTS)

Business Description

BTS Group Holdings Public Company Limited primarily engages in mass transit, property, media, and service businesses in Thailand. Its Mass Transit segment operates and maintains Sky Train system, an elevated mass transit system covering 23.5 kilometers (km) with 23 stations in Bangkok; and operates bus rapid transit line with 12 stations and 15 km of dedicated bus lane. The company's Media segment manages advertising spaces in trains, buses, and stations; and advertises through a network of real-time TV screens in lifts and lobbies of office towers. Its Property segment develops and sells residential real estate properties, such as housing and condominiums; and commercial real estate properties, including hotels, serviced residences, and offices. The company's Services segment provides e-money and common ticketing system services; and owns and manages Thana City golf and sports club, and offers construction management and interior decoration services, as well as hotel management services. In addition, it is involved in the restaurant and related businesses. The company was formerly known as Tanayong Public Company Limited and changed its name to BTS Group Holdings Public Company Limited in May 2010. BTS Group Holdings Public Company Limited was founded in 1968 and is based in Bangkok, Thailand.

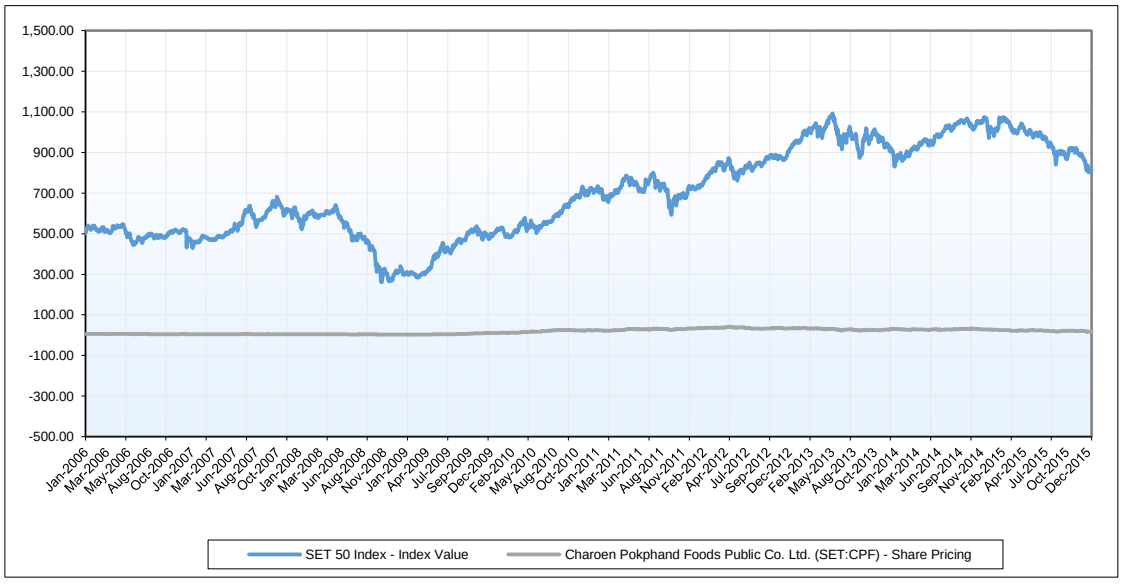


2.3 Charoen Pokphand Foods Public Co. Ltd. (SET:CPF)

Business Description

Charoen Pokphand Foods Public Company Limited, together with its subsidiaries, operates in agro-industrial and integrated food businesses in Asia, Europe, the United States, and internationally. It operates through two segments, Livestock Business and Aquaculture Business. The company produces and sells animal feeds, including swine, chicken, duck, shrimp, and fish feeds; various form of feeds, such as concentrate, powder and pellet, and feed-mill plants; and semi-cooked meat and fully-cooked meat, as well as food products and ready meal products. It is also involved in the animal feed raw material distribution; restaurant business; trading; wholesale and retail of food products; import and distribution of processed meat and ready meals; property leasing; animal feed mill and livestock farming; shrimp hatchery business; aquaculture farming; sale of machines and spare parts; swine businesses; and chicken integration business. In addition, it operates training centers; and offers information technology, food research and development, and financial services. The company offers its feeds under the CP, Hyprovite, Hi-Gro and Star Feed, Novo, Safe Feed, Erawan, Hogtonal, C.F., Anvipro, Marine, Hi-Grade, Turbo and Hilac, Blanca, Stargate, Safe Fo, and Safe Fish brands. The company sells its products to small independent farmers and large farms directly and via agents or distributors. Charoen Pokphand Foods Public Company Limited was founded in 1978 and is headquartered in Bangkok, Thailand.

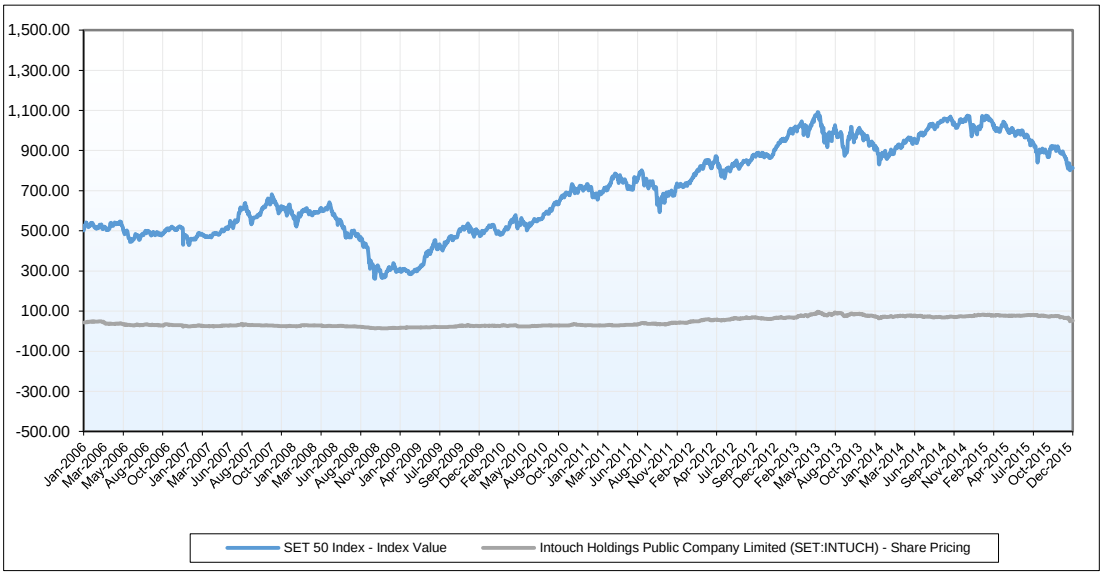
Stock Quote and Chart (Currency: THB)



2.4 Intouch Holdings Public Company Limited (SET:INTUCH)

Business Description

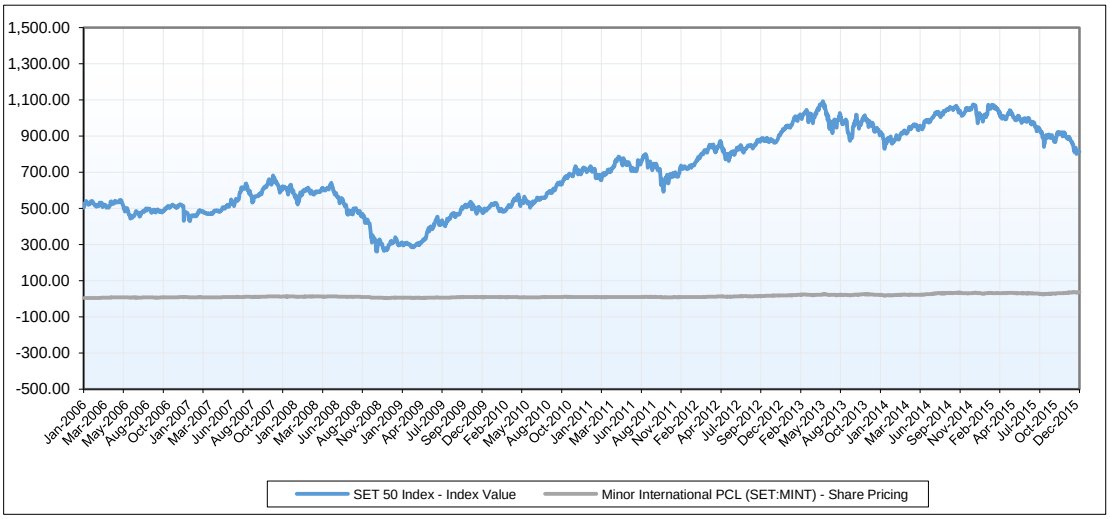
Intouch Holdings Public Company Limited engages in the satellite, Internet, telecommunications, and media and advertising businesses. It operates through Local Wireless Telecommunications, Satellite and International Businesses, and Other Businesses segments. The company offers transponder rental and related services for domestic and international communications; broadband content services; Internet data center, Internet, satellite uplink-downlink, and telecommunication services; mobile content, banner advertising, telephone network, and engineering development services on communication technology and electronics. It also sells user terminals of IPSTAR and direct television equipment; is involved in trading and rental of telecommunications equipment and accessories; engages in printing and publishing of business telephone directories; and offers computer program and related services, and information technology services. The company has operations in Thailand, Singapore, Australia, the Lao People's Democratic Republic, the People's Republic of China, India, Japan, and internationally. The company was formerly known as Shin Corporation Public Company Limited and changed its name to Intouch Holdings Public Company Limited in March 2014. Intouch Holdings Public Company Limited was founded in 1983 and is headquartered in Bangkok, Thailand.



2.5 Minor International PCL (SET:MINT)

Business Description

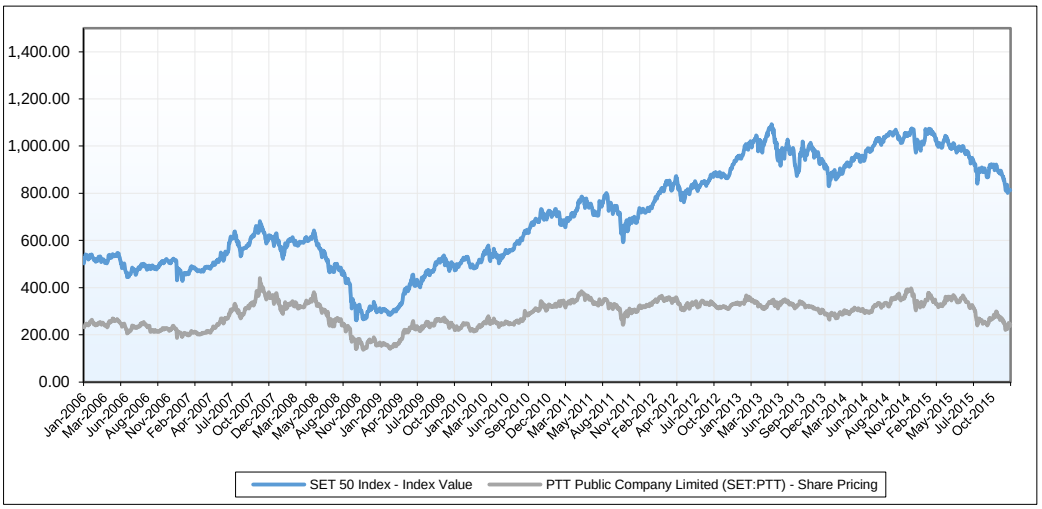
Minor International Public Company Limited, together with its subsidiaries, operates as a hospitality and leisure company in Thailand and internationally. It operates through four segments: Hotel & Spa, Mixed use, Restaurant, and Retail. As of February 19, 2016, the company had approximately 1,800 restaurant outlets operating system-wide in approximately 19 countries under The Pizza Company, Swensen's, Sizzler, Dairy Queen, Burger King, Thai Express, The Coffee Club, Ribs and Rumps, BreadTalk, and Riverside brands. It also invested in, owned, and operated a portfolio of 145 hotels and serviced suites under the Anantara, AVANI, Oaks, PER AQUUM, Tivoli, Elewana, Marriott, Four Seasons, St. Regis, Radisson Blu, and Minor International brands in 22 countries across the Asia Pacific, the Middle East, Africa, the Indian Ocean, Europe, and South America. In addition, the company distributes fashion and cosmetic products primarily under the Gap, Esprit, Bossini, Banana Republic, Charles & Keith, Pedro, Red Earth, Zwilling J.A. Henckels, and ETL Learning brands; and operates Mysale, an online shopping Website, as well as offers contract manufacturing services. Further, it is involved in the entertainment venues and shopping mall operation, property rental and sale, food and beverage sale, supply chain management, spa service, vacation club point sale, distribution, management, catering service, franchise, consulting, sales and marketing service, real estate, travel agency, asset management, accommodation, and property development businesses; manufacture and sale of cheese and ice-cream; and distribution of kitchen utensils, garments, shoes, luggage products, and perfumes.



2.6 PTT Public Company Limited (SET:PTT)

Business Description

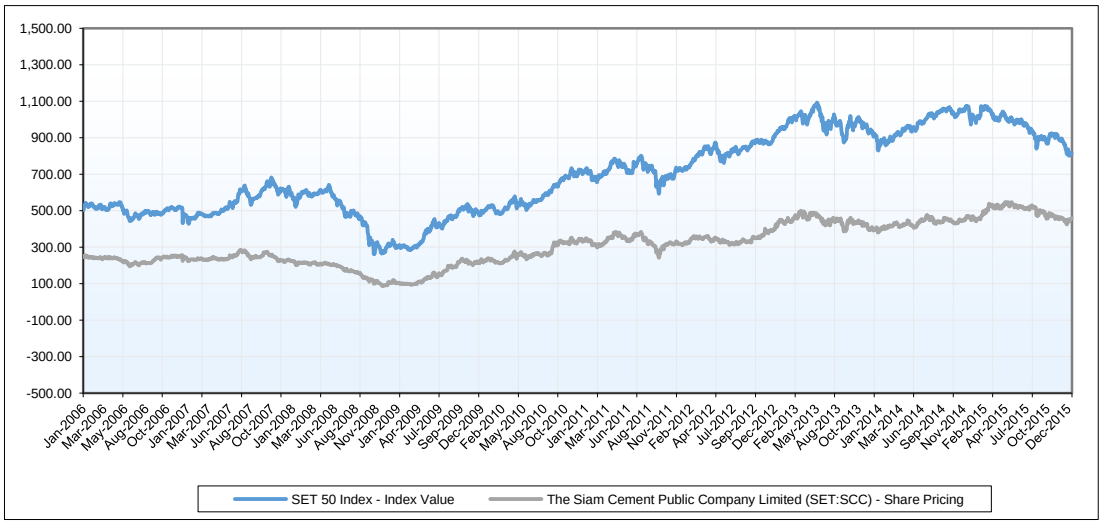
PTT Public Company Limited engages in upstream petroleum, natural gas, downstream petroleum, coal, and other related businesses in Thailand and internationally. It is involved in the exploration and production of petroleum; and exploration, production, procurement, transportation, separation, marketing, and transmission of natural gas; and sale of natural gas at service stations for vehicles. The company is also involved in the production and distribution of petrochemical products; oil refining business; and procurement, storage, marketing, distribution, and retail of petroleum products and lube oil. In addition, it is involved in the procurement, import, export, and trading of crude oil, condensate, petroleum, petrochemical products, and other specialty substances; and the exploration, production, and distribution of coal. The company operates approximately 6 petroleum terminals, 13 oil terminals, and 2 liquefied petroleum gas terminals; a natural gas pipeline system of approximately 511 kilometers; and approximately 1,180 oil service stations. Additionally, it is involved in palm oil, human resource support, financing, infrastructure, marine engineering and transportation, football club management, ethanol business and alternative energy products, and vocational school businesses; the generation of electricity, steam, and chilled water; and the provision of factory maintenance and engineering, safety and environmental, management and general, and oil vessel rental services. The company also offers security and treasury services, coal transport equipment and delivery services, and rental services for chemical tanks; and blending and bottling services for lube oil, as well as operates convenience stores. PTT Public Company Limited was founded in 1978 and is headquartered in Bangkok, Thailand.



2.7 The Siam Cement Public Company Limited (SET:SCC)

Business Description

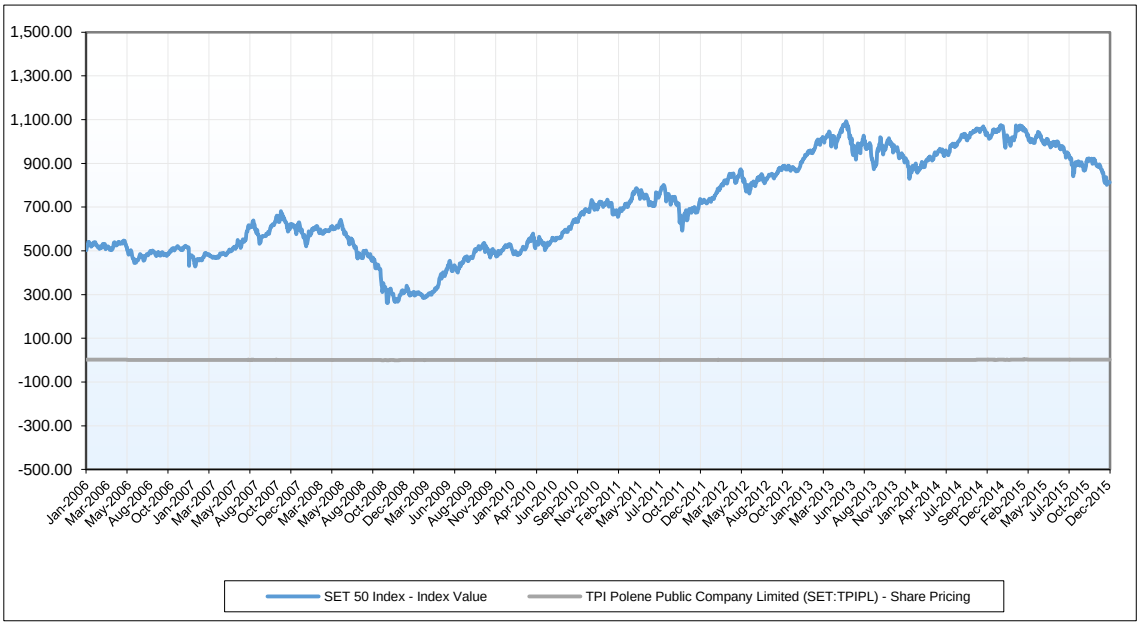
The Siam Cement Public Company Limited, through its subsidiaries, engages in cement, building materials, chemicals, packaging, and investment businesses in Thailand, Vietnam, China, Indonesia, and internationally. The company operates through SCG Cement-Building Materials, SCG Chemicals, SCG Packaging, and Other segments. The SCG Cement-Building Materials segment manufactures and sells grey cement, ready-mixed concrete, white cement, dry mortar, roof tiles, concrete paving blocks, ceramic tiles, and sanitary wares and fittings. It also distributes cement, building, and decorative products; and imports fuel products, waste paper, and scrap iron. The SCG Chemicals segment manufactures and sells olefins, polyolefins, and other chemical products. The SCG Packaging segment manufactures and sells pulp, printing and writing paper, gypsum linerboards, Kraft paper, and corrugated containers. The Other segment invests primarily in agricultural machine, automotive parts and components, and steel businesses, as well as other services. The company is also involved in land leasing, marketable securities, insurance, and industrial site businesses; and provides accounting, financial, and tax services, as well as legal consultancy services. The Siam Cement Public Company Limited was founded in 1913 and is headquartered in Bangkok, Thailand.



2.8 TPI Polene Public Company Limited (SET:TPIPL)

Business Description

TPI Polene Public Company Limited operates in the cement, construction materials, and plastic industries in Thailand. It operates in four segments: Construction Materials, Petrochemical & Chemicals, Energy & Utilities, and Agriculture. The company manufactures and distributes cement, dry mortar, ready mixed concrete, melt sheets, and organic fertilizers; distributes gasoline, diesel, and natural gas; and manufactures and distributes electricity, refuse derived fuel, and organics waste. It also explores for petroleum; and engages in construction and property development activities, as well as exports cement and plastic. TPI Polene Public Company Limited is headquartered in Bangkok, Thailand.

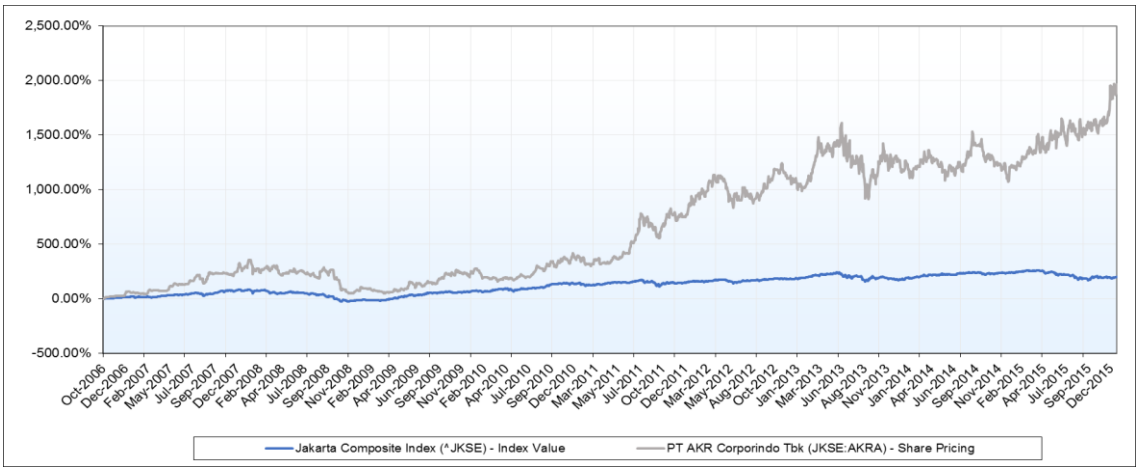


Appendix 3 : Profiles of Indonesia Conglomerates*

3.1 PT AKR Corporindo Tbk (JKSE:AKRA)

Business Description

PT AKR Corporindo Tbk, together with its subsidiaries, distributes and trades in petroleum and chemical products primarily in Indonesia. It operates through five segments: Trading and Distribution, Logistics Services, Manufacturing, Industrial Estate, and Coal Mining and Trading. The Trading and Distribution segment distributes petroleum products and various basic chemicals, including caustic soda, sodium sulphate, PVC resin, and soda ash. The Logistics Services segment offers various logistics services, such as rental of storage tanks and warehouses, bagging, port handling, and transportation services for liquid and solid chemical, and petroleum products in Indonesia, as well as operates ports in Guigang, China. The Manufacturing segment produces sorbitol liquid and powder, as well as adhesive materials. The Industrial Estate segment is involved in the development and construction of industrial projects. The Coal Mining and Trading segment has coal mining licenses in the area of Kalimantan, Indonesia. The company was formerly known as PT Aneka Kimia Raya Tbk and changed its name to PT AKR Corporindo Tbk in September 2004. PT AKR Corporindo Tbk was founded in 1977 and is headquartered in Jakarta, Indonesia. PT AKR Corporindo Tbk is a subsidiary of PT Arthakencana Rayatama.

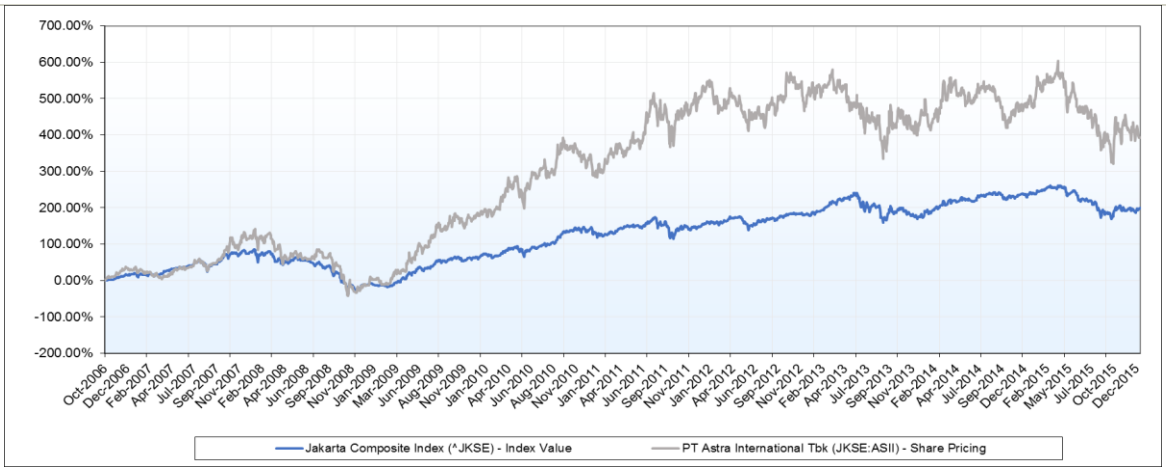


* Source: CapitalIQ website. Note that for all profiles, data is quoted directly from website content.

3.2 PT Astra International Tbk (JKSE:ASII)

Business Description

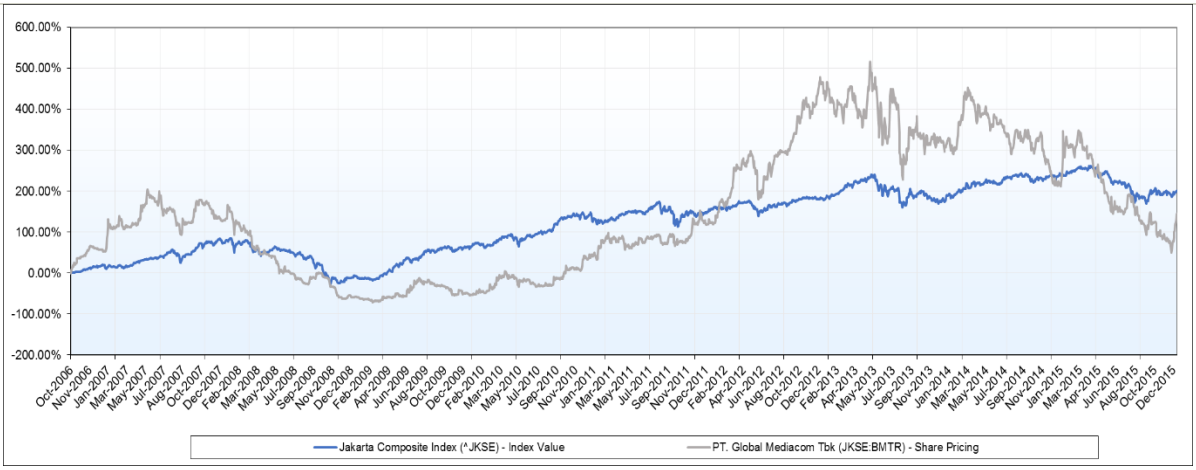
PT Astra International Tbk engages in the automotive, financial services, heavy equipment and mining, agribusiness, infrastructure, logistic and others, and information technology businesses in Indonesia. The company offers cars, trucks, and motorcycles of various brands; manufactures and sells automotive components to the original equipment for manufacturers and replacement markets, as well as provides consultation services to its customers; financing for cars, motorcycles, and heavy equipment; general insurance; and various banking products and services. It also distributes heavy equipment products for the mining, plantation, construction, forestry, transportation, and material handling industries; provides coal mining contracting services; operates coal mines; and produces palm oil. In addition, the company is involved in the development and management of toll roads; supply of water; rental and leasing of vehicles; resale of used cars; and provides public transportation services, and port and logistics facilities. Further, it offers various information technology business solutions based on document, information, and communication technology; and mobile financial platform services for the financial industry. The company was founded in 1957 and is headquartered in Jakarta, Indonesia. PT Astra International Tbk is a subsidiary of Jardine Cycle & Carriage Ltd.



3.3 PT. Global Mediacom Tbk (JKSE:BMTR)

Business Description

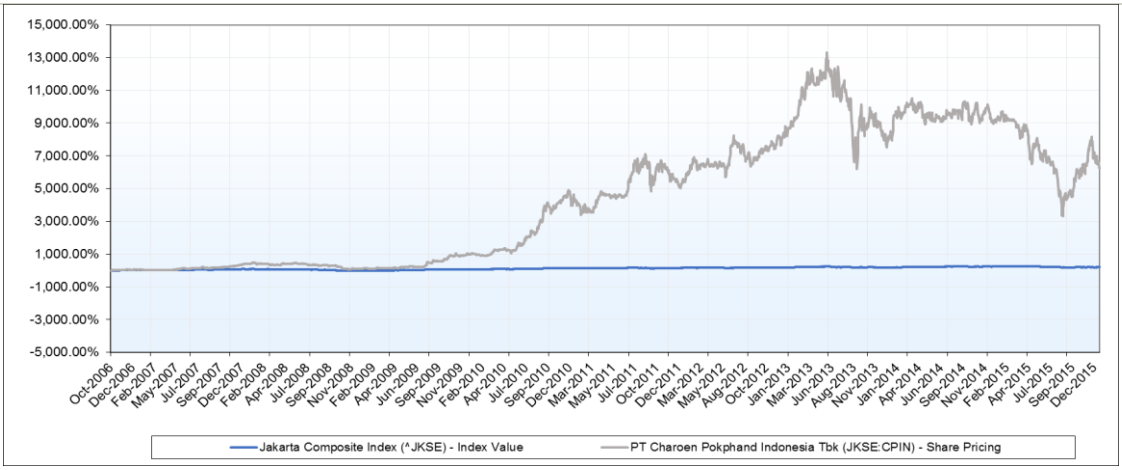
PT. Global Mediacom Tbk engages in the media, broadcasting, entertainment, and telecommunication businesses in Indonesia. The company operates through Content and Advertising Based Media, Subscribers Based Media, and Online Based Media divisions. It is involved in the content production and distribution, nationwide television broadcast network, television program channel, newspaper, magazine, tabloid, and radio network operations; and mobile content aggregation and IT system integration activities. The company also delivers VSAT services for companies in the oil, mining, and gas industry, as well as other services, which include telecommunication network, IT outsourcing, multimedia value added, and business process outsourcing services. In addition, it offers pay TV services under the Indovision brand name. The company was formerly known as PT Bimantara Citra Tbk. and changed its name to PT. Global Mediacom Tbk in March 2007. The company was founded in 1981 and is based in Central Jakarta, Indonesia. PT. Global Mediacom Tbk is a subsidiary of PT. MNC Investama Tbk.



3.4 PT Charoen Pokphand Indonesia Tbk (JKSE:CPIN)

Business Description

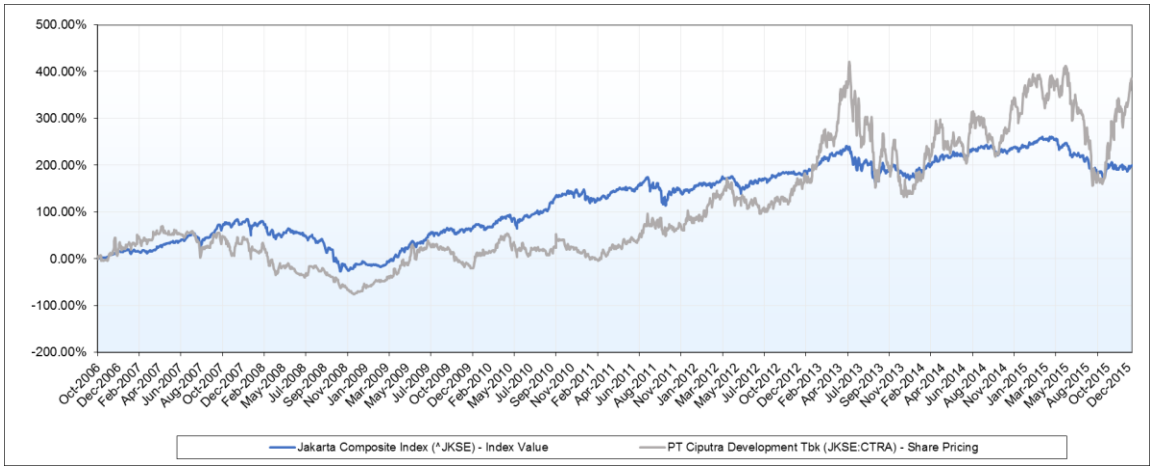
PT Charoen Pokphand Indonesia Tbk produces and sells poultry feed, day old chicks (DOC), processed chicken, and other products in Indonesia. The company offers broiler poultry feed and layer poultry feed; and various poultry feed products for parent stock, duck, native chicken, fighting cock, and quail, as well as feed for cattle and swine under the HI-PRO, HI-PRO-VITE, BINTANG, BONAVITE, ROYAL FEED, TURBO FEED, and TIJI brands. It also provides various types of DOC, such as broiler DOC; layer DOC; and other DOC, such as DOC for parent stock and male layer. In addition, the company sells various food products under the Golden Fiesta, Fiesta, Champ, and Okey brand names. Further, it is involved in poultry farming and beverage activities; the trading of processed chicken; the production of plastic packaging products; and the production and distribution of chicken feather meal. The company was founded in 1972 and is headquartered in Jakarta, Indonesia. PT Charoen Pokphand Indonesia Tbk is a subsidiary of PT Central Agromina.



3.5 PT Ciputra Development Tbk (JKSE:CTRA)

Business Description

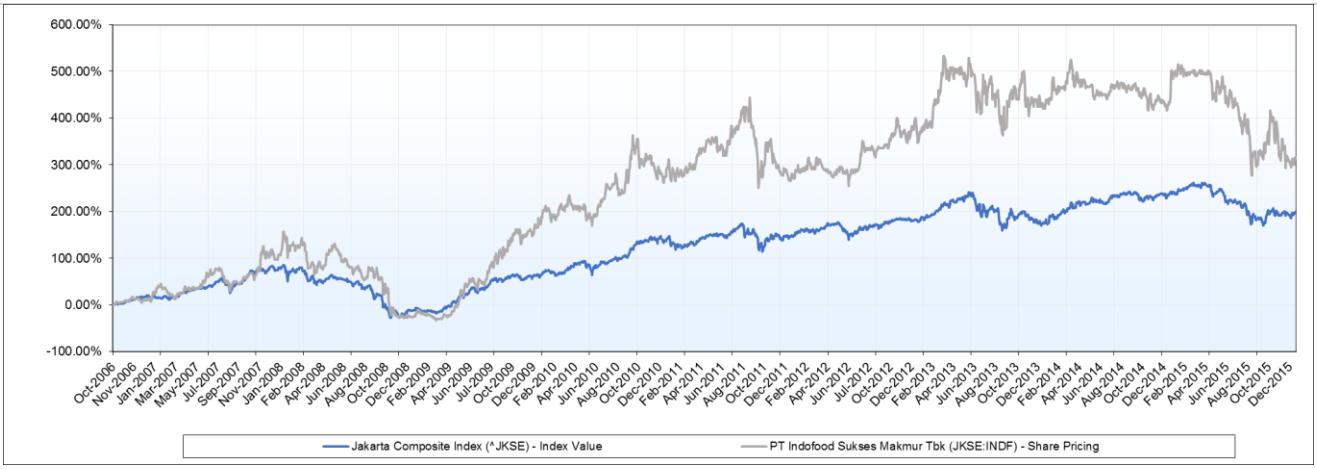
PT Ciputra Development Tbk, together with its subsidiaries, develops and sells real estate properties in Indonesia. The company operates through Real Estate, Rental, and Others segments. It develops housing, commercial and recreational centers, and mixed-use developments, including hotel, shopping, and office complexes, as well as golf courses and hospitals. The company was formerly known as PT Citra Habitat Indonesia and changed its name to PT Ciputra Development Tbk in December 1990. The company was founded in 1981 and is headquartered in Jakarta, Indonesia.



3.6 PT Indofood Sukses Makmur Tbk (JKSE:INDF)

Business Description

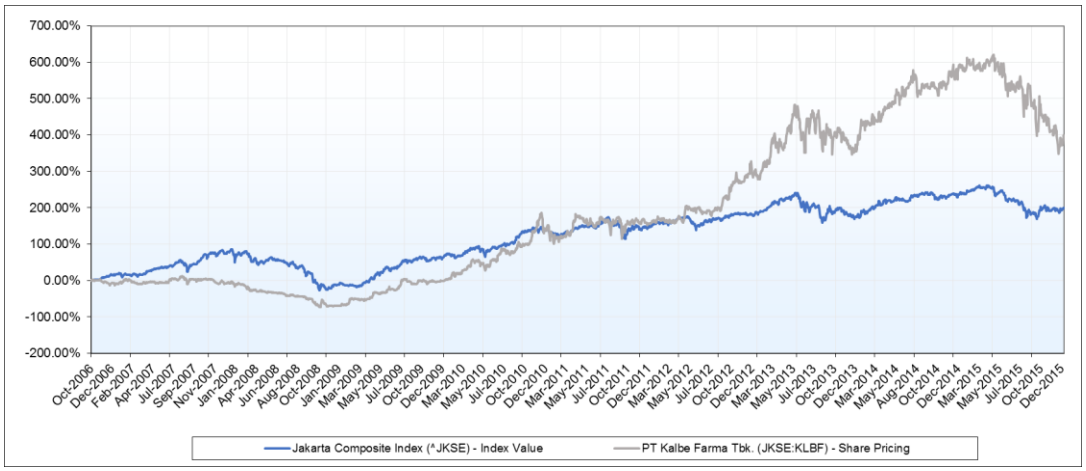
PT Indofood Sukses Makmur Tbk produces and sells various food products in Indonesia and internationally. Its Consumer Branded Products Business Group segment offers noodles; dairy products, including sweetened condensed, temperature, sterilized bottled, pasteurized liquid, and powdered milk, as well as butter and ice cream; snack foods, such as potato, cassava and soybean chips, curly and prawn crackers, and extruded snacks, as well as biscuits; culinary products and syrups; nutrition and special foods; non-alcoholic beverages; and packaging materials. The company's Bogasari Business Group segment produces wheat flour and pasta. Its Agribusiness Group segment produces palm oil, rubber, sugar cane, cocoa, and tea; and manufactures and markets cooking oils, margarine, shortenings, crude coconut oil, and other by-products. The company's Distribution Business Group segment distributes company's products and third-party products. Its Cultivation and Processed Vegetables Business Group segment cultivates and processes vegetables. The company is also involved in the shipping, investment, trade export agency, industrial estate, and restaurant chain management activities; and provision of management consulting, flour blending and trading, research management and technical, and food and fisheries processing services. In addition, it manufactures coffee; produces and sells fruits and edible fungi; cultivates and processes mushroom; operates bulking station; provides transportation services, as well as prefabricates houses; and markets and distributes paper diapers and packaged drinking water. The company was formerly known as PT Panganjaya Intikusuma and changed its name to PT Indofood Sukses Makmur Tbk in 1994. The company was founded in 1990 and is headquartered in Jakarta, Indonesia. PT Indofood Sukses Makmur Tbk is a subsidiary of CAB Holdings Limited, Seychelles.



3.7 PT Kalbe Farma Tbk. (JKSE:KLBF)

Business Description

PT Kalbe Farma Tbk., together with its subsidiaries, develops, manufactures, and trades in pharmaceutical products in Indonesia. It operates in four segments: Prescription Pharmaceutical, Consumer Health, Nutritionals, and Distribution and Logistics. The company offers generic, branded, and licensed drugs, including Brainact, Cefspan, Mycoral, Cernevit, Cravit, Neuralgin, Broadced, Neurotam, and CPG that are distributed to hospitals, pharmacies, and drug stores. It also provides over-the-counter drugs, energy drinks, ready-to-drink healthy beverage products, supplements, and other preventive products; nutritional products comprising powdered milk products for infants, toddlers, children, pre-teenagers, adults, pregnant and lactating women, and elders, as well as for consumers with special medical needs; and non-milk nutritional products. In addition, the company operates Mitrasana Clinics, an integrated retail health service clinic network consisting of physician's general practice, pharmacies, laboratory, and health mart, which also offers hemodialysis services; contract services and resources, including clinical study management, bioavailability/bioequivalence studies, and contract analysis to pharmaceutical companies; and animal health products. Further, it offers health screening services; produces reagents; operates as an agent for biotechnology products; distributes consumer products, medical equipment, cosmetics, and other trading products; markets and distributes ophthalmic products; and trades in medical and laboratory equipment and supplies, raw materials for pharmaceutical products, and consumable products for hemodialysis therapy.



3.8 PT Lippo Karawaci Tbk (JKSE:LPKR)

Business Description

PT Lippo Karawaci Tbk, together with its subsidiaries, operates as a property development company in Indonesia. The company operates in six segments: Urban Development, Large Scale Integrated Development, Retail Malls, Healthcare, Hospitality and Infrastructure, and Property and Portfolio Management. The Urban Development segment engages in real estate, urban development, land acquisition and clearing, land development and excavation, and infrastructure development activities. The Large Scale Integrated Development segment is involved in large scale integrated development projects and its infrastructure development, and other activities. This segment's integrated development projects comprise residential condominiums, commercial and entertainment areas, office spaces, healthcare facilities, and education facilities in a single location. The Retail Malls segment develops and manages shopping centers. Its retail portfolio comprises strata-titled malls and leased malls. The Healthcare segment provides healthcare services. The Hospitality and Infrastructure segment engages in the operation of hotels, restaurants, and recreation centers; town management activities; and the provision of water and sewage treatment, transportation, and maintenance services. The Property and Portfolio Management segment is involved in property management operations. PT Lippo Karawaci Tbk also engages in the real estate trading; printing; land transport; home improvement; water treatment; logistics; and bowling, golf, mining, bar, recreational park, catering, and agribusinesses, as well as provides construction, investment, hotel management, tourism, and accommodation services. The company was formerly known as PT Tunggal Reksakencana. PT Lippo Karawaci Tbk was founded in 1990 and is based in Tangerang, Indonesia.

Appendix 4: PH 9-year Performance Appraisal Metrics Summary

DATA SUMMARY		1	2	3	4	5	6	7	8	9
Metric	**Symbol**	**PSEi**	**AC**	**AEV**	**AGI**	**DMC**	**JGS**	**LPZ**	**LTG**	**SMIC**
Quarterly Period, 9 years - Downside										
Correlation w/ PSEi	**ρMS**	1.00	0.62	0.55	0.60	0.46	0.65	0.36	0.42	0.81
Ave. quarterly TSR	**TSR**	0.84%	-1.05%	2.26%	5.09%	9.55%	3.46%	12.63%	47.64%	-2.16%
TSR Premium over PSEi	**TSR'**		-1.90%	1.42%	4.25%	8.71%	2.62%	11.79%	46.80%	-3.00%
Risk-Free Rate (average)	**Rf**	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%
Ave. quarterly TSR	**μ**	0.84%	-1.05%	2.26%	5.09%	9.55%	3.46%	12.63%	47.64%	-2.16%
Differential ave. TSR	**DRμ**		-1.90%	1.42%	4.25%	8.71%	2.62%	11.79%	46.80%	-3.00%
Quarterly SD (price only)	**σd**	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
Beta (price only)	**βd**	1.00	0.81	0.80	1.06	0.72	1.09	0.69	0.68	0.99
Excess Returns	**μ – Rf**	-2.38%	-4.27%	-0.96%	1.87%	6.33%	0.24%	9.41%	44.42%	-5.37%
Jensen's Alpha	**JA**	-	(0.02)	0.01	0.04	0.08	0.03	0.11	0.46	(0.03)
Total Risk										
Sharpe Ratio	**SR**	(2.43)	(3.28)	(1)	1.06	4.06	0.14	4.91	27.57	(4.39)
Leverage (RAP)			0.75	0.69	0.55	0.63	0.59	0.51	0.61	0.80
Risk Adjusted Performance (RAP)	**RAP**	0.84%	0.00%	2.56%	4.26%	7.20%	3.36%	8.02%	30.21%	-1.07%
Differential RAP	**DRrap**		-0.84%	1.72%	3.41%	6.35%	2.52%	7.18%	29.37%	-1.92%

Market/Systematic Risk

Treynor Ratio	**TR**	(0.02)	(0.05)	(0.01)	0.02	0.09	0.00	0.14	0.66	(0.05)
lever/delever Beta	**d**	-	0.23	0.26	(0.06)	0.39	(0.08)	0.45	0.48	0.01
Market Risk Adjusted Performance (RAP)	**MRAP**	0.84%	-2.03%	2.02%	4.98%	11.99%	3.44%	16.87%	68.76%	-2.19%
Differential MRAP	**DRmrap**		-2.87%	1.17%	4.14%	11.15%	2.60%	16.03%	67.92%	-3.03%

Quarterly Period, 9 years - Normal										
	Symbol	**PSEi**	**AC**	**AEV**	**AGI**	**DMC**	**JGS**	**LPZ**	**LTG**	**SMIC**
Correlation w/ PSEi	**ρMS**	1.00	0.61	0.56	0.53	0.45	0.66	0.42	0.32	0.81
Correlation w/ Sector	**ρSM**									
Ave. quarterly TSR	**TSR**	0.84%	-1.05%	2.26%	5.09%	9.55%	3.46%	12.63%	47.64%	-2.16%
TSR Premium over PSEi	**TSR'**	0.00%	-1.90%	1.42%	4.25%	8.71%	2.62%	11.79%	46.80%	-3.00%
Risk-Free Rate (average)	**Rf**	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%
Ave. quarterly TSR	**μ**	0.84%	-1.05%	2.26%	5.09%	9.55%	3.46%	12.63%	47.64%	-2.16%
Differential ave. TSR	**DRμ**		-1.90%	1.42%	4.25%	8.71%	2.62%	11.79%	46.80%	-3.00%
Quarterly SD (price only)	**σ**	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
Beta (price only)	**β**	1.00	0.83	0.81	1.10	0.74	1.14	0.97	0.77	0.99
Excess Returns	**μ – Rf**	-2.38%	-4.27%	-0.96%	1.87%	6.33%	0.24%	9.41%	44.42%	-5.37%
Jensen's Alpha	**JA**	-	(0.02)	0.01	0.04	0.08	0.03	0.12	0.46	(0.03)

Total Risk

Sharpe Ratio	**SR**	(2.43)	(3.14)	(0.66)	0.91	3.85	0.14	4.11	18.69	(4.39)

Leverage (RAP)			0.72	0.67	0.47	0.60	0.57	0.43	0.41	0.80
Risk Adjusted Performance (RAP)	**RAP**	0.84%	0.15%	2.57%	4.11%	6.99%	3.36%	7.24%	21.51%	-1.07%
Sharpe - check		(2.43)	(3.14)	(0.66)	0.91	3.85	0.14	4.11	18.69	(4.39)
Treynor - check		(0.02)	(0.05)	(0.01)	0.02	0.09	0.00	0.10	0.58	(0.05)
Jensen - check		-	(0.02)	0.01	0.04	0.08	0.03	0.12	0.46	(0.03)
Differential RAP	**DRrap**		-0.69%	1.73%	3.26%	6.15%	2.51%	6.40%	20.67%	-1.92%
Market/Systematic Risk										
Treynor Ratio	**TR**	(0.02)	(0.05)	(0.01)	0.02	0.09	0.00	0.10	0.58	(0.05)
lever/delever Beta	**d**	-	0.21	0.23	(0.09)	0.36	(0.12)	0.03	0.30	0.01
Market Risk Adjusted Performance (RAP)	**MRAP**	0.84%	-1.94%	2.04%	4.92%	11.83%	3.43%	12.95%	60.82%	-2.19%
Differential MRAP	**DRmrap**		-2.78%	1.20%	4.07%	10.99%	2.59%	12.11%	59.97%	-3.03%

Appendix 5: TH 9-year Performance Appraisal Metrics Summary

DATA SUMMARY		1	2	3	4	5	6	7	8	9
9 Years		**Market**								
Metric	**Symbol**	**SET50**	**BJC**	**BTS**	**CPF**	**INTUCH**	**MINT**	**PTT**	**SCC**	**TPIPL**
9-Year Period - Downside										
Correlation w/ SET50	**ρMS**	1.00	0.72	0.50	0.45	0.52	0.43	0.54	0.14	0.63
Ave. quarterly TSR	**TSR**	15.31%	17.06%	37.75%	22.36%	41.24%	37.64%	31.33%	46.24%	20.03%
TSR Premium over SET50	**TSR'**		1.74%	22.44%	7.04%	25.92%	22.33%	16.02%	30.92%	4.71%
Risk-Free Rate (average)	**Rf**	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%
Ave. mo. annualized TSR	**m**	15.31%	17.06%	37.75%	22.36%	41.24%	37.64%	31.33%	46.24%	20.03%
Differential ave. annualized TSR	**DRm**		1.74%	22.44%	7.04%	25.92%	22.33%	16.02%	30.92%	4.71%
Quarterly SD (price only)	**sd**	1.33%	1.98%	1.84%	2.44%	2.34%	2.21%	2.42%	2.96%	1.83%
Beta (price only)	**bd**	1.00	1.02	0.66	0.79	0.87	0.68	0.94	0.29	0.82
Excess Returns	**m - Rf**	11.54%	13.28%	33.97%	18.58%	37.46%	33.87%	27.56%	42.46%	16.25%
Jensen's Alpha	**JA**	-	0.02	0.26	0.09	0.27	0.26	0.17	0.39	0.07
Total Risk										
Sharpe Ratio	**SR**	8.66	6.70	18	7.61	16.00	15.30	11.41	14.33	8.87
Leverage (RAP)			0.67	0.72	0.55	0.57	0.60	0.55	0.45	0.73
Risk Adjusted Performance	**RAP**	15.31%	12.71%	28.34%	13.92%	25.09%	24.15%	18.97%	22.86%	15.60%
Differential RAP	**DRap**		-2.61%	13.03%	-1.40%	9.78%	8.84%	3.66%	7.55%	0.28%

Market/Systematic Risk

Treynor Ratio	**TR**	0.12	0.13	0.52	0.24	0.43	0.50	0.29	1.44	0.20
lever/delever Beta	**d**	-	(0.02)	0.52	0.27	0.15	0.47	0.06	2.39	0.21
Market Risk Adjusted Performance	**MRAP**	15.31%	16.84%	55.56%	27.30%	46.68%	53.70%	33.11%	147.72%	23.50%
Differential MRAP	**DRmrap**		1.52%	40.25%	11.99%	31.36%	38.38%	17.79%	132.40%	8.19%

9-Year Period - Normal

	Symbol	SET50	BJC	BTS	CPF	INTUCH	MINT	PTT	SCC	TPIPL
Correlation w/ SET50	**ρMS**	1.00	0.74	0.50	0.42	0.51	0.41	0.51	0.10	0.63
Correlation w/ Sector	**ρSM**									
Ave. quarterly TSR	**TSR**	15.31%	17.06%	37.75%	22.36%	41.24%	37.64%	31.33%	46.24%	20.03%
TSR Premium over SET50	**TSR'**	0.00%	1.74%	22.44%	7.04%	25.92%	22.33%	16.02%	30.92%	4.71%
Risk-Free Rate (average)	**Rf**	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%	3.78%
Ave. annualized TSR	**m**	15.31%	17.06%	37.75%	22.36%	41.24%	37.64%	31.33%	46.24%	20.03%
Differential ave. annualized TSR	**DRm**		1.74%	22.44%	7.04%	25.92%	22.33%	16.02%	30.92%	4.71%
Quarterly SD (price only)	**s**	1.39%	2.28%	2.18%	3.07%	2.96%	2.74%	3.08%	4.66%	2.07%
Beta (price only)	**b**	1.00	1.21	0.77	0.93	1.08	0.80	1.12	0.34	0.94
Excess Returns	**m - Rf**	11.54%	13.28%	33.97%	18.58%	37.46%	33.87%	27.56%	42.46%	16.25%
Jensen's Alpha	**JA**	-	(0.01)	0.25	0.08	0.25	0.25	0.15	0.39	0.05

Total Risk

Sharpe Ratio	**SR**	8.27	5.82	15.60	6.04	12.66	12.37	8.95	9.11	7.85

Leverage (RAP)			0.58	0.61	0.43	0.45	0.49	0.43	0.29	0.64
Risk Adjusted Performance (RAP)	**RAP**	15.31%	11.53%	24.56%	11.83%	20.64%	20.25%	15.70%	15.91%	14.23%
Sharpe - check		8.27	5.82	15.60	6.04	12.66	12.37	8.95	9.11	7.85
Treynor - check		0.12	0.11	0.44	0.20	0.35	0.42	0.25	1.25	0.17
Jensen - check		-	(0.01)	0.25	0.08	0.25	0.25	0.15	0.39	0.05
Differential RAP	**DRrap**		-3.79%	9.24%	-3.49%	5.32%	4.94%	0.39%	0.60%	-1.09%
Market/Systematic Risk										
Treynor Ratio	**TR**	0.12	0.11	0.44	0.20	0.35	0.42	0.25	1.25	0.17
lever/delever Beta	**d**	-	(0.18)	0.29	0.07	(0.07)	0.24	(0.11)	1.95	0.07
Market Risk Adjusted Performance (RAP)	**MRAP**	15.31%	14.72%	47.62%	23.67%	38.57%	45.87%	28.29%	128.97%	21.13%
Differential MRAP	**DRmrap**		-0.59%	32.30%	8.35%	23.25%	30.56%	12.97%	113.65%	5.81%

Appendix 6: ID 9-year Performance Appraisal Metrics Summary

DATA SUMMARY		1	2	3	4	5	6	7	8	9
9 Years		Market								
Metric	Symbol	LQ45	ASII	KLBF	INDF	AKRA	LPKR	BMTR	CTRA	CPIN
9-Year Period - Downside										
Correlation w/ JKSE	ρ_{MS}	1.00	0.72	0.52	0.65	0.47	0.40	0.38	0.53	0.52
Ave. x years TSR	TSR	19.06%	31.25%	35.06%	32.47%	41.09%	16.81%	38.16%	30.38%	68.10%
TSR Premium over JKSE	TSR'		12.19%	16.00%	13.41%	22.02%	-2.26%	19.09%	11.32%	49.03%
Risk-Free Rate (average)	Rf	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%
Ave. annualized TSR	μ	19.06%	31.25%	35.06%	32.47%	41.09%	16.81%	38.16%	30.38%	68.10%
Differential ave. annualized TSR	DR_{μ}		12.19%	16.00%	13.41%	22.02%	-2.26%	19.09%	11.32%	49.03%
Quarterly SD (price only)	σd	1.48%	2.60%	2.36%	2.62%	2.44%	1.97%	2.92%	3.37%	3.01%
Beta (price only)	βd	1.00	1.26	0.82	1.15	0.77	0.53	0.74	1.22	1.05
Excess Returns	$\mu - Rf$	10.77%	22.96%	26.77%	24.18%	32.80%	8.51%	29.86%	22.09%	59.81%
Jensen's Alpha	JA	-	0.09	0.18	0.12	0.25	0.03	0.22	0.09	0.48
Total Risk										
Sharpe Ratio	SR	7.27	8.82	11	9.24	13.45	4.33	10.23	6.54	19.87
Leverage (RAP)			0.57	0.63	0.57	0.61	0.75	0.51	0.44	0.49
Risk Adjusted Performance (RAP)	RAP	19.06%	21.36%	25.13%	21.99%	28.22%	14.70%	23.45%	17.99%	37.74%
Differential RAP	DR_{rap}		2.30%	6.07%	2.92%	9.16%	-4.36%	4.39%	-1.07%	18.68%

Market/Systematic Risk

Treynor Ratio	**TR**	0.11	0.18	0.32	0.21	0.43	0.16	0.40	0.18	0.57
lever/delever Beta	**d**	-	(0.20)	0.21	(0.13)	0.30	0.88	0.35	(0.18)	(0.05)
Market Risk Adjusted Performance (RAP)	**MRAP**	19.06%	26.55%	40.74%	29.33%	50.89%	24.32%	48.50%	26.45%	65.20%
Differential MRAP	**DR_{mrap}**		7.49%	21.68%	10.27%	31.83%	5.25%	29.43%	7.39%	46.14%

9-Year Period - Normal

	Symbol	LQ45	ASII	KLBF	INDF	AKRA	LPKR	BMTR	CTRA	CPIN
Correlation w/ JKSE	ρ_{MS}	1.00	0.72	0.50	0.65	0.46	0.39	0.35	0.51	0.48
Correlation w/ Sector	ρ_{SM}									
Ave. x years TSR	**TSR**	19.06%	31.25%	35.06%	32.47%	41.09%	16.81%	38.16%	30.38%	68.10%
TSR Premium over JKSE	**TSR'**	0.00%	12.19%	16.00%	13.41%	22.02%	-2.26%	19.09%	11.32%	49.03%
Risk-Free Rate (average)	**Rf**	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%	8.29%
Ave. annualized TSR	μ	19.06%	31.25%	35.06%	32.47%	41.09%	16.81%	38.16%	30.38%	68.10%
Differential ave. annualized TSR	DR_{μ}		12.19%	16.00%	13.41%	22.02%	-2.26%	19.09%	11.32%	49.03%
Quarterly SD (price only)	σ	1.48%	2.73%	2.54%	2.65%	2.52%	2.04%	3.47%	3.69%	3.40%
Beta (price only)	β	1.00	1.33	0.86	1.16	0.78	0.54	0.83	1.27	1.09
Excess Returns	$\mu - Rf$	10.77%	22.96%	26.77%	24.18%	32.80%	8.51%	29.86%	22.09%	59.81%
Jensen's Alpha	**JA**	-	0.09	0.18	0.12	0.24	0.03	0.21	0.08	0.48
Total Risk										
Sharpe Ratio	**SR**	7.27	8.42	10.53	9.14	13.03	4.17	8.60	5.99	17.60

Leverage (RAP)			0.54	0.58	0.56	0.59	0.73	0.43	0.40	0.44
Risk Adjusted Performance (RAP)	**RAP**	19.06%	20.77%	23.89%	21.83%	27.60%	14.47%	21.03%	17.16%	34.36%
Sharpe - check		7.27	8.42	10.53	9.14	13.03	4.17	8.60	5.99	17.60
Treynor - check		0.11	0.17	0.31	0.21	0.42	0.16	0.36	0.17	0.55
Jensen - check		-	0.09	0.18	0.12	0.24	0.03	0.21	0.08	0.48
Differential RAP	**DR_{rap}**		1.70%	4.83%	2.77%	8.54%	-4.59%	1.97%	-1.90%	15.30%
Market/Systematic Risk										
Treynor Ratio	**TR**	0.11	0.17	0.31	0.21	0.42	0.16	0.36	0.17	0.55
lever/delever Beta	**d**	-	(0.25)	0.17	(0.14)	0.28	0.86	0.21	(0.21)	(0.08)
Market Risk Adjusted Performance (RAP)	**MRAP**	19.06%	25.61%	39.55%	29.17%	50.16%	24.12%	44.37%	25.64%	63.18%
Differential MRAP	**DR_{mrap}**		6.54%	20.49%	10.10%	31.09%	5.06%	25.30%	6.58%	44.12%

Appendix 7: Multiple Regression Analysis of Variables Against TSR

9-year
SUMMARY OUTPUT OF MULTIPLE LINEAR REGRESSION

Regression Statistics	
Multiple R	0.68690286
R Square	0.471835539
Adjusted R Square	0.240763587
Standard Error	0.03291235
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	0.015483147	0.002212	2.041942	0.11230855
Residual	16	0.017331564	0.001083		
Total	23	0.032814711			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.182660153	0.117026071	-1.56085	0.138119	-0.4307443	0.06542403	-0.430744341	0.065424034
Beta_Index	0.128884238	0.266774068	0.483121	0.635554	-0.4366515	0.69442	-0.436651522	0.694419998
Downside Beta_Index	-0.141640125	0.293505603	-0.48258	0.63593	-0.7638442	0.48056396	-0.763844208	0.480563957
Total Risk	-0.101972044	4.728876433	-0.02156	0.983063	-10.126742	9.92279817	-10.12674225	9.922798166
Down Total Risk	6.067832675	6.705764937	0.904868	0.378959	-8.147754	20.2834193	-8.14775395	20.2834193
Size	0.004557957	0.010746947	0.424116	0.677128	-0.0182246	0.02734047	-0.018224554	0.027340467
Debt/Capital	0.198589244	0.083309538	2.383752	0.029869	0.02198091	0.37519758	0.021980912	0.375197576
PBV	0.014546339	0.007125978	2.041311	0.05807	-0.0005601	0.02965274	-0.000560059	0.029652737

3-Year
SUMMARY OUTPUT OF MULTIPLE LINEAR REGRESSION

Regression Statistics	
Multiple R	0.595280013
R Square	0.354358294
Adjusted R Square	0.071890047
Standard Error	0.06879659
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	0.041562804	0.005938	1.254507	0.33174767
Residual	16	0.075727533	0.004733		
Total	23	0.117290337			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.033235512	0.201876031	-0.16463	0.871295	-0.4611936	0.39472256	-0.461193579	0.394722556
Beta_Index	-0.436397932	0.472795321	-0.92302	0.369709	-1.4386792	0.56588337	-1.438679239	0.565883374
Downside Beta_Index	0.529801396	0.545140632	0.971862	0.345583	-0.6258451	1.68544791	-0.625845118	1.68544791
Total Risk	-2.341940714	6.175032933	-0.37926	0.709481	-15.432426	10.7485443	-15.43242575	10.74854432
Down Total Risk	6.929719381	9.935526018	0.697469	0.495521	-14.132655	27.9920936	-14.13265487	27.99209364
Size	-0.00907987	0.020465673	-0.44366	0.663227	-0.0524652	0.03430542	-0.052465158	0.034305419
Debt/Capital	0.163812959	0.11790694	1.389341	0.183762	-0.0861386	0.41376451	-0.086138588	0.413764506
PBV	0.014793632	0.019817942	0.746477	0.466207	-0.0272185	0.05680579	-0.027218527	0.056805791

6-Year
SUMMARY OUTPUT OF MULTIPLE LINEAR REGRESSION

Regression Statistics	
Multiple R	0.596794884
R Square	0.356164134
Adjusted R Square	0.074485942
Standard Error	0.035713679
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	0.011289227	0.001613	1.264436	0.32727823
Residual	16	0.02040747	0.001275		
Total	23	0.031696697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.187961965	0.127647645	-1.47251	0.160282	-0.4585629	0.08263896	-0.458562884	0.082638955
Beta_Index	0.366104027	0.256406333	1.427828	0.172569	-0.1774531	0.90966117	-0.177453118	0.909661171
Downside Beta_Index	-0.387902952	0.281697724	-1.37702	0.187469	-0.9850755	0.20926955	-0.98507545	0.209269547
Total Risk	9.08087159	5.956551955	1.524518	0.146901	-3.5464545	21.7081976	-3.546454464	21.70819764
Down Total Risk	-7.313528177	7.767260211	-0.94158	0.360406	-23.779384	9.1523279	-23.77938426	9.152327904
Size	0.015759653	0.011583032	1.360581	0.192506	-0.0087953	0.04031458	-0.008795278	0.040314583
Debt/Capital	0.052393461	0.095287045	0.549849	0.590017	-0.1496061	0.25439297	-0.149606052	0.254392973
PBV	0.004774317	0.005833909	0.818374	0.425165	-0.007593	0.01714165	-0.007593017	0.017141651

Appendix 8: Simple Regressions for Significant Variables Only

9-year
SUMMARY OUTPUT FOR BETA

Regression Statistics	
Multiple R	0.145787845
R Square	0.021254096
Adjusted R Square	-0.02323435
Standard Error	0.038208319
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000697447	0.000697	0.477744	0.496675325
Residual	22	0.032117264	0.00146		
Total	23	0.032814711			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.051848861	0.031707748	1.635211	0.116234	-0.013908984	0.117607	-0.01390898	0.11760671
X Variable 1	0.022654273	0.032775736	0.69119	0.496675	-0.045318443	0.090627	-0.04531844	0.09062699

3-year
SUMMARY OUTPUT FOR BETA

Regression Statistics	
Multiple R	0.241900818
R Square	0.058516006
Adjusted R Square	0.015721279
Standard Error	0.07084778
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006863362	0.006863	1.367365	0.254778972
Residual	22	0.110426975	0.005019		
Total	23	0.117290337			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.029268172	0.039831155	0.734806	0.470218	-0.053336588	0.111873	-0.05333659	0.11187293
X Variable 1	0.05430403	0.046439748	1.169344	0.254779	-0.042006112	0.150614	-0.04200611	0.15061417

6-year
SUMMARY OUTPUT FOR BETA

Regression Statistics	
Multiple R	0.055328703
R Square	0.003061265
Adjusted R Square	-0.04225413
Standard Error	0.037899187
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	9.7032E-05	9.7E-05	0.067555	0.797348039
Residual	22	0.031599665	0.001436		
Total	23	0.031696697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.064962975	0.033078663	1.963894	0.062302	-0.003637973	0.133564	-0.00363797	0.13356392
X Variable 1	0.008254071	0.031757083	0.259913	0.797348	-0.057606088	0.074114	-0.05760609	0.07411423

9-year
SUMMARY OUTPUT FOR DOWNSIDE BETA

Regression Statistics	
Multiple R	0.160148018
R Square	0.025647388
Adjusted R Square	-0.01864137
Standard Error	0.03812247
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000841612	0.00084161	0.5790948	0.454747246
Residual	22	0.031973099	0.00145332		
Total	23	0.032814711			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.050138989	0.03114949	1.60962471	0.12173651	-0.0144611	0.11473908	-0.0144611	0.11473908
X Variable 1	0.025822464	0.033933046	0.76098279	0.45474725	-0.044550366	0.09619529	-0.04455037	0.09619529

3-year
SUMMARY OUTPUT FOR DOWNSIDE BETA

Regression Statistics	
Multiple R	0.292301559
R Square	0.085440202
Adjusted R Square	0.043869302
Standard Error	0.069827393
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.01002131	0.01002131	2.05528872	0.165739006
Residual	22	0.107269027	0.00487586		
Total	23	0.117290337			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.018977112	0.040070484	0.47359329	0.64045586	-0.064123985	0.10207821	-0.06412398	0.10207821
X Variable 1	0.072064473	0.050267212	1.43362782	0.16573901	-0.032183344	0.17631229	-0.03218334	0.17631229

6-year
SUMMARY OUTPUT FOR DOWNSIDE BETA

Regression Statistics	
Multiple R	0.029460684
R Square	0.000867932
Adjusted R Square	-0.04454716
Standard Error	0.037940855
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.75106E-05	2.7511E-05	0.01911109	0.891306035
Residual	22	0.031669186	0.00143951		
Total	23	0.031696697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.068956837	0.032512711	2.12091933	0.04543718	0.001529602	0.13638407	0.001529602	0.13638407
X Variable 1	0.004515263	0.032661819	0.13824286	0.89130603	-0.063221204	0.07225173	-0.0632212	0.07225173

9-year

SUMMARY OUTPUT FOR TOTAL RISK (Standard deviation)

Regression Statistics	
Multiple R	0.364846
R Square	0.133113
Adjusted R Square	0.093709
Standard Error	0.035959
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.004368	0.004368	3.378159	0.079608
Residual	22	0.028447	0.001293		
Total	23	0.032815			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.008725	0.035782	0.243829	0.809623	-0.06548	0.082931	-0.06548	0.082931
X Variable 1	2.630666	1.431284	1.837977	0.079608	-0.33763	5.598967	-0.33763	5.598967

3-year
SUMMARY OUTPUT FOR TOTAL RISK (Standard deviation)

Regression Statistics	
Multiple R	0.147726
R Square	0.021823
Adjusted R Square	-0.02264
Standard Error	0.072215
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.00256	0.00256	0.490814	0.490908
Residual	22	0.114731	0.005215		
Total	23	0.11729			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.037921	0.051738	0.732944	0.471331	-0.06938	0.14522	-0.06938	0.14522
X Variable 1	1.18838	1.696278	0.700581	0.490908	-2.32949	4.706246	-2.32949	4.706246

6-year

SUMMARY OUTPUT FOR TOTAL RISK (Standard deviation)

Regression Statistics	
Multiple R	0.451507
R Square	0.203858
Adjusted R Square	0.16767
Standard Error	0.033868
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006462	0.006462	5.633267	0.026779
Residual	22	0.025235	0.001147		
Total	23	0.031697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.0077	0.034832	-0.22119	0.826983	-0.07994	0.064532	-0.07994	0.064532
X Variable 1	3.702428	1.559935	2.373451	0.026779	0.467321	6.937534	0.467321	6.937534

9-year

SUMMARY OUTPUT FOR DOWNSIDE RISK (SEMI-DEVIATION WITH RESPECT TO RISK FREE RATE)

Regression Statistics	
Multiple R	0.473253
R Square	0.223969
Adjusted R Square	0.188694
Standard Error	0.034022
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.007349465	0.007349465	6.34936796	0.019504202
Residual	22	0.025465246	0.001157511		
Total	23	0.032814711			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.02104	0.037997591	-0.55376625	0.58532383	-0.099843964	0.0577604	-0.09984396	0.0577604
Down Total Risk	4.367328	1.733207595	2.519795223	0.0195042	0.772875666	7.96178077	0.772875666	7.96178077

3-year

SUMMARY OUTPUT FOR DOWNSIDE RISK (SEMI-DEVIATION WITH RESPECT TO RISK FREE RATE)

Regression Statistics	
Multiple R	0.348892
R Square	0.121726
Adjusted R Square	0.081804
Standard Error	0.068428
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.014277271	0.014277271	3.04912736	0.09473118
Residual	22	0.103013066	0.004682412		
Total	23	0.117290337			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.03227	0.061698249	-0.52307295	0.60615227	-0.160227021	0.09568165	-0.16022702	0.09568165
Down Total Risk	4.305522	2.465687444	1.746175067	0.09473118	-0.808000847	9.41904472	-0.80800085	9.41904472

6-year

SUMMARY OUTPUT FOR DOWNSIDE RISK (SEMI-DEVIATION WITH RESPECT TO RISK FREE RATE)

Regression Statistics	
Multiple R	0.368508
R Square	0.135798
Adjusted R Square	0.096517
Standard Error	0.035286
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.004304361	0.004304361	3.45702325	0.076410586
Residual	22	0.027392336	0.001245106		
Total	23	0.031696697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00431	0.037809372	0.113999981	0.91027179	-0.074101571	0.08272211	-0.07410157	0.08272211
Down Total Risk	3.445939	1.853345553	1.859307195	0.07641059	-0.397664706	7.28954215	-0.39766471	7.28954215

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