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Benchmarking the competitiveness of the ASEAN 5 equity markets: An application of Porter's diamond model

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An application of Porter's diamond model

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Abstract

Purpose – The purpose of this paper is to study the competitiveness of the stock markets in ASEAN 5, which are the Stock Exchange of Thailand (SET), the Singapore Exchange (SGX), Bursa Malaysia (BM), the Indonesia Stock Exchange (IDX), and the Philippine Stock Exchange (PSE).

Design/methodology/approach – This research applies Porter's (1990) diamond model to analyze the competitiveness and the data were collected from World Economic Forum, International Institute for Management Development, the World Federation of Exchanges database, and DataStream.

Findings – The results show that SGX is the most competitive exchange in ASEAN 5 region. It dominates other exchanges in every dimension. It gains its reputation for being the region's most prominent exchange, followed by BM, SET, IDX, and the PSE, respectively.

Practical implications – The results of this investigation provide rank for competitiveness of stock exchanges among ASEAN 5 and identify the way to improve its competitive position.

Social implications – It is useful for public and private sectors involved in the development and policy making to promote funding and investment efficiency of the exchanges. It will be benefit to establish the well-planned development strategy and policy to build up the competitive advantage of the nations.

Originality/value – Identifying and benchmarking the competitiveness of the stock markets in ASEAN economies. By using Diamond Model, the authors propose indicators to assess the competitiveness of the stock markets in ASEAN 5 countries. Assessing the competitiveness of the ASEAN stock markets in this paper will lead us to better understand about each country's strengths and weaknesses and to promote a mutual collaboration among the region toward ASEAN Economic Community.

Keywords Benchmarking, Competitive advantage, ASEAN, Stock markets

Paper type Research paper

Introduction

The ASEAN has been a regional economic integration initiated in 1967. The collaboration aims to increase the potential of bargaining position in the global, and share resources among members within this region. The cooperation has been started by ASEAN Free Trade Area initiating in 1993. ASEAN's economic performance continues to outpace the rest of the world with the Asian Development Bank (ADB) predicting that GDP in ASEAN countries will grow 5.3 percent in 2013 and 5.6 percent in 2014. One important attempt devoted to financial sector development is the linkage between seven stock markets from six countries in ASEAN, namely, ASEAN exchanges. The members of the ASEAN exchanges are Thailand, Malaysia, Indonesia, Philippine, Singapore, Ho Chi Min, and Hanoi. The issue of stock markets integration has been emphasized

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by the liberalization of financial markets, which start out by relaxation of international capital flows and the growing cross-border investment into ASEAN. Furthermore, leaders of the ASEAN countries confirmed their commitment to the founding of the ASEAN Economic Community (AEC), briefly AEC, by the end of 2015. It is enthusiastically to transform ASEAN to be a free movement zone of goods, services, skilled labor, investment, and capital. This impressive performance will shape the region with an important investment opportunity. One of the main objectives for the collaboration is to establish market base economies, in which financial sectors are liberalized. It is expected that financial and capital markets will be integrated to ensure that capital flows are flowed toward the right mechanism, so reducing the vulnerable to the crisis.

One accelerating pace of regional stock market integration that worth noted is devoted to ASEAN trading link, a gateway for securities brokers to offer their clients access to each exchanges at ease. Individual investors can be able to buy about 2,300 shares of a company in Malaysia, Singapore, or Thailand at their convenience with a tax exemption for capital gains. The link of three exchanges accounts for 67 percent of the total market capitalization of the ASEAN exchanges group. In stock market integration areas, there is a marked interest in assessing the issue of competitiveness among each stock exchange in the region. This attempt toward regional stock market integration not only creates benefits toward a cross-border harmonization and more trading of ASEAN centric products, but also intensifies competition among them. Therefore, benchmarking provides the baseline by which an equity market can articulate key issues and a means by which to measure their competitiveness among each national stock exchange. Many organizations worldwide look at benchmarking as a tool to help them to achieve better result and to learn from others in order to improve competitive advantage, with no exception for the stock exchanges in ASEAN.

In this study, we benchmark the competitiveness of the stock market among five nations of ASEAN using Porter's diamond model. There are two main search questions for this paper. First, which stock exchange has higher level of competitiveness than others in ASEAN region? And how to improve competitiveness of each stock exchange to be more competitive in the future? In answering them, we first construct indicators examining the competitiveness under Porter's diamond model. Then, we compare the competitiveness of each stock exchange in each dimension. Next, we discuss results and implications for each exchange and ASEAN as a region by introducing many different ideas and policies for continuous improvement toward competiveness.

The contribution of this research has two folds. First, benchmarking stock market competitiveness is interesting area of research, which, there are no research has previously explored. This study will fill a literature gap in benchmarking equity markets under the theme of financial integration in ASEAN. Through benchmarking process, we can assess stock market in each country for its competiveness against the best-in-class exchange in the region and provides an opportunity to learn from others in order to reduce gap among regional exchanges to foster the future of the economics and financial integration. The benchmarking process is valuable to each stock market by introducing many different ideas for continuous improvement toward competiveness. Since the stock market in one country can compare its score against other exchanges and identify the weak and strong points, the analysis is also useful for public and private sectors involved in the development and policy making to promote funding and investment efficiency of the exchanges. Second, the approach being used in this paper is new. This paper computes simple indices using published information, organizes, and adds them for comparing the stock markets of five ASEAN stock markets. To the

best of our knowledge, it is also the first attempt to generalize Porter's diamond model to benchmark stock market competitiveness. A number of prior researches have been focussed on comparative study of the stock market integration in the ASEAN region such as Karim and Ning (2013) or Das (2014). However, these research works are quantitative studies focussing on one or a few particular aspects of the stock markets, not the competitiveness aspect. This study analyzes several facets of competitive advantage using quantitative approach to benchmark stock exchanges in the region.

The paper is divided in five parts. The first part is devoted to the motivation for competiveness among ASEAN 5 countries. It is then followed by second part, which presents a short overview of the stock market integration in ASEAN and the literature reviews and conceptual framework explaining stock market competitiveness based on Porter's diamond model. The third section presents the data and methodology used in the study. After that, we analyze and compare the competitiveness of ASEAN 5 stock markets in the fourth section based on the diamond model. The last section concludes the main findings and implications of the research.

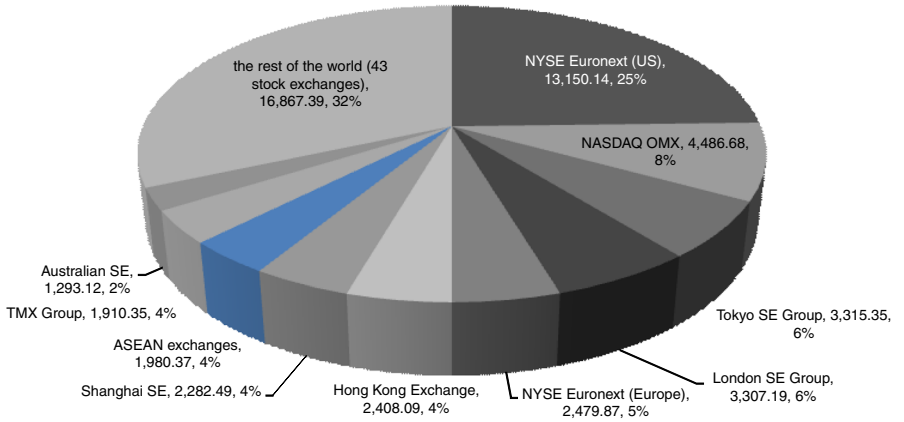
Literature review

A brief review of ASEAN stock markets

This section provides a brief review of ASEAN stock markets. A stock exchange is an organized market in which a participant can trade securities in a publicly visible manner, under recognized guidelines relevant to all memberships of the organization. As part of the financial system, exchanges can have an effect on economic growth through their effects on capital accumulation. The concern for stock market development is a key alarm in all ASEAN members as important fragment of their particular financial deepening programs. In 2009, the ASEAN step forward to AEC for establishing market base and working together to strengthen in the region. One of activities related to financial sector development is the linkage between seven stock markets from six countries in ASEAN, namely, ASEAN exchanges. The members of the ASEAN exchanges are Thailand, Malaysia, Indonesia, Philippine, Singapore, Ho Chi Min, and Hanoi. The purpose of forming the ASEAN exchanges is to make the feasibility for funding and investment in the region. Together, there are 3,613 companies listed in seven stock markets. Total stock market value is USD1,980.37 billion, making the eighth ranked with about 4 percent of the market capitalization in the world according to the World Federation of Exchanges (2012) as shown in Figure 1. There are 3,613 companies listed in seven stock markets. Hopefully, the integration of stock markets in ASEAN becomes more interesting in global investor's perspective and attracts more foreign investment to the region.

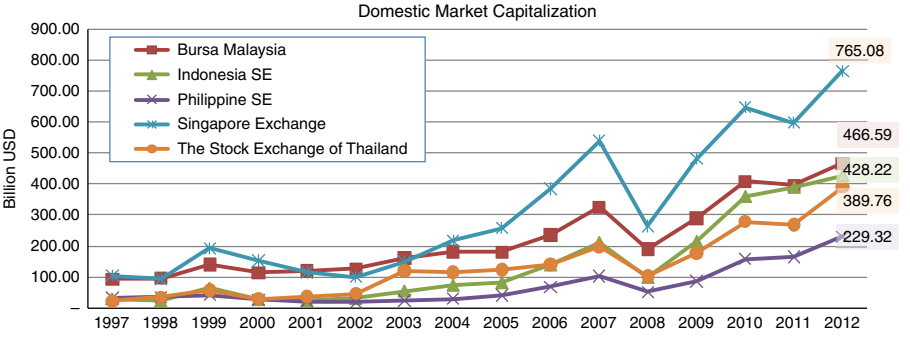
The stock market capitalizations of the ASEAN region have noticed considerable progress after the 1997 Asian financial crisis, although with different speed of progress across countries. After Asian financial crisis, ASEAN has been riding an unprecedented bull market. ASEAN members have initiated plans to develop their local stock markets. There have been also determinations to synchronize the market, set up settlement customary, promote transparency, and integrate exchanges among members. The market value of equity markets in Malaysia, Thailand, and Singapore have approximately been at comparable level as shown in Figure 2. According to data reported by world federation of exchange, in 2012, the stock market in Malaysia, Indonesia, Thailand, and the Philippines are at 466.59, 428.22, 389.76, and 229.32 billion dollars, respectively.

The underlying growth in ASEAN stock market is significant. Table I shows annual growth rates of ASEAN 5 stock exchanges during 1997-2012. It is noted that the



Note: Units: billion USD
Source: World Federation of Exchanges (2012)

Figure 1.
Market capitalization of ASEAN 5 exchanges and the world stock market



Source: World Federation of Exchanges (2012)

Figure 2.
Market capitalization of ASEAN 5 exchange during 1997-2012

Stock market	Average annual market capitalization growth (1997-2012) (%)	Market capitalization growth during 1997-2012
Bursa Malaysia	11.33	4.0
Indonesia SE	19.65	13.7
Philippine SE	14.18	6.3
Singapore Exchange	14.20	6.3
The Stock Exchange of Thailand	20.80	16.0
ASEAN 5	*14.98*	*7.1*

Notes: The average annual market capitalization growth is the geometric mean of the market capitalization for each year during 1997-2012. The market capitalization growth is the change calculated using 2012 and 1997 data

Table I.
Growth of ASEAN 5 exchanges

geometric average annual growth rate for the region is 14.98 percent. Among others, the Stock Exchange of Thailand (SET) occupies the top spot with average annual growth of 20.80 percent, followed by Indonesia Stock Exchange (IDX) (19.65 percent), Singapore Exchange (SGX) (14.20 percent), Philippine Stock Exchange (PSE) (14.18 percent), and Bursa Malaysia (BM) (11.33 percent). Moreover, the total market capitalization of the SET has ascended at maximum speed, up to 16 times during 1997-2012. IDX is a runner-up in growth. The growth of the market capitalization for IDX is almost 14 times. The total stock market capitalization of SGX and PSE have risen more than six folds in the past 16 years, followed by BM, quadruple the market capitalization, during 1997-2012, respectively.

Benchmarking and the competitiveness

Benchmarking is the process of systematically identifying, analyzing, and adapting industries' best practices for an organization's performance (Boxwell, 1994). Benchmarking is an increasingly important management tools being used for continuous improvement by comparing a firm's practices and performance measures with that of its most successful competitors (Leibfried and McNair, 1992; Boston Consulting Group, 1994; Attiany, 2009) defined benchmarking as a systematic approach through which organizations can measure their performances against the best-in-class organizations. The process of benchmarking is more than just a means of gathering data on how well an organization performs against others. It is a powerful and effective tool to learn from other in order to get the excellence. Benchmarking can also be used at industry or country level. Comparing best practice from an international geographic location of the comparison organization is referred to international benchmarking (Watson, 1993). The key motivation behind benchmarking is for an organization to improve its performance and reduce gap between the organization and its superior comparables (Oakland, 2003; Van Schalkwyk, 1998).

There are several types of benchmarking that are in use today. These are process benchmarking, performance benchmarking, strategic benchmarking, international benchmarking, and competitive advantage benchmarking (Bogan, 1994; Boxwell, 1994; OECD, 1997). Among these, Lankford (2000) argues that competitive benchmarking is the most difficult type of benchmarking to practice. For obvious reasons, organizations are not interested in helping a competitor by sharing information. Most of the time, this form of benchmarking is measuring the performance, products, and services of an organization against its direct or indirect competitors in its own industry. This does not just include the disassembly and examination of the product but it analyzes the entire customers' path of the organization's competitor. This is a difficult thing to do because this information is not easily obtained; therefore, it needs to do an extensive research and requires unbiased outsiders to perform the benchmarking functions. Overall, different organizations can have their own benchmarking methods, but no matter which method is used, benchmarking practices usually imply the notions of competition. Therefore, in a world of scarce resources, the attempt to analyze competition has been in the center of researches since the 1980s. The use of benchmarking as a competitive tool was embraced by firms cutting across diverse industry including construction, education, aviation, manufacturing, banking, financial services, insurance, health care services, and government among others (Luu *et al.*, 2008; Henderson *et al.*, 2006). Andersen (1999) notes that competitive benchmarking can be useful and add most value when comparing performance levels and/or strategies of organizations. Among others, some studies have been focus on the role of benchmarking in achieving competitive advantage or continuous improvement (such as Boxwell, 1994; Attiany, 2014), but not benchmarking the competitiveness.

The study of the competitiveness has recognized popular due to its importance in shaping an organization to a sound business strategy development (Feurer and Chaharbaghi, 1994). Several studies have been focussed on the issue of competitiveness. These studies can be grouped further into organization, industrial, and national competitiveness; in other words, micro-, meso-, and macro-level of competitiveness. Flanagan *et al.* (2007) discuss and review main schools of competing thought for the competitiveness. These are, first, the competitive advantage model of Porter (1980) which based on the industrial organization view, and second, the resource-based view of Wernerfelt (1984). The diamond framework by Porter (1980, 1985) has been widely used when analyzing competitiveness at both industry and national level. There were limited studies on benchmarking or comparative study of organizations on their competitiveness until Porter published his seminal works on diamond model system (Porter, 1990, 1998, make possible). He proposed a model that examines why some states are more competitive and why some industries within states are more competitive than others are. In this fashion, Porter's diamond model of national competitiveness has been perceived as a model that helps understand the competitive position of a nation in global competition as well.

A resource-based view of competitiveness clarifies its capacity to deliver sustainable competitive advantage when resources are managed such that their consequences cannot be imitated by competitors, which ultimately creates a competitive barrier. In his article "A Resource-Based View of the Firm" Wernerfelt (1984), on the other hand, assumes competitive advantage does not depend on market and industry structures, but restrain from the resources inside an organization. The unique resources such as financial resources, tangible resources, and intangible resources, of an organization is the source of competitiveness. A competing firm can come in the market with a resource that has the ability to overthrow the preceding firm's competitive advantage, which results in reduced. However, the concept of resources remains an amorphous one that is rarely operationally defined and explored in different competitive environments (Miller and Shamsie, 1996). Moreover, the use of its inward concentration may risk ignoring the market structures and conditions. More importantly, a resource-based view holds that sustained competitive advantage can be attained effortlessly by taking advantage of internal rather than external factors as compared to industrial organization view such as Porter's diamond model (Hooley *et al.*, 1998).

Since our objective in this study is to benchmarking the competitiveness of ASEAN stock exchanges, in which external environment rather than the performance of the stock exchanges is the main concerns; therefore, it is more justified to apply Porter's diamond model as a framework for benchmarking competitiveness. ASEAN stock exchanges are also appropriate case study for benchmarking the competitiveness because ASEAN integration is attempted toward collaborative regional stock market, and at the same time, also intensifies competition among them. This situation is consistent with benchmarking concept because benchmarking measures their competiveness against the best-in-class exchange in the region and provides an opportunity to learn from others in order to reduce gap among regional exchanges to foster the future of the integration. The benchmarking process is valuable to each stock market by introducing many different ideas for continuous improvement toward competiveness. This is because improving competitiveness is a long-term process rather than a short-term operation (Dixit and Joshi, 2011).

Porter's competitive advantage framework

As the objective of the research is to benchmarking the competitiveness of the stock exchanges in the ASEAN region, we have to build our indicators representing competitiveness of the stock exchanges. There are numerous issues that affect the environment in which stock markets function. We try to develop those indicators on the competitiveness of the stock exchanges taking into account that stock exchanges work in a national environment that can develop or hamper those businesses' ability to compete within their own countries or internationally. This concern can be assessed by using Porter's (1990) framework, which attempts to establish a connection between the academic literatures in strategic management and international economics. In his book, *Competitive Advantage of Nations* in 1990, his model has been constructing a foundation for developing national policies on competitiveness by introducing the comprehensive framework, which he calls the diamond. The model is a dynamic system in which all elements interrelate and support each other so as to make it difficult to replicate the structure of the industry in another country. Diamond model is the competitive advantage framework for countries, sectors, and firm levels. He investigates different economic characteristics of firms operated in ten countries to find the elements that determine the competitiveness of nations. He tries to explain why some regions are more competitive than others are and how firms gain superior positions in the country on global competitiveness.

The phenomena that are analyzed under the model are classified into six broad factors incorporated into the Porter diamond, which has become a key tool for the analysis of competitiveness (Porter, 1990). There are four important determinants for the competitiveness, factor conditions, demand conditions, related and supporting industries, and firm's strategy, structure, and rivalry factors. The government influences each component positively to achieve national competitive advantage. Chance is any event or occurrence that is outside of control of a firm. The details are illustrated in Figure 3.

Early works using this framework are based on one country's competitiveness. Later, several prior studies commonly apply Porter's diamond model when comparing competitiveness among nations to identify the sources of international competitive advantage (Hitt *et al.*, 1999; Öz, 2002). One significant research is Stone and Ranchhod (2006) utilize Porter's diamond of competitive advantage and develops a quantitative approach to determine the competitive advantage of a nation. The paper attempts to redress this balance by providing a more robust framework for assessing the relative global competitive advantage of a nation. Applying this approach to the BRIC nations,

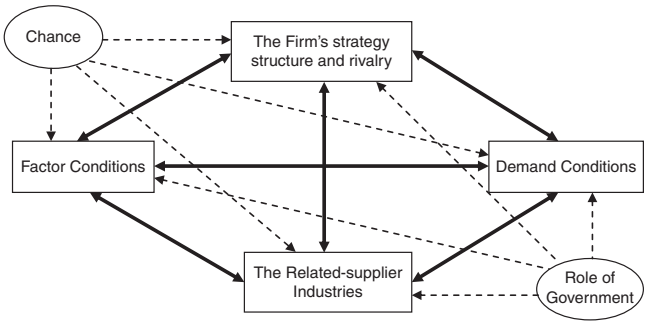


Figure 3.
Diamond model

Source: Porter (1990)

the UK, and the USA has yielded some interesting results indicating that the UK is currently the most competitive nation and that China will soon position itself as a truly competitive one.

In this study, we propose that the diamond model can be used to analyze stock market competitiveness. Diamond model chosen for analysis since it is one of the most popular tools for the competitiveness analysis among nations. Also, we compare many external environment factors rather than focus on only performance of the stock exchanges; therefore, it is more justified to apply Porter's diamond model as a framework for benchmarking competitiveness instead of using resource-based view's model. Factor conditions are basic input and high quality/specialized input such as human resources, physical resources, knowledge resources, capital resources, and infrastructure. Specialized resources are often specific for an industry and important for its competitiveness. Specific resources can be created to compensate for factor disadvantages. These are commonly called by economists as factors of production and represent merely the inputs necessary for everyday operations. Within this framework, we look at basic infrastructure of the country in which the stock markets operate in, for instance, capital market structure, financial skills of human resources, infrastructure, availability of financial services, affordability of financial service, and share of stock market capitalization. Demand conditions in the home market can help companies create a competitive advantage, when sophisticated home market buyers pressure firms to innovate faster and to create more advanced products than those of competitors. In the context of stock exchange, we look at various proxies of market size, growth, variety of products offered, and level of competition in each market. Related and supporting industries can produce inputs which are important for innovation and internationalization. These industries provide cost-effective inputs, but they also participate in the upgrading process, thus stimulating other companies in the chain to innovate. We focus on business environment to support the stock exchange activities. These factors include level of ethical standard, corporate governance mechanism, auditing, and level of internal control system, as well as availability of venture capital companies. Firm's strategy, structure, and rivalry constitute the fourth determinant of competitiveness. The way in which companies are created, set goals and are managed is important for success. In our study, we investigate the basic infrastructure of each exchange to facilitate the security trading, trading participants, and level of market stability. The presence of intense rivalry in the home base is also important. It creates pressure to innovate in order to upgrade competitiveness. We then include market share and overall financial performance and attractiveness of listed companies into analysis.

Further, role of government and chance can influence each of the above four determinants of competitiveness. Role of government can influence the supply conditions of key production factors, demand conditions in the home market, and competition between firms. Government interventions can occur at local, regional, national, or supranational level. One of the key relationships between government and the facets of the model is the governmental policy to impose or reduce taxes related to security trading such as capital gain taxes or dividend taxes. Although chance events are occurrences that are outside of control of a firm, they are important because they create discontinuities in which some gain competitive positions and some lose. We incorporate efficiency of the country's public finance policy and institutional framework, as well as government regulations of business for the analysis.

Data and methodology

Data

In this study, we collect the data from secondary sources and compute simple indices for each factor under the Porter diamond to comparatively analyze the competitiveness of the ASEAN 5 stock markets. There are a variety of sources the statistical data or indices are collected. We comply the data and categorize them using Porter's diamond framework. The macroeconomics factors are synthesized from the Global Competitiveness Report presented by World Economic Forum, World Bank, and International Institute for Management Development. Financial structure data were obtained from ADB, tax rates and structures are compared using Deloitte International Tax Source. For stock market information, we collect from the stock market database of each country, the World Federation of Exchanges database and DataStream. Corporate governance information is obtained from Asian Corporate Governance Association. Data relating to performance in monetary and fiscal policy is gathered from IMD's World Competitiveness Yearbook. Industry concentration (measured by Herfindahl Index (HI)), concentration ratio, and volatility of the stock markets are calculated by the authors using statistics from DataStream. All data are analyzed at the end of the year 2012 or at the nearest available period.

Methodology

We employ exploratory research to analyze data of various dimensions proposed by Porter (1990) for stock markets of five ASEAN members. Kotler *et al.* (2004, p. 345) described that exploratory research is a kind of research, intended to "gather preliminary information that will help to better define problems and suggest hypothesis." Various academic papers suggest that exploratory research is suitable to study multi-dimensional phenomena (Yin, 2003) since the methodology provides a clearer holistic assessment of the context (Ghauri and Gronhaug, 2005). We acknowledge that selection of performance measures or indicators is one of the most important steps in benchmarking. Benchmarking will have limited benefits or even be damaging if the quality of the indicators is not satisfactory. As a result, we then conduct focus group methodology to identify indicators in each dimension under the framework of Porter's diamond model that are appropriate for assessing stock exchange competitiveness. A group of ten capital market experts are invited to the forum to generate indicators. These indicators are generally used to compare the results of one stock market to other stock markets. In doing so, stock market in one country can compare its score against other exchanges and identify the weak and strong points. This can consequently seek to reduce the weaknesses by benchmarking their processes against best-in-class organizations (Helgason, 1997).

After getting raw data for each indicator from various sources, we then use relative value approach. This method is proposed by Stone and Ranchhod (2006) to describe the growth of the BRIC nations (Brazil, Russia, India and China) relative to the competitive advantage of the main OECD nations. Their paper utilizes the framework within Porter's diamond of competitive advantage and develops a quantitative approach to determine the competitive advantage of a nation. They compute the relative value of subcategories under each competitiveness indicator for comparison. Therefore, we employ this approach to compute relative value for each indicator under Porter's framework among ASEAN 5 stock markets. Relative value approach is a method of determining an indicator's value that takes into account the value of other countries' data for comparison. In contrast, absolute value looks only at a country's indicators and

does not compare them to other countries. Supporting references to the methodology about using the relative value calculation for comparing data for different countries are World Bank (2011a, b); which the calculation is based on four aspects for financial sector and stock market development. However, these studies do not cover the assessment of competitiveness. Since our objective is to benchmark competitiveness of stock markets in ASEAN; therefore, we use of the Porter's diamond framework to measure competitiveness. The indicators based on the diamond model included factor condition, demand condition, related and supporting industries, and firm strategy, structure and rivalry are transformed into relative values. The relative value of each indicator for assessment of stock market development among five nations can be calculated by using following equation:

$$C_{A,i} = \frac{(\text{Value}_{A,i} - \text{Min}_A)}{(\text{Max}_A - \text{Min}_A)/10} \quad (1)$$

where $C_{A,i}$ is the relative value of factor A for stock market i; $\text{Value}_{A,I}$, the numeric value of factor A for stock market i; Min_A, the minimum value of factor A in all stock market; Max_A, the maximum value of factor A in all stock market; $10 =$ graph scale full points to compare among stock market; $i =$ SGX, SET, BM, PSE, IDX; A, the four important determinants for the competitiveness; factor conditions, demand conditions, related and supporting industries, and firm's strategy, structure, and rivalry factors.

Scores that are computed can vary from 0 to 10 and show relative positions on selected criteria. In principle, a higher competitive advantage stock market should have higher relative value than a lower competitive advantage equity market for one or all dimensions. Unlike the absolute value, since the relative value adjust the most preferable facet to the maximum score and least preferable one to the minimum score. For instance, among all stock markets, an equity market with a relative value of 10 in the scale indicates a more competitive condition for a particular aspect comparing to other stock markets. Therefore, we then hypothesize that the cumulative overall relative value for a country having higher competitive advantage should be greater than lower competitive advantage equity markets.

Analysis of the competitiveness for ASEAN 5 stock markets

The competitiveness of stock market among ASEAN 5 nations was analyzed based on diamond model. This model considers the four aspects of stock market environment including factor condition, demand condition, related and supporting industries, firm strategy, structure, and rivalry. In addition, the role of government is affecting factor on four key factors. We hypothesize that the cumulative relative value for a country having higher competitive advantage should be greater than lower competitive advantage equity markets.

Factor condition

Factor condition comprises of basic, or non-key, factor and advanced, or specialized, factor. Basic factor such as unskilled labors and raw materials or basic infrastructures can be obtained by any organizations. Basic factor refers to quality of infrastructures, investment in telecommunication, connectivity of people and firms and technological cooperation. Specialized factors of production involve heavy, sustained investment. They are more difficult to duplicate. This leads to a sustained competitive advantage because if other firms cannot easily duplicate these factors. Advanced factor refers to innovation, skill of labor in finance market and financial deepening.

The results show that the mean score of the factor condition among five nations is 4.66. Comparing factor condition between five nations, SGX holds the first position ($C_{F,\mathrm{SGX}} = 9.16$) and BM is ranked second ($C_{F,\mathrm{BM}} = 7.44$). They are only two stock markets that have score on factor condition above the mean score. Although SET is ranked third among ASEAN 5 stock markets, however, the score on factor condition is below average ($C_{F,\mathrm{SET}} = 2.85$) Whereas the PSE ($C_{F,\mathrm{PSE}} = 2.19$) and IDX ($C_{F,\mathrm{IDX}} = 1.67$) are fourth and fifth in ranking, respectively.

When considering the details of factor condition, we find that SGX has highest score in almost every aspect. BM has highest score in telecommunication infrastructure investment, low-financial risk, and high capacity for innovation, but low score for remuneration in services professions dimension. SET has more strength such as financial depth, as measured by the market capitalization to GDP ratio, financial risk factor, and relative competitive remuneration for labors in services professions, but SET has many weaknesses such as quality of overall infrastructure, language skills, company spending on R&D, capacity for innovation, and quality of management schools.

Considering the size of the equity markets in this region, the ratio of stock market capitalization to GDP for Singapore and Malaysia have exceeds 100 percent (290 percent for SGX and 170 percent for BM). This means the size of the two stock markets is larger than the size of the economy as a whole for each country. However, it is not the case and less pervasive for Thailand, Philippines, and Indonesia, which have the ratio of stock market capitalization to GDP at 87, 83, and 51 percent in 2012, respectively. The meaning is that the sizes of these stock markets are smaller than the size of the economy for each country. The details are shown in Table II.

Demand conditions

Demand conditions are the pressure based on requirement about quality and service in stock market of the market participants. It comprises of two sets: size and growth of demand, and sophisticated demand. Size and growth of demand refer to GDP growth rate, market capitalization, and value of share trading. Sophisticated demand refers to number of listed companies, number of newly listed, products in market, market concentration (CR10), and HI in industries. The market concentration ratio, CR10, is the percentage market share attributable to a given number of the ten largest listed firms in a stock market. Likewise, HI is a measure of market concentration. It is calculated by squaring the market share of each firm competing in a market, and then adding the resulting numbers. A more developed and competitive market should have low concentration of a few largest firms in the market and high competition within a particular industry in order for market participants to take part.

The results in Table III show that among five nations, mean score of demand condition was 4.37. Comparing demand conditions among five nations, there are three equity markets in the region having above average score. SGX holds the first ranked ($C_{D,\mathrm{SGX}} = 6.14$), BM is second ranked ($C_{D,\mathrm{BM}} = 5.36$), SET was third ranked ($C_{D,\mathrm{SET}} = 4.62$). Another two markets are below the average score; IDX was fourth ranked ($C_{D,\mathrm{IDX}} = 3.69$). Lastly, PSE holds lowest rank ($C_{D,\mathrm{PSE}} = 2.04$).

Besides, considering the details of demand conditions, we find that SGX has highest score in almost every aspect, except for relatively slow economic growth, low volume of share trading, and low-competitive forces as measured by HI. BM has highest score in accessibility to the stock market as highlighted by a large number of listed companies and a more dispersed market structure. SET has its strength in turnover velocity and average daily turnover which is highest among five nations. In addition, SET has a relatively high variety of investment products, following SGX. However, SET has many threats such as

Descriptions	Data					Score (0-10)				
	SGX	SET	BM	PSE	IDX	SGX	SET	BM	PSE	IDX
1. Factor conditions										
1.1 Basic factor										
Infrastructure										
Quality of overall infrastructure	6.5	4.9	5.4	3.6	3.7	10.00	4.48	6.21	0.00	0.34
Investment in telecommunications	0.32	0.39	0.83	0	0.43	3.86	4.70	10.00	0.00	5.18
Connectivity of people and firms	9.11	6.65	8.18	7.62	6.39	10.00	0.96	6.58	4.52	0.00
Technological cooperation	7.13	5.27	6.89	5.17	4.98	10.00	1.35	8.88	0.88	0.00
Score						8.46	2.87	7.92	1.35	1.38
1.2 Advance factors										
Financial depth (market size)	1,408	*1,054*	1,151	*415*	*1,060*	10.00	*6.44*	7.41	*0.00*	*6.50*
Availability of financial services	6.1	5.1	5.6	5	4.8	10.00	2.31	6.15	1.54	0.00
Affordability of financial services	5.8	4.8	5.4	4.8	4.4	10.00	2.86	7.14	2.86	0.00
Ease of access to loans	4.7	3.6	4.4	3.1	3.9	10.00	3.13	8.13	0.00	5.00
Soundness of banks	6.5	5.6	5.7	5.7	4.6	10.00	5.26	5.79	5.79	0.00
Euro money country risk	88.4	60.6	66.2	53.4	57.5	10.00	2.06	3.66	0.00	1.17
Financial risk factor	6.58	6.37	6.73	6.42	5.35	8.91	7.39	10.00	7.75	0.00
Quality of labor										
Finance skills	7.66	6.16	7.42	7.2	5.45	10.00	3.21	8.91	7.92	0.00
Information technology skills	8.84	5.84	7.78	7.98	6	10.00	0.00	6.47	7.13	0.53
Language skills	8.07	4	7.58	7.46	5.06	10.00	0.00	8.80	8.50	2.60
Quality of management schools	5.7	4.3	5	4.7	4.2	10.00	0.67	5.33	3.33	0.00
Remuneration in services professions ($)	22,488	13,728	8,629	2,484	4,315	10.00	5.62	3.07	0.00	0.92
Brain drain	5.7	4.1	4.7	3.4	4	10.00	3.04	5.65	0.00	2.64
Capacity for innovation	4.4	3	4.6	2.9	3.9	8.82	0.59	10.00	0.00	5.88
Company spending on R&D	5.1	3.1	4.7	3.2	3.9	10.00	0.00	8.00	0.50	4.00
Score						9.85	*2.84*	6.97	*3.02*	*1.95*
Mean score (4.66)						9.16	*2.85*	7.44	*2.19*	*1.67*

Table II.
Factor condition

Table III.
Demand conditions

Descriptions	Data					Score (0-10)				
	SGX	SET	BM	PSE	IDX	SGX	SET	BM	PSE	IDX
2. Demand conditions										
2.1 Size and growth of demand										
GDP growth (%)	3.59	4.50	5.00	5.00	6.54	0.00	3.08	4.78	4.78	10.00
Market capitalization (billion USD)	549.33	235.53	345.77	132.16	284.02	10.00	2.48	5.12	0.00	3.64
Market capitalization growth (%)	14.70	27.71	18.31	36.07	31.95	0.00	6.09	1.69	10.00	8.07
Value of share trading (billion USD)	204.7	101.99	71.54	15.83	65.48	10.00	4.56	2.95	0.00	2.63
Volume of share trading (thousand shares)	114.64	201.29	52.3	65.72	314.64	2.38	5.68	0.00	0.51	10.00
Stock traded per capita (USD)	55,576	3,233	3,154	290	553	10.00	0.53	0.52	0.00	0.05
Turnover velocity (%)	0.52	0.76	0.33	0.22	0.40	5.56	10.00	2.04	0.00	3.33
Score						5.42	4.63	2.44	2.18	5.39
2.2 Sophisticated demand										
Number of list companies	778	541	956	253	420	7.47	4.10	10.00	0.00	2.38
Product in market	16	13	12	6	10	10.00	7.00	6.00	0.00	4.00
Market concentration CR10	0.33	0.47	0.37	0.46	0.46	10.00	0.00	7.14	0.71	0.71
Herfindahl Index (HI)	0.23	0.17	0.15	0.18	0.22	0.00	7.39	10.00	6.92	0.94
Score						6.87	4.62	8.29	1.91	2.01
Mean score (4.37)						6.14	4.62	5.36	2.04	3.69

low-stock traded per capita (the SET had USD3,233 per capita, but the SGX had USD55,576 per capita) and lack of newly listed companies (five years average newly listed companies in SET is 13 firms, and average newly listed in ASEAN 5 exclude PSE was 30-40 firms). IDX has made a remarkable economic growth and high-volume trading with strong market capitalization growth, while has poor score for sophisticated demand conditions. PSE has strong market capitalization growth, but less pronounced score in almost sub-indicators.

Related and supporting industries

Related and supporting industries are networks of suppliers and distributors that cooperate with the industry to support it in international competition. Since stock market is one of the financial intermediations to enhance the effective allocation of the resources, it interconnects many different sectors of the economy. Synchronization across these sectors is extremely critical to make sure capital market is able to develop in a sustainable and efficient manner. The existence of a cluster of competitive-related and supporting industries serves to enhance competitiveness of the equity markets.

In this study, related and supporting industries refer to venture capital availability, ethical practices which are implemented in the listed companies. Credibility of managers and corporate boards of the listed companies, which are the member of each exchange. Also, auditing firms and accounting practices, as well as image abroad also enhance their competitiveness for each exchange.

The results show that among five nations, mean score of the related and supporting industries was 4.93. Comparing among five nations, SGX is the first ranked ($C_{R,\mathrm{SGX}} = 9.85$) and BM is second ranked ($C_{R,\mathrm{BM}} = 7.50$). The two stock markets have very high scores on related and supporting industries aspect far above other countries in the region. Whereas SET is third ranked ($C_{R,\mathrm{SET}} = 3.47$), PSE ($C_{R,\mathrm{PSE}} = 2.43$), and IDX ($C_{R,\mathrm{IDX}} = 1.41$) are fourth and fifth ranked, respectively. The three countries have much lower. In addition, considering the details of related and score on related and supporting industries comparing to the first two countries. Under this facet, we find that SGX has the highest score in almost every aspect. BM has a relatively high score, holding second rank in almost categories, comparing to the rest of the stock market in the region.

The SET has moderate score on every indicator, particularly image abroad, credibility of managers, and corporate boards. However, the SET has many threats such as venture capital availability, ethical practices, and auditing and accounting practices. PSE has moderate score on overall country's ethical practices, credibility of managers, and corporate boards and auditing and accounting practices. However, it has poor score in venture capital mechanism and image abroad.

Finally, IDX has made strength in venture capital mechanism and maintain a fair image abroad, while has poor score for other related and supporting industries criteria. However, IDX has the lowest score on ethical practices, creditability of the managers, corporate boards, and auditing and accounting practices. Overall, the results suggest that stock markets in Thailand, Indonesia, and the Philippines need to improve their related and supporting industries to catch up with SGX and BM. The results are showed in Table IV.

Firm strategy, structure, and rivalry. Firm strategy, structure, and rivalry constitute the fourth determinant of competitiveness. This element describes the conditions in the nation governing the way in which each stock market is created, set goals and is managed. These aspects are important for success. But the presence of intense rivalry in the home base is also important it creates pressure to innovate in order to upgrade

competitiveness. The results show that among five nations, mean score of the firm strategy, structure, and rivalry was *4.94*. Comparing the firm strategy, structure, and rivalry between five nations, SGX is the first ranked ($C_{S,SGX} = 7.18$) SET is second ranked ($C_{S,SET} = 5.77$), then BM ($C_{S,BM} = 5.21$). These stock markets are above average score on the firm strategy, structure, and rivalry. For those stock markets that have

Descriptions	Data SGX	SET	BM	PSE	IDX	Score (0-10) SGX	SET	BM	PSE	IDX
3. Related and supporting industries										
3.1 Business development										
Ethical practices	7.78	5.67	6.84	5.82	5.2	10.00	1.82	6.36	2.40	0.00
Credibility of managers	7.93	6.9	7.33	6.84	5.9	10.00	4.93	7.04	4.63	0.00
Corporate boards	7.05	6.42	7.17	6.43	5.85	9.09	4.32	10.00	4.39	0.00
Auditing and accounting practices	8.3	6.9	7.71	6.92	6.29	10.00	3.03	7.06	3.13	0.00
Venture capital availability	4.4	2.9	4	2.7	3.6	10.00	1.18	7.65	0.00	5.29
Image abroad	8.95	7.1	7.65	4.78	6.1	10.00	5.56	6.88	0.00	3.17
Mean score (4.93)						9.85	3.47	7.50	2.43	1.41

Table IV.
Related and supporting industries

Descriptions	Data SGX	SET	BM	PSE	IDX	Score (0-10) SGX	SET	BM	PSE	IDX
4. Firm strategy, structure, and rivalry										
4.1 Structure										
Market capitalization to GDP (%)	181.2	70.21	141.8	63.8	41.5	10.00	2.06	7.18	1.60	0.00
Financial sector liberalization	5.69	4.56	5.4	4.06	4.52	10.00	3.07	8.22	0.00	2.82
Trading participants	30	38	35	118	134	0.00	0.77	0.48	8.46	10.00
Corporate governance (CG watch report)	69	58	55	41	37	10.00	6.56	5.63	1.25	0.00
4.2 Rivalry										
Market share in WFE	1.33	0.68	0.81	0.29	0.74	10.00	3.75	5.00	0.00	4.33
Stability of stock market										
Stock volatility	0.067	0.075	0.043	0.064	0.077	2.94	0.59	*10.00*	*3.82*	0.00
Stock return	0.02	0.1	0.03	0.09	0.09	0.00	10.00	1.57	9.04	9.16
Skewness of market return index	−0.26	−0.49	−1.41	−0.81	−0.58	10.00	7.99	0.00	5.21	7.22
Exchange rate volatility	0.017	0.020	0.019	0.020	0.027	10.00	6.56	7.79	6.60	0.00
Fundamental financial performance										
Price-earning ration (P/E ratio)	12.32	12.08	15.58	17.47	16.7	9.56	10.00	3.51	0.00	1.43
Price to book ratio (P/B ratio)	1.41	1.78	1.88	1.92	3.13	10.00	7.88	7.27	7.03	0.00
Dividend yield	3.09	3.97	3.39	2.57	2.64	3.71	10.00	5.86	0.00	0.50
Mean score (*4.94*)						7.18	5.77	*5.21*	*3.58*	2.95

Table V.
Firm strategy, structure, and rivalry

score below average are PSE ($C_{S,PSE} = 3.58$) and the IDX ($C_{S,IDX} = 2.95$). They are third, fourth, and fifth ranked, respectively. The details are shown in Table V.

Structure of stock market includes sub-criteria such as market capitalization to GDP, degree of financial liberalization, trading participants, quality of corporate governance. The three stock markets, SGX, BM, and SET, have superior score in almost aspects under firm's structure and rivalry sub-dimension except indicators relating to trading participants. For risk and return performance of the competing stock markets, IDX and SET are two markets with higher return and risk comparing to the rest. When comparing fundamental financial information, on average, the stocks listed in the SET seems to be cheap among its competing stock markets.

The role of government. The role of government in Porter's diamond model is acting as a catalyst and challenger; it is to encourage, or even push, companies to raise their aspirations and move to higher levels of competitive performance. They must encourage companies to raise their performance, stimulate early demand for advanced products, and focus on specialized factor creation and to stimulate local rivalry by limiting direct cooperation and enforcing regulations or deregulations. The government of each country takes on plans to develop capital market by formulating and implementing several policies to foster capital market in various aspects. These include changing in public finance and fiscal policy, shaping the institution framework, and changing regulation related to transaction and income generated from the stock market. In this study, the role of government was separated into three sets; efficiency of public finance and fiscal policy, institutional framework, government regulation.

The results from Table VI show that among five nations, mean score of the role of government was 4.16. Comparing between five nations, SGX holds the first ranked ($C_{G,SGX} = 9.81$) and BM is second ranked ($C_{G,BM} = 6.06$). SET is third ranked ($C_{G,SET} = 2.86$). Whereas IDX ($C_{G,IDX} = 1.72$) and PSE ($C_{G,PSE} = 0.33$) are fourth and

Descriptions	Data					Score (0-10)				
	SGX	SET	BM	PSE	IDX	SGX	SET	BM	PSE	IDX
5. Role of government										
5.1 Efficiency of public finance										
Public finance	7.92	2.95	5.23	2.6	3.24	10.00	0.66	4.94	0.00	1.20
Fiscal policy	10	2.8	3.2	3.0	2.6	10.00	0.26	0.80	0.59	0.00
5.2 Institution framework	9	2.9	4.2	2.8	2.9	10.00	0.10	2.24	0.00	0.08
5.3 Government regulation of business										
Burden of government regulation	5.6	3.4	4.6	3	3.7	10.00	1.54	6.15	0.00	2.69
No. of procedures to start a business	3	5	4	15	8	10.00	8.33	9.17	0.00	5.83
No. day to start a business	3	29	6	35	45	10.00	3.81	9.29	2.38	0.00
Efficiency of legal framework in challenging regs	5.5	3.6	5.1	3.2	3.8	10.00	1.74	8.26	0.00	2.61
Shareholders' rights	5.6	4.5	5.3	4.7	4.6	10.00	0.00	7.27	1.82	0.91
Public trust in politicians	6.3	2.2	4.4	2.4	3	10.00	0.00	5.37	0.49	1.95
Taxation										
Corporation income tax	17	23	25	30	25	10.00	5.38	3.85	0.00	3.85
Dividend tax	0	10	0	15	15	10.00	3.33	10.00	0.00	0.00
Value-added tax (VAT)	7	7	6	12	10	8.33	8.33	10.00	0.00	3.33
Mean score (4.16)						9.81	2.86	6.06	0.33	1.72

Table VI.
Role of government

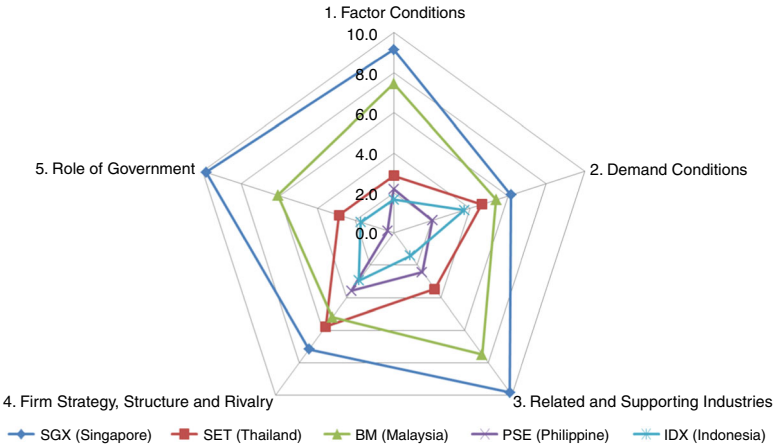
fifth ranked, respectively. In addition, when we consider the details of role of government, we find that SGX leave behind other equity markets in the region in almost aspects. SGX and BM are only two exchanges that have extremely high score on the role of government. The three exchanges, SET, IDX, and PSE have many threats such as shareholders' rights, public trust in politicians, and fiscal policy.

We then combine all aspects into analysis and report the results in Table VII. As we hypothesized, the overall results are expected. SGX, therefore, holds the highest stock market competitiveness among ASEAN 5 with highest average score at 8.43. SGX has received the highest score in every aspect in Porter's diamond model. This is due to its distinction on more liberalized market with strong environment and government aspect. Singapore Government plays an important role in the investment in basic infrastructure development since this will remove the bottleneck effect caused by low-infrastructure conditions and to increase energy productivity, transportation quality, and communication capability. SGX is the heart of ASEAN financial services industry and the Asian Gateway to global and regional financial markets. With SGX's electronic trading system, it provides an opportunity for a global trading access to SGX markets where 80 percent of the customers are from outside Singapore (Huat Tan, 2002). Moreover, SGX offers its clients a variety span of equity products such as index derivatives, uniquely centered on Asia's three largest economies – China, India, and Japan. Also, SGX provides opportunity for companies listed on SGX originating outside of Singapore, which cannot be beaten by its ASEAN counterparts. Last but not least, SGX offers a fully integrated value chain from trading and clearing, to settlement and depository services. BM has a second rank with average score of *6.31*. Both SGX and BM have above average score and higher rank than other exchanges in ASEAN 5 region, they outrank others in almost every dimension in Porter's diamond model. Although SET gets third ranked in term of competitiveness and it outranks the other two ASEAN equity markets (IDX and PSE), all of them have lower than average competitiveness score. In general, the results are in line with our expectations since similar studies on the development of ASEAN financial and capital markets by World Bank (2011a, b), also report the rank on development, though not competitiveness, consistent with our studies.

The results of the assessment of the competitiveness are shown in Figure 4. We utilize radar chart to graphically display multivariate data in the form of a two-dimensional chart of five variables. The star plot can also be used to explain the competitiveness of ASEAN stock markets. Each dimension is represented on a spoke, where each spoke represents one of dimensions of Porter's model. The data length of a spoke is proportional to the magnitude of the variable for the data point relative to the

Table VII. Summary

Descriptions	Score (0-10) SGX	SET	BM	PSE	IDX
1. Factor conditions	9.16	*2.85*	7.44	*2.19*	*1.67*
2. Demand conditions	6.14	4.62	5.36	2.04	3.69
3. Related and supporting industries	9.85	3.47	7.50	2.43	1.41
4. Firm strategy, structure, and rivalry	7.18	5.77	*5.21*	*3.58*	2.95
5. Role of government	9.81	2.86	6.06	0.33	1.72
Total score	8.43	3.92	*6.31*	*2.11*	*2.29*
Rank	1	3	2	5	4



Total Scores:	SGX 8.43	BM *6.31*	SET 3.92	IDX *2.29*	PSE *2.11*

Figure 4.
Analysis of the competitiveness for ASEAN 5 stock markets

maximum magnitude of the variable across all data points. A line is drawn connecting the data values for each spoke. This gives a star-like appearance. The bigger star normally indicates a superior position for this plot; therefore, attain the highest level of competitiveness. The radar plot also implies that there are inequalities in the level of competitiveness for stock markets in this region. In particular, there are only two exchanges, SGX and BM, having superior competitiveness than other countries in the group. SGX dominates its counterparts in every aspect such as international listings, robust online trading platforms, and efficient clearing houses. BM outperforms SET in almost every aspect, except firm structure, strategy, and rivalry dimension. However, IDX and PSE cannot completely dominate each other in terms of competitiveness. Results in the figure show that there are vast differences in the level of competitiveness among stock markets in the ASEAN region. From the results in the figure separate the five stock exchanges into two groups. The higher competitive markets include SGX and BM. And, the lower competitive markets are SET, IDX, and PSE.

Policy implications and discussions

One remarkable implications of the radar chart in the above figure is the distance between each point on the same spoke. The distance represents the competitiveness gap between two stock exchanges under a particular dimension of Porter's diamond model. From the previous analysis, the relative competitiveness score has separated the five stock exchanges into two groups. There are three aspects of Porter's diamond model that contribute to this separation. The higher competitive group surpasses another in the role of government, factor condition, and related and supporting industries aspects. The three aspects are more macro-factors related to government policies and decisions. This indicates that government and the environment the stock exchanges operating in plays an energetic role in supporting the financial and capital market development. The result shows that the leader stock exchanges of the region, Singapore and Malaysia have significant involvements from the government. To learn from the best-in-class exchange, SGX, the remaining stock exchanges should focus on the role of government since government plays an important role in the investment

in basic infrastructure development under factor condition aspect, relaxing regulations related to investment and taxation under the role of government, as well as creating supportive activities and business environment for the advancement of equity markets. Therefore, the government of the lower competitive group should indorse basic infrastructure, increase level of involvement in public policies and taxation, as well as promote supporting industries so as to explore domestic and regional demand for financial products and to improve the supply chain efficiency.

As Flanagan *et al.* (2007) noted in their paper "research is then suggested to move forward from understanding competitiveness to improving it. Measuring competitiveness is not the ultimate purpose; improving it and achieving long-term performance is." With the results presented in the previous sections, it is clear that ASEAN 5 stock markets are in a dynamic environment with unparalleled opportunities. Several things should have been done for increasing the competitiveness of each market. For SGX, the battlefield is not ASEAN, it needs to go beyond competing within the region, but a more challenging landscape in global environment. From the analysis, SGX is obviously a market dominant and best-in-class exchange in ASEAN. SGX faces its challenges in demand condition and firm strategy, structure and rivalry aspects, according to Porter's diamond model. Specifically, SGX should find its way to stimulate the growth of market and volume trading as well as correcting the problem of industry concentration. The highlights should be placed on expanding the total market, protecting market share, and expanding market share. Since the internal market is nearly soaked, SGX should look for many alternatives to seize new opportunities. SGX needs to create blue oceans strategy, the creation of innovative value to unlock new demand. Innovation can be using new technologies to facilitate investment trading or finding new products for competing. In doing so, SGX needs to become a leader in some selected industries and should work with investment bankers to target both companies and investors in these industries and bring them together on the SGX platform. SGX has targeted biotechnology, but it should also consider expanding into pharmaceuticals and health care given the long-term prospects in the global market. Focussing on innovations will stimulate demand condition and at the same time lessen the concentration to existing industry the exchange has focussed.

BM has reached a second rank, the market challenger. The implication for BM is to aggressively expand its market share by attacking the dominant exchange, SGX. Since BM has above average score and higher rank than the remaining three exchanges in ASEAN 5 region, it outranks the remaining three exchanges in almost every dimension in Porter's diamond model. For BM, The analysis of the competitive structure of the Malaysian stock market reveals that BM has its strong points on factor condition, related and supporting industries, and the role of the government, comparing to the rest of the countries. Only exceptions on firm strategy, structure, and rivalry dimension that it follows the SET. Therefore, BM should improve its policy toward trading participants and financial return dimensions. For private sector, investment banking houses can assist the exchange by allocating more research analysts and traders to cover Malaysian equities among region and to the world. In this way, the true valuation of the assets will be revealed to the markets for their fair prices. In addition, more analysts mean more information and analytics, which should attract more investors to the market accordingly. BM has also need to do various initiatives aimed at improving its product and service offerings. It should develop new products by using its strengths. One way to enhance its product variety is to introduce new products related to its strong points are to encourage development of a wider range of competitive products and services related to Islamic securities and regulatory framework for the

Islamic capital market so that it can create a sustainable market for the effective mobilization of Islamic funds. Liquidity is one of the largest factors for both issuers and investors make one equity exchange more attractive to an issuer than another. Therefore, to achieve a more competitive advantage, BM should be positioning itself as an international Islamic capital market center and increase the liquidity and turnover velocity of its markets, as well as improving the efficiency and transparency of the market. To do this, the role of government should be improved. Combining with firm strategy, structure, and rivalry aspect, the Malaysian Government has to establish its market infrastructures and policies in supporting the promising embryonic Islamic capital markets. More relaxed comprehensive accounting procedure is needed to be revised, more incentives should be given to attract foreign investors, more tax-reduction scheme or lower fees and taxes on profits earned by institutions undertaking activities related to Islamic products should be launched; for example.

The SET holds the third position, classified as the market follower which is designated as a runner-up that should not rock the boat. To enhance its competitiveness over short run, the policymakers should primarily improve its weakness on the laws and regulations to facilitate investment environment. Thailand should also ensure easing procedures, providing better protection to investors, and amendments to the existing laws to improve investment condition. Most importantly, since the gap analysis in the previous section indicates that the SET should improve its factor condition, related and supporting industry, and the role of government facets. These dimensions are the focus for the SET to improve its competitiveness. Therefore, the trading systems, general infrastructure quality, and the skills of human resource in financial industry are needed to be enhanced. The issue of labor quality is the most important sub-dimension since the labor quality is far below others for the information technology skills, language abilities, and financial literacy. Next, the SET may consider pursuing focus strategies by exercising its strength on geographic location in the Greater Mekong Subregion (GMS). The SET should collaborate with other stock exchanges in GMS to strengthen its competitiveness. By having a deep understanding of the greater Makong Regions market and the unique needs of its counterparts, the SET can therefore develop unique lower cost or differentiated products or services for GMS market. The SET may consider promoting capital markets connectivity among emerging in-land ASEAN countries. For instance, it can be the center of the GMS capital market in raising funds or promoting cross-border listing in multiple exchanges in ASEAN. In addition, the exchange can also encourage merger and acquisition activities among companies in the emerging ASEAN countries. In this way, the SET can create competitive advantage by exploring an entirely new market opportunity or by expanding market supply of products and services. At the same time, the SET can build up the competitive advantage in the long run by serving a market segment that other exchanges can access with more geographic difficulties.

Considering IDX and PSE, from the factor condition perspective, there is a need to be strengthened for the exchange's infrastructure and organizational foundation. PSE should also focus on its general infrastructures, while IDX should focus on quality of labor issues to improve their competitiveness. From demand condition perspective, these two markets have not expanded at a speed rapid enough to catch their counterpart exchanges. There are a variety of reasons. One reason is the predominance character of less developed countries, in which less investor participation in the stock markets comparing to SGX, BM, or the SET. Another is low-awareness and negative perception of the stock market investing that have been prevalent subjects which

continue to keep investor levels low. Such incidences can be explained by looking at related and supporting industries dimension. These are due to low ethical practice, loosing creditability of managers, weak corporate boards, and insufficient auditing agencies. Moreover, from firm strategy, structure, and rivalry dimension, to expand the market size and increasing volume, IDX and PSE can learn from the leader's experience. They can follow or even improve on the leader's existing products, programs, and back-office supporting systems. This will help expand the market with much less expenses. For example, the exchange authority may consider having a more efficient internet trading platform to help facilitate the trading transaction, which will increase liquidity of the market. Electronic trading and modern information technologies are enabling the two exchanges to attain global access from foreign investor at very low costs. They can join the ASEAN trading link network leaded by SGX, BM, and the SET. Also, the exchanges could possibly relax its regulation to allow for securities borrowing and lending activities that help investors managing their position more efficiently. Moreover, an increased variety of products available for trading and enhanced investor base will result in significant mobilization of funds feeding into capital markets and increasing the number of listed firms and trading volumes. Information disclosure of the listed firms and good corporate governance score are low for the two exchanges. Therefore, the two exchanges need to enhance good corporate governance among their listed firms since transparency and corporate governance will strengthen investor confidence. For the role of government, it is clear that government in these two countries should improve its regulations, specifically on regulation related to business operation and taxation to support firms and facilitate the trading activities. Regulations at the central and regional level need to be modernized to comfort the doing of business.

Over the long run, IDX and the PSE can increase their competitiveness by searching niches to focus on. Specializing in certain product lines or courting specific sectors has proofed from the leading exchanges to be paid off and indicates significant opportunity for long-term capital markets growth. Since Indonesia and the Philippines need logistic infrastructure improvements. Significant development elements, such as nationwide infrastructure development, are promising opportunities. Due to the limitation of government funding, it is resulted in the slow achievement of adequate infrastructure to support rapid development. With capital market, there are opportunities for cooperation between the government and the private sector under the public-private partnership scheme. Infrastructure funds are expected to bring in needed capitals. This massive amount of investment will help boost the size of the stock market and enhancing the competitiveness of the countries eventually. For example, strategic collaboration between one of the leading exchanges in ASEAN should be strengthen to find mutual benefits among exchanges. In doing so, less developed exchanges can learn from the leaders to improve their competitiveness and can move toward sustainable growths based on long-term partnership.

Overall, though the results in the previous section point out that there are large discrepancies among stock markets in the ASEAN region, the main concern is not the case that SGX is going to prosper to a great extent than another because of the its high-competitiveness scores. Rather, the evidence points out existing gaps should be abridged in order to foster the benefits of integration. One effective way to lessen the gap is to promote strategic alliances among the region. Less competitive markets, such as IDX or PSE, could finds their weak points in a particular dimension under Porter's diamond model. Then, they can match with the higher competitive exchanges to find

synergies. This helps the lower competitive stock markets to determine what they could be doing better with the help of the higher competitive ones. The lower competitive markets would benefit by learning from the leaders' experiences for its products and trading systems. Most importantly, firms in the lower competitive markets can widen the investor base and raise addition funds by means of dual listing on the local and the more competitive bourses, potentially SGX, BM, or the SET. With a broader market access to raise capitals within ASEAN, listed companies have the prospect to circumvent the foreign exchange mismatch when doing business overseas. This would be especially beneficial for a multinational corporation that prefers to obtain funding in the location of operation. In doing so, the higher competitive exchanges also benefit from synergies. They can expand their market size for their sustainable growth of the stock exchanges, stimulate the growth of market and volume trading, as well as correcting the problem of industry concentration.

As mentioned on the work of Karim and Ning (2013) on the ASEAN 5 stock markets integration, there a need for policy coordination among ASEAN 5 members to foster the success of the integration and mitigate the impacts of financial instability. For ASEAN, we believe the next important move for all countries would be set the priority task to improve the role of government dimension in order to benefit from the full collaboration since this aspect is a crucial condition before doing business since each country has different regulations. The law and regulations should be first synchronized and open the room for new products cross-border listings. For example, the capital gain and dividend taxes for each country should be aligned and harmonized. Also, cross-border clearing and settlement process have to be redefined and synchronized since settlement is the final leg of the trade cycle, where assets are swapped for cash. Likewise, all exchanges including SGX should focus on the important role of the venture capital industry as a source of financing to emergent high-growth firms. Policies and initiatives to promote innovation need the funding from the venture capital industry. One way to do is to increase private sector participation in the venture capital and private equity industries. Moving forward, the growth of the role of the private sector in developing the venture capital industry and the complementary development of the private equity industry are vital strategies to widen the sources of financing. At last, we expect the agreement to have a cross-border listing of exchange traded funds, or ETFs. ETFs are useful to track the performance of stock indices in each country. These products should be open to all ASEAN members and foreign investors. In this way, ASEAN will benefit from integration and meet its objective in attracting foreign investors as one of the asset classes to seek further asset diversification from local markets.

Conclusion

This paper investigates the competitiveness of the stock markets in ASEAN 5, applying Porter's diamond model to analyze the competitiveness. The model is based on five main pillars of competitiveness, comprising of several indicators that emphasize different aspects of competitiveness. This research contributes to a deepened concern of the sources of competitive advantage among ASEAN stock markets. To the best of knowledge, this study is the first to conduct benchmarking on the competitive advantage for stock exchanges, which has never been studied before. The study sheds light on the competitiveness structure of the stock markets in the ASEAN region. The results show that SGX tops the list far ahead of others. BM acquires the second highest-ranking after Singapore in terms of competitiveness. The SET is third ranked

ahead of IDX and the PSE, respectively. This finding reveals that the competitiveness and the development levels of the stock markets in this region are imbalanced. The existing gaps should be reduced in order to foster the future of integration. One effective way to lessen the gap is to promote strategic alliances and cross-border listing of equity products among the region. The benchmarking process in this study helps the lower competitive stock markets to determine what they could be doing better. The lower competitive markets should indispensably need to establish the well-planned development strategy and policy to build up the competitive advantage and to find synergies among the region before full participation of AEC in 2015.

There is one noteworthy limitation of this study. In our methodology section, we normalize raw data for each indicator to compare competitiveness score. We convert published and calculated indices to numbers between 0 and 10 inclusively; therefore, it is implicitly assumed each indicator receives the same weight under the framework. Though this limitation exists, the impact of this limitation is little in relation to the overall findings and conclusions of your study. This is because score on competitiveness for SGX, the best-in-class stock exchange, is far beyond its counterparts and better than other exchanges in the same region in every dimensions. Changing weights may not alter the results. This limitation may affect the rank of two of the least competitive exchanges when one indicator has more weight than others since their competitiveness score are almost similar; however, to assign different weights on indicators may trigger another restraint. For example, one of such question is why one indicator is more important than others. Also, the level of importance of each indicator for exclusive country may be different; therefore, we leave this issue as the room for future research.

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Appendix. Factor definition

This section describes indicators constructed using Porter's diamond model: factor condition, demand condition, related and supporting industries, firm strategy, structure and rivalry and role of government.

1. Factor conditions

1.1 Basic factor. Infrastructure. Quality of overall infrastructure: quality of general infrastructure (e.g. transport, telephony, and energy) in each country (Source: World Economic Forum, 2013).

Investment in telecommunication: investment refers to as the annual capital expenditure; this is the gross annual investment in telecom (including fixed, mobile, and other services) for acquiring property and network. The term investment means the expenditure associated with acquiring the ownership of property (including intellectual and non-tangible property such as computer software) and plant. This includes expenditure on initial installations and on additions to existing installations where the usage is expected to be over an extended period of time (Source: IMD, 2013).

Connectivity of people and firms (e.g. telecom, IT, etc.) (Source: IMD, 2013).

Technological cooperation between companies is lacking or developed (Source: IMD, 2013).

1.2 Advancing financial systems. Deepening financial system. Financial depth is measured by market size of financial market in each of country. It is divided into three types: domestic bank credit, stock market capitalization, and debt securities market (Source: World bank, 2012).

Availability of financial services: the financial sector provides a wide range of financial products and services to businesses (Source: World Economic Forum, 2013).

Affordability of financial services: it indicates whether financial service are affordable or not (Source: World Economic Forum, 2013).

Ease of access to loans: in each country, this variable is measure the ease to obtain a bank loan with only a good business plan and no collateral. It shows extremely difficult or extremely easy) (Source: World Economic Forum, 2013).

Soundness of banks: in each country, banks are generally healthy with sound balance sheets or require recapitalization (Source: World Economic Forum, 2013).

Euro money country risk (ECR) evaluates the investment risk of a country, such as risk of default on a bond, risk of losing direct investment, risk to global business relations, etc. by taking a qualitative model, which seeks an expert opinion on risk variables within a country (70 percent weighting) and combining it with three basic quantitative values (30 percent weighting) (Source: www.euromoneycountryrisk.com/ 2010).

Financial risk factor: the risk factor in the financial system is adequately addressed. Higher score indicates adequately addressed to these risks (Source: IMD, 2013).

Quality of labor. Financial skill is the ability to understand how money and economy work, how people earn or make money, and how they invest and use it to help themselves and others. If people in the country have higher financial skill, then it has a positive effect on stock market development (Source: IMD, 2013).

Information technology skills: the way people get access the readily available of information technology skills (Source: IMD, 2013).

Language skills: the way people have the language skills that meet the needs of enterprises (Source: IMD, 2013).

Quality of management schools: it shows the quality of management or business schools in the country. The more number of high quality of management schools can be interpreted as people can work effectively (Source: IMD, 2013).

Remuneration in service professions: total base salary plus bonuses and long-term incentives, US dollars. Researcher uses salary of bank credit officer as proxy variable. The higher salary signals higher quality labor flows into financial industries (Source: IMD, 2013).

Brain drain: country retains and attracts talented people. In financial sector, most people like to take opportunities working in another country because it provides higher salary and better benefit. Higher brain drain in the country affects stock market development and lessens its competitiveness, accordingly. (Source: IMD, 2013).

Capacity for innovation: the level technology and innovation of companies in a particular country involve with technology. Higher score can be interpreted as higher competitive advantage of stock market development (Source: World Economic Forum, 2013).

Company spending on R&D: the extent to companies in a country spend money on R&D. Higher score can be interpreted as higher competitive advantage of stock market (Source: World Economic Forum, 2013).

2. Demand conditions

2.1 Size and growth of demand. GDP growth: this indicator illustrates the growth of a nation in terms of the production and income (Source: World Bank, 2013).

Market capitalization: the domestic market capitalization of a stock exchange is the total number of issued shares of domestic companies. It describes the developing of stock market. Higher stock market capitalization interprets a higher economy of scale and competitiveness (Source: World Federation of Exchanges, 2012).

Market capitalization growth: this indicator demonstrates the growth of stock market. Higher growth of stock markets attracts investors and implies that stock market will have a better performance in the future (Source: World Federation of Exchanges, 2012).

Value of share trading: this indicator is measured as total number of shares traded multiplied by their respective matching prices. The liquidity of stock exchange that is important for stock market development and competitiveness. Higher value of share trading can be interpreted as a higher competitiveness (Source: World Federation of Exchanges, 2012).

Volume of share trading: it measures liquidity of stock market, like value of share trading. However, volume of share trading is calculated from the number of shares traded in a security during a given period of time (Source: World Federation of Exchanges, 2012).

Stock traded per capita: it shows proportion of value of share trading to number of population in the country. If there is a higher stock traded per capita, it can be interpreted as people in the country have capacity to invest (Source: World Federation of Exchanges, 2012).

Turnover velocity is the ratio between the Electronic Order Book (EOB) turnover of domestic shares and their market capitalization. The value is annualized by multiplying the monthly average by 12, according to the following formula:

$$\frac{\text{Monthly EOB domestic share turnover} \times 12}{\text{Month} - \text{end domestic market capitalization}}$$

Higher turnover velocity displays a higher liquidity (Source: World Federation of Exchanges, 2012).

2.2 Sophisticated demand. Number of listed companies: it is the number of companies which have shares listed on an exchange at the end of the period, split into domestic and foreign, excluding investment funds, and unit trusts, and companies whose only objective is to hold shares of other listed companies, such as holding companies and investment companies, and regardless of their legal status. A company with several classes of shares is counted just once. Only companies admitted to listing are included (Source: World Federation of Exchanges, 2012).

Product in market: it is divided into three parts: equity products (e.g. equity, REITs, warrants, etc.), derivative products (e.g. index future, index options, single stock future, etc.), and bond products. A variety product shows market efficiency responsiveness to investor demand (Source: Autayani *et al.*, 2009).

Market concentrates (CR10): the indicator is measured by the total output produced in an industry by a given number of firms in the industry. In case of CR10, it uses the market share of the biggest ten firms listing in stock market each of country. Higher value of CR10 will retract stock market development and competitiveness because the market is manipulated from some firm (industry is oligopolistic) (Source: Datastream calculated from researcher).

Herfindahl Index (HI): it measures the size of firms in relation to the industry and an indicator of the amount of competition among them. HI index is calculated as the sum of the squares of the market shares of over all of the firms, according to the following formula:

$$HI = \sum_{i=1}^{N} s_i^2$$

where s_i is the market share of firm i in the market, and N is the number of firms.

Higher Herfindahl Index generally indicates a decrease in competition and an increase of market power, which will retard stock market development and competitiveness (Source: Datastream calculated by researcher).

3. Related and supporting industries

3.1 Business development. Ethical practices: it is sub-indicators of management practice. Higher score shows ethical practices are implemented in companies (Source: IMD, 2013).

Credibility of managers: higher score indicates that credibility of managers in society is strong. (Source: IMD, 2013).

Corporate boards: higher score shows that corporate boards do supervise the management of companies effectively (Source: IMD, 2013).

Auditing and accounting practices: higher score shows that auditing and accounting practices are adequately implemented in business (Source: IMD, 2013).

Venture capital availability: this indicator expresses the level to access to capital for entrepreneurs with innovative but risky projects to find venture capital. higher score shows that the venture capital in country is available (Source: IMD, 2013).

Image abroad: the image abroad of your country encourages business development (Source: IMD, 2013).

4. Firm strategy, structure, and rivalry

4.1 Structure. Market capitalization to GDP: it shows the development of stock market compare with the growth of country economy (Source: World Bank, 2013).

Financial sector liberalization: the Financial Development Report 2012 (World Economic Forum) summarize the level of financial sector liberalization in 3 levels; conservative, transition, liberal; in years book analyze from exchange rate stability, bank system, impact of financial crisis.

Trading participants are the number of dealers, brokers, brokers-dealers, and individuals acting as principals who trade on the exchange through direct access to the trading system. Clearing and settlement members are excluded. Several branches of a same organization have the right to apply as trading member to an exchange, and each license is computed as one trading participant. For example, if two branches belonging to the same organization apply as trading members, they are counted as two trading participants (Source: World Federation of Exchanges, 2013)

Corporate governance (CG watch report) is a managerial principle for a company to balance the interests of stakeholders, and enhance efficiency, transparency, and accountability of the company.

4.2 Rivalry. Market share in WFE: it calculate from market capitalization each of ASEAN 5 country divide total of markets capitalization of markets which are listed in World Federation of Exchanges. according to the following formula:

$$\frac{\text{Domestic market capitalization} \times 100}{\text{Total market capitalization}}$$

Higher scores imply the country has competitive stock market (Source: World Federation of Exchanges, 2013).

Stability of stock market: this indicator shows stock market has high liquidity, appropriate volatility and stock price can reflect market prices. Sub-indicators include stock price volatility, stock return, skewness of market return index, Exchange rate volatility and fundamental financial performance (price earnings ratio; price to book ratio; dividend yield) (Source: dataStream calculated from researcher, average 2007-2012).

5. Role of government

5.1 Efficiency of public finance. The ways government manages revenue and expenditure of the public authorities and the adjustment of one or the other to achieve desirable effects and avoid undesirable ones. Five sub-indicators consists of government budget surplus/deficit (percentage of GDP), total general government debt-real growth, public finance is efficiently managed, tax evasion, and pension funding (Source: IMD, 2013).

Fiscal policy is the means by which a government adjusts its spending levels and tax rates to monitor and influence a nation's economy. Three sub-indicators consist of total tax revenues (percentage of GDP), real personal tax, taxation (Source: IMD, 2013; Deloitte, 2012).

5.2 Institution framework. Efficiency of monetary policies in the country. Five sub-indicators consist of real discount/bank rate, cost of capital, efficiency of central bank policy, foreign policy reserves and interest rate spared (Source: IMD, 2013).

5.3 Government regulation of business. Government has regulated business that need for more responsive and effective business regulation. Five sub-indicators consist of burden of government regulation, number of procedures and days to start a business, efficiency of legal framework in challenging registration, shareholders rights and, public trust in politicians (Source: IMD, 2013).

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