CHAPTER II

THEORETICAL FRAMEWORK AND LITERATURE REVIEW ROLE OF STOCK EXCHANGES AND DEVELOPMENT

2.1 Role of a Stock Exchange

Stock exchanges have been analyzed and written about for centuries due to their crucial role in market based economies and was recognized by Rousseau and Sylla (2001) as one of five key components of a financial system. Their main responsibility is to facilitate the sale and resale of transferable securities. This single activity being handled in a single location provides several key benefits for consumers highlighted below.

Price discovery is the process of determining a security's fair value, or at least the current value based upon all known information relevant about that security. It comes from knowing collectively what others are willing to pay to buy a security and what others are asking to sell the security for as well as the last price agreed upon. Ideally it should be a fair value based upon all publicly known information however it has also been viewed as a gauge of market sentiment or emotions at a given point in time.

Provision of liquidity is the ability of consumers to be able to buy or sell a large number of shares at anytime without suffering extra costs to do so. It is amount of money/securities available at any given moment for trade and according to Sarr and Lybek (2002) liquidity can be discussed in five different ways which are tightness, immediacy, depth, breadth, and resiliency. *Tightness* is measured by the spread between the bid and ask price and shows the level of competition to buy and sell a security. The less competitive the security, the wider the spread becomes. *Immediacy* is the length of time required for the transaction to occur and can be measured in seconds, minutes, and even days. This can also cover the length of time required for each step in transaction, clearing, and/or settlement times. *Depth* is the existence of abundant orders both above and below the current price. This indicates how many traders are interested in a particular security. *Breadth* is the existence of abundant orders with significantly large enough volume to limit the impact of new orders. And finally, *resiliency* is the ability of new orders to flow in quickly to correct order imbalances. A market is considered more liquid

when it has tight spreads, instant immediacy, great depth and breadth, and strong resiliency.

Standardization is the process of establishing rules and requirement so that activities can be uniformly followed and measured. The creation of standards reduces the efforts required by consumers to research the alternative choices for trading similar securities and instead allows them to focus upon the value of the assets supporting the securities. These standards which are established by an exchange help remove risk from the system and increase consumers confidence that the information they receive from the exchange is accurate and similar for everyone. Some of these standards include the currency(s) used for trading, lot size, and the requirements to gain access to trading. For the purpose of this paper the standardization of activities is vital for exchanges that merge their operations. While it is not tested numerically, it is deemed a necessary step that operations consolidate after a merger, a process that can take several years to complete. Once it is completed, the other roles of price discovery and provision of liquidity are expected to show an impact.

There are other functions of stock exchanges as defined by the OMX stock exchange operators such as the timely dissemination of information, clearing securities (the physical transfer of money and securities after a trade has agreed upon), and the creation/dissemination of trading software for the newer automated trading systems. However, these roles could be outsourced to or performed by non-exchange businesses.

2.2 Historical Stock Exchange Development and Consolidation

Across the history of stock exchanges in most market economies worldwide one surprising similarity stands out, that there were previously many more exchanges in a region than there are today. Arnold (et al 1999) highlights the consolidation of stock exchanges across the United States during the 20th century, starting with around 100 exchanges at the start of the century and ending with fewer than 10 at the end of it. In most countries local exchanges either closed down or merged with rivals over time. The challenges growing an exchange can be viewed through Carmine de Noia's (1998) use of game theory to explore the implications of competition versus implicit mergers of stock exchanges located in the same 'relevant' market. Essentially he highlights how

competitors in the same 'relevant' market can seek greater efficiency through specialization until only the most efficient survive. Considering recent advances in computer and communication technology along with the expanded reach of businesses and investors, their choices regarding capital are no longer confined locally. Yet this grim outlook for exchanges is not universally shared and this next section will examine various methods to evaluate crucial areas of operation and their problems with measuring development.

2.2.1 Measurements and Liquidity

An increased number of emerging markets having established a stock exchange over the past 20 years and has challenged some of the most common measures of market development. These popular measures according to Levine and Zervos (1998) are capitalization, turnover, value traded, volatility, and international integration measures. With emerging markets ranging in size from Saint Kitts and Nevis in the Caribbean to China in Asia, capitalization and value traded are occasionally placed in a ratio with GDP to account for size differences. Larsen and Kenny (1995) further refined the market development measures into three groups: gross measures, adjusted for size standardized measures, and growth measures.

Gross measures are useful for analyzing if critical mass has been reached or not. They include capitalization and value traded as they examine the total size of activities. While they help define who the absolute global leaders are, they have troubles looking at comparative advantages in local markets.

Adjusted for size standardized measures are useful to compare how stock market activity relates to the relative size of the economy and favor the use of GDP ratios. With the focus of this study limited to small nations, this adjustment helps compare the relative success each nation has with developing their exchange. This method has been criticized for an overestimation bias towards small nations over larger ones due to the relative ease of making a ratio when compared to creating the absolute size required for meeting critical mass.

Growth measures calculate periodic changes in terms of percentages. This is useful when comparing the relative speed of development or if certain policies have an

immediate impact upon activities. This too biases growth towards the smaller exchanges as larger exchanges are challenged with improving upon substantially larger base numbers.

The challenge of using these measures with many of the newest exchanges comes from the many different strategies employed to establishing their stock exchange. Some countries were emerging from a bankrupt socialist/communist system and had all the state owned companies listed during the first few years. Some countries limited the participation of foreign investors in their market. Most countries allowed only a few investment vehicles which were common in developed market economies. Fortunately, exchanges today participate in regional conferences and share their best practices with each other helping to overcome, overtime, these challenges.

Liquidity is the most essential measure of a healthy market. Liquidity can be measured many ways but for the purpose of this paper it is measured in terms of value traded and turnover.

Value traded is the single count value of equity transactions in nominal currency terms. It reflects both the collective amount of money investors are willing to spend purchasing securities during a period of time and to a lesser extent an indicator of how closely watched the market is. Increasing values of trading indicate either increased demand for securities and/or increased prices of securities. In either case, investors expect greater returns in the future if they are willing to purchase securities.

Turnover is the ratio of value traded against market capitalization. This comparison helps show how active the exchange really is relative to its size. It does have a few problems though. It doesn't distinguish between an underperforming market due to a lack of investors' interest from those that underperforms due to rarely traded state owned enterprise that were unloaded and hide the several very active firms attracting investors' attention. These concerns are of course temporary and a longer analysis of the markets would reveal which type of an exchange is truly there.

2.2.2 Listings and Capital

In terms of investing, size matters. Large exchanges draw more attention, have large corporations listed, and can offer better trading costs. Since this paper is examining

stock exchanges in small countries all of these are deemed highly important. Some of the most common methods of measuring size are market capitalization, number of listed firms, and the average size of the firm listed.

Market capitalization is the total value of all firms traded on the stock exchange. This measurement follows the collective future expectations of growth for all firms listed on the exchange and effectively forecasts the overall expectations of the nations' economic development in the near future. This is only an effective measure when there are an adequate number of firms listed on the exchange that covers all major sectors of the economy.

Number of companies are the total number of firms, foreign and domestic, traded on the exchange. It is not the number of listings since some firms might have multiple listings of common stock with slightly different investors' rights. The ability of an exchange to attract companies to go public is a sign of efficient operations. The willingness of firms to be listed on an exchange can also be an indicator of adequate law enforcement. When firms across a nation are unwilling to go public, Claessens, et al (2000), speculates that firms might be trying to avoid paying taxes and closer government scrutiny.

Average size of a firm listed is the ratio of market capitalization over the number of companies. The larger the average company on the exchange becomes, the more likely it is to attract investors' attention. Size after all, is very important in attracting attention.

Again, one of the biggest challenges using such measurements is the overstating of an exchange's size due to the government unloading state owned enterprises in the early 1990s as socialist/communist economies went bankrupt. Many of these companies are rarely traded which tends to overstate the relative size of the exchange. Over time, this disturbance is expected to disappear as inefficient companies enter bankruptcy or are delisted while the efficient firms thrive.

2.3 Consumers' Criteria

Investors are known to seek several qualities beyond the expected rate of return before making an investment in publicly traded companies. They seek companies of large size, with liquid secondary trading, and significant public information for their evaluation.

Companies seeking a listing on an exchange seek low cost to capital and adequate media coverage of the market. Both types of customers benefit from companies growing in size, increased trading liquidity, and increased media coverage of businesses listed on the exchange.

Size. Larger companies attract the attention of institutional investors that require large companies to invest and diversify their capital into. Large companies seeking a listing also require institutional investors to take a significant investment in their company to lower the cost of raising capital. This circular relationship is the first challenge of newly established exchange. Pension funds, mutual funds, and sovereign wealth funds are a few investment pools small nations can create to help encourage the development of their stock exchange. Ultimately the goal is to encourage both international investors and individual investors to take an active role in the stock exchange which encourages more companies of all sizes to list on the exchange, raising both total market capitalization and hopefully, the average size of a firm listed.

Liquid secondary trading. The more liquid the market is the easier and less expensive it is to raise money for companies listing for the first time. The more liquid trading becomes, the more it attracts speculators and institutional investors. Claessens et al (2000) noticed that the larger the institutional investors are, the greater the turnover on the exchange was. This circular relationship is the second challenge of newly established stock exchanges face. Fleming and Remolona (1999) noticed that public news encouraged liquidity as investors digest new information and changed their investment portfolios to reflect the relative importance of that new information. The more robust business news coverage there is in a nation, it could be deferred, the more liquid the market will become until saturation is reached.

Media coverage/Information. Rules and regulations that public companies are required to meet are vital for investors to make informed investment decisions. Enough information needs to be revealed to the public so that potential investors can understand the business and build financial models to forecast future growth. Claessens et al (2000) noticed that some firms fear too much public information gives their competitors information that could put the firm at a competitive disadvantage. This trade off between public dissemination of information and retaining any competitive advantages gained

from privacy are unique from nation to nation. Differences in business laws and exchange regulations exist, complicating the decisions of where businesses wish to raise capital and increases the required knowledge international investors need when investigating an investment opportunity.

2.4 Reinforcing Feedback and Critical Mass

As noted above, several key aspects of a stock exchange have a circular, self-reinforcing relationship between the two main customers, investors and listed firms. A third aspect should be added to this when evaluating the success of an exchange and that is economies of scale. Nicholas Economides (1994) recognized this pattern in his research about economics of networks. Essentially some networks, like a stock exchange, increase their value for consumers when more consumers use it. Unfortunately, the network needs to reach a certain size, or a critical mass, before economies of scale can benefit consumers and ensure the success of the network itself. Most stock exchanges in small nations face the challenge of reaching the critical mass required to add more benefits for their consumers.

This reinforcing feedback can be further broken down into supply side economies of scale, normally just called economies of scale, and demand side economies of scale which are often called network externalities. Economies of scale allow the average cost of service to decline as more people use the service, as fixed costs are spread out over more users. In service matching businesses, like an auction house or a stock exchange, network externalities recognizes the increased attractiveness of using a service when there are more consumers using it as each consumer adds more variety and availability of products/services to the system overall. Critical mass is essentially the point of development where economies of scale and network externalities become self-reinforcing and profitability becomes sustainable.

2.5 Mergers

In business there are mergers where two companies decide together that the combination of their operations will improve economies of scale, scope, or network externalities, thus making them more competitive and profitable. There are also

acquisitions where one firm decides to buy another and combine the two with or without the approval of the management of the other firm. Carmine di Noia (1999) highlights another type of merger that can reshape the stock exchange industry, implicit mergers. These are agreements between exchanges that allow each exchange to list shares that were originally listed on the other exchange for trading by customers that use their exchange. This can lead to economy of scale for each exchange to specialize in either trading or listing securities while each exchange retains managerial control and ownership of their own exchange yet still benefits their customers through expanded trading choices from other countries. While it is generally polite to gain permission before allowing the trading of stock certificates from another exchange, there are few restrictions prohibiting an exchange or another financial institution from accumulating a sizable number of physical stock certificates and offer the trading of those shares on their own exchange. Such practice is rare but perfectly viable and could alter the profitability of each exchange involved.

For the purpose of this paper, only mergers and acquisitions that fully unite management of exchanges in multiple countries are considered. Memorandums of Understanding and other strategic agreements between exchanges are not evaluated.

2.6 Stock Exchange Development

While many papers have examined stock exchanges in large, developed nations very few have focused upon the challenges of reaching and staying above critical mass faced by small nations. Shahrokh Saudagaran (1988) and Kathryn Lavelle (2001) explore the choices that developing nation companies and governments face with creating their own securities market and notice how businesses from smaller nations face an inelastic supply of savings prompting a struggle to decide where they will raise capital. The crowding out effect of local governments raising funds further hinders capital raising activities of local businesses. The competition for capital is only one of the many factors that influence the development of stock exchanges. Other factors include the underlying financial system, macroeconomic factors, the legal framework of the nation, the policies

and methods used during the creation of the stock exchange[1], concentrated ownership, and the participation of institutional investors just to name a few.

2.7 Raising Capital

Schmukler and de la Torre (2004) examined capital markets regionally and evaluate them on a global scale. They find that allowing international investments into a local market can provide a crowding in effect for investments, helping all customers that use the local stock exchange. They also noticed that small countries may still struggle to develop their own capital market even after implementing all the required financial policies to align their market with international standards. While the crowding in effect is desired, Claessens et al (2002) notes that richer countries tend to have larger stock exchanges. This can thus further limit the development of exchanges in small nations regionally. Regions with larger populations and overall economic wealth tend to have quicker developing stock exchanges. Smaller exchanges located in small countries, according to Claessens et al (2000) face limited growth potential and will be pressured into international mergers of exchanges.

The general stability of the macro economy is a crucial factor of stock exchange development. Claessens et al (2004) recognize the vast literature that indicates sound local economic stability is vital for development while Boyd et al (2000) notice how higher inflation, higher interest rates on government bonds, and higher rates on bank deposits all slow down the development of the capital market. The more risk there is in the local system, the more capital that will leave the country for safer markets or safer investments. On the other hand, Bekaert and Harvey (2002) highlight how various changes in local policies in emerging markets has improved the types of international capital entering the markets in safer, less volatile forms of financing.

2.8 Attracting Listings

A key challenge of any new stock exchange is their ability to attract more companies applying for listing, qualifying, and complying with listing requirements. The challenges of reforming the West African region's financial system and establishing a

[1] Vladimir Atanasov, 2004, examines in Bulgaria the impact during privatization of state owned enterprises.

more market based economy were addressed in Kathryn Lavelle's (2001) report on the Abidjan regional bourse while Yartey and Adjasi (2007) took a look at the challenges that face the entire Sub-Sahara Africa region. The Bourse Régionale des Valeurs Mobilières (BRVM) that emerged from the 1998 agreement to integrate the West African region's equity market around the Abidjan Stock Exchange has found limited success attracting new listings. 10 years after the unification most listings still come from Cote d'Ivoire and half of the unified nations have zero businesses listed. Citizens' lack of understanding, poor legal enforcement, and under-developed infrastructure are cited for most of the troubles attracting more listings. In these cases, the challenges of developing stock exchanges have been closely linked with broader economic, legal, and financial reforms needed in the countries.

The other extreme is when governments decide to use the stock exchange to sell off former state owned enterprises. Many Eastern European and former socialist nations established their exchanges as a tool to help reform their economy and to reduce the governments' burden of supporting unprofitable businesses. Some markets listed all the companies onto a single system while others created a scaled system for companies needing to meet different listing requirements. Alar Kein (1998) reviews Estonia's creation of a tiered stock exchange, a model that became popular to use in many other markets suffering from mass privatization. These markets saw a peak in listings within the first few years followed by a steady decline as firms closed down, de-listed, or were bought out. In this example getting firms to comply with listing requirements has been the challenge. Further increases in firms listings are unlikely to happen until de-listings have stabilized and compliance with established regulations are widely accepted.

2.9 System Technology and Integration

In a historical context, the rise of electronic trading has quickly replaced the centuries old practice of open outcry at exchanges. Exchanges of all sizes depend upon computers and software to efficiently operate. With most exchange operators purchasing their software from a limited number of producers, the ability to interlink operations with other exchanges has never been easier. Language, distance, and regulations, the typical barriers for interlinking exchanges, have been disappearing. Heiko Schmiedel's (2001)

examination into the level of European exchange efficiency highlights the progress electronic trading and regulatory reforms have had upon operations and notices that efficiencies have been improving over time. These efficiencies have improved more in larger markets while smaller markets have lagged behind. This has exposed exchange operators to the potential for greater competition if they cannot operate efficiently.

Increased standardization has been occurring globally due to the pressures of international trade. The increased similarities in operations has allowed for improved economies of scale and scope in the securities exchange industry. Hasan and Malkamaiki (2001) find that economies of scale and scope are more pronounced for the big exchanges than for medium and small size exchanges. Effectively these forms of increased efficiencies rely upon standardized regulations covering a large region and population. The more that a group of nations can harmonize their laws, regulations, and procedures the more potential mergers there will be.

2.10 Complications in the Mergers of Exchanges

Exploration into international merger of exchanges have focused upon either the financial benefits or the technical challenges they create. Di Noia's comparison focused upon finding a competitive advantage in a region that had exchanges relatively close proximity of each other, more specifically throughout Europe. It also carried several simplifying assumptions to exclude differences in accounting standards and investment restrictions. The following section will further explore the challenges posed with cross border mergers.

2.11 Regulation Differences

The recent merger proposal between Euronext and the New York Stock Exchange was commented upon by Ethiopis Tafara (2007) from the Securities Exchange Commission in the United States. Legal challenges highlighted by the commission were securities fraud, dissimilar accounting standards, and dissimilar oversight and enforcement of regulations.

Securities fraud is when serious misrepresentation of a business or an asset is presented to investors with the intent to deceive them for a profit through the sale of

securities. Investigating such cases is challenging enough within the boundaries of one nation. The ability of regulatory officers to recover lost investments from fraudulent misrepresentation of foreign securities often stops at the national borders of the regulator's home country. To ensure a safe and fair market for investors in multiple countries requires coordinated regulatory efforts in all markets seeking to unite. The ability to recover money also requires joint regulatory access to foreign bank accounts to prevent the flight of capital during an investigation. While investigation laws and procedures can be created to protect investors in all unified countries, currently such regulations and procedures are not commonly shared.

Accounting standards vary considerably from nation to nation globally. While there has been significant advances over the years to unify accounting standards internationally few investors are sophisticated enough to fully understand these differences. Misunderstandings arise when local accounting standards are incorrectly applied to foreign securities that distort the true value of the securities. Over the long term, such differences will become better understood or eliminated, however they still represent a current point of confusion for investors trying to analyze foreign securities. In a similar manner, taxation laws upon dividends and capital gains differ significantly internationally and can affect foreign investment returns and analysis.

Regulatory oversight and enforcement can vary greatly from country to country. These regulations include establish listing requirements, anti-manipulation laws, trading practice, and disclosure requirements just to highlight some of the most significant areas. Many small nations still establishing their first stock exchange have looser regulatory enforcement than their older, more established neighbors. The weaker oversight and enforcement increases investors' risks in a variety of ways. These risks include, but are not limited to, insider trading, market manipulation, untimely release of financial statements, and fraud. While regulations and enforcement can be coordinated and improved between nations there currently are not many widely accepted standards upheld by all nations. Stock Exchange organizations, such as the World Federation of Exchanges have been established on every continent and encourage the standardization of such regulations.

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2.12 Clearing and Settlement

Clearing and settlements is the behind the scenes action that exchanges money for securities after the terms of the trade between investors has been negotiated[2]. This is typically done on a national level with limited international clearing of securities. The costs for processing international orders can be, but are not always, more expensive than local orders. There are, however, significant economies of scale in the clearing and settlement industry yet market segmentation based upon national boundaries creates expensive duplication of services within a larger region such as Europe or ASEAN. This cost of duplication can be seen in higher costs of settlement in smaller markets which need to be passed onto investors. Efforts to consolidate clearing and settlement depositories (CSD) are just as important as consolidating stock exchanges to reduce the costs of trading for investors.

There are several obstacles to consolidating CSDs. Most stock exchanges own the clearing and settlement business creating a vertical integration of services. Koeppl and Monnet's (2004) examination of the European markets contrasts the success of a fully merged CSD against the failure of profit sharing agreements. While both systems promised lower costs and better efficiency, the vertical integration of services linking stock exchanges with the clearing and settlement of trades created a barrier for increasing business in the later. The transfer of revenues from one exchange to another raises fear of supporting a competitor, a fear that limits the success of profit sharing agreements. A third option is an independent firm that handles all the clearing and settlement of securities in a region. While this would create a single cost for all exchanges in the region, leveling the playing field, it reduces the profits from bigger exchanges that gained advantages from their respective size.

2.13 Home Bias

Investors have a bias towards investing in companies and products they are familiar with. This familiarity pattern supports the linking of markets geographically close to each other and that already share robust trade with each other. While sharing a common

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[2] Monnet and Koeppl (2004) presents a more technical definition of what clearing and settlements are by discussing what occurs in each step.

culture, language, and currency are not necessary, they do help. Along these lines, there is a higher cost for obtaining information in other markets. These higher costs limit the willingness of investors to examine foreign equities according to Karen Lewis (1998). Investors are more comfortable investing in foreign companies they recognize, even if that means obtaining a smaller return on investments. This limitation of information becomes another challenge for consolidating exchanges that are not close to each other. A lack of cross border investing between member nations would limit the expected gains in liquidity and the corresponding improvement in profitability of the multinational exchange group. Without improved liquidity from the merger member exchanges' ability to attract more listings and further their growth and development is retarded.

2.14 Benefits of Consolidation

In summary the expected benefits from consolidation are considerable, although they still present some daunting challenges to overcome. Consolidating exchanges in a region should lead to greater profits for the group as infrastructure, technical hardware and software, personnel, and other general expenses can be structured for a more efficient level of productivity thus lowering the inflection point to reach profitability and critical mass. For many small nations this is one of their greatest concerns as operation costs often exceed revenues. A larger, multinational exchange group is expected to be more persuasive in attracting both investors as well as organizations seeking capital. This increase in size is expected to improve liquidity in each market, either from improved confidence in local, regional, or more distant international investors. It is also expected to improve the attractiveness for organizations to seek raising capital through one of the member exchanges as greater liquidity in the group should support more capital demanding public offerings. The unified listing requirements, regulations for trading compliance and other standardized regulations accepted by member exchanges supports a more trustworthy environment for consumers of their services to rely upon. These benefits create the reinforcing feedback that Nicholas Economides termed 'network economies'.