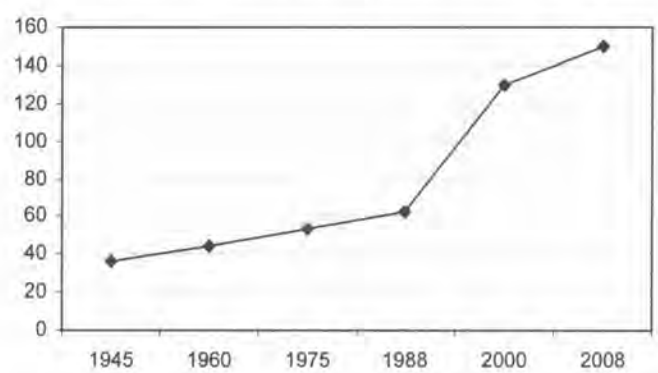
CHAPTER I
INTRODUCTION

1.1 A Brief History and Stylized Facts

Organized stock trading started at the beginning of the 17^{th} century as tiny Amsterdam sought out a solution to finance international trade with Asia. Three centuries later many of Amsterdam's European neighbors and several of their key trading partners had established a similar system of trading public ownership in companies to raise capital in order to establish capital intensive corporations. Following the Second World War political and economic idealism divided the world into three groups and only key allies and trading partners of market economies continued to establish stock exchanges during the USA vs. USSR cold war years. Until the fall of the Berlin wall and the insolvency of the Soviet Empire in 1989, there were only 66 nations and 4 dependencies[1] that were operating a stock exchange. The past 20 years has seen the number of nations and dependencies with a stock exchange double as nations around the world have adopted more aspects of market based economics and leaving relatively few countries without a stock exchange today.

Figure 1. Nations with a Stock Exchange



Historically development has been regionally concentrated in Europe followed by the Americas and Asia with Africa being the slowest to adopt. This trend in development has led to the current situation where some regions have a higher percentage of nations with an established exchange meanwhile other regions have several nations proposing the

[1] There were 18 dependent regions that were tracked. These regions did not have full national sovereignty however they had considerable control of local government operations and often had their own currency. Dependencies were not included in the stylized facts.

establishment of a national exchange. Development of an exchange has also been more probable in countries with larger populations as they have a greater pool of savings and demand for capital. There are currently 11 out of 31 independent nations with a population greater than 100,000 citizens that are examining the establishment of an exchange.

Figure 2. Nations Currently with a Stock Exchange by Region

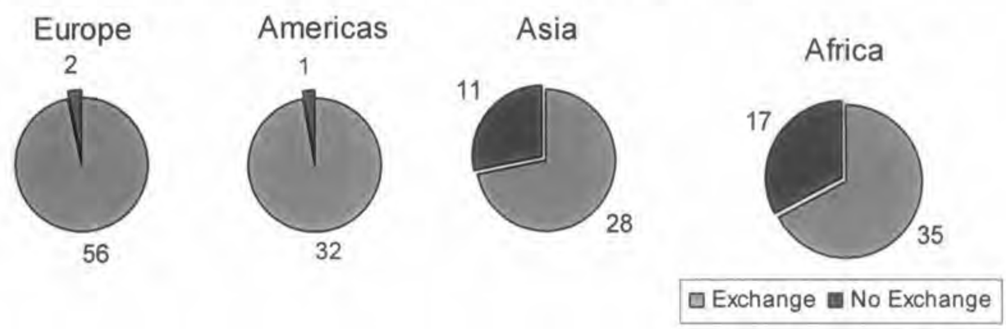


Figure 3. Nations Historically with a Stock Exchange by Region

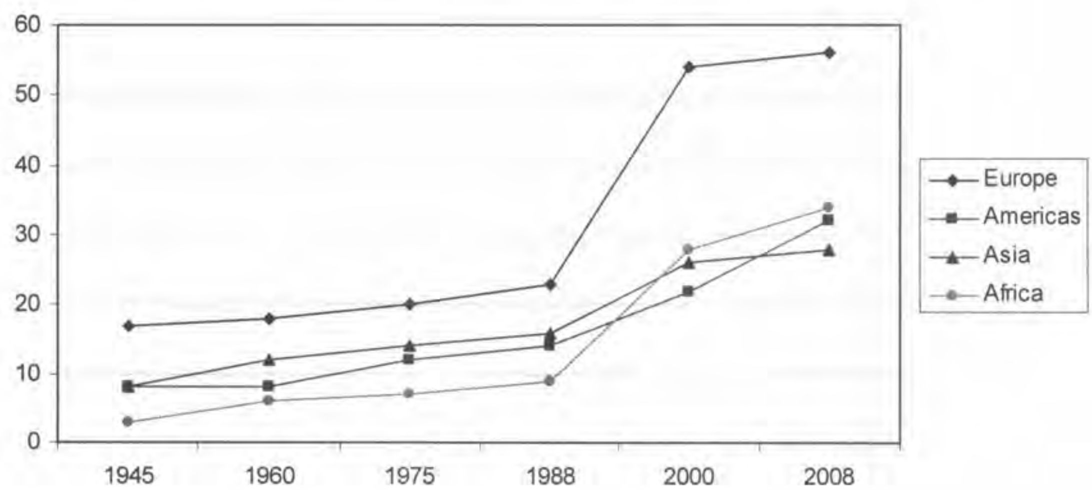
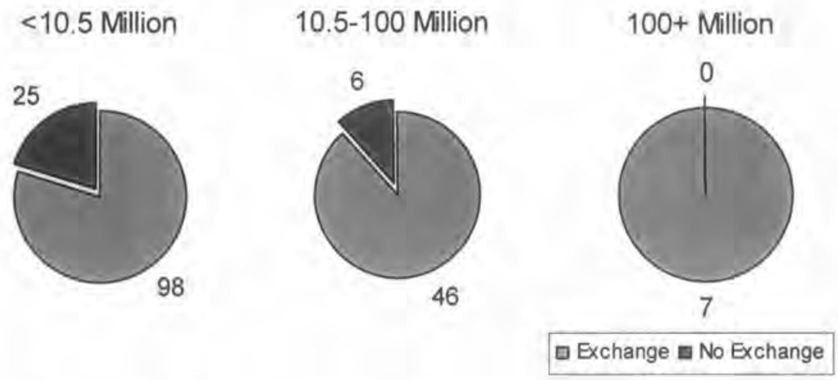


Figure 4. Nation's Population Size and Operating a Stock Exchange



There have been many studies on various aspects of stock markets over the years however due to limitations with data the vast majority of these studies have examined stock exchanges in medium and large sized nations. Large nations, with a population over 100 million, have numerous advantages compared with small nations, those with a population fewer than 10.5 million. The recent explosion of new stock exchanges has been largely dominated by the vast number in small nations seeking tools to help reform their financial systems.

1.2 History of International Stock Exchange Consolidation

The first case of multiple nations coming together to use one stock exchange amongst them was in west Africa and the establishment of the Bourse Regionale des Valeurs Mobilieres (BRVM) in 1998. Government officials from seven nations decided in 1993 to explore a regional financial market, taking advantage of the monetary union already established amongst them. Instead of opening 6 new stock exchanges, the exchange already established in Abidjan, Cote d'Ivoire was determined to be the main exchange for the region with supporting national branch offices being opened up in member countries. Prior to the launching of this program Guinea Bissau became the eighth nation to join. The costs of member nations sharing one exchange was considered more reasonable than establishing 8 individual exchanges, however not every nation is active in using the exchange. A vast majority of activity on the exchange still comes from businesses in Cote d'Ivoire with limited activity from other member nations.

The second case of multiple nations coming together to form one exchange was the much discussed merger of operations in Europe creating Euronext in 2000. National stock exchanges in France, Netherlands, and Belgium consolidated their operations initially before expanding with the 2001 acquisition of derivatives trading in England and in 2002 merging with the national exchange in Portugal. With the exception of the British operations, all other nations had converted to the Euro currency prior to consolidation. While each nation still operates their national exchange as a subsidiary of the Euronext Group and shares information within the group they also consolidated the clearing and settlements division of each exchange, except Portugal, by selling them to a non-exclusive third party operation, Euroclear Group. In 2006 Deutsche Borse and the New York Stock Exchange (NYSE) both bid to acquire the multinational exchange group, with the NYSE eventually merging with the group. This marked the first intercontinental equity exchange group and currently the world's largest exchange group measured by the market value of both equities traded and market capitalization of listings.

The third case involves the creation of an exchange amongst eight of the of the world's smallest nations, the creation of the Eastern Caribbean Securities Exchange (ECSE) in 2001. With a combined population around 600,000 citizens this group of nations had already established a common currency, the East Caribbean Dollar. The island of Saint Kitts became home for the new stock exchange with respective offices on the other islands. Regional agreements in the early 1990s between the oldest Caribbean exchanges; Jamaica, Barbados, and Trinidad and Tobago; had already established a movement towards shared listing of companies across the Caribbean Community (CARICOM) region and the promotion of cross border investments. While the ECSE is the only multinational exchange in the region, regular meetings are held to promote a more coordinated operation of stock exchanges and investments. There are eight stock exchanges in CARICOM covering 15 nations with two more exchanges located within the five associate members. The greater CARICOM region is home to roughly 16 million people plus 24 million more on neighboring islands Cuba, Dominican Republic, and Puerto Rico. Their similar economies and history has been a starting point for their efforts of a more consolidated equities exchange market and their active promotion for further integration within the region.

A similar approach of creating an exchange when none previously existed was launched in 2008 by the Central African Stock Exchange, headquartered in Gabon, covering the 6 nations that share the Central African CFA Franc. Their efforts are similar to those of the CARICOM region while blending in the same challenges affecting their neighbor, the West African community, and their multinational stock exchange BRVM.

The fourth case is the most ambitious of the group as it involves the creation of a multinational exchange with member nations all using different currencies. The OMX Group started to prepare for consolidation with the Alliance of the Nordic Stock Exchanges in the late 1990s when they agreed to use the same software for their trading and clearing sytems. The movement towards consolidation started in 2001 when the Helsinki Exchange (HEX) in Finland acquired the Tallinn Stock Exchange in Estonia. The following year the Riga Stock Exchange in Latvia was acquired by the new HEX Group however it was the 2003 merger of the HEX Group with the OM Company that operated the Stockholm Exchange in Sweden that finally got Europe's attention. By 2006 the OMX Group operated in seven nations using seven different currencies with their proprietary trading software seamlessly linking up their operations. The profitable operations of their business model attracted both the Armenian government to sell their stock exchange to OMX as well as a bidding war, won by NASDAQ from the USA, to acquire the company.

The successful consolidation of the OMX model has attracted attention within Europe as well as internationally. The Vienna Borse from Austria has used a similar approach to start consolidating stock exchanges in the Balkans region. Underlying this consolidation are two important factors, the promise of a unified currency and the unprofitable nature of many small stock exchanges. While many eastern European countries issue their own currency, efforts have been made to bring many of them onto the Euro. Local governments in small nations, not interested in subsidizing the operations of these fledgling exchanges, are looking for ways to continue their operations in a more profitable manner. Consolidation, prior to the two US stock exchanges acquired their European peers, could be described as ethnically and culturally similar nations joining together to strengthen their equities trading systems. Contrary to the headlines that are generated when large exchanges merge together, most stock exchanges exploring the consolidation of operations come from small nations with a population under 10.5 million citizens.

1.3 Statement of the Problem

Based upon the network externality principles noticed by Nicholas Economides (1996), stock exchanges benefit significantly from economies of scale and network externalities after expanding beyond a size and profitability target called critical mass. This is to say that after reaching a certain level of user activity, ever increasing amounts of activity provide ever increasing value and benefits for both suppliers and consumers. These benefits include lower trading costs, improved liquidity, and the attraction of more listings. Unfortunately small nations have obvious problems reaching critical mass, or the stage of development which is required before this virtuous cycle of benefits can be enjoyed. There is also no static definition of critical mass as changes in regional competition can raise or lower that critical mass point.

Historically, small nations had to go to larger nations to raise capital, both for government needs as well as business ventures. The rise of exchanges in small nations has been an effort to independently fund their own needs. For many of the smallest nations the costs involved with operating a stock exchange have often exceeded revenues earned, creating a dependence upon the government to subsidize operations. To date, cooperative efforts between small and mid-sized nations have been advanced along with improvements in the electronic trading technology used in European, West African, and the Caribbean Island regions since the mid 1990s. Their respective goal is to reach a self-sustainable level of operations to ensure their long-term viability.

There has been widespread acclaim that mergers or alliances between exchanges regionally will produce vast improvements in operations for operators based in small markets as they expand beyond the vital level of critical mass. If factual, there would be a significant improvement in liquidity and the likely expansion of operations in countries that merge operations or form an alliance than for those who remain independent. In most cases establishing a common currency preceded the unification of operations, however very recent advances in trading and telecommunication technology has given rise to mergers of exchanges that operate in nations using different currencies. Yet not all multinational exchange operations came from a merger of previously independent exchanges. In the case of western Africa and the Caribbean Islands, the 'merger' of operations was merely the acceptance of multiple nations to use the already established exchange located in Cote d'Ivoire and an agreement to cooperate with the introduction of a regional exchange in Saint Kitts and Nevis. Each story of establishing a regional exchange is unique yet the ultimate goals are quite universal, a viable financial system that allows local business and government easier access to raising capital.

1.4 Objective

The purpose of this thesis is to create an empirical model to validate the claim that merging stock exchange operations across multiple nations improves liquidity and the overall size of the relative operations for each country.

1.5 Scope

The focus is upon the 98 stock exchange operations in the 141 nations with a small population, 10.5 million citizens or less, operating a minimum of four years during 1986 to 2006. Annual data is compiled since 1986 or the year of origin for selected countries. Only 69 nations were able to provide enough data to be included in this analysis.

1.6 Research Methodology

This theoretical framework and literature review examines two aspects of stock exchanges in small nations. The first stage is an examination of role a stock exchange plays in a small nation and the challenges it has in being successful. The second stage is to examine the literature concerning the merger of stock exchanges.

The model created is a combination and modification of models used by Kasauskas and Visockas, De la Torre and Schmukler, and Levine and Demirguc-Kunt. It was designed to take into account some of the most challenging aspects of a comprehensive comparison of stock exchange development globally.

The required data which are market capitalization, value traded, number of companies listed, average size of company listed, years of operation, GDP, money + quasi money, population, FDI inflow, Fiscal deficit, government revenues, and four dummy variables, multinational exchange, region, investment restrictions, and unloading of State Owned Enterprises (SOEs) were collected for each nation. A detailed table of the sources of information can be found in Appendix A. Model testing and the interpretation of results is the final stage of research.

This paper is organized into 4 sections with an additional two sections of appendixes related to chapter 3. Chapter 2 reviews the various theories that underlie stock exchanges and their operations, their functions, and relevant literature upon the topics of stock exchange consolidation and the operations of an exchange. Chapter 3 establishes the models used for testing, reviews the variables selected, and highlights the results of the testing. Extra details about the testing and model creation can be found in the two appendix sections at the end of the paper. Chapter 4 concludes the results as well as highlights the problems and weaknesses of the analysis.