

**INTRODUCING DERIVATIVES EXCHANGE: ASIA'S
EMERGING MARKETS EXPERIENCES**

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Major in International Finance

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DEDICATION

To My Husband,

Josphat K. Waweru

For All Your Steadfast Love,
Support, Encouragement, and Patience.

ACKNOWLEDGEMENTS

Writing this dissertation has been an extremely challenging undertaking for me. I thank the Almighty God for bringing me this far, gave me the strength knowledge and understanding. To Him be Glory and Honor. He also blessed me with wonderful people who offered enormous support in this project. It is to these people that I hold my greatest gratitude.

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ABSTRACT

What makes some derivatives exchange as well as products successful while others fail is a puzzle that is yet to be fully solved. Some derivatives markets become very successful while others fail to record any significant trading. This dissertation attempts to shed light on introducing successful derivatives exchanges especially in emerging markets which lag far behind developed markets in introducing derivatives instruments. The paper critically analyzes some of the necessary factors (requisites) prior to and after the establishment of derivatives exchange. Indicators that a derivatives market has a high likelihood of being successful when established as discussed include; economic development, political stability, strong legal and regulatory framework, sound infrastructural systems, developed capital markets, products traded, education to market participants, large and active investors as well as a detailed feasibility study. These indicators were analyzed through a comparative case study and were found to clearly distinguish successful and unsuccessful derivatives markets. Further, to determine the success of derivatives products, an empirical analysis on the factors influencing contracts' success was conducted. Confirming our hypothesis, we found the size of the underlying market, the price variability of the spot market, as well as the cash market liquidity to significantly influence contracts success.

In conclusion therefore, prior to introducing a derivatives exchange, an emerging market should first examine whether the indicators of a successful derivatives exchange are favorable and then introduce those products with high probability of being successful.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

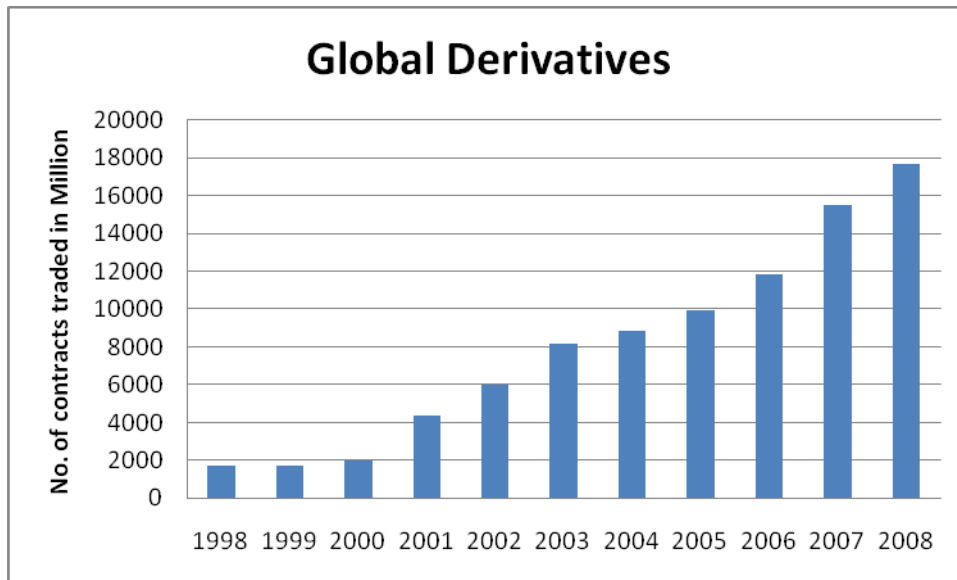
The world is fast changing and things that were thought in yester years as unimaginable are fast becoming a reality. The changes have come in all forms and all sectors are actively collaborating in this era of globalization. Financial sector has not been left behind and has experienced radical changes. These changes have been fueled greatly by the liberalization of financial sectors taking place in various countries resulting to tremendous growth in financial institutions like banks, insurance companies, mutual funds, investments trusts among others. The growth in financial sector as well as financial integration across economies has led to birth of diverse products in the last few decades ranging from forwards, down to futures options and swaps — termed as derivatives products (Appendix 1A).

A derivative product is defined as a financial contract whose price is derived from that of underlying item such as a commodity, equity index, currency, security, interest rates, or event. Derivatives products are classified into financial or commodity derivatives products depending on the underlying products. As finance theory and information technology advance, the trading volume and complexity of derivative products (especially financial derivatives products) offered by the banks and exchanges have greatly increased as shown in Table 1.1. Derivatives products are of various classes and are found in different forms. They are traded either in organized markets commonly referred as *Exchange-Traded markets* (ETD) or in privately negotiated agreements referred as *Over-the-Counter* (OTC) markets¹. The financial derivatives products which started trading in 1972 have gained remarkable growth both in terms of trading volume and value. Many markets, both developed and emerging have introduced derivatives exchanges. However, while some exchanges

¹ The basic distinction between the two is by the degree of contract flexibility and the organization of trading activity. ETDs are standardized products traded in organized exchanges, and have rigid structures. OTCs on the other hand are privately negotiated, bilateral agreements transacted off organized exchanges. They are generally not regulated by a regulatory authority or the exchange's self-regulatory organization, although they are affected indirectly by national legal systems, banking supervision and market surveillance. Initially, the OTC markets were common and traders could agree on the quantity and price of the products. However, since a trader required a counterparty that had a similar offsetting interest, the OTC posed an illiquidity risks. Also, lack of regulation posed a larger challenge as one party could default and this led to the desire for better markets, hence the birth of ETD markets. The two markets have since been growing almost at the same rate though the ETD registers higher volumes of outstanding amounts.

have enjoyed great success especially in trading activity, others have failed or have recorded dismal performances, leading us to the main question, *why do some derivatives exchanges become successful while others fail?*

Table 1.1 Growth of Global Derivatives Traded



Source: Futures Industry Association (FIA)

Despite the tremendous growth in derivatives trading volume as shown in Table 1.1, derivatives' trading remains a complex issue. While some markets view them as useful tools with great gain to the economy in terms of transferring risks and price discovery, other markets are skeptical about derivatives products and view them as dangerous tools² or even similar to gambling. These wide and different views about derivatives can be best summed in the words of two well renowned financial gurus;

"What many critics of equity derivatives fail to realize is that the markets for these instruments have become so large not because of slick sales campaigns, but because they are providing economic value to their users."

Alan Greenspan, 1988 (former Fed chairman)

² Derivatives were blamed as the cause of the 1997/98 Asian Financial Crisis.

“Derivatives are “financial weapons of mass destruction”
Warren Buffet, 2002 (CEO, Berkshire Hathaway)

Whilst Greenspan statement emphasizes the benefits of derivatives trading, Buffets statements paints a different picture of them being dangerous, if not handled well. In essence, derivatives products, just like any other product, have both inherent risks and benefits as captured in Mr. Leavitt’s words;

"Derivates are something like electricity; dangerous if mishandled, but bearing the potential to do good"

Arthur Leavitt's, 1995 (former SEC chairman)

For the immense benefits of derivatives trading to be achieved, it is thus critical to handle them with care and expertise. In spite of derivatives being a complex issue with numerous benefits and risks (Appendix 1B), it is an area that has received less academic attention. Both academic research and popular press have dealt with the derivatives exchange mainly from the perspective of a “black box” focusing mostly on their pricing, liquidity, volatility, and the relationship between derivative and spot markets among others. However, the core and critical issue as to what constitutes successful markets to begin with, is sparingly dwelt with. This paper attempts to look into determinants of derivatives (financial) exchange success, prior to and after its establishment.

1.2 Motivation and Importance

The fast evolution of financial derivatives during the past two decades after Chicago Mercantile Exchange first introduced derivatives in 1972 is related to the fundamental changes that have occurred in financial markets. Over time, many countries have been introducing derivatives exchange either as a department in the existing stock exchange or as an independent exchange. According to World Federation of Exchanges (WFE) and Futures Industry Association (FIA) statistics, there are 75 derivatives exchanges (Appendix 1C and 1D) in over 30 countries worldwide — 48 of which have financial derivatives exchanges. On the other hand, there are 127 stock exchanges globally in 110 countries as per the Global Stock Market Fact

Book. The number of financial derivatives exchanges is way behind the number of stock exchanges. More intriguing, as shown in Table 1.2, there are more emerging markets with more number of stock exchanges but they fall far behind when it comes to the number of financial derivatives exchanges.

Table 1.2: Stock Exchanges and Financial Derivatives Exchanges

	<i>Developed Markets</i>	<i>Emerging Markets</i>	<i>Total</i>
Panel A: Stock Market Exchanges			
Countries	28 (25%)	82(75%)	110
Exchanges	32(25%)	95(75%)	127
Panel B: Financial Derivatives Exchanges			
Countries	13(46%)	15(54%)	28
Exchanges	30(63%)	18(37%)	48

Source: FIA, WFE, Global Stock market Fact Book.

The table shows the number of stock exchanges in developed and emerging markets and compares them to the number of financial derivatives exchanges. As seen, though developed markets are less in number than emerging markets, they have more financial derivatives exchanges.

The table compares the number of financial derivatives exchanges established in emerging markets and developed markets³. As shown in Panel A, out of the 110 countries listed by the Global Stock market Fact book, 28 are classified as developed markets while 82 are classified as emerging markets, a 0.25:0.75 ratio. The 110 countries have 127 stock exchanges of which 32 are in developed markets and 95 in emerging markets, a 0.25:0.75 ratio. The scenario is however different in Panel B for the financial derivatives markets case. Out of the 110 countries, 28 of them have financial derivatives markets in which 13 are developed markets while 15 are emerging markets, a ratio of 0.46: 0.54. From these 28 countries, the total number of financial derivatives markets is 48 from which 30 are in developed markets while only 18 are in emerging markets, a 0.63: 0.37 ratio.

While almost half (13 /28) of developed markets with stock markets also have financial derivatives exchanges, only 18% (15/82) of emerging markets with stock markets have financial derivatives exchanges. Also, ratio composition between the number of countries and the number of exchanges for developed and emerging markets in stock markets section and financial derivatives

³ Clear distinction and more information on developed and emerging markets is discussed in Chapter Two.

exchanges section is different. In stock markets section (Panel A), the ratio of countries in developed and emerging markets is 0.25:0.75 and it's same as the ratio of number of exchanges. In the financial derivatives exchanges section (Panel B), the ratio of countries in developed and emerging markets is 0.46:0.54. However, the ratio of the number of exchanges for developed versus emerging markets is 0.63:0.37. These shows; (i) there are more emerging markets with equally higher number of stock markets than developed markets, (ii) there are more emerging markets but with less number of financial derivatives exchanges compared to developed markets.

As shown on the table, emerging markets are lagging behind developed markets when it comes to introducing financial derivatives thus losing out on the benefits of derivatives trading. This can be due to the high resources and costs required to introduce derivatives exchange as well as underdevelopment status in most emerging markets. There is thus need of a faster or more effective process in which emerging markets can introduce financial derivatives successfully — the main motivation of this research — in order to catch up or even outdo the developed markets. This will not only be less costly but will also save some of the time on research.

Most emerging countries⁴ carried out extensive research for several years before introducing financial derivatives. Some countries like India, Korea, South Africa and Turkey successfully⁵ introduced derivatives while others were unsuccessful. Many other emerging economies have plans or may also wish to introduce derivatives but have not attempted. Some of the factors derailing them include — inadequate regulations, poor infrastructure, lack of capital and experienced staff to carry out detailed research among others but greatly, due to fear of exchange failure once introduced. These countries would be greatly relieved if there are important factors to determine the likelihood of the exchange being successful.

Majority of the papers⁶ done on the introduction of derivatives are fragmented and non conclusive. Fratzscher (2006) discusses the roadmap for a prudent development of derivative

⁴ (a) Korea: “Launching Markets for Stock Index Futures and Options: Case of Korea” Yu-Kyung Kim. Research done since mid 1980s while trading started in 1996.

(b) Turkey: “When to start Financial Derivatives Trading? The Example of the Istanbul Stock Exchange” by Oral Erdogan-Murad Kayacan; Research started since mid 1990s while trading started in 2001

(d) India: SEBI set up two committees to oversee and research on the derivatives introduction; L. C. Gupta and J. R. Varma Committee in 1998. Research started since mid 1990s while trading started in 2002.

⁵ Second chapter deals extensively on the distinction between successful and unsuccessful markets.

⁶ Black (1986), Fratzscher (2006), Jobst (2007), Jobst (2008), Tsetsekos and Varangis (1997), Tsetsekos and Varangis (2000),

markets citing sound regulations, infrastructure and liquidity as the pillars of derivatives trading. Black (1986) conducted a statistical comparison of successful and failed futures contracts. She goes further to identify the contribution of various factors to the probability of a contract's success (liquidity, volatility, volume, size). Tsetsekos and Varangis (2000) emphasize that success of a derivatives exchange depends on the structure adopted and the products traded. Tsetsekos and Varangis (1997) using capital markets and economic proxies as indicators of market readiness for the development of derivatives exchanges did not find any conclusive evidence of the degree of market readiness. The paper proposed the need for more research to determine otherwise. Jobst (2007) focused on the need for a good legal and regulatory framework as well as a strong infrastructure system. The information from the papers though scattered and fragmented, lays a sound foundation for the preparations necessary for derivatives trading from a theoretical view.

The papers however, fail to give a unified theory of what determines an exchange's success. They also fail to address how a market can predict the probability of success or failure once the exchange is established. In other words, are there some dos and don'ts that may be guide to knowing what and when to trade derivatives? Are there some indicators into what determines whether it's time or not to introduce derivatives? These critical questions help determine when is the right time for establishing derivatives exchange – when the derivatives exchange has a higher probability of success.

To address these issues, it is thus important to carry out a detailed analysis of the determinants of derivatives exchanges success. This dissertation seeks to address the questions as well as to fill the existing gap and it is covered in two main categories: (i) *what determines derivatives exchanges success?* and, (ii) *what influences derivatives products success?*. This involves developing a statistically generated success model.

The findings of this paper will be of great use to many emerging markets that wishes to introduce derivatives trading as it will give recommendations on the right time to introduce derivatives exchange. It discusses the main determinants of derivatives exchange success and also necessary measures required for successful establishment of derivatives exchange. Also, for the markets that have successfully introduced derivatives exchanges, it will be useful in determining the probability of introducing other successful contracts. It will also form a base upon which other scholars interested in similar topics can build or expand on.

1.3 Thesis Outline

Having introduced the dissertation, the rest of the paper is arranged as follows:

Distinction between emerging and developed markets as well as success and unsuccessful markets and literature review is given in Chapter Two.

The determinants of derivatives exchanges are discussed in Chapter Three and analyzed using a detailed comparative case study of a successful and unsuccessful derivatives exchange.

Chapter Four analyzes the factors influencing derivatives products success. An empirical analysis is carried out and the indicators that best influence products success are determined. The established success model can help examine if a contract will be a potential success or a probable failure once established. This in turn determines the success or failure of derivatives products and by extension, the derivatives exchange success (especially if it's the first product to be listed in the exchange).

Finally, Chapter Five concludes the dissertation and gives recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Emerging versus Developed Derivatives Markets

Financial derivatives were first introduced in U.S and other developed markets such as Canada, England, and Netherlands before spreading to emerging markets like Argentina, Brazil, Korea, South Africa, and Turkey among others. To better understand emerging and developed markets derivatives trading, it is important to address a crucial question; *how can an emerging market be objectively distinguished from a developed market?*

Tsetsekos and Varangis (1997) dwelt in length with the categorization of derivatives exchanges. They used three procedures to classify exchanges into either emerging or developed as discussed below:

First classification was done according to the country's economic development. Using World Bank's classification of countries as developed or developing according to income level, derivatives exchanges were classified into either developed or emerging. Exchanges in countries classified as developed by World Bank like Canada, Germany, Hong Kong, Japan, Singapore, and U.S were considered developed. On the other hand, exchanges in countries which were classified developing like Brazil, India, Korea, South Africa, Mexico, and Taiwan among many more were considered emerging. The *second* classification focused on the development stage of the country's equity capital market. To find the stage of development of the capital market, International Finance Corporation (IFC) "Emerging Stock Market Fact Book"⁷ was relied on to classify capital markets as emerging or developed and consequently their derivatives markets. *Third* classification was done according to the maturity or aging of the derivatives exchange. This was measured by the number of years the exchange had been in operation. First, the year the derivatives exchanges were established in all the countries was considered and their median taken. According to a survey using various countries and their derivatives exchanges (Appendix 2A), the median number of years a typical exchange had been in operation was 14 years.

⁷It defines an "emerging market" as a stock market that is in transition, increasing in size, activity, or level of sophistication. A stock market is classified as "emerging" if it meets at least one of two general criteria: (i) Its located in a low- or middle-income economy as defined by the World Bank, and (ii) its investable market capitalization is low relative to its most recent GNI figures.

Exchanges in operation for more than 14 years were thus considered developed, while those with less than 14 years were considered emerging.

The third classification is however more ambiguous than the previous two and requires caution. An exchange that has been established recently is not necessarily less advanced than one established some time ago. Recently established exchanges are actually more advanced technologically than older ones. What is different, however, is a lack of experience and less historical information about volatility in a recently established market, which may relate to a market's success or failure.

Further distinction between emerging and developed markets is done by analyzing the chronology of product introduction in the markets. Tsetsekos and Varangis (2000) found that emerging markets usually take relatively lengthy time⁸ to introduce derivatives products compared to developed ones. A noticeable difference is that emerging exchanges introduce index products (stock) relatively more quickly than developed markets. Their study revealed that while historically exchanges first introduced derivatives for agricultural commodities, more recent exchanges introduce financial derivatives products starting with index-based derivatives products. In emerging markets, equity index products are introduced first followed by interest rate products and currency products. This can be due to the fact that in emerging markets, stock markets are relatively more developed compared to other financial sectors (like foreign exchange) and hence many investors would be more interested in hedging their stock portfolios more than other products like currency and interest rates whose markets may be too small initially. Also, it may be due to the globalization of commodity markets and liberalization of agricultural markets in emerging economies which has reduced interest in development of commodity derivatives relative to financial derivatives⁹. On the other hand, developed markets introduce agriculture products first followed by equity and interest rate products. This may be because in developed

⁸ Maybe due to the costly process of introducing a derivatives exchange in terms of detailed research required as well as effective implementation of other key elements of a derivative exchange — infrastructure and regulations — which need to be in place.

⁹ This can be explained by several reasons; (i) Commodity market liberalization has increased the pass-through of international commodity price movements to domestic commodity prices making use of existing commodity derivative contracts feasible for domestic hedgers especially in open economies; (ii) Financial markets are more country specific and the demand for derivative instruments mainly comes from domestic users. Equity based products are based on equities in the local stock market and interest rate derivatives are based on the local bond market. Thus, the country specificity of financial instruments usually makes derivatives based on these instruments to appear in local markets. (iii) Experience shows that financial derivatives attract relatively higher liquidity compared to the commodity derivative contracts.

countries, financial sectors are well developed and hence no urgency in developing stock index over other products. Also, several exchanges in developed countries were established years ago when agricultural products (and commodities in general) were more important in the overall economy and capital markets were less developed.

However, more recently, newly established exchanges in developed markets introduce first financial derivative products based on equity indexes, individual stocks, interest rates and currencies. Thus, among newly established derivative markets there is little distinction between emerging and developed in the sequencing of contract introduction. Consequently, agricultural derivative products were the first to stop trading in developed markets followed by index products. However, emerging markets rarely de-list their products even though its trading volume may have dropped to zero. In regards to timing of successive product introduction, both markets were same. The median number of months required between the first and the second contract introduction was 36 months. Between the second and third contract the time was 18 months and between the third and the fourth was 48 months.

Economic and capital market development was also analyzed to determine the extent to which they explain differences in the degree of development of their derivative exchanges (i.e.) are there any indicators related to the economic and/or capital markets for the development of derivatives exchanges. They can be termed as indicators of market readiness for the development of derivatives exchanges since a well developed capital market in a developed economy is more likely to succeed in introducing derivatives as opposed to less developed ones. Economic proxies used are; changes in consumer prices, prime interest rates, government bond yields, industrial production, real GDP growth, level of GNP, and share of investments in GDP using data from IMF International Financial Statistics. The proxies for capital market conditions include; stock market turnovers, stock market capitalization, variance in stock market capitalization, value traded, volatility in value traded and the number of listed companies in the stock exchange. They were tested using the economic and capital market proxies. The results however did not show any statistically significant differences between emerging and developed derivatives markets in respect to the economic proxies. There were some differences in capital market conditions between derivatives exchanges in emerging and developed markets, but these differences may be explained by the size and maturity of developed capital markets.

In summary, three main ways to distinguish an emerging market from a developed market were discussed: according to the country's economic development; according to stage of development of the country's equity capital market; and, according to maturity or aging of the derivatives exchange. In addition, economic and capital markets differences in emerging and developed markets did not give any conclusive indicators of the degree of market readiness for developing a derivatives exchange. Emerging markets takes relatively longer time in introducing derivatives exchanges compared to developed ones but they introduce index products more quickly than developed exchanges.

This paper distinguishes exchanges into emerging or developed based on the development stage of the country's capital market. The development stage of a country's capital market follows the IFC "Emerging Stock Markets Fact book" classification. Derivatives exchanges are thus classified according to the country's capital market development level.

2.2 Successful and Unsuccessful Derivatives Markets

Having categorized emerging and developed exchanges, it is important to further distinguish a successful and unsuccessful¹⁰ derivatives exchange. Borrowing from the classification of exchanges according to maturity or aging of the derivatives exchange (Tsetsekos and Varangis, 1997), the medium number of years a derivative exchange was in operation was 14 years. Hence, exchanges in operation for more than 14 years were considered developed and thus successful, while those with less than 14 years were considered emerging (can be successful or unsuccessful) requiring further classification. The success or failure of a derivatives exchange to a large extent depends on choice of products traded. If the products are successful, especially if it's the first product, so is the exchange and vice versa. A successful product is defined as one with a high trading volume, attracts a lot trading interest, and draws many people to trade (Black, 1986). To classify a derivative product as either a success or failure, Black used the average daily volume of the product. A contract that recorded more than 1,000 daily average trading volume during the first three years is considered successful. The time period over which the volume is calculated begins on the date the product is introduced and ends either three years or later or

¹⁰ The term failure and unsuccessful derivatives exchange and/or products are used interchangeably.

when the volume falls to zero – whichever is shorter¹¹. Products which had been in existence and traded actively for three or more years are considered successful while those that die within three years after introduction are considered failure.

A successful derivatives exchange as used in this paper is thus, one that has been in existence for more than 14 years and/or whose product trading is successful. On the hand, an unsuccessful derivatives exchange is one that closed down — due to failure to generate enough trade, trading malpractices, bankruptcy or any other reasons — within 14 years. Also, an unsuccessful exchange refers to those markets whose listed products have recorded low trading volume (less than 1000 daily average volume) or an exchange that have been trying to introduce a derivatives exchange and/ or list initial product without success.

2.3 Determinants of Derivatives Exchange Success or Failure

In order to develop a successful derivatives exchange, countries should meet several preconditions. Several papers¹² have outlined a wide-range of these preconditions or necessary factors that are required before a derivatives exchange is established. Compliance with these factors may lead to the success of the exchange once established while non-compliance in part or whole would contribute to failure of the derivatives exchange. Tsetsekos and Varangis (2000) dwelt on the determinants of derivatives exchange success in length and identified the structure adopted and products traded as very crucial, in addition to a stable economic and political background. Jobst (2007) emphasized on the importance of solid infrastructural and regulatory structures, transparent pricing in liquid cash markets, essential economic conditions as well as the importance of government support. The development of the underlying capital market was also found necessary and each market should first carry out a feasibility study prior to the establishment of a derivatives market (Tsetsekos and Varangis, 1997). Fratzscher (2006) identified three critical policy issues that need to be carefully considered before derivatives markets can be successfully developed as: how can liquid cash markets be expanded; how much regulation is needed and what infrastructure is necessary. Unis (1997) and Ansari et. al (2006) addressing the same issue emphasized the need of proper education to the derivatives exchange

¹¹ The choice of three years duration was reached after it was found that a large fraction of contracts die within two years of their initial listing (Carlton, 1984). Since contracts are not listed immediately after introduction, three years provide adequate time for contracts to distinguish themselves as successes or failures on the basis of volume trading.

¹² Ansari et. al. (2006), Fratzscher (2006), Jobst (2006), Jobst (2007), Tsetsekos and Varangis (1997), Tsetsekos and Varangis (2000), Unis (1997)

participants as well as investor protection and technology advancement which would enable the derivatives market to operate efficiently.

These factors and how they might contribute to a derivatives exchange success are discussed in this section in the following order; economic background, political climate, legal and regulatory framework, infrastructure, capital market development, education, investors, and feasibility study.

2.3.1 Economic Background

The establishment of derivatives exchanges is mainly driven by economic and financial reasons. The more developed a country's economic status, the higher the probability the capital market is developed and in turn the higher the likelihood of derivatives exchanges succeeding. The rapid growth of economic sectors especially financial industry in the last few decades has brought about development of new instruments such as structured financial products and exchange-traded funds (ETFs). This has been greatly fueled by the global deregulation of financial markets and market liberalization which has created new investment opportunities and risks therefore necessitating these new financial instruments. Agents in liberalized market economies are exposed to more risks like the currency risks, liquidity risks, interest rates risks, among others and hence require appropriate hedging products to deal with these risks. Corporations also need better ways to manage financial and commodity risks. These risks faced by the corporations, agents, and investors in general have thus necessitated the need for hedging products and hence the need for derivatives products which are traded in derivatives markets. Tsetsekos and Varangis (1997) as well as Jobst (2007) using World Bank's data established a list of economic factors that are used as indicators of market readiness for the development of derivatives exchanges. The factors included; real GDP growth, the level of GDP, and the share of investments in GDP, consumer prices index, interest rates, government bond yields, industrial production, inflation rates, as well as unemployment rates.

The gross domestic product is one of the most important indicators of economic growth. A high GDP indicates high market value of final good and services produced in a country and hence a strong economy as compared to one with low GDP. An increase in GDP growth means more production in a given year and hence a growing economy as opposed to one with decreasing GDP (a shrinking economy). In a growing economy, there is a higher probability of

capital market developing and by extension, derivatives market succeeding. On the other hand, in a declining economy, there is less chances of capital markets developing and this may result to unsuccessful derivatives market once established. Interest rates are commonly used to spur an economy in a certain direction. Low interest rates stimulate the economy by encouraging borrowing and investments thus leading to economic growth. However, when a market wants to encourage savings and control borrowings, interest rates are raised. The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a fixed market basket of consumer goods and services. CPI is considered a more accurate measure of the underlying rate of inflation. The lower the inflation rate, the more the economy is expected to be growing as it encourages savings and investment. Unemployment rate is a lagging indicator of economic expansion and should be maintained at minimal possible. An increase in foreign exchange rate is usually referred as a devaluation of the local currency which is normally associated with an expansion in the economy.

Depending on how high or low these factors are, they might support or impede the development of capital markets and by extension, derivatives exchange development. Economic development is thus very important in determining the probability of a derivatives exchange success. This is because in most cases, a country's capital market development can only be equal or less to its economic level of development.

2. 3. 2 Political Climate

Political climate is the bed rock of any country's development as it provides the favorable climate for carrying out business. The government is responsible for forming policies which may encourage or deter economic development. Jobst (2007) argues that the government should ensure and assure a broad domestic and foreign participation in the nations' building and development. In case of unfavorable political climate or political instability¹³, there are minimal chances of any economic activity flourishing or development. Economist Intelligence Unit (EUI) composes a political instability index which gives the level of threat posed to governments by social protest. The index scores are derived by combining measures of economic distress and

¹³ Political instability is defined in terms of changes in, or challenges to, a country's political systems (Pin and Marcel, 2008)

underlying vulnerability¹⁴ to unrest. Economic distress focuses on GDP growth, GDP per head in PPP and the unemployment rates. If the GDP growth declines by more than 4%, or the unemployment rate is higher than 10%, and a low GDP PPP, then there is a significant risk of political instability. The index classifies countries as very high risk, high risk, moderate risk and low risk. Most emerging economies dominate the high and moderate risk categories thus more politically unstable while developed economies are in moderate and low risks categories (Appendix 2B).

Pin and Marcel (2008) found that political instability do affect economic growth. Most obviously, violent challenges to the regime may damage or destroy physical capital and hence affect production levels. Moreover, political instability may hamper legal reforms since the marginal costs reform for incumbent politicians is likely to be larger than the marginal benefits, since part of these benefits will flow to future incumbents (Svensson, 1998). They used various factors to measures a county's level of political instability. These measures includes; government changes, changes in president, coups d'etat, demonstrations, strikes, number of years a party is in office, cabinet changes, resignations of top government officials among others. They concluded that political instability and economic growth are negatively related (i.e) the higher the political instability, the lower the expected economic growth. In addition to negative economic growth, Brink (2004) found that changes in the political climate of a country can results in risks that might impact negatively on a foreign operation's viability and profitability consequently lowering foreign investments in the country¹⁵. There is thus a great need for political stability and pro-business policies since the desirability, effectiveness and success of a derivatives exchange depends primarily on the political situation of the country concerned.

2.3.3 Legal and Regulatory Framework

The proliferation of derivatives exchanges is rather a recent phenomenon and governments are uncertain about how to regulate this market. Since countries have different legal and regulatory framework as well as business practices and trades, there is no general or uniform legal and regulatory framework across countries. However, the problems in the legal-regulatory

¹⁴ Economic distress variables include: Growth in incomes, Unemployment and Level of income per head. Underlying vulnerability composes: Inequality, State history, Corruption, Ethnic fragmentation, Trust in institutions, Status of minorities, History of labour unrest, Level of social provision, A country's neighbourhood, Regime type, Regime type and factionalism.

¹⁵ See book by: Brink C.H. 2004. Measuring Political Risks: Risks to Foreign Investments.

structures are similar in various countries. These problems are major impediments in the drive to develop derivatives exchanges especially in many emerging markets (Jobst, 2006). Some of the problems facing markets in regard to legal-regulatory framework includes: jurisdiction- the antagonism between market sectors like banking, derivatives, and securities over which entity should regulate and supervise the exchange and under what rules: the lack of investor's confidence¹⁶ as a result of market failures, corruption, and scandals: the uncertainty about equitable application of laws and regulations, the enforceability of obligations, and lack of market-oriented insolvency laws.

To address these problems, most exchanges have internal regulations with wide range of rules for the exchange to observe and are thus referred as self-regulatory organizations (SRO). Derivatives exchange needs to develop the capability to self-regulate by monitoring trading activities, ensuring contract execution, resolving disputes, enforcing rules and sanctions, and promoting professional conduct in order to increase investors' confidence (van der Bijl, 1997). In addition to SROs, there is also need for external regulations by governments or any agency of power. As Tsetsekos and Varangis (1997) emphasizes, the government's main objective is to monitor the exchange's activities and to set broad parameters for its operation. It should set minimum standards in areas such as contract design, market surveillance, reporting and record keeping, market transparency, safeguarding customer funds and assets, ensuring financial integrity of the trading process, and protecting customers from fraud as well as markets from manipulation and trading abuses.

The World Federation of Exchanges (WFE)¹⁷ has set various legal and regulatory structures which all exchange members should comply with. Since most of the leading exchanges in the world are members of the WFE, the regulatory structures laid down can be used as the baseline against which each exchange should gauge its own regulatory structure. The WFE stipulates that members must have and enforce regulations which address wide topics like: market access and participation; listing; timely, relevant and continuous disclosure of listed companies' information; trading; order rules for entry, display, and execution which establish priority; transparency and supervision of market activities; regulatory oversight and enforcement;

¹⁶ Measured by The State Street Investor Confidence Index, based on the willingness of the investors to put money into equity rather than more conservatives' vehicles like savings in the bank. Link: <http://www.statestreet.com/>

¹⁷ The WFE is the association of 56 leading regulated exchanges around the world. It develops and promotes standards in markets. <http://www.world-exchanges.org> for a list of members as well as the regulatory measures required.

clearing of trades; settlement of payment and transfer of title; enforcement of rules; settlement of disputes; emergency and summary powers; business continuity planning. Compliance with all or many of the WFE's regulations signifies an exchange has the proper regulatory systems and so a higher probability of succeeding.

Jobst (2007) concludes by stipulating the important standards a prudential legal and regulatory framework should be based on: solid accounting rules and the alignment of local accounting standards to IFRS; specific derivatives laws; full balance sheet disclosure requirements and market supervision through self-regulating organizations (SROs); capital rules on positions and transactions; as well as tax environment that creates a level playing field for all cash and derivatives trading.

2.3.4 Infrastructure

The architecture on which a derivatives exchange is built on is very crucial for its success. Some advocate that since the exchanges main functions is to transfer risks, then the infrastructure across markets is the same. In this broad setting, the infrastructure consists of the legal and accounting procedures, the organization of trading and the clearing facilities. However, opposing views as those advocated by Merton and Bodie (1995) argues that while the functions performed by the exchange are the same across time and place, the infrastructure arrangements employed to perform these functions are not. Nevertheless, they emphasize the importance of derivatives exchange architecture to enable its smooth functioning.

The elements of derivatives exchange infrastructure as discussed by Fratzscher (2006), Genotte and Leland (1994), Jobst (2006, 2007) and Tsetsekos and Varingas (1997, 2000) are as discussed below:

Market mechanisms: It refers to the system through which selling and buying prices are determined in an exchange. There are various types of market mechanism namely; market-making including margin requirements, order-driven, quote-driven and specialist mechanisms. A market can utilize any of the market mechanisms or use a hybrid of two or more mechanisms. The merits of the various market mechanisms have been fiercely debated and there is no conclusion of which mechanism is the best since each has its strengths and weaknesses. Nevertheless, many derivatives markets use order-driven followed by market-making or a hybrid mechanisms.

Clearing and settlements of trades: It involves the use of clearing houses commonly known as central counterparty (CCP) and settlement. After a trade has been matched by a trading system, it needs to be cleared and settled so that the seller gets paid and the buyer gets ownership of the security traded. Clearing is all steps of the post-trade processes apart from the final settlement — i.e. apart from the final payment and change in ownership. Clearing is the calculation of the bilateral or multilateral obligations of market participants. Clearing houses may act as central counter-parties. Settlement is the last step in the post-trade process. Financial obligations may be settled one by one, that is on a gross basis. They may also be settled net, whereby only the difference between debit and credit positions is settled. Settlement may also be real-time (transactions are settled as and when trades are agreed with no delay), or, occur at regular intervals, usually on a rolling schedule at the end of a day. This usually takes place a set number of days after trading that is the standard for a particular market or type of security. Netting can be bilateral (arrangements between two parties) or multilateral (arrangements between parties where risks is spread across participants).

Exchange ownership: Exchanges ownership is usually by members (as mutual organizations), by government (as non-profit organizations), or by public (demutualized exchanges). According to a survey carried out by Tsetsekos and Varingas (1997), 34% of the exchanges surveyed operated as self-governing entities while another 25% indicated that they are privately owned, government regulated exchanges. Smaller percentage indicated that they operate as a subsidiary, as a part of a larger organization or as a limited liability company. However, this trend is rapidly changing with many exchanges increasing demutualizing¹⁸ since the Stockholm Stock Exchange demutualized in 1993. The issue of demutualization however remains controversial with some arguing that demutualization changes incentive structure and operating environment of an exchange. Those against it argue that demutualized exchanges may have an inherent degree of conflict of interest. They have less incentive to commit resources to less profitable issues like self-enforcements or to take action against customers or users who are a source of income incase of imprudent trading by these customers¹⁹. Proponents of

¹⁸ It refers to the change in legal status of the exchange from a mutual association (one vote per member) into a company limited by shares, with one vote per share

¹⁹ For detailed arguments on the cases for and against demutualization, see: Akhtar, S., 2002. Demutualization of Stock Exchanges; Problems, Solutions, and Case Studies. East and Central Asia Department, Asian Development Bank; Ho, B. 2002. Demutualization of Organized Securities Exchange in Hong Kong: The Great Leap Forward. Law and Policy in International Business; Demutualization of Stock Exchanges in India, Is it Good or Bad? on

demutualization however argue that such exchanges have greater competitive advantage and resources to devote to regulations and self-assessment. In addition, the market pressures in a demutualized exchange would ensure that the company strives to be competitive by upholding principles of market integrity and transparency and by maintaining cost effectiveness and efficiency in the primary and secondary market regulation. Finally, demutualization is the only way an exchange can be able to operate profitably, effectively and efficiently in the face of mergers, alliances and stiff competitions from other exchanges. (Akhtar,2002).

Information dissemination process involves how efficiently order flow and trade execution are carried out. The information dissemination process of futures contract innovations is of great influence on the success of a futures contract (Pennings, 1998). There should be proper channel through which information is communicated between the investors, the brokers and the market. Information dissemination includes order flow, trade execution among other features.

Price stabilization features which ensures that the prices remain within a prescribed range of price limits predetermined by the exchange usually based on the previous day's closing prices. Circuit breakers are mostly used to halt trade in case of continuous decline in prices. Most exchanges have a prescribed range of price limits based on the previous day's closing prices. In case the prices move outside the set range, exchanges have mechanisms to restore the prices to the required range. It allows the market to cool before trading resumes (McInish, 2000). Other infrastructural features include exchange monitoring, control and enforcement functions. Gennotte and Leland (1994) concluded that all these essentials need to be laid and carried out to enhance the probability of a derivatives market success.

2.3.5 Capital Markets Developments

The financial structure in a given country plays a role in development of capital market as discussed by (Levine 1997, 2000). Financial structure refers to the mixture of financial markets and institutions operating in an economy. There are various financial structures measures which includes structure-activity, structure-size, structure efficiency, and structure-aggregate. The most

<http://www.economicstimes.com/guide/etclass/etmark5.htm>; Dorety (2006) on <http://financialservices.house.gov/media/pdf/051106td.pdf> for cases against demutualization.

preferred indicator of financial structure is structure-activity, which indicates the activity of stock markets relative to the activity of banks. Using this criterion, markets are classified into bank-based or market-based systems. Bank-based system refers to a market where companies prefer using the banks to finance their activities and this may thus hinder development of the capital markets. In a market-based system, the companies usually raise their finances from the capital markets. We would thus expect a market-based financial structure to have a more developed capital market and consequently derivatives markets as opposed to a bank-based system.

The development of the spot market lays the foundation of the establishment of the derivatives market. The most fundamental observation is that cash markets need to be liquid, efficient, and integrated in order to allow sound trading of related derivatives. A market should be liquid so that it can attract many participants and hence increase the trading volume leading to an exchanges' success (Remolona, 1992). The spot market variables indicate the readiness of the capital market to establish a derivatives exchange. These variables include; the stock market capitalization, market liquidity, trading volume, values traded, volatility, and the number of listed companies in the stock exchange.

Levine (1996) discusses how these variables affect the capital market's developments as well as their impacts on the economic developments. The market capitalization measures the size of the market and hence the higher its value, the bigger the market and thus the higher the probability of supporting derivatives trading. High liquidity encourages investments as it makes them less risky and more attractive. High investments levels are necessary for derivatives trading to flourish. The individual shares trading value determines the costs of buying and selling securities. If it's costly or risky, there will be no much trading which will hamper the overall market growth and hinder derivatives market development. There is therefore need for the value of individual shares to be at the affordable levels of its investors to encourage more trading and hence a higher total trading value. A high number of traded shares (trading volume) facilitate faster growth of the market which might boost derivatives markets growth. According to a sample of 38 countries, Levine found that countries with higher volatility ratios grew faster than those with low volatility. Kim (1998) concluded that the development of the capital markets indicate its ability to support a derivatives markets. The more developed the capital market, the higher the probability of a successful derivatives exchange.

2.3.6 Products Traded

After all the necessary infrastructures as well as legal and regulatory framework are put in place, the products introduced in a new exchange and especially the first product in an exchange greatly determines the chances of the exchange succeeding. Most emerging economies first introduces equity index products followed by interest rates and then currency products. Some products become successful after introduction while others never record any significant trading. Both qualitative and quantitative literature has attempted to explain success of contracts which determines success of derivatives products. Most studies use volume and/or open interest as the measure of success. Sandor (1973) used cut-off point of 1,000 contracts traded annually to distinguish successful from unsuccessful contracts.

In Silber's (1981) study of financial innovation by US futures exchanges between 1960 and 1980, contract success is defined by; (i) the number of years a contract is trading, and (ii) annual volume exceeding 10,000 contracts. Carlton (1984) analyses longevity and competition for US futures between 1921 and 1983, and relies on average lifetime and survival rates. Black (1986) uses Wall Street Journal's criterion for listing contracts in its financial pages: i.e. a contract is considered successful if its daily open interest exceeds 5,000 contracts and/or its daily average trading volume exceeds 1,000 contracts. She imposes a longevity criterion on the Wall Street Journal criteria and further states that contracts should record at least 1,000 daily average volume for the first three years before being termed as successful²⁰. Corkish, Holland and Vila (1997) adopt the Blacks criteria of distinguishing successful contracts. They further states that, high volume in the first three years is not a sufficient condition for contracts succeeding in subsequent years as failure rates in contracts after 3 years was still high. The product success is however derived from other underlying factors like the hedging effectiveness (i.e.) how well the product can hedge the underlying product risk (Tashjian, 1995), market liquidity as well as the size and volatility of the underlying market. In general, if the products are successful, the exchange will be successful.

2.3.7 Education

Ansari (2006) on importance of education states that to enhance the success of a derivatives market, it is critical to familiarize and train participants, from the employees of the

²⁰ This is the criteria which most literature has used to distinguish successful and unsuccessful contracts.

stock exchange to brokers, authoritative body, and even potential investors, students and technical staff in the regulatory bodies. Unis (1997) stated that the education initiative should be led by the stock exchange as well as other capital markets institutions. The education must range from basic concepts of derivatives products to ethical standards of transacting in markets to the rights of investors and the international best practices that should be exercised by the brokers. It can be carried out through seminars, workshops, media coverage as well as publications. Education is also a form of marketing the derivatives exchange and its products to the potential investors and markets should embrace it.

2.3.8 Feasibility study

In considering the establishment of new derivatives exchanges, policymakers should begin with a feasibility analysis. Such analysis should investigate the extent to which other preconditions of a successful derivatives exchange are observed, identify key areas of weakness, and formulate plans to address these areas. There is no point in proceeding with the design of the exchange and the products to be traded until this analysis is conducted. The government should thus encourage and support assessments of the feasibility of such markets and also ensure the implementation of the research's findings (Tsetsekos and Varangis, 1997). Through a well detailed study, a market is able to determine if it's ready or when it will be ready to start derivatives trading. Most markets, developed or emerging, do carry out detailed study before establishing derivatives exchanges and products to assess its probability of being successful. Other factors that enhance derivatives exchange success include the technology adapted, Technological support is necessary for a derivatives exchange success. It should be continuously upgraded to enhance speed, efficiency and reliability of the entire network infrastructure (Unis (1997).

2.4. Success and Failure Prediction Models

Success or failures prediction models are applied in diverse areas using empirical analysis. Majority of the models developed are in the area of *bankruptcy prediction* for various companies' in different countries. The most famous model known for bankruptcy prediction is the Altman's model (1998) on U.S companies. Other fields covered by success and failure models include *futures contracts* by Black (1986) and Corkish, Holland and Vila (1997), the *stock market* by Lin and Chen (2008) among others. Some have predictive ability for as far as

five years prior to failure and different degrees of accuracy are obtained depending on the period covered, the classification approach as well as the variables used.

2.4.1 Success and Failure of Futures Contracts: Theory and Empirical Evidence

In her Monograph series in Finance and Economics (1986-1), Deborah G. Black analyses the combination of variables which determine the success or failure of future contracts in an exchange. She deviated from various other studies (Gray (1966), Powers (1967), Sandor (1973), Silber (1981)) done in similar area but with individual variables e.g. contract size, delivery size etc analysis of success and failure. The paper starts by looking into why new contracts are introduced? Maximization of member utility was the main reason contracts are introduced which is a function of revenue and has an increasing function of trading volume. Increasing volume in an exchange implies innovating contracts that are heavily traded. The variables that determine a contracts volume are nothing more than the determinants of success (since a successful contract from the exchanges point of view is the one with high volume of trading).

To classify a contract as a success or failure, the average daily volume was used. The time period over which the average was calculated began on the date of introduction of futures contract and ended either three years or later or when the volume falls to zero – whichever was shorter. Determinants of success are the factors that an exchange might implicitly consider in choosing a commodity and designing contract specifications. The volume of trading in futures contract i is related to the relative residual risk for commodity i of cross hedging verses own hedging (RR_i) and the liquidity cost of using the own futures market rather than the best existing liquid cross futures market for commodity i ($CLIQ_i$). Price volatility of commodity i ($PVAR_i$) and $SIZE_i$ corresponding to the total size of the cash market for commodity i :

$$VOLUME_i = f(RR_i, CQIQ_i, PVAR_i, SIZE_i)$$

This can be transformed to log-log specifications for estimation;

$$\ln VOLUME_i = \ln \beta_0 + \beta_1 \ln RR_i + \beta_2 \ln CQIQ_i + \beta_3 \ln PVAR_i + \beta_4 \ln SIZE_i + u_i$$

The cross-sectional model is estimated using ordinary least squares and their coefficients obtained in the actual results just as expected.

Using 19 observations and annual data for each variable, the optimal function was;

$$VOLUME = -0.209 + 1.875RR - 0.0384CQIQ + 0.493PVAR + 0.501SIZE$$

The model was tested among various futures contracts listed in the Wall Street Journal and found to be highly successful. To analyze its predictive ability, the model was tested on municipal bonds and found to succeed (though a minimal success rate of 35%). In conclusion therefore, the model could be used as a predictive tool in analyzing potential new contracts.

2.4.2 Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy

Edward I. Altman²¹, commonly referred as the father of bankruptcy was the first one to use ratios to develop a model for predicting a company's failure. He came up with the Z score formula with an accuracy rate of 94% and 72% in one and two years respectively prior to failure. The model was first developed in 1968 but was later revised in 1983 by reassessing the variables and increasing the sample size to include the small firms. In his model, Altman (1968) had an original sample of 66 firms half of which 33 had failed due to bankruptcy. He used multiple discriminant analysis (MDA) approach to classify an observation into one of several a prior groupings dependent upon the observation's individual characteristics. It considers an entire profile of characteristics common to the relevant firm as well as interactions of these properties (Heine, 2000).

A list of twenty-two potential helpful variables collected from the income statement and the balance sheet was compiled and five variables were selected as doing the best overall job in the prediction of bankruptcy. The contribution of the entire profile was evaluated and after numerous computer runs, a final discriminant function was obtained as follows;

$$Z = 6.56 X_1 + 3.26 X_2 + .033 X_3 + 6.72 X_4 + 1.05 X_5$$

X_1 = Networking Capital/Total Assets

X_2 = Accumulated Retained Earnings/Total Assets

X_3 = Earnings before Interest and Taxes/Total Assets

X_4 = Market Value of Equity/Book Value of Total Debt

X_5 = Book Value Equity /Total Liabilities

²¹ Altman I Edward, 1968. "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy." The Journal of Finance, Vol. XXIII No. 4 September 1968

The variables of various firms, both successful and failed ones were tested and the individual firms Z score value for a year prior to bankruptcy were determined. The results were then classified into three zones — bankruptcy zone, zone of ignorance, and non- bankrupt zone. From the initial sample, tests were done for five, four, three, two and one year prior to bankruptcy. However, the discriminant model became unreliable in its predictive ability and that the accuracy diminished substantially after two years. By observing those firms which had been misclassified by the discriminant model and using one year prior to bankruptcy data, it was concluded that all firms having a Z score of greater than 2.99 clearly fall into the “non-bankrupt” sector, while those firms having a Z score below 1.81 are all bankrupt. The area between 1.81 and 2.99 are defined as the “zone of ignorance” or “gray area” because of the susceptibility to error classifications. The model has become very popular and has been adapted by many countries to predicting bankruptcy of their companies. Other countries (Belgium, England, and Greece) have built on this model to come up with their own bankruptcy prediction models.

2.4.3 A genetic-based hybrid approach to corporate failure prediction: New maths model to predict company’s success, failure at share market

Ping-Chen Lin and Jiah-Shing Chen from Taiwan universities proposes a genetic-based hybrid approach to predict the possibility of corporate failure. Different variables, such as earnings per share, liabilities and net income, into the genetic-based hybrid algorithm, which then assigns a weighting to each value. As output, the algorithm generates a new set of variables that are then selected for how well they fit the next set of financial results from the company. Those that fail are discarded or reduced in weight, while those that match the actual results more closely are fed back into the algorithm for the next round. Then, using actual data from successful and failed companies and feeding this into the algorithm the researchers build up the fittest set of variables and weightings, which allows the algorithm to evolve so that it can then predict the financial future of any given company based on current income and expenditure, and tax obligations. Experimental results show that this hybrid approach obtains better prediction performance than when using a single approach effectively.

Success and failure prediction models whether for company’s bankruptcy, stock markets or products plays crucial roles in helping the user early in advance the correct path to follow saving cost that could be incurred. Different models as discussed use varied statistical methods

like discriminant analysis, logit or probit regressions among others to come with appropriate prediction models. Borrowing from these findings, this paper develops a derivatives products success prediction model, which emerging markets can use to predict the chances of contracts succeeding and by extension, the derivatives exchange success.

2.5 Introduction of Derivatives Exchanges in Emerging Markets

Derivatives introduction seem to be a contagious phenomena which form a kind of a pattern. During the 1980s, most stocks exchanges in America and Europe introduced derivatives exchanges starting from U.S. and spread to Brazil, Mexico, Netherlands, and U.K among others. Turning the decade to 1990s and 2000s, the wave caught up with the Asian stock markets like Hong Kong, India, Korea, Malaysia, Singapore, Taiwan, etc. most of which have since become world powers in derivatives trading. The establishment of derivatives exchanges in same regions during the same period can be partly explained by the effect of positive externality whereby the new markets can borrow (operations know-how and expertise) from the well established markets. This pattern is referred to as *Regionalism derivatives*²². There are however, other countries which have succeeded even without any regional support e.g. South Africa is the only country in Africa with a derivatives exchange, also Singapore and Japan were among the first countries to introduce derivatives exchange in the 1980s when most of their neighbors were still lagging in poverty and had very weak capital markets if any. It is thus prudent to conclude that regionalism plays a big but not sole role in introducing derivatives exchanges.

2.5.1 Selected Successful and Unsuccessful Cases on Introduction of Derivatives Exchanges in Emerging Markets.

Having distinguished emerging from developed markets, as well as successful and unsuccessful derivatives exchanges, we look into some experiences of emerging markets when introducing derivatives markets.

²² Hong Kong Exchange, Research and Planning Unit (2000).

2.5.1.1 Successful Cases

2.5.1.1.1 Korea

Korea Stock Exchange (KSE), started to look into a possibility²³ of establishing an equity index futures and options market in the mid-1980's, not long after the first stock index futures market was opened at the Kansas City Board of Trade. They investigated and analyzed other countries' financial futures and options trading activities and regulatory environments.

A committee²⁴ was formed to study whether the financial market was ready to deal with exchange-listed derivatives products. In-depth analysis indicated that financial derivatives are better than commodity derivatives. Commodities such as grains, livestock, meat and metals, were not economically feasible since some of the products were monopolized, had inefficient distribution channels, were under government control and were lacking clear-cut pricing mechanisms. The products were also difficult to standardize in terms of quality and trade unit, many producers were too small in scale to utilize the derivatives market and thus commodity products were unappealing. In financial derivatives, the long-term and short-term interest rates, currency and equity index were analyzed if they could fulfill the following criteria: market size, price volatility, standardization requirements and the degree of market liberalization. As far as interest rate-related products were concerned, both primary and secondary markets for bonds were not yet in mature stage and a market for government bonds had not been developed²⁵. The short-term bond market was closed to foreigners and under heavy influence from the government. The market for currency-related products was too small in size and too heavily regulated.

The stock index was most close to satisfying the necessary conditions. According to the 1989 year-end figures, the market capitalization stood at \$119 billion which represented 68% of GDP, and the total number of shares outstanding and the trading value were 4.2 billion and \$102 billion, respectively. Comparing it with its benchmark countries (*Australia, Finland, New Zealand and Sweden.*), Korean market thus had a good chance to succeed. Additionally, the investor base was steadily increasing, 14% of total population owned at least one stock while the comparable figures for the U.S. and Japan were 20% and 17% respectively. The regulatory environment was a concern as the stock market was still under strong influence of the government. While the market had grown

²³ Kim, Y.K. 1998. "Launching Markets for Stock Index Futures and Options: Case of Korea" ISE Review, Vol. 2 No.5 March 1998.

²⁴ It was an independent committee called blue-ribbon and was made up mainly by University professors

²⁵ Korea introduced government bonds in 1999

quantitatively, qualitative aspect of the market was still some years behind those of the advanced markets. However, the speed of information dissemination had been quickened, the numbers of professional investors and investment advisory firms had increased, and the market had been rapidly internationalized. All of these changes were forcing the market to be more efficient and self-sustained without government's strong-arm tactics. The committee thus recommended that the stock index was at the best position to succeed in comparison to other financial derivatives.

The next step was determining which stock index-related derivatives product should be introduced, futures or options. The first criterion employed was how conveniently the new product could be used as a hedging tool and the second criterion was how flexible the new product was in helping to manage stock portfolios. While futures were more convenient tools in hedging market risk, options had simpler margin and settlement systems. In terms of flexibility, the futures market has a low transaction cost feature and has excellent liquidity due to its large trading volume. The options market, on the other hand, has a variety of expiration dates and also has excellent liquidity. The options were also more responsive to volatility and the options contracts were in small sizes suitable for the retail investor. After reviewing other countries experience in introducing derivatives products and given the committee's own investigation criteria, the committee recommended that the order of equity derivatives products to be introduced was, first, index futures, followed by index options and individual stock options. The final step was thus to educate the government as well as other stakeholders on the importance of having stock index futures market in the financial system.

Korea Exchange has experienced explosive growth since established especially in options trading and it has surpassed prominent American, European, and other international exchanges to become world number one in annual trading volume size since 2001 (Appendix 2C). This has been enhanced mainly by KOSPI200 options though KOSPI 200 futures have experienced less trading. Korea Exchange currently trades different kinds of derivatives as shown in Table 2.1

Table 2.1: Korea Exchanges Derivatives Products

Underlying Asset	Derivative Products	Listing Date
Equity Index (KOSPI 200,KOSTAR)	KOSPI 200 Futures	May 3, 1996
	KOSPI 200 options	July 7, 1997
	KOSDAQ Star Futures	Nov 7, 2005
Currency	US Dollar futures	April 23, 1999
	US Dollar Options	April 23, 1999
	Japanese Yen Futures	May 26,2006
	Euro Futures	May 26,2006
Individual Equity (30 blue chips)	Equity Options	Jan. 28, 2002
Interest Rate (KTB, MSB)	3-year KTB Futures	Sept. 29,1999
	5-year KTB Futures	Aug.22, 2003
	10-year KTB Futures	Feb. 25,2008
	MSB Futures	Dec. 6, 2002
Commodity	Gold Futures	April 23, 1999

Source: Korea Exchange (KRX), 2008

2.5.1.1.2 India

The plan to introduce derivatives in India was initially mooted by the National Stock Exchange (NSE) in 1995. The main purpose of this plan was to encourage greater participation of foreign institutional investors (FIIs) in the Indian stock exchanges. Their involvement had been very low due to the absence of derivatives for hedging risk. The first step towards introduction of derivatives trading was promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives.

The Securities and Exchange Board of India (SEBI) set up a 24-member committee under the Chairmanship of Dr.L.C.Gupta in 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report two years later prescribing necessary pre-conditions for introduction of derivatives trading in India. It carried out a big survey and their first recommendation was that derivatives should be declared as ‘securities’ so that regulatory framework applicable to trading of ‘securities’ could also govern trading of derivatives. SEBI set up another group in 1998 to recommend measures for risk containment in derivatives market in India. The report worked out the operational details of margining system, methodology for charging initial margins, broker net worth, deposit requirement and real-time monitoring requirements. According to results of the committees’ survey, financial derivatives were more preferred as opposed to commodity derivatives similar to trends among many markets introducing derivatives. The survey clearly revealed that there was wide recognition of the need

for all the three major types of financial derivatives — equity derivatives, interest rate derivatives and currency derivatives. The stock index futures ranked as the most popular and preferred type of equity derivative, the stock index options came second while options on individual stocks were third. The individual stock futures however, were favored much less as the case is in most countries. In terms of contract duration of stock index futures and options, the three months duration was the most favored. The American options were preferred overwhelmingly as compared to European types of options.

The Committee favored the introduction of equity derivatives in a phased manner so that the complex types are introduced after the market participants have acquired some degree of comfort and familiarity with the simpler ones. This was also easier from the regulatory angle too. After all the necessary mechanisms were put in place, derivatives trading commenced in India in June 2000 when SEBI granted the final approval to this effect. SEBI permitted derivatives segments of National Stock Exchange of India (NSE) and Bombay Stock Exchange (BSE), and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. The first product to be introduced was index futures contracts based on S&P CNX Nifty and BSE-30(Sensex) index. This was followed by approval for trading in options based on these two indexes and options on individual securities.

Table 2.2: Products traded in NSE & BSE (as per the date of introduction)

Derivative products	Listing date at NSE	Listing date at BSE
Equity Index Futures	June 12, 2000	June 9, 2000
Equity Index options	June 4, 2001	June 1, 2001
Stock Options	July 2, 2001	July 9, 2001
Stock Futures	Nov. 9, 2001	Nov. 9, 2002
Sectoral Indices	Dec 2002	n/a
Interest Rates Futures	June 2003	n/a

Source: National Stock Exchange of India (NSE), Bombay Stock Exchange of India (BSE), 2008.

In regard to regulations, the committee's recommendations for derivatives trading envisage two-level regulation, i.e. at exchange-level and at SEBI-level. Their main emphasis was on exchange-level regulation by ensuring that the exchanges operate as effective self-regulatory organizations (SRO) under the overall supervision of SEBI. It was thus necessary that SEBI should review the working of the governance system of stock exchanges and strengthen it further. At the same time, the committee was of the opinion that the use of derivatives by mutual funds should be only for hedging and portfolio balancing and not for speculation. The responsibility for proper

control in this regard should be cast on the trustees of mutual funds. It also recognized the need of an efficient cash market for an efficient futures market because if the cash market behavior is erratic or does not reflect fundamentals, a futures market, based on such a cash market, will fail to give a correct indication of future spot prices and its usefulness for price discovery will be reduced.

The introduction of derivatives products in India was well received by stock market players and it gained substantial popularity moving up to second position in Asia after Korea in terms of trading volume. Derivatives on stock indexes and individual stocks have since grown rapidly. In particular, single stock futures (SSF) have become hugely popular; and NSE is now the second largest market in the world for SSF's after Johannesburg Stock Exchange. Single stock options are less popular than futures while index futures are increasingly popular. On relative terms, volumes in the index options segment continue to remain poor which may be due to the low volatility of the spot index. Typically, options are considered more valuable when the volatility of the underlying (in this case, the index) is high. A related issue is that brokers do not earn high commissions by recommending index options to their clients, because low volatility leads to higher waiting time for round-trips.

The success of single stock futures in India is unique, as this instrument has generally failed in most other countries. One reason for this success may be retail investors' prior familiarity with "badla"²⁶ trades which shared some features of derivatives trading. Another reason may be the small size of the futures contracts, compared to similar contracts in other countries. Retail investors (including small brokerages trading for themselves) are the major participants in equity derivatives, accounting for about 60% of turnover in October 2005, according to NSE.

The general success of derivatives trading in India can be attributed to study and survey carried out. Regulation changes were the first recommendation so that derivatives could be recognized as securities and trade freely. Also, the survey gave the most sought after products (high demand) which were to be introduced step-wise. Past experience with "Badla" trading played a big role in investor's fast acceptance of single stock derivatives among investor.

²⁶ The badla system of transactions has been in practice for several decades in the Stock Exchange, Mumbai and serves 3 needs of any stock exchange: (i.e.) (a) Quasi-hedging, (b) Stock lending and (c) Financing Mechanism just as it is in normal futures markets.

In essence, however, both futures and badla system allow investors to buy stocks without huge cash outflow. Like a traditional futures contract, *badla* is a form of leverage; unlike futures, the broker—not the buyer or seller—is responsible for the maintenance of the market-to-market margin

2.5.1.1.3 Turkey²⁷

While most of the developed exchanges were launching derivative products in the 1980's, the Istanbul Stock Exchange (ISE) was realizing well-designed attempts towards structuring an organized market in terms of legal and technical dimensions. The primary aim of ISE was steps regarding the promotion of the capital markets and the enhancement of liquidity as well as the depth of the cash market. In their study, introduction of the first derivatives market, with index futures, was first evaluated with respect to the risk analysis. Accepting that; market composite index represents systematic risk according to the finance theory, it was expected that those derivatives instrument could be used for facilitating hedging against the systematic risk. In trading of the ISE-30²⁸ futures contracts, interest rates, inflation and currency risks could be avoided by the investors.

In order to extend the number of observations, they first examined whether the ISE-100²⁹ could be used to represent ISE-30. The daily returns of both indexes were regressed and found that ISE-100 could be significantly³⁰ used to represent ISE-30 at 1% level. Volatility of ISE-100 was then determined using variances and was realized to be high thus calling for the need to use derivatives to facilitate hedging and lower the volatility. According to some studies³¹, there is a negative and significant correlation between interest rate changes and market returns. Excluding the interest rate effect, the market expectation was positive. Significance of the result, based on f and t statistics (1% level) showed that, in Turkish capital markets, the interest rates is the dominant factor in securities pricing. Finally, since derivatives' trading is related to the systematic return while the market index returns seem very sensitive to interest rates, it was necessary to structure futures or options on interest rates. The dominance of interest rates in the financial markets showed that it may have a striking impact on development of derivatives exchanges. However, the dominance of the public sector in defining the interest rates in Turkey created confusion in the completion of

²⁷ Kayacan, O. and O. Erdogan, 1998, "When to Start Trading Financial Derivatives" The Example of the Istanbul Stock Exchange, ISE Review, Vol. 2 No.5.

²⁸ It is composed of 30 blue-chip companies except investments trusts chosen on pre-determined criteria directed for the companies to be included in the indices and will be revised biannually. The specifications of this index futures contract, such as contract size, contract months and the minimum price change are determined and announced by the ISE Executive Council taking the applications of developed securities exchanges into consideration.

²⁹ ISE 100, which has been calculated since the inception of the ISE, is composed of National Market companies except investment trusts. It contains the ISE 50 and ISE 30 Index companies.

³⁰ The regression gave a 98.56% correlation coefficient between the two indexes.

³¹ Chen & Chan (1989) calculates the coefficient of linear relationship -0.049 between the portfolio and interest rates of T-Bills; Schrand (1997), calculates that -0.041 for the period of 1984-1988 for 57 financial institutions. It is noteworthy that there is negative correlation according to many findings

the markets. This therefore called for the reduction in size of the public sector and the free formation of the interest rates in the markets for effective formation of the derivatives market.

According to ISE research, financial derivatives were chosen as the first instruments to be introduced and this was to be done in three consecutive stages; first futures, then options and finally deliverable futures and options. Initially, the ISE planned to launch the market of futures and options contracts for the following instruments; index futures, index options, stock options, interest rate futures, and interest rate options. Later, the ISE would introduce other futures and options markets, such as futures on single equity stocks and foreign currency denominated bills and bonds taking into consideration the preferences of the market participants to the extent allowed by the legal framework. At the initial stage, the settlement of futures contracts was to be in cash and then later, the physical delivery settlement will be introduced.

The Turkish derivatives exchange (TURKDEX) was established in 2002 as the Turkey's first private derivatives exchange. It conducted various education programs like seminars and some training to enlighten the members, traders and public about derivatives trading. In 2005, trading of the first contracts, Equity Index- 30 Futures started. Only futures contracts are traded but it is planning to introduce options soon. The following contracts are traded in TurkDEX;

Table2. 3: Products traded in TURKDEX

Derivative Products	Underlying Asset
Equity Index Futures	ISE 30 Futures ISE 100 Futures
Currency futures	TRYUSDollar TRYEuro
Interest Rates Futures	91 Day T-Bill Futures 365 Day T-Bill Futures T-Benchmark Futures
Commodity Futures	Cotton Futures Wheat Futures Gold Futures

Source: Turkish Derivatives Exchange (TurkDEX), 2008

TurkDEX has performed exceptionally well since it started trading in 2005. In 2006, it recorded the greatest increase of 273.63% in volume and was ranked 36th worldwide by Futures Industry Association (FIA). In the first quarter of 2007, it had the fastest growing foreign currency contract which recorded a 304.7% increase to 1.1 million contracts and it is expected to perform better by the end of the year. In 2008, FIA named TurkDEX as the fastest growing exchanges in

the world. It had the 4th largest currency futures in terms of trading volume and the 11th most liquid index future in the world. The success of ISE in introducing derivative exchange was a result of immense research carried out by the ISE. The research identified the interest rate risk creating the need for derivatives. Just like other emerging derivatives exchange, ISE recommended the introduction of equity index futures.

Successful cases summary

Analyzing the successful establishment of derivatives exchanges in different countries, there are several inferences that can be drawn as driving forces for a derivatives exchange success. First, a detailed feasibility study on the introduction of derivatives markets should be done as evident in most of successful countries. It's through this research that countries identify crucial factors that need to be addressed in its markets. Secondly, the infrastructure (e.g. SRO enforceability, margins requirements, high code of conduct, demutualized exchanges, among other) should be well developed to support the exchange while the regulatory policies should be flexible to allow for proper trading of derivatives products while at the same time safeguarding the interests of the investors. Technology advancement has played a key role in enhancing derivatives exchanges success. Also, a large and active investor population is required for successful trading of derivatives. All parties concerned — brokers, government, and the investors' — should be well educated and trained on trading of derivative products. It is also important to assess the stock market to determine its readiness in introducing derivatives exchanges. Some of the factors to be considered in stock markets includes: stock market turnover and market capitalization, outstanding shares and trading value, market size, the number of companies listed, and volatility in the stocks traded and liquidity in the cash market.

To sum up, the success of a derivatives exchange depends on the soundness of the foundations on which it is built, the structure adopted, and the products traded. Also, it is very important to capture the spirit of the market community at a particular appropriate time— proper timing — and sustain that spirit to power a period of growth in the derivatives exchange.

2.5.1.2 Unsuccessful Cases

2.5.1.2.1 China

China though being one of the world leaders in commodity derivatives trading (Dalian Commodity Exchange) has not been able to introduce financial derivatives products despite great efforts to do so since 1990s. By 2001, the Shanghai Futures Exchange (SFE) had already finished a feasibility study on the introduction of financial derivatives products including the design of contracts, formulation of rules and personnel training. They then applied to the China Securities Regulatory Commission (CSRC) to open a stock index futures market which however, did not come to be.

Later in 2006, China's dream of having financial derivatives came nearer to realization when — with the approval of the State Council and the CSRC — China Financial Futures Exchange (CFFEX) was inaugurated in 2006³².

The first product to be introduced will be the stock index futures, CSI 300 index futures³³ which is expected to be hit, though most local observers caution that initial volume will be modest. Afterwards, CFFEX will introduce other financial derivatives such as other index futures, index options, government bonds futures and currency futures. CFFEX is expected to start operating steadily, control the risk strictly, and keep innovating. It aims to construct a healthy, standard, dynamic and energetic exchange which grows as time elapses so as to promote the steady development of China's capital market, safeguard the national finance security, and realize the steady operation of the economy. The launch of CFFEX was however a bit of an anti-climax, since it was accompanied by no product launch or even an announcement of a launch date. Early plans called for a launch of the index futures contract before the end of 2006, but organizational and operational delays were expected to push the launch into early 2007. However, this did not come to be and it was until a year later in 2008 that CSI 300 was launched, almost two decades after the preparations for financial derivatives started. It has however recorded minimal trading. The reason maybe that there is still more preparations required and also the

³² The exchange is owned jointly by the five existing mainland Chinese exchanges—two securities exchanges, three commodities (i.e.) The Shanghai Stock Exchange, the Shenzhen Stock Exchange, the Shanghai Futures Exchange, the Dalian Commodity Exchange, and the Zhengzhou Commodity Exchange each have a 20% equity stake in the CFFEX.

³³ This index, which was created in April 2005 in the expectation that it would become the basis for a futures contract, is a capitalization weighted index of 300 representative shares stocks.

fact that CSRC— the regulatory authority— has a tight grip on the listings and trading of products in China and also a weak market infrastructure.

2.5.1.2.2 Philippines

Philippine Stock Exchange (PSE) has since the early 1990s been exploring the possibility of developing an equity index of the single stock futures market, in an attempt to attract international traders to its market. There is hope for a financial derivatives exchange being established after PSE signed a deal with the operator of the country's electronic currency and debt trading system in early 2008. PSE is expected to draft the structure for a derivatives exchange for hedging currency, stocks, credit and interest rate exposure within three months. The hindrances for establishing a financial derivatives exchange include strict government rules, poor markets infrastructure, limitation in regulations, and fraud on customers— which saw the closure of the Manila International Futures Commodity Exchange back in 1996 and has since been closed.

Summary

As stated previously, a successful derivatives exchange requires a sound infrastructure and regulatory structure, as well as a careful selection of products to be traded. Lack of this three core pillars is thus the biggest challenge to introducing derivatives exchange and/or financial derivatives products in emerging markets. Strong regulations like those experienced in China, and Philippines as well as Hong Kong Korea, and Malaysia before being relaxed can greatly hinder establishment of an exchange just like lack of regulations can led to improper trading. A small or a big but inactive investor base is another cause and in most of these exchanges, the investors are uninterested in derivatives trading. Other derailing factors for emerging markets to introduce financial derivatives exchange include — speculative population like the one in Taiwan in the 1990s leading to closure of the exchange before it was reopened later and also in Hong Kong; poor legal-regulatory framework, proliferation of illegal operators, lack of readiness in the market, improper timing, poor risk management, and lack of government cooperation in establishing derivatives exchange.

2.6 Conclusion

Different ways in which an emerging market can be distinguished from a developed market were discussed mainly; following the World Bank criteria of categorizing markets as developed or developing; the Stock Market fact book of classifying markets according to the level of capital markets development; finally the number of years an exchange had been in operation was used and using 14 as the median number of years exchanges were in operations, those exchanges with more than 14 years of operations were considered developed and those with less than 14 years were considered emerging. Other factors like economic and capital markets variables were also discussed but they did not differentiate between a developed and an emerging market.

Successful and failed derivatives exchanges were then distinguished. We define a successful derivatives exchange as one which had been in operation for more than 14 years and/or whose products traded more than 1,000 daily average number of contracts in the first three years after introduction.

Having distinguished emerging markets and developed markets as well as successful and unsuccessful derivatives markets, we next examine what makes one market succeed while another fails. (i.e) what are the determinants (factors) of derivatives exchange success? These factors can be both qualitative (such as regulatory and infrastructure requirements) and quantitative forms (such as capital markets variables). Qualitative factors require a detailed comparison with benchmarking markets (already successful derivative exchange) to assess if an emerging market is ready to establishing an exchange. The quantitative factors require the use of a statistical method to assess their readiness in establishing a successful derivatives exchange.

The determinants of derivatives exchange success are analyzed in depth in chapter three while a statistical success model on factors influencing derivatives products is developed in chapter four.

CHAPTER THREE

CASE STUDY ON EMERGING MARKETS EXPERIENCES IN INTRODUCING DERIVATIVES EXCHANGE

3.1 Introduction

This chapter uses case study research³⁴ methodology which has been accepted as a very important research method especially in an empirical inquiry that investigates a contemporary phenomenon within its real-life context. It analyses the experiences of emerging markets in introducing derivatives market. Some emerging markets have become successful in introducing derivatives while others are not. The question is, what makes some markets succeed in derivatives trading and others not? Are there any underlying factors that boost the chances of success or not? To address these questions, we evaluate the factors that enhance derivatives exchange success, if any, and how they might have resulted in those derivatives being successful while others do not.

This is carried out by a comparative case study of two emerging markets that share some historical and cultural similarities and differences, which have successfully or unsuccessfully established derivatives exchange. Markets from the same geographical regions are more likely to share some historical as well as cultural similarities as opposed to those of different geographical regions. The geographical segmentation³⁵ as used by the Futures Industry Association (FIA) and the Global Stock Market Fact book is applied. FIA has listed the Asia-Pacific region as the fastest growing region on derivatives trading and is expected to continue growing fast as many investors turn to invest in the East. In 2007, the region was ranked second³⁶ accounting for 28% of futures traded volume on exchanges in the world. Korea Exchange has recorded the largest trading volume in index options for several years while the National Stock Exchange of India (NSE) continues to move up the top exchange list in total volume and has the fastest growing stock options.

The Asia-pacific region currently has 11 countries with financial derivatives market namely; Australia, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Singapore, Taiwan, and Thailand. Since Australia, Hong Kong, Japan, New Zealand, and

³⁴ See appendix 3A for use of Case Study as a Research Methodology.

³⁵ Africa, Asia-Pacific, Europe, Latin America, Middle East, and North America.

³⁶ North America was leading with 40% and Europe came third with 22% of derivatives trading volume.

Singapore are classified by the Global Stock Market Factbook as developed markets, they are eliminated from the study sample. FIA ranks Korea, India, Taiwan and Malaysia high based on the trading volume among other world derivatives exchange³⁷ as shown in Table 3.1.

Table 3.1: Asia's Emerging Markets Ranking by FIA

Country	Exchange	2005	2006	2007	2008
Korea	Korea Exchange	1	1	2	3
India	National Stock Exchange of India	14	15	9	8
Taiwan	Taiwan Futures Exchange	18	18	21	17
Malaysia	Malaysia Derivatives Exchange Berhad	46	49	45	40

Source: Futures Industry Association (FIA)

Since Korea has one of the leading exchanges in the world, it can therefore be termed as a successful derivatives market and it is thus selected as the best case study for successful derivatives introduction. Indonesia and Thailand have the two exchanges that were not ranked by FIA as per 2007 and hence they may represent unsuccessful derivatives exchange. To determine whether they are successful, trading volume³⁸ of the listed products is used. The trading volume determines the success of contracts traded which in turn enhances the success of the derivatives exchange. The higher the trading volume, the higher the chances of the derivatives exchange success. The trading volume of Indonesia and Thailand derivative's markets for a three year period after the commencement of derivatives trading is as shown in Table 3.2.

Table 3.2: Thailand and Indonesia Exchanges Index Futures Trading Volume (Indonesia $t_0 = 2001$, Thailand $t_0 = 2006$)

		t_0	t_{+1}	t_{+2}
Volume (contracts in 000) % Change	Indonesia	128	96 (-25)	17 (-83)
	Thailand	199	1,228 (+517)	2,099 (+71)
Daily Avg. (contract)	Indonesia	525	392	72
	Thailand	1,204	5,013	8,498

Source: Indonesia Exchange (IDX), Thailand Derivatives Exchange (TFEX)

³⁷ The FIA has 58 derivatives exchanges registered members. Many of the world's leading derivatives exchanges are regular or associate members of the FIA and hence, the ranking can be used to signify the individual exchanges position in the world. It does not rank exchanges that do not report their volume. Thailand is a member and it was ranked from 2008. Indonesia is not a member of the FIA.

³⁸ See Black (1986), Carlton (1984), Corkish, Holland, and Vila (1997) and Silber (1981) on the use trading volume as a measure of contract success which largely determines derivatives exchange success.

Comparing the two emerging markets, Indonesia recorded a 25% decline in the second year and 83% decrease rate in the third year in the number of contracts traded. Thailand on the other hand recorded a huge increase of 517% in the first year and a moderate increase of 71% in the second year. Black (1984) classified a contract as unsuccessful if its daily average trading volume is less than 1,000 contracts³⁹. For the first three years as shown in the table, IDX recorded a daily average below 1,000 contracts. By the end of the first year (t_0), IDX's daily average trading volume was 525 contracts while TFEX's contracts were 1,204. Since TFEX's average daily trading volume is more than 1,000 contracts for the three years,— increasing from 1,204 to 5,013 and 8,498 in the first, second and third years respectively — they are qualified as successful contracts and hence Thailand derivatives market can be classified as successful. In contrast, Indonesia derivatives market recorded a decline in the daily average trading volume from 525 contracts in the first year to 392 and 72 contracts in the second and third years respectively. The daily volume is less than 1,000 contracts hence termed as failed contracts and by extension, Indonesia derivatives market is classified as unsuccessful. Based on this information, Indonesia was selected as the unsuccessful case study for this paper.

With Korea being chosen as the successful case study and Indonesia as the unsuccessful case study for introduction of derivatives trading in a market, the similarities or differences in these two markets prior to the establishment of derivatives market were evaluated. Korea and Indonesia share several historical, cultural and economical similarities as well as differences. However, their derivatives markets have performed differently since establishment. Korea's derivatives exchange has performed exceedingly well with KOSPI 200 options leading the world⁴⁰ in contract volume since 2001. The performance of the two exchanges since derivatives products trading were introduced is summarized in Table 3.3.

³⁹ For a contract to be termed as successful, it should record more than 1,000 daily average contracts for at least the first three consecutive years since its launch (Black, 1984).

⁴⁰ It declined to 2nd position in 2007 (after CME) and 3rd position in 2008 (after CME and Eurex).

Table 3.3: Comparison of Korea and Indonesia Derivatives market Performance (KRX $t_0=1996$, IDX $t_0=2001$)

	KRX ('000')	IDX
Panel A. Average annual data since derivatives launching		
Derivatives products* annual growth rate (%)	+88	-30
Index futures annual growth rate (%) since t_0	+85	-31
Index futures daily average volume since t_0	129	184
Panel B. Contracts data in 2007		
Index futures	47,758 (+2.5%)	430 (-94%)
Index Options	2,709,844 (+12.2%)	NT
Stock Options (not in 000's)	103(-91%)	371 (-94%)

Sources: World Federation of Exchanges (WFE), KRX and IDX statistics.

* Derivatives products as listed in Appendix 3B

NT: Not traded. IDX does not have index options

Korea's derivatives market has recorded an average annual increase rate of 88% while Indonesia's derivatives market has recorded an annual decline of 30%. KRX index futures have recorded an annual increase rate of 85% with daily average of 129,000 contracts. On the contrary, Indonesia index futures experienced very low trading volumes since inception— 180 daily average contracts with a 30% decrease rate. In 2007, Korea annual trading volume for index futures increased by 2.5% to 47,758,000 contracts, while the index options increased by 12.2% to 2.7 billion contracts. However, the equity options recorded a 91% decrease to 103 contracts. During the same period, Indonesia stock options total contracts were 371 while the index future had 430 contracts (both products recorded a 94% reduction from 2006 figures)⁴¹. Table 3.3 shows a big difference in derivatives market. Given the fact that the two emerging markets, Korea and Indonesia share some historical similarities, it's important to analyze what led to the big differences in the derivatives market performance — the main objective of this chapter.

The determinants of derivatives exchange success as discussed in chapter two are analyzed in Korea and Indonesia markets and how they might have contributed to either success or failure. The chapter flows as follows; first, a comparative case study of Korea and Indonesia is carried out and the determinants of derivatives exchange are analyzed in these two markets in 3.2.

⁴¹ The sharp decline was a result of the merger between SSX and JSX. Initially, the spot market of LQ45 index was 150 points, and an auto rejection was set at 6 points of LQ45 index (4%), with Rp500,000 as multiplier. So, the investors must pay Rp3, 000, 000.- as an initial margin. After the merger, the spot market of LQ45 index increased up to 500 points index after the years. The impact is that the spot market of LQ45 index fluctuated up to 15 points index a day. So, most the investors could not execute their orders because of 6 points of auto rejection.

The determinants applicability is tested on the Turkish derivatives market (TurkDEX) in 3.3 and a summary and conclusion of the chapter is given in 3.4

3.2 Comparative Case Study of Korea and Indonesia

3.2.1 Introduction

Korea and Indonesia, both located in Asia share several historical as well as cultural similarities. They largely operate free market economies modeled alongside United States. In addition, contemporary history of the two nations starts a few years after the end of Second World War. They both experienced decades of colonial occupation—Korea achieved its independence in 1945 from the Japanese, the same year Indonesia achieved its independence from the Dutch— which affected their societies in the front of socio-cultural structures. After independence, Korea and Indonesia depended on agriculture for economic development. They focused on import-substitution policy but later turned to manufacturing and service industries. Just like Korea which had conglomerates (Chaebols) that received special favors from the government, in Indonesia, the president's children owned the big companies which received special treatment from the government. Corruption cases were rampant in both countries, in Indonesia, military took up most of the state companies and run them to bankruptcy while in Korea, the conglomerates chiefs' gave huge money donations to the politicians so that their businesses could be protected. The two countries were also heavily affected by the 1997 financial crisis which led to loss of confidence in the Asian economy by both the local and international community. Korea however recovered faster probably because of better governance whilst Indonesia still had lots of political and social unrest that inhibited the recovery (Abonyi, 2005).

Despite these commonalities, Indonesia did not take the same route economically in the years following. In fact, apart from some shared historical elements, Indonesia is quite different from Korea. Geographically, Indonesia's total area is 19 times bigger than Korea and has a population of over 200 million people, while Korea's population is just 48 million⁴². Unlike Indonesia, Korea is characterized by a very high level of cultural and linguistic homogeneity with no significant 'ethnic' minorities. Indonesia on the other hand is a multi-ethnic society with ethnic minorities very active in the economy. Korea is a Confucianism society while Indonesia is

⁴² As per The Central Intelligence Agency (CIA) 2008 estimates.

predormitary Islamic. Confucianism is credited with forming the base of norms of social morality, influencing personal, family, and institutional relationships, and the system of governance. It also emphasizes education and family value and exerts the pressure to “achieve” in the realm of education. Indonesia on the other hand has a background of collectivist spirit and social pressure not to achieve or to stand out from the rest of the group.

These similarities and differences between Korea and Indonesia history and developments paths might have led to the big differences of the countries’ development level thus affecting the development of derivatives market. Given the market differences and similarities, the next step is to illuminate how the determinants of derivatives exchange success in these two markets may have contributed to successful or unsuccessful derivatives market in Korea and Indonesia respectively.

3.2.2 Economic Background

Korea and Indonesia economic background began at the same period after attaining independence in 1945. The two countries relied on agriculture as the core economic activity. Korea then focused on the manufacturing and service industries as an alternative to agriculture for economic development. As Korea’s industries, mainly the conglomerates started picking up in the 1980s and producing positive effect on the economy, its exports increased contributing significantly to GDP as shown in Table 3.4.

By comparison, Indonesia relied on oil and gas exports which accounted for 82% of all exports and 73% of government tax revenue in the 1970s. The oil companies (especially the main government oil company, Pertamina) were however marred by corruption which saw the companies running to almost bankruptcy with very minimal contribution to the economy.

Table 3.4: Rapid increase of Korea exports’ share in GDP (%)

1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
3	9	14	24	28	32	26	24	34	36

Source: Korea Institute for Industrial Economics and Trade, 2006

During the 1980s, Korea's GDP grew at an average of 9.7%⁴³ while Indonesia's grew at 5.4%. Korea's impressive economic performance was evidenced by its admission to OECD in 1996. When the Asian financial crisis broke out in 1997, both countries were severely affected. The main causes of the crisis was the rapid liberalization of the market amidst major weaknesses in the financial sector such as companies borrowing short-term to finance long term projects and banks giving loans without proper evaluation of credit worthiness. There was also poor governance, notably the governments' involvement in the private sector, lack of transparency in corporate and fiscal accounting as well as the provision of financial and economic data. Both countries turned to the IMF for rescue package⁴⁴ which included programs for comprehensive reform of financial systems as well as governance issues. (Abonyi, 2005).

Both countries however did recover from the crisis but Korea continued to outperform Indonesia in economic growth. According to The World Bank classifications based on per capita income, Korea is classified as a high income country. By comparison, Indonesia is classified as low-middle-income country. This portrays a big difference in the market size between the two countries. In 2007, Korea's GDP per capita was seven times that of Indonesia — it stood at \$25,000 with a growth rate of 5% compared to Indonesia's GDP per capita of \$3,600 and growth rate of 6.3%.

A comparison of Korea and Indonesia's economic conditions prior to establishments of their derivatives market is as shown in Table 3.5

The table shows the differences between Korea and Indonesia various economic indicators in a five-year period prior to the introduction of derivatives market. Korea recorded a continuous growth in GDP from US\$308 billion in t_{-5} to US\$557 billion in t_0 recording an 80% increase and a 25% decrease in GDP growth rate. Indonesia's GDP on the other hand declined from US\$227 billion in t_{-5} to US\$143 billion in t_0 recording a 37% drop and a 54% decrease in GDP growth rate. On the average of the five years period, Korea had a 13% increase while Indonesia had a 2% decline on GDP levels. Generally, a high GDP indicates high market value of final goods and services produced in a country and hence a strong economy as compared to one with a low GDP. An increase in GDP growth means more production in a given year and hence a growing economy as opposed to one with decreasing GDP (a shrinking economy). The

⁴³ Growth data obtained from the World Bank and the respective country's statistics source (KNSO and BPS)

⁴⁴ See Appendix 3C on the aid received by each country.

inflation as measured by GDP deflator⁴⁵ shows Korea's inflation rates fell by 25% from 9.4 in t₅ to 7 in t₀ compared to Indonesia inflation levels increased by 60% from 8.9 in t₅ to 14.3 in t₀. The low declining inflation rates in Korea are good to encourage investments and savings. High inflation rates as those present in Indonesia usually causes adverse effects as it causes uncertainty in the economy thus discourages investment and saving. In a growing economy (Korea), there is a higher probability of capital market developing and by extension, derivatives market succeeding. On the other hand, a declining economy (as Indonesia's case), there is less chances of capital markets developing and this may result to unsuccessful derivatives market once established.

**Table 3.5: Comparison of Korea and Indonesia Economic Factors
(Korea t₀= 1996, Indonesia t₀=2001)**

		t ₅	t ₄	t ₃	t ₂	t ₁	t ₀
GDP (Millions US\$)	Korea (+13)*	308,185	329,886 (+7)	362,136 (+10)	423,434 (+17)	517,118 (+22)	557,644 (+8)
	Indonesia (-2)*	227,370	215,747 (-5)	94,156 (-56)	141,306 (+50)	153,255 (+8)	143,034 (-7)
GDP Growth rate (%)	Korea (-2)*	9.4	5.9 (-37)	6.1 (+3)	8.5 (+39)	9.2 (+8)	7.0 (-24)
	Indonesia (-8)*	7.8	4.7 (-40)	-13.1 (-379)	0.8 (-106)	4.9 (+513)	3.6 (-27)
Inflation rates, GDP deflator (%)	Korea (-12)*	10.7	7.6 (-29)	6.3 (-17)	7.8 (+24)	7.4 (-5)	5.1 (-31)
	Indonesia (+94)*	8.9	12.6 (+42)	75.3 (+498)	14.2 (-81)	20.4 (+44)	14.3 (-30)
Forex (Local currency per US\$)	Korea (+2)*	732.1	780.6 (+7)	802.6 (+3)	803.2 (0)	771.7 (-4)	804.7 (+4)
	Indonesia (+57)*	2328.1	2890.4 (+24)	10267.8 (+255)	7838.4 (-24)	8401.6 (+7)	10259 (+22)
Interest rates (%)	Korea (-6)*	17.7	15.8 (-11)	12.4 (-22)	12.3 (-1)	13.5 (+10)	12.11 (-10)
	Indonesia (+77)	11	60 (+445)	49.23 (-18)	12.95 (-74)	13.24 (+2)	17.24 (+30)
Unemployment rates (%) per total labor force	Korea (-3)*	2.5	2.5 (0)	2.9 (+16)	2.5 (-14)	2.1 (-16)	2.1 (0)
	Indonesia (+11)*	12.5	12.0 (-4)	13.8 (+15)	15.8 (+14)	15 (-5)	20.3 (+35)

*Simple average increase rate in percentage

Sources: Global Stock Markets Fact book 2001~2006: World Bank: BPS Indonesia: Korea National Statistics Office (KNSO)

⁴⁵ GDP deflator unlike other measures of inflations like CPI is not based on a fixed basket of goods and services. The basket is allowed to change with people's consumption and investment patterns. (Specifically, for GDP, the "basket" in each year is the set of all goods that were produced domestically, weighted by the market value of the total consumption of each good.). It thus reflects up to date expenditure patterns in a given country.

Changes in interest rates have a great significance in economic growth. Economies use interest rates to encourage savings or investments. When the interest rates are low, they encourage borrowing and investments thus encouraging economic expansion. However, to control investments and also encourage savings, the interest rates are raised. In Korea, though the interest rates were high, they fell gradually from 17% in $t_{.5}$ to 12% in t_0 . This may have encouraged investments and economic expansion. Indonesia on the other hand recorded a very high increase in interest rates especially during the financial crisis where the rates were raised to curb the situation. An increase in foreign exchange rate is usually referred as a devaluation of the local currency which is normally associated with an expansion in the economy. Korea's forex rate increased slightly by 10% from 732.1 to 804.7 in $t_{.5}$ to t_0 and hence no significant economy expansion. Though Indonesia recorded a higher increase of 341% from 2328.1 to 10259 in $t_{.5}$ to t_0 value, this was mainly due to the 1997/98 financial crisis which led to massive sale of the local currency (Indonesian Rupiah) against other major currencies and not expansion of in economy. Korea's unemployment rates fell slightly by 16% from 2.5 in $t_{.5}$ to 2.1 in t_0 . This means that majority of the labor force was employed and therefore more capable of investing as opposed to a market with high unemployment rates like Indonesia which recorded a 62% increase from 12.5 to 20.3. This means that a large section of the labor force was unemployed and hence the savings and investment levels will be low as the working population has to support the unemployed ones.

The high GDP levels, the low and decreasing inflation rates as well as low unemployment rates prior to the introduction of derivatives trading in Korea was good to support derivatives market. In contrast, Indonesia experienced various problems and was not fully recovered from the financial crisis when it was establishing derivatives market in 2001. The dwindling growth rates, high and increasing inflations rates as well as high and growing unemployment rates in Indonesia may have inhibited the developments of capital market and hence derivatives market.

We can therefore infer that high GDP levels, increasing growth rates, low and declining or stable inflation as well as unemployment rates are good indicators for a ready economy that can support a derivatives exchange.

3.2.3 Political Climate

Since independence, both countries have experienced different political climates. After independence, Korea experienced several periods of political unrest. In 1960, the first president, Mr. Syngman Rhee was forced to resign, the second president Mr. Yun Po Sun lasted more than a year before an army coup toppled the government, and worse the assassination of president Park Chung Hee in 1979 and a military coup took place later the same year. In 1980, the government was forced to resign. It was not until 1992 amidst trend towards greater democratization that Korea elected a civil president in a free and fair election for the first time in 30 years of its recent history. Since then, Korea has continued to advocate for democracy with the president being elected for a five-year term⁴⁶ by popular vote. This has resulted to a stable political climate, necessary for economic growth in the country.

Similarly, Indonesia has also experienced turbulent political situation since independence. The first president, Mr. Sukarno who served for 22 years was overthrown by his military, and his place was taken by Mr. Suharto who declared himself as president for life, ruling the country for 32 years. During this period, poverty levels increased, unemployment rates went up and rampant corruption cases were witnessed. It was not until the outbreak of the Asian financial crisis that the president was forced to resign in 1998 — a situation accompanied by great social unrest and massive destruction. Between 1998 and 2004, there were three different presidents who were removed from power after elections. In 2004 elections were held and the incumbent president Mr. Yudhoyono was elected. The constitution was amended to give the president a five year term which is renewable once, a move expected to bring about political stability in the country.

According to Pin and Marcel (2008) there is a negative relationship between political instability and economic growth, and we thus expected that Korea and Indonesia had low or negative economic growth during the periods of political instability. Consequently, according to Brink (2004) findings, the political instability had a negative impact on foreign operations in a country resulting to a decline in the foreigner's investments. The biggest question is; was there any political instability in Korea and Indonesia prior to the establishment of derivatives market? If yes, how did it affect the success of the derivatives trading? To address these questions, various measures of political instability as advocated by Brink (2004), Pin and Marcel (2008) and Economist Intelligence Unit (EUI) are referred to.

⁴⁶ Adopted in 1998

The EUI political instability index (Appendix 2B) measures the level of political risk and social unrest which have negative implications in economic development. The index is composed of two main components; underlying vulnerability and economic distress. Underlying vulnerability includes such factors as the inequality, state history, corruption cases, ethnic fragmentation, trusts in institutions, status of minorities, history of political instability, proclivity to labor unrest and regime type among others. Economic distress includes the growth in income (GDP), the unemployment rates and the levels of income per head. Both Korea and Indonesia had periods of political vulnerability characterized by massive corruptions, labor unrest and colonization which are indicators of political instability. In addition, Indonesia is a multi-ethnic country with various minorities and experienced periods of authoritative regimes. As for the economic distress, if the GDP growth decline by more than 4% or the unemployment rate is higher than 10%, with a low GDP PPP, then there is a significant risk that political instability may occur. Korea's and Indonesia's economic distress variables are as compared in Table 3.6, in addition to the FDI net inflows as advocated by Brink (2004).

Table 3.6: Comparison of Korea and Indonesia Political Factors
(Korea $t_0=1996$, Indonesia $t_0=2001$)

		t_5	t_4	t_3	t_2	t_1	t_0
FDI, net inflows (Millions US\$)	Korea	1,180	728	588	809	1,776	2,325
	Indonesia	6,194	4,677	-241	-1,866	-4,550	-2,977
GPD growth	Korea	9.4	5.9	6.1	8.5	9.2	7.0
	Indonesia	7.8	4.7	-13.1	0.8	4.9	3.6
GDP Per capita, PPP	Korea	8,641	9,263	9,957	10,926	12,050	13,013
	Indonesia	2,447.79	2,566.23	2,220.57	2,237.20	2,435.31	2,549.85
Unemployment rates	Korea	2.5	2.5	2.9	2.5	2.1	2.1
	Indonesia	12.5	12.0	13.8	15.8	15	20.3

*Simple average growth in percentage

Sources: The World Bank: BPS Indonesia: Korea Tourism Organization (KTO)

FDI gives the amount of investments by foreigners in a country. A negative FDI is often interpreted as withdrawal of investment by foreign investors from the host economy. Brink (2004) found that changes in the political climate of a country can results in risks that might

impact negatively on a foreign operation's viability and profitability thus lowering the foreign investments in the country. Political instability leads to uncertainty in the future of the country prompting most investors to keep off from investing in the country and/or to withdraw their investments. The first indicator analyzed is the change of FDI as a measurement of political instability. Korea recorded a steady increase in the net inflow of investment between t_{-5} and t_0 , the FDI inflows doubled from US\$ 1 billion to US\$ 2 billion signifying the confidence of the investors in the Korean market. Thus, it can be taken to denote a stable political climate prior and after introduction of derivatives. In contrast, Indonesia FDI net inflows dropped from a high of US \$ 6 billion in t_{-5} to a low of US\$ -2 billion in t_0 . The negative sign indicates the withdrawal of investments by the foreigners. The largest declines were recorded in t_{-4} and t_{-3} , 1997 and 1998 during the financial crisis which resulted to strikes, massive destruction and forceful removal of the president from power. This therefore supports the relation of FDI with political stability in a country as many investors kept away from investing in Indonesia during this period. In addition to FDI, Korea also recorded increases in capital flows. Though it was initially closed to foreigners, the market was later opened and there was a big inflow of foreign investment.

Looking into the EIU economic distress factors, a decline of more than 4% in GDP growth rate, an unemployment rate of more than 10% and a GDP per capita of less than US \$ 3,000 in a given period (year) signifies political instability of significant risk. Korea's growth rate over the t_{-5} to t_0 period declined by 25% which translates to a 4% annual decline rate, the unemployment rates was below 3% in all the years and the GDP per capita was higher than US\$ 8,000. They are all above the EUI cut off points for significant risk or political instability. We can thus infer from these indicators that Korea enjoyed a period of political stability necessary for development. Consequently, over the same period, Indonesia's growth rate declined by 54% translating to 9% annual decrease rates, the unemployment rates was more than 12% and the GDP per capita was less than US\$3,000. All these factors demonstrate that Indonesia had significant risk and hence political instability.

In addition to the above determinants of political instability, the number of national strikes directed to government, change of government, change of presidents, and resignation of high government officials were also evaluated. In Korea, during the period t_{-5} to t_0 (1991 to 1996) before the establishment of derivatives market, there were no anti-government protests recorded and neither were there resignations by top government officials as a result of

dissatisfaction with the government. Free and fair elections were held in 1992 and President Kim Young-Sam⁴⁷ was elected for a single five –year term, a period characterized by political stability. These may have increased foreign investors' confidence on Korea's market, leading to an increase in investments especially in t_2 and t_1 (1994 and 1995 respectively).

In contrast, during Indonesia five-year period t_5 to t_0 (1996 to 2001), there were enormous protests with huge destruction of property which led to Mr. Suharto's resignation in 1998. The next president, Mr. Habibie ruled for only a year before he was rejected by his party (Golkar) to vie for presidency in 1999 elections. When the elections were held in October 2001, Mr. Wahid was elected as president but also only lasted until 2001 when he was impeached and removed from office by the parliament. During this period, several ministers resigned and other were sacked on unclear circumstances (Greg, 2002). This indicates that Indonesia experienced great political instability prior to the establishment of derivatives.

Both Korea and Indonesia have had their shares of political turbulence though of different angles. While Korea's first three presidents were forcefully removed from power, Indonesia experienced dictatorship⁴⁸ with one president staying in power for long followed by rapid changes of president in the following years. However, Korea was able to restore its political stability as indicated by the increase in FDI, the favorable economic distress factors, as well as free and fair elections in the early 1990s which was good for the economic growth, hence encouraging capital markets development and derivatives trading to flourish. Indonesia on the other hand established the derivatives market amidst political instability evidenced by the declining rates of FDI, net inflows, significant risk from the economic distress indicators, forceful removal of president and the presence of three different presidents with a short period of four years. All these signified unfavorable business environment therefore deterring investments. Under this situation of political instability in Indonesia, there was less probability of the capital markets development hence resulting in an unsuccessful derivatives market.

It is therefore crucial to have a stable political climate prior to the establishment of derivatives exchange by any market. This can be determined using the factors as described by

⁴⁷ He presided over a massive anti-corruption campaign, the arrest of his two predecessors, and an internationalization policy called *Segyehwa*.

⁴⁸ The dictatorship adversary affected the economy as the President used the country's resources to enrich his family and a few other people especially the military so as to maintain their support and loyalty to him. Though Korea also experienced dictatorship in the early 1960s, the government worked hard to improve the economy and high economic growth rates were experienced during this period.

Brink (2004) and Pin and Marcel (2008) as well as country's political instability risk by EUI. The government in place should also put in place pro-business policies since the desirability, effectiveness and success of a derivatives exchange depends primarily on the political situation of the country.

3.2.4 Legal and regulatory framework

A good regulatory framework as outlined by Fratzscher (2006), Jobst (2007) and WFE should include features like; self- regulatory, transparency and disclosure in the market, derivatives law, tax harmonization, level playing field, compliancy to the IFRS⁴⁹ which emphasizes on accounting standards and reporting among others. As elaborated by Kim (1998), the regulatory environment was a main concern prior to the establishment of derivatives market in Korea. The stock market was still under strong governmental influence. The view of the Ministry of Finance and Economy (MOFE) was that while the market had grown quantitatively, the qualitative aspect of the market was still years behind those of advanced markets. To improve the situation, several measures were therefore undertaken especially in relation to laws and regulations affecting the derivatives on taxation, accounting and disclosure.

The legal framework of Korean derivatives market is prescribed in the Futures Trading Act, which became effective in 1996. However, according to the addenda to the Act, equity-linked derivatives were subject to the Securities and Exchange Law. MOFE regulates the stock index futures market as the ultimate government regulatory organization. In 2008, the former Financial Supervisory Commission (established in 1998) took over the policy-making authority from the Finance Ministry and its name was changed to Financial Services Commission (FSC). The FSC has four main mandates: advancing the financial industry, stabilizing financial markets, promoting a sound credit system and encouraging fair trading practices. The FSC also has power and responsibility to approve the listing of new derivatives products, supervise unfair trading and to control foreign investment. It also oversees the implementation and compliance of the capital market's laid down laws and rules.

⁴⁹ International Financial Reporting Standards (IFRS) are standards and interpretations used in International Financial Reporting and is adopted by many countries. They are considered a "principles based" set of standards in that they establish broad rules as well as dictating specific treatments. Most countries have their Accounting and disclosure rules which are very similar to IFRS with very minimal difference.

As a self-regulatory organization (SRO), Korea exchange maintains a fair and orderly market, and it is solely responsible for implementing the clearing and settlement operations. It also has a well laid down derivatives laws that clearly governs and administers the derivatives exchange. Under the Korean tax law, derivatives transactions are normally viewed as financial services, which are not subject to VAT⁵⁰. Derivatives transactions are also not subject to any stamp duties and/or transfer taxes (KPMG Korea, 2008). Unlike derivatives, other securities attract a significant transaction tax⁵¹. whether they are listed or not. Unlike many other countries, Korea does not have capital gains tax on listed shares. For accounting and disclosure, Korea has not yet adopted the IFRS⁵². Currently, Korea uses GAAP (Generally Acceptable Accounting Principles) which has various similarities as well as differences with the IFRS.

Soon after Indonesia stock market was re-activated in 1977, the government took steps to establish a proper legal and regulatory framework. It established The Indonesian Regulatory Authority for Indonesian Capital Market (BAPEPAM), answerable to the Ministry of Finance. Bapepam was initially formed as the supervisory authority for capital market and non-bank financial institutions, with a focus to supervise and manage the Jakarta Stock Exchange. Bapepam was also formed to support capacity building in key areas and institutions related to capital market development. When JSX was privatized in 1992, the functions of Bapepam changed to become the Capital Market Supervisory Agency (Bapepam-LK).

During the feasibility study, Pardy (1998) found the legislative and regulatory framework for financial derivatives were opaque, unclear and shallow. Therefore, there was a great need for clarity and detailed legal and regulatory systems before establishment of derivatives market. To begin with, there was also lack of clarity in jurisdiction (i.e.) which laws and agency should govern derivatives. There were also no clear tax regulations for derivatives in regards to what will be taxed, at what rate, in what circumstances and when? Although the regulatory structure established by the Capital Market Law and implemented in over 300 Bapepam rules⁵³ is quite

⁵⁰ Instead, the Education Tax Law (“ETL”) provides that companies engaging in a finance business enumerated in the ETL (e.g., banking, insurance, etc) are subject to education tax at the rate of 0.5 percent on income earned from derivatives transactions. In this case, the education tax base varies depending on the type of derivative transactions.

⁵¹ Korea tax rate on transactions is 30 basis which is high compared to other countries like Japan and Australia which have scrapped the taxes. Information obtained from The Korean Securities Dealers Association (KSDA).

⁵² Korea has announced a plan to adopt IFRSs as Korean Financial Reporting Standards effective 2011, with early adoption permitted starting 2009. Indonesia has also not yet implemented IFRS rules.

⁵³ These rules and regulations cover wide areas including: the clearing and settlements systems, the accounting and disclosure rules, margin trading, licensing and registration among others. It also prohibits criminal activities like insider trading, money laundering, and securities frauds.

sophisticated and is generally considered to be at par with international standards, enforcement of this rules has lagged behind rule making due to lack of independence of the regulator as well as general permissiveness in the business culture.

Prior to the establishment of derivatives in Indonesia, numerous regulatory adjustments and improvements were made as shown in Table 3.7. However, even after the derivative trading was established, the critical issue about jurisdiction was still not addressed. There was a struggle between the Indonesian Capital Market Supervisory Agency and The Indonesian Commodity Futures Trading Commission over jurisdiction of the Indonesian Financial Futures Market. Though clear law is a prerequisite for any securities market, it is not strictly observed in Indonesia and there are many loopholes. The Indonesia Central Bank is the overall regulator of financial services in Indonesia. According to the KPMG 2008 Indonesia's derivatives tax report, Indonesia has no specific rules governing income recognized under derivatives transactions in the Income Tax Law or the implementing regulations. Therefore, there are cases where Indonesian legal entities prefer to exclude the unrealized gains and losses related to derivatives transactions from taxable profit. The law is also unclear regarding the withholding tax, VAT or stamp duty of derivatives transactions or income gains/losses and due to lack of such clarity and specific tax regulations, derivatives are treated like other services. The uncertainty about jurisdiction and lack of implementation of the established rules may therefore have resulted to exchange inefficiency and hence unsuccessful derivatives trading. In addition, most Indonesian's have no confidence⁵⁴ in the judicial system and business people usually fear entering into any transaction that may need the intervention of the court since justice is not guaranteed. Hence, many potential investors do not invest in the capital market thus adversely affecting the derivatives market. A comparison of the regulatory systems in both countries is shown below.

⁵⁴ See: Herwidayatmo (2003). *Rebuilding Market Confidence*. Presented in The 5th Round Table on Capital Market Reform In Asia.

Table 3.7: Korea and Indonesia Regulatory Systems

Elements	Korea	Indonesia
SRO	√	√
IFRS	◇	◇
Disclosure	√	√
Derivatives law	√	X
Tax harmonization	√	√
Legal clarity	√	◇
Implementation	√	◇

Sources: Korea Exchange; Indonesia Stock Exchange, Asia Development Bank

√ denotes best practice, ◇ denotes progress on existing deficiencies, X denotes major problems

Korea has better and operational legal and regulatory system compared to Indonesia. Korea has complied with most of the WFE regulatory requirements. It only has deficiencies in adopting the IFRS which is in the process of adapting fully. This therefore might have improved the investors' confidence in Korean market thus leading to high trading volume and consequently, a successful derivatives market. In comparison, as shown in Table 3.7, Indonesia had and still has major deficiencies in regulatory framework. It has no derivatives law in place and it has not yet adapted IFRS. Indonesia, though it has several rules in book and in level with the international standards, has major handles in the clarity, enforcement and implementation of these rules (Shalahuddin, 2002). As mentioned by the chairman of Bapapem-LK, Mr. Herwidayatmo (2003), the poor regulatory framework in Indonesia lead to loss of investors' confidence in the capital market. This therefore may have resulted to low trading and market illiquidity hence unsuccessful derivatives trading.

The importance of a functional legal–regulatory framework cannot be overemphasized. Every market should strive to comply with the WFE and other international organizations regulatory requirements. Regulations⁵⁵ should be extensive, implemented and enforced. Incase of any unfair trading practices or other malpractices, concerned people should be punished in accordance with the laws in place. This helps to build investors' confidence in the market, which is critical to the success of the derivatives market.

⁵⁵ They should neither be too strict to inhibit growth nor too loose so as it can protect the investors.

3.2.5. Infrastructure⁵⁶

Some of the important infrastructural elements in derivatives exchanges include: market mechanisms (market-making, order-driven, quote-driven and specialist mechanisms), clearing and settlement systems (CCPs, netting options), exchange ownership (demutualized exchange, members owned or government owned), information dissemination process, price stabilization features (circuit breakers), as well as exchange monitoring, control and enforcement systems. The presence of these elements preceding and during derivatives trading enhances the smooth, transparent and efficient operation of an exchange and thus increases the derivatives exchange chances of success.

After identifying the key areas of weaknesses in the infrastructure that could hinder the establishment and smooth flow of a derivatives exchange in Korea, important measures were put in place. Its trading systems were fully automated back in 1988 to enhance order flows and trade executions through an electronic trading platform called ISE Xetra. The clearing and settlement functions are carried out by two independent bodies. The clearing process is carried out by the Korea Exchange which acts as the central clearing party (CCP) while the settlement is done by the Korea Securities Depository (KSD). Clearing process involves the confirmation of trading, revision of trading by mistake, take-over of obligation, netting (multilateral), instruction of payment, guarantee of settlement fulfillment and handling of settlement default. The settlement process is concluded in T+2 days. Korea futures' trading requires an initial margin of 15% and a maintenance margin of 10%. There are no official market makers in KRX but most banks acts as market makers and employs a hybrid system. To maintain price stability, circuit breakers⁵⁷ are used especially incase of a slump in the stock price. They provide investors with time for calm judgment of investment at such times. All trading is suspended in case KOSPI decreases continuously for one minute more than 10% of closing price of the very preceding day. KRX currently operates as a members owned organization, but it's planning to be demutualized with the launching of the "IPO plan" in 2006 as the first step. However, the move was delayed for the government to revise the stock exchange law as a prerequisite to its approval for KRX IPO. The general control and monitoring of the exchange is under the Financial Service Commission.

⁵⁶ Most information is obtained from the Korea Exchange and Indonesia Exchange websites.

⁵⁷ Once circuit breaker is exercised, suspension is made for 20 minutes with regard to receipt of offer in the market and though it's not possible to make a new offer, it's possible to cancel offer submitted prior to suspension. Circuit breakers are exerted in case slump only, it is limited to once a day and is not issued 40 minutes before market closing so as to secure time for closing price of the day.

During the feasibility studies on introducing derivatives market in Indonesia, Pardy (1998) concluded that the infrastructural system was not yet developed and needed to be addressed urgently. Various measures were henceforth laid down during the three year period prior to the establishment of the derivatives but they were not fully implemented. The clearing and settlement functions of both the stock and derivatives market are carried out by the Indonesian Clearing & Guarantee Corporation (KPEI) which serves as the CCP and carries out multilateral netting of the transactions. The clearing system is however not yet fully developed and requires major improvements. The clearing and settlement process takes T+3 trading days to be finalized. Indonesia futures' trading requires an initial margin of 4% while the stock option requires an initial margin of 6% with no maintenance margin. Indonesia Exchange is privately owned⁵⁸ but is in the process of demutualization. To enhance smooth order flow and execution, IDX has automated its operations and has market makers to improve liquidity. The order flow and trade execution is done through automated JATs/JOTs system. In order to stabilize prices, circuit breakers are used to halt trading incase of a sharp decline in prices.

A summary and comparison of the infrastructures system present in Korea and Indonesia is given in Table 3.8. It gives the infrastructures elements available and how well they are implemented and enforced.

Table 3.8: Infrastructure Elements in KRX and IDX

	Korea	Indonesia
Clearing and settlements	√	◇
CCP	√	◇
Netting options	√	√
Market mechanisms	√	√
Market makers	√	√
Order-driven /hybrid	√	◇
Margin requirement (Initial)	√	√
Margin requirement (Maintenance)	√	X
Demutualized exch.	◇	◇
Circuits breakers	√	√

Sources: Korea Exchange; Indonesia Exchange, Asia Development Bank

√ denotes best practice, ◇ denotes progress on existing deficiencies, X denotes major problems

Korea and Indonesia have put immense efforts to lay a sound infrastructure which would enhance the exchange success as shown in Table 3.8. Basic infrastructure requirements of

⁵⁸ By the previous owners of JSX and SSX

clearing and settlements, market making, order flow and trade execution have been put in place. KRX has well functional and operational infrastructure elements except in the demutualization of the exchange which is in progress. The clearing and settlements in Korea are carried out by separate entities as the case in many other countries. The elements denote best practices which mean that the exchange is at par with leading international derivatives exchange infrastructures. IDX comparably has good infrastructure laid down and just like Korea, its exchange is not demutualized. It also has no maintenance margin requirement which is important to cushion the market incase the investors funds are reduced to losses. Lack of maintenance margin exposes the market to more risks. As shown in Table 3.8, IDX infrastructural elements still have deficiencies in various infrastructure systems. The biggest challenge of the IDX infrastructure is the implementation which inhibits the exchanges' smooth and efficient operations. This may have led to low trading volume and in turn unsuccessful derivatives trading. As Tsetsekos and Varingas (1997) concluded, implementation, monitoring, control and enforcement of the infrastructure elements discussed are important before and during derivatives trading. The elements enhance the smooth, transparent and efficient operation of an exchange, thus increasing the derivatives exchange chances of succeeding.

3.2.6 Capital Markets Development

3.2.6.1 Equity Market

Korea and Indonesia capital markets have recorded similar trends over time. Both countries started with few listed companies⁵⁹ and with minimal initial trading activities. Though Indonesia exchange was established earlier during the colonial period, it was closed several times during the world war I and II, a phenomena not experienced in Korea— whose exchange started long after its colonial days. Both countries undertook several measures to enhance the growth of the exchange such as computerization of the exchange and opening of the market for foreigners. Prior to the crisis, as many foreigners turned to investing in the emerging markets for higher returns, Korea Stock Exchange (KSE) and Jakarta Stock Exchange (JSX) exchanges enjoyed a large number of international investors. Both Korea Exchange (KRX) and Indonesia Stock Exchange (IDX) were formed as a result of mergers. In Korea, KSE, KOSDAQ, and Korea

⁵⁹ Korea Stock Exchange was established in 1956 with 12 listed companies. Jakarta Stock Exchange was established in 1912 but closed during the World wars only to be reopened later in 1977 with 24 listed companies.

Futures Exchange (KOFEX) merged in 2005 to form KRX, while in Indonesia, Surabaya Stock Exchange (SSX) and JSX merged to form IDX. In contrast, while retail investor's make the largest proportion of investors in the Korea Exchange⁶⁰, Indonesia is composed mainly of institutional investors. In terms of listing, IDX listed foreign companies back in the 1990s while Korea listed its first foreign company in 2007. KRX currently trades five different kinds of financial derivatives products while Indonesia has only two (Appendix 3B). In addition to these differences, the stock market variables for both markets performed differently prior to the establishment of derivatives trading.

As previously stated, the stock market variables are used as indicators of the readiness of the market to establish derivatives market. Analyzing five- year period prior to the establishments of derivatives market in Korea and Indonesia gives various results as shown in Table 3. 9.

Most of Korea's market variables had higher and increasing figures compared to Indonesia market variables and they even recorded higher growth rates comparing the period t_5 and t_0 ⁶¹. The variables performances of both KRX and IDX are analyzed as follows; (a) **Market capitalization:** Korea had higher market capitalization than Indonesia. KRX's market capitalization increased from US496 billion in t_5 to US\$138billion t_0 recording a 44% and an average annual growth rate of 10%. However, IDX's market capitalization declined from US91billion in t_5 to US\$23billion in t_0 recording a 75% decrease rate. (b) **Volatility:** KRX's volatility doubled from 11% in t_5 to 24% in t_0 . IDX also recorded high volatility rates especially during the 1997/98 (t_4 and t_3) financial crisis. However, comparing the t_5 and t_0 periods, the volatility increased slightly from 13% to 15%. (c) **Liquidity:** KRX recorded much higher liquidity rate as compared to IDX. KRX's liquidity increased from 0.8821 in t_5 to 1.2759 in t_0 recording a 44% increase. IDX recorded a slight decline in liquidity from 0.4070 in t_5 to 0.39 in t_0 , a 4% decline rate.

⁶⁰ Retail investors make 64% of the total trades by transactions volume — 22% of retail investors in South Korea are active traders, with 5% trading daily in 2007. In Indonesia, less than 1% of the population are active retail traders.

⁶¹ t_5, t_4, t_3, t_2, t_1 refers to five, four, three, two, and one years respectively, prior to the year (t_0), when derivatives market was established.

**Table 3.9: Comparison of (KRX) and (IDX) Capital Market variables
(KRX t₀= 1996, IDX t₀=2001)**

		t ₅	t ₄	t ₃	t ₂	t ₁	t ₀
Market Capitalization (million US \$) (% Change: Avg)	KRX (+10)*	96,373	107,448 (+11)	139,420 (+30)	191,778 (+38)	181,955 (-5)	138,817 (-24)
	IDX (+5)*	91,016	29,105 (-68)	22,104 (-24)	64,087 (+190)	26,834 (-58)	23,006 (-14)
Volatility** (% change: Avg)	KRX (+34)	0.1122	0.1013 (+10)	0.2537 (+150)	0.1706 (-33)	0.1289 (-24)	0.2406 (+87)
	IDX (+17)	0.1306	0.3025 (+132)	0.3568 (+18)	0.2569 (-28)	0.1335 (-48)	0.1465 (+10)
Liquidity*** (% change: Avg)	KRX (+11)*	0.8821	1.0787 (+22)	1.5186 (+41)	1.4956 (-2)	1.0191 (-32)	1.2759 (+25)
	IDX (+13)*	0.4070	0.5670 (+39)	0.5680 (0)	0.4180 (-26)	0.3720 (-11)	0.3900 (+5)
Trading Volume (in Millions) (% change: Avg)	KRX (+19)*	4,094	7,064 (+73)	10,398 (+47)	10,911 (+5)	7,648 (-30)	7,785 (+2)
	IDX (+52)*	30	77 (+159)	91 (+18)	178 (+97)	135 (-25)	148 (+10)
Trading Value (US\$ Billions) (% change: Avg)	KRX (+23)*	85	116 (+36)	212 (+82)	286 (+35)	185 (-35)	178 (-4)
	IDX (-3)*	32	43 (+34)	11 (-75)	20 (+88)	14 (-28)	10 (-32)
No. of listed Co.s (% change: Avg)	KRX (+2)*	686	688 (0)	693 (+1)	699 (+1)	721 (+3)	760 (+5)
	IDX (+5)*	253	282 (+11)	288 (+2)	277 (-4)	290 (+5)	316 (+5)

Source: Global Stock Markets Fact book 2001~2006, WFE, KRX, and IDX Statistics.

NB: Though KRX and IDX are used as the stock exchanges for Korea and Indonesia respectively consistency, the names of the exchanges prior to the establishment of derivatives market were Korea Stock Exchange (KSE) and Surabaya Stock Exchange (SSX)

* The simple average percentage change during the period.

** Volatility calculated as the annualized standard deviation of the monthly index return ($v = \text{std} * \text{sqrt}[12]$).

*** Liquidity is the turnover velocity⁶²

(d) **Trading volume and value:** KRX trading volume and value is much higher than IDX's volume and value. However, IDX's trading volume increased four folds from US\$30million to US\$148million, a 390% increase rate between t₅ and t₀. This high increase rate is however not

⁶² Turnover Velocity is calculated by WFE as the ratio between the turnover of domestic shares and their market capitalization. The value is annualized by multiplying the monthly moving average by 12, according to the following formula: Monthly Domestic Share Turnover*12; Month-end Domestic Market Capitalization.

Turnover velocity is calculated in 2 steps :

- step 1 : first, the annualized ratio between the domestic share turnover and the domestic market capitalization, for each month is calculated and multiplied by 12 ;
- step 2 : then, the percentage ratios obtained in step 1, divided by 12 are added together, using a moving average methodology.

Turnover velocity compares the turnover of the total trading value by the market capitalization of the market (or remove the price of stocks from both sides of the equation reduces the definition to: shares traded/shares outstanding).

replicated in the trading value which declined from US\$32million to US\$10million, a 69% decrease rate. This therefore indicates that the growth in trading volume maybe as a result of sale of cheap shares and not increases in trading activities. KRX's volume doubled from US\$4billion to US\$8billion over the same period. This was matched by the trading value which increased from US\$85billion to US\$178billion, a 108% increase rate. (e) **Number of listed companies:** Although KRX has almost twice IDX's number of listed companies, IDX had a higher number of listings for the period, a 24% increase rate from 253 companies in t_{-5} to 316 in t_0 compared to KRX's 10% increase rate. The higher the number of listed companies, the wider the diversity of companies available to invest in and hence we may expect larger number of investors and therefore higher trading volume in Korea.

The result in Table 3.9 thus shows significant differences in the spot market variables on a five- year trend of the two markets prior to the introduction of the derivatives market. Borrowing from Levine (1996) conclusion, the disparities in KRX and IDX stock market variables may thus explain the differences in the successful and unsuccessful derivatives trading in Korea and Indonesia respectively. The results are as expected. KRX's variables had higher figures compared to IDX's variables. The changing rates from t_{-5} to t_0 are positive with an increasing trend towards year t_0 in most of the variables. In comparison, most of the Indonesia's variables have low increase rates or decline rates. KRX had a higher and increasing trend in market capitalization, liquidity, trading volume and value as well as the number of listed companies. This therefore means that the market size was big, there was higher liquidity to encourage investments, and the large number of listed companies offered a wider variety of investments which attracted a wider range of investors, leading to high trading volume and trading value which in turn enhanced faster growth of the market. Korea's higher spot market variables laid a strong foundation and hence the derivatives exchange had a good chance to succeed once launched (Kim, 1998).

In contrast, IDX had low market capitalization signifying a smaller market. The liquidity marked a decreasing trend which might have discouraged investments. Furthermore, the trading value was on a declining rate which hampered the market growth. However, the increasing rate of volume, volatility and number of listed companies was an indicator of potential market growth in the future. Indonesia therefore had low and declining trend in variables which indicated that

the stock market might not have been ready yet for a derivatives exchange introduction and hence a higher probability of unsuccessful derivatives trading once established.

It is therefore essential for a market that is considering establishing a derivatives market to have a large market capitalization, high liquidity, trading volume and trading value, a big number of listed companies, and big volatility ratios. This will increase the probability of the derivatives market success. The underlying spot market should be large and liquid so that it can attract many participants and hence increase the trading volume, thus leading to an exchanges success (Remolona, 1992). Generally, the introduction of derivative instruments usually follow as a natural development of the domestic capital market.

3.2.6.2 Bond Market

During its early years, Korea government bond market was small and under-developed. Bond trading was minimal and was cumbered by a number of problems such as: small amount of outstanding government bonds, narrow deficits of fiscal balances; issues were performed at odd intervals; issuing periods were usually for five years or less; there were many types of government bonds; investors holding bonds all the way up to maturity; and lack of liquidity, among other shortcomings. The corporate bond market was more developed and the 3-yr corporate bond emerged as the benchmark bond. The market was also heavily regulated and the short-term bond market was closed to foreigners. At the time Korea established derivatives market in 1996, both primary and secondary bond markets were not yet in mature stage and a market for government bond had not been developed⁶³. After the financial crisis, the government took several measures to improve the bond market such as opening the market to foreign investors. The bond markets picked up in the 1990s and performed well recording greater growth. The bond market started performing well both in terms of corporate and treasury bond(Appendix 3D) leading to the launch of an interest rate future based on 3-year Treasury bond in 1999.

Indonesia bond market is classified as a small but growing market by the Asian Development Bond (ADB). It started with the establishment of Surabaya Stock Exchange (SSX) back in 1989⁶⁴. Just like Korea, the market was initially dominated by government bond with maturity ranging from one to seventeen years with semi annual coupon payment. SSX listed both

⁶³ Korea introduced government bondfuture in 1999

⁶⁴ Over-the-counter transactions (OTC) were carried out mainly through banks prior to this period.

government and corporate bond though the later had experienced minimal growth over the years until 2003 when it recorded an increase in volume/value traded. Nevertheless, the corporate bond market still remains illiquid compared to the government bonds. For example, while the average daily trading nominal value in 2007 for government bond was Rp. 3,752.17 billion (US\$ 403 million), the corporate bond was only Rp. 241.5 billion (US\$ 26Million). The secondary market for bond has remained immature though various efforts are being carried out to improve the situation.

Both Korea and Indonesia had similar bond markets. The institutional investors are the main participants with minimal retail investor's participation. Both the primary and secondary bond markets in the two countries were not yet mature at the time when derivatives' trading was introduced. However, Korea's corporate bond were developed earlier than government bond and were more liquid unlike Indonesia where the government bond market was developed earlier than corporate which are illiquid. We can therefore conclude that the level of bond market development may not have been a good indicator as to whether a derivatives exchange will succeed and or not once established.

3.2.6.3 Financial structure

In addition to evaluating the capital market variables, it is important to consider the financial structure of the given country. Countries are mostly classified into either bank-based or market based. Bank-based system refers to a market where banks play a crucial role in the financial systems and companies prefer using the banks to finance their activities which might hinder the development of the capital markets. In a market-based system, the companies usually raise their finances from the capital markets which might boost the capital market development. Generally, most developed countries are market-based while most developing or emerging economies are bank-based. According to Levine (1997, 2000), Korea is classified as a market-based system while Indonesia is categorized as a bank-based system. This can be supported by the fact that Korea's corporate bond market was developed earlier than government bond markets while in Indonesia, the corporate bond market was inactive. This may therefore explain the fact that the capital markets were developed more in Korea as compared to Indonesia.

3.2.7 Education

Korea, having carried out a successful feasibility study, turned to educate the government authorities on the advantages of establishing derivatives products as hedging tools. It also educated its staff, brokers and the public by developing a number of programs for market participants as well as public. As a part of the education programs, they held international seminars with distinguished academics and renowned practitioners on the need for derivatives market and how to use it (Kim, 1998). This education program enabled all the concerned parties to understand and accept derivatives and consequently success of the derivatives market.

In Indonesia's feasibility study, the need to educate the market participants from the staff to the brokers and other participants were identified as vital before the establishment of derivatives market. However, this was not conducted and still many people in Indonesia have little or no information and knowledge about derivatives trading which inhibits its chances of succeeding in derivatives trading. Realizing the need to educate the market participants, IDX vigorously undertook various awareness initiatives in 2008⁶⁵ to inform and educate both investors and the public on capital markets and derivatives trading. This should have been done prior to the establishment of derivatives trading but it is done quite late eight years after the introduction of derivatives trading and may thus explain the low derivatives trading volumes.

3.2.8 Investors

Prior to the introduction of derivatives, Korea exchange had almost 14% of its population⁶⁶ owning at least a share which was high enough compared to benchmarking countries like US and Japan which had 21% and 17% respectively (Kim, 1998). Retail investors⁶⁷ are the majority traders by trading volume in the stock market compared to institutional investors and the same investor pattern is also reflected in the derivatives market. Institutional investors are mainly mutual funds followed by insurance companies and banks. Generally, Koreans have long history of saving just like the other Asia tigers. Consequently, they are also active traders in the capital markets. The retail investors have greatly contributed to the success of Korea's derivatives exchange, as most of them are active traders. This great

⁶⁵ The programs include: Investor Summit and Capital Market Expo 2008; Roadshow of Potential Investors Forum, December 10 2008; Education Program for Capital Market Journalists, December 15-24 , 2008 (Source: IDX).

⁶⁶ Increased to 18% of the population by 2007 (according to KRX statistics)

⁶⁷ See Appendix 3E for investor's data.

participation by retail investors was the result of various reasons as discussed by HKEx (2003): First, the market is not particularly sophisticated by international standards; Second, derivatives trading was a game that anyone could play and for many investors it was an electronic game; Third, the government, pushing for the country to become a knowledge economy, made broadband access cheap and encouraged households to get online; Fourth, securities firms provided their clients with PDAs (personal digital assistants) almost for free and conducted seminars to promote understanding of option; Fifth, the KSE (currently KRX) disseminated its market data widely and free of charge accordingly, thus providing an efficient trading system that could handle the high volumes; Sixth, there are no official market makers and the functionality of the KRX's self-developed trading and clearing mechanism is relatively limited; and finally, all KRX members are participants in the options market, there being no separate qualifications. Korea exchange also enjoys a significant number of foreign investor's both in the stock market as well as in derivatives market with more institutional investors than retail investors — US leads in the number of foreign investors followed by the UK and Japan.

Majority of Indonesia's investors are institutional investors with very few retail investors. Just like Korea, mutual funds are the most active segment followed by the insurance companies and investment banks. Less than 1% of the Indonesia population owned a share before the derivatives market was introduced and were usually inactive traders. The small number of retail investors in the stock market was similarly reflected in the derivatives market. Generally, most people have no information about the capital markets operation and even those who do have; they do not trust the capital market⁶⁸. Majority of the population prefers keeping their savings in banks rather than investing in the capital markets as they lack confidence⁶⁹ in the market (Herwidayatmo, 2003). Furthermore, the institutional investors, who are the main participants in

⁶⁸ As Pardy (1998) pointed out, Indonesia's capital market legal-regulatory framework was not yet developed which in turn eroded the investors' confidence in the market. Also, see Herwidayatmo (2003), "Rebuilding Market Confidence" in Indonesia Capital Market.

⁶⁹ The State Street developed the Investor Confidence Index which measures the attitudes of investors to risks. Investor confidence can be defined as the willingness of investors to put money in more risky investments like equity and derivatives rather than in more safer or conservative vehicles like savings in the bank. Confidence in the economy and the capital markets is a critical driver of economic and financial fluctuations and of the business cycle. When confidence increases, consumers and investors want to buy consumer goods, durables and invest at prevailing prices. When confidence decreases, spending and risk-taking tend to fall. Investors are said to be confident when the news about the future is good and stock prices are rising. However, rising prices are related both to good fundamentals, such as growth in industrial production and productivity, as well as to the underlying sentiment or mood of investors. A good confidence measure should indicate whether, for a given set of fundamentals, investors have an increased or decreased appetite for risk.

the market could easily access already liquid overseas derivatives market in Singapore, Malaysia, Hong Kong, Taiwan, Chicago, London, and Sydney to hedge their interest rate and currency positions against US\$, Yen, Deutschmark and AU\$ rates (Pardy,1998) . The minimal participation by the retail investors and availability of already liquid products in international markets for the institutional investors deprived the Indonesia's derivatives market much needed investors, leading to market illiquidity and as a result, unsuccessful derivatives trading.

Investors' trade in the exchange creates trading volume which should be large for the derivative market to be successful. *Ceteris paribus*, a large number of investors lead to high trading volume hence enhancing the probability of success. It is therefore vital to have a large and active investor population comprised of local and foreign investors as well as retail and institutional investors.

3.2.9 Feasibility Study

Korea started looking into the possibility of establishing derivatives market in the mid-1980s. An independent committee was formed composed mainly of university professors to carry out the feasibility study. Stock markets variables were found to be ready⁷⁰ for the establishment of a derivatives exchange. Other preconditions necessary for derivatives trading like the investor population, the regulatory as well as infrastructures were evaluated and were found to be strong enough or in need of several adjustments to allow derivatives trading. The committee recommended the establishment of financial derivatives exchange with stock index as the first product to be introduced. In 1996, derivatives exchange was established (almost ten years since the study began) with index futures — KOSPI 200 futures — listing on May 3 1996. The Index products were the first products to be introduced followed by currency products, interest rates and single stock in accordance to the study recommendation. The detailed feasibility study and the implementation of the recommendation can be attributed to the great success of the Korea derivatives exchange.

⁷⁰ According to the 1989 year-end figures, the market capitalization stood at \$119 billion which represented 68% of GDP, and the total number of shares outstanding and the trading value were 4.2 billion and \$102 billion, respectively (Kim, 1998)

On its part, Indonesia contracted a consulting firm in 1998 to look into the feasibility of exchange-traded derivatives in Indonesia⁷¹. Though the research done was brief and carried out during periods of economic uncertainty due to the financial crisis, it highlighted major problems in the infrastructure as well as legal and regulatory framework. Interest rates futures were recommended as the most required products, followed by currency futures, stock index and finally stock options. However, when the derivatives trading was launched in 2001, three years later, the second least required product by the potential investors, stock index futures, was the first product to be launched. It was followed by single stock options, the least requested products. Introducing the least required products (stock index futures followed by stock options) might be the main reason why the products experienced low trading volumes as the potential investors were not ready or willing to trade the introduced derivatives products. In comparison to most emerging economies, it took them several years⁷² to conduct a feasibility study and implement the recommendations before establishing a derivatives exchange. The period of the study (two months) and the duration between the study and the launch of derivatives exchange (three years) was thus insufficient to carry out a detailed analysis as well as to implement the recommendations especially in regard to the poor infrastructure and regulations in place. In addition, the exchange started by introducing the least required products and this can be attributed to the low trading volumes of derivatives products and hence the unsuccessful derivatives trading.

⁷¹ For detailed information on the derivatives feasibility in Indonesia, see: Pardy, R. 1998. Feasibility of Exchange-Traded Financial Derivatives in Indonesia. Analit Capital Market Consulting under contract from the Asian Development Bank.

⁷² The durations taken by different emerging markets to carry out feasibility study and implement recommendations were: Korea (10 years), Turkey (14 years), Thailand (more than 15 years), and India (7 years).

3.3 Testing the Determinants of Derivatives Exchange

3.3.1 Introduction

The Turkish Derivatives Exchange (TurkDEX) is the first futures exchange in Turkey and started trading on the February 4th 2005. This was after several years of study about the introduction of derivatives trading in Turkey and many necessary requirements⁷³ being put into place. The exchange trades four different derivatives products⁷⁴ namely; Equity index futures, Currency Futures, Interest rates Futures, and Commodity Futures. Since the trading started, the exchange has recorded big increases in trading volume especially in the Equity Index⁷⁵ and currency futures. In 2008, the Futures Industry Association (FIA) named TurkDEX as one of the fastest growing exchange in the world as shown in Table 3.10, Panel A. It had the 11th most liquid index future in the world and its currency futures ranked 4th in trading volume. As seen in Table 3.10, Panel B, ISE 30 recorded more than 1000 daily average contracts by the 2nd year with 1629% increase in the number of contracts traded. Thus, ISE qualifies as a successful product according to the Wall Street Journal classification and consequently, TurkDEX can be termed as a successful derivatives exchange just like Korea exchange.

Table 3.10: Turkish Derivatives Exchange (TurkDEX)

Panel A: TurkDEX growth				
	2005	2006	2007	2008
Volume*	1,832,871	6,848,087	24,867,033	54,472,835
% Change	-	274%	253%	119%
FIA Rankings	-	46	38	28
Panel B: ISE—30 Index Futures				
	t_0	t_{+1}	t_{+3}	t_{+4}
Volume	99,821	1,866,202	14,852,889	37,188,103
Daily Average	430	7,435	58,940	148,160
% Change		1629%	693%	151%

* The volume is for the number of Futures traded.

Source: Futures Industry Association, TurkDEX

This section tests the determinants of derivatives exchange success as analyzed in Korea and Indonesia case study. It will help in determining if Korea's success was just a special case or some factors, if favorable, increase the probability of exchange's success. The determinants are

⁷³ Mainly the necessary regulatory systems and infrastructure framework.

⁷⁴ Currently, TurkDEX does not trade any options.

⁷⁵ ISE-30 Index Futures

briefly analyzed in regard to Turkey's experience and a comparison (in trend) is done between Turkey and Korea to assess any similarities or differences.

3.3.1 Economic factors

**Table 3.11: Comparison of the Korea and Turkey Economic Factors
(Korea $t_0=1996$, Turkey $t_0=2005$)**

		t_5	t_4	t_3	t_2	t_1	t_0
GDP (Millions US\$)	Korea	308,185	329,886	362,136	423,434	517,118	557,644
	13*		7	10	17	22	8
	Turkey	267,209	196,036	232,745	304,594	393,038	483,992
	15*		-27	19	31	29	23
GDP Growth rate (%)	Korea	9.4	5.9	6.1	8.5	9.2	7
	-2*		-37	3	39	8	-24
	Turkey	7	-6	6	5	9	8
	13*		-186	200	-17	80	-11
Inflation rates (%)	Korea	10.7	7.6	6.3	7.8	7.4	5.1
	-12*		-29	-17	24	-5	-31
	Turkey	49	53	37	23	12	7
	-30*		8	-30	-38	-48	-42
Interest rate (%)	Korea	17.7	15.8	12.4	12.3	13.5	12.11
	-6*		-11	-22	-1	+10	-10
	Turkey	35.8	87.4	62.4	38.9	19	11
	-3*		144	-28	-37	-51	-42
Forex (Local currency per US\$)	Korea	732.1	780.6	802.6	803.2	771.7	804.7
	2		7	3	0	-4	4
	Turkey**	0.625	1.234	1.515	1.503	1.429	1.347
	22		97	23	-1	-5	6
Unemployment rates (%) per total labor force	Korea	2.5	2.5	2.9	2.5	2.1	2.1
	-3*		0	16	-14	-16	0
	Turkey	6.5	8.3	10.3	10.5	10.3	10.3
	10*		28	24	2	-2	0

*Simple average increase rate in percentage

** Turkish Lira was revalued by a factor of 1,000,000 from 2005 (t_0). However, for consistency, we revalued for the whole period from t_5 to t_0 .

Sources: Global Stock Markets Fact book 2001~2006: World Bank: Korea National Statistics Office (KNSO)

Table 3.11 shows the economic indicators of Turkey and Korea prior to the introduction of derivatives exchange. Though Korea had a higher GDP than Turkey, they both recorded an 80% increase in GDP from US\$308billion (US\$ 267 billion) at t_5 to US\$558 billion (US\$ 484billion) at t_0 in Korea (Indonesia). However, while Korea's GDP growth rate fell from 9.4%

in t_5 to 7% in t_0 , Turkey recorded a slight increase from 7% to 8%. Both countries recorded a decline in inflation rates with Korea's decline of 52% while Turkey's fell by 56%. The interest rates also declined substantially from the 87% recorded during the financial crisis to low levels of 11% which tend to encourage investments and economic expansion just as the case in Korea. In forex changes, Korea had a 10% increase while Turkey experienced a devaluation of 116% especially due to the 2001 financial crisis⁷⁶ and not necessary expansion of economy. Korea maintained low level of unemployment which had declined slightly by 16%. Turkey's unemployment levels however rose by 58% from 6.5% in t_5 to 10.3% in t_0 .

The two countries can thus be said to have had similar economic trends. The GDP increased substantially, the inflation rates were lowered while the forex rates increased. However, they had slightly varying trends in unemployment rates as well as growth rate.

3.3.2 Political Climate

**Table 3.12: Comparison of the Korea and Turkey political factors
(Korea $t_0=1996$, Turkey $t_0=2005$)**

		t_5	t_4	t_3	t_2	t_1	t_0
FDI net inflows (Mil US\$)	Korea	1,180	728	588	809	1,776	2,325
	Turkey	982	3,352	1,137	1,752	2,883	9,801
GPD growth rate	Korea	9.4	5.9	6.1	8.5	9.2	7.0
	Turkey	7	-6	6	5	9	8
GDP Per capita, PPP	Korea	8,642	9,263	9,957	10,926	12,050	13,013
	Turkey	7,740	8,226	8,705	9,844	11,006	7,740
Unemployment rates	Korea	2.5	2.5	2.9	2.5	2.1	2.1
	Turkey	6.5	8.3	10.3	10.5	10.3	10.3

*Simple average growth in percentage

Sources: The World Bank: Korea Tourism Organization (KTO), Ministry of Tourism, Turkey.

Turkey received more FDI⁷⁷ than Korea whose FDI initially declined in t_4 and t_3 , before regaining and increasing steadily. Turkey on the other hand, recorded high levels and an increase in FDI inflow except in t_3 . The increasing trends of FDI net inflows in both countries are

⁷⁶ Just like Korea was hit by financial crisis in 1997/98, Turkey also experienced financial crisis in 2000/01 caused mainly by the fragile banking sector. In both countries, the IMF intervened to stabilize the situation (Ozatay and Sak, 2002)

⁷⁷ More than 60% of Turkey's FDI is from European countries mainly Holland, Germany, France and Italy.

indicators of investor's confidence in these markets and thus a sign of political stability. Just like Korea, Turkey's economic distress factors had favorable indicators for political stability except for unemployment rate which was slightly above 10%. GDP per capita was more than US\$ 3,000, and the growth rate increased slightly by 2%. This indicated that Turkey did not have significant risk for political instability.

Turkey experienced political turmoil since the Ottoman Empire in the 1920s to the mid 1990s, a period characterized by a high rate of change of the governments⁷⁸ as well as low economic growth. After the 1995 elections, stability was restored and has been maintained. There has been no coup, and democratic elections have been held regularly after every four years. Also, there were no demonstrations against the government or resignation of top government officials. As earlier discussed, this indicates political stability in Turkey which encouraged investors, both local and foreign.

The stable political climate in Korea and Turkey in the period preceding the introductions of derivatives market meant higher chances for the exchange's success.

3.3.3 Legal and Regulatory Systems

Table 3.13: Korea and Turkey⁷⁹ Regulatory Systems

Elements	Korea	Turkey
SRO	√	√
IFRS	◇	√
Disclosure	√	√
Derivatives law	√	√
Tax harmonization	√	X
Legal clarity	√	√
Implementation	√	◇

Sources: Korea Exchange; Indonesia Stock Exchange, Asia Development Bank

√ denotes best practice, ◇ denotes progress on existing deficiencies, X denotes major problems

Just like Korea, Turkey has complied with most of the WFE legal and regulatory systems requirements. The Capital Markets Board (CMB) is the overall and single regulatory body for all kind of exchange-traded derivatives in Turkey and it ensures that the market operates in a fair,

⁷⁸ In a span of 50 years, the Turkish people maintained four separate systems and almost 30 separate governments. Most of these governments either died out or were overthrown. Except between 1980 and early 1990s when there was political stability, during the one-party government which adopted a global-oriented economy program.

⁷⁹ According to the International Monetary Fund's (IMF) 2006 Financial System Stability Assessment of Turkey, released in November 2007, the country has achieved a fair degree of compliance with the International Organization of Securities Commissions (IOSCO) Objectives and Principles of Securities Regulation.

transparent, and an efficient manner as stipulated in the Capital Markets Law. TurkDEX is a SRO but these regulations should comply and not overlap with CMB's regulations. Turkey adopted IFRS in 2005 and all Turkish companies were required to comply with the new standards⁸⁰ as from 2006, when the IFRS was translated to Turkish. As for taxation, there are no specific rules relating to derivatives' products taxation but they is special tax treatment from other securities⁸¹. Most of the regulations meet the international standards, and CMB has made effort to comply with the European Commission (EC) regulations requirements. However, it lags behind in the implementation of these rules. The sound regulatory system put in place before the exchange was established led to investors' confidence in the market, hence greater chances of TurkDEX success just like in KRX.

3.3.4 Infrastructure

Table 3.14: Infrastructure Elements in KRX and ISE

	Korea	Turkey
Clearing and settlements	√	√
CCP	√	√
Netting options	√	√
Market mechanisms	√	√
Market makers	√	√
Order-driven /hybrid	√	√
Margin requirement (Initial)	√	√
Margin requirement (Maintenance)	√	√
Demutualized exch.	◇	◇
Circuits breakers	√	√

Sources: Korea Exchange; Indonesia Stock Exchange, Asia Development Bank

√ denotes best practice, ◇ denotes progress on existing deficiencies, X denotes major problems

Derivatives' trading in Turkey was allowed in 2001 and TurkDEX was set as a corporation in 2002. Between 2002 and 2005 when trading actually commenced, preparations were being made, particularly by putting in place the necessary infrastructure framework, prior to the establishment of derivatives exchange. TurkDEX is a fully electronic exchange which utilizes Exchange Operations System (TEOS) for trading and with continuous efforts to improve

⁸⁰ As from 2006, when the IFRS was translated to Turkish.

⁸¹ TurkDEX is tax free for foreign and domestic investors unlike other securities transactions which are taxed.

the current trading system. All the clearing is handled by the Takasbank⁸², an independent company which acts as the central counter party clearing for both ISE and TurkDEX. It uses multi-lateral netting with final settlement done in T+2 days. To safeguard and protect its customers, TurkDEX uses market surveillance to ensure that trading is done efficiently and transparently. In addition, it has Guarantee Fund with paid-in capital of the clearing members in case of default. Information dissemination is done through data vendors. Just like KRX, it has both initial and maintenance margins though at different rates. Margining is an account-based upfront and the margin levels are determined and adjusted regularly according to market conditions⁸³. Maintenance margin is 75% of initial margin while KRX's initial margin is 15% with a maintenance margin of 10%. Similar to KRX, TurkDEX is also not demutualized. They both use circuit breakers to halt trading in case prices decline beyond pre-determined levels or in case of irregularity in trading. Market makers are used to provide and improve liquidity at the exchange. Both countries had similar infrastructural framework which enhanced smooth and efficient operation of the exchange, thus improving its chances of being successful.

3.3.5 Capital Market Development

3.3.5.1 Equity Market

Korea and Turkey recorded varying stock market variables though they had similar trends as explained: (a) **Market Capitalization**; KRX and ISE recorded an increase in market capitalization. While ISE increased by 131%, KRX's increased by only 44% from t_5 to t_0 . KRX's capitalization was however higher than ISE's market capitalization. (b) **Liquidity**; though ISE had higher liquidity than KRX, it experienced a minor decline of 6% from 1.817 in t_5 to 1.699 in t_0 . KRX however recorded a 44% increase from 0.882 to 1.276. (c) **Volatility**; Just like liquidity, ISE had higher volatility than KRX. However, the volatility in ISE declined by 56% from 32% to 14% while KRX's increased by 50%. (d) **Trading volume and trading value**; ISE recorded high trading volume with a huge increase of 636% compared to KRX whose volume was lower, and recorded a 50% growth over the period. However, the trading value presents a different scenario. While KRX's trading value doubled similar to the trading volume,

⁸² Takasbank complies with the "Eligible Foreign Custodian" definition of the US SEC (Securities Exchange Commission) and is recognized by the UK SFA (Securities Futures Authority) as an "Approved Depository" and an "Approved Bank." It also complies with the standards predetermined by JSCC (Japan Securities Clearing Corporation) and JASDEC (Japan Securities Depository Center).

⁸³ It is normally between 150 TRY and 200 TRY.

ISE's trading value increased minimally by 12% as opposed to the 600% increase in trading volume. This may indicate that ISE traded cheap shares which might be the reason behind the massive increase in trading volume. (e) **Number of listed companies**; KRX's number of listed companies is more than twice those listed in ISE. KRX recorded a very slight listing of companies while ISE experienced minimal delisting over the period.

Table 3.15: Comparison of KRX and ISE Spot Market Variables

(KRX $t_0=1996$, ISE $t_0=2005$)

		t_5	t_4	t_3	t_2	t_1	t_0
Mkt. Cap (Mil US\$)	KRX	96,373	107,448	139,420	191,778	181,955	138,817
	ISE	69,659	47,150	34,217	68,379	98,299	161,538
Liquidity	KRX	0.8821	1.0787	1.5186	1.4956	1.0191	1.2759
	ISE	1.8170	1.7880	1.8070	2.1190	1.9710	1.6990
Volatility	KRX	0.1122	0.1013	0.2537	0.1706	0.1289	0.2406
	ISE	0.3184	0.4877	0.5184	0.2838	0.0935	0.1394
Trading Volume (Mil Contracts)	KRX	4,094	7,064	10,398	10,911	7,648	7,785
	ISE	11,076	23,938	33,933	59,100	69,629	81,108
Trading Value (Bil US\$)	KRX	85	116	212	286	185	177
	ISE	179	75	70	98	147	201
No. of listed Companies	KRX	686	688	693	699	721	760
	ISE	316	311	289	285	297	304

Source: Global Stock Markets Fact Book 2001 ~ 2006, WFE, KRX, and ISE statistics.

As shown in Table 3.15, KRX and ISE recorded almost similar trends in stock market variables which were increasing in most cases. They were favorable and indicated the stock markets' readiness to the introduction of derivatives market.

3.3.5.2 Bond Market

The Bond and Bills Market in ISE was established in 1991 while repo/reverse repo transactions began in 1993. Later in 1996, the Real Estate Certificates Market was launched within the ISE Bond and Bills Market. Before the organized Bond and Bills market was opened in 1991, there was minimal bond activity for both the government and corporate bonds. Nevertheless, the government bond market was more liquid than the corporate bond market.

With the introduction of exchange traded bonds, the government bond continued to perform well both in the organized and the off-exchange markets. ISE has a virtually non-existent corporate bond market after it dried up in the mid-1990s⁸⁴. Reasons for low corporate bond includes among others; heavy public sector borrowing, high budget deficits in the country, as well as high interest rates. Even in the government bond and bills market, only the repo/reverse repo market is active (Appendix 3E).

Just like Korea and Indonesia whose bond markets were not yet developed, ISE bond market was also not developed before the establishment of derivatives market.

3.3.5.3 Financial structure

Similar to Korea, Turkey is also classified as a market-based economy. In this regard, the market plays a significant role in the financial system. The capital market is developed and in turn the derivatives market has higher chances of success.

3.3.6 Investors

Unlike Korea which had a relatively large population⁸⁵ owning at least a share, the ownership in Turkey is small, only about 2% of the population. One major peculiar trend in Turkey is the heavy presence of foreign investors. 60% of foreign investment⁸⁶ is by firms in the European Union. Largest investors are (in order of contribution) from Holland, France, Germany, US, Italy, England, and Japan. By 2007⁸⁷, around 70% of equity ownership was held by foreign investors while domestic investors accounted to 30%. However, domestic investors had 80% of the value traded with foreign investors accounting to 20%. In both domestic and foreign investors, institutional investors largely overshadow retail investors. Only 2% of domestic investors are retail while foreign retail investors account for less than 1% of the total foreign investors. Of the foreign investors, mutual funds and pension funds are the largest investors. These figures are similar in TurkDEX and just like in KRX, the large and active investors enhance liquidity in the market which increases the probability of derivatives exchange success.

⁸⁴There have been recent efforts to revive the corporate bond market such as loosening the regulations.

⁸⁵ About 18% of population by 2007 up from 14% in 1990s.

⁸⁶ More than half of these investments are into the financial sector.

⁸⁷ Topbas, O.G.2007. "Banks and Securities Services in Turkey". Presented at Turkish Bankers Association, Citibank A.S

3.3.7 Feasibility Study and Education

Soon after the establishment of the capital market, Istanbul Stock Exchange in 1986, the agenda of introducing derivatives products was raised. However, nothing much was done then as the focus was on the development of the newly established ISE. Later in late 1990s, as ISE continued to perform well, the establishment of derivatives was looked into seriously with the research department of ISE conducting studies on the same. Seminars were held in which other emerging countries that had succeeded in introducing derivatives shared their experiences⁸⁸. In 2001, the legislation on “The Establishment and Operation of Futures and Options Exchange” was published in the official Gazette and in 2002, TurkDEX was set up. More research on derivatives exchange, products, and trading was carried out and necessary parameters were put in place. It was not until 2004, when the permission to operate a derivatives exchange was received from CMB. The exchange opened officially in 2005 after compliance with the few concerns raised previously⁸⁹ by CMB (TurkDEX, 2009).

The exchange also educated and trained its members⁹⁰, employees, and the general public about derivatives trading and products. The education program is an ongoing process in TurkDEX. It still organizes series of seminars and training programs for members and traders to assist them in market rules, regulations, and all related topics on derivatives market.

Similar to Korea, Turkey undertook feasibility study about introduction of derivatives market. They also educated their market participants creating awareness of derivatives exchanges and products and consequently boosting the chances of exchange success once established.

3.3.8 Summary

Applicability of the determinants of derivatives exchange success in the Turkish Derivatives Market (TurkDEX) was analyzed in this section. Turkish factors were compared alongside those of Korea, a successful case study, to assess similarities or differences in trends of the determinants prior to the introduction of derivatives market. From the analysis, Turkey and Korea had comparable trends. Their economies as well as political situations were stable which provided favorable climate for investment. They had put in place most of the necessary infrastructure and regulatory framework according to international standards before they could

⁸⁸ See: ISE. 1998. Istanbul Stock Exchange Review. Vol 2, No. 5. ISSN 1301-1642

⁸⁹ Mainly in relation to non-compliance with all the legal and regulatory issues as required by CMB.

⁹⁰ There were 32 members initially and had increased to 87 by 2007.

be established. Though Korea established stock exchange many years before Turkey, most of their stock market variables recorded increasing trends before the derivatives exchange were established, showing that the markets were ready for the establishment of derivatives market. Neither of the market had developed bondmarkets at the time derivatives were introduced. While Korea has a large number of retail investors, Turkey has mainly institutional investors and minimal participation by retail investors. Also, domestic investors are majority share owners in KRX while foreign investors are the majority owners in ISE and TurkDEX. Both countries invested much resources and time in feasibility studies and also education programs for the market participants before derivatives trading started.

In conclusion, Turkey and Korea variables were similar in most cases which may have contributed to the success of derivatives exchange in their countries. We can therefore infer that the success of Korea was not a special case but was due to the favorable underlying factors— *the determinants of derivatives exchange success*.

3.4 Summary and Conclusion

The great success of the Korean derivatives market can be attributed to several favorable conditions present at the time of the derivatives market launch. In contrast, Indonesia unsuccessful derivatives market can be attributed to insufficient or lack of the desired conditions before introducing derivatives. From the cases discussed in the chapter, there are few inferences as to what led to the successful and unsuccessful of derivatives trading in Korea and Indonesia respectively, which are summarized below:

- **Economic background:** Although the two countries had similar economic background initially after attaining independence with reliance on agriculture. Korea however shifted to manufacturing and service leading to greater economic growth and stability, supporting capital markets developments. On the other hand, Indonesia introduced derivatives amidst a weak economy as measured by the GDP growth rates, as well as inflation and unemployment which might have contributed to unsuccessful derivatives trading.
- **Political climate:** Stable political economy and government support is necessary for derivatives market development. Political stability was measured by the levels of FDI net inflows, the number of tourists' arrivals as well as change of presidents among other determinants. Korea had experienced a relatively stable political situation with elections

being held frequently and with high FDI inflows, hence a higher probability of derivatives trading success. Indonesia had political instability especially during the financial crisis and this may have negatively affected the derivatives market growth.

- **Timing:** Korea was able to time when the market was performing well and was ready for something new. Indonesia on the other hand missed the timing as it introduced derivatives exchange in 2001, too soon after the crisis when the participants were not yet ready. The timing can be enhanced by carrying out a detailed feasibility study which will give indication of when the market is ready for the establishment of derivatives exchange (HKEx 2003).
- **Legal and regulatory framework:** The legal and regulatory structure in relation to derivatives exchange, products and trading should be clear and properly detailed. These laws and rules should also be operational and implemented for a successful derivatives exchange. Strong regulations can greatly hinder establishment of an exchange. Conversely, lack of proper regulations can lead to improper trading and can encourage proliferations of illegal operations. Therefore there is need for balanced laws and rules which are neither too strong nor loose but which will encourage as well as safeguard and monitor derivatives trading. Both Korea and Indonesia took several steps to improve the legal and regulatory systems. However, Indonesia still experiences various problems regarding clarity as well as implementation.
- **Infrastructure:** The infrastructure allows the smooth and efficient operation of the derivatives exchange and hence it should be well structured. Both countries have laid most of the important elements in the exchanges and have continually improved their systems to be at par with the international standards and requirements.
- **Capital market variables:** Strong underlying spot market is good for a sound derivatives exchange. Korea's stock market variables were performing exceedingly well, hence laying a solid ground for the derivatives market to flourish. In comparison, Indonesia capital market was small and not yet fully developed which might have led to the poor performance of the derivatives exchange. The bond market in both markets were not yet developed prior to the establishment of derivatives market. We can therefore infer that development of bond market may not have been a significant factor for the establishment of derivatives exchange.

- **Education:** Korea undertook intensive training for its staff and education to the brokers, government and the investors at large prior to the introduction of derivatives. This helped in familiarizing the participants with the products as well as equipping them with know-how and knowledge on how to carry out derivatives trading. Indonesia lacked such an extensive education undertaking especially to the investor leaving them uninformed on derivatives trading. This may have adversely affected the derivatives trading as it lacked large number of investors, hence unsuccessful derivatives trading in Indonesia.
- **Investor:** Investor population and confidence are necessary for the establishment of derivatives exchange. There is a need for a large and active investor population participating in derivatives market. An inactive investor base, whether small or big will lead to less trading which may result to unsuccessful exchanges. The investors need to be divided to speculators, hedgers and arbitragers so as to enhance balance in the market.

Investors' confidence: The Indonesia capital markets have been suffering from lack of investor confidence especially due to the weak legal systems as well as lack of implementation. Korea stock market already enjoyed investors' confidence by the time the derivatives exchange was established exhibited by the high number of retail traders in the capital market.

This chapter has attempted to look into the various determinants of a derivatives exchange success and/or failure. These factors have been analyzed in the light of Korea Exchange and Indonesia Exchange experiences in introducing derivatives market. How the determinants may have contributed to the successful and unsuccessful derivatives trading was also analyzed. There were big differences on the factors present in Korea and Indonesia prior to the introduction of derivatives trading as explained in the chapter. When compared with another successful market, TurkDEX, Korea's and Turkey's determinants exhibited similarities in economic, political, regulatory and infrastructure framework, capital market development, feasibility study, and education. They had minimal differences in the investor population. Therefore, in conclusion, the determinants explained can be relied on for general reference as to the probability of a derivatives exchange succeeding or not when established. If the determinants are favorable, then there is a higher likelihood the exchange will be successful and vice versa.

CHAPTER FOUR

FACTORS INFLUENCING DERIVATIVES PRODUCTS' SUCCESS

4.1 Introduction

In the previous chapter, factors determining derivatives exchanges success were discussed. Though these factors indicate the probability of a derivatives exchange succeeding, the exchange may however subsequently fail when trading starts even though it had met some of the factors of derivatives exchange success initially. It is thus important to establish what enables an exchange to remain successful after it's established. Tsetsekos and Varangis (2000) state that the products traded on an exchange to a great extent determine whether an exchange will be successful or not. This is to say, if the products — especially the initial product introduced in a new derivative exchange — are successful, then the exchange will be successful and vice versa. This leads us to the big question: *What determines derivatives products success?*

Some products become successful after introduction while others never record any significant trading. Both qualitative and quantitative literature has attempted to explain success of contracts which in turn determines success of derivatives products. Most studies use volume and/or open interest as the measure of success. Sandor (1973) used cut-off point of 1,000 contracts traded annually to distinguish successful from unsuccessful contracts. In Silber's (1981) study of financial innovation by US futures exchanges between 1960 and 1980, contract success is defined by; (i) the number of years a contract has been trading, and (ii) annual volume exceeding 10,000 contracts. Carlton (1984) analyses longevity and competition for US futures between 1921 and 1983, and relies on average lifetime and survival rates. Black (1986) uses Wall Street Journal's criterion for listing contracts in its financial pages: i.e. a contract is considered successful if its daily open interest exceeds 5,000 contracts and/or its daily average trading volume exceeds 1,000 contracts. She imposes a longevity criterion on the Wall Street Journal criteria and further states that contracts should record at least 1,000 daily average volumes for the first three years⁹¹ before being termed as successful⁹².

⁹¹ Carlton (1984) found that most contracts die within the first two years of their introduction. Since contracts may delay for a while before listing, three years were found to be an optimal period for a contract to distinguish itself as successful or not on the basis of trading volume. Furthermore, Silber (1981) examined volume during the third year of trading on the grounds that contracts that are deemed successful at that time "frequently grow considerably during subsequent periods".

⁹² This is the criteria which most literature has used to distinguish successful and unsuccessful contracts.

Corkish, Holland and Vila (1997) adopted the Black's criteria of distinguishing successful contracts. They further stated that, high volume in the first three years is not a sufficient condition for contracts succeeding in subsequent years. Researching on the LIFFE's contracts' success, all but two contracts introduced between 1982 and 1994, could have been designated successful according the Wall Street criteria of 1,000 average daily contracts (Appendix 4A). However, as shown in Table 4.1, the number of contracts delisted in the first three years and between six to ten years, was same (five contracts).

Table 4.1: Liffe's Contract Success

(A) Number of years contract is trading	(B) Total Number of Contracts	(C) Surviving Contracts	(D) Delisted Contracts
Less than 1	2	1	1
1 – 2	5	1	4
3 – 5	7	5	2
6 – 10	8	3	5
More than 10	3	3	-

Source: Corkish et.al (1997)

Table 4.1 tabulates the distribution of contract lifetimes for all contracts introduced by LIFFE between 1982 and 1994. Column A shows the number of years contracts had traded while Column B shows the total number of contracts. Column C shows the distribution of contract's that were still in existence as of October 1994 while Column D tabulates the contracts that had ceased to exist as of October, 1994.

As shown in Table 4.1, 12 out of the 25 contracts listed by LIFFE failed recording a 48% failure rate. According to literature, most exchanges recorded high failure rates⁹³ of the contracts introduced. Tashjian (1995) reported a 72% failure rate on CME and CBOT contracts listed in the years 1984, 1989 and 1993 (61 out of 85 futures contracts failed). Silber (1981) empirical test on US futures exchanges show that only 32% of all contracts listed between 1960 and 1977 were still trading in 1980 (68% failure rate). Carlton (1984) concluded that the rate of product failure was high, with a median lifetime of seven years for all contracts. Majority of contracts failed within ten years of introduction.

⁹³ Contracts failure can be attributed to various factors which include among others: competition from other contracts or exchanges; low or decreasing hedging effectiveness; future uncertainty (LIFFE investors were faced by monetary uncertainty due to the formation of EU); regulatory changes that may adversely affect a contract; “me too” trend (i.e) introducing a contract popularly introduced by other exchanges; sophisticated contracts; drop in purchasing power of the investors; failure to keep up with the technology advancement; and, introducing contracts on a “trial and error” basis.

Given the high rates of contracts failure, most exchanges⁹⁴ invest heavily in time and resources before introducing a contract. Other exchanges list contracts on a trial and error basis to find out if they will be successful or not (Marton, 1984). Nevertheless, the main aim of any exchange is to list a contract that will attract huge trading leading to its success. It would therefore be of great importance to the exchanges, if they could determine whether a contract will be a potential success or a probable failure once introduced. This necessitates identification and analysis of factors (determinants) which influence a contracts' success. The determinants of success (exogenous variables) are the factors that an exchange might consider in choosing a product and designing contract specification.

This chapter seeks to establish the factors influencing contracts' success and is presented as follows; first brief literature review is given in 4.2., the methodology adopted is discussed in 4.3. In section 4.4, data composition is discussed and in section 4.5, empirical results are discussed. Finally, conclusion is given in 4.6.

4.2 Literature Review

The success of derivatives products and contracts has been discussed in both qualitative as well as quantitative terms. First, contracts are likely to succeed when the underlying *market is large* and characterized by *volatile prices*. All empirical investigations find a strong correlation between trading volume and price volatility. Corkish et al. (1997) found that changes in the market size (measured by the spot market capitalization) do have a positive impact on the growth in futures volume. They concluded that successful contracts benefit from a large spot market. However, their findings weakly supported that a volatile spot market is a necessary condition of contract's success. Similarly, Black (1986) found that contracts where the cash market is large and cash prices volatile are more likely to succeed. Cornell (1981) established that "new contracts should be written on commodities with "sufficient" price variability. Tashjian and Weissman (1995) concluded that "good" contracts have payoffs that are highly correlated with payoffs on a large cash market with highly variable cash prices. Empirical evidence supported these predictions.

⁹⁴ Emerging markets however, rarely innovate new products but usually follow and introduce those contracts or products that have proved successful in developed markets.

Tashjian (1995) further analyzed the role of *competition* in contract's success. A contract is likely to be affected by the existence of competing contracts. She stated that if two contracts are sufficiently similar, typically only one will attract significant trading volume. Black (1986) investigated the issue empirically and found that new contracts with actively traded close substitutes are less likely to succeed than new futures contracts without close substitutes. Corkish et. al. (1997) tested the first mover advantage, i.e. whether contracts introduced when there are no competing contracts are more likely to succeed than those with already trading contracts. The results confirmed the first-mover advantage. Cuny (1993) shows that a first-mover advantage exists since traders are attracted to liquidity offered by established market. However, there are some cases that contradict the first mover advantage where the volume of a contract migrates from existing successful foreign market to own market. Some newly established contracts (in own market) may trade more successfully even though a similar contract was already successful in a different market (foreign market). For example, Nikkei 225 index futures contracts, an index future based on Japanese Nikkei 225 index on Tokyo Stock Exchange was first listed in Singapore Stock Exchange (SGX) in 1986 and became very successful. Later in 1988, Osaka Securities Exchange (OSE) listed the Nikkei 225 futures and the volume shifted to OSE. Similarly, Bund, a 10-year futures contract based on a German Government Bond was first listed in Liffe in late 1988 and became very successful. However, when Eurex listed Bund futures later, Bund volume migrated from Liffe to Eurex.

Most literature⁹⁵ identified hedging use referred to as *hedging effectiveness* (HE)⁹⁶ of a contract as important prerequisite to its success. A derivative product and contract must address the hedging demand of the traders. Tashjian (1995) states that a market should first look for a group of investors with significant risk exposure and high costs to bearing price risks; e.g. the banks. Then identify the risk that cannot be diversified and finally design an instrument that is highly correlated with the underlying asset. HE of a contract in relation to its underlying asset is thus a key to success. Lack or low HE leads to low trading volume and hence unsuccessful

⁹⁵ Black (1986), Corkish et.al. (1997), Cuny (1993), Duffie and Jackson (1989), Ederington (1979), Figlewski (1985), Gray (1960b, 1961, 1966, and 1970), Johnston and McConnell (1989), Silber (1981), Tashjian and Weissman (1995), Tashjian (1995).

⁹⁶ Measured as the reduction in price variation that results when the asset to be hedged is combined with a futures contract in such a way as to minimize the variance of the two-asset portfolio. It is defined by the coefficient of determination (R^2) of the regression: $RS_t = \alpha + \beta RF_t + et$, where RS_t (spot return) and RF_t (futures return) are defined as logarithmic price changes.

contracts. For example, a big drop in HE is attributed to the fall of GNMA CDR⁹⁷ contract which enjoyed considerable success, with volume climbing steadily from its introduction in 1975 to 1980 (Appendix 4B) when it leveled off at 2 million contracts per year before it dropped precipitously to below 10,000 contracts by 1987. Johnston and McConnell (1989) shows that GNMA CDR hedging effectiveness dropped dramatically concurrently with a decline in volume⁹⁸. For a contract to be successful therefore, it is important that it addresses the hedging demand of the traders.

Additionally, hedgers and speculators are also concerned about *liquidity* of the contract. Lack of sufficient liquidity in most newly initiated markets results to relatively high cost of hedging, thereby inhibiting contract growth. Tesler (1981) argues that liquidity is the key difference between futures and forwards markets. *Ceteris paribus*, traders will prefer a liquid market⁹⁹ even at the expense of low HE, because trading costs (the bid-ask spread) and the execution risk (the risk that adverse price movement occur before trade execution) will be lower. Black (1986) uses the cross market liquidity cost to assess liquidity of own market. Among the numerous measures of liquidity¹⁰⁰, Black uses breadth as the measure for liquidity (i.e.) using the average contract volume as the proxy for liquidity. If the cross market provides a more liquid market, investors might prefer to use it even though it may have lower HE to an own market with higher HE but lower liquidity. This is possible because of two reasons; (a) Large volume is highly correlated with market breadth (Garbade and Silber (1983), Tesler (1981)), and (b) Volume of trading is also a major determinant of the bid-ask spread. Corkish et. al. (1997) examines market liquidity with the bid – ask spread as proposed by Roll (1984) using tick – by-tick data. They also used the ratio of volume to open interest as a measure of liquidity. A high ratio indicates that trading is high compared to the number of outstanding contracts and hence a more liquid market. They however found futures market liquidity to be a consequence rather

⁹⁷ GNMA (Government National Mortgage Association) CDR (Collateralized Depository Receipt) is an interest rate futures contract introduced by the Chicago Board of Trade in 1975, aimed at mortgage bankers to hedge current coupon (newly produced) mortgage securities.

⁹⁸ For more information on the failure of GNMA CDR futures contracts, see Appendix 4C.

⁹⁹ Addressing how to increase liquidity in a market, Cuny (1993) argues that the optimal contracts attract a sufficiently large set of non-hedgers as liquidity providers by setting appropriate entry fees.

¹⁰⁰ Since liquid market exhibit different characteristics (i.e.) tightness, immediacy, depth, breadth, and resiliency. Sarr and Lybek (2002) classified liquidity measures into four categories: (i) transaction costs measures; (ii) volume – based measures (breadth and depth); (iii) equilibrium price-based measures (resiliency); and (iv) market – impact measures (resiliency and speed of price discovery).

than a cause of success. Chordia, Roll, and Subrahmanyam (2000) found that increasing liquidity attracts more investors resulting to more trading activity.

Most derivatives markets, developed or emerging, look into the indicators of derivatives products success before developing and listing a new product or contract. For example, the CME Group, which is the world's largest futures exchange and enjoys a long history of successful new product innovation and development, carefully lists products¹⁰¹ which have achieved "benchmark" status and hence, with higher success probability. To determine if the product has achieved benchmark status, they reference relevant characteristics of potential new products. They identify five "core" requisites that reference the characteristics of the underlying market. These requisites include: *price transparency and volatility* - volatility produces speculative opportunity and the necessity to hedge market risks while protection is the key to protecting traders against possibility of manipulation; large, competitive cash or underlying markets; lack of suitable cross hedges; free of government interference or excessive regulation; homogenous product with established grades and standards for quality and quantity; competitive or strategic considerations; and product support. Ultimately, they attempt subjectively to rate and weight each product by reference to the above criteria in order to guide their prioritization and choice of the product to be listed. Given this example from the leading futures exchange, emerging markets can follow suit and critically analyze their products against the discussed requisites of product success before listing.

Based on the existing literature, the level of trading volume has been used as the measure of contracts success and the two terms are used as synonymous. Some of the measures of success as discussed among others include: size of the underlying spot market measured by market capitalization, price variability of the underlying product, hedging effectiveness, liquidity as well as the presence or absence of competing contracts either in the same exchange or different exchanges.

4.2.1 Success Models

Black (1986) pioneered an empirical model that can be used to determine the success or failure of contracts. Analyzing various futures contracts listed in the US exchanges, she used cross-market approach to determine success of own market. This means, if a similar market with

¹⁰¹ See Appendix 4D for more on development of new products at CME.

more liquidity or higher hedging effectiveness exists, then the likelihood of own market being successful are minimal and vice versa. She developed a model to predict the success of contracts using a sample of 19 interest rates futures contracts from different US derivatives exchanges. Following the Wall Street Journal listing criteria, she distinguished successful and failed contracts. The paper emphasized on the “efficient¹⁰² cross hedge” determined by relative residual risk¹⁰³ measure of own hedging versus cross hedging. Trading volume was used as the dependent factor. The independent variables include; (i) relative residual risk of cross hedge versus own hedge for commodity i , RR_i ; (ii) market liquidity of cross market for commodity i , CLQ_i (measured by the average daily trading volume); (iii) cash market volatility for commodity i , $PVAR_i$ (measured by the standard deviation of daily price changes in a contract equivalent dollar amount of the cash commodity); and, (iv) the size of the cash market for commodity i , $SIZE_i$ (measured by the market capitalization of the cash instruments). The model is as shown.

$$\ln VOLUME_i = \ln \beta_0 + \beta_1 \ln RR_i + \beta_2 \ln CLQ_i + \beta_3 \ln PVAR_i + \beta_4 \ln SIZE_i + u_i$$

Where: $VOLUME_i$ = average daily volume of trading in the innovated (own) futures market.

RR_i = relative residual risks.

CLQ_i = liquidity of the cross market.

$PVAR_i$ = price variability of the cash market commodity.

$SIZE_i$ = size of the cash market.

Using annual and average data with volume and open interest as dependent variables¹⁰⁴, she obtained various equations to determine contracts success. To establish the prediction capability of the models, two other contracts¹⁰⁵ not included in the initial sample were used. The models correctly predicted one as a success and the other as unsuccessful. Finally she tested the

¹⁰² Efficient as used to refers to low liquidity cost and low residual risk.

¹⁰³ Residual risk refers to the risk remaining in a hedged position compared with a theoretically perfect hedge in which all risk is eliminated. It is calculated by $(1-R^2)$ where R^2 refers to the coefficient of determination between the cash and futures price changes

The relative residual risk variable is the ratio of the residual risk for the cross hedge (R^*_{c}) to residual risk for the own hedge (R^*_{o}) as shown:

$$\frac{\text{Residual risk}_{\text{cross}}}{\text{Residual risk}_{\text{own}}} = \frac{\text{Var}(R^*_{c})}{\text{Var}(R^*_{o})}$$

¹⁰⁴ She used a sample of 19 contracts established between 1975 and 1983 in various US futures exchanges (CBT, CME, NYFE, ACE, COMEX). However, four contracts were traded in more than one exchange. She run regressions with and without duplicate contracts to check for robustness. Models from both cases performed the similarly and the variables displayed the expected signs although there were differences in the relative importance of the variables.

¹⁰⁵ One successful and one already delisted from CBOT.

forecasting capability of a contract that was awaiting listing. The contract¹⁰⁶ was predicted to be successful and when it was listed later, it was a success.

Though a useful model, it suffers from the fact that it only considered the first three years to determine the success of a contract. However, as Corkish et. al. (1997) pointed out, some contracts may record more than 1,000 daily average contracts in the first three years but fail in subsequent years.

Corkish et. al. (1997) adapted to a great extent Black's work in their model on determining product success. However, they analyzed the hedging effectiveness and the liquidity variables separately. They used the bid-ask spread as well as the execution risks as measures of liquidity. Their results rejected the hypothesis that high volume contracts have lower bid-asks spreads. Also, their intra-day analysis indicated that market liquidity in terms of both execution risks and transaction costs is fairly constant across active Liffe contracts. Consequently, liquidity seemed to be a consequence rather than a cause of contract success (or lack of liquidity a cause of failure). They estimated hedging effectiveness by the coefficient of determination of the regression: $RS_t = \alpha + \beta RF_t + \epsilon_t$ (Where RS_t (RF_t) represent spot (futures) return). They found that more successful contracts clearly serve their purpose by providing effective risk reduction. At the same time, proper contract design does not guarantee success.

In addition to liquidity and hedging effectiveness, they carried out a success regression model. They used quarterly volume data as the dependent variable. The explanatory variables as shown in the model below are: (i) spot market volatility, VOLAT (measured by the quarterly average of daily closing price changes); (ii) size, DSVOL (of the underlying market measured by market capitalization); and (iii) dummies.

$$DFVOL_{it} = \alpha + \beta_1 DSVOL_{it} + \beta_2 VOLAT_{it} + \beta_3 D_{it} + w_{it}$$

Where: $DFVOL_{it}$ is the change in quarterly futures volume;
 $DSVOL_{it}$ is the change in quarterly spot market capitalization;
 $VOLAT_{it}$ is the change in spot market volatility.

The following Dummies were used in the regression: $D0 = 1$ if the contract has option; $D1 = 1$ if the contract was a first-mover contract; $D2 = 1$ if a cross-listed contract exists with non-overlapping trading hours; $D3 = 1$ if a cross-listed contract exists with overlapping trading hours;

The coefficients for size (DSVOL) were significant leading to a conclusion that successful contracts benefit from a large spot market. However, the volatility coefficients were

¹⁰⁶ Municipal Bond Futures contract based on an index of municipal bond prices. It was listed on CBT in 1985 and became a success.

small and mostly negative. The data weakly supported that a volatile spot market is a necessary condition for futures contract's success. First-mover advantage was also confirmed. Competition from contracts with the same trading hours had a positive, but insignificant effect on volume while options had a negative, but insignificant effect on futures volume. This suggests that exchange-listed options are not instrumental in creating additional trading opportunities in the markets.

These success models attempted to explain determinants of contracts success in a quantifiable way. They used trading volume as the dependant variable but they vary in the independent variables and how to measure them. They models thus shed light on key factors that influence contracts success and how they can be measured.

4.3 Methodology

4.3.1 Developing a Contract Success Model

This paper slightly borrows from Black's work to develop a success¹⁰⁷ model. It focuses mainly on the underlying market variables that emerging markets can focus on to determine the likelihood of a new contract succeeding. Trading volume¹⁰⁸ is used as the proxy for success and is thus the dependent variable while the spot market size, the cash market variability and market liquidity are used as explanatory variables together with various dummy variables. From each of the derivative markets, equity index contracts data are collected from the first year the contract was listed (t_0) to t_{10} depending on data availability and the duration the contract has been trading. Our final data is presented as long format panel data. However, since derivatives markets vary in the number of equity index contracts traded and the years each contract has been trading, our

¹⁰⁷ Our model largely differs from the Black's model as explained: (a) *Data*: (i) While Black used only the first three years data, we use a 11-years period data or when a contract ceased trading (whichever is shorter); (ii) Black uses three years average data for the variables while we use annual data (to capture the time patterns); (b) *Variables*: (iii) We introduce the cash market liquidity instead of the futures markets liquidity; (iv) Unlike Black's model, we use dummy variables to capture the qualitative factors that determine contract's success; (c) *Approach*: (v) Black uses the cross-market approach (using cross market to determine own market success) while we focus on own market success; (vi) Black's paper analyzed contracts in developed market (US exchanges) while we focus on emerging markets in Asia; (vii) Black focuses principally on interest rates futures contracts while we use equity futures and options contracts.

¹⁰⁸ The trading volume refers to the numbers of contracts traded. Though this approach suffers from the drawback in that contracts vary in size and hence when comparing across contracts we will not be comparing like with like, the alternative of using the trading value may require converting the value to single currency. However, it would be impossible to distinguish between "real" growth and "exchange rate related" growth. Hence, volume was preferred as an absolute measure of activity.

panel is unbalanced. The model is estimated as panel with common intercepts and coefficients (fixed effect).

4.4 Data

4.4.1 Data and Sample Composition

As discussed earlier, Asia is classified as one of the fastest growing region¹⁰⁹ in derivatives trading in the world. The Asia-pacific region currently has 11 countries with financial derivatives markets namely; Australia, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Singapore, Taiwan, and Thailand. However, since our study is focused on emerging markets, Australia, Hong Kong, Japan, New Zealand, and Singapore are classified by the Global Stock Market Fact book as developed markets, they are not included in the sample. Our study sample thus encompasses India, Indonesia, Korea, Malaysia, Taiwan, and Thailand.

We use these emerging markets derivatives exchanges to establish the indicators of derivatives products success. The derivatives markets are¹¹⁰: Bursa Malaysia, Malaysia (1995); Indonesia Stock Exchange (IDX), Indonesia (2001); Korea Exchange (KRX), Korea (1996); National Stock Exchange (NSE), India (2000); Taiwan Futures Exchange (TAIFEX), Taiwan (1998); and Thailand Futures Exchange (TFEX), Thailand (2006). The most traded products as shown in Table 4.2 are equity index products, followed by interest rate products and currency products.

¹⁰⁹ In 2008, Asia - Pacific region was second after the North America region and accounted for 28% of futures traded volume on exchanges in the world. Korea Exchange has recorded the largest trading volume in index options for several years while the National Stock Exchange of India (NSE) continues to move up the top exchange list in total volume and has the fastest growing stock options.

¹¹⁰ Numbers in parenthesis refers to the year the derivatives market was established.

Table 4.2 Financial Products Traded in the Derivatives Markets.

Market	Year Est.	Product	Year Est.
Bursa Malaysia	1995	Index Futures	1996
		Interest rates Futures	1997
		Index Options	2001
		Single Stock Futures	2006
Indonesia Stock Exchange (IDX)	2005	Index Futures	2001
		Single Stock Options	2004
Korea Exchange (KRX)	1996	Index Futures	1996
		Index Options	1997
		Interest Rates Futures	1999
		Currency Options	1999
		Currency Futures	1999
		Single Stock Options	2002
		Options on Interest Rates Futures	2002
National Stock Exchange of India (NSE)	2001	Index Futures	2000
		Index Options	2001
		Single Stock Futures	2001
		Single Stock Options	2001
		Interest Rates Futures	2003
Taiwan Futures Exchange (TAIFEX)	1998	Index Futures	1998
		Index Options	2001
		Single Stock Futures	2003
		Single Stock Options	2003
		Interest Rates Futures	2004
Thailand Futures Exchange (TFEX)	2006	Index Futures	2006
		Index Options	2007

Sources: Bursa Malaysia, IDX, KRX, NSE, TAIFEX, TFEX.

The table shows the derivatives markets in Asia-pacific region emerging markets, the year they were established, the different products traded in each market and the year the product was introduced. It is important to note that most of these products have diverse contracts listed under them.

From the respective derivatives exchanges data bases as well as from the Futures Industry Association (FIA) and World Federation of Exchanges (WFE), data is collected for 27 equity index futures and options¹¹¹ contracts. For each contract, data is obtained for the year's t_0 to t_{10} depending on data availability and duration the contract has been trading. The year refers to calendar year and t_0 is the first year a contract was traded¹¹². Total number of contracts and observations from each market are shown in Table 4.3.

¹¹¹ Equity based products (especially index products) are the most popular derivatives contracts in exchanges and are first introduced in emerging markets followed by interest rates based products and then currency products (Tsetsekos and Vangaris, 1997). Some of the reasons for equity products development more than other products include; more developed equity market (Kim, 1998, Donmez 1997), larger market size (Kim, 1998), less regulation (Kim 1998, Pardy 1998) compared to the bond or forex markets. If the first products (equity products) are successful, the market is deemed to be successful and other products introduced later may become substantial success.

¹¹² For almost all the contracts, t_0 is less than one calendar year since there are seldom any contracts listed on January 1st.

Table 4.3: Distribution of Contracts and Observations

Market	Contracts			Observations		
	Futures	Options	Total	Futures	Options	Total
India	5	1	6	23	8	31
Indonesia	3	-	3	17	-	17
Korea	2	1	3	15	11	26
Malaysia	1	1	2	11	9	20
Taiwan	8	3	11	52	16	68
Thailand	1	1	2	3	2	5
Total	20	7	27	121	46	167

Source: Bursa Malaysia, IDX, KRX, NSE, TAIFEX, TFEX, WFE, FIA

The table shows the number of equity index contracts and number of observations from each derivative market. The selection depended largely on the number of equity index contracts traded and availability of data. Generally, equity index futures are the most frequently traded than options contracts which explains the high number of futures than options. Taiwan (Taifex) leads with the total number of index futures and options followed by India (NSE).

4.4.2 Variables

To determine the relative importance of the various factors that influence trading volume which in turn determines the products success, a panel data is considered. The variables are selected based on prior findings of the factors influencing contracts success as well as by intuitive a priori reasoning. The first step is to determine the dependent variable that best captures success of a contract. Logically, successful contracts are those with (high trading volume) while unsuccessful contracts have less number of contracts traded (low trading volume). Hence, trading volume is selected as the proxy for success and we use trading volume (VOL) as the dependent variable. Various explanatory variables for contracts' success are as discussed.

4.4.2.1 Size

The size of the underlying spot market (SIZE) is measured by annual market capitalization of the underlying products. Black (1986) estimated that contracts where the cash market is large are more likely to succeed. Corkish et.al (1997) hypothesized that changes in market size have positive impact on the growth futures volume. Similarly, Tashjian and Weissman (1995) found that “good” contracts are highly correlated with payoffs on a large cash market. Consistence to other literature hypotheses, we expect a large underlying spot market to yield high trading volume and a positive sign on this variable is hence expected. The main hypothesis tested is:

H4.1: The size of the underlying cash market is positively related to trading volume.

4.4.2.2 Volatility

The cash market price variability (CMVOL) is measured by annualized standard deviation of daily price changes¹¹³ of the cash instrument. Most empirical investigations have found a strong, positive correlation between trading volume and price volatility. Rutledge (1979) examined the causality between the trading volume and contracts and found “strong support for the hypothesis that movements in trading volume represent a response to, rather than a cause of, movements in price variability. While Corkish et.al. (1997) weakly supported that volatile spot market as a necessary condition of contract’s success, Cornell (1981) established that “new contracts should be written on commodities with sufficient price variability. Black (1986) hypothesized those contracts written on volatile cash markets are more likely to succeed. Our analysis and previous studies hypotheses leads us to expect that higher cash price volatility will result in larger trading volume, and we thus expect a positive coefficient for this variable. The main hypothesis tested is:

H4.2 Price variability of the cash market is positively related to trading volume.

4.4.2.3 Liquidity

We include spot market liquidity (MLIQ) to assess how it affects trading volume. The rationale is based on the notion that if the underlying market is liquid, we expect more trades to be attracted to the market who in turn use the derivatives market to hedge, speculate or arbitrage. We measure market liquidity by the turnover velocity which is the ratio between the turnover of domestic shares and their market capitalization. Both theoretical and empirical studies suggest that liquidity is an important measure of success. Chordia et. al. (2000) found that increasing liquidity attracts more investors resulting to more trading activity. Based on our analysis, we thus expect a positive sign. We test the following hypothesis:

H4.3: Liquidity of the underlying cash market is positively related to trading volume.

4.4.2.4 Dummies

In addition to the above quantitative variables, dummy variables are introduced to capture how qualitative factors might affect contract’s success;

DFIRST: It takes a value of 1 if the contract is the first one to be introduced in a new exchange, otherwise 0. Out of our total number of observations, 54 are first contracts. As

¹¹³ Following Bacha and Villa (1993), the logarithmic return of daily closing prices is defined as; $\ln(C_t / C_{t-1})$. Where C_t is the closing price on day t .

previously stated, if the first contract listed in a newly established derivatives market is successful, then, the exchange will thus be successful and vice versa. The staff will put a lot of effort to make sure the product is successful and we therefore expect a positive coefficient on this variable. The hypothesis tested is:

H4.4: The first contract in a new exchange is positively related to trading volume.

DFUT: It takes a value of 1 if it is a futures contract and 0 if it's an option contract. It determines whether futures or options contracts have higher trading volume compared to option contracts or vice versa. From our sample, 121 observations are futures contracts¹¹⁴. Futures contracts normally requires a large initial margin whereas for an option contract, an investor normally pays a small premium and only puts a premium margin in case they are selling. Therefore, futures contracts have higher financial burden than option contracts. In addition, since trading an option contract is similar to several thousand underlying shares, option contracts normally attracts more traders. We therefore expect option contracts to have higher trading volume than futures contracts. The hypothesis tested here is:

H4.5: Futures contracts are negatively related to trading volume.

Additionally, given that contracts are introduced in different time periods and years, which might affect the trading volume, a period dummy (non-crisis and crisis periods) is introduced. Non-crisis¹¹⁵ years take the value of 1 while crisis years take 0. Period dummy (DNON-CRISIS) thus captures the differences in trading volume as a result of varying financial periods. Generally, during financial crisis periods, we expect less trading volume¹¹⁶ compared to non-crisis periods.

H 4.6: Non-crisis period are positively related to trading volume.

Furthermore, since the contracts are from different markets with diverse economic development, political as well as legal and regulatory situations that may affect success of a contract, market dummies are also introduced. However, to avoid loss in degree of freedoms, the

¹¹⁴ Most emerging markets introduce more futures contracts than options, hence the high number of futures than options contracts.

¹¹⁵ Non- crisis years include 1996, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007 while crisis years are 1997, 1998, 1999, 2008.

¹¹⁶ As investors' purchasing power is reduced or the foreign investors have fled the market.

six markets are classified into two main categories – high/middle income markets (HIE) and lower income markets (LIE) – as classified by the World Bank¹¹⁷.

H 4.7: DHIE markets are positively related to trading volume.

4.5 Determining Success Model

4.5.1 Model Estimation

Having described dependent and explanatory variables for contract i at time t , we estimate our model as follows;

$$VOL_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 CMVOL_{it} + \beta_3 MLQ_{it} + \beta_4 DFIRST_{it} + \beta_5 DFUT_{it} + \beta_6 Period\ Dummies_{it} + \beta_7 Market\ Dummies_{it} + e_{it}$$

(Equation 4.1)

Where: VOL_{it} = Log of annual trading volume
 $SIZE_{it}$ = Log of size of the cash market
 $CMVOL_{it}$ = Cash market price variability
 MLQ_{it} = Cash market liquidity
 $DFIRST_{it}$: = 1 If first contract, otherwise 0.
 $DFUT_{it}$: = 1 If future contract, 0 if option contract.
 $DNON-CRISIS_{it}$ = 1 for non-crisis period, 0 if crisis period.
 $DHIE_{it}$ = 1 if high/upper middle income economy, 0 otherwise.

From the estimated model, we expect the following; $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 < 0$, $\beta_6 > 0$, $\beta_7 > 0$.

The data is presented in unbalanced long panel format. To capture time effect (period dummies) and group effect (market dummies), the data is regressed as a two-way fixed effect regression model. Robust standard errors are used and t-statistics are adjusted for heteroscedasticity (White 1980).

4.5.2 Summary Statistics

First, we present the empirical data used in the model to give a general sense of the data in Table 4.4.

¹¹⁷ Markets are classified following the World Bank's classification of various economies. High/middle income countries include Korea, Malaysia and Taiwan while lower income countries include India, Indonesia and Thailand. Economies in same categories have almost similar backgrounds in terms of economic development, political stability among others.

Table 4.4: Empirical Data

(A) Exchange	(B) Contract	(C) Obs period	(D) Obs	(E) VOL (No. of contracts)	(F) SIZE (USD M)	(G) CM VOL (%)	(H) MLI Q (%)	(I) CSIZE (USD)	(J) GDPP C (USD)	(K) GDPGR (%)	(L) INF (%)	(M) FMVOL (%)
Bursa Malaysia	KLCI Futures	1996 ~ 2006	11	609,978	158,957	29	38	565,767	4,446	5	3	10
	OKLI Options	2000 ~ 2008	9	102	180,900	18	36	2,464,948	5,262	5	2	NA
IDX	LQ-45Futures	2001 ~ 2008	8	39,090	88,968	26	49	13,602	1,388	5	9	27
	JP Futures	2004 ~ 2008	5	547	1,922,143	17	126	15,290	1,660	6	9	17
	Mini-LQ Futures	2005 ~ 2008	4	0	132,692	27	58	3,955	1,778	6	10	29
KRX	Kospi 200 Futures	1996 ~ 2006	11	31,042,752	309,164	31	205	46,900	12,949	5	4	35
	Kospi 200 Options	1997 ~ 2007	11	1,457,860,875	398,572	33	214	10,991	13,756	4	3	NA
	KOSTAR	2005 ~ 2008	4	54,757	786,455	29	198	12,808	19,606	4	3	26
NSE	S&P CNX Nifty	2000 ~ 2008	9	55,019,842	511,605	26	95	11,781,378	651	7	5	26
	S&P CNX Nifty	2001 ~ 2008	8	29,631,524	548,686	25	87	12,577,342	677	7	5	NA
	CNXIT Futures	2003 ~ 2008	6	104,380	694,439	58	84	32,018,092	753	8	5	59
	Bank Nifty F.	2005 ~ 2008	4	949,906	887,617	38	72	96,457,603	850	9	6	38
	Junior Nifty F.	2007 ~ 2008	2	118,340	1,130,189	38	72	41,059,801	978	8	8	39
	CNX 100 Futures	2007 ~ 2008	2	10,171	1,130,189	34	72	21,109,583	978	8	8	35
TAIFEX	TX (F)	1998 ~ 2008	11	6,673,401	395,490	26	203	7,663,896	14,579	4	1	27
	TF (F)	1999 ~ 2008	10	822,537	408,989	30	191	5,154,051	14,777	4	1	31
	TE (F)	1999 ~ 2008	10	957,614	408,989	28	191	6,774,252	14,777	4	1	30
	MTX (F)	2001 ~ 2008	8	2,450,346	433,223	24	171	467,336	14,977	3	1	24
	TXO (O)	2001 ~ 2008	8	53,685,689	433,223	21	171	467,336	14,977	3	1	NA
	T5F (F)	2003 ~ 2008	6	3,525	485,267	19	157	1,493,436	15,594	4	2	21
	TFO (O)	2005 ~ 2008	4	956,147	522,776	24	143	66,706	16,365	4	2	NA
	TEO (O)	2005 ~ 2008	4	897,069	522,776	23	143	21,976	16,365	4	2	NA
	MSF (F)	2006 ~ 2008	3	3,630	538,362	21	147	6,705	16,605	4	2	23
	XIF (F)	2007 ~ 2008	2	112,338	510,213	33	149	2,437,659	16,900	3	3	33
	GTF (F)	2007 ~ 2008	2	48,215	510,213	-	149	2,703,937	16,900	3	3	40
TFEX	Set 50 Futures	2006 ~ 2008	3	1,175,358	146,806	27	71	1,855,040	3,676	4	4	34
	Set 50 Options	2007 ~ 2008	2	27,165	150,129	32	70	2,782,559	3,929	4	4	NA

Source: Bursa Malaysia, IDX, IMF, KRX, NSE, TAIFEX, TFEX, WFE, World Bank, FIA, IMF
NA- Not Applicable

The table gives the average empirical data used in the model. Column A shows the six exchanges data is derived from while column B shows the contracts in each derivative market. Column C gives the time period for each contract whereas column D gives the total number of observations from each contract. Column E (VOL) gives the average number of contracts traded over the period of observations. The main explanatory variables used in estimation model include the SIZE, CMVOL and MLIQ. Column F (SIZE) gives the size of the underlying market (average data in millions of USD), measured by market capitalization. Column G (CMVOL) gives the average cash market price variability which is measured by the annualized standard deviation of daily price changes (Bacha and Villa, 1993). Column H is the average cash market liquidity and is measured by the turnover velocity (shares traded/shares outstanding). The other independent variables (CSIZE, GDPPC, GDPGR, INF, and FMVOL) are used for robustness check. The CSIZE shown in column I is the average contract size in USD. (CSIZE = closing price x multiplier). Column J contains the average gross domestic price per capita (GDPPC) in USD for each of the country. The average GDP growth rate is recorded in column K while the average inflation rate is given in column L. These three variables are economic and political indicators and their data is obtained from World Bank and IMF database. Finally, in Column F, we have the average futures market price variability (FMVOL) which is measured by the annualized standard deviation of daily price changes. In this column, since only the futures contracts are used, the options contract cells appear as NA, not applicable.

A summary statistics for the trading volume (VOL), and the explanatory variables; size of the underlying market (SIZE), cash market volatility (CMVOL), and market liquidity (MLIQ) is presented in Table 4.5.

Table 4.5: Summary Statistics

Variable	Obs	Mean	Std. Dev.
VOL	167	105,830,792	469,421,233
SIZE	167	463,142	417,881
CMVOL	165	28%	21%
MLIQ	167	133%	71%

The table shows the summary statistics including the number of observations (Obs), the mean, as well as the standard deviation. VOL refers to annual trading volume of contracts, SIZE refers to the size of the underlying market measured by market capitalization while MLIQ refers to the market liquidity of the cash market and is measured by the turnover velocity. DFIRST is a dummy variable taking the value of 1 if the contract was the first one to be introduced in the exchange, otherwise 0. DFUT is also a dummy variable taking the value of 1 if it is a futures contract and 0 if it is an option. DNON-CRISIS is a period dummy taking the value of 1 for non-crisis years and 0 for crisis years. DHIE is a market dummy taking the value of 1 for high/upper income economies, otherwise 0. All the dummy variables are not reported. From the table, we note that CMVOL has less number of observations (165) compared to other variables due to some missing values.

To check how the dependent variable (VOL) is correlated with explanatory variables (SIZE, CMVOL, MLIQ, DFIRST and DFUT) as well as multicollinearity amongst the independent variables, a correlation was run and presented in correlation matrix as shown in Table 4.6.

Table 4.6: Pearson Correlation between Variables

	SIZE	CMVOL	MLIQ	DFIRST	DFUT
VOL	0.1169*	0.0854	0.4010**	0.2256**	-0.1130*
SIZE		-0.1568**	0.2029**	-0.3938**	0.0537
CMVOL			0.0778	-0.0000	0.0870
MLIQ				-0.1279**	0.0217
DFIRST					0.4204**

The table shows the correlation between the dependent variable (VOL) with the independent variables as well as among the independent variables. The trading volume (VOL) is positively correlated to the SIZE, CMVOL, MLIQ and DFIRST but negatively correlated with DFUT. VOL refers to the annual trading volume of contracts, SIZE refers to the size of the underlying market measured by market capitalization while MLIQ refers to liquidity of the cash market and measured by the turnover velocity. DFIRST is a dummy variable taking the value of 1 if the contract was the first one to be introduced in the exchange, otherwise a 0. DFUT is also a dummy variable taking value of 1 if it is a futures contract and 0 if it is an option. DNON-CRISIS is a period dummy taking the value of 1 for non-crisis years and 0 for crisis years. DHIE is a market dummy taking the value of 1 for high/upper income economies, otherwise 0. The period dummy (DNON-CRISIS) and the market dummies (DHIE) are not reported. * = correlations significant at 10% level, and ** = correlations significant at 5% level.

Most of the variables are significant at 5% significant levels. Similar to our expectations, the trading volume (proxy for success) is positively correlated with the size of the underlying market (SIZE), the cash market price volatility (CMVOL) as well as the market volatility (MLIQ). In addition, VOL is also positively correlated to the dummy variable (DFIRST) in case

it is the first contract to be introduced but negatively correlated to the dummy variable (DFUT) if it is a futures contract as opposed to options contracts.

As indicated in the correlation matrix, market liquidity has the strongest correlation with volume followed by the size and cash market volatility. Amongst the explanatory variables, there is no case of multicollinearity and hence we can rely on the variables to empirically estimate success model.

4.5.3 Empirical Results

This section reports two-way fixed effect regression results of trading volume and explanatory variables of contracts' success. Regression coefficients are reported in Table 4.7.

As expected and similar with previous empirical studies, the cash market price volatility has a positive effect on the success of a contract. The higher the price variability, the higher the chances of contract success. Our findings are similar to Black's (1986), Cornell (1981), Fratscher (2006) and Tashjian and Weissman (1995), who found trading volume to be highly sensitive to cash market price volatility. This is however contrary to Corkish et.al. (1997) findings that the cash market volatility weakly support success. The findings confirm our hypothesis that cash market price variability is positively correlated with the trading volume and contract's success. Hence, contracts should be written on products with "high" price volatility.

Similarly, the size of the underlying market has a positive effect on the success of a contract. The larger the underlying market, the higher the chances of the contracts succeeding. Similar to Corkish, et. al. (1997), Black (1986), Tashjian and Weissman (1995), empirical results, spot market capitalization has a positive and significant effect on trading volume. Our results thus strongly support the hypothesis that the size of the underlying markets is positively related to the trading volume. Our findings also show that successful contracts benefit from a large cash market.

The liquidity of the cash market also has a positive effect on trading volume and hence on a contract's success. Both theoretical and empirical studies suggest that liquidity is an important requisite of success and are positively related. Carlton (1984) found liquidity as positively correlated to trading volume. Cuny (1993) shows that the optimal futures contract attracts a sufficiently large set of non-hedgers when the market is liquid. Chordia et.al. (2000) similarly finds that market liquidity increases trading activity and thus volume. As the other explanatory

variables and similar to other empirical results, market liquidity significantly influences contracts' success. Our findings thus support the hypothesis that market liquidity positively affects trading volume and that contracts established on liquid cash markets have higher chances of being successful.

Table 4.7: Empirical Results

VOL	Coeff	t-stat
SIZE	1.7677 (.457)	3.87***
CMVOL	1.8359 (.917)	2.00**
MLIQ	1.2657 (.271)	4.66***
DFIRST	2.6681 (.320)	8.34***
DFUT	-1.8953 (.356)	-5.32***
DNON-CRISIS	0.4790 (0.370)	1.29
DHIE	0.1533 (0.368)	0.42
Constant	-6.5143 (2.554)	-2.55**
R Squared	0.3852	
Obs.	165	
F -test	14.05	

Note: The table reports the results for the regression:

$$VOL_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 CMVOL_{it} + \beta_3 MLIQ_{it} + \beta_4 DFIRST_{it} + \beta_5 DFUT_{it} + \beta_6 Period\ Dummies_{it} + \beta_7 Market\ Dummies_{it} + e_{it}$$

The dependent variable VOL (used as the proxy for success) is the annual trading volume for each contract i at time t . The main explanatory variables include: SIZE which is the size of the underlying market measured by market capitalization. CMVOL is the cash market price volatility and is obtained by the annualized standard deviation of logarithmic return of daily closing prices; $\ln(c_t/c_{t-1})$ where C_t is the closing price on day t (Bacha and Villa, 1993). MLIQ refers to liquidity of the cash market and is measured by turnover velocity. The following dummy variables are introduced in the model. DFIRST is a dummy variable taking the value of 1 if the contract was the first one to be introduced in the exchange, otherwise a 0. DFUT is also a dummy variable taking the value of 1 if it is a futures contract and 0 if it is an option. DNON-CRISIS is a period dummy taking the value of 1 for non-crisis years and 0 for crisis years. DHIE is a market dummy taking the value of 1 for high/upper income economies, otherwise 0. The model was estimated by a two-way fixed effect model incorporating both the time effect (year dummies) and group effect (market dummies). Robust t-statistics shows standard errors (presented in parenthesis) and are adjusted for heteroscedasticity (White 1980). Values significantly different from zero at 10%, 5% and 1% significant levels presented by *, ** and *** respectively.

As for dummy variables, the results confirm our hypothesis. DFIRST which took a value of 1 if it's the first contract and 0 if option contract, has a positive coefficient. This shows that the first contract introduced in a new exchange has higher likelihood of being successful compared to other contracts, similar to our expectations. DFUT has a negative coefficient similar to our expectations. This therefore means that futures contracts has less chances of being successful compared to option contracts. The Period dummy, DNON-CRISIS which took a value of 1 for non- crisis years and 0 for crisis period, has a positive coefficient as expected. This means that trading volume is normally high in non-crisis period compared to crisis years. Similarly, the Market dummy also has a positive coefficient as hypothesized. In high or upper middle income economies since the per capita income is higher and better economic conditions, then the trading volume will be higher compared to low income economies.

In conclusion therefore, our model works well in explaining contracts success using trading volume as the success proxy. The explanatory variables have positive signs and are significantly different from zero at 5% significant level. We therefore reject the null hypothesis that all coefficients are zero or insignificant. Empirical results support hypothesis that the size of the underlying cash market (SIZE), the cash market price volatility (CMVOL), and market liquidity (MLIQ) are all positively correlated with the trading volume. Also, the dummy variables DFIRST, DNON-CRISIS and DHIE are positively correlated with the trading volume while DFUT is negatively related with the trading volume. Our main explanatory variables can thus be relied on as some of the factors influencing trading volume and hence determinants of contracts success.

4.5.4 Robustness Check

The robustness of our model results is explored by altering and adding various other variables that may affect contract success. The results are as presented in Table 4.8.

Column A presents our model and is reproduced for reference with the other models. In Column B, we include the contract size¹¹⁸ (CSIZE). As can be seen from the expanded data set, there is no significant changes on the explanatory powers of the independent variables. They all remain positive. While SIZE and CMVOL coefficients reduce slightly, MLIQ coefficient

¹¹⁸ Calculated as product of (Closing price x multiplier x volume) converted to \$US. For comparison purposes, we use the volume of one contract and hence, we can re-write the equation as (Closing price x multiplier).

increases minimally. The t-statistics for SIZE, CMVOL and MLIQ remains significant at 5% significant levels. The R squared increases slightly as one more variable is added to the model while the F test reduces a little. Basically, the model still performs similar to original model.

Table 4.8: Robustness Check

	(A) Original Model	(B) With Contract Size	(C) With Economic and Political Indicators	(D) With FMVOL instead of CMVOL
SIZE	1.7677***	1.4704***	1.6855***	1.4170**
CMVOL	1.8359**	1.6378***	1.9765***	
MLIQ	1.2657***	1.3414***	0.9727***	-0.2316
Csize		0.2027**		
GDPPC			1.1061**	
GDPGR			0.6911	
INF			-3.9705	
FMVOL				1.6278**
DFIRST	2.6681***	2.6369***	2.7299***	2.4983***
DFUT	-1.8953***	-1.9999***	-2.0588***	
DNON-CRISIS	0.4790	0.0910	0.3917	0.5090
DHIE	0.1533	-1.9999***	-0.8919	1.9957
Constant	-6.514**	-5.8864**	-8.8306***	-5.4220**
R Squared	0.3852	0.4009	0.4195	0.4328
Obs	165	165	165	111
F-test	14.05***	13.05***	11.13***	13.23***

The table reports the robustness of our model (Column A) in comparison to other models with various adjustments to the original model. The dependent variable VOL (used as the proxy for success) is the annual trading volume for each contract i at time t . The main explanatory variables include: SIZE which is the size of the underlying market measured by market capitalization. CMVOL is the cash market price volatility and is obtained by the annualized standard deviation of logarithmic return of daily closing prices; $\ln(c_t/c_{t-1})$ where C_t is the closing price on day t (Balla and Villa, 1993). MLIQ refers to liquidity of the cash market and is measured by turnover velocity. DFIRST is a dummy variable taking the value of 1 if the contract was the first one to be introduced in the exchange, otherwise a 0. DFUT is also a dummy variable taking the value of 1 if it is a futures contract and 0 if it is an option. DNON-CRISIS is a period dummy taking value of 1 for non-crisis years and 0 for crisis years. DHIE is a market dummy taking the value of 1 for high and upper middle income economies and 0 for lower income economies. In columns B, C and D, we alter the original model by introducing several other factors to check for robustness. In Column B we add the contract size (Csize) to the model calculated as the product of closing price, and the multiplier converted to USD. In Column C, we capture the economic and political indicators which include the GDP per capita (GDPPC), the GDP growth rate (GDPGR) and the inflation rates (INF) all data obtained from the World Bank and IMF. In Column D, we replace the cash market variability with the futures markets variability. The models were estimated by a two-way fixed effect model incorporating both the time effect (year dummies) and group effect (market dummies). Values significantly different from zero at 10%, 5% and 1% significant levels presented by *, ** and *** respectively.

In Column C, we include economic and political indicators to capture how they might affect products success. These indicators are GDP per capita (GDPPC), growth rate (GDPGR) and inflation rates (INF). All the explanatory variables have positive signs and their t-statistics remains significant at 5% significant levels. SIZE and MLIQ declines slightly while CMVOL increases in explanatory power.

In Column D, we use futures contract variability (FMVOL) instead of the cash market variability (CMVOL). The coefficient for SIZE still remains positive and statistically significant at 5% significant level. Similar to cash market price variability, futures market volatility (FMVOL) is positively related to trading volume and has a positive sign significant at 5% significant levels. However, the market liquidity contrary to expectation has a negative which is insignificant at 5% significant levels. The inclusion of FMVOL therefore leads to the lack of significance for the estimated market liquidity.

In conclusion, the results presented in Columns B and C and D are qualitatively similar to those in Column A. SIZE, CMVOL, and MLIQ¹¹⁹ has positive signs and values are different from zero at 5% significant levels. There is only slight loss or increase for some of the coefficients explanatory power. The F values in the different panels are also significant at 1% significant levels. The findings support that our model is strong and robust.

4.6 Conclusion

This chapter looks into the indicators or determinants of derivatives products success which were analyzed through the development of a contract's success determining model. An empirical analysis was carried out and variables that influence contracts trading volume which in turn determine contracts' success were identified. From our findings, the explanatory variables, the size of the underlying market (SIZE), the cash market variability (CMVOL) as well as the market liquidity (MLIQ) can be relied on to determine the likelihood of a contract being successful once introduced. The variables have positive coefficients with high explanatory powers. The values adjusted for heteroscedasticity are different from zero at 5% significant levels. When tested for robustness, our model is extremely robust and works well in influencing contract success. In conclusion therefore, we have shown there is a strong quantitative way of determining the likelihood of a contract's success which in turn enhances derivatives products and by extension, derivatives exchange success.

¹¹⁹ Except for Column D using FMVOL

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This paper has attempted to shed light on the successful introduction of derivatives exchange. The main focus was on financial derivatives exchange in emerging markets. We first stated that it is important to establish a derivatives market when there is a high probability of success. This therefore prompted us to explore *what a successful derivatives exchange is* or *what lead's to success in some derivatives exchange while others fail* i.e. what are the factors or determinants of successful derivatives markets. This was analyzed in two main sections; (i) the necessary factors prior to the establishment of the exchange (determinants of derivatives exchange) and, (ii) the important factors after the establishment of the derivatives exchange. To a great extent, the success of the derivatives exchange after its establishment largely depends on the success of the products traded. We thus empirically analyzed the factors that influence (determinants of) derivatives products success. The two sections are briefly summarized below;

5.1.1 Determinants of Derivatives Exchange Success

Prior to the establishment of a derivatives exchange, there are various factors that a market should consider to evaluate whether it is ready. As discussed, there are various factors which signify higher chances of derivatives exchange success. From our findings, these indicators are as summarized;

5.1.1.1 Economic Factors

They refer to the market's economic factors which indicate whether the economy is capable of supporting derivatives market development. They comprise both the macroeconomic and microeconomic factors such as the GDP, GDP growth rate, inflation rates, unemployment rates, interest rates, among others. Favorable economic factors (e.g. high GDP, high growth rates, low inflation rates, low unemployment rates and interest rates) indicate that the economy is ready to support derivatives market development. A derivative exchange introduced on such an economy was found to have a higher probability of being successful.

5.1.1.2 Political Stability

It refers to the political climate in a country that may support or inhibit capital market development and by extension the derivatives market development. Political instability can be measured by various factors such as political instability index which incorporates index of underlying vulnerability and an economic distress index. Other indicators of political instability as discussed include massive protests against the government, frequent changes in presidents or his cabinet members, coup d'état among others. Generally, when there is political instability, there is less likelihood of a derivatives market developing or being successful. Political stability was thus found to be important for derivatives success since the desirability and effectiveness of a derivatives exchange depends primarily on the political state of the country concerned.

5.1.1.3 Legal and Regulatory Framework

Both government regulations and a self-regulatory structure in which most exchanges operate are usually needed. Governments should clearly define and implement the regulatory structure while the exchange should enhance self-regulatory systems compatible with the degree of market development. The legal and regulatory framework should stipulate standards on areas like accounting rules to be followed, disclosure requirements, specific derivatives laws and tax environment, among others. The legal and regulatory framework are intended to make derivatives markets more transparent and efficient and less susceptible to disruptions and distortions thus boosting their likelihood of being successful.

5.1.1.4 Infrastructural System

Derivatives exchange should have sound infrastructural system. Some of the important features of a good infrastructure which support a well-functioning market operation include: clearing and settlement systems; market making mechanisms; information dissemination systems; price stabilization features like circuit breakers; exchange ownership, monitoring, control and enforcement systems. The infrastructural system is thus very vital in an exchange as it ensures a smooth, transparent and efficient operation of the exchange. In designing the infrastructure, it's critical to use up-to-date technology to support the numerous operations required.

5.1.1.5 Capital Market Development

Development of the capital market to a great extent determines the development and success of derivatives exchange. Derivatives markets derive their products from the underlying cash markets products. High and increasing trends of capital market variables like market capitalization, liquidity, volatility and the number of listed companies indicates the capital market readiness to support derivatives exchange establishment and development. Contrary to the findings of Tsetsekos and Varingas (1997, 2000) whose results did not find any indicators for market readiness, we find the underlying capital market variables to determine the likelihood of a contracts' success. If the capital market is developed, then, there is a high likelihood that a derivatives market built on such a capital market will be successful and vice versa. Capital market is categorized into stock market and bond market. According to our findings, the stock market development was found to greatly determine derivatives market success. The development of the capital market on the other hand however, largely depends on the financial structure of the given country especially among emerging markets. In a market-based system, a capital market has higher chances of developing and hence a derivatives market has higher probability of succeeding as opposed to bank-based system.

5.1.1.6 Education

Proper education to all the participants involved is very important for the success of derivatives markets. Key players include the brokers, staff, government authorities, investors as well as the general public. It can be done through workshops, brochures, radio programs etc. The participants should be well informed on derivatives products and trading, as well as rules and regulations guarding them. Those markets that conducted intensive and extensive educational programs before establishment of the derivatives exchange were found to be more successful.

5.1.1.7 Investor

By and large, it's the investors who actually buy and sell the derivatives products that are the key to its success. If the investors are many and active, there will be high trading volumes and thus successful markets, but when the investors are few or inactive, there will be low or no trading activity leading to failure. Investors can be either domestic or foreign as well as retail or institutions. Markets should always ensure that all necessary precautions are taken to attract as

many investors as possible. When designing products, exchange should bear in mind the targeted segment of investors and meet their demands. Usually, new emerging markets can greatly benefit if they attract foreign investors who are more experienced in derivatives trading. The governments should ensure a broad domestic and foreign participation in the process and enhance investor's confidence.

5.1.1.8 Feasibility Study

Feasibility study is vital to determine when the derivatives market should be established. Such a study should investigate the extent to which other preconditions of a successful derivatives exchange are observed, identify key areas of weakness, and formulate plans to address these areas. There is no point in proceeding with the design of the exchange and the products to be traded until this analysis is conducted. Through a well detailed study, a market is able to determine if it's ready or when it will be ready to start derivatives trading. As discussed, most markets, developed or emerging, carried detailed study before establishing derivatives exchanges and products to assess its probability of being successful.

5.1.2 Factors influencing Derivatives Products Success

An empirical analysis was conducted and a success model was developed to determine the success of contracts which in turn determine the success of products. We found the success of derivatives contracts measured by trading volume to be highly influenced by the size of the underlying cash market, the market liquidity as well as the cash market price variability. Our findings, similar to most empirical studies strongly supported that to enhance success, contracts should be introduced on a large underlying market with great liquidity and experiencing high price variability.

5.2 Conclusion

Derivatives' trading has immense benefits though carrying some risks as well. Emerging markets should strive to establish derivatives market to enjoy the benefits of derivatives trading enjoyed by most developed markets. In most emerging markets, development of derivatives exchanges, along with stock markets, sends a message to international investors that the market can be relied on. Derivatives markets are also, to some extent, complementing developments in the stock markets in many countries. However, emerging markets should not just establish

derivatives markets blindly but ought to assess the prevailing conditions, to determine the probability of the exchange being successful. All the necessary measures need be laid down to boost success. Economic development and political stability are very important. The legal and regulatory framework should be strong enough to protect the investors but not too strong to inhibit growth. The infrastructural system should be operational with up-to-date technology. Key emphasis ought to be on the education for the market participants. A large and active investor pool also needs to be attracted to the market. For products success, we have stated that key focus should be on the size of the underlying market, the cash market price variability as well as the market liquidity. Failure to analyze these conditions usually through a feasibility study may lead to higher chances of unsuccessful derivatives exchange. It is only after all or most of the conditions are met and determinants are favorable, which increases the probability of success, as discussed in this paper, that a derivatives' exchange can be established.

5.3 Recommendations

Given the benefits of derivatives trading, more and more emerging markets are establishing derivatives exchanges and even performing similarly or better than¹²⁰ developed markets. To establish a derivatives exchange, emerging markets can consider several alternatives; *first*, they can introduce derivatives markets as an independent exchange or as a department or division in the existing stock market. Going by the trend in many emerging markets, most of them have derivatives market as a division of the existing capital market. Even the few markets that started a futures market as an independent exchange¹²¹ were later merged. In developed markets as well, cases of joint ventures, mergers and acquisitions¹²² are common. *Secondly*, instead of establishing an own market, emerging markets can form joint ventures with already successful derivatives exchanges. New exchanges will benefit from the technology and know-how of existing exchanges and existing exchanges (their members) can gain access to a potentially high growth emerging market. *Thirdly*, emerging markets can first design and list

¹²⁰ The JSE was the largest single stock futures market followed by India's NSE, in 2008 while Korea Exchange has been among the top exchanges in the world in number of contracts traded.

¹²¹ Examples include; BM & F Bovespa (Bolsa de Mercadorias & Futuros); Korea Exchange (KOFEX and Korea Stock Exchange).

¹²² Examples include: Australia Securities Exchange (Sydney Futures Exchange and Australian Stock Exchange); CME Group (Chicago Mercantile Exchange, Chicago Board of Trade, and New York Mercantile Exchange); CBOE Holdings (Chicago Board Options Exchange and CBOE Futures Exchange); Eurex (Eurex, and International Securities Exchange).

their products in well established derivatives exchange so as to gain popularity. For example, derivative instruments on Latin American stocks are traded in Chicago and not in their countries. *Lastly*, markets in same geographical region especially those that have cross-listed companies on their capital markets, can establish a regional derivatives market.

As for the products to be traded, most emerging markets first introduce equity derivatives followed by interest rates and finally currency products. Index-based and interest rate derivative products stand a relatively better chance of being successful if introduced first. Markets should first introduce simple products that are easier to understand and trade and once the investors become familiar and comfortable with derivatives trading, then other complex products can be introduced.

For further research, scholars can also look into how various others factors not carried out in this dissertation may affect the success of the contract. For example, how do the fees charged by the exchange or brokers affect its success? What about the tick size and value? How do pricing affects a contract's success? It would also be advisable to carry out an empirical analysis on the determinants of derivatives exchange and develop an exchange's success determining model.

REFERENCES

- Abonyi, G. 2005. *Policy Reform in Indonesia and the Asian Development Bank's Financial Sector Governance Reforms Program Loan*. ERD Working Paper Series No. 76, Economics and Research Department, Asian Development Bank.
- Akhtar, S. 2002. *Demutualization of Stock Exchanges; Problems, Solutions, and Case Studies*. East and Central Asia Department, Asian Development Bank.
- Allen, F. and D. Gale. 1994. *Financial Innovation and Risk Sharing*. MIT Press.
- Altman, I. E., 1968. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, Vol. XXIII No. 4 September 1968.
- Anderson, R.W. 1984. "The Industrial Organization of Futures Markets; A Survey." *The Industrial Organization of Futures Markets*, Lexington Books, Lexington, Massachusetts: 1-33.
- Ansari, A, Mian A, Said A, Janjua Iqbal I, Kamal Imran and Cassim Nihal, eds. 2006. *Feasibility of Introducing Exchange Traded Derivatives in Pakistan*. Securities and Exchange Commission of Pakistan.
- Bacha, O.I. and F.Villa. 1993b. *Futures Markets, Regulation and Volatility: The Case of the Nikkei Stock Index Futures Markets*. Working Paper 92-93, Boston University.
- Bacha, O.I., Ibrahim A.J., and Othman K. 1999. *Issues in Stock Index Futures Introduction and Trading. Evidence from The Malaysia Index Futures Market*. MPRA Paper No. 13075. <http://mpa.ub.uni-muenchen.de/13075/> (accessed Feb 25, 2009).
- Basle, 1999. *Market Liquidity: Research Findings and Selected Policy Implications*. Bank for International Settlements, May 3rd, 1999.
- Bessembinder, H. and P. Seguin. 1993. Price Volatility, Trading Volume and Market Depth: Evidence from Futures Markets. *Journal of Financial and Quantitative Analysis*, 28: 21 – 39.
- Black, G. D. 1986. Success and Failure of Futures Contracts: Theory and Empirical Evidence. *Monograph Series in Finance and Economics* 1986-1.
- Brink, C.H. 2004. *Measuring Political Risks: Risks to Foreign Investments*. Ashgate Publishing, UK.
- Bulgaria Stock Exchange, 2004. *Feasibility Study for a Financial Derivatives Market*. Capital Markets Research, Ref No. 223.
- Capital Market Supervisory Agency and Non Bank Financial Institution Supervisory, 2007. *Policies, Initiatives, Incentives and Investment Opportunities in Financial sector in Indonesia*.
- Carlton, D.W. 1984. Futures Markets; Their Purpose, Their History, Their Growth, Their Successes and Failures. *Journal of Futures Markets*, Vol 4, No. 3 (fall): 237-271.

- Cornell, B. 1981. The Relationship Between Volume and Price Variability in Futures Markets. *Journal of Futures Markets*, Vol. 1, No. 3 (fall), 303 - 316
- Choe, H., Kho B. C., and M.R. Stulz. 1999. Do Foreign Investors Destabilize Stock Markets? The Korean Experience in 1997. *Journal of Financial Economics* 54: 227-264.
- Chordia, T., Roll, R., and A. Subrahmanyam. 2000. Market Liquidity and Trading Activity. *Journal of Finance*, Vol. 56, Issue 2, 501 - 530.
- Corkish, J., Holland A., and A.F. Vila. 1997. *The Determinants of Successful Financial Innovation: An Empirical Analysis of Futures Innovation on LIFFE*. Bank of England, ISSN 1368-5562
- Corsetti, G., Paolo P., and R.Nouriel. 1998. What caused the Asian Currency and Financial Crisis?, *NBER Working Paper 6833*, December 1998.
- Cuny, C. 1993. *The Role of Liquidity in Futures Market Innovation of Future Contracts*. Review of Financial Studies, 2: 275 – 296.
- Damgard, J.2005. *Trends in Global Futures Market*. 2005 International Futures Semina, Taipei, Taiwan.
- Dardanoni, V. 2005. *Multivariate Ordered Logit Regressions*. Department of Economics, University of Palermo, Viale Delle Science, 90128 Palermo.
- Das, S. 1994. *Swaps and Derivatives Instruments* 2nd Ed., Law Book Company, Sydney/McGraw-Hill, Chicago: Chapter 1 and 19.
- Datar, M. K. 2000. *Stock Market Liquidity: Measurements and Implications Capital Market Conference*. Fourth Capital Market Conference December 2000.
- Denis, D.J. 1994. Organizational form and the consequences of s highly leveraged transactions Kroger’s recapitalization and Safeway’s LBO. *Journal of Financial Economics*, 36: 193-224.
- Duffie, D. and M. Jackson. 1989. Optimal Innovation of Futures Contracts’. Review of Financial Studies, 2: 275- 96.
- Ederington, L.H. 1979. The Hedging Performance of the New Futures Markets. *Journal of Finance*, 34: 157 – 170.
- Erdogan, O. and O. Kayacan. 1998. *When to Start Trading Financial Derivatives: The Example of the Istanbul Stock Exchange*, ISE Review, Vol. 2 No.5.
- Erelcin, A.D. 2006. *Development of Financial Markets in Turkey*. HSBC, Yatrim. IIFA.

- Figlewski, S. 1985. Hedging with Stock Index Futures: Theory and Application in a New Market. *Journal of Futures Markets*, 5: 183 – 199.
- Financial Standards Foundation. 2008. *Turkey: Objectives and Principles of Securities Regulation*.
- Flyvbjerg, F. 2004. *Five Misunderstandings about Case-study Research*. In C. Seale, G. Gobo, J. F. Gubrium, and D. Silverman, eds., *Qualitative Research Practice*. London and Thousand Oaks, CA: Sage.
- Fratzscher, O. 2006. *Emerging Derivatives Markets in Asia; Asian Financial Market Development*. The World Bank, March 2006.
- Garbade, K.D., and W.L., Silber. 1982. Cash Settlements of Futures Contracts: An Economic Analysis. *Journal of Futures Markets*, Vol. 3, No. 4: 451-472
- Gennotte, G. and H.Leland. 1994. *Low Margins, Derivative Securities, And Volatility*. Review of Futures Markets, 1994, vo13 (3): 709-742.
- Ghysels, E. and J.H. Seon. 2000. *The Asian Financial Crisis: The Role of Derivatives Securities Trading and Foreign Investors Scientific Series*. Centre of Interuniversity's Research and Analysis Organization (CIRANO), Quebec, March 2000.
- Gray, R.W. 1966. *Why Does Futures Trading Success or Fail: An Analysis of Selected Commodities*, in Proceedings of the Futures Trading Seminar, Vol. III, Chicago Board of Trade: 115 – 137.
- Greg, B. 2002. *Abdurrahman Wahid: Muslim Democrat, Indonesian President*. Singapore: UNSW Press.
- Guo, H. 2002. *Stock Market Returns, Volatility, and Future Output*. Federal Reserve Bank of St. Louis, September/October 2002.
- Gupta, R. 1995. *Badla Trading: A Primer and a Proposal*” Indian Institute of Management Ahmedabad. Research and Publication Department in its series IIMA Working Papers with number 1253, 01 May 1995.
- Gloubos G. and T. Grammaticos. 1988. *Success of bankruptcy prediction models in Greece*. Studies in Banking & Finance, International business failure prediction models. vol. 7: 37- 46.
- Helper, S. 2000. Economics and Field Research: “You can Observe a Lot Just by Looking.” *American Economic Review* 90(2, May): 228-32.
- Herwidayatmo, 2003. *Rebuilding Market Confidence*. Presented in The 5th Round Table On Capital Market Reform In Asia, Tokyo.
- Ho, B. 2002. *Demutualization of Organized Securities Exchange in Hong Kong: The Great Leap Forward*. Law and Policy in International Business

- Hong Kong Exchange, 2000. *Asian Derivatives Markets*. Research and Planning Unit, HKEx. Feb 2000.
- Hong Kong Exchange, 2001. *Stocks Options Lead in Global Derivatives Trading*. Research Planning Unit, HKEx. Dec 2001.
- Hong Kong Exchange, 2003. *Success Factors for the Region's Derivatives Exchanges*. Research and Planning Unit, HKEx.
- Hong Kong Exchange, 2004. *Market-Making Mechanisms on the Stock Exchange*. Research and Planning Department, HKEx.
- Hsieh, S. 1993. A note on the optimal cutoff point in bankruptcy prediction models, *Journal of Business Finance & Accounting*, Vol 20, no. 3: 457 – 464.
- Hunter, C. W. and David M. 1999. *Thoughts on Financial Derivatives, Systematic Risks, and Central Banking: A Review of Some Recent Developments*. Federal Reserve Bank (System).
- India SEBI. 2002. *SEBI Advisory Committee on Derivatives, Development and Regulation of Derivative Markets in India*.
- Inoue, T. 2006. *Diversification of Stock Exchanges Trading Platform*. Nomura Capital Market Review, Vol. 9, No. 1: 41-53.
- International Monetary Fund, 1999. *The IMF's Response to the Asian Crisis*. January Factsheet
- Jobst, A. A. 2006, Sovereign Securitization in Emerging Markets, *Journal of Structured Finance*, Vol. 12, No. 3.
- Jobst, A. A. 2007. *The Development of Equity Derivative Markets in Emerging Asia*. Working Paper, International Monetary Fund, Monetary and Capital Markets Department.
- Jobst, A.A. 2008. The Development of Equity Derivative Markets: An examination of current standards and challenges in emerging Asia, *International Journal of Emerging Markets*, Vol. 3.issue 2: 1163 – 180.
- Jones, F. 1987, Current techniques in bankruptcy prediction, *Journal of Accounting Literature*, 6: 131-164.
- Johnston, E.T., and J.J., McConnell. 1989. Requiem for a Market: An Analysis of the Rise and Fall of a Financial Futures Contract. *The Review of Financial Studies*, Vol. 2, No. 1: 1-23
- Kim, D.H. 2006. *Trade Promotion and Economic Development in Korea*. Korea Institute for Industrial Economics and Trade.
- Kim, W. and Wei S. J., 1999. *Foreign Portfolio Investors Before and During a Crisis*, NBER Working Paper 6968, February.

Kim, Y. K. 1998. *Launching Markets for Stock Index Futures and Options: Case of Korea*. ISE Review, Vol. 2 No.5.

Koh, H.C. 1992. The sensitivity of optimal cutoff points to misclassification costs of type I and type II errors in the going concern prediction context. *Journal of Business Finance and Accounting*, vol. 19, no. 2: 187-197.

Kolb, R. W. and J.A Overdahl. 2007. *Futures, Options and Swaps*. 5th ed. Blackwell Publishers. U.S.

KPMG, 2008. *Derivatives: International Tax Handbook. Indonesia*.
http://www.kpmg.com/SiteCollectionDocuments/Derivative_Tax_Handbook/Indonesia.pdf
(accessed April 15,2008).

KPMG, 2008. *Derivatives: International Tax Handbook. Korea*.
http://www.kpmg.com/SiteCollectionDocuments/Derivative_Tax_Handbook/Korea.pdf
(accessed March 24, 2008).

KPMG, 2008. *Derivatives: International Tax Handbook. Turkey*.
http://www.kpmg.com/SiteCollectionDocuments/Derivative_Tax_Handbook/Turkey.pdf
(accessed September 13, 2008).

Kwon, E., 2006. *The Pathway from Financial Liberalization to Crisis: A Comparative Case Study of Mexico and South Korea*. Paper presented at the 47th Annual Convention of the International Studies Association, San Diego, CA. March 22-25, 2006.

Labuszewski, J.W. 2009. *Financial Innovation in a Distressed Economy*. Presented at the 2nd Annual Financial Institution Risk Management Conference. Federal Reserve Bank of Chicago.

Levine, R. 1996. *Stock Market: A Spur to Economic Growth*. The World Bank, Finance and Development, Vol. 33, No.1.

Lin, P.C. and Chen, J.S. 2008. A genetic-based hybrid approach to corporate failure prediction *International Journal of Electronic Finance*, Vol. 2, No.2: 241 - 255.

Loader, D. 2005. *Clearing and Settlement of Derivatives*. Elsevier Butterworth-Heinemann. Great Britain.

Mala R. and Reddy M. 2007. Measuring Stock Market Volatility in an Emerging Economy *International Research Journal of Finance and Economics*, ISSN 1450-2887 Issue 8.

Marton, A. 1984. *How Much is Too Much? Brokers and Investors are being inundated with new futures contracts that they didn't ask for and don't understand*. Institutional Investor, Vol. 18, No. 8: 238 – 250

Mathieson, J. D, Schinasi J.G et al. 2000. *International Capital Markets, Developments, Prospects, and Key Policy Issues*. *World Economic and Financial Surveys*. International Monetary Fund.

- Matif, S.A. 1993. *The World's Futures & Options Markets. The EFFAS (European Federation of Futures Analyst Society)*. European Bond Commission, Cambridge, England.
- McInish, T.H. 2000. *Capital Markets: A Global Perspective*. Blackwell Publishers: 282 -309.
- Merton, R., C. and Bodie Z. 1995. *The Global Financial System: A Functional Perspective*. Harvard Business School Press.
- Mullins, G.E. 2000. *Stock Market Volatility: Measures and Results Division of Business Economics*.
- Ngugi, W. R. 2003. *Development of the Nairobi Stock Exchange: A Historical Perspective*. KIPPRa Macroeconomics Division, Discussion Paper No. 27.
- Ngugi, W. R. 2003. *What Defines Liquidity of the Sock Market? The Case of the Nairobi Stock Exchange*. KIPPRa Macroeconomics Division, Discussion Paper No. 29.
- Ngugi, W. R. and R. Njiru. 2005. *Growth of the Nairobi Stock Exchange Primary Market*. KIPPRa Private Sector Development Division, Discussion Paper No. 47.
- Odell, J. S. 2001. Case Study Methods in International Political Economy. *International Studies Perspectives* April.
- Ooghe, H., Joos P. and D. DeVos. 1991. *Failure prediction models*, Working Paper, Department of Business Finance (RUG), Gent, 213.
- Ooghe H., Joos P. & C. De Bourdeaudhuy, 1995. Financial Distress Models in Belgium: The Results of a Decade of Empirical Research, *The International Journal of Accounting*, vol. 30, no. 3: 245-274.
- Oral, E. and K. Murad. 1998. *When to Start Financial Derivatives Trading? The Example of Istanbul Stock Exchange*. ISE Review, Vol. 2 No.5.
- Ozatay, F. and G. Sak. 2002. *The 2000-2001 Financial Crisis in Turkey*. Central Bank of Turkey and Ankara University.
- Pardy, R. 1998. *Feasibility of Exchange- Traded Financial Derivatives in Indonesia*. Analit Capital Market Consulting under contract from the Asian Development Bank.
- Park, Y. C. and C.Y. Song. 1999. *Financial Contagion in the East Asian Crisis - With Special Reference to the Republic of Korea*. Working paper, Korea University and Kookmin University.
- Pennings, J. M. E. 1998. The Information Dissemination Process of Futures Exchange Innovations A Note. *Journal of Business Research*, Vol. 43, Issue 3: 141-145
- Pin, J.A, and Marcel, R. 2008. *Essays on political instability: Measurements, causes and consequences*. University of Groningen, Dissertation.

- Powers, M.J. 1967. Effects of Contract Provisions on the Success of a Futures Contract. *Journal of Farm Economies*, Vol. 49, No. 4: 833 – 843.
- Radelet, S. and J. Sachs. 1999. *The Onset of the East Asian Financial Crisis*. Working paper, Harvard University.
- Randall, D. 2003. *Consequences of Liberalizing Derivatives Markets* Derivatives Study Center. Financial Policy Forum, Washington D.C.
- Randall D. 2004. *Derivatives Markets: Sources of Vulnerability in U.S.* Financial market Derivatives Study Center, May 15, 2004.
- Remolona, E.M. 1992. *The recent growth of financial derivative markets*, Quarterly Review, Federal Reserve Bank of New York, issue Win: 28-43.
- Robert, A. Strong. 2005. *Derivatives: An Introduction*, 2nd ed. Thomson South-Western, U.S.
- Robinson, R.D. 1963. *The First Turkish Republic; a Case Study in National Development*. Harvard Middle Eastern studies. Cambridge: Harvard University Press: 367.
- Rutledge, D.J.S. 1979. *Trading Volume and Price Variability: New Evidence on the Price Effects of Speculation*. International Futures Trading Proceedings. Board of Trade of the City of Chicago
- Roll, R. 1984. A Simple Implicit Measure of the Effective Bid – Ask Spread in an Efficient Market. *Journal of Finance*, 4 : 1,127 – 39.
- Saha, S. 2005. *Stock Exchange Demutualization and Self Regulation*. Securities and Exchange Board of India.
- Sandor, R.L. 1973. Innovation by an Exchange: A Case Study of the Development of the Plywood Futures Contract, *Journal of Law and Economics*, Vol. 16, No. 1: 119 – 136.
- Sarr, A., and T. Lybek. 2002. *Measuring Liquidity in Financial Markets*. IMF Working Paper.
- Sayar, Z.A.R. 2004. *How Should IFRS Be Enforced? The Experience of Turkey*. Russian Corporate Governance Roundtable Meeting.
- Shalahuddin, H. 2002. Who Actually has Jurisdiction Over The Indonesia Financial Futures Market. *Manajemen dan Usahawan Journal*, Vol. 31, No. 03: 3-6.
- Soesastro, H. The Economic Crisis in Indonesia: Lessons and Challenges for the Governance and Sustainable Development.
- Shin, P.H. 2005. *The Impact of Electronic Trading System on Secondary market*. Korea Stock Exchange
- Soon, C.1994. *The Dynamics of Korean Economic Development*. ISBN paper 088132-162-1.

Silber, W.L. 1981. Innovation, Competition, and New Contract Design in Futures Markets, *Journal of Futures Markets*, Vol. 1 No. 2: 157 – 159.

Svensson, J. 1998. *Investment, Property Rights and Political Instability. Theory and Evidence*. European Economic Review, 42: 1317-134

Takacs, H.A. 1995. *Feasibility Study Derivatives Trading in Slovakia*. Reference project managed on behalf of Wiener Börse AG (Vienna Exchange).

Tashjian, E. 1995. *Optimal Futures Contract Design*. Quarterly Review of Economics and Finance, Volume 35 Number 2, summer 1995.

Tashjian, E., and M., Weissman. 1995. Advantages to Competing with Yourself: Why an Exchange Might Design Futures Contracts with Correlated Payoffs. *Journal of Financial Intermediation*, 4: forthcoming

Tesler, L. 1981. Why There Are Organized Futures Market. *Journal of Law and Economics*, 24: 1-22

The World Bank Research Observer, vol. 15, **88** no. 1 (February 2000).

Thomas, S. and S. Ajay. 2007. *A Case Study of the Indian Equity Derivatives Market*. Colombo Stock Exchange.

Thomas, S. and S. Ajay. 2007. *Launching a Derivatives Market on Seven Easy Steps*. Colombo Stock Exchange.

Topbas, O.G. 2007. *Banks and Securities Services in Turkey*. Presented at Turkish Bankers Association, Citibank A.S.

Tsetsekos, G., and P.Varangis, 1997. *The structure of Derivatives Exchanges: Lessons from developed and Emerging Markets*. Policy Research Working Papers No. 1887, World Bank, Development Economics and Department.

Tsetsekos G., and P.Varangis, 2000. *Lessons in Structuring Derivatives Exchanges*. The World Bank Research Observer, Vol 15, no. 1: 85-98.

Unis, M. 1998. *The Right Time to Introduce a Derivatives Market*. Sao Paulo Stock Exchange-BOVESPA. ISE Review, Vol. 2 No.5

van der Bijl, R. 1997. *Exchange-Traded Derivatives in Emerging Markets: An Overview*. Presentation at the Commodity Futures Trading Commission International Regulatory Training Seminar, Chicago, Ill., October 20. Processed.

Vedat, A.1998. *The Impact of Financial Innovation and Risk Management on Economic Performance*, ISE Review, Vol. 2 No.5.

White, H. 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test of Heteroskedasticity. *Econometrica* 48: 817 - 838

Working, H. 1953. Futures Trading and Hedging. *American Economic Review*, Vol. 43, No. 3, pp 314 – 343, as reprinted in *Selected Writings of Holbrook*, (Board of Trade of the City of Chicago, 1977): 139 – 163.

Wyss, R.V. 2004. *Measuring and Predicting Liquidity in the Stock Market*. Ph.D. Dissertation No. 2899, The University of St. Gallen.

Yin, R. K. 1984. *Case study research: Design and methods*. Newbury Park, CA: Sage

Zavgren, C.1983. The prediction of corporate failure: the state of the art, *Journal of Accounting Literature*, vol. 2: 1-33.

Online sources:

"Database and Development Indicators ." Economics and Statistics.
<http://www.adb.org/> (accessed October 16, 2008).

Dorety, Tom. "credit union conversions to mutual savings banks.." *Credit Union National Association Hearing 1* (2006): 1-9.

Hazart, Patrick. "Statistics." WFE: World Federation of Exchanges. <http://www.world-exchanges.org> (accessed September 18, 2008).

"Hong Kong Exchanges and Clearing Limited." Hong Kong Exchanges and Clearing Limited. <http://www.hkex.com.hk> (accessed February 7, 2008).

"IMF -- International Monetary Fund Home Page." IMF -- International Monetary Fund Home Page. <http://www.imf.org> (accessed May 25, 2008).

"Istanbul Stock Exchange." Istanbul Stock Exchange. <http://www.ise.org> (accessed June 23, 2008).

"JSE Limited ." JSE Limited . <http://www.jse.co.za/> (accessed May 12, 2008).

"Korea's Economy." AsianInfo.org.

<http://www.asianinfo.org/asianinfo/korea/economy.htm> (accessed August 17, 2008).

"KRX(Korea Exchange)." KRX(Korea Exchange). <http://www.krx.co.kr> (accessed December 26, 2007).

"Market Data ." Turkish Derivative Exchange .

<http://www.turkdex.org.tr/VOBPortalEng/DesktopDefault.aspx> (accessed May 13, 2009).

"Market Data service." CME Group. <http://www.cmegroup.com> (accessed March 24, 2009).

"Market Data." Taiwan Future Exchange. http://www.taifex.com.tw/eng/eng_home.htm (accessed February 12, 2009).

"Market Data." Thailand Future Exchange. <http://www.tfex.co.th> (accessed March 17, 2009).

"Market Information." National Stock Exchange of India Limited. www.nseindia.com (accessed September 15, 2008).

"Nairobi Stock Exchange." Market Statistics. www.nse.co.ke/newsite/inner.asp?cat=Stats (accessed November 23, 2007).

"Safex FDD | JSE Limited ." Untitled Document. <http://www.safex.co.za/ed/> (accessed May 12, 2007).

"State Street Corporation Home Page." State Street Corporation Home Page. <http://www.statestreet.com> (accessed February 12, 2008).

"Statistics Indonesia." Statistics Indonesia. <http://www.bps.go.id> (accessed January 17, 2008).

"The World Factbook." Country or Location Economic issues. <https://www.cia.gov/library/publications/the-world-factbook/index.html> (accessed July 25, 2007).

APPENDIXES

Appendix 1A: Types of Derivatives

- **Forwards:** A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.
- **Futures:** A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardized exchange-traded contracts
- **Options:** Options are of two types - calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.
- **Warrants:** Options generally have lives of up to one year, the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.
- **LEAPS:** It refers to Long-Term Equity Anticipation Securities. These are options having a maturity of upto three years.
- **Baskets:** Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average or a basket of assets. Equity index options are a form of basket options.
- **Swaps:** Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are:
 - **Interest rate swaps:** These entail swapping only the interest related cash flows between the parties in the same currency.
 - **Currency swaps:** These entail swapping both principal and interest between the parties, with the cashflows in one direction being in a different currency than those in the opposite direction.
 - **Swaptions:** They are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaption is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions.

Appendix 1B: Benefits and Risks of Trading Derivatives

Why Introduce Financial Derivatives Products?

Countries introduce derivatives products for diverse reasons — but mainly due to economic rationale which is derived from three main sources: (i) economic incentives which includes the efficient price discovery as well as the need to share and hedge risk; (ii) restrictions and constraints on financial activity, including regulation, investment restrictions, and taxation of financial transactions; (iii) financial globalization, associated technological and methodological advances, which require more complex and comprehensive cross-border risk management strategies.

Economic rationale assumes gains from efficient price discovery and risk shifting. Derivatives' trading improves the allocation of resources, maintain efficient pricing and information flows, and act as a conduit for the transfer of risk within a country and even across countries. Additionally, they make more information publicly available which leads to lower transaction costs and thus better allocation of resources. (Peck 1985, Chang, Kaplan, and Knapp 1999,). Derivatives' trading also increases liquidity in the markets. As the risk-averse market participants (such as banks, farmers, processors, and traders) transfer their risk to other market participants willing to accept the risk, more participants are attracted to market who in turn increase the volume of transactions, thus contributing to the creation of a liquid market. Corporations use derivatives instruments mainly for hedging purposes while the common investors view derivatives as a powerful investment tools with many advantages over trading shares, including high liquidity, low transaction costs and leverage.

Derivatives like any other products, comes with benefits as well as risks. Some of the benefits as discussed include market efficiency, low transaction costs, risk sharing and transfer, capital intermediation, liquidity enhancement, price discovery, cash market development, hedging, increased volume and regulatory savings. However, there are several disadvantages of trading derivatives. There may be counter-party risk as either of the parties may fail to honor their obligation¹ and also high leverage due to the high number of traders attracted to the market.

¹ This however may not be a problem in ETD markets since the clearing house acts as the central counter party acting as a buyer to every seller and a seller to every buyer.

Financial derivatives may also pose great dangers to the stability of financial markets causing them to be termed as potential “weapons of mass destruction” especially with reference to the 1997 Asian financial crisis. These episodes of turbulence revealed the risks posed to market stability originating in features of derivatives’ instruments and markets. Consequently, all the risks inherent in financial instruments are also valid for derivatives. Further, critics argue that derivatives neither create nor destroy wealth, they merely transfer it (from hedgers to speculators) and hence, not much benefit to the overall economy.

It is thus important to introduce financial derivatives products due to the important role they play in the economy. They enhance *risk management* by transferring risk from those who wants to avoid the risk (risk averse) to those willing to take the risk (risk lovers). They also *generate income* from the premium charged when writing a contract. Derivatives are also used as building blocks in the creation of specialized products, a process referred as *financial engineering*. These roles are achieved through the effective interaction of the market key players — *Hedgers* (risk averse), *Speculators* (risk lovers), and *Arbitrageurs* to maximize the overall gains.

Appendix 1C: List of exchanges covered by Futures Industry Association (FIA) statistics and their traded derivatives

Exchange	Financial Derivatives						Non-Financial derivatives
	Equity Index futures	Equity Index options	Stock futures	Stock options	Interest rate products	Currency products	
1. American Stock Exchange		★			★		
2. Australian Stock Exchange	★	★	★	★			
3. Bolsa de Mercantile Futures, Brazil*	★	★			★	★	★
4. Borsa Italiana (Italian Derivatives Market)*	★	★	★	★			
5. Boston Options Exchange				★			
6. Bourse de Montréal*	★	★		★	★	★	
7. BOVESPA, Brazil		★	★	★			
8. Budapest Stock Exchange, Hungary*	★	★	★		★	★	★
9. Bursa Malaysia Derivatives Berhad*	★		★		★		★
10. CBOE Futures Exchange*	★						
11. Central Japan Commodity Exchange*							★
12. Chicago Board of Trade*	★	★			★		★

13. Chicago Board Options Exchange*		★		★	★		
14. Chicago Mercantile Exchange*	★	★	★		★	★	★
15. Dalian Commodity Exchange, China*							★
16. Eurex*	★	★	★	★	★		
17. Eurex US*	★				★	★	
18. Euronext*	★	★	★	★	★	★	★
19. Fukuoka Futures Exchange, Japan							★
20. HKEx*	★	★	★	★	★		
21. ICE Futures, UK*							★
22. International Securities Exchange		★		★			
23. JSE, South Africa*	★	★	★	★	★	★	★
24. Kansai Commodities Exchange, Japan							★
25. Kansas City Board of Trade, USA*	★						★
26. Korea Exchange*	★	★			★	★	★

27. London Metal Exchange, UK*							★
28. MEFF Renta FIJA of BME Spanish Exchanges*					★		
29. MEFF Renta Variable of BME Spanish Exchanges*	★	★	★	★			
30. Mercado A Termino De Buenos Aires (MATBA)							★
31. Mercado A Termino De Rosario (ROFEX)*						★	★
32. Mexican Derivatives Exchange (MEXDER)*	★	★	★	★	★	★	
33. Minneapolis Grain Exchange, USA*							★
34. National Stock Exchange of India*	★	★	★	★			
35. New York Board of Trade*	★	★				★	★
36. New York Mercantile Exchange*							★
37. New Zealand Futures Exchange	★			★	★		
38. OMX Exchanges*	★	★	★	★	★		
39. OneChicago*	★		★				

40. Osaka Mercantile Exchange							★
41. Osaka Securities Exchange	★	★		★			
42. Oslo Børs	★	★		★	★		
43. Pacific Exchange				★			
44. Philadelphia Stock Exchange		★		★		★	
45. Singapore Exchange (SGX)*	★	★	★		★		
46. Shanghai Futures Exchange*							★
47. Sydney Futures Exchange*	★	★	★		★	★	★
48. Taiwan Futures Exchange (TAIFEX)*	★	★		★	★		★
49. Tel-Aviv Stock Exchange	★	★			★	★	
50. The Tokyo Commodity Exchange*							★
51. Tokyo Financial Exchange*					★		
52. Tokyo Grain Exchange*#							★
53. Tokyo Stock Exchange*	★	★		★	★		
54. Turkish Derivatives Exchange	★				★	★	★

55. Warsaw Stock Exchange	★	★	★	★	★	★	
56. Wiener Börse, Austria	★	★	★	★			
57. Winnipeg Commodity Exchange, Canada*							★
58. Yokohama Commodity Exchange, Japan#							★
59. Zhengzhou Commodity Exchange, China							★
Total number of exchanges	33	31	19	26	26	16	29

★ Products offered by the exchange.

* Associate members of FIA.

#Yokohama Commodity Exchange merged into Tokyo Grain Exchange in April 2006

Appendix 1D: List of exchanges and their selected derivatives covered by World Federation of Exchanges (WFE) derivatives statistics

Exchange	Stock Index futures	Stock Index Options	Stock futures	Stock Options	Bond futures	Bond options
1. American Stock Exchange		★			★	
2. Athens Derivatives Exchange	★	★	★	★		
3. Australian Stock Exchange	★	★	★	★		
4. BME Spanish Exchanges	★	★	★	★		
5. Bombay Stock Exchange	★	★	★	★		
6. Borsa Italiana	★	★	★	★		
7. Bourse de Montréal	★	★		★	★	★
8. BOVESPA, Brazil		★	★	★		
9. Budapest Stock Exchange, Hungary	★	★	★	★		
10. Buenos Aires Stock Exchange				★		
11. Bursa Malaysia Derivatives Berhad	★				★	

12. Chicago Board of Trade	★	★			★	★
13. Chicago Board Options Exchange		★		★		
14. Chicago Mercantile Exchange	★	★				
15. Eurex	★	★	★	★	★	★
16. Euronext.liffe	★	★	★	★	★	★
17. HKEx	★	★	★	★	★	
18. JSE, South Africa	★	★	★	★	★	
19. Korea Exchange	★	★		★	★	★
20. Mexican Derivatives Exchange (MEXDER)	★	★	★	★	★	
21. National Stock Exchange of India	★	★	★	★		
22. OMX Exchanges	★	★	★	★	★	★
23. Osaka Securities Exchange	★	★		★		
24. Oslo Børs	★	★		★		
25. Philadelphia Stock Exchange		★		★		

26. Santiago Stock Exchange	★	★				
27. Singapore Exchange (SGX)	★	★			★	★
28. Sydney Futures Exchange	★	★	★		★	★
29. Taiwan Futures Exchange (TAIFEX)	★	★		★	★	
30. Tel-Aviv Stock Exchange	★	★			★	
31. Thailand Futures Exchange	★					
32. Tokyo Stock Exchange	★	★		★	★	
33. Warsaw Stock Exchange	★	★	★	★	★	
34. Wiener Börse, Austria	★	★	★	★		
Total number of exchanges	29	31	17	26	16	8

* Products offered by the exchange.

★ Exchanges not included in FIA statistics

Appendix 2A: Various Countries and when they Introduced Derivatives

Country	Name of the Exchange	Types of Derivative Instruments	First Derivatives Trading
Argentina	Buenos Aires Future Market; Buenos Aires Stock Exchange; Cordoba Stock Exchange; Rosario Futures Exchange; Futures and Options Market.	- forwards -futures -options	1907 May 1992
Australia	Sydney Futures Exchange Ltd.	-forwards (commodity, rate, currency) -futures (commodity, rate, currency) -options (commodity, rate, currency, shares, - swap.	1960: futures (commodity: wool)
Austria	The Austrian Futures and Options Exchange (OTOB)	-futures (public bond, -options (index, shares)	10.4.1991; Options
Belgium	Belgian Futures and Options Exchange (BELFOX)	-futures (index, p. bond. BIBOR) -options (shares, index, bond, U.S. dollar)	12.6.1991; Futures al public bond with 9% and 2.5 million Bel.francs value); April 1993: Futures (Bel 20
Brazil	Rio de Janeiro Stock Exchange The Commodities and Futures Exchange (BM&F); Over-the-Counter	-forwards (interest rate, cur- -currency ABD\$/R\$, DM/RS. shares) -futures (interest rate, currency, shares, Ibovespa index);	1845 1890 1979: Buy options 1984: Sell options (shares)
	The Sao Paulo Stock Ex.: The Brazilian Stock Exchange.	-options (interest rate, -- currency ABD\$/R\$, shares, Ibovespa futures);	
Canada	Toronto Futures Exchange. Vancouver Stock Exchange	-futures -options	1984: futures, options (index)
Colombia	Banco Andino Colombia.	-forwards (currency C.Peso/U.S.\$); -options (currency, in. rate)	Oplions (currency): 1995.
Denmark	Denmark Futures and Options Market (FUTOP).	-futures (shares, public bonds. index and so on) -option (shares. public bonds)	September 1988: First futures and options agreements (Mortgage bonds with 9% coupon rate, maturing in 2006)

Ecuador	Over-the-Counter.	- forwards (currency, interest rate.shares)	1996: Forward (currency sucre/U.S.S)
England	International Petroleum Exchange(IPE): London Commodity Exchange (LCE): London International Financial Futures and Options Exchange (LIFFE): London Metal Exchange (LME); London Stock and Derivatives Exchange (OMLX).	*IPE - futures (gas. etc.) -options (gas. Brent unrefined petroleum) 'LIFFE - futures (long term public bonds of various countries and so on) -options (shares, bonds and so on) •OMLX - futures (various	•IPE-Aprtl 1981 futures (gas) 'L1FFE-930.1982 Futures (Currency. public bond). •LME-1877 ♦OMLX-12.12.1989 First derivatives trading of Swedish shares
Finland	Finnish Options Market (SOM); Finnish Options Exchange Ltd. (SOP).	'SOM - futures (index, shares. Sterling. DM, U.S. dollar) -options (index. Sterling. DM. U.S. \$. Shares) •SOP - forwards (public bond. and so on.)	'SOP: 1986: Derivatives agreements (Standardized currency and interest rate) *SOM: November 1987- Buy and sell options
France	Paris Options Exchange (MONEP): France International Futures Exchange (MAT1F): Potatoes Futures Market	*MAT1F - futures (public bond, ECU bond, public bond) •MONEP - options (securities. index)	'MATIF 2.20.1986: Futures (public bonds with maturity of 7-10 years) 'MONEP 9.10.1987: Options (shares)
Germany	German Futures and Options Exchange (DTB).	-futures (interest rate-FIBER. BOBL. BUND. BUXL-. shares) -options (interest rate, shares index)	1.26.1990: Options) 14 shares)
Hong Kong	Hong Kong Futures Exchange Ltd.; Stock Exchange of Hong Kong (SEHK).	-options (shares, warrant) -warrants	•HKFE 1976 agricultural products: 1980 gold: 1986 first futures agreement; 1990 first derivative on warrant. •SEHK 1995 First stock options.

Ireland	Ireland Futures and Options Exchange (IFOXj.	- futures (long, medium, short term Irish public bond and DIBOR)	5.29.1989; Futures agreements (Long term public bonds with maturity of 20 years, DIBOR of 3 months, Irish Pound/US \$)
Israel	Tel Aviv Stock Exchange.	-futures (index, currency) -options (index, currency)	August 1993: TA-25 index options. October 1995: index futures. October 1994 NISSt options
Italy	Italian Financial Futures Market (MIF): B1F.	*MIF - futures (public bonds with maturity of 5 and 10 years) - options (public bonds with maturity of 10 years) •B1F- futures (10000	*MIF 9.11.1992: Futures (Italian public bonds with 250 million Italian Lire nominal value and 12% coupon rate, with maturities of 8-10 years) *B1F 1U7.1994; Futures (MIB 30 index)
Japan	Tokyo Stock Exchange: Tokyo International Financial Futures Exchange.	-futures -options	1988: futures (currency): 1989: Options (currency)
Malaysia	Kuala Lumpur Commodity Exchange: Kuala Lumpur Options and Financial Ex.	-futures -options -warrants	•KLOPFE December 1995; futures-options
Mexico	Mexico Stock Exchange.	- derivatives market (Mexder)	1977 petrobond (Mexican Government)
Netherlands	European Options Exchange (EOE): Financial Futures Exchange (FTA): Rotterdam Energy Futures Exchange (ROEFEX): Amsterdam Agricultural Products Futures Market (ATA).	•EOE - futures (public bond, index, currency) -options (shares, bond, currency. and so on.) -warrants *FTA - futures (public bond. index. U.S. Dollar) ♦ROEFEX - futures (unrefined petroleum, etc.) *ATA - futures	1958: Futures (potatoes) •EOE 4.4.1978 call options •FTA 6.19.1987 Futures (on bonds) ♦ROEFEX 10.31.1989
Peru	Lima Stock Exchange.	- forwards market (currency) - derivatives market	1991

Poland	Warsaw Board of Trade: Warsaw Stock Exchange.	- forwards -futures (index WIG20) • options (currency, interest rate, index, shares)	1994: futures (index)
Portugal	Oporto.	-futures (index, interest rate)	1995: Futures (Fixed yield public bond with a maturity of 10 years) 1996: Futures (shares of 'blue-chip' in.)
Singapore	Singapore International Monetary Exchange Ltd. Singapore Commodity Exchange; Over-the-Counter	-futures (commodity) -company warrants -third party warrants - futures (index, interest rate, currency)	1984 1992; futures (tobacco)
South Korea	Korean Stock Exchange.	- futures (index)	May 1990: Futures (Kospi 200 index)
Spain	Spanish Financial Futures Market (MEFF); Over-the-Counter.	-futures (interest rate) -options (interest rate) -swap	1990
Sweden	Swedish Futures and Options Market (OM STOCKHOLM AB).	-forwards (shares) -futures (shares, bond, public bond) -options (shares, bond)	6.12.1985; Standard buy options on si listed Swedish shares.
Switzerland	Swiss Options and Financial Futures Exchange (SOFFEX).	-forwards -futures (index, conf) -options (shares, index, conf)	1988 SMI futures.
Taiwan	Taiwan Stock Exchange.	-options -swap	March 1977
U.S.	Chicago Board of Trade; Kansas City Board of Trade; MidAmerica Commodity Exc; NYSE.	-forwards - futures -options -swap	1851: Forward (corn); 1973: Options (securities) 1982: Options (Value Line, S&P500, NYSE Compound).

Source: The Euromoney Derivatives Handbook 1997, London 1997;

The IFR Handbook of World Stock and Commodity Exchanges, IFR Pub, London 1997.

Appendix 2B: Political Instability Risks

The Economist Intelligence Unit (EIU) defines social and political unrest or upheaval as those events or developments that pose a serious extra-parliamentary or extra-institutional threat to governments or the existing political order. The events will almost invariably be accompanied by some violence as well as public disorder. These need not necessarily be successful in the sense that they end up toppling a government or regime. Even unsuccessful episodes result in turmoil and serious disruption. The assessment of what constitutes a "serious threat" still requires judgment and can be arbitrary, but this is a step forward from having no definition at all.

Political Instability Index

The overall index on a scale of 0 (no vulnerability) to 10 (highest vulnerability) has two component indexes—an index of underlying vulnerability and an economic distress index. The overall index is a simple average of the two component indexes. There are 15 indicators in all—12 for the underlying and 3 for the economic distress index.

I. Underlying vulnerability

1. Inequality

Measured by Gini coefficient

0 if lower than 40

1 if 40-50

2 if higher than 50

Sources: World Bank, *World Development Indicators 2008*; EIU estimates.

2. State history

Measured according to date of independence

0 if before 1900

1 if between 1900 and 1950

2 if after 1950

Source: CIA, *Factbook*.

3. Corruption

Economist Intelligence Unit ratings

0 for low

1 for moderate

2 for high

Source: Economist Intelligence Unit.

4. Ethnic fragmentation

Ethnic fractionalisation index (0 to 100 scale)

0 if lower than 30

1 if 30 to 50

2 if higher than 50

Source: Alesina Alberto et al, "Fractionalization", *NBER Working Paper 9411*, 2003.

5. Trust in institutions

Percentage of population that trusts/has confidence in parliament

0 if more than 50%

1 30-50%

2 if less than 30%

Sources: The Euro, Latino, Africa and Asia Barometer polls; World Values Survey.

6. Status of minorities

High rates of economic or political discrimination against minorities. Based on latest available assessment and scoring on 0 (no discrimination) to 4 (extreme discrimination) scale by Minorities at Risk Project (MRP). The MRP defines extreme discrimination (score of 4) if any minority group is subject to public policies that constitute formal exclusion and/or recurring repression, and that substantially restrict the groups' economic opportunities or political participation. There is significant discrimination (score of 3) if minority group suffers from significant poverty and under-representation owing to prevailing social practices by dominant group.

0 if low or no discrimination (MRP scores lower than 3)

1 if significant discrimination (if score of 3 by for any minority by MRP)

2 if extreme discrimination (if score of 4 for any minority by MRP)

7. History of political instability

Significant episodes or events of political instability (regime change) as recorded by Political Instability Task Force (PITF)

0 if no recorded episode

1 if one major episode

2 if two or more episodes

Source: PITF database.

8. Proclivity to labour unrest

Risk of labour unrest

0 if low

1 if moderate

2 if high

Source: Economist Intelligence Unit, Risk Briefing.

9. Level of social provision

Measured on the basis of the "expected" infant mortality rate; based on residuals from a regression of the natural logarithm of the infant mortality rate on the logarithm of GPP per head US\$ at purchasing power parity (PPP) for 2006.

- 0 if the actual infant mortality rate is lower than predicted, or if the actual rate does not exceed the predicted rate by a significant margin
- 1 if ratio between actual and predicted infant mortality rate is greater than 1.1 but less than 1.5
- 2 if ratio between actual and predicted infant mortality rate is greater than 1.5

Sources: Economist Intelligence Unit; World Bank, *World Development Indicators 2008*.

10. A country's neighbourhood

Based on the average vulnerability index (calculated on the basis of all indicators except the neighbourhood indicator) for all of the country's geographic neighbours.

- 0 if index is less than 5.8
- 1 if index is 5.8 to 6.3
- 2 if index is higher than 6.3

Source: Economist Intelligence Unit.

11. Regime type

Based on classification of political regimes, according to the Economist Intelligence Unit's Index of Democracy

- 0 if either a full democracy or authoritarian regime
- 2 if either a non-consolidated, "flawed" democracy or a hybrid regime (neither a democracy nor an autocracy)

Source: Economist Intelligence Unit.

12. Regime type and factionalism

The interaction of regime type with the existence of political factionalism (according to Polity IV database). According to Polity, factionalism is defined as polities with parochial (possibly, but not necessarily, ethnic-based) political factions that regularly compete for political influence to promote particularist agendas and favour heavily group members to the detriment of a common agenda.

4 if a country is both an intermediate regime and suffers from factionalism

0 if not

II. Economic distress

1. Growth in incomes

Growth in real GDP per head in 2009

0 if forecast growth in real GDP per head is positive, with minimal risks that it could be negative

1 if a fall in GDP per head is forecast or there is a significant risk of that occurring, but the decline is less than by 4%

2 if a forecast decline in GDP per head is greater than by 4% or there is a significant risk that this could occur

Source: Economist Intelligence Unit.

2. Unemployment

Unemployment rate, %.

0 if forecast unemployment rate is less than 6% and there are only minimal risks that it could be higher than 6%

1 if a forecast unemployment rate is higher than 6% or there is a significant risk of that occurring, but the rate does not surpass 10%

2 if a forecast unemployment rate is higher than 10% or there is a significant risk that this could occur

Sources: Economist Intelligence Unit; International Labour Organisation.

3. Level of income per head

Measured by GDP per head at PPP, US\$ in 2007, on the assumption that richer countries can more easily withstand economic distress

0 if more than US\$12,000

1 if between US\$3,000 and US\$12,000

2 if less than US\$3,000

Notes: In the compilation of the economic distress sub-index, growth in GDP per head and unemployment have weights of 40% each, and GDP per head has a weight of 20%.

Index for the period 2009-10

Key: ▲ Risk has increased since 2007 ▼ Risk has decreased since 2007 ▶ Risk is unchanged since 2007

■ Very high risk ■ High risk ■ Moderate risk ■ Low risk

Rank	Country	Underlying vulnerability	Economic distress	Index score		2007 score
1	Zimbabwe	7.5	10.0	8.8	▶	8.8
2	Chad	7.1	10.0	8.5	▲	7.5
3	Congo (Democratic Republic)	8.3	8.0	8.2	▲	7.2
4	Cambodia	7.9	8.0	8.0	▲	6.0
4	Sudan	7.9	8.0	8.0	▲	7.0
6	Iraq	8.8	7.0	7.9	▶	7.9
7	Cote d'Ivoire	7.5	8.0	7.8	▶	7.8
7	Haiti	7.5	8.0	7.8	▲	6.8
7	Pakistan	7.5	8.0	7.8	▲	5.8
7	Zambia	7.5	8.0	7.8	▲	6.8
7	Afghanistan	7.5	8.0	7.8	▲	6.8
7	Central African Republic	7.5	8.0	7.8	▲	5.8
13	North Korea	5.4	10.0	7.7	▲	3.7
14	Bolivia	8.3	7.0	7.7	▲	5.7
14	Ecuador	8.3	7.0	7.7	▲	6.7
16	Angola	6.3	9.0	7.6	▲	5.6
16	Dominican Republic	6.3	9.0	7.6	▲	5.6
16	Ukraine	6.3	9.0	7.6	▲	4.6
19	Bangladesh	7.1	8.0	7.5	▲	4.5
19	Guinea	7.1	8.0	7.5	▲	6.5

19	Kenya	7.1	8.0	7.5	▲	6.5
19	Moldova	7.1	8.0	7.5	▲	4.5
19	Senegal	7.1	8.0	7.5	▲	6.5
19	Guinea Bissau	7.1	8.0	7.5	▲	6.5
19	Nepal	7.1	8.0	7.5	▲	6.5
19	Niger	7.1	8.0	7.5	▲	5.5
27	Bosnia and Hercegovina	7.9	7.0	7.5	▲	6.5
28	Liberia	8.8	6.0	7.4	▲	5.4
29	Venezuela	6.7	8.0	7.3	▲	4.3
29	Timor Leste	6.7	8.0	7.3	▲	4.3
31	Sri Lanka	7.5	7.0	7.3	▲	4.3
32	Sierra Leone	8.3	6.0	7.2	▲	5.2
33	Argentina	6.3	8.0	7.1	▲	4.1
33	Kyrgyz Republic	6.3	8.0	7.1	▲	5.1
33	Madagascar	6.3	8.0	7.1	▲	6.1
33	Myanmar	6.3	8.0	7.1	▲	4.1
33	Panama	6.3	8.0	7.1	▲	5.1
33	Tajikistan	6.3	8.0	7.1	▲	6.0
39	Colombia	7.1	7.0	7.0	▲	6.0
39	Lebanon	7.1	7.0	7.0	▲	5.0
39	Peru	7.1	7.0	7.0	▲	6.0
39	South Africa	7.1	7.0	7.0	▲	4.0
39	Thailand	7.1	7.0	7.0	▲	6.0
44	Lesotho	7.9	6.0	7.0	▲	6.0
44	Nigeria	7.9	6.0	7.0	▶	7.0
44	Mali	7.9	6.0	7.0	▲	5.9
47	Burkina Faso	5.8	8.0	6.9	▶	6.9
47	Burundi	5.8	8.0	6.9	▲	5.9
47	Cameroon	5.8	8.0	6.9	▲	4.9
47	Papua New Guinea	5.8	8.0	6.9	▲	5.9
47	Mauritania	5.8	8.0	6.9	▲	3.8
52	Honduras	6.7	7.0	6.8	▲	4.8
52	Indonesia	6.7	7.0	6.8	▲	3.8
54	Philippines	4.6	9.0	6.8	▲	4.8
55	Turkey	7.5	6.0	6.8	▲	5.7
56	Eritrea	5.4	8.0	6.7	▲	2.7
56	Estonia	5.4	8.0	6.7	▲	5.7
56	Gambia	5.4	8.0	6.7	▲	2.7

56	Latvia	5.4	8.0	6.7	▲	5.7
60	Guyana	8.3	5.0	6.7	▲	5.6
61	Algeria	6.3	7.0	6.6	▲	4.6
61	Guatemala	6.3	7.0	6.6	▲	5.6
61	Macedonia	6.3	7.0	6.6	▲	3.5
64	Malaysia	7.1	6.0	6.5	▶	6.5
64	Uganda	7.1	6.0	6.5	▲	3.5
66	Russia	5.0	8.0	6.5	▲	3.4
67	Paraguay	5.8	7.0	6.4	▲	3.4
67	Romania	5.8	7.0	6.4	▲	5.4
67	Serbia	5.8	7.0	6.4	▲	5.4
67	Montenegro	5.8	7.0	6.4	▲	3.3
71	Greece	4.6	8.0	6.3	▲	3.3
71	Uzbekistan	4.6	8.0	6.3	▼	8.3
73	Congo (Brazzaville)	7.5	5.0	6.3	▶	6.3
73	Georgia	7.5	5.0	6.3	▲	5.2
75	Albania	5.4	7.0	6.2	▲	4.2
75	Belize	5.4	7.0	6.2	▲	5.2
75	Iran	5.4	7.0	6.2	▲	3.2
75	Turkmenistan	5.4	7.0	6.2	▲	5.1
79	Croatia	6.3	6.0	6.1	▲	4.1
79	Equatorial Guinea	6.3	6.0	6.1	▲	3.1
79	Mexico	6.3	6.0	6.1	▲	5.1
79	Yemen	6.3	6.0	6.1	▲	3.1
83	Hungary	4.2	8.0	6.1	▲	2.1
83	Lithuania	4.2	8.0	6.1	▲	4.1
83	Saudi Arabia	4.2	8.0	6.1	▲	3.1
83	Mongolia	4.2	8.0	6.1	▲	4.0
87	Bulgaria	5.0	7.0	6.0	▲	4.0
87	Jamaica	5.0	7.0	6.0	▲	3.9
89	Benin	5.8	6.0	5.9	▲	4.9
89	Ghana	5.8	6.0	5.9	▲	3.9
89	Nicaragua	5.8	6.0	5.9	▶	5.9
89	Tanzania	5.8	6.0	5.9	▲	4.8
93	Namibia	6.7	5.0	5.8	▲	4.8
94	Armenia	4.6	7.0	5.8	▲	3.8
94	Syria	4.6	7.0	5.8	▲	4.7
96	Malawi	5.4	6.0	5.7	▲	4.7

96	Mozambique	5.4	6.0	5.7	▲	5.6
98	Morocco	6.3	5.0	5.6	▲	4.5
99	Bahrain	5.0	6.0	5.5	▲	4.5
99	Cape Verde	5.0	6.0	5.5	▲	2.5
99	Israel	5.0	6.0	5.5	▲	3.5
99	Kuwait	5.0	6.0	5.5	▲	3.5
99	Slovakia	5.0	6.0	5.5	▲	2.5
104	Spain	2.9	8.0	5.5	▲	4.4
105	Brazil	5.8	5.0	5.4	▲	4.4
106	Egypt	3.8	7.0	5.4	▲	4.4
106	Jordan	3.8	7.0	5.4	▲	5.3
108	Togo	4.6	6.0	5.3	▲	3.3
108	Bhutan	4.6	6.0	5.3	▲	2.3
110	France	2.5	8.0	5.3	▲	1.3
110	Iceland	2.5	8.0	5.3	▲	1.3
110	United States of America	2.5	8.0	5.3	▲	3.2
113	Azerbaijan	5.4	5.0	5.2	▲	4.2
113	El Salvador	5.4	5.0	5.2	▲	3.2
115	Uruguay	3.3	7.0	5.2	▲	4.1
116	Gabon	6.3	4.0	5.1	▲	3.1
117	Chile	4.2	6.0	5.1	▲	4.1
117	Ethiopia	4.2	6.0	5.1	▲	4.1
117	Laos	4.2	6.0	5.1	▲	2.1
117	South Korea	4.2	6.0	5.1	▲	2.0
121	Italy	2.1	8.0	5.0	▲	4.9
122	Rwanda	5.8	4.0	4.9	▲	3.9
123	Portugal	1.7	8.0	4.8	▲	1.8
124	Belarus	4.6	5.0	4.8	▲	2.8
124	China	4.6	5.0	4.8	▲	3.8
124	Kazakhstan	4.6	5.0	4.8	▲	3.8
127	Botswana	5.4	4.0	4.7	▲	2.7
127	Swaziland	5.4	4.0	4.7	▲	4.2
127	Trinidad and Tobago	5.4	4.0	4.7	▲	2.7
130	Malta	3.3	6.0	4.7	▲	2.7
130	Singapore	3.3	6.0	4.7	▲	1.7
132	Ireland	1.3	8.0	4.6	▲	0.6
132	United Kingdom	1.3	8.0	4.6	▲	0.6
134	Tunisia	4.2	5.0	4.6	▶	4.6

135	India	5.0	4.0	4.5	▶	4.5
136	Poland	2.9	6.0	4.5	▲	3.5
137	Libya	4.6	4.0	4.3	▲	2.3
137	Sao Tome & Principe	4.6	4.0	4.3	▶	4.3
139	Taiwan	2.5	6.0	4.3	▲	1.3
139	Vietnam	2.5	6.0	4.3	▲	2.3
141	Cuba	3.3	5.0	4.2	▲	2.2
142	Cyprus	4.2	4.0	4.1	▲	2.1
142	Qatar	4.2	4.0	4.1	▶	4.1
142	Seychelles	4.2	4.0	4.1	▼	5.1
142	United Arab Emirates	4.2	4.0	4.1	▲	2.1
146	Belgium	2.1	6.0	4.0	▲	2.0
146	Hong Kong	2.1	6.0	4.0	▲	1.0
146	Netherlands	2.1	6.0	4.0	▲	1.0
149	Oman	3.8	4.0	3.9	▲	2.9
150	Germany	1.7	6.0	3.8	▲	1.8
150	Japan	1.7	6.0	3.8	▲	0.8
150	Slovenia	1.7	6.0	3.8	▲	1.8
153	Czech Republic	3.3	4.0	3.7	▲	2.7
154	Australia	1.3	6.0	3.6	▲	0.6
154	Austria	1.3	6.0	3.6	▲	0.6
154	Luxembourg	1.3	6.0	3.6	▲	0.6
154	New Zealand	1.3	6.0	3.6	▲	0.6
158	Costa Rica	2.1	5.0	3.5	▲	1.5
158	Mauritius	2.1	5.0	3.5	▲	2.5
160	Switzerland	0.8	6.0	3.4	▲	0.4
161	Finland	0.4	6.0	3.2	▲	1.2
161	Sweden	0.4	6.0	3.2	▲	1.2
163	Canada	1.7	4.0	2.8	▲	1.8
164	Denmark	0.4	4.0	2.2	▲	0.2
165	Norway	0.4	2.0	1.2	▲	0.2

Source: The Economist Intelligence Unit
Score on a scale 0~10, where 0- no vulnerability and 10-highest vulnerability.

Appendix 2C: 10 major derivative markets over a period of 9 years: Global Futures and Options

Volume

Rank	2001	2002	2003	2004	2005	2006	2007
1	Korea Exchange	Korea Exchange	Korea Exchange	Korea Exchange	Korea Exchange	Korea Exchange	CME Group
2	Eurex	Eurex	Eurex	Eurex	Eurex	Eurex	Korea Exchange
3	Euronext.liffe	Euronext.liffe	Euronext.liffe	Chicago Mercantile Exchange	Chicago Mercantile Exchange	Chicago Mercantile Exchange	Eurex
4	Chicago Mercantile Exchange	Chicago Mercantile Exchange	Chicago Mercantile Exchange	Euronext.liffe	Euronext.liffe	Chicago Board of Trade	Liffe
5	Chicago Board Options Exchange	Chicago Board of Trade	Chicago Board of Trade	Chicago Board of Trade	Chicago Board of Trade	Euronext.liffe	Chicago Board Options Exchange
6	Chicago Board of Trade	Chicago Board Options Exchange	Chicago Board Options Exchange	Chicago Board Options Exchange	Chicago Board Options Exchange	Chicago Board Options Exchange	International Securities Exchange (U.S)
7	American Stock exchange	American Stock exchange	International Securities Exchange(U.S)	International Securities Exchange(U.S)	International Securities Exchange(U.S)	International Securities Exchange(U.S)	Bolsa de Mercadorias & Futuros
8	New York Mercantile Exchange	International Securities Exchange(U.S)	American Stock exchange	Sao Paulo Stock Exch. (Bovespa)	Sao Paulo Stock Exch. (Bovespa)	Sao Paulo Stock Exch. (Bovespa)	Philadelphia Stock Exchange
9	Pacific Stock Exchange	New York Mercantile Exchange	Sao Paulo Stock Exch. (Bovespa)	Mexican Derivatives Exchange	New Mercantile Exchange	Bolsa de Mercadoria & Futuros	National Stock Exchange of India
10	Philadelphia Exchange	BM & F	Mexican Derivatives Exchange	American Stock exchange	American Stock exchange	New Mercantile Exchange	Bolsa de Valores de Sao Paulo

Source: Futures Industry Association

Appendix 3A: Use of Case Study Methodology in Social Sciences

Case study has been used as the main methodology. Case study has been accepted as part of research and it excels at bringing to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. There is an extensive and growing literature focusing on the case study method, e.g., Flyvbjerg (2004), Helper (2000), Odell (2001) and Yin (1994), and many researchers have used it across a variety of disciplines including law, medicine, management, social sciences as well as public administration and public policy. Social scientists, in particular, have made wide use of this qualitative research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods. Researcher Robert K. Yin defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin, 1984, p. 23).

Critics of the case study method believe that the study of a small number of cases can offer no grounds for establishing reliability or generality of findings. Others feel that the intense exposure to study of the case biases the findings. Some dismiss case study research as useful only as an exploratory tool. Yet researchers continue to use the case study research method with success in carefully planned and crafted studies of real-life situations, issues, and problems. Reports on case studies from many disciplines are widely available in the literature.

Appendix 3B: Korea and Indonesia Exchanges Derivatives Products

Table 3B.1: Korea Exchanges Derivatives Products

Underlying Asset	Derivative Products	Listing Date
Equity Index (KOSPI 200,KOSTAR)	KOSPI 200 Futures	May 3, 1996
	KOSPI 200 options	July 7, 1997
	KOSDAQ Star Futures	Nov 7, 2005
Currency	US Dollar futures	April 23, 1999
	US Dollar Options	April 23, 1999
	Japanese Yen Futures	May 26,2006
	Euro Futures	May 26,2006
Individual Equity (30 blue chips)	Equity Options	Jan. 28, 2002
Interest Rate (KTB, MSB)	3-year KTB Futures	Sept. 29,1999
	5-year KTB Futures	Aug.22, 2003
	10-year KTB Futures	Feb. 25,2008
	MSB Futures	Dec. 6, 2002
Commodity	Gold Futures	April 23, 1999

Source: Korea Exchange (KRX), 2008

Table 3B.2: Indonesia Exchanges Derivatives Products

Underlying Asset	Derivative Products	Listing Date
Equity Index Futures (LQ45 Index)	LQ45 Futures	Aug. 13, 2001
	Mini LQ45 Futures	June 21,2005
	LQ 45 Futures Periodic	Nov. 21,2006
Individual Equity	Stock Options	Oct. 2004
Dow Jones Japan Titan 100	JP futures	April 27, 2004

Source: Indonesia Exchange (IDX), 2008

Appendix 3C: IMF and International Donors aid during the Asian Financial crisis

Table 3C.1: Korea and Indonesia Real GDP growth rates

	1996	1997	1998	1999
Korea	7.1	5.5	-7.0	-1.0
Indonesia	8.2	2.0	-16	-2

Source: IMF

Table 3C.2: Commitments of the International Community and Disbursements of the IMF in Response to the Asian Crisis

Country	Commitments(Billions of US dollars)				IMF
	IMF	Multilateral ¹	Bilateral	Total	Disbursement As of 1/17/99
Indonesia ²	11.2	10.0	21.1	42.3	8.8
Korea ³	21.1	14.2	23.1	58.4	19.00
Thailand	4.0	2.7	10.5	17.2	3.1
Total	36.3	26.9	54.7	117.9	30.9

Source: IMF

1 World Bank and ADB

2 Includes augmentations since July 1998

3 Disbursements does not reflect Supplemental Reserve Facility repayments of US\$2.8 billion made by Korea in December 1998

Appendix 3D: Bond Market: Listed Bonds and their Trading Value

Table 3D.1: Listed Bonds in Korea Exchange

Years	Public bonds		Corporate bonds		Total amount listed
	No. of listed issues	Amt listed	No. of listed issues	Amt listed	
1999	5,701	253.3	4,054	111.1	364.4
2000	5,030	296.8	2,436	127.9	424.7
2001	5,585	363.5	2,306	141.2	504.7
2002	6,303	422.6	2,260	141.3	563.9
2003	6,528	471.2	2,422	136.1	607.3
2004	6,273	546.1	2,442	115.7	661.8
2005	5,968	614.5	2,434	107.3	721.8
2006	5,925	677.8	2,268	101.0	778.8
2007	6,484	736.1	2,114	94.8	830.8

Table 3D.2: Trading Value of Bonds listed in Korea Exchange

Years	Public bonds	Corporate bonds	Total
1999	281,921	11,685	293,606
2000	23,521	3,648	27,169
2001	12,213	2,013	14,226
2002	46,063	1,111	47,174
2003	214,010	892.2	214,902
2004	383,123	987	384,109
2005	360,824	1,935	362,759
2006	293,480	1,452	294,933
2007	349,189	2,110	351,298

Table 3D.3: Turkey Bonds and Bills Market: Number of Contracts

Years	Outright M.		Repo		Total
	Total	D. Avg	Total	D. Avg	
2000	206,453	823	386,907	1,541	593,360
2001	177,170	709	321,898	1,288	499,068
2002	292,312	1,155	245,876	972	538,188
2003	445,868	1,783	283,586	1,134	729,454
2004	553,359	2,196	383,085	1,520	936,444
2005	592,437	2,332	482,687	1,900	1,075,124

Table 3D.4: Turkey Bonds and Bills Market: Traded Value

Years	Outright M.		Repo		Total
	Total	D. Avg	Total	D. Avg	
2000	262,941	1,048	886,732	3,533	1,149,673
2001	37,297	149	627,244	2,509	664,541
2002	67,256	266	480,725	1,900	547,981
2003	144,422	578	701,545	2,806	845,967
2004	262,596	1,042	1,090,476	4,327	1,353,072
2005	359,371	1,415	1,387,221	5,462	1,746,592

Source: ISE, KRX

Appendix 3E: Korea Exchange Investors

Table 3E.1: Trading value by Investor group

Year	Institutional Investors			Individual	Foreigners
	Merchant & Mutual Savings Funds	Pension Funds	Others		
1999	6,491 (0.7)	2,708 (0.3)	22,818(2.7)	660,141 (76.1)	44,707 (5.2)
2000	3,006 (0.5)	2,179 (0.4)	16,035 (2.5)	451,083 (71.9)	57,475 (9.2)
2001	2,308 (0.5)	3,129 (0.6)	10,989 (2.2)	359,739 (73.2)	51,485 (10.5)
2002	3,511 (0.5)	5,818 (0.8)	21,981 (2.9)	532,823 (71.8)	85,266 (11.5)
2003	3,440 (0.6)	5,878 (1.1)	17,856 (3.3)	360,433 (65.8)	77,867 (14.2)
2004	2,953 (0.5)	9,330 (1.7)	19,827 (3.6)	324,501 (58.4)	120,372 (21.7)
2005	2,514 (0.3)	17,449 (2.2)	22,768 (2.9)	482,510 (61.4)	164,677 (20.9)
2006	2,931 (0.4)	18,162 (2.1)	28,888 (3.4)	436,438 (51.4)	226,277 (26.7)
2007	4,248 (0.3)	31,586 (2.3)	43,740 (3.2)	721,141 (52.9)	349,493 (25.6)

Source: Financial Supervisory Service

Table 3E.2: Number of Foreign Investors by Type in KRX

End of Year	Institutions					%	Individual	%	Total
	Funds	Pensions	Securities Co.s	Others	Sub-total				
1998	3,763	522	285	759	5,329	63	3,151	37	8,480
1999	4,240	597	310	938	6,085	61	3,869	39	9,954
2000	4,966	686	336	1,225	7,213	61	4,535	39	11,748
2001	5,503	766	361	1,436	8,066	63	4,794	37	12,860
2002	6,190	874	388	1,652	9,104	64	5,024	36	14,128
2003	6,752	990	422	1,929	10,092	66	5,242	34	15,335
2004	7,464	1,131	449	2,317	11,361	67	5,538	33	16,899
2005	8,193	1,255	489	2,726	12,663	68	5,836	32	18,499
2006	9,008	1,413	513	3,466	14,400	70	6,235	30	20,635
2007	9,818	1,534	553	4,367	16,272	71	6,721	29	22,993

Source: Financial Supervisory Service

Table 3E.3: KRX Index Futures Trading by Investor Group (%)

Year	Securities Cos.	Banks	Insurance Cos.	Investment Trust Cos.	Others	Individuals	Foreigners
1998	41.9	0.3	0.2	2.6	1.9	50.9	2.3
1999	41.2	0.8	.2	4.7	3.1	47.2	2.8
2000	32.6	2.6	0.2	6.4	2.7	50.8	4.8
2001	32.7	0.8	0.5	4.4	2.5	50.6	8.5
2002	26.3	0.8	0.5	4.7	3.8	53.1	10.8
2003	22.1	0.8	0.3	3.7	1.7	55.1	16.4
2004	22.9	0.8	0.4	3.4	1.6	48.6	22.3
2005	25.6	1.3	0.2	2.7	1.9	44.0	23.7
2006	27.9	1.1	0.2	2.9	2.6	40.2	25.1
2007	32.3	0.7	0.4	2.5	0.8	35.9	25.8

Note: 1. Figures are based on double-counting basis where bought and sold are added up together.
 2. Others include finance companies and pension funds.
 Source: Korea Exchange

Figure 1: Retail Investors participation in KRX.



Source: KSDA, Celent estimates

Appendix 4A: LIFFE Contracts

Table 4A.1: Average Daily Trading Volume

Year	1	2	3	4	5	6	7	8	9	10	11	12	13
LIFFE	2,904	5,407	9,024	13,414	26,012	49,470	54,816	88,280	117,842	130,014	221,031	320,014	493,561
lgilt	962	2,094	3,064	2,722	10,323	27,584	22,084	16,121	22,393	22,289	34,664	46,676	83,981
short€	1,045	796	1,349	1,950	3,791	5,917	13,986	28,214	32,977	31,886	44,474	48,076	67,306
3m\$	1,859	1,828	4,046	5,070	4,374	6,859	6,517	8,162	4,934	3,929	2,793	969	470
Ftse100	438	351	484	1,819	1,843	4,080	5,709	6,839	10,298	12,365	17,507		
tbond	1,254	2,479	6,112	6,122	8,073	3,837	3,040	1,829	1,071	45			
bund	4,850	21,145	37,635	39,984	53,561	81,116	158,358						
3mecu	353	253	454	1,247	2,869	2,477							
3mdm	5,374	10,513	18,914	47,927	84,634	124,425							
jgb	529	872	1,672	2,511									
3mswf	2,415	7,758	7,320	7,026									
btp	6,715	14,855	25,219	52,322									
3mitl	2,290	5,863	14,390										
bobl	4,379	422											
ecubond	261	34											
Eurotrack	21	0											
bonos	223												

Source: LIFFE

The table shows the daily average trading volume of the contracts listed in LIFFE between 1982 and 1994. All but two contracts (Ftse100 and 3mecu) reached the 1000 daily average volume by the third year while four contracts were delisted before their third year. The table also shows that high trading volume is not a sufficient condition for contract to succeed. For example, the Bobl contract recorded 4,379 daily average volumes in its first year but was delisted one year later.

Appendix 4B: GNMA CDR Futures Contract

Table 4B.1: Annual Trading Volume, 1975 - 1987

Year	Volume, "000"
1975	20
1976	129
1977	422
1978	953
1979	1371
1980	2326
1981	2293
1982	2056
1983	1693
1984	862
1985	84
1986	24
1987	8

Trading of GNMA CDR futures contract began on the Chicago Board of Trade on October 20, 1975.

Source: Johnston and McConnell (1989).

Appendix 4C: The fall of GNMA CDR Futures Contract²

As discussed by Johnston and McConnell (1989), the GNMA CDR futures contracts appeared to have failed because of flaws in its design. After considerable success following its introduction in 1975, by 1987 trading on the contract had declined to the point where price quotations were no longer listed in the daily financial press. They found that over the period from 1983 to 1985, when trading volume experienced its most dramatic decline, the effectiveness of the GNMA CDR futures contract as a hedge for current coupon (newly produced) mortgages also declined. Furthermore, during the years in which the GNMA CDR volume declined, the Treasury-bond futures contract provided a better hedge for current coupon GNMA securities than did the GNMA CDR contract. They attributed the decline in the quality of the hedge provided by the delivery options embedded in the contract.

Their empirical investigation suggests that the structure of the quality option, which allows the short to deliver any of the available coupon rate securities, is the most likely cause of the GNMA CDR contract's failure as hedging instruments. The method used to convert the various deliverable coupon rates in a common, comparable basis presumes that the mortgages underlying the various coupon rates securities will have identical prepayment patterns. However, in the interest rates environment of early 1980s, when rates first rose and then fell dramatically, the prepayment rate on high coupon securities was much higher than implicitly assumed in the contract. Consequently, the high coupon securities became relatively cheap to deliver, causing the futures price to follow the price of the high coupon securities, while, at the same time, hedging demand was concentrated in the considerably lower current coupon securities. They estimate that, over the period September 1982 through June 1985, the difference between delivering the cheapest and the current coupon securities was typically in excess of 4 percent of the futures price and at one point was as much as 19 percent of the futures price. The high value of the quality option drove a wedge between the futures price and the prices current coupon mortgages that, in turn, caused the GNMA CDR futures contracts to become a poor hedge for he

² As discussed in a case study of the GNMA CDR futures contracts by Johnston and McConnell (1989)

current coupon mortgages, where hedging demand is likely to be concentrated. As the contract became less useful to mortgage hedgers volume would have declined, thereby, creating a less liquid market. The loss of liquidity would have had the reinforcing effect of making the contract less appealing to other market participants as well, which, in turn, would have further reduced the appeal of the contract to mortgage hedgers.

The GNMA CDR futures contracts appears to have been a victim of the conflicting needs to design a contract that has broad appeal while at the same time is useful to a particular class of hedgers. In this instance, the delivery options were intended to make the contract appealing to many different mortgage hedgers. The unfortunate unintended result was that the options appear to have rendered the contract appealing to few or, perhaps, no mortgage hedgers.

Appendix 4D: New Product Development at CME Group³

CME Group is the world's largest futures exchange formed from the merger between the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT) in 2007 and later with NYMEX in 2008. It is well known for its culture of innovation. It has demonstrated ongoing leadership in developing creative products and has maintained a continuing series of firsts over the decades: (i) 1970s: 1st financial futures - CME currency futures; 1st interest rate futures contract - CBOT GNMA CDR futures; 1st Treasury futures contract - CBOT 30-Yr Bond futures, (ii) 1980s: 1st successful stock index - S&P 500®; 1st successful cash-settled futures - CME Eurodollars; (iii) 1990s: 1st global electronic trading system in CME Globex® E-mini™ S&P 500 futures; (iv) 2000s: 1st US financial exchange to demutualize; 1st US financial exchange to IPO.

CME Group enjoys a long history of successful new product innovation and development. It records high rates of successful product innovation as well as new products failure. A center for innovation was created to encourage and spearhead creative thinking and great ideas about new products. It also has research and product development centers for the product which together with the innovation team is responsible for developing new products. CME's successful futures' tends to be built on underlying products that have achieved "benchmark" status. The centers' main task is to identify products that might achieve benchmark status in the future — not so soon such that the futures contract will fail as premature — but not so late as to allow their competitors to enjoy the first mover advantage.

CME Group attempts to apply a systematic process to the evaluation of new product possibilities as a means of systematically and rationally combing through the possibilities and identifying their most likely priorities. In order to do so, they reference relevant characteristics of potential new products following various studies done on the characteristics requisite to supporting a successful futures market.

Sorting through all the possible criteria, they have identified five "core" requisites that reference the characteristics of the underlying market.

³ Information obtained from CME Group Research and Product Development center.

1. *Price Transparency and Volatility* – Volatility produces speculative opportunity and the necessity to hedge market risks. Volatility is generally measured in terms of an annualized standard deviation of day-to-day price movements noting that an ideal market incorporates long-term trends and significant intra-day ranges. Pricing transparency often accompanies competitive market structure – second criteria as discussed below. Note that futures’ trading tends to enhance price transparency and is sometimes resisted by cash market dealers. However, transparency is key in protecting traders against the possibility of manipulation and is necessary to comply with CFTC Core Principles.

2. *Large, Competitive Cash or Underlying Market* – Can be measured either in terms of outstanding value or turnover. In addition to identifying market size and turnover, they are also interested in trends in market size and turnover. Market structures may broadly be categorized as competitive, oligopolistic or monopolistic. Clearly, the presence of many prospective natural buyers and sellers is ideal – industry concentration ratios may be useful. Further, they are interested in whether the product is traded or manufactured? Market priced, indexed priced? In general, they seek to find a balance between buying and selling interests which is preferred to avoid administrated pricing structures

3. *Lack of Suitable Cross-Hedges* - Are there related products available with high correlations that are used as a cross-hedge? They attempt to consider basis risks, liquidity of alternate hedge vehicles.

4. *Free of Government Interference or Excessive Regulation* - CME Group has, to date, restricted itself to operating per Designated Contract Market (DCM) status under the Commodity Exchange Act (CEA). Note, however, that further restrictions are associated with trade in the so-called “enumerated commodities.” They however crossed the CFTC / SEC line with the introduction of security futures products (SFPs) on the joint venture operation OneChicago that specializes in trading single stock futures. Also, futures in some markets may effectively be prohibited by U.S. law. *E.g.*, can’t trade futures on nonexempt securities such as corporate bonds. Credit default swaps are growing market with somewhat hazy regulatory status which have attracted interest.

5. *Homogeneous Product with Established Grades and Standards for Quality and Quantity* - Fragmented markets may not achieve “critical mass” in terms of size and liquidity. Often futures are developed which call for gradation based premiums or discounts. This is sometimes workable to correct a fragmentation problem but may require high maintenance on the part of the Exchange. This approach has sometimes even been known to produce added interest in a contract, *e.g.*, cheapest-to-deliver shifts in CBOT Treasury contracts. Futures trading may foster the development of homogeneous product standards to a degree. Further, they have found through a process of validation that a successful product must hit on two of the first three criteria and that a surplus on one criterion cannot compensate for a deficiency in another. Note that the first two criteria address the risk of manipulation or squeezes. The last two criteria are basically self-regulating. Two additional criteria may be added as “icing on the cake” as it were.

6. *Competitive or Strategic Considerations* - Do other futures exchanges list similar products and what was/is their experience with the product in terms of volume, open interest? Are there any outstanding contract design considerations – flaws, possible opportunities to enhance the design? Does contract support an exchange strategic initiative? Do they face competition from the over-the-counter markets noting that compatibility with OTC derivative markets is sometimes a strong pull.

7. *Product Support* - A willing market maker is ideal as CME Group inevitably transitions to an electronic environment, “cyber market makers” must replace locals on floor. Cosponsorship or licensing of product from a broker dealer who can act as direct sales conduit and/or market maker is ideal. Sometimes, they look to internal or external product “champions” that may serve to “grease the skids.”

In conclusion, CME Group spends considerable time and resources making a systematic study of possible new product opportunities, creating voluminous files of data on various products using the above mentioned criteria. Ultimately, they attempt subjectively to rate and weight each product by reference to the above criteria in order to guide their prioritization.