

Derivatives Market in Emerging Economies: Economic Benefits and Challenges

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Abstract

The developing economies frequently have a threat of being affected largely by changes happening outside, it is imperative to have a financial system that reveals perfect information, reduces transaction cost and facilitates an efficient capital allocation for investment opportunity. This theory of market is studied well and recommended by Arrow - Debreu. In the absence of market of risk, and efficient system, an efficient economy is not possible to achieve. This paper discusses the economic benefits from the introduction of derivatives market in a developing economy. It also studies the areas and intensity of benefits in the financial system of the economy. Data used in the paper are from various secondary sources and are unable to cover the full potential of the emerging economy.

Key Words: derivatives, emerging economies, risk management.

Introduction

Over last one decade, there have been abrupt declines in asset prices, major bouts of volatility in the foreign exchange markets, a contagion effect in the equity market, and many operational failures across the globe. The decade also experienced an exchange rate crisis together with a debt crisis in the emerging markets in early 1995, and a number of costly and severe banking problems in some emerging markets and countries. However, it has also seen a simultaneous transformation and restructuring of international financial markets and thus the complete set up of global economy. These included the liberalization of the economy due to competition; the integration of capital markets the increasing dominance of institutional investors, the development of new financial techniques and instruments, and the growth of emerging markets (IMF, 1996).

It is needless to say that financial markets finance the economic growth. They channelise the savings into investments and thereby decompose them again. The banks and the securities markets are two competing mechanism for the development of the economy. The stock market development is highly significant statistically in forecasting future growth of per capita GDP (Levine and Zervos, 1996). The economic benefit from the developed financial markets comes out as catalyst by a) augmenting the real saving and formation of capital from any given level of national income, b) Increasing the net capital inflow from abroad, c) raising the productivity of investment by improving allocation of funds, and d) reducing the cost of capital. These lead to a better market. It becomes imperative to have a liberalized market for more efficient allocation of capital. The strengthening indication of the domestic financial market implies that the domestic economy is opened up to international competitive pressures, which help to raise efficiency.

Since last two decades, derivative¹ products have created a new energy to the financial market and also have given a new strategy to manage the risk worldwide with force. Theoretical work on Derivatives supports on this as a tool to utilize information better, manage risk, and reduce transaction cost (Scholes (1981), Sibler (1985), Merton, (1995)). For an understanding to the market need of this, Gibson & Gimmerman (1994) find that derivatives instruments are not redundant securities once the existence of information asymmetry and market frictions is recognized. The welfare of the derivatives instruments has been tested specially for the options by Ross (1976) and Hakansson (1978). They found that simple options and options on portfolios are required and sufficient to complete the markets and hence to allocate the risks efficiently. Breeden and Litzenberger (1978) did calculate that how specific strategy can be used to manufacture synthetic state securities. The informational role of some of the derivates instruments are theoretically proposed by Grossman (1977) and Anderson (1983) with basic argument that the trading significantly accelerates the price discovery process in the market, and hence leads to complete market model.

The financial market has experienced tremendous growth in terms of primary issues and trades on secondary market. An economic reform in a market dwells between efficiency and productivity of the market. For example; during the economic reforms of Indian market in 1991, one of the developments were to establish the market for time i.e. credit market and debt market, and to create a market for risk i.e. derivatives market. For existence of the markets, mechanism of trading is imperative and their being competitive is simultaneously required to have both the benefits of the reforms.

¹ This not only helps to the economic development through managing risk on financial products, commodity, interest rate, currency but also through weather based business that have an influence on cost, revenue and cash flows towards rise or fall. There are derivatives products defined on the underlying asset. However, Weather based derivatives products cannot be defined as underlying asset and thus are defined as underlying value.

Along with various other changes, the introduction of derivative² market and innovation in the products in the derivatives market have become a standard instrument to risk management that enables risk sharing and thus facilitates efficient capital allocation to productive investment opportunities (Gibson and Zimmermann, 1994). A systematic analysis of risk sharing and need of this is provided by state-preference model developed by Arrow (1953, 1964) and Debreu (1959), which reflects that derivatives trading may complete the capital market. In a market where information asymmetry and market friction are recognized, presence of such products are always beneficial to many a parties of the all the economic faculties. Therefore it helps in capturing the information that is not easily available and so converging to complete the financial market. The core function of financial system is to facilitate the allocation and development of economic resources both spatially and across time, in an uncertain environment (Merton, 1990).

Academic research on the commodity investment and their impact over the economic development has been read by many contributors and it has also examined the economic determinant of returns to commodity investment. Fama and French (1988) and Schneeweis, Spurgin, and Georgiev (2000) identified a strong business cycle component in the variation of spot and futures prices of industrial metals. A related implication is that the term structure of forward price volatility generally declines with time to expiration of the futures contract – the so called “Samuelson (1965) effect.” This is caused by the expectation that, while at shorter horizons mismatched supply and demand forces for the underlying commodity increase the volatility of cash prices, these forces will fall into equilibrium at longer horizons. Litzenberger and Rabinowitz (1995) observe that oil futures prices are often below spot prices- futures markets are backward dated. The economic utility of the

² International Monetary Fund (IMF) defines derivatives as “financial instruments that are linked to a specific financial instrument or indicator or commodity and through which specific financial risk can be traded in financial market in their own right. The value of a financial derivative derives from price of an underlying item such as an asset or an index. Unlike debt securities, no principal is advanced to be repaid and no investment income accrues.”

difference make a country manage the risk better where oil price is a major issue. The investment in derivatives commodities principally argues that rise in price with inflation provides a natural hedge against losses in equity and debt holdings that typically lose value during periods of unexpected inflation (Bodie, 1983; Becker and Finnerty, 2000).

While the economic utility and benefits of the derivatives market has been discussed widely in academia, there is increasing concern in academia and financial community that derivatives markets, both regulated and non-regulated, create a dis-balance as most of the investments in the derivatives are a short term in nature due to speculative transactions. One of the economic advantages of derivatives trading is to discover the price of product; it has a tremendous opportunity to earn money from the information differences in a developing market. The cases of Proctor & Gamble, Metallgesellschaft in 1993 and Baring Bank in 1995 are real happenings and contradicting the market. Whereas, the same has proved to be a failed feature if looked into the stock market crash of 1987 and the Asian crises to an extent.

The Economic Attributes

Last decade has been exiting in reading the progress on the derivatives market and also their role in the acceleration of economy and economic growth. The financial derivatives market has grown tremendously in terms of variety of instruments available, their complexity and also turnover. The factors generally attributed as major driving force behind the growth are

- a) Increased volatility in financial markets due to mis-pricing of the asset,
- b) Increased integration of national financial markets with the international markets due to foreign exchange, interest rate, and market risk,
- c) Decline in trading costs,
- d) Development of more sophisticated risk management tools like exotics,

e) Innovation in the derivatives markets, which optimally combines the risk and return over a large number of financial assets leading to higher returns and reduced risk compared to individual financial assets.

The cumulative impact of market performance has weakened the balance sheets of the companies, increasing their vulnerability to further asset price decline (et al, 2002).

There is always needed an inherent financial system which has the appetite for the economic developments with and for opportunities created by the high volume investment strategies from developed to the emerging economies. The core function of the financial system is to facilitate the allocation and development of economic resources, both spatially and across time, in an uncertain environment (Merton, 1990). The economic functions of any financial system are formulated around the mix of time, risk, and information. The uncertain environment means that risk (varies by nature) is an inherent characteristic of financial decision. The economic and financial system must provide an opportunity to trade and price the risks to achieve an unconstrained Pareto-efficient allocation. Hence, the economic functions of a market become imperative understanding on the benefit and loss matrix. For the market of risk, the derivative market performs a number of economic functions³ as follows;

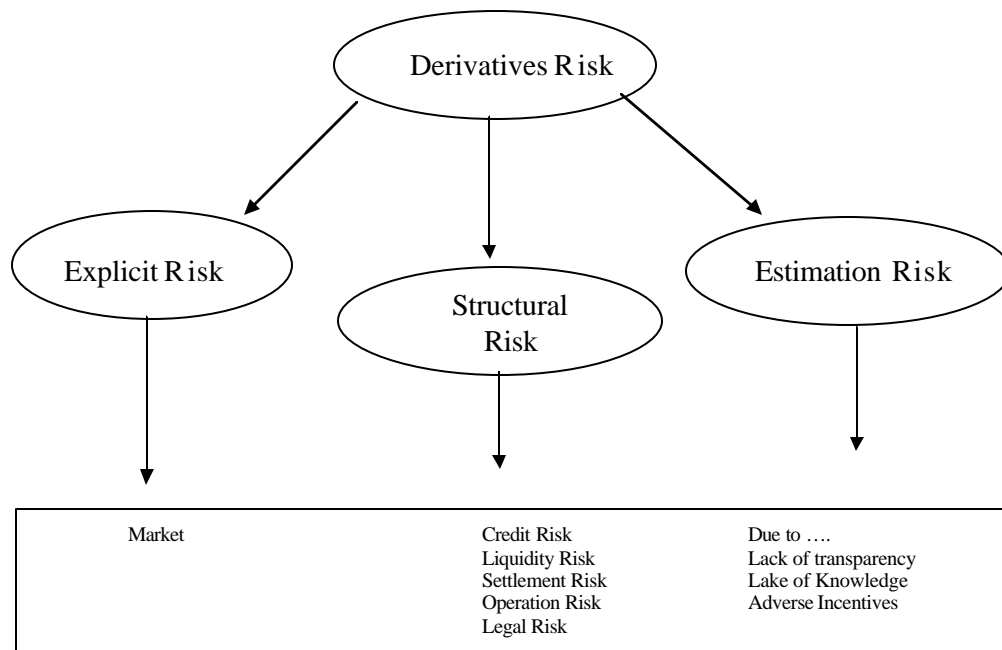
- Prices in an organized derivatives market reflect the perception of market for future and lead the prices of underlying to the perceived future level.
- The derivatives market helps to transfer risks from those who have them to those who have appetite for them.

³ Due to the economic characteristics embedded in the derivative products, *financial derivatives should be considered in the national accounts as financial assets and in a separate functional group in the Balance of Payment reflecting their distinct characteristics, regardless of whether they are traded on or off the exchanges. If the financial derivatives cannot be valued because a prevailing market price for the underlying item is not observable, it cannot be regarded as a financial asset.* The practical implication of this change need to be considered before it is implemented into the international reporting standards for Balance of Payment. (Recommendation made by the IMF Informal Group on the Measurement of Financial Derivatives,1998)

- Derivatives are linked to the underlying cash markets. With the introduction of derivatives, the underlying market witnesses higher trading volumes because of participation by more players who would not otherwise participate.
- Speculative trades shift to a more controlled environment of market.
- Derivatives markets help increase saving and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.

There are sure opportunities which advocate for the development of the financial system and hence the money circulation in the economy. It may still raise questions; if a derivative trading creates a new risk, if this affect the investment and return behavior of the underlying cash market, if risk assessment is made effectively and sufficiently, and if the derivative market is creating excess leverage in the market. These doubts encourage reading the risk associated with the derivatives products.

Figure 1: Risk structure of derivatives products.



Source: Gibson and Zimmermann, *The Benefits and Risks of Derivatives Instruments: An Economic Perspective*, 1994.

Global Derivatives Markets

The developments of the derivatives market has been in very narrow regional locations of the world. *A decade before, more than 99 percent of the market was performed by the developed financial markets in derivatives trading (UNCTAD).* At the moment, global derivatives market is expanding and growing faster in all supported regions. For a stagnation of over considerably long period, exchange traded as well as OTC markets have experienced a remarkable recovery since 2001. Whereas turnover in the exchange-traded financial contracts monitored by the BIS averaged about \$360 trillion in the second half of the 1990s, average activity in the first two years of the new millennium rose by nearly 80% to \$644 trillion. The triennial survey of BIS for 2001 reflects on the trading volume in OTC foreign exchanges derivatives for five Latin American countries for USD 1739 billion and for five East Asian countries USD 1861 billion. The major influence in the trading in exchanges worldwide has been due to increase in the interest rate trading whereas OTC markets have not recognized the same growth in recent years possibly due to concern about counterparty credit risk and the introduction of new hedge accounting rules. Segregating on the regional developments in the derivatives market (Table 1), *it is evident that the developing economies have been successful in attracting the investments and increased their share in the world market. There have been approximately 10 percent and 100 percent growth in the market size in Europe and Asia respectively.*

Table 1: Global Futures and Options by region (in percent)

Regions	1997	1998	1999	2000
USA	42	43	38	33
S America	8	5	3	4
Europe	36	36	40	40
Africa	1	1	1	1
Oceania	2	2	2	2
Asia	11	13	16	20

Source: UNCTAD research paper on Global derivatives market, 2002.

The approximate size of global derivatives market was US\$ 109.5 trillion as at end December 2000 (Table 2). The total estimated notional amount of outstanding over-the-counter (OTC) contracts stood as US\$ 95.2 trillion as at end-December 2000, an increase of 7.9% over end-December 1999. The amount outstanding in regulated exchange markets increased by 5.8% from US\$ 13.5 trillion as at end-December 1999 to US\$ 14.3 trillion as at end-December 2000.

Table 2: Global Derivatives Markets by size.

(USD billion)

National amounts outstanding as at year-end								
	1993	1994	1995	1996	1997	1998	1999	2000
OTC Instruments, of which:	8,475	11,303	17,713	25,453	29,035	80,317	88,201	95,199
A. Interest Rate Swaps and Options	7,575	10,388	16,515	23,453	27,211	44,259	53,316	58,244
B. Currency Swaps and Options	900	915	1,197	1,560	1,824	5,948	4,751	5,532
C. Other Instruments*4	-	-	-	-	-	30,110	30,134	31,423
Exchange-traded Instruments:	7,776	8,898	9,283	10,018	12,403	13,932	13,522	14,302
A. Interest Rate F & O	7,323	8,431	8,618	9,257	11,221	12,643	11,669	12,626
B. Currency Futures and Options	110	96	154	171	161	81	59	96
C. Stock Market Index F & O	343	371	511	591	1,021	1,208	1,793	1,580
Total	16,250	20,201	26,996	35,471	41,438	94,249	101,723	109,501

Source: Bank for International Settlements, 2002.

The exchange traded turnover globally increased by 9.8% during 2000 to US\$ 384 trillion as compared to US\$ 350 trillion in 1999 (Table 3). While interest rate futures and options accounted for nearly 90% of total turnover during 2000, the popularity of stock market index futures and options grew modestly during the year.

Table 3: Turnover in Derivative Contracts Traded on Exchanges

(US \$ trillion)

	1993	1994	1995	1996	1997	1998	1999	2000
Interest Rate Futures	177.3	271.9	266.4	253.6	274.8	296.6	263.8	292.3
Interest Rate Options	32.8	46.7	43.3	41	48.6	55.8	45.6	47.5
Currency Futures	2.8	3.3	3.2	2.6	2.7	2.5	2.6	2.4
Currency Options	1.4	1.4	1.3	1.3	0.9	0.5	0.3	0.2
Stock Market Index Fut.	7.1	9.4	10.6	12.9	16.4	19.6	21.7	22.7
Stock Market Index Opt.	6.3	8	9.3	10.2	13.1	14.7	15.7	18.7
Total	227.7	340.7	334.1	321.6	356.5	389.7	349.7	383.8

Source: Bank of International Settlements 2002.

Derivatives in Emerging Markets

Despite rapid growth over the past several years in the financial market across the globe, emerging market derivatives account for lesser than 2 percent of the total outstanding notional values in global derivatives markets. The domestic derivatives markets in emerging economies differ greatly in their sizes, both in absolute terms and relative to cash markets, behavior and purpose of investment. Compared to mature markets, the ratio of outstanding notional value in bond and equity derivatives to market capitalization of the underlying asset markets is fairly small in most emerging economies (GFS Report, 2002).

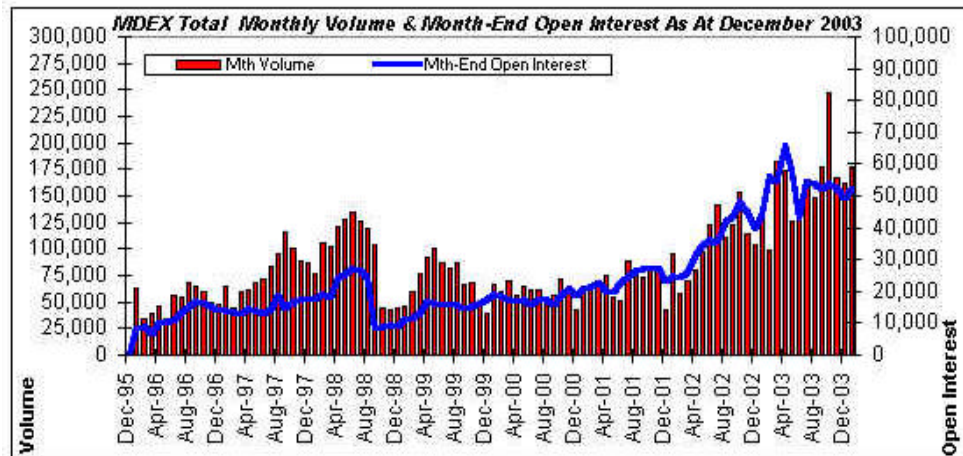
The developments in the derivatives products like currency derivatives, fixed income derivatives, credit derivatives, and equity linked derivatives have been the parameters for the scaling of the emerging market economies. *There is common consensus that the development of the various financial products has facilitated the capital flow across the globe and subsequently exposed the markets to expose both lenders and borrowers to foreign exchange, interest rate, market, credit, and liquidity risks.* Thus derivative products, here, allow the market players to transfer and share the risks to those who have better appetite for the risks. There are many ways in which the use of derivatives by local and foreign market participants can facilitate cross-border capital flows.

The economic understanding of the emerging economies indicates that the positive sentiment towards emerging market economies is reflected by the declining spreads of the emerging markets bond indices, which can serve as a warning signal of financial-sector weakness in emerging markets. Another factor that contributed to the positive performance has been strong rise in commodity prices. *Moreover, the use of derivatives products in the financial market and in the economy as a whole through the sectors like foreign exchange, equity market, debt market, oil market, commodity market, mutual fund industry, insurance market, and other allied areas certainly provide a fresh breath in the times of trouble*

in the economy. It would appear that the risk of contagion between emerging economies has reduced significantly. Nevertheless, financial stability concerns might still arise from rapid credit growth in these economies, financed by either external or domestic capital. Past experience (the 1997/98 Asian crisis, for example) suggests that periods of rapid inflows can be associated with an inadequate assessment of risk and a build-up of future imbalances. It is therefore important that strong capital inflows do not detract from the need for these economies to pursue structural reform.

It is evident from the data performance that there has been a growing pattern in the derivatives volume trading as well in the open interest. The behavior in recent years has been more towards the derivatives products usage due to the growing volatility of the market and proving relationship between and among the overseas market.

Figure 2: MDEX Derivatives Performance as at December 2003.



Source: Statistics Monthly Data, MDEX, Bursa Malaysia Derivatives Berhad, March 2004.

The countries where derivatives markets were introduced some time before this has had started fetching extraordinary attention, it is evident that significant gains in both market capitalization and in trading volume on the cash market have been registered following the launch of trading in index derivatives.

Table 4: The Derivatives Market Performance for South Africa

	2003	2002	2001	2000	1999	1998	1997	1996
JAN	1,637,946	3,058,947	3,797,121	1,534,403	1,226,088	1,728,785	1,279,359	830,902
FEB	2,016,357	2,373,665	2,133,633	1,728,466	1,324,885	1,343,767	1,348,295	827,791
MAR	2,767,161	2,558,934	2,010,083	1,580,870	1,685,106	1,704,734	749,980	666,151
APR	1,693,380	2,056,659	1,521,037	1,017,474	1,962,661	1,233,410	861,580	902,206
MAY	2,289,167	1,764,710	3,051,925	1,721,964	1,645,858	1,168,354	908,538	1,011,327
JUN	3,893,791	2,401,159	3,003,075	2,298,536	2,084,605	1,212,347	697,839	538,012
JUL	3,278,534	2,794,907	2,728,186	2,016,790	1,664,025	1,370,403	632,109	779,282
AUG	1,841,611	3,426,038	2,771,219	2,758,771	1,238,957	1,019,053	631,058	811,914
SEP	3,397,643	2,025,359	3,413,204	2,135,367	1,531,128	1,393,988	958,359	791,498
OCT	2,446,116	2,416,574	3,395,024	2,614,724	1,767,949	1,891,869	1,427,398	690,977
NOV	1,663,511	2,697,745	3,595,192	2,385,357	1,205,634	1,191,272	1,091,522	703,310
DEC	3,771,848	1,803,031	3,909,312	2,434,118	1,347,115	855,759	1,040,982	741,769
TOTAL	6,423,467	7,993,548	7,942,838	4,845,739	4,238,078	4,779,284	3,379,631	2,326,840

Source: Research department of JSE Securities Exchange, South Africa, 2004.

The growth in the South African derivative market has been registered for approximately 170 percent between 1996 and 2003. An approximate average growth of 40 percent till year 2000 was broken to register an extraordinary growth rate of 65 percent for 2001. Thereafter it has not been an impressive market on the development ratings.

Table 5 - Turnover of Futures and Options (Contracts in thousands) in Hong Kong.

Period	Futures	Options	Total
1995	4,572	1,017	5,589
1996	4,851	2,364	7,215
1997	6,934	2,797	9,731
1998	7,684	2,443	10,127
1999	5,563	2,966	8,529
2000	4,522	4,739	9,261
2001	5,831	4,719	10,550
2002	6,228	4,801	11,029
2003	8,175	6,372	14,547

Source: HKEx research department, 2004.

Note : The data includes Hang Seng 100 Futures, Hang Seng Properties Sub-Index Futures, Red-Chip Futures, Stock Futures, International Stock Futures, Rolling Forex, One- Month HIBOR Futures, Three-Year Exchange Fund Note Futures and Dow Jones Industrial Average Futures, and Including Hang Seng 100 Options, Hang Seng Properties Sub-Index Options, Red-Chip Options and International Stock Options.

Table 6: Turnover in the Equity Derivatives Market in India.

Month /Year	The Stock Exchange, Mumbai (BSE)				The National Stock Exchange (NSE)			
	Index Futures	Index Options \$	Stock Futures	Stock Options \$	Index Futures	Index Options \$	Stock Futures	Stock Options \$
2000-01	1,672.62	–	–	–	2,365	–	–	–
2001-02	1,276.30	78.30	451.60	115.51	21,482	3,766	51,516	25,163
2002-03	1,810.99	1.98	644.30	21.17	43,952	9,247	2,86,532	1,00,133
2002-03								
April	1.11	0.61	21.49	0.55	1,656	382	15,065	4,570
May	9.90	0.03	104.70	0.32	2,022	463	15,981	5,133
June	12.31	0.00	90.36	0.43	2,123	389	16,178	4,642
July	0.89	0.00	77.38	0.40	2,513	511	21,205	6,178
August	0.02	0.00	43.93	0.46	2,978	518	17,881	5,562
September	0.09	0.00	18.10	1.99	2,836	583	17,501	6,221
October	0.00	0.00	13.85	0.15	3,145	727	21,213	8,357
November	0.00	0.00	13.15	0.10	3,500	845	25,463	10,028
December	0.00	0.00	15.51	0.45	5,958	1,088	35,532	13,043
January	546.57	0.00	100.26	0.27	5,557	940	38,299	14,353
February	589.42	0.03	89.70	5.68	5,040	946	32,445	10,964
March	650.68	1.31	55.87	10.37	6,624	1,856	29,770	11,082
2003-04								
April	64.77	0.00	20.77	1.80	6,994	1,707	29,749	11,569
May	8.13	0.03	10.46	4.33	6,283	1,617	32,752	12,722
June	0.59	0.00	6.08	2.54	9,348	1,942	46,505	15,042

Source: The Stock Exchange, Mumbai and the National Stock Exchange of India Limited, 2003.

Note: Index futures were introduced in June 2000, index options in June 2001, stock options in July 2001 and stock futures in November 2001 both on BSE and NSE. \$ Notional turnover for call and put options., – Not Applicable.

With the start of the derivatives market in India, it has shown a learning behavior for risk management. The first year been the introduction period was able to catch the attention of the market with full precautions and anxiety. This raised apprehensions in the market on the launch of the risk market in India. On contrary to this, there has not been any other chance of market disinterest for the derivatives products reading the volatility and efficiency of the India market (Table 6). Thereafter, Indian Derivatives market has been growing in the equity and in all other areas of operation for which the data has not been shown here. This has led to the progress in the financial turnover and interest of the foreign investors and other intuitional investors for a safer and better in vestment opportunity (Gambhir & Goel, 2003).

It has also been registered that countries often venture into derivatives as part of a broader economic liberalization process (shah, 1995). For example; China started its derivatives market in 1990 in a complete disorderly manner with weak governance, less regulated environment and no experience of handling such market. However this start has provided them the first mover advantage in the region and they could learn the complexities and consolidated the derivatives market. Countries like Turkey, Bulgaria, Chile, Colombia, Costa Rica, Czech Republic, Greece, India, Indonesia, Mexico, Poland, Taiwan, Thailand are in the process of establishing their markets better since these are late starters and can not afford to have a complex environment of investment to loose the more.

Table 7: Impact of Index Derivatives upon the Equity Spot Market

	One Year Before		Two Years After	
	Mkt. Cap.	Trade Vol.	Mkt. Cap.	Trade Vol.
Argentina	3	1	44	10
Brazil	43	21	32	17
Spain	148	41	155	62
Singapore	11	1	24	4
Hong Kong	35	10	74	23

Source : Bijl, Rudolf, Exchange—traded derivatives in emerging markets – An overview,1995.

If the markets do not recognize the need of liberalized way of economic development and introduction of markets of potential opportunities, they should be ready to suffer in immediate development as well as in long term establishment and growth of the market. For example; the rapid growth of Brazil market and proximity of exchange in Chicago (which are in the same time zone), has slowed the growth of Mexican market. The prime reason for this slow growth has been the launch of numerous derivatives products based on Mexican underlying assets. This nature of example very kindly suggests that the consolidation of the markets with proper understanding of the sharing of the local market development is necessarily required, which also leads to develop a synergy in the governance across the borders. A common

minimum supervision has to be understood among the economies to safeguard from the misfortunes of the derivatives market.

On one hand, derivative offers a strong welfare effect to the market and economy grows by providing the price discovery facility and efficiency in risk shifting mechanism; the other hand, it poses few negative consequences also.

- Creating a high degree of leverage to purposefully use for speculative attacks. This is normally of a non-transparent nature.
- Presence of the derivatives market will not be able to reflect the accurate status of the balance of payment and foreign reserve position at a time.
- This may lead to the manipulation of the financial reporting due to its nature of transaction and accounting treating.
- This may lead to support the international crises contagion.
- Under the weak supervision, this may lead to provide a window to outflank the market regulations.

Some of the problems which shall require immediate attention of the emerging economies, primarily, in the times of development and crises deal with the

- The type of the financial instrument launched at different stages of the development of the market.
- Weak or inadequate market infrastructure for trading, settlement, and monitoring.
- The supervision range and quality to facilitate the development and allow a crises.
- Restrictions on the use of derivatives by local and foreign bodies.

The statistical performance shows that the derivatives markets in emerging economies have grown rapidly over past few years. This progress has been faster in countries which have removed capital controls and have developed

their underlying securities markets in terms of trading facilities, settlement, and could also manage the information technology. This has proved to be the wish to the economy development; however the use of derivatives has also made crises dynamics in some recent episodes more unpredictable by accelerating capital outflows, amplifying volatility, and, in some cases, increasing the correlation between asset and currency markets (GFS report). The further researches after the financial crashes have found that the reasons have been either due to domestic market immaturity, poor infrastructure support to the system, and watchdog behavior of supervision.

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Figure 6: Total GDP of Developing Nations, 2002.

Countries	Million US dollars
Brazil	452,387
Chile	64,153
China	1,266,052
Colombia	80,925
Czech Republic	69,514
Denmark	172,928
Finland	131,508
Hong Kong SAR	161,531
Hungary	65,843
India	510,177
Indonesia	172,911
Korea	476,690
Malaysia	94,900
Mexico	637,203
Philippines	77,954
Poland	189,021
Russia	346,520
Singapore	86,969
South Africa	104,242
Thailand	126,905
Turkey	183,665

Source: World Development Indicators Database, World Bank, April 2004

Figure 7: Average Daily Turnover in the OTC Derivatives Markets (billion USD)

Country	<i>Total</i>		<i>Foreign Exchange</i>		<i>Interest Rate</i>	
	April 98'	April 01'	April 98'	April 01'	April 98'	April 01'
Brazil	...	2.1	...	1.9	...	0.3
Chile	0.5	0.6	0.5	0.6	—	—
China	...	—	...	—	...	—
Czech Republic	3	1.4	3	1.2	—	0.2
Hong Kong SAR	51.4	52	48.9	49.4	2.4	2.6
Hungary	0.5	0.2	0.5	0.2	—	—
India	1.3	2	1.3	1.8	—	0.1
Indonesia	1	0.5	1	0.5	—	—
Korea	1.1	4	1	3.9	—	0.1
Malaysia	0.8	0.9	0.8	0.9	—	—
Mexico	2.6	4.6	2.4	4.2	0.2	0.4
Philippines	0.4	0.6	0.4	0.6	—	—
Poland	0.5	3.8	0.5	3.3	...	0.5
Russia	0.9	0.2	0.9	0.2	—	—
Singapore	90.7	72.5	85.4	69.3	5.3	3.2
South Africa	6	8.4	5.2	7.9	0.8	0.6
Taiwan Province of China	1.6	1.8	1.5	1.7	0.1	0.1
Thailand	2.2	1.3	2.2	1.3	—	—
Turkey	...	0.7	...	0.7	...	—
Total	164.5	157.6	155.5	149.6	8.8	8.1

Source: Bank for International Settlements, Triennial Central Bank Survey 2001.

Note: Turnover is defined as the absolute gross value of all new deals entered into during the month of April. No distinction is made between sales and purchases.