

Financial Stability and Financial Crises: The Role of Derivative Instruments in International Financial Crises

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Abstract

The paper aims to analyse the role of derivative instruments in the international financial crises, experienced in the developing countries since 1990, such as the Mexican Crisis in 1994, the South East Asian Crisis in 1997 and the Russian crisis in 1998 etc. In this respect, in the paper the role of derivatives in international financial crises is handled, in terms of the direct crisis effect as creating crisis by leading massive capital outflows, and indirect crisis effects as preparing the pre-conditions of crises by leading financial instability and accelerating the crisis by the usage of some specific types of derivatives, such as Total Return Swaps and Put-able Debt etc. It is maintained that derivatives, designed to hedge currency risks and thus to prevent financial instability after the collapse of the Bretton-Woods System, exposed, particularly, developing economies to remarkable risks and financial instabilities in the 1990s, and they played a much greater role than previously estimated in the international financial crises. Within the framework of the potential contributions of the paper, an increase in understanding of the reasons behind the international financial crises and in clarifying the mechanism of the role of derivatives in financial crises by doing a new classification as direct and indirect crisis effects would be useful both for developing countries to avoid the crises and also for literature in order to go further.

Key Words: international financial crises, derivative instruments, the globalization of the 1990s, financial instability

JEL-classification: F3, F4, G1

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I- Introduction

The 1990s, in which several remarkable international financial crises were experienced around the world, can be called “the international financial instability and financial crises era” of the history of political economy. In theory, the potential determinants of these crises have been extensively studied. However, the mysteries about their reasons were not able to be solved completely and moreover, the role of derivative instruments¹ as one of the triggering factors in international financial crises and financial instability has not been covered fully.

In this regard, my paper aims to analyse the role of derivative instruments in the international financial crises, experienced around the world since 1990, such as the Mexican Crisis of 1994, the South East Asian Crisis of 1997 and the Russian crisis of 1998 etc. It is maintained that derivatives, designed to hedge currency risks and thus to prevent financial instability after the collapse of the Bretton-Woods System, exposed, particularly, developing economies to remarkable risks and financial instabilities in the 1990s, and they played a much greater role than previously estimated in the international financial crises.

Furman and Stiglitz (1998) put this situation as follows:

“...the problems of designing an appropriate regulatory structure are becoming more difficult with derivatives and off-balance sheet items, and are more difficult for developing countries, both because they are likely to face a shortage of good regulators, and because they face greater risks” (Furman and Stiglitz ,1998, pp.28).

In the paper, as an introductory part, the 1990s, which tells the development of the derivative instruments, is handled firstly. The second part includes the brief literature review on the role of derivatives in international financial crises. In the main part of the paper, the subject, the role of derivatives in the international financial crises, is handled in two sections: Firstly, direct crisis effect as creating crisis by leading massive capital outflows and secondly, the

indirect crisis effects as preparing the pre-conditions of crises by leading financial instability and market failures, through economically harmful purposes, and accelerating the crisis by the usage of some specific derivatives, such as Total Return Swaps and Structured Notes etc.

II-The 1990s: The Rise of the Derivative Instruments

The restructuring of the world economy, which has started since the 1980s through the policies of “liberalisation” and “deregulation” of financial markets had a momentum in the 1990s, under the name of “globalisation”, which has a tri-sided structure, by virtue of the significant developments in the information and communication technologies (ICTs) and in the political arena through having entered a new bipolar world order after the collapse of the Soviet Union.

The tri-sided structure of the 1990s’ globalisation² is as follows: The first side is liberalisation of trade policies including international trade and economic integrations; the second side is Multinational Companies (MNCs)’ operations including international production and third side is liberalisation of financial markets including international finance. In this regard, inspired from David Ricardo’s Theory of Comparative Advantages telling that International Trade, a traditional pattern of international economics, is an “Increasing-Sum Game” rather than a “Zero-Sum Game”, which means that it maintains benefits for both sides, all tariffs, quotas that obstruct free trade, have been banned within the General Agreement on Tariffs and Trade (GATT) and World Trade Organisation (WTO). Thus; liberalisation of international trade, namely, globalisation in trade was tried to be realised. In addition to this attitude, by means of regional organisations such as European Union (EU) and North American Free Trade Agreement (NAFTA), economic integration among countries was tried to be maintained (Eun and Resnick, 2001, pp. 9-15).

The third side which is financial liberalization and financialization of the world economies had the most significant results for the whole world, especially for developing countries, such as leading “speculative and excessively liquid financial flows that create debt-laden balance sheets, overly short-term perspectives, volatility and mispricing of important asset prices, including exchange rates and subsequent misallocation of resources and unstable economic growth” (Epstein, 2005, pp.12). However, by virtue of such liberalisation of capital in all over the world, without any barrier, enhancing the volume, speed and prevalence of capital, which has been scarce in the developing world, was aimed. In this regard, in the 1990s, many parts of the developing countries, which underwent complete and rapid liberalization in order to open up their financial markets to both greater capital flows and a wider array of capital vehicles have witnessed the new form of capital flows, which is criticised in terms of being volatile and possibly short lived character, such as stocks and bonds and parallel transactions, the so called “shadow transactions” such as derivative instruments (Dodd, 2002, pp.1).

Due to the lack of data about Over The Counter (OTC)³ derivatives for the whole 1990s and for all developing countries, only exchange traded derivatives for some developing countries such as Hong Kong, Singapore, Malaysia, South Korea, Brazil, Hungary and South Africa, are included in the below figure. Including both crisis and non-crisis developing countries this group of countries can be accepted as appropriate representatives for all of the developing countries. In this regard, the accelerating upward trend of derivatives in the developing countries in the 1990s can be seen in the below figure.

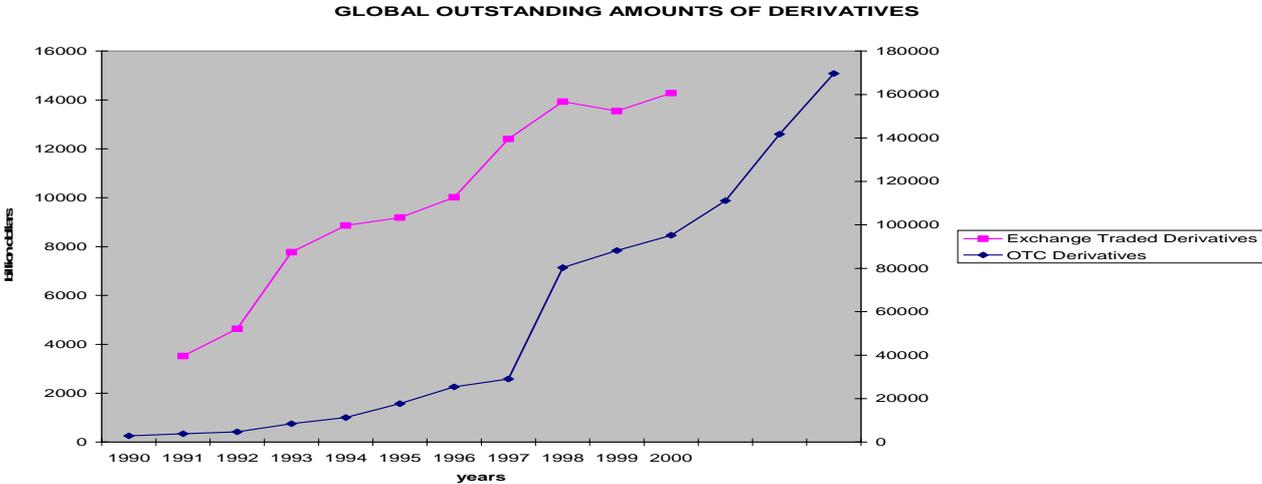
Figure 1. Derivatives in Developing Countries in the 1990s



Data Source: BIS

Below figure indicates the uptrend of derivative instruments in the whole world, including both exchange traded derivatives and OTC derivatives, in the 1990s.

Figure 2. Global Derivatives in the 1990s



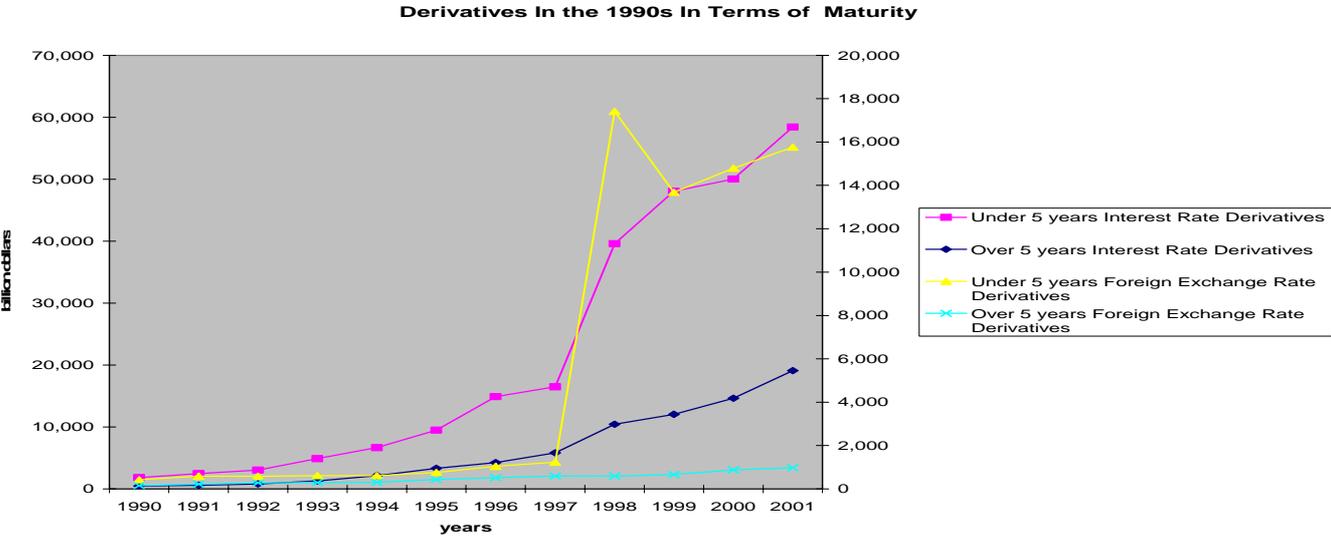
Data Source: BIS and Derivatives Study Centre

It is argued that the large increase in short term flows to the developing countries, especially the South East Asia, was a result of the derivative contracts of which integral role in these flows is highlighted (Kregel, 1998, pp.689). It is also argued that by maintaining opportunities

for global funds to hedge their market risks the derivative instruments fuelled international short term flows and made them “more sudden and more violent” (Kelly, 1995, pp. 218-219).

In the below figure it is easily seen that the under 5 years derivative products, both interest rate and foreign exchange rate derivatives, increased dramatically over the 1990s, which can be accepted as a reflection of short term capital flows in all over the world. As seen, the short term derivative products were increased gradually till the 1997, the year of South East Asian Crisis, but by the year 1997 they accelerated significantly, pointing out a parallelism with the 1997 crisis which is compared with the Great Depression of the 1930s in terms of severe consequences in overall the economy and welfare, such as the dramatic decrease in output and consumption with the increase in poverty and insecurity (Wade, 1998, pp.694).

Figure 3. Global Derivatives in the 1990s in terms of maturity



Data Source: BIS

Indeed, the derivative instruments were not new for the developed countries since they were initially designed to reduce foreign exchange risk, created by the exchange rate volatility, by shifting from a fixed exchange rate regime to a floating exchange rate regime, after the

collapse of the Bretton Woods System in 1973. And also, it is noted that the volatilities in interest rates stemming from the Federal Reserve's switch from targeting interest rates to monetary aggregates and volatility in stock markets started with the stock market crash in 1987 contributed to the early usage of derivatives in developed countries (McClintock, 1996, pp.18). However, in the 1990s, they were relatively new for the developing countries both for investors and authorities. In this regard, since in the presence of poorly structured and improperly regulated derivatives markets, which developing economies in the 1990s had, derivatives have been open to be used for economically harmful purposes, they were used for taking high risks and escaping from the prudential regulations. So, although they were designed to build financial stability by virtue of their potential economic benefits such as risk shifting, price discovery, increasing the value of firm and the profitability of the banking system (Thorbecke, 1995, pp.3), mostly in the developing countries, they caused financial instabilities and market failures, as moral hazard and adverse selection, which stem from the asymmetric information problems that can be commonly seen in financial markets (Mishkin, 1999, pp. 4), leading financial crisis by triggering the massive and rapid capital outflows.

Financial crisis⁴ occurs when serious economic problems happen due to huge fluctuations in foreign exchange markets or stock exchange and also due to significant increases in defaults of bank credits. In this regard, the financial crises of the 1990s in the developing countries were experienced under fixed or pegged exchange rate systems with highly liberalized but weak and fragile financial markets in which huge foreign exchange and credit risks were seen.

Granville (1999) puts the crisis-prone situation as follows:

“...Local commodity exporters, real estate companies and domestic commercial banks borrowed in dollars or yens, avoiding high domestic interest rates, and invested the proceeds converted into local currencies, either on the domestic bond market where yields were high, as

in Russia, or in local short-term loans profiting from the high interest rates, as in the Asian countries where bank credit increased by more than 10% a year in real terms during the 1990s” (Granville, 1999, pp.721).

In this regard, it is argued that due to “...the existence of weak financial (and) obsolete accounting systems, slow reporting and unprepared supervisors” highly leverage positions in the developing countries were taken by the usage of derivatives (Garber, 1998, pp.2), which were increased dramatically in the 1990s by virtue of the developments in ICTs and the competition among banks and non-banks, which made financial institutions go towards developing countries to gain high returns and to avoid increased tax liabilities on yields (Granville, 1999, pp. 726), by constituting a relatively easy and low cost channel for rapid capital reversals.

III-Brief Literature Review

In the literature, much has been written about the global financial crises. However, there have been few works on the role of derivatives in the international financial crises (See Ghysels and Seon, 2001; Dodd, 2000; Dodd, 2002b; Dodd, 2003; Harmes, 2002; Rothig 2004; Lim, 1999, Kregel, 1998, Neftci, 2000, Kelly, 1995, Garber and Lall, 1998).

Among them, Dodd’s works (2000, 2002b, 2003) try to explain the mechanism of the usage of derivatives in the financial crisis and more broadly, the usages of derivative instruments in an economy. In this regard, Dodd (2003) argues that derivatives play a “two-track role” in an economy, of which one is providing economically useful role in “hedging and risk management”, thus allowing capital flows to developing countries, which are not self-sufficient in terms of capital for development and also in “price discovery and establishment of benchmark market prices”, thus reducing uncertainty and enhancing market efficiency and

stability. On the other hand, the other one of the two-track role is the usage of derivatives for economically harmful purposes in the presence of “poorly structured and improperly regulated derivative markets” under the complete and rapid financial liberalisation of the crisis economies in the 1990s (Dodd, 2003, pp.1-2).

Dodd (2003) classifies the aims of the economically harmful usages of derivatives as “Abuses of Derivatives”, which can be handled as “threats to financial market integrity and efficiency and thus all over the economy” and “Misuses of Derivatives”, which can be handled as “vulnerability to disruption and crises” (Dodd, 2003, pp.8). Dodd (2003) tackles the crisis creator role of derivatives in terms of speculation. He argues that after taking profitable position on the possible fall in the currency’s value in derivatives market, mounting an attack on the fixed or pegged exchange rate points out self-fulfilling crises (Dodd, 2002a, pp.15). He summarises the mechanism as follows:

Most hedge funds or more broadly, speculators, took position against the local currency (for example, Thai baht, in the South East Asian case) in the forwards market as short positions, selling currency, which point out the massive capital outflows, due to the synthetic forwards or swaps of the local banks in the developing countries, in order to offset their foreign exchange exposure (Dodd, 2002b, 467). In terms of the negative consequences of the misuses of derivatives, which are deliberate or undeliberate efforts, Dodd (2003) lists “leverage, illiquidity, crisis accelerator and channel for contagion” (Dodd, 2003, pp.16-19). Although, he added the speculation factor as crisis creator into the abuses of derivatives list, it is thought that in terms of the direct crisis effect, which constitutes one of the potential contributions of this paper in terms of terminology and classification used in the relevant theory, it should be

placed in this second part by distinguishing it from the other harmful usages of derivatives as indirect crisis effects. So, in this paper it is placed and tackled under the direct crisis effects.

Thus, it has been claimed that fixed or pegged exchange rate systems can be made less stable by derivatives, and also that the route to the inevitable result, devaluation, can be created by speculation and the impact of the devaluation can be deepened by virtue of them. As a result, they raise “the systemic risk⁵” in financial markets and increase the tendency of contagion of the crises among countries. After the acute stage of the crises, the policies that aim at achieving economic recovery can be made even more challenging by them (Dodd, 2000, pp.21-22).

However, arguing that hedge funds as a type of financial phenomenon have been ignored within all the economic analyses of financial crises, Harmes (2002) mainly tackles derivatives in terms of hedge funds and focuses on self-fulfilling crisis within the framework of second generation models. In this regard, Harmes (2002) clarifies how the collapsing process of pegged exchange rates occurs in the conditions of uncertainty about the future of a government’s exchange rate policies, as large traders try to prompt devaluation by selling the currency in return for foreign exchange. Selling the currency in significant amounts constrains the central bank to defend the currency as its first obligation in that regime by tightening the monetary policy, causing an interest rate increase at the expense of raising unemployment and decreasing growth as political trade-offs. Therefore, it is concluded that whereas in first-generation models under unstable economic fundamentals the currency peg, which is believed to be unsustainable, is simply attacked by currency traders, in second-generation models, indeed currency traders manipulate the conditions of the countries by their speculative attacks to benefit from chanced conditions. In this way, it is claimed that large traders such as hedge

funds may have the ability to ‘create’ currency crises in conditions of uncertainty (Harmes, 2002, pp.166).

It is accepted as what Harmes (2002) argues that the activities of hedge funds are of the utmost importance for policymakers because of their ability to become “extensively overleveraged” and “to act as market leaders”. He discusses the role played by hedge funds in financial crises, market volatility, market manipulation and systemic risk. He maintains that the neoclassical view, having shaped the world political economy, has had a tendency to handle hedge funds as mostly “too-small-to-matter” in terms of public policy, although they are significant in amount and they are able to leverage their capital by means of “borrowing up to twenty times” of it from commercial and investment banks. In addition, he points out that the “leveraging” of these hedge funds by benefiting derivatives is an opportunity to buy an asset without paying its full cost up front (Harmes, 2002, pp.158).

McClintock (1996) puts the importance of hedge funds as follows “Hedge funds constitute only a small fraction of total investor assets in play in global financial markets, but they have had magnifying and destabilizing impacts on markets in recent years, most notably during the European currency crisis of September 1992 and the decline in the stock market in early 1994” (McClintock,1996, pp.22).

As noted earlier, the neo-classical view argues that, because of their high risk-taking manner, hedge funds are better handled as “contrarian investors”, making markets more liquid and efficient. It is concluded that sometimes, this may be true, but mostly; however, the ability of hedge funds to act as market leaders gives them an increased incentive to “manipulate, rather

than to arbitrage against, other trend-chasing investors” (Harmes, 2002, pp.169). At least in terms of potential, macro hedge funds, which are defined as “international portfolio investors taking large positions in national markets based on analyses of a country’s financial statistics” and are widely thought to have triggered several currency crises in the 1990s, are argued to have the ability and potential to deliberately manipulate markets for their own economic benefit (Lim, 1999, 192-193).

In Ghysels and Seon (2001)’s paper, which aims to discover the role of derivatives and foreign investors in the Asian Financial Crisis, the Korean market is examined. They list two reasons for using the Korean market, which are accepting it as a representative example of the Asian Financial Crisis and the availability of detailed data set of all transactions by different types of speculators, including foreign investors (Ghysels and Seon, 2001, 1-3). In addition, Rothig (2004) addresses the role of financial derivatives in currency crises by investigating the impact of currency futures trading on some exchange rates. In his work, the empirical results indicate that there is a positive relationship between currency futures trading activity and spot exchange rates volatility (Rothig , 2004, pp.19-20).

Desai (2000) argues that in 1997, in Russian case, the short term government bonds markets were opened up to foreigners, which took positions in derivative markets by signing forward contracts with the central bank of Russia. Beside them Russian banks, which also did not want to miss the speculative gains, started to borrow from abroad, having created risks in terms of open positions in their balance sheets and time inconsistency (Desai, 2000, pp.49).

Tomita (2000) argues that tesebono swaps⁶, a kind of derivative instruments, which were used by Mexican banks to borrow dollars from abroad, were pointing out the fact that Mexican

case was not a basic currency crisis. Indeed, it constituted one of the new types of currency crises of the 1990s, since tesebono swaps have presented neither wrong government policies nor weak macroeconomic fundamentals, but pointed out the speculative attacks to pegged exchange rates and also crisis accelerators, stressing the quick capital outflows (Tomita, 2000, pp. 4). In any case, all refers to the significant role of derivatives in the financial crises.

To sum up, discussing and acknowledging the role of derivative instruments in emerging market crises Mathieson et.al. (2004), an IMF publication, agree that the derivative markets played a negative role in the Mexican crisis, the Asian crisis and Russia's default and devaluation. However, this issue is tackled by Mathieson et.al. (2004) as follows: "the deteriorating fundamentals were the main causes of the recent emerging market crises, but derivatives amplified the impact of these crises on financial systems of emerging market economies" (Mathieson et.al., 2004, pp.67-68), pointing out the first generation models of financial crisis. On the other hand, in the work of Dodd (2000), it is suggested that derivatives played a key role in the East Asian Financial Crisis of 1997 (Dodd, 2000, pp. 5-16), which can be regarded as more than "amplification the impact of the crises".

IV-The Role of Derivative Instruments in International Financial Crises

It is argued that by derivative instruments, viewed at the macroeconomic level, the economy was first made more crisis-prone and then, by speculation against local currency, "which is accepted as one way bet" under pegged exchange rate regimes, the crisis was created by massive capital outflows and the collapse of currency and after the crisis began, the collapsing process was accelerated and deepened by the usage of some specific types of derivatives (Dodd, 2000, pp.20-21).

Apart from the existing literature, the Role of Derivative Instruments in International Financial Crises can be handled and redefined as follows: 1-Direct Crisis Effects and 2-Indirect Crisis Effects of the Derivative Instruments in International Financial Crises.

IV-1.The Direct Crisis Effects

In the presence of poorly structured and improperly regulated derivatives markets under complete and rapid financial liberalization in the case of fixed exchange rate system, whether a hard peg or a soft peg, derivatives can have a direct crisis effect on economies by creating instability in the fixed exchange rate system and leading the system to collapse. In this regard, it is argued that under such conditions, derivatives are open to be used as a speculative or hedging instrument against the success of government's policy by speculators, attackers or hedge fund operators. Dodd (2002) asks the right question that "...how and why would they (derivatives) use since there is no market volatility to hedge?" Because of the fact that in a fixed exchange rate system, a risk regarding the exchange rate is "a failure of the fixed exchange rate system that results either a devaluation of the pegged exchange rate or a complete collapse of the regime" speculators using a forward, swap or option to take a profitable position on the possible fall in the currency's value is accepted as "practically a one way bet" as self-fulfilling the expectations of devaluation (Dodd, 2002a, pp.15).

So, it can be maintained that in the 1990s, derivatives were mostly used with the aim of speculation, rather than hedging in the crises economies of the 1990s, which point out self-fulfilling crises. Because, in the 1990s, there were fixed or pegged exchange rate systems under a complete financial liberalisation, by especially freeing of capital movements, in the developing countries which experienced financial crises. Moreover, the developing countries,

which were trying to fill their capital gap by importing capital in relatively lower costs, were taking long positions on their own securities, which were not hedging due to the fact that it did not serve in reducing risk; rather played an important role in taking additional risk by using OTC derivatives to speculate (Dodd, 2003, pp.3). Thus, these costs which were reckoned relatively low initially caused much more costs to those developing countries at the end together with the whole system.

The direct crisis effect of the derivatives starts with the attack on local currency of the speculators or hedgers taking position in derivatives market either in the OTC derivatives such as forwards and swaps or exchange traded derivatives such as futures and options suddenly or gradually “in the expectation of an impending devaluation”. In this regard, it is argued that the aims of speculators who bet on the currency, and foreign investors, who hedge their investment, do not create any difference in terms of tackling these kinds of short positions on local currency by international banking system (Garber, 1998, pp. 21). All these large short positions on local currency for the future constitute a forward discount, for now telling that in the future local currency is expected to be depreciated, namely price discovery process will indicate a future devaluation reflecting “the likelihood of government failure or a measure of the lack of confidence in the government’s ability to maintain a fixed exchange rate...(the so called) ‘political price’ ” (Dodd, 2002a, pp.15) by showing that the future value of currency will be below the present pegged spot rate. In this regard, Rothig (2004) puts this as follows: “negative overshooting in futures prices, leading to a negative basis⁷ and thus increasing the pressure on the cash market dramatically” (Rothig, 2004, pp.7).

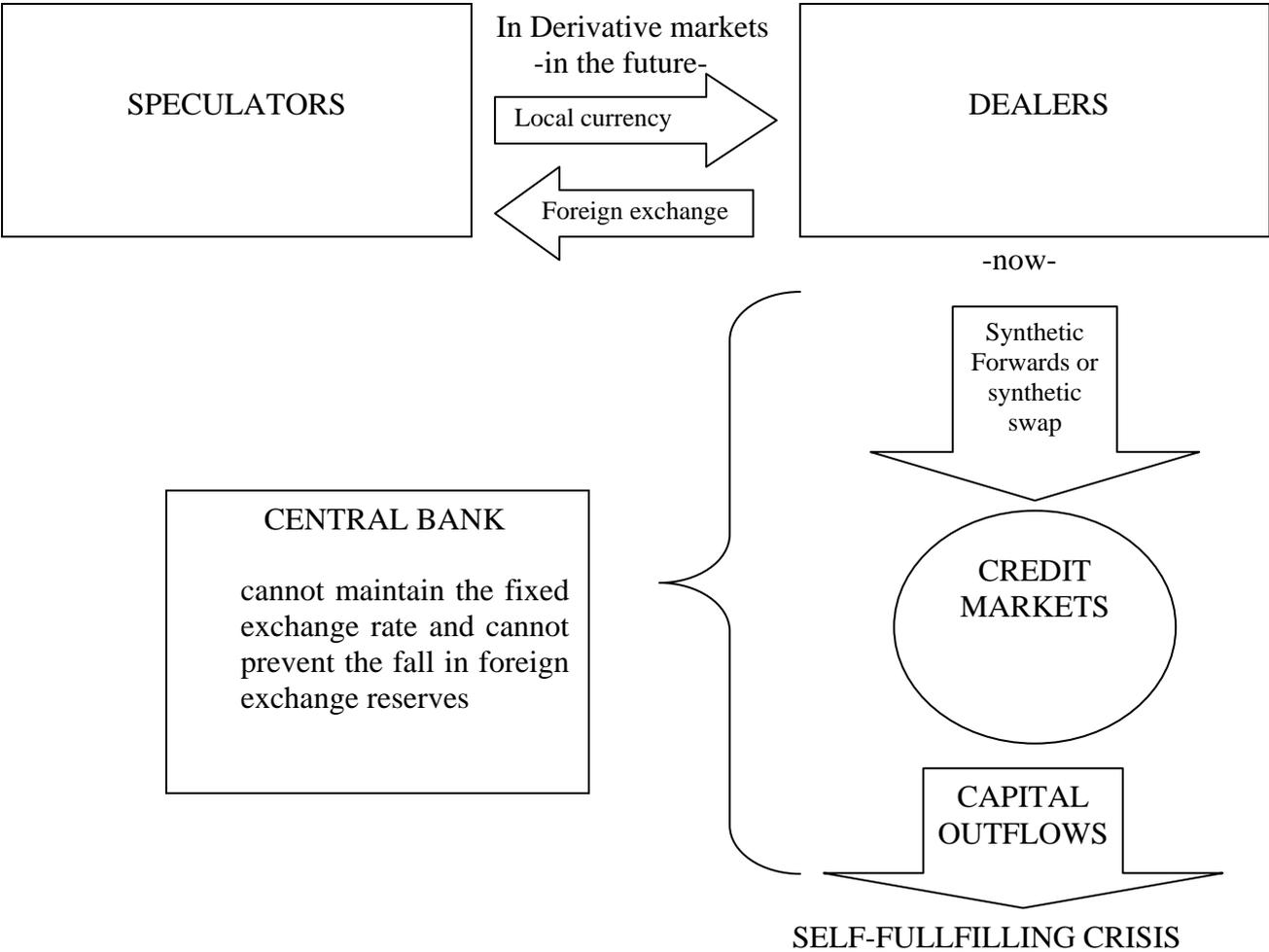
Within the framework of “one way bet” process, this forward discount will signal to the other market participants as selling weak local currency in exchange of hard currency⁸, US Dollar

or Euro, before it is devaluated, since an expectation on leaving the peg system of government will be established by the forward or swap price. Indeed, in the derivative markets of developing countries the forward rates mostly indicate forward discount due to the higher interest rate relative to the developed countries since the local currency is expected to depreciate at the same rate as the interest rate differential. In this regard, it is noted that if the credit markets in which dealers mostly take synthetic short positions as foreign exchange market makers are not perfectly efficient then dealers require a market risk premium, which is added to interest rate differential, pointing out higher discount in the forward or swap rates (Dodd, 2002b, pp. 468).

All these will create challenges for Central Banks to maintain the fixed exchange rate since the direct intervention of Central Banks works in the Foreign Exchange (FX) spot market; however, it does not work in the present derivative markets because of the fact that there is “potentially no end to the effort”. As it is noted, derivative markets provide high leverages to speculators and “players”, who might trigger an attack on the fixed exchange rate, by empowering that betting against the success of the macroeconomic policy of government through lowering the costs and increasing the gains. As a second tool to defence the exchange rate Central Bank can raise the local interest rates. However, as mentioned before this would increase the interest rate differential, leading forward discount more thus creating more capital outflows. All these point out the inefficiency of the regular tools of Central Banks. Instead, it is argued that under the currency attack conditions Central Banks should implement capital controls such as banning the local currency transfer to the foreign speculators in order to prevent the realization of forward contracts beside the policy of increasing the interest rates (Dodd, 2002a, pp.15-16).

The mechanism of the direct crisis effect of derivatives is shown below.

Figure 4. The Direct Crisis Effect



1-Speculators take large positions against pegged exchange rate as short in local currency in derivatives market either forward, swap, futures or put option. In the figure, it is a forward contract telling that at the maturity in the future, speculator will buy foreign currency in the exchange of local currency at a forward discount rate.

2-This position creates a liability for dealers in terms of foreign exchange in the future. Since everybody in the weak currency market is short in local currency they had to create synthetic forwards or swaps to offset this.

3-Within the framework of synthetic short positions in the credit market, the dealers borrow in the local currency now (time t_0) and create local currency liability for the future (time t_1).

4-They buy foreign exchange with the local currency in the spot market.

5-They invest this amount of foreign exchange in foreign exchange assets for the maturity of initial forward.

This process creates massive capital outflows now (time t_0). In a short time, after this speculative attack to the pegged exchange rate by using derivatives, forward rates start to constitute a signal for devaluation then everybody starts to be in short for local currency. At last, exchange rate system collapses as creating self-fulfilling expectations and thus, self-fulfilling crisis.

Dodd (2002a) puts this as follows (in order) “to complete the market for instance derivative dealers will have to engage in the action of creating synthetic short positions⁹ in order to lay-off their long-side risks. The result is capital outflows and as the short interest rate grows in the derivative markets capital outflows increase” (Dodd, 2002a, pp.15). This “one-way bet” can be called self-fulfilling expectations creating crisis.

All this process puts the central bank on the spot exposure. This can be either in the case of fixed exchange rate system to maintain the fixed exchange rate or floating exchange rate system to stabilize the economy following a speculative attack or at the financial disruption.

IV-2.The Indirect Crisis Effects

The Indirect Crisis Effects of Derivative Instruments in International Financial Crisis can be handled in two parts as the first one is “Preparing the Pre-conditions for Crisis” and the second one is “Accelerating the Crisis”. In other words, the presence of derivative instruments in the developing countries, which underwent complete and rapid financial liberalisation, without implementing efficient and necessary regulations, build the pre-conditions for crises pointing out the financial market failures. In addition, some types of derivatives such as Total Return Swaps and Putable Debts have a role as crises accelerators, pointing out the quick capital outflows, which are called ironically “microwave money” when compared to the description of “hot money” (Dodd, 2000, pp.21).

IV-2a) Preparing the Pre-conditions for Crisis

The abuses of derivatives can be tackled within the framework of Preparing the Pre-conditions for Crisis. These kinds of deliberate efforts can be listed as credit or default risk, manipulation and moral hazard, evading prudential regulation and information distortion, which create prone to crises economies, by threatening the financial market integrity and efficiency, thus, pointing out the market failures.

Credit or default risk¹⁰ means “the risk that the counterparty to a derivatives contract will fail to fulfil its contracted obligations” (Figlewski, 1997, pp. 4). In this regard, derivatives are open to the credit risk due to potential fraud activities. It is argued that separated by place, which is due to the distant locations of parties, and time, which results in the fraud not being noticed for some period of time allowing the participants to escape, derivative transactions

can be resulted by misleading promises of returns (Dodd, 2003, pp.9). This result creates financial losses within the framework of “firm specific risk” and also, due to the market value of the contract becomes volatile, it creates another exposure for the potential credit risk for over the life of the contract (McClintock, 1996, pp. 23).

Manipulation can be “information-based manipulation” involving “insider trading” or “making false reports on the market”, as experienced in the Enron case. They can be also “action-based manipulation” involving “deliberately taking of some actions that changes the actual or perceived value of an asset”¹¹ (Dodd, 2003, pp.10). It is noted that by insider trading activity Enron executives sold their Enron security holdings as early actions to “cash out their employee stock options”. In addition, some corrupted Wall Street firms in touch with Enron made “buy” recommendations to their customers. It is argued that although the managers are prohibited to sell directly stocks of the corporation that they manage they can do this by using derivatives to have huge improper personal benefits, pointing out the moral hazard problems in the derivative markets (Thorbeeke, 1995, pp.10).

It is argued that derivatives can be used to evade prudential market regulations such as “reserve requirements, limits on lending to individuals, firms or sectors, liquidity requirements against the domestic or foreign exchange liabilities, net foreign currency exposure limits, capital requirements etc.” aiming at maintaining financial stability through preventing capital inflows away from risky or inefficient projects (Garber, 1998, pp. 17). In this regard, derivatives are criticised in terms of destroying the efficient allocation of funds by masking the actual risk in an investment (Kregel, 1998, pp. 679).

Derivatives can also be used to avoid from the tax liabilities and capital requirements by managing reported earnings through moving income from one period to another, by showing today's profits in the future, through using accounting tricks. Within the framework of "information distortion", it is argued that derivatives "reduce transparency by being off-balance sheets", thus, cause to distorting the meaning of balance sheets of firms as "the basis for measuring the risk profile of firms" (Dodd, 2000b, pp. 463-464). So, it is argued that the balance of payments accounts of those countries do not show the real country risks since by being off-balance sheets, derivatives distort the meaning of balance sheets as the basis for measuring the risk profile of firms, central banks and national accounts, thus "reducing transparency"¹². In other words, there became a gap between the total risk exposure and that reflected by balance sheets. So, when it is looked at the balance sheets of the firms there does not seem any problem in terms of risks, thus a balanced foreign exchange liabilities and assets. But indeed, the reality is different due to derivatives.

In other words, derivative instruments can be used for escaping from the capital requirements, tax liabilities on short term gains and limitations on foreign exchange exposures and the level of risk relative to capital. Moreover, pension funds and insurance companies, which are restricted to hold foreign currency assets, can use derivatives to avoid from such restrictions in order to have more risky high yield portfolios. For example, among derivatives, structured notes can be used to evade restrictions on foreign exchange exposure on the balance sheets of financial institutions and to manipulate accounting rules in order to show high yield notes as if they were top rated credit instruments in order to circumvent capital requirements. Puttable debts can convert short term loans to long-term ones easily. Short term dollar loans can be indicated as if they were portfolio investment by virtue of TRS. All these information distortions create challenges for firms to make an accurate assessment of their counterparty's

creditworthiness and for regulatory authorities to find out how much risk their financial markets are exposed, by leading systemic risk, “which refers to the vulnerability of the financial system to shocks” (McClintock, 1996, pp. 26).

IV-2b) Accelerating the Crisis

The Accelerating Crisis effect of derivative instruments can be handled as the quickening and deepening the crisis after the crisis began. These kinds of crisis accelerator effects can be experienced more frequently if there is the usage of some specific types of derivatives, such as Total Return Swaps, Structured Notes and Putable Debts etc., since all these derivatives require some margin or collateral requirements, pointing out the capital outflows at the weak of the crises in which capital or liquidity is most required.

Within the framework of quicken the process it can be said that the derivative transactions of financial institutions of developing countries are generally required strict collateral or margin requirements such as hard currencies or securities because of the default risk of these relatively weak economies. In this regard, at the beginning of devaluation or much more broad financial crises causing a sharp fall in the price of the underlying collateral such firms are immediately required to add hard currency assets to their collateral in proportion to the loss in the present value of their derivatives position. This causes to rapid outflows of foreign currency reserves as local currency and other assets were exchanged into dollars in order to meet the collateral requirements (Dodd, 2003, pp.18), causing to shortage of liquidity, which is defined as “the ability to match obligations with the ability to pay” (Kelly, 1995, pp.230).

Within the framework of the deepen the impact of the crisis, in the case of the high leverage defined as “creating higher risks by the possibility of gaining huge amounts of money, with

relatively small amounts of capital”, which is especially seen in the OTC derivatives, that derivatives provide the process of effort to meet collateral requirements will accelerate the size of the losses to the whole financial system and hence deepen the impact of the crisis by creating international financial instability. In this regard, it is accepted that these kinds of derivatives turn into channel for contagion¹³ as many derivatives involve cross-border counterparts and so, such counterparts will be adversely influenced by the losses of market value and credit rating in crisis country, due to international nature of markets as herding behaviour or the fact that many derivatives involve cross border counterparts. Secondly, in crises economies to meet collaterals selling securities in other markets is common (Dodd, 2003, pp.20).

Derivative transactions in huge amounts also point out the Systemic Risk due to the possibility of a rapid expansion of counterparty credit risk during the economic downturn. On the other hand, it can be argued that systemic risk is diminished by virtue of derivative instruments through their ability of cancelling or shifting the risk to the ones that most able to manage and bear it (Darby, 1994, pp.17).

IV-2b1. Total Return Swaps (TRS)

If there is interest rate differential between two countries under fixed exchange rates the local banks, which want to benefit from the interest rate arbitrage, make a swap contract which will pay a variable interest rate, mostly London Interbank Offer Rate (LIBOR), plus some spread to offset the lender’s credit risk in the exchange of total returns on security, namely, change in market price plus interest or dividend payments, at the maturity. They make swap instead of a dollar bank loan in order to avoid from some restrictions on foreign exchange exposure.

Since for this swap agreement the local banks pay collaterals which operate as margins in the future derivatives, which are adjusted marked to market¹⁴ daily, this creates a potential crisis accelerator during a sharp downturn due to immediate capital outflows, overnight or intraday, in order to meet margin requirements as called “microwave money” compared to the hot money creating international financial instabilities and more broadly crises. It is also criticised in terms of being open to high leverage, which creates significant risks, especially foreign exchange risk, by being in short in dollar, although this foreign exchange exposure is masked in the Balance of Payments Account of the country due to the capital inflows are seen as local currency denominated security instead of dollar bank loans, which is restricted by government financial regulations (Dodd, 2003, pp.11) The mechanism as follows:

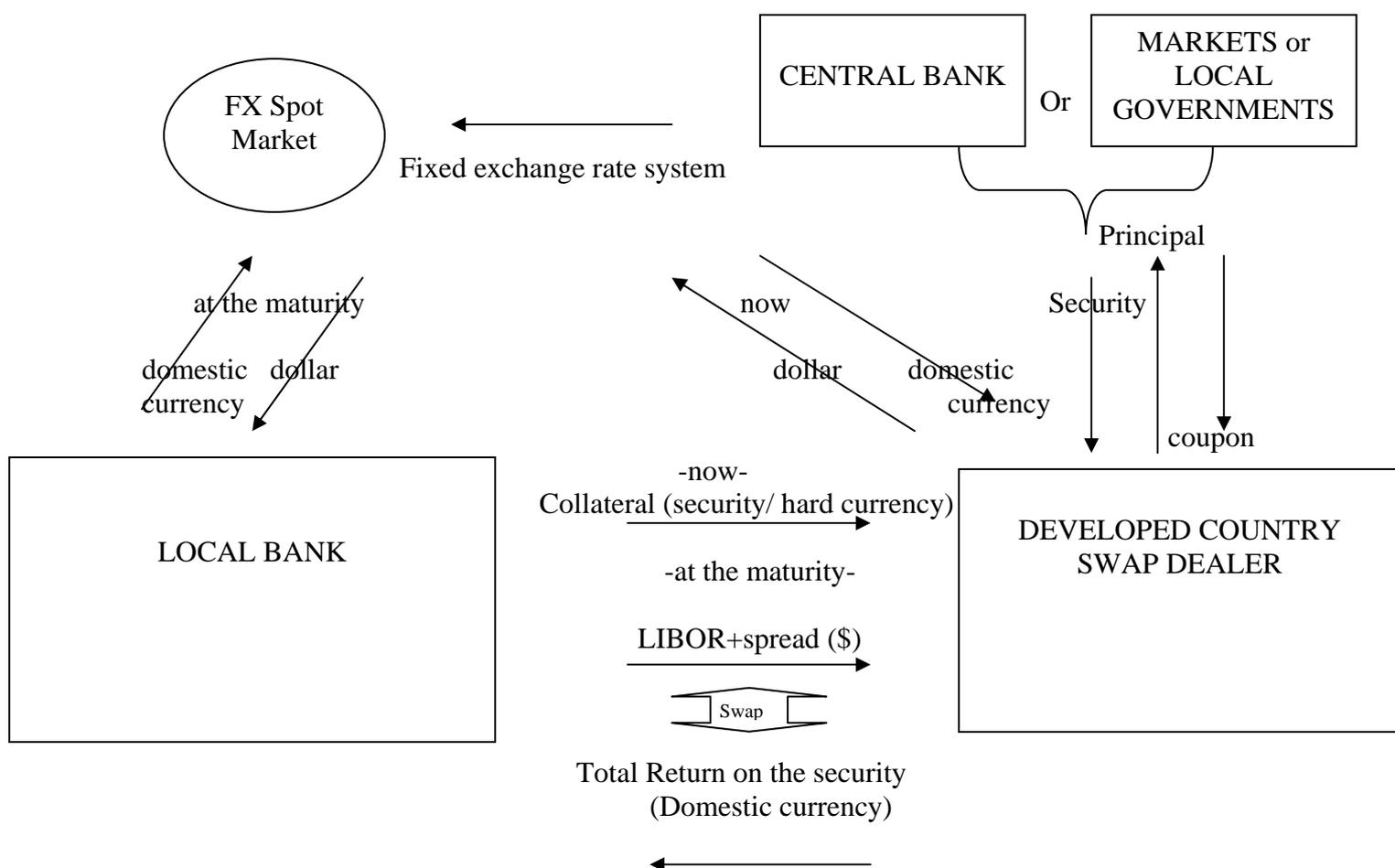
1-By giving some collateral the local bank in the developing country makes a Total Return Swap contract with the swaps dealer in order to swap LIBOR+spread with total returns on underlying security, which is accepted to consider as a benchmark but not create any ownership or debt.

2-At the same time, the swap dealer buys the underlying security from markets or Central Bank or local Government, depending on the characteristic of the underlying security, in order to hedge its position in the TRS after it exchanges its dollar with domestic currency.

3-At the maturity, total returns are calculated according to the underlying security as change in market price plus interest rate or dividend and also LIBOR+spread on the notional principal of underlying security is computed as the local bank’s liability.

4-During this process, if the domestic interest rate increases, in other words the value of the security decreases, or the local currency depreciates or both of them in order to maintain the value of the collateral additional collateral is required to fill the gap.

Figure 5. The Mechanism of Total Return Swaps (TRS)



Capital outflows as additional collaterals in the weak of the crisis



At the weak of the crisis or a sharp downturn the additional collaterals are highly required although the liquidity is the most important need in those times, creating permanent capital outflows and thus deepening the crisis. This result was experienced both in the Mexican crisis in 1994 and South East Asian Crisis in 1997.

It is noted that in the Mexican case, tesobono swaps, a kind of TRS, in which Mexican residents were holding the tesebono risk by having been “a short term borrower of dollars”,

were used to mask short term dollar loans that the foreign swap dealers gave (Garber, 2000, pp.364). It is also criticised that taking position against peso was easily achieved in the form of tesobonos through forward sales of the peso to the Mexican government itself, having led to “the turbulence in the foreign exchange markets that followed the December 1994 devaluation” (Garber and Lall, 1998, pp.210-214).

It is argued that in the Korean crisis there was a significant role of derivative instruments, which Korean banks used, such as Indonesian TRS, to gain higher rates of return to offset the rise in their funding costs. However, by the crisis they exposed to Indonesian credit, although their balance sheets did not indicate this issue, pointing out the contagion issue and even unpredictable and severe contagion (Neftci, 2000, pp.22) It is noted that by having allowed investors to borrow yen at low interest rates and invest in higher-yielding currencies, such as the Thai baht or Indonesian rupiah, TRS became very popular in Korea (Kregel, 1998, pp. 686).

For the Russian Crisis in 1998, it is noted that legal framework for finance and also implementing process were inadequate, so that vulnerability of banking sector was high, due to their open foreign exchange positions and off-balance sheet-activities, such as derivatives especially TRS. Moreover, banks especially financed government deficits, not real sector, causing banking sector and government highly vulnerable to the volatilities of international capital markets (European Bank, 1998, pp.2-9). In this regard, it is argued that Russian financial institutions, especially banks were in short position in dollar by borrowing from abroad in huge amounts and in long position in rubbles in order to speculate on the short-term liabilities of government (Taylor, 1998, pp.675).

IV-2b2.Putable Debt

Put-able debt, which is accepted as “the largest threat to financial market stability that did not directly involve foreign exchange exposure”, refers to the bond or loan debt contracts which include put options in themselves (Dodd, 2002b, pp.461).

The creditors in developed countries that do not trust the weak macroeconomic or political conditions of the debtor developing countries require “put-able debt”, namely, the loans or bonds attached put provisions, either hard puts or soft puts¹⁵, from the debtors in developing countries, in order to reduce the default risk. In this regard, companies in developing countries prefer put-able debt due to its relatively low cost and also in order to avoid regulations since tax and regulatory requirements tackle it as long term debt although it functions as short term debt (Dodd, 2000, pp. 14).

Within the framework of put-able debt, once a crisis begins in a developing country then the loans in foreign currency are called even in the most required period or the debt conditions get harder, forcing the debtor country. All this creates crisis accelerator or deepening process as causing liquidity shortages.

It is noted that put-able debts were widely used in the South East Asian case, leading the deepening the crisis by accelerating the illiquidity after the conditions started to worsen (Dodd, 2002a, pp.15). The table below indicates the size of the put-able debts in the South East Asian economies, pointing out the potential illiquidity risk and thus vulnerability to the crisis.

Table1. The Size of Putable Debt in the South East Asian Economies in 1999

*(\$ millions)	P. Bonds(P.B.)	P. B. % of FR**	P. Loan (P.L)	P.L. % of FR**	Putable Debt (PB+PL) % of FR**
Hong Kong	2642	%3	1549	%2	%4
Indonesia	963	%4	2876	%11	%15
Korea	3986	%5	3263	%4	%10
Malaysia	1730	%6	547	%2	%7
Thailand	1313	%4	1680	%5	%9

Data Source: IMF (1999) and IMF IFC Statistics

* Due in 1999 or 2000

** Foreign Reserves in 1999

The Percentages are rounded.

IV-2b3. Structured Derivatives: Structured Notes

It is argued that Structured Derivatives are developed by global investment banks, which are mostly allowed to invest in assets with a minimum of risk, marked by “investment grade credit rating”, and prohibited to take foreign exchange risk or foreign exchange credit risk, with the aim of overcoming these kinds of restrictions on global funds (Kregel, 1998, pp. 680). In order to match its hard currency liabilities on its balance sheet the developing country investor buys a hard currency denominated assets from derivatives dealer in the developed country, who wants to “create long-dated futures or options positions on developing country currencies and securities”, in exchange of hard currency, for example dollar. In this contract, the dollars that are paid to developing countries as assets yields, in the form of interest rate or dividend, are dependent to the derivative contracts such as long position in the value of the developing country currency, either in a futures contract or a short-put position, which dealers make, leading the instruments in dollars of which value is linked (Dodd, 2000, pp.14).

There are many types of Structured Derivatives, which are allowing combining securities, such as bonds, notes or stocks, with derivative instruments like option or futures contracts acting as hybrid instruments. Among these, Structured Notes, which were widely used in the crisis economies, are defined as “Investment vehicles with coupon payments and principal repayments driven by formulas that can vastly leverage the initial capital invested” (Garber, 1998, pp.17). Most common example of structured notes were Principal Exchange Rate Linked Note (PERL), used in the South East Asian crisis, in which the dollars that were paid to developing countries as interest rate were dependent to a short-put position, or future contract of the dealer. It is argued that when a developing economy investor buys a high yielding structured note, such as a PERL, then the capital flow can be reversed and principal can go to the dealer’s country due to the devaluation or a significant depreciation in developing country by allowing negative return of structured note or at least fall of the note’s return to the below the norm (Dodd, 2000, pp.14). Garber (1998) gives the example that, as experienced before, if the Korean banks buy a structured note that tied to the Indonesian rupiah with a face value of \$ 20 million then the principal payment and interest payment will depend on the dollar-rupiah exchange rate, making them fall when the rupiah depreciates (Garber, 1998, pp.370).

It is also noted that during the Mexican crisis, structured notes of which counterparts were investment houses in New York, were widely used by the Mexican financial institutions. Garber and Lall (1998) put the situation as follows: “Booked as claims with dollar principal and dollar payoffs, these notes in fact were currency bets that allowed the banks to leverage their investment into a short dollar and long peso position to take advantage of the positive interest rate spreads between peso and dollar money markets”. In fact, it is also argued that due to Mexican regulators were not aware of the mechanism of these instruments, which can

be easily used for avoiding from the prudential regulations on currency position, such as limit of a maximum of 15 per cent of capital, or interest rate inconsistencies, they did not restrict them. However, during the devaluation occurred in Mexico there were much more short dollar positions and losses of the Mexican Banks than reckoned by the authorities (Garber and Lall, 1998, pp.221).

V-Conclusion

It can be said that derivative products were developed with the aim of treatment of some diseases, such as risks and volatilities, which threat the stability and efficiency of markets. However, ironically, as experienced in the 1990s, they themselves can create such diseases as sometimes “side effects” by hedging or sometimes with deliberately harmful purposes by speculation; at least, they can contribute to the downturn more than reckoned before.

Indeed, these highly sophisticated financial engineering products involve the potential detriments in themselves as they never eliminate the overall risks in the markets rather they “only transform and re-allocate risk” as in the IMF’s words (IMF Survey, 1994, from Kelly, 1995, pp.216). If the risk which is transformed by derivatives is shifted to the developing countries of which financial markets are weak, poorly regulated and vulnerable to crisis and of which foreign exchange rate system is fixed or pegged, then it can be argued that such derivatives play a significant role in converting those risks into real financial crises, which were witnessed in several cases, such as Mexican Crisis, South East Asian Crisis and Russian Crisis.

By not forgetting that in the weak and unregulated financial markets derivatives can be a dangerous tool creating massive capital outflows and causing to the collapse of the exchange rate system, it can be concluded that prohibition of all of them is not a “win-win” solution. As Garber and Lall (1998) put it “The policy implication that emerges from this is that the growth of derivatives should be seen as a two-edged sword that can be very beneficial if used properly but can be harmful if not” (Garber and Lall, 1998, pp. 229). In this regard, by increasing transparency in especially OTC markets monitoring them and their over all risk in the economies, separating the ones hedging aimed and speculation aimed by some regulatory activities and by increasing the accountancy standards making them “in balance sheets” with their gains and losses can be first steps.

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Notes

¹Derivative Instruments are the financial contracts, whose value or price depends on, or is derived from, that of another asset such as a commodity, security, interest rate, index, an event or foreign exchange rate. The term "derivative" is used to stress the fact that the prices or values of these contracts are "derived from" the price of an underlying item such as a commodity, security or the value of interest rate, foreign exchange rate, index or an event (See Derivatives Glossary).

There are four main types of derivative instruments: Forwards, Futures, Options and Swaps. In this regard, a foreign exchange forward is a contract in which counterparties agree to exchange specified amounts of foreign currencies at some specified exchange rate on a specified future date. Futures contracts are like forwards, but they are highly standardized, publicly traded and cleared through a clearing house. An option contract gives the buyer or holder of the option (known as the long options position) the right to buy (sell) the underlying item at a specific price at a specific time period in the future. The basic idea in a swap contract is that the counter-parties agree to swap two different types of payments. A foreign exchange swap is simply the combination of a spot and forward transaction (or possibly two forwards) (See Derivatives Instruments).

²Contrary to the general view, globalization experienced in the 1990s was not the first time for the world (See Rodrik, 1997).

³OTC derivatives refer to the "generally privately-negotiated forwards (such as forward commodity or foreign exchange-contracts, forward rate agreements (FRAs) or currency, interest rate, commodity, or equity swaps) or privately-negotiated options (such as commodity, currency, equity, FRA, swap, and bond options...)" (Darby, 1994, pp.3).

⁴Mishkin (2001) defines financial crisis as follows: "A financial crisis is a disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities" (Mishkin, 2001, pp. 2). In addition, "international financial crises" can be defined as "a situation where the international dimension substantially worsens a crisis in ways that would not occur in a closed economy" (Summers, 2000, pp.4).

⁵BIS's Lamfalussy Report defines Systemic Risk as "the risk that the illiquidity or failure of one institute and its resulting inability to meet its obligations when due, will lead to the illiquidity or failure of other institutions" (See BIS, 1990).

⁶A Tesebono Swap is defined as "...offshore derivative operations used by Mexican banks as a means of leveraging tesobono holdings, the notorious treasury bills of the Mexican government indexed to the peso-dollar Exchange rate" (Garber, 1998, pp.10).

⁷The difference between futures and cash prices is called the basis: $bt = ft - st$ where ft is the futures price in t and st is the spot price in t . (Rothig, 2004, pp.6).

⁸Hard currency is defined as "A currency in which investors have confidence, such as that of an economically and politically stable country" (http://www.investorwords.com/2280/hard_currency.html)

⁹For a detailed analysis of Synthetic Assets see Neftci (2002).

¹⁰The other firm specific risk types in the derivative markets are listed as follows: Market Risk, Operational Risk and Legal Risk. Market Risk is defined as “The risk that movements in financial market prices will impair a firm’s financial condition due to its positions in derivatives”. Operational Risk is defined as “The risk of derivatives-related losses from deficient internal controls or information systems. Legal Risk is “the Risk that derivatives contracts will not be legally enforceable”. Another risk is added to this list as Model Risk that refers to the situation when “the actual probability of a large price change is greater than the model allows for” (See Figlewski, 1997).

¹¹It is putted as follows: “Managers of a firm short the firm’s stock and then announce the loss of an importance a contract or the closing factories. After they profitably cover their short positions by buying at lower prices they can capture further gains by announcing the negotiation new contracts or open new factories... Trade-based manipulation, involves either unexpectedly amassing a large position in the market or more likely using one market to capture the gains from creating a price distortion in another interrelated market, (such as derivatives market, especially the OTC market)...A manipulator acquires a large long position in the derivatives market by entering forward or swap contracts for future delivery based on the future price. If the derivative positions were transacted through OTC market, then neither the government nor other market competitor would be able to observe the total position of the manipulator. Then the manipulator goes into the spot market for crude oil and amasses a large enough inventory in order to push up present price. This raises the value of the long derivatives positions so that they can be offset profitably. Then if the manipulator can sell off the amassed inventory without incurring substantial losses, the manipulation will be successful” (See Dodd, 2003).

¹²For a detailed discussion of the Effects of Derivatives on Interpretation of BOP Accounting see Garber (1998).

¹³“The tendency of a firm crisis in one country to adversely affect the financial markets in other economies” is called Contagion. In other words, it can be said that it is the systemic risk in international level (Dodd, 2000, pp.21)

¹⁴When a trader enters into a contract he has to deposit a certain amount known as the initial margin. The margin account is adjusted at the end of every single trading day. This procedure known as 'marking to market' reflects the trader's gain or loss (Rothig, 2004, pp.2).

¹⁵In the hard put case they can call the principal after for example one year although the debt is for five years. In the soft puts, of which conditions is softer than the other, they do not call the principal in a short period, but change the debt conditions and make them harder compared to the initial ones (See Dodd, 2000).