



ESJ Social Sciences

Analyzing the Impact of Derivatives on the Emerging Markets Financial Stability

Lela Schöler-Jordanashvili, PhD Student

Business Administration, Grigol Robakidze University, Georgia

Doi:10.19044/esj.2020.v16n28p40 URL:<http://dx.doi.org/10.19044/esj.2020.v16n28p40>
Submitted: 9 July 2020 Accepted: 11 October 2020 Published: 31 October 2020
Copyright 2020 Scholer-Jordanashvili L. Distributed under Creative Commons CC-BY 4.0 OPEN ACCESS

Abstract

In recent decade, volatility of stocks and interest rates, together with the globalization of capital markets, increased the demand on financial instruments with the purpose of distribution of risks. The estimation of the role of financial derivatives instruments is very important for the stability of international financial system. The impact of derivatives upon International Financial Crises is an issue that is still dividing academics and practitioners. This paper focuses on analyzing the roles of derivatives in the financial crises. Within the framework of this research, three (3) emerging countries were studied for 1997-2010 quarterly. OLS regressive equation was used for empirical tests. The model includes the following variables: crisis index (dependent variable) and independent variables which include: the Ratio of the Current Account to GDP, the Ratio of the Domestic Credits on Private Sector to GDP, and the Ratio of the total notional amounts outstanding of the exchange traded derivatives to Foreign Exchange Reserves. Empirical analysis shows that the influence of derivatives over financial stability is not unilateral, and it depends on the characteristics of the financial system of the country. The study conducted on example of emerging markets, particularly Argentina, Russia and Brazil, revealed negative influence of derivatives on the financial system.

Keywords: Derivatives, financial crisis, hedging, currency reserve, OTC, Forwards, Futures, Options.

Introduction

The economies and financial markets of emerging market economies (EMEs) tend (with some exceptions) to be more volatile than those of advanced economies. This is true whether one focuses on output growth, exchange rates, interest rates or capital flows. Given this volatility, one would expect hedging markets in EMEs to be well developed. However, this does not seem to be the case. EMEs make up for about one-third of the global economy when measured at market exchange rates and just under

one-half when measured at purchasing power parity. Their share in global trade is 36%. Still, derivatives referencing their currencies or interest rates account for only 10% of the global turnover of such contracts, despite notable growth in some cases in recent years¹.

Financial instruments, known as derivatives, have played an important role in economic activity from ancient times, i.e., from support of the delivery of goods to support of trading and provision of hedging toward various risks. Derivatives were used in form of commodity, financial assets, and together with changes in their regulation. It directly plays a vital role in a financial system and greatly contributes to various aspects of an economy as a whole. Lien (2008) summarizes the roles and functions of the derivatives market in emerging economies, in both theoretical and empirical studies. First, the derivatives market offers an effective mechanism that facilitates the sharing of price risks for commodities traded on the market, which helps producers to deal with price volatility. Second, it is widely accepted that the derivatives market functions as a channel of risk reduction and redistribution, which is a means for price discovery and price stabilizer. Subsequently, various derivative instruments appear to suit the risk preference of different agents, such as hedgers or speculators.

New financial products, improved computer and telecommunications techniques, and advances in the theory of finance have generated rapid changes in the structures of global financial markets. Progress in finance theory has strongly influenced a wide spectrum of finance applications and has enabled advancements in asset allocation models, performance measurement, and risk management (Merton, 2005).

The development of new asset classes and the changing of institutional structures are expected to strengthen the financial sectors' ability to foster economic growth. Also, financial innovations may also influence the stability of the financial sector (Rajan, 2006).

Furthermore, the question about if financial markets have a positive influence on financial stability has been discussed for many years. Are there changes in the structure of the financial markets that have influenced financial stability? Did the advent of derivatives markets encourage speculation in the underlying asset markets, diverting private and public resources from efficient allocation (Tobin, 1984)?

Dodd argues that while derivatives performed the economically useful purpose of risk shifting (hedging) and price discovery, they also created new risks that were potentially destabilizing for developing economies (Dodd, 2002).

¹Bank for International Settlement
<https://www.bis.org/statistics/derstats.htm?m=6%7C32%7C71>

Therefore, various contribution have been made to the existing literature by extending the conventional financial stability view to the derivatives markets, by providing a theoretical framework for analyzing the impact of derivatives on the ability of the financial sector to support growth and investment, and by empirically analyzing the impact of derivatives on the finance crisis in three (3) emerging economics.

Literature Review

The development of derivatives market for a long time is a subject of interest for researchers, policy makers, and financial agencies. It plays a vital role in financial system and makes large contribution in various aspects of the economy. Lien and Zhang (2008) summarize derivatives market role and functions in emerging economies, in theoretical and empirical researches. First, derivatives market offers effective mechanism that simplifies sharing of cost-related risks on marketed commodity and thus helps producers to overcome variation of prices. Besides, it plays a basic role in correct hedging and risk management by supporting capital inflow to the market of emergency countries. Thus, it has a negative influence on the financial systems by causing unforeseen dynamics of crisis and also serves as the mechanism for the activation of chain reaction. Second, it is accepted that the function of derivatives market is a method for the reduction and redistribution of risk, means of price discovery, and stabilization.

Garber (1998) argues 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.” Its aim is to maintain financial stability by preventing capital inflows away from risky or inefficient projects (Garber, 1998, p. 17). In this regard, derivatives are criticized as it destroys the efficient allocation of funds by masking the actual risk in an investment (Kregel, 1998).

Consequently, it is very important to study the mechanism of derivatives use in financial crisis and the wide mechanism of the use of derivatives instrument in an economy. In connection to the above mentioned, Dodd stated that derivatives plays a “double role” in an economy, one of which provided economically useful role “in hedging and risks management” and enables capital inflows to developing countries which are not enough for development. On the other hand, it also plays a role in “price discovery and establishment of standard market prices”, thus reducing uncertainty and improving the efficiency and stability of the market (Dodd, 2002). Sendeniz-Yüncü (2018) opinioned that a well-functioning derivatives market makes it possible for firms to share risks efficiently, and it allows them to conduct projects with higher risk in a view of boosting economic growth.

However, derivatives can be used for economically harmful purposes due to the existence of “poorly structured and improperly regulated derivatives markets” -under conditions of full and rapid financial liberalization of crisis economy in the 1990s (Dodd, 2008). Willem and Verschoor (2012) argued that increase in the credit derivatives held by financial institutions reduces the stability of the financial sector. Khan (2017) used a panel vector autoregressive method and the Granger causality approach. Vo (2019) shows the existence of bidirectional Granger causality between the derivatives market and economic growth, although the causal relation differs between high- and middle-income countries. Dodd (2008) argues that the use of derivatives for economically harmful purposes is classified as “misuse of derivatives”. This can be considered as a threat to the completeness and efficiency of financial market and therefore to the whole economy. Also, the “incorrect use of derivatives” can be considered as “dissolution and crisis variability”. However, Dodd stated that derivatives can play a significant role in the creation of crisis if conditions of speculation exist. He further noted that during possible reduction of currency cost on derivatives market after getting to a profitable position, attack toward fixed or floating exchange rate indicates the creation of crisis. Hence, he summarizes the mechanism as follows:

Majority of hedge funds, or, more exactly, of speculators occupy positions against local currency (for example, Thai baht, south-west Asia case) based on forward market as short positions. Thus, they sell currency which means a massive outflow of capital due to synthetic forwards or swaps of local banks in developing countries for compensation of foreign exchange rate risk. Under negative conditions of incorrect use of derivatives which are planned or non-planned, Dodd allocates “leverage, non-liquidity, crisis accelerating factors and infection channels.” He also added speculative factor as creator of the crisis, although he reviewed it as factor of indirect effect.

Therefore, fixed or controlled currency regimens can appear to be less stable because derivatives and devaluation consequences cannot be avoided. Additionally, this can be created as a result of speculation attacks, and devaluation effect can be deepened because of them. Thus, “systemic risk” is created on financial markets and the tendency of spreading crisis among countries is increasing. The acute stage of crisis policy is aimed at improving the economy which can become ineffective because of them (Dodd, 2000).

From this standpoint, Harms explains how the process that destructs artificially maintained exchange rate in conditions of unclear future of exchange rate policy of the government appears. This is because large traders try to recognize devaluation by selling currency for foreign currency. However, the selling of significant amount of currency forces central bank to

protect currency in such regimen as its primary obligation due to the delay in monetary policy. This increases interest rate on account of growing unemployment and reduction of political alternatives. In the first generation model, under conditions of unstable economical bases, the currency is considered to be non-solid and it experiences attacks from currency traders. The second generation models currency traders are manipulated by the country's conditions with their speculative attack in order to get benefit when there is a chance. Therefore, it is supposed that large traders, such as hedge-funds, can "create" currency crisis under unclear conditions (Harms, 2002).

McClintock notes the significance of hedge-funds as follows: "Hedge funds are only a small part of total investment assets that exist on global financial markets but they had a growing and stable violating influence over markets, especially during the European currency crisis – in September 1992 – and the impairment of fund merge in the beginning of 1994" (McClintock, 1996).

In examining and studying the derivative role in causing market crisis, Mathieson (2004) stated that the derivatives market played a negative role in Mexican crisis, Asian crisis, and Russian default and devaluation. Mathieson explains this as follows: "Worsened fundamental factors were the basic reasons for market crisis, but derivatives deepened the influence of this crisis over the economy of forming markets." However, this was indicated on first generation models of financial crisis. In his work, Dodd stated that derivatives played a basic role in the financial crisis of East Asia in 1997 what can mean more than "strengthening of crisis effect". Huang (2017) and Tanha (2017) noted that the risk channel is concerned with the negative impact of derivatives market development on financial market and economic growth. It may raise speculation about underlying assets, making the financial markets more volatile and adding more uncertainty to the economy. However, using derivatives as hedging instruments could be beneficial to firms and agents.

Subsequently, due to derivatives instruments which are examined on a macroeconomic level, economy, first of all, was more intended to crisis. This is also as a result of speculation toward local currency, which is accepted as "one way bet" under the regimens of artificially maintained exchange rates crisis. Furthermore, this was created by massive outflows of the capital and collapse of currency system. In addition, the process of dissolution after the beginning of the crisis was accelerated and deepened by the use of some specific types of derivatives (Dodd, 2000). The role of derivatives instruments in international financial crisis can be explained as follows: (1) direct crisis effects and (2) indirect crisis effects of derivatives instruments in international financial crisis.

Research Methodology

This paper addresses the impact of the derivatives market on financial stability and growth volatility in three (3) economies using time-series analysis. A quantitative research method was used. Database containing three (3) emerging countries (Brazil, Russia and Argentina) was used for empirical testing for the period 1997-2010. Through the analysis of this database, the potential role of derivatives was studied for countries with emerging markets in the global financial crisis of 1998 and 2008. From this standpoint, a methodology analysis of database was conducted. Also, time-series regression was used for data analysis as shown in the following equation below:

$$Y_{it} = a + X_{it}B + \mu_{it}$$

Where i means family economy, individuals, firms, countries, etc., and t means time within which variables are being observed.

Basically, the study covered three major economies in the world, namely: Brazil, Russia, and Argentina. The timeframe varied across countries, starting from 1997Q1 to 2010Q4 for China. The data used for the analysis were collected from various sources. Information on the derivatives market originates in the Bank for International Settlements (BIS) database. It is difficult to define a good measure for the derivatives market, which has a wide variety of products. In this paper, we proxy it by an outstanding notation amounts of exchange-traded derivatives. For the remaining variables, we obtained data from the International Monetary Fund (IMF) and International Financial Statistics (IFS). Table 1 describes the data for the variables.

Model Specification

Based on extensive review of the literature on financial development and derivatives as well as empirical studies on this link, an analytical framework consisting of the derivatives market and macroeconomic factors which act as control variables was constructed. However, the initial goal was to develop a proper procedure for estimating the link between these variables. The regression specification is as follows (Hayali, 2013):

$$CI_t = c + \beta_1 CPS_{GDP_t} + \beta_2 CRGDP + \beta_3 CAGDP_t + \beta_4 TDFR_t + \omega_t$$

Table 1. Dependent and Independent Variables

Expected Sign	Symbols	Definitions	Unit and Scale
+	CI	Crisis index	Index
+	CPS	Claims on private sector (nonperforming loans)	In national currency millions
	CA	Current account	In USD

	CR	Credit to private sector	In national currency, in millions
	TD	Total outstanding amounts of the exchange traded derivatives.	In USD
	GDP	Gross domestic product	In national currency, in millions
	FR	Foreign reserves minus gold	In USD
+	CPSGDP	The ratio of the non-performing loans to GDP Correlation of unpaid loans to GDP	Rate
-	CAGDP	The ratio of the current account to GDP	Rate
+	CRGDP	The ratio of the domestic credits on private sector to GDP.	Rate
+	TDFR	The ratio of the total outstanding amounts of the exchange traded derivatives to foreign exchange reserves.	Rate
	DSR	debt service ratio	Rate

Dependent Variable

CI (Crisis Index): This can also be known as “financial Pressure index”, “crisis pressure index”, or “Exchange Market Pressure Index”. Thus, what this means is that if it increases, the ability of crisis will increase too, particularly the impact of the crisis. Based on applied literature, this can be calculated as follows:

$$CI = \% \Delta S - \alpha 1 \% \Delta R$$

% Δ S: Quarterly percentage change of the exchange rate, defined in the domestic currency per unit of the US Dollar.

% Δ R: Quarterly percentage change of the foreign exchange reserves

$$\alpha 1 = \sigma s / \sigma r$$

σ s: The fixed standard deviation of the percentage change of the exchange rate

σ_r : The fixed standard deviation of the percentage change of the foreign exchange reserves.

In this paper, crisis index is calculated as the weighted average of percentage changes in the bilateral nominal exchange rate and the percentage change in foreign reserves. This is with weights such that the two components of the index have equal sample volatility. Therefore, changes in the exchange rate have positive signs. On the other hand, changes in monetary reserve have negative signs, devaluation of exchange rate, and reduction of monetary reserve which increases the impact of crisis. However, it can be stated that an increase in crisis index means an increase of weighted difference between reduction of exchange rate percentage and reduced percentage of monetary reserves. Weighting here is achieved by the multiplication of the changes in the reserves by α_1 coefficient. Therefore, the definition of crisis based on the calculation of crisis index is an “episode in which attack to currency causes sharp reduction of currency, strong reduction of international reserves or a combination of both effects” (Edison, 2000).

Independent Exponential Variables

CPSGDP - (The Ratio of the Non-Performing Loans to GDP): This is a proxy variable for bank’s non-performing loans which are calculated as claims on the private sector of the deposit money banks. Hence, this means that where the liquidity is increased by foreign capital inflows, this excessive liquidity is spread into the private sector by banks through bank credits. In this regard and in such conditions when the loans increase, the banks act in a relaxed manner. Thus, the criteria of the banks for examining loan applications get relatively loose leading to “bad bank loans” and, as a result, non-performing ones (Akiba, 2007). So, the expected sign of this variable is positive — pointing out the positive relationship with the Crisis Pressure Index (Edison, 2000)

CAGDP (The Ratio of the Current Account to GDP): While CAD, which is negative sign of current account, can increase the impact over devaluation of currency, it is a general determinant used in empirical studies. Other case involves excess of current account which indicates that current account has a positive sign. From this part, the rate of current account towards GDP is used here as one of the possible determinants/ reasons of financial crisis. It is expected that this variable (CAGDP) should have a negative relation on crisis impact index (Hayali, 2014).

CRGDP (The Ratio of the Domestic Credits on Private Sector to GDP): This variable is estimated as “loans boom” variable which indicates that current banking system does not have solid/ healthy structure which is also estimated as determinant of financial weakness. Also, it causes negative expectations and reduction of investors trust toward banks and system as a

whole, which is what finally ends with self-realizable crisis e.g., weak banking system increases the ability of speculative attack (Kruger, 2000). Indicator which can be also used in the literature as positive index of financial liberalization/ development indicates a potential inter-relations between weak banking system and account crisis. An expected sign of this variable is positive while it indicates a positive relation with crisis impact index.

TDFR (The Ratio of the Total Notional Amounts Outstanding of the Exchange Traded Derivatives to Foreign Exchange Reserves): A high value of this rate is one of the possible determinants of the financial crisis of emerging markets. This happens because of fully liberalized, badly structured, and improperly regulated derivatives market. In addition, derivatives can be highly open to use for economically harmful purposes. This purpose might include manipulation, high risky positions presented by high leverages, incorrect information, reduction of transparency, avoidance of reasonable regulations, etc. Thus, this is a weak point for the crisis. Even more, incorrect use of derivatives, such as creation of non-liquidity, is a contagious channel for crisis. It distorts balance statements of firms and the conditions of financial fragility which causes sensitivity of financial sector and crisis by threatening the integrity and efficiency of financial market. All of the above mentioned causes negative expectations and loss of investors trust towards the whole system, and it also increases its impact over fragile currency (Garber, 1996; Garber, 1998; Rothig, 2004, Hayali, 2013).

When the role of derivatives is taken as direct crisis effect of vulnerability to crisis, derivatives can present financial market failures and destabilizing effects on economy by creating vulnerability to crisis, whether in fixed or floating exchange rate systems of emerging markets (Hayali, 2014). Within the framework of time series data analysis, the potential role of the derivative instruments in the financial crises of emerging market countries in the 1997-2010 was investigated. Thus, the presence of derivatives in emerging markets is handled as a destabilizing factor of the financial sector and the economy as a whole. Therefore, this creates vulnerability to crisis by affecting the dynamics of a crisis, whether in the floating or fixed exchange rate systems (Hayali, 2013).

H0: There was no role of derivatives in the global financial stability of the emerging market countries

H1: There was a role of derivatives in the global financial stability of the emerging market countries

Empirical Results

As shown in Table 2, Brazil gives a very interesting picture of derivatives. Thus, it is obvious that derivatives are negatively related to financial stability and this variable is statistically significant.

Table 2. Results of regressive equation for Brazil
 (Dependent variable is currency crisis)

Source	SS	df	MS	Number of obs = 55
				F(4, 50) = 2,97
Model	.317056516	4,00	.079264129	Prob > F = 0,0282
Residual	1.33555678	50,00	.026711136	R-squared = 0,19
				Adj R-squared = 0,12
Total	1.6526133	54,00	.03060395	Root MSE = 0,16
CI	Coef.	Std. Err.	t	P>t
CAGDP	-.0087071	.0255751	-0.34	0.735
TDFR	-.4650818	.1933797	-2.41	0.020
CRGDP	-.0025758	.0034681	-0.74	0.461
CPSGDP	.0192595	.0525028	0.37	0.715
_cons	.3727575	.1878262	1,98	0.053

CAGDP and CRGDP are negatively related to financial stability, although these variables are not statistically significant. For variable CPSGDP, despite the fact it is positively related to financial stability, this variable is not also statistically significant.

Table 3. Results of regressive equation for Russia
 (Dependent variable is currency crisis)

Source	SS	Df	MS	Number of obs =44
				F(8, 31) = 15766,00
Model	2399.05898	8,00	299.882373	Prob > F =0.0062
Residual	2714.11678	31,00	87.5521541	R-squared = 0.4692
				Adj R-squared = 0.3322
Total	5113.17576	39,00	131.107071	Root MSE = 9,36
CI	Coef.	Std. Err.	T	P>t
CAGDP				
--.	-21.14026	15.75612	-1.34	0.189
L4.	37.79076	14.64345	2,58	0.015
TDFR				
--.	-28.78385	11.76226	-2.45	0.020
L4.	23.12101	9.58498	2,41	0.022
CRGDP				
--.	-1.002122	.7747395	-1.29	0.205
L4.	1.377483	.8068871	1,71	0.098
DSR				
--.	1.536312	.6188175	2,48	0.019
L4.	.3872123	.6095537	0.64	0.530
_cons	-27.60569	16.41353	-1.68	0.103

Table 3 shows example of Russia. The table shows that derivatives have a significant negative influence over financial stability. CAGDP and CRGDP also have a negative influence over financial stability, although their influence is not statistically significant.

Table 4. Results of regressive equation for Argentina
 (Dependent variable is currency crisis)

Source	SS	df	MS	Number of obs =55
				F(4, 50) = 2,95
Model	2466.48033	4,00	616.620083	Prob > F = 0,0290
Residual	10459.0012	50,00	209.180023	R-squared =0,1908
				Adj R-squared = 0,1261
Total	12925.4815	54,00	239.360768	Root MSE = 14,463
CI	Coef.	Std. Err.	t	P>t
CAGDP	2,85	1.929844	1,48	0.145
TDFR	-6.174462	3.299214	-1.87	0.067
CRGDP	.0054612	2.386662	0.00	0.998
CPSGDP	201.2427	182.6504	1,10	0.276
_cons	-23.34083	11.54553	-2.02	0.049

In Table 4, there is an influence of derivatives over financial stability on example of Argentina. The table shows that derivatives have a negative influence over financial stability, and this influence is statistically significant. CAGDP, CRGDP, and CPSGDP have a positive influence over financial stability, although their influence is not statistically significant.

Conclusion

The development of the derivatives market has played an increasingly important role in the financial market. It serves not only as an effective hedging instrument but also as a useful provider of immediate information, thus boosting the efficiency of financial market operations. Recent interest focuses on how the development of derivatives markets influences financial stability as a whole. Some research has theoretically suggested that the derivatives market positively affects financial stability by accelerating capital accumulation, making investment more efficient by offering more diversity in highly risky projects, and reducing uncertainty in the economy as a risk hedging tool.

The relation between the derivatives market and Exchange Market Pressure Index and other macroeconomic variable was studied. Also, the three economies (Russia, Argentina and Brazil.), which have a mature derivatives market, was selected for analysis using time-series econometric methods. The derivative market in Brazil, Argentina, and Russia was found to have a significant negative impact on financial stability.

Research was based on empirical testing which was realized via OLS regression. Empirical analysis does not give the whole picture since the data of OTC derivatives could not be included in the existing data due to lack of the relevant data. So, it can be concluded that whether derivatives played a key role (by considering OTC or contagion issue) or not, the findings of the empirical analysis point out that they had an increasing role in the emerging market crisis pressures/crises. As demonstrated by research, derivatives have negative influence which depends on the existence of a proper financial system. This confirms the opinion of scientific literature that derivatives can be used for economically harmful purposes during “poorly structured and improperly regulated derivatives markets” under conditions of rapid financial liberalization.

Therefore, the research examines the impact of derivatives on the financial stability of emerging markets, which allowed us to analyze the causes and consequences of the last two global financial crises (1998 and 2008). To obtain the results, it was important to study the data for 1997-2010. In addition to derivatives, we used three (3) control variables (CAGDP, CRGDP, CPSGDP) in the model and the information about them is not available. This is a limitation to this research as it does not reflect recent developments, especially the shocks caused by the COVID-19 pandemic and its expected impact on the world financial market.

References:

1. Akiba, H. A. (2007). Reassessment of Currency Index by Fundamentals. *Annals of Economics and Finance.* , 1, 57-85.
2. Atilgan, Y. K. (2016). Derivative markets in emerging economies: A survey. *International Review of Economics and Finance*, 42: 88–102. Retrieved from file:///D:/user/Downloads/derivativemarketsinemergingeconomiesasurvey.pdf
3. Dodd, R . (2002). Consequences of Liberalizing Derivatives Markets. *Financial poicy forum derivatives study ceneter*, pp.2-3.
4. Dodd, R. (2008). Consequences of Liberalising Derivatives Markets. In J. A. Stiglitz, *Capital Market Liberalization and Development* (pp. pp. 288-317). New York: Oxford Universitu Press.
5. Dodd, R. (2000). The Role of Derivatives in the East Asian Financial Crisis. *International Capital Markets and the Future of Economic Policy*

- Working Paper No. 20* (pp. pp. 1-29). New York: Center for Economic Policy Analysis. Retrieved from http://policydialogue.org/files/publications/papers/Role_of_Derivatives_in_East_Asian_Crisis.pdf
6. Dodd, R. (2002). Derivatives, the shape of international capital flows and virtues of prudential regulation. [*Journal*] // *United Nations University Discussion paper.*, pp. 1-23. Retrieved from <http://www.financialpolicy.org/dscwider2002.pdf>
 7. Edison, H. J. (2000, July). Do Indicators of Financial Crises Work? An Evaluation of An Early Warning System. *Board of Governors of the Federal Reserve System, International Finance Discussion Papers*, pp. 1-76. Retrieved from https://pdfs.semanticscholar.org/685e/bf9f3b867ed51feb442e28e5408a740695b7.pdf?_ga=2.244242636.835450589.1590140763-489055684.1560868097
 8. Garber, P. M. (1998). Derivatives in International Capital Flow. *NBER Working Paper Series No: 6623*.
 9. Garber, P. M. (1996). Derivative Products in Exchange Rate Crises. In Glick R. (eds). *Managing Capital Flows and Exchange Rates: Lessons from the Pacific Basin* Cambridge: Cambridge University Press, (pp. 206-231).
 10. Haiss, P. A. (2010). The Impact of Derivatives Markets on Financial Integration, Risk, and economic Growth. *the Bundesbank / Athenian Policy Forum 10th Biennial Conference on "Regulatory Responses to the Financial Crisis"*, (pp. 2-46). Frankfurt. Retrieved from [file:///D:/user/Downloads/SSRN-id1720586%20\(2\).pdf](file:///D:/user/Downloads/SSRN-id1720586%20(2).pdf)
 11. Harms, A. (2002). Trouble with Hedge Funds. *The Review of Policy Research*, pp. 156-76
 12. Hayali, A. S. (2013). Analyzing the role of financial derivate in the international emerging markets financial crisis in terms of the existing crisis literature: a contribution to the third generation model. *Journal of Social Science*, 19-26.
 13. Hayali, A. S. (2014). A time-series cross section analysis of the role of financial derivatives in the emerging market financial crises of the 1990s. *Ataturk University Journal of Economics and Administrative Sciences*, 21-54.
 14. Huang, P. M. (2017). Does corporate derivative use reduce stock price exposure? Evidence from UK firms. *Quarterly Review of Economics and Finance*, pp. 65: 128–36.
 15. Khan, H. H. (2017). Efficiency, growth and market power in the banking industry: New approach to efficient structure hypothesis. . *North American Journal of Economics and Finance*, 42: 531–45.
 16. Kregel, J. A. (1998). Derivatives and Global Capital Flows: Applications to Asia. *Cambridge Journal of Economics*, vol. 22, no. 6. p. 679.
 17. Kruger, M. O. (2000). Fundamentals, Contagion and Currency Crisis: An Empirical Analysis. *Development Policy Review.* , 18, 257-274.

18. Lien, D. A. (2008). A survey of emerging derivatives markets. *Emerging Markets Finance and Trade*, 44: 39–69. Retrieved from <https://www.tandfonline.com/doi/abs/10.2753/REE1540-496X440203>
19. Lien, D. A. (2008). A survey of emerging derivatives markets. *Emerging Markets Finance and Trade*, 44: 39–69. .
20. Mathieson, D. J. (2004.). *Emerging Local Securities and Derivatives Markets*. . Washington, D. C.: World Economic and Financial Surveys. IMF,.
21. McClintock, B. (1996). International financial instability and the financial derivatives market. *Journal of Economics Issue*. - 1996 : [s.n.], 1996. - Vol. XXX. , pp. 13-33.
22. Merton, R. C. (2005). “Design of Financial Systems: Towards a Synthesis of Function and Structure”. *Journal of Investment Management*,, Vol. 3, No. 1, pp. 1-23 .
23. Moore, M. A. (2016). "Downsized FX markets: causes and implications", , . pp 35-51: BIS Quarterly Review, December.
24. Rajan, R. (2006). “Has Financial Development Made the World Riskier?” *European Financial Management*,, Vol. 12, No. 4, pp. 499-533.
25. Ross, S. (1976). "Options and Efficiency.". *Quarterly Journal of Economics*, 90:79-89. Retrieved from <https://users.business.uconn.edu/jgolec/phd/statespace.pdf>
26. Rothig, A. (2004). Currency Futures and Currency Crises. *Darmstadt Discussion Papers in Economics*, no.136.
27. Sendeniz-Yüncü, L. (2018). Do stock index futures affect economic growth? Evidence from 32 countries. . *Emerging Markets Finance and Trad*, pp. 54: 410–29.
28. Tanha, H. A. (2017). Derivatives usage in emerging markets following the GFC: Evidence from the GCC countries. *Emerging Markets Finance and Trad*, 53: 170–79.
29. Tobin, J. (1984). “On the Efficiency of the Financial System”. *Lloyd’s Bank Review (July)*, pp. 1-15.
30. Vo, D. H. (2019). Derivatives market and economic growth nexus: Policy implication for emerging markets. . *North American Journal of Economics and Finance*.
31. Willem, F. C. & Verschoor, R. C. (2012). The Effect of Credit Derivatives on Financial Stability. *APPLIED FINANCE LETTERS* |.