

Derivatives and the Financial Crisis of 2008: Managing Risk, Creating Risk, and Regulations

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Exchange-traded derivatives, i.e., futures and options are the most powerful financial instruments in financial markets for hedging policies aimed at managing the price risks which are originated in physical markets as well as for speculative strategies. After a brief reference to the nature of these instruments, we have shown in this paper that derivatives, which are basically advanced innovations in financial studies, can be extremely risky and complex in practice, hence may be considered as a constant threat to international financial stability. Despite the presupposition of financial economists that innovation is the engine of growth and “capitalism’s foundational energy”, we have concluded that the widespread application of derivatives during the past two decades together with the complexities of hedging and speculation strategies, which can be misused by financial investors, can be considered as one of the main causes of the failure in market discipline mechanism which manifested in the financial crisis of 2008 and its aftermath. The effectiveness of financial regulation is a challenging question which naturally arises in this context.

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1. Introduction

Derivatives is a generic term for all financial instruments which are being traded in exchanges and over-the-counter (OTC) on securities, currencies and commodities. These financial instruments, which are also called derivative assets or derivative products, can broadly be classified into four principal classes: forwards, futures, options and

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swaps. The existence of derivatives has greatly facilitated strategies on hedging the price risks resulting from trading in physical markets as well as investment strategies on speculations. The above-mentioned financial instruments, are called derivatives because “their value depend on (or derived from) the value of other, more basic, underlying variables” (John Hull, 2011, Chapter 1). More precisely the value of a derivative, such as a futures or an option, is a function of the price of its underlying asset. Obviously, different strategies based on derivative instruments behave or respond differently to the price variation of the underlying asset. Hence different investors, i.e., hedgers, speculators or arbitrageurs may adopt different strategies with respect to market conditions.

It is widely believed that the use of derivatives can be traced back to ancient time when Thales, for the first time developed an option strategy (Derakhshan, 2003). Derivatives trading, as a practice of buying and selling commodities in the future, dates back in the (630s during the Dutch Tulip Bulb mania, and rice markets in Osaka in the 1650s (see Chance, 1995 and Derakhshan, 2003). However, the year 1848 can be considered as the turning point in the history of finance. This is the year that the Chicago Board of Trade (CBOT) was established, and the year that Marx and Engels published the *Communist Manifesto*, and much of Europe was in turmoil as the working class was confronting the new industrial capitalism.

According to Cronon (1991), CBOT introduced contracts which allowed grain traders to sell grain at an agreed price for delivery in a fixed date in the future. Farmers soon realized that this contract would allow them to hedge themselves against the risk of unwanted price variations. The first formal regulation of futures trading was introduced in 1865 by CBOT. Speculators were trading actively at CBOT, and as Cronon states (1991, p. 125), “men who don’t own something are selling that something to men who don’t really want it”. The London Metal Exchange (LME) was founded in 1877, and in 1972, the Chicago Mercantile Exchange (CME), which was initially formed in 1919, created the International Monetary Market which allowed trading currency futures. This was the first derivatives contracts not based on physical products.

However, we may say that the symbolic birthday of modern derivatives is the collapse in 1971 of Bretton Woods Agreement on fixed currency parity with the US dollar and gold and the removal of

exchange controls in advanced countries. This, combined with changes in financial regulations and the rapid development of information and communication technologies paved the way for rapid development of modern derivatives, i.e., forward, futures, options and swaps.

Forward contracts are legally binding contracts to purchase or sell an asset for a fixed price at a specified date in the future. The idea of a fixed price can be generalized to a fixed price formula in which the market price in a fixed future date or time interval, can be used in a formula to provide the forward price.

Futures contracts are simply the standardized forward contracts which can only be traded in exchanges. Not all commodities can constitute the underlying asset of futures contracts; the approval of exchange authorities based on standardization and market conditions is needed.

Options contracts, similar to futures contracts, are defined on the underlying assets but have the interesting property that provide the holder of the option with the right to exercise the option at a strike price at or before the maturity date. In other words, the buyers of an option has the right to buy or sell the underlying asset at a fixed price on or before a fixed date, whereas the party who has sold the option is obliged to sell or buy the underlying asset at the specified strike price. Hence options contracts are broadly classified into two categories of call and put options. The buyer obtains the right of buying or selling the underlying asset at the strike price by paying the option price to the seller. Likewise, the seller of the option is obliged (due to receiving the option price) to sell or buy the underlying asset if the option traded is a call or put option, respectively. If the option traded, can be exercised only at a fixed date in the future (maturity date), at any time prior to the maturity date, or at specified certain dates prior to the maturity, it is call European, American, or Atlantic options, respectively.

In a swap contract, the two parties agree to exchange a series of cash flow during a certain period of time, which are calculated on the basis of quantities of underlying assets. Swaps are equivalent to a series of forward contracts. In other words, swaps in derivatives are defined as the exchange of one type of cash flow for another, and can be classified as commodity swap, cross-currency swap and interest swap.

Futures and options are exchange-traded derivatives whereas forward and swap contracts are traded OTC. There is, however, an exemption that forward contracts may be traded at London Metal Exchange (LME). Our main concern in this paper is, however, the exchange-traded derivatives, i.e. futures, options and the related derivatives such as options on futures in which a futures contract constitutes the underlying asset of an option.

2. Hedging vs. Speculators: Complementary Activities?

Trading Exchange-registered derivatives has virtually no credit risk since the clearing house in an exchange acts as a buyer against the seller of a futures or option contract and vice versa, hence the risk of a default is zero because the credit risk of an exchange is nil. This argument applies for both parties who take a short or long position in derivatives trading. A hedge policy for a trader who intends to trade in physical market and wishes to protect his or her position against an undesirable price variation involves taking positions simultaneously in both physical and paper markets. Assuming the market expectation for the trader is bullish, and the trader has entered a forward contract to buy an asset for a fixed price at a fixed date in the future, the policy to hedge the investment against the price risk is, for example, taking a long position in a call option with a fixed strike price at a maturity date near to, but not before, the delivery date in the forward contract. This would enable the trader to go short when the price of the underlying increases, hence making a profit in the paper market (i.e. the option market) and simultaneously buying underlying asset in the physical market, though at higher price as compared to the time that the forward contract was initiated. The profit gained in the derivatives market would partly offset the loss occurred in the physical market, making the effective price for the trader less than the case if trading in physical market had no protection.

Taking a long or short hedge policy would secure the trader with a fixed price for the underlying asset in the future, hence derivatives trading is usually regarded as having a stabilizing character, which would facilitate planning a production scheme or providing services to consumers.

The above-mentioned argument does not however apply to policies adopted by speculators in derivatives markets since speculators take positions only in paper markets with no counterpart trading in physical

markets. Speculators are, in fact, seeking profit by taking appropriate strategies in futures or options markets based on their expectations on the future price movements. There are a wide variety of basic option strategies, which may broadly be classified into two categories of spreads and combinations. The first category involves bull spreads, bear spreads, box spreads, butterfly spreads, calendar spreads, diagonal spreads, and the second category includes straddle, strips and straps, strangles. One can name a large number of other strategies based on the above-mentioned basic strategies. Each strategy may increasingly become more complicated in accordance with the knowledge and skill of the speculator. This implies that the mechanism of policy formulation necessarily becomes so technical and complicated that would fall beyond the understanding of companies' board of directors or share holders, hence exposing the owners of the company to serious risk of taking a wrong strategy by risk managers.

Despite the general agreement amongst economists and financial analysts regarding the price discovery of speculators activities in derivatives markets, the above-mentioned complexities inherent in designing speculative strategies in options or futures trading, have always been a source of concern on destabilizing the market. This, together with the dramatic growth of derivatives trading in the past two decades and the widely reported derivatives-related losses has caused a serious debate amongst economists and financial analysts as to the destabilizing character of derivatives instruments. More importantly, when it was widely publicized that trading derivatives on mortgage-back securities (MBS) in the US housing market was partly responsible for September 2008 credit crash leading to financial and economic crisis world-wide, the community of economists and financial experts looked more carefully on the role of derivatives in the future course of development in corporate capitalism. It follows therefore, that an examination of benefits, risks, and proper regulation of these financial innovations are and will be the central theme in financial economics in the foreseeable future.

3. Managing Risks: The Optimistic Views on the Role of Derivatives in the 1990s; the Backdrop of Financial Crisis in 2008

As discussed in section 2, derivatives have evolved as instruments of prime practical importance in hedging price risks which are of

theoretical significance too. However, the reported massive derivatives-related losses and the wide spread debates on the risky nature of derivatives trading have triggered serious concerns on the destabilizing character of these strong and powerful financial instruments: possible exposure of unique and excessive risks to firms, investors, and even the overall functioning of financial markets at regional and international levels. The 2008 credit and financial crisis is usually cited as a clear example of this shortcoming. These developments have called for serious legislative actions with particular emphasis on major expansions of federal regulations.

The regulatory responses have, however, been questionably slow, measured, and prudent, and can be reduced to a set of recommendations such as: *a*) improved risk management practices, *b*) a better a deeper understanding of the nature of derivatives risks, and *c*) achieving more efficient co-ordination amongst regulators. Legislative responses to some derivatives-related losses have gone further than simple recommendations and have introduced ban or severe limitations of the use of derivatives by some governmental entities like municipalities and state pension funds, with various degrees of success even failures in some cases.

The starting point to explore the nature of risk in derivatives is the liberalization of global capital markets during the past four decades and especially since 1990s. Exchange controls are basically removed, interest rates show extreme volatilities, and major markets have opened and major financial institutions have dramatically become important not in the sphere of finance and economics, but also in the realm of global political economy. The new conditions have exposed the entire production process in the real economy to excessive risk. Highly volatile exchange rates or interest rates can be considered as purely external forces which may cause massive losses exactly in the same fashion that factors operating in the political sphere may change the price of strategic commodities. Risk has therefore become “the essential building block of all markets and will remain a permanent fixture in the business world” (Burns, 1994, p. 9). Financial innovation risk management has therefore become an integral part of modern financial economics: “The history of finance has demonstrated an unswerving ability to innovate in order to minimize risk and uncertainty. Derivatives, in all forms, are another example of this progression. While the products of innovation are susceptible to

abuse, if is far worse to stunt the creative process through misguided regulatory practice". (Burns, 1994, p. 9)

Similar optimistic views in supporting derivatives trading have been reported by leading academics, regulators and end-users in this field. Let us briefly quote a few cases as follows:

3.1. Views Expressed by Academics

i) "Efficient risk-sharing is what much of the futures and options revolution has been all about." Merton H. Miller, Nobel Laureate, University of Chicago, (See Miller, 1992)

ii) "The dramatic reductions in transactions costs achieved by [derivative] markets have made it possible for business firms to hedge against the uncertainties of currency exchange rates, interest rates, and basic commodity prices for more quickly and cheaply than was possible before". Robert C. Merton, Professor, Harvard University (See Merton, 1992). Also, believing that derivatives are the most advanced innovation in contemporary finance, Merton states that "Innovations are inherently risky, ... innovation is the engine of growth, ... and is capitalism's foundational energy".

iii) "There is no significant evidence that spot volatilities have increased since the introduction of index futures." John Board, Charles Goodhart and Charles Sutcliffe, Professors, London School of Economics and University of Southampton (see Borad *et al* 1995).

iv) The notion that an expansion in the use of OTC derivatives has somehow increased systemic risk, and that additional regulation is needed to reduce this risk, has no obvious factual basis." Franklin R. Edwards, Professor, Columbia University. (See Edwards, 1994).

v) "Derivatives markets act to reduce systemic risk by spreading the impact of underlying economic shocks among a larger set of investors in a better position to absorb them." Ludger Hentschel and Clifford H. Smith, Jr., Professors, University of Rochester. (See Hentschel and Smith, 1995).

vi) "Systemic risk at root is about failure of firms and fear of resulting failure of other firms, especially financial firms. The growth of the derivatives market has reduced that risk through widespread cancelling of risk as well as shifting risk to those most able to manage and bear it." Michael R. Darby, Professor, National Bureau of Economic Research. (See Darby, 1994)

3.2. Views Expressed by Regulators

i) “Derivatives have facilitated the financing of investment in physical assets.” William J. McDonough, President, Federal Reserve Bank of New York. (See McDonough, 1993)

ii) “I believe the most important benefits of derivatives are usually overlooked. The complexity of derivatives activities, along with the intense scrutiny these activities have attracted, are forcing a revolution in risk management practices.” Susan M. Phillips, Governor, Federal Reserve Bank of New York. (See Phillips, 1994)

iii) “Derivatives serve an important function in the global financial marketplace, providing end-users with opportunities to better manage financial risks associated with their business transactions. The rapid growth and increasing complexities of derivatives reflect both the increased demand from end-users for better ways to manage their financial risks and the innovative capacity of the financial services industry to respond to market demand.” U.S. General Accounting Office. (See U.S. General Accounting Office, 1994).

iv) “It is unlikely that the underlying markets would have performed as well as they did (during the European currency crisis) without the existence of related derivative markets that enabled currency positions to be managed, albeit with some difficulty in some instruments.” U.S. Banking Supervisors. (See Board of Governors of Federal Reserves, 1993).

v) “Research suggests that no statistically significant evidence has been published to support the hypothesis that there is a relationship between spot market volatility and the existence of derivatives markets.” Ontario Securities Commission. (See Ontario Securities Commission, 1994).

vi) “When one assesses this field, I think it is not hyperbole to suggest that the development and growth of financial derivatives constitutes one of the most dramatic success stories in modern economic history.” David W. Mullins Jr., Vice Chairman, Federal Reserve Board. (See Mullins, 1993)

3.3. Views Expressed by End-Users

i) “Mobil is committed to active debt management using derivatives to reduce risk and to achieve the lowest after-tax financial costs over time ... Most (commentators) have missed the fact that derivatives

when used properly reduce risk.” Elizabeth Glaeser, Treasurer, Mobil Corporation. (See Glaeser, 1995).

ii) “McDonald’s Corporation has been using derivatives for over ten years, and we find them invaluable for managing our interest rate and foreign currency risks. Even more important, banks and other lenders have found ways to offer the benefits of these complex instruments to our 2600 independent franchise holders in the U.S.” Carleton O. Pearl, Treasurer, McDonald’s Corporation. (See Pearl, 1993)

iii) “On the funding side, Fannie Mae uses a variety of risk management derivatives instruments to reduce interest rate risk on its mortgage portfolio and to reduce its debt costs, both of which help lower mortgage rates for American home-owners.” James Johnson, Federal National Mortgage Association. (See Johnson, 1993)

iv) “Derivatives allow municipalities to reduce the overall cost of borrowing, lock in forward rates., reduce interest rate risk, adjust the ratio of variable-and fixed-rate debt or match assets and liabilities.” Philip N. Shapiro, Chief Financial Officer, Massachusetts Water Resources Authority. (See Shapiro, 1992)

v) “The agency has sizable financing needs and manages a large investment portfolio; therefore, interest rate risk is a major concern ... [the] Port Authority sees ... derivatives transactions, which provide opportunities to achieve low financing costs that would be otherwise unattainable, playing an increasing important role in its financial structure.” John Hauptert, Treasurer Port Authority of New York. (See Hauptert, 1992)

In short, we may conclude that the supporting views expressed by academics, regulators and end-users on the use of derivative instruments by market players in financial markets were so strong that overshadowed the measured and prudent views on the risk generating character of derivatives. However, the strong support of academics on the unconditional use of derivatives deserves special attention. We may propose the hypothesis that the prevailing economic theories in competitive markets and the vast and rich literature on the justification of financial liberalization developed in the 1980’s and 1990’s play an important role in explaining the position taken by academics in this debate. In fact, within the domain of new advances in financial liberalization, most economists would intuitively regard regulation as

a serious deviation from the performance of perfectly competitive markets.

However, the economists who argued against the regulation did not pay attention to the fact that perfect competition, if left entirely unchecked, will not be self-sustaining due to the strong incentives amongst traders to establish coalitions in order to benefit from exercising the resulting market power. Despite the optimistic views of academics, the derivatives-related losses which occurred in the 1990's called for regulation of financial markets in general and derivatives transactions in particular, which is the subject matter of section 4.

It should be mentioned however that the general support of the use of derivatives as strong and efficient instruments in risk management as well as being able to create profit was responsible for the dramatic growth of derivatives transactions which yielded substantial benefits to corporations, government entities and financial institutions worldwide. More effective management of portfolios of assets and liabilities should also be mentioned in support of derivatives. The positive and promising outcome of derivatives trading did not last long and the early signals of the most serious financial crisis after the 2nd world war appeared in 2005, leading to the September 2008 credit and financial crash, as will be discussed in section 5.

4. Creating Risk: The Pessimistic Views on the Role of Derivatives in the 1990s with Little or No Impact on Preventing the Financial Crisis of 2008

Massive losses resulting from derivatives trading in the 1990s drew the attention of many economists and financial experts on the risk creating nature of derivatives. Below is a short reference to some of these losses incurred in 1994 and 1995. (Cohen, 1995, pp. 1994-1995)

1. Barings PLC-The loss occurred to the Barings Bank, resulting from wrong strategies taken by Nick Leeson, the risk manager of the bank, on trading futures contracts pegged to the Nikkei 225 Index amounted to \$950 million, hence the Barings PLC collapsed in 1995. *The Sunday Times* (London) wrote on March, 5, 1995 that "how an entire financial system failed to stop a trader's mad gamble that flushed Barings Bank into oblivion."

2. Orang County, California-County Treasurer Robert L. Citron's aggressive strategy of investing in inverse floaters, i.e. betting on lower interest rates, successful for over 15 years, suddenly became a

disaster as interest rates continued to rise, causing \$1.5 billion loss for county in 1995. (See *The Wall Street Journal*, Jan. 18, 1995)

3. Escambia County, Florida-The County's losses from investment in Collateralized Mortgage Obligations (CMO) in 1995. (See *The Wall Street Journal*, March, 21, 1995.

4. Proctor and Gamble-This financial institution reported a loss of \$157 million as a result of derivatives transactions in 1994. (See *Insights*, Nov. 1994)

5. Gibson Greetings-This financial institution reported a loss of \$23 million from derivatives transactions with Banker Trust and sued the Bank. This is the first case by an American corporation to recover OTC derivatives losses.

6. Odessa Community College, which lost more than \$10 million in derivatives trading, according to *The Wall Street Journal*, September 23, 1994.

7. The losses on derivatives by three banks in Farm Credit System, which according to *The Wall Street Journal*, November 16, 1994 amounted to \$23 million from derivatives investments, including structured notes.

Our examples of derivatives-related losses are confined to only mid-1990s since the losses occurred in this decade induced concerns on the disadvantages of using derivatives, hence calling for serious regulatory measures. It is interesting to note that attentions to derivatives as a source of creating rather than managing risks were initially expressed by regulators and NOT by academics. Below are a number of comments by regulators expressed in 1990s, related to the importance of regulation in derivatives trading as well as their risk creating character.

i) "The collapse of Barings PLC was caused in large part by a lack of adequate internal control over [an] employee's proprietary trading activities, including those conducted in exchange-traded futures and options." Global Task Force on Financial Integrity Futures Industry Association, (See Global Task Force on Financial Integrity, 1995)

ii) "The use of such dynamic hedging methods can generate liquidity problems [since they] can trigger an avalanche of sales into a relatively illiquid market for the underlying security, thereby collapsing the price or causing a breakdown in trading." International Monetary Fund (See IMF, 1993)

iii) “Strong internal control systems; independent, knowledgeable audit committees; and public reporting on internal control are critical to firms engaged in complex derivatives activities and should play an important role in ensuring sound financial operations and protecting shareholder interests of these firms.” U.S. General Accounting Office. (See U.S. General Accounting Office, 1994)

iv) Policies governing derivatives use should be clearly defined, including the purpose for which these transactions are to be undertaken. Senior management should approve procedures and controls to implement these policies, and management at all levels should enforce them.” Global Derivatives Study Group. The Group of Thirty. (See Global Derivatives Study Group, 1993)

v) “There can be no doubt that each organization’s conscious and disciplined attention to understanding, measuring, and controlling risk should help ensure that the risks to individual institutions and to markets as whole is limited and manageable.” Paul Volcker, Chairman, The Group of Thirty. (See Volcker, 1993)

vi) “Derivatives instruments tend to strengthen market linkages between individual financial institutions in ways which are difficult to quantify. Consequently, disruptions or increased uncertainty in one market may now be more likely to spill over into other derivative markets and into cash markets” Group of Thirty. (See Group of Thirty, 1997)

Despite a number of warnings on the risk creating character of derivatives trading and the strong recommendations on the necessity of regulating the exchange and OTC traded derivatives, the dramatic growth in the use of derivatives by public and private financial institutions and investors world-wide, continued with little or no effective supervisions. This created the backdrop to the financial crisis of September 2008.

5. Derivatives and the Financial Crisis of 2008

It is well-known that the financial crisis of September 2008 can be traced back to the US mortgage crisis in 2006, which rapidly expanded to the US Credit System resulting initially to the credit crash of 2008, and then extended to European major credit institutions. (Derakhshan, 2008)

The bankruptcy of Lehman Brothers, the major US financial institutions in early September 2008, caused a panic in financial

markets, and induced a series of bankruptcies world-wide. Credit and financial institutions adopted a severe tight policies in lending, hence lowering household's expenditures with adverse effects on economic growth and employment through a downward trend in firms' sales and profits. Consumers and investors' expectations on economic recession exacerbated the process of degenerating economic and financial systems, hence worsening the deteriorating conditions prevailing in the credit system.

Following the burst of the dot.com bubble in 2000, the upward trend in the US property prices which started in 2001 and 2002, accelerated investment expenditures in the US housing sector, which became a strong engine of recovery and growth in the US economy. Further financial liberalization made the easy access to loans in the mortgage market possible. This, together with continuous surge in property prices, provided a strong stimulus to a large and increasing number of households to borrow in view of becoming home-owners.

Strengthening households' expectations about a better future accelerated the process of economic growth, hence further expanded the credit market aimed at facilitating the loans to buy properties. The US housing bubble thus created. The great profit which emerged in the US mortgage market was so strong that the warning of financial and economic experts on the likelihood of bursting this bubble did not receive appropriate and careful attention.

According to the traditional practice in housing market, the property purchased by a borrower usually remained with the lender as collateral. However, the innovations in financial markets following the financial liberalization in the 1990s, and particularly the financial innovations in mortgage markets, provided a unique opportunity for the creation of a secondary market for mortgages. This was made possible by the creation of the *Mortgage Backed Securities*, or MBS, in which a security is defined with the property purchased as its underlying asset. Derivatives trading on MBS were made possible which provided higher yields, as compared with other derivatives trading, due to continuous surge in the US property prices. Speculators entered into MBS market, increasing the liquidity and hence the profitability of trading derivatives on MBS. Major banks and financial institutes in the US, Europe and Asia became active players in this newly emerged derivative market.

Rapid financial deregulation which allowed lending to an increasing number of households with little or even no income or job, i.e., subprime borrowers, created unprecedented risk of default by borrowers. Bankers, financial and lending institutions sought to manage this risk by a financial innovation called “originating and distributing” the risk of default by subprime borrowers.

The above-mentioned credit mechanism worked reasonably well, hence providing higher yields to the investors until the burst of the US housing bubble occurred and a downward trend in the property prices started. The return on MBS investment declined rapidly alongside with the failure of many subprime borrowers to pay their mortgages. Those bank and financial institutions in the US, Europe and Asia which maintained a sizeable amount of MBS in their portfolios and had engaged in derivatives trading on MBS, faced serious financial difficulties and some went bankrupt. Hence, the credit and financial crisis triggered in September 2008.

It is now agreed that the capital market is truly a global market in which a crisis in say US mortgage market can easily and rapidly be transmitted to other markets. Moreover, as discussed before, derivatives trading have the property of strengthening the market linkages amongst financial institutions, hence a disturbance in one market, or an increase uncertainty in the future course of development in another market will soon affect related paper markets as well as cash and physical markets.

The credit and financial crisis of 2008 has provided two clear facts: First, the risk creating character in using derivatives instruments, and secondly, the necessity of a coordinated effort world-wide to regulate and supervise derivatives markets.

Unfortunately, banks and financial institutions did not take seriously the warnings of professionals, regulators, economists and financial analysts on the likelihood of bursting the US housing bubble as well as the dangerous consequences of derivatives trading on MBS. Brief references to some of these warning are as follows:

i) David Andrukonis, the previous director of Freddie Mac, one of the two largest credit organization in the US mortgage market, warned the chairman of the company, Richard F. Syron, in 2003 on the risky loans that the company has granted, emphasizing the massive financial risk which this policy may impose on the US economy. (See *The New York Times*, 5 August 2008)

ii) In 2001, Edward Gramlich, Director of the Federal Reserves, warned against the potential danger of subprime mortgage borrowers. (See *The Wall Street Journal*, 2007)

iii) In 2005, *The Economists* emphasized on the surge in the property prices as the biggest bubble in history, and concluded that the world should expect the economic pain and suffering resulting the burst of this bubble. (See *The Economists*, 2005)

iv) In January 2006, Paul Krugman, the Nobel laureate in Economics, stated that the current prices of the US properties have lost its relation with economic realities and painful adjustments are expected. (See Krugman, 2006)

v) In September 2006, Joseph Stiglitz, the Nobel laureate in Economics, predicted that the US economy will soon enter an economic recession following the decline in property prices. (See Stiglitz, 2006)

vi) In March 2007, a number of financial analysts predicted that the collapse of subprime mortgage market will cause those Wall Street investment banks dealing with mortgage-backed securities, such as Bear Stearns, Lehman Brothers, Goldman Sachs, Merrill Lynch and Morgan Stanley, to go bankrupt. (See *Business Week*, 2007)

Unfortunately, the community of directors and regulators in financial institutions in the US, Europe and Asia did not take these warnings seriously. September 2008 credit and financial crisis happened and the Wall Street crash promptly disturbed all the major exchanges and financial institutions world-wide.

6. Concluding Remarks

After a brief reference to the nature of derivatives instruments, i.e., forward, futures, options and swaps, we have examined the role of hedgers and speculators in derivatives markets. The rapid expansion of derivatives trading in the past two decades has been mainly due to the financial liberalization and the financial innovations in designing derivatives trading strategies.

Despite the fact that public and private financial institutions have greatly benefited from using derivatives to manage the risk by adopting hedging strategies, the risk creating character of using derivatives is an open problem which deserves special academic attention. The role of speculators in price discovery as well as their

possible destabilizing effect on market conditions is another topical issue which has been examined in this paper.

The selected wide range of views expressed by academics, regulators and end-users on the advantages and disadvantages of using derivatives has been discussed. It is surprising that in the 1990s, when the world witnessed the dramatic growth in using derivatives, the academics advocated strongly the risk management property of derivatives, hence supported the wide spread use of these powerful instruments. However, during the few years prior to the 2008 financial crisis, economists and financial analysts were quick to warn policy-makers and regulators to the coming danger of using derivatives and the necessity of comprehensive and effective regulatory schemes and supervision on derivatives trading.

Unfortunately, banks, financial and regulatory institutions did not take economists and financial expert's recommendation seriously, and derivatives trading progressively expanded with innovations such as "originating and distributing risks". Despite the fact that innovations are inherently risky and at the same time are the engine of economic and financial growth, the role of regulation in controlling the excessive measures of profitability and risky transactions has remained effectively unattended. The September 2008 financial and economic crisis and the 2011 public debt problems in the US and a number of EU member countries have apparently called for serious and effective regulations. However, the lack of satisfactory theoretical justifications for further regulations as well as the absence of favorable political and economic conditions to establish regulatory institutions able to carry out proper and disciplined regulations of derivative trading deserves further research work.

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