

# Revealing the Effects of ill Global Eco-Financial Systems and their Capsules

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**Abstract:** This paper examines the origins of the global crisis, the impact of the crisis and the different capsules taken to address the crisis. Using daily data from mid-July 2002 to mid-July 2012 for five groups of economies, our estimation is based on BEKK diagonal GARCH. We augmented two dummy variables to represent the U.S. financial crisis and the debt crisis of Greece. We find that the U.S. crisis has insignificant impact on the mean returns of all the economies except the African economies. The U.S. financial crisis, however, has positive and significant impact on the stock volatilities of all the groups except the African economies. The debt crisis of Greece, on the other hand, has negative and significant impact on the mean returns of the European and Latin American economies. Its impact on the stock volatilities, however, is positive and significant in all the economies except the African economies. In examining the origins of the crisis, we identify that excessive reliance of the U.S. economy on the credit system and on the stock market together with historic negligence of the production sector and inadequate regulation are some causative factors.

*Keywords:* global financial crisis, subprime mortgage, stock market return and stock volatility.

*JEL Codes:* E31 F32 G15

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## 1. Introduction

The U. S. Economy in general and the U.S capital market in particular have become more global in the second half of the twentieth century. As a result, whatever affects the U.S economy affects the rest of the world. For instance, when the Dow Jones Industrial Average dropped by 504 points in 2008, its largest drop since September 17, 2001 (Chossudovsky, 2008), the European and Asian stock markets cracked immediately reporting a sharp plunge

in their stock indices. The overall global financial firms' loss soared to 1.8 trillion pounds (2.8 trillion U.S. dollar) (Shah, 2008). The financial loss gradually led to economic crisis which was revealed in the form of high unemployment rates and low growth around the world. Moreover, the crisis set chains of events which progressively led Europe into deepest recession and adversely affected the public finance and economic condition of Greece, Ireland, Italy and Spain. According to the IMF world economic outlook, the debt-to-GDP ratio rose to 160 percent, 105 percent, 120 percent and 84 percent in these countries respectively. The rate of unemployment also jumped into 17.3 percent, 14.3 percent, 8.3 percent, and 21.6 percent in those countries in 2011.

A report by the European Economy (2009) shows that the current global crisis has similar initial conditions and geographical origins as the crises in 1907-08 and 1929-35. All these crises originated in the U.S. and they all occurred after the rise in asset prices, the growth of money and credit, high confidence of the investors and the economic boom. However, the underlying causes of these crises vary significantly. Although there are several factors that contributed to the recent crisis, the crisis has strong ties with the subprime mortgage crisis which damaged the U.S banking industry and later spilled its effect over to the U.S economy and to the rest of the world. Dependence of the economy on loans, inadequate regulation of the banking industry, excessive consumption financed by loans, the war in the Middle East and the injection of excessive money into the economy that lowered the interest rate are some of the contributory factors to the crisis. The crisis intensified due to a historic record of low level of saving, speculation, fear and a lack of adequate banking and business confidence. To tackle the global crisis, different countries have taken different measures. Since the depth of the crisis is large, however, the effectiveness of the capsules will take time to reveal their actions.

The remaining part of the paper is organized as follows: the next section discusses the global economic and financial crises. Data collection and methodology are presented in section 2.2.1. The empirical results are discussed in section 2.2.2 followed by the discussion of identifying the roots of the turmoil. Section 4 presents the capsules used to allivaithe the crisis. Conclusion is reported in section 5.

## **2. The Global Economic and Financial crisis**

The initial stages of the global crisis began to emerge in late 2006. The crisis then developed into a serious credit crunch with major downturns in the stock market in August 2007, as Langley (2008) indicates. The crisis became severe when the big financial corporations such as AIG, Merrill Lynch, Lehman, Fannie Mae and Freddie Mac declared bankruptcy in September 2008. The collapse of these financial institutions spread out to the global stock markets within seconds which ultimately sent damaging signals to the global economy. In this paper, we first present the economic crisis and then discuss the financial aspect of the crisis.

### **2.1. Economic crisis**

It is evident from Table 1 that the economic growth across all the economies falls dramatically right after the crisis. The decline in growth, however, is marked more in advanced economies and in the European Union than in the remaining economies. This indirectly indicates that the European Union and advanced economies have stronger economic and financial ties with the U.S. than the rest. This could partly be the reason for the Euro zone crisis although there might be some other factors that possibly explain the causes.

With the exception of emerging and developing economies as well as Sub-Saharan African countries, all the economies reported negative growth in 2009. The table indicates that the decline in GDP growth is sharper in the European Union than in other economies. All the economies somewhat recovered from their down turns in 2010 with the great break through in Latin American and Caribbean economies. The recovery, however, was followed by a plunge in the growth of GDP in 2011 which could be primarily due to the Euro zone crisis. The severity of the fall in the growth is less in Sub-Saharan African and emerging and developing economies, at 4 percent and 13 percent respectively. The decline in growth in advanced economies and in Latin American countries, on the other hand, is 47 percent and 25 percent. This again indicates the low level of interaction of the Sub-Saharan and emerging and developing economies with the European economies. In contrast, the large percentage fall in the growth of advanced economies and Latin American and Caribbean economies suggests a high level of integration of these economies with the European economies.

Another aspect of the crisis is its impact on the current account balance of these economies, which is reported in Table 2. The table shows that emerging and developing economies have managed to maintain surplus current account balance despite the U.S. and the Euro zone crises. Although the level of surplus declined after the U.S. crisis by 10 percent, it increased in 2010 and continued to rise in 2011 by 21 percent despite the Euro zone crisis. In contrast, the advanced economies, the European Union, the Latin America and the Caribbean economies have shown deficit balances through out the crisis.

The current account balance of advanced economies was affected largely by the U.S. crisis which accounts for 36 percent than by the Euro zone crisis which shows a fall by 33 percent. Relative to the rest of the economies, the U.S. crisis mainly affected the current account balance of the European Union, with a decline of 86 percent. The Sub-Saharan African economies maintained surplus current account balance right after the U.S. crisis but slid into deficit in 2009 and 2010 though they recovered in 2011.

The impact of the U.S. crisis followed by the Euro zone crisis on the inflation rate is shown in Table 3. All economies experienced a rise in the inflation rate right after the U.S. crisis. The inflation rate, however, subsided in 2009 and 2010 partly due to the different policy measures taken by different economies across the globe to ease the crisis. In 2011, the rate of inflation jumped again across all the economies with the highest rises in advanced economies, by 68 percent, followed by the European economies where the rate rose by 47 percent.

## **2.2. Financial crisis**

In this section, we conduct an empirical analysis on how the mean returns of the economies and their stock market volatilities have been affected as a result of U.S. and Greece crises. The following section, therefore, discusses the specific model employed in the analysis as well as the type of data used in the analysis.

### **2.2.1. Data collection and methodology**

To examine the impact of the U.S. financial crisis and the Euro zone crisis on the stock market performance of advanced and emerging economies, Europe, Pacific, Latin American, and selected African economies, daily data starting from mid-July 2002 to mid-July 2012 are used. More specifically, the stock price indices of these groups of economies,

represented by MSACWF, MSEROP, MSPACF, FTSELAT and BOTDCII, are collected from the equity section of the DataStream.

Two dummy variables representing the credit crunch of the U.S. and the debt crisis of Greece are employed. It has been noted that the first U.S. financial crisis started in August 2007 (Langley, 2008). Based on this information, we applied one to all the days, month and years from 2007 onwards and zero for all the time periods before 2007. It has also been observed that the Greek government debt crisis began in late 2009 (Nelson et al., 2011). We, therefore, assigned the ones after the crisis and the zeros before the crisis in constructing the second dummy variable. The growth rate and the current account balance data of all the economies are collected from the IMF World Economic Outlook.

The most commonly used measurement of volatility is the Autoregressive Conditionally Heteroscedastic method (ARCH family) and a standard deviation method.<sup>1</sup> The ARCH family method provides conditional volatility while the standard deviation method measures unconditional volatility. A study on the exchange rate volatility in eight Asian countries by Rana (1981) shows that measuring volatility using standard deviation is inconsistent and misleading if the distribution is non normal. This resulted from the non normality of the distribution of the exchange rate in his studies in which the second moment is infinite and the standard deviation is unstable. For this study, ARCH family method has been selected over standard deviation method as the distributions of the stock market returns have shown platykurtic, positive excess kurtosis.

From the ARCH family, Generalized Autoregressive Conditionally Heteroscedastic (GARCH) model is chosen. More specifically, a multivariate GARCH model is employed as it captures the effects of the interaction of the variables. From multivariate GARCH, diagonal BEKK is selected over diagonal VECH as the former guarantees a positive semi definite of conditional variance-covariance matrix, according to the argument of Engle and Kroner (1993). The diagonal BEKK GARCH model can be specified as follows:

$$\left( \ln \frac{S_{iit}^p}{S_{iit-1}^p} \right) = \delta_{0i} + \gamma_{fi} D_f + \gamma_{di} D_d + \sum_{j=1}^5 \delta_{ij} S_{ijt-1}^r + u_{it}$$

$$H_t = W'W + C_f D_f + C_d D_d + A' \Xi_{t-1} \Xi_{t-1}' A + B' H_{t-1} B$$

In the conditional mean equation  $s^p_{iit}$  and  $s^p_{iit-1}$  represent the stock price indices of the economies at time  $t$  and  $t-1$  respectively.  $i=1, \dots, 5$  stands for advanced and emerging economies, selected African economies, Europe, Latin American and Pacific economies respectively. The coefficient  $\delta_{0i}$  is the constant term of the  $i^{\text{th}}$  economy.  $\gamma_{fi}$  and  $\gamma_{di}$  are the coefficients of the dummy variables employed to represent the U.S. financial and Greece government debt crises respectively. The parameter  $\delta_{ij}$  captures the past conditional mean return of the stocks of own economy represented by  $i$  and the past conditional mean return of the stocks of the other economies represented by  $j$  which runs from 1, ..., 5.

In the conditional variance and covariance equation,  $H_t$  is the conditional variance and covariance matrix at time  $t$  and includes:

$$H_t = \begin{pmatrix} h_{11t} & h_{12t} & h_{13t} & h_{14t} & h_{15t} \\ h_{21t} & h_{22t} & h_{23t} & h_{24t} & h_{25t} \\ h_{31t} & h_{32t} & h_{33t} & h_{34t} & h_{35t} \\ h_{41t} & h_{42t} & h_{43t} & h_{44t} & h_{45t} \\ h_{51t} & h_{52t} & h_{53t} & h_{54t} & h_{55t} \end{pmatrix}$$

The conditional variance of the stock returns of each country is represented by the parameters on the diagonal of the matrix, whereas the conditional covariances between the countries are represented by the parameters off the diagonal of the matrix.  $W'W$  are  $N \times N$  parameter matrices. The positive semi definiteness of the  $H_t$  comes as a result of the product of  $W'W$  as pointed out by Silvennoinen and Teräsvirta (2007).  $C_f$  and  $C_d$  represent the parameters of the U.S. financial crisis and Greece debt crisis.  $A$  and  $B$  are diagonal matrices parameters of ARCH (1) and GARCH (1) respectively.

### 2.2.2. The empirical results

The results of the BEKK GARCH using the U.S. financial crisis as a dummy variable are presented first. The results are shown in three different sections. The first section mainly reports the findings of the mean equation. The second section reveals the results of variance and covariance equation. The results of the dummy variables in the variance and covariance equation are depicted in section three. The results in Table 4 show that the stock market returns of the advanced and emerging economies are positively and significantly affected by its own lagged return and also by the lagged returns of the African economies. It is, however, negatively and significantly influenced by the lagged returns of the European and Pacific

economies. This indicates that an increase in the lagged returns of Europe's stock market decreases the mean stock market returns of these economies.

On the other hand, the lagged stock market returns of the advanced and emerging economies have positive and significant impact on the mean stock market returns of Europe and Latin American economies. The positive impact of the returns in the stock markets of advanced and emerging economies shows the co-movement of the European and Latin American stock markets along with the advanced and emerging economies. Similarly, the lagged return of the Pacific stock market has negative and statistically significant impact on advanced and emerging economies, Europe and Latin America.

The coefficients of the dummy variable that signify the U.S. financial crisis are negative for all groups of economies. This implies that the crisis has caused the decline of the mean returns of all the economies. However, apart for the African stock market, the t-ratios of the coefficients are small which shows that they are statistically insignificant. It can be seen from the results in Table 5 that all the constant terms are positive and statistically significant. All the results of ARCH and GARCH are positive and statistically significant. The sum total of the ARCH and GARCH, however, indicates that the conditional variances are highly persistent and also unstable

The impact of the crises on the stock market volatilities are shown by the results of the variances on the diagonal section of Table 6. It is clear from the results that the U.S. financial crisis has positive and statistically significant impact on the stock market volatility of all the economies except the African economies. This means that volatilities of the stock market in these economies have increased as a result of the U.S. financial crisis.

When the Greek debt crisis is included in the model, the results of the mean equation, the variance and covariance equation as well as the impact of the crisis on the volatilities are reported in Tables 7, 8 and 9 below. The results in Table 7 suggest that there is a positive and statistically significant effect of own and African economies lagged returns on the mean returns of the advanced and emerging economies. There is, however, negative and significant effect of the European and Pacific economies' lagged returns on the mean returns of the advanced and emerging economies.

The mean returns of the African economies is hardly affected by the lagged returns of the remaining economies regardless of using the US or Greece crises in the analysis. The mean

returns of the European Union and the Latin American economies are positively and significantly affected by the lagged return of the advanced and emerging economies. It is evident from the results that the Greek crisis has negative impact on the mean returns of all the economies but it has significant impact only on the mean returns of the European Union and the Latin American economies.

As in the case of the U.S. financial crisis results, the coefficients of the variance and covariance equation in Table 8 are positive and significant. Furthermore, the ARCH and GARCH results are positive and significant, the sum of which shows that there are persistent volatilities. The results of the impact of the Greece crisis on the volatilities are specifically shown in Table 9. The results of the dummy variable that stands for the Greece debt crisis show positive and statistically significant impact on the mean returns of all the economies except the African economies. Like the impact of the U.S. financial crisis, the debt crisis of Greece has negative and statistically significant impact on the mean returns of the African stock market.

### **3. Identifying the Roots of the Turmoil**

Relaxed regulation in the lending practices of the banking industry that was liberal in providing subprime mortgage loans is the main driving force beneath the roots of the crisis. Prior to 1990 it was very hard for those people in the U.S. with bad credit history to get home loans if they were not qualified for conventional Federal Housing Administration loans. The subprime loans, however, were introduced to provide loans for those who were less credit worthy (Subprime loans, n.d.). The idea of subprime mortgage, that is providing subprime loans securitised by Wall Street, was invented by an investment banker, William Komperda. The idea became a funding bonanza in 1990 when Wall Street adopted and promoted this new investment security (Parsons, 2007).

With the healthy economic foundation of the U.S., the subprime loans were very profitable in the 1990s. As a result, subprime mortgage loans grew from 20 billion during 1993 to 150 billion in 1998 and to 507.9 billion in 2005 as per the U.S. Department of Housing and Urban Development report. The number of subprime lenders also grew from 5 percent in 1994 to 20 percent in 2005 (Zywicki, 2007 & Getter et. al., 2007). This poses a question as to how the profitability of the subprime loans eventually led the economy into crisis. The



crisis was built gradually in the process of different economic and financial interactions and the policy responses to the changes in the economy. On average, the Federal Funds Rate (FFR) of the 1990s was high relative to the FFR of the 2000s. It can be seen from Figure 1 that in addition to high FFR, the unemployment rate starting from 1992 was low during the 1990s.

Despite the risk related to the subprime mortgage loans, the fall in unemployment rate provided lenders an assurance that borrowers were able to service their debt with less probability of defaults. Besides the high FFR and low unemployment rate, Figure 2 shows that the U.S. economic performance measured by GDP growth rate was reasonably well during the 1990s apart from 1991. The economic boost of the 1990s strengthened the confidence of lenders and their trust in the profitability of the market.

There was a significant decline in growth during 2000, as is shown in Figure 2, which triggered the decrease in the FFR and tax rate in early 2001. The tax cuts, however, favoured the wealthiest investors with the expectation that they would re-invest and that there would be a trickledown effect in the economy. However, the capital earned from the tax cuts was invested in the stock markets in search of a higher rate of returns instead of in the production sector. This enhanced massive capital flight to the financial sector.

While the stock market and the housing industry were in reasonably stable condition, the U.S. economic system was disrupted by the attack on the World Trade Center on 11 September 2001. This external shock is believed to be the fundamental origin of all the crisis. The attack damaged the U.S. stock market and thereby wiped out the capital flight to Wall Street by the wealthiest investors. The GDP growth rate in the third quarter of 2001, as is shown in Figure 2, dropped to 1.41 percent, the lowest since 1992. Unemployment rate, as can be seen on Figure 1, also soared to 4.47 percent from 4 percent in the previous year. This triggered further tax cuts to the wealthiest investors and a FFR cut to stimulate the economy. The cycle repeated itself with massive investment on Wall Street due to the tax cuts to the wealthiest. Furthermore, the attack triggered the war in Afghanistan and the war in Iraq which drained the U.S. budget and paved the way to external debt growth, as expenditure on war is unprofitable and has no capital return or gain.

Looking back to Figure 1, the unemployment rate kept growing since 2001 and gained its momentum in 2003 when it reached 6 percent. This had an impact on borrowers' ability to

service debt which enhanced the growth of defaults. Moreover, going to war in Iraq had a tremendous impact on oil prices which surged from 23 dollars to 36 dollars a barrel in the U.S. that undermined the U.S. economy (Frick, 2008). This then caused the fall in the FFR to 1.13 percent in 2003, the lowest rate since 1955 according to the FFR records from 1955 to 2007. The decline in FFR drew more demand for loans and boosted the housing market. The housing market continued to grow from 1997 and ultimately gained its momentum in 2005. This strengthened the confidence of the lenders in using the house property as collateral in cases when borrowers became delinquent. The growth of house prices, nonetheless, began to decline from the last quarter of 2005 and became negative in 2007, as is shown in Figure 3. The decline in the growth of the housing prices shattered the expectations of the lenders. Using houses as insurance against borrowers' default became ineffective.

With the fall in house prices, the FFR jumped from 1.13 percent to 3.22 percent in 2005 and continued to soar until it reached 5.02 percent in 2007. The rise in the FFR made it hard for subprime borrowers, who obtained adjustable-rate mortgages<sup>2</sup>, to make their monthly payments. As a result, the magnitude of borrowers' default began to grow fast. With the fall in the housing prices and the growth of the defaults, lenders began to incur substantial amount of capital loss. Consequently, the wealth of U.S investors and investors around the world who had invested in the U.S. mortgage-backed securities have been wiped out. The existence of extreme financial liberty and global financial openness accelerated the spill-over effect of the crisis. The dominance of speculation in the stock market has also played a great role in spreading and worsening the crisis. The stock prices became more unpredictable as the stock market players swung more with every policy update declared in the media.

#### **4. The Capsules**

This study has shown how the U.S. crisis evolved and became global. Due to its global nature, different countries across the world have taken different policy measures in response to the crisis. Most of the instantaneous reactions of these countries, however, were limited to targeting the financial sector with the aim of restoring healthy credit flow in their economies. Although it was not wrong to target the financial sector, targeting other sectors of the

economy would have minimised the cost of restoration at the very beginning. An analogy of a patient with infectious wisdom teeth can help explain the advantages of policy responses aimed at targeting both the financial sector and other sectors. The patient with infected wisdom teeth does not only take painkillers and leave out anti-biotics to heal the infection. The patient has to take both at the same time and perhaps also take anaesthesia to extract the teeth. Likewise, the global eco-financial system has to take its different medications at the same time. Targeting the financial sector and thereby bailing out the banking industries may only have an anti-pain effect. Stimulating the economy, however, was needed simultaneously to have an anti-biotic effect which forbids the infection from widening and deepening its effect. Easing fear and repairing confidence in the economy might have an anaesthetic effect which then requires setting sound regulations in the banking system to have extraction effect of the toxic.

Despite the seriousness of the global eco-financial crisis, politicians spent considerable amount of time trying to reach an agreement before even implementing the financial sector rescue plans. Just as putting the patient with serious infection on a waiting list jeopardises the patient's health, so does the health of the global eco-financial system suffer while decisions are delayed. Minimizing the time lag would, therefore, have minimized the cost of recovery.

Some of the policy responses taken by some countries are: the bailing out of the banking industry, deposit guarantee schemes, injecting stimulus packages, arranging reciprocal currency (swap lines) and lowering interest rates. Contrary to the policy response of most countries, some Latin American countries such as Brazil and Argentina inflated their interest rate after the U.S. financial crisis although they lowered by a insignificant amount later on. Lowering interest rates alone by some other countries, particularly by U.S., might not have a desired effect. There might be a massive capital flight to these Latin American countries. Considering the global representation of the U.S. financial institutions, it is likely that these financial institutions might get money at a cheaper borrowing cost from the U.S and invest in these countries in search of higher return. Ensuring consumers' ability to service their debt is required in order to restore confidence and lessen fear and panic. For this reason, creating more jobs and stimulating the economy via appropriate labour market policy and tax cuts, as Classical and Keynesians would agree, would be more effective.

In lowering tax, however, permanent fiscal change is required. It is not only due to the permanent-income theory of Milton Friedman and the life-cycle theory of Franco Modigliani, that short term tax cuts will not lead to significant increase in consumer spending but also due to the historic record of massive consumer debt that needed to be financed. Lowering tax might enhance consumer spending. In contrast to this, as reported by Shedlock (2008), the famous financial forecaster and economist Peter Schiff suggests lowering consumer spending and enhancing saving and investment. However, it should be noted that spending less in the midst of an economic downturn might be less effective while expecting more production at the same time.

## **5. Conclusion**

In the past four years, the international economy has been affected by a succession of crises, the most influential being the U.S. crisis. The U.S. financial crisis, that began its early symptoms in late 2006 and burst its effect in 2008, spread globally with serious economic and financial consequences that hit the world in general and Europe in particular. The intensity of the crisis was manifested by low economic growth, high current account deficits and unstable financial systems across the globe which ultimately severely weakened the economy of Greece, Spain, Ireland and Italy. In addition, the crisis had severe implications for the financial contagion related to the sovereign debt crisis in the Euro zone, significant exchange rate fluctuations leading to rising oil prices and shifted competitive positions of some major traders, such as Brazil, and increased geopolitical risks.

This paper carefully examines the fundamental origins of the crisis within the context of U.S. economic and financial historic performance. The analysis shows that the subprime mortgage crisis alone is not the only causative factor of the financial crisis. The monetary and fiscal policies adopted by the U.S. that generally favoured the wealthiest have also played vital roles in leading the U.S. economy into erratic condition and chains of economic fragility which made the financial sector vulnerable to defaults.

Moreover, this paper empirically examines the effects of U.S. and Greece crises on the global stock market. Relative comparisons of the impact of the U.S. and Greece crises on the volatilities and mean returns of the stock markets indicate that, with the exception of the African economies, both crises have positive and significant effect on the volatility of all the economies. On the other hand, while the U.S. crisis has insignificant impact on the mean

return of the stock market of all the economies, except the African economy, the Greek crisis has negative and significant effect on the mean return of the stock market of European and Latin American economies. The increase in volatility as a result of the U.S. and Greece crisis indicates the extent of uncertainty in the stock markets which influence the decision of investors. Moreover, it shows how close the markets are to the U.S. and Greece stock markets.

Despite the adoption of different policies in response to the crises, the global economic and financial system recovery has been slow and quite disquieting since the financial crises. The further slowing of trade expected in 2012 shows that the downside risks remain high. Likewise, the present trade forecast assumes global output growth of 2.1 percent in 2012 at market exchange rates, down from 2.4 percent in 2011, based on a consensus of economic forecasters, which indicates severe downside risks for growth and negative consequences for trade. The global representation of the U.S. currency together with the global representation of the U.S. financial market hinder any quick fix solution to the problem even if the affected countries take radical measures. There is, therefore, a need to revisit the current global monetary system and systematically drift into a new system which will contribute to the restoration of the global economic and financial status.

### **Endnotes**

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1. See Akcay et.al., (1997), Brodsky (1984), Dell Ariccia (1999) and Kenen and Rodrick (1986).
2. An adjustable-rate mortgage is a rate obtained below market rate for some period and then followed by higher market interest rates for the rest of the mortgage's term ((Myers, 2008).

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**Table 1. GDP Growth Rate across Different Economies**

Year	Advanced economies	European Union	Emerging & developing economies	Latin America & the Caribbean	Sub-Saharan Africa
2000	4.162	3.962	5.896	4.003	3.568
2001	1.436	2.162	3.72	0.448	4.92
2002	1.723	1.376	4.678	0.341	7.219
2003	1.931	1.493	6.243	2.074	4.873
2004	3.11	2.593	7.482	6.008	7.064
2005	2.662	2.162	7.278	4.649	6.183
2006	3.064	3.604	8.239	5.619	6.445
2007	2.755	3.302	8.871	5.778	7.103
2008	0.092	0.669	6.03	4.28	5.585
2009	-3.717	-4.209	2.795	-1.747	2.784
2010	3.072	1.793	7.327	6.083	5.404
2011	1.613	1.692	6.395	4.532	5.174

Source: data collected from the International Financial Statistics of International Monetary Fund.

**Table 2. Current Account Balance in percentage of GDP**

Year	Advanced economies	European Union	Emerging & developing economies	Latin America & the Caribbean	Sub-Saharan Africa
2000	-1.054	-1.015	1.457	-2.279	0.698
2001	-0.871	-0.322	0.752	-2.605	-1.481
2002	-0.813	0.157	1.191	-0.891	-3.661
2003	-0.729	0.108	1.906	0.493	-2.793
2004	-0.657	0.449	2.37	0.979	-1.355
2005	-1.183	-0.133	3.757	1.358	-0.582
2006	-1.238	-0.38	4.981	1.607	4.287
2007	-0.858	-0.56	3.976	0.402	1.585
2008	-1.167	-1.017	3.559	-0.711	0.106
2009	-0.18	-0.086	1.589	-0.605	-2.313
2010	-0.22	-0.144	1.961	-1.177	-1.166
2011	-0.292	-0.182	2.367	-1.398	0.567

Source: data collected from the International Financial Statistics of International Monetary Fund.

**Table 3. Inflation Rate across a Group of Economies**

Year	Advanced economies	European Union	Emerging & developing economies	Latin America & the Caribbean	Sub-Saharan Africa
2000	2.266	3.121	8.554	8.375	14.981
2001	2.165	3.001	7.8	6.494	13.874
2002	1.552	2.511	6.815	8.537	11.039
2003	1.851	2.199	6.648	10.375	10.84
2004	2.033	2.34	5.94	6.623	7.571
2005	2.325	2.294	5.828	6.272	8.89
2006	2.359	2.322	5.569	5.265	6.912
2007	2.163	2.379	6.459	5.413	6.883
2008	3.399	3.679	9.228	7.916	11.712
2009	0.145	0.941	5.205	5.971	10.57
2010	1.554	2.021	6.08	5.987	7.46
2011	2.613	2.977	7.468	6.733	8.432

Source: data collected from the International Financial Statistics of International Monetary Fund.

**Table 4. The Mean Equation-U.S. Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
$\delta_{0i}$	-0.293259*** (-8.752253)	-0.012630 (-1.144819)	-0.783557*** (-18.19211)	-1.360430*** (-28.10336)	-0.864095*** (-28.10655)
$\delta_{1i}$	0.293736*** (8.765581)	0.013322 (1.208683)	0.784227*** (18.20587)	1.361721*** (28.13394)	0.865*** (28.118)
$\delta_{2i}$	0.053947* (1.776798)	0.145693*** (5.634698)	0.069708* (1.807058)	0.065543 (0.998784)	0.017728 (0.458227)
$\delta_{3i}$	-0.095437*** (-4.410957)	-0.003496 (-0.343445)	-0.451717*** (-14.69897)	-0.635032*** (-16.97261)	-0.134202*** (-6.334704)
$\delta_{4i}$	0.008824 (0.948872)	0.000260 (0.043512)	-0.007985 (-0.696160)	-0.033883 (-1.322056)	0.028815*** (3.943185)
$\delta_{5i}$	-0.067639*** (-4.681864)	-0.006934 (-1.104010)	-0.099492*** (-5.251951)	-0.247082*** (-7.914756)	-0.277281*** (-16.17795)
$\gamma_{fi}$	-0.000320 (-0.930308)	-0.000743*** (-4.071298)	-0.000819 (-1.684072)	-0.000963 (-1.187539)	-0.000502 (-1.272394)

Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels \* represents statistically significant at 10 percent. RN\_ACW, RN\_AFR, RN\_EU, RN\_LA and RN\_PACI stand for the return on the stock market of Advanced and Emerging Economies, Selected African economies, European economies, Latin American Economies and Pacific economies.  $\gamma_{fi}$  = dummy variable representing the U.S. financial crisis.

**Table 5. The Variance and Covariance Equation - U.S. Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
w <sub>1i</sub>	0.000000713*** (8.377539)	0.0000000405 (0.314961)	0.000000717*** (7.644927)	0.00000325*** (7.748468)	0.00000069*** (5.465497)
w <sub>2i</sub>		0.00000325*** (28.03845)	0.00000001 (0.062753)	-0.000000307 (-0.820146)	0.000000182 (0.089474)
w <sub>3i</sub>			0.00000112*** (7.199175)	0.0000039*** (7.065526)	0.00000072*** (4.807719)
w <sub>4i</sub>				0.0000252*** (8.487791)	0.00000178*** (3.425872)
w <sub>5i</sub>					0.00000304*** (6.220645)
a <sub>1i</sub>	0.198458*** (33.65417)				
a <sub>2i</sub>		0.361913*** (47.51238)			
a <sub>3i</sub>			0.176667*** (25.6393)		
a <sub>4i</sub>				0.335446*** (30.562)	
a <sub>5i</sub>					0.211905*** (23.27793)
b <sub>1i</sub>	0.971812*** (621.8617)				
b <sub>2i</sub>		0.874452*** (254.7688)			
b <sub>3i</sub>			0.975973*** (605.2998)		
b <sub>4i</sub>				0.885472*** (90.05847)	
b <sub>5i</sub>					0.961354*** (263.0212)

Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels. \* represents statistically significant at 10 percent.

**Table 6. The Impact of the Crisis on the Volatilities - U.S. Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
$d_{f1i}$	0.00000167*** (6.237404)	-0.000000166 (-0.731193)	0.0000024*** (7.131076)	0.00000826*** (5.583725)	0.000000875*** (3.42586)
$d_{f2i}$		-0.000000399*** (-5.047367)	-0.000000135 (-0.44523)	-0.0000000437 (-0.055917)	0.0000000118 (0.043028)
$d_{f3i}$			0.00000367*** (7.457398)	0.0000124*** (5.997236)	0.00000109*** (3.299857)
$d_{f4i}$				0.0000407*** (8.274372)	0.00000254** (2.113562)
$d_{f5i}$					0.000000993*** (2.933564)

Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels. \*\* signify statistically significant at 5 and 10 percent. \* represents statistically significant at 10 percent.  $d_t$  = the dummy variable representing the U.S. financial crisis in the variance and covariance equation.

**Table 7. The Mean Equation- Greece Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
$\delta_{0i}$	-0.296294*** (-8.947604)	-0.012205 (-1.056029)	-0.783140*** (-18.73068)	-1.394822*** (-29.96949)	-0.864725*** (-28.52104)
$\delta_{1i}$	0.296720*** (8.960523)	0.012547 (1.086918)	0.783735*** (18.74609)	1.396171*** (29.97059)	0.864980 (28.52527)
$\delta_{2i}$	0.056334** (2.002675)	0.155087*** (5.906340)	0.074153** (2.014055)	0.057551 (0.891297)	0.023087 (0.584912)
$\delta_{3i}$	-0.095244*** (-4.532404)	-0.005699 (-0.556530)	-0.451014*** (-15.19585)	-0.651102*** (-17.00717)	-0.132753*** (-6.501690)
$\delta_{4i}$	0.008420 (0.895160)	0.001566 (0.248076)	-0.007504 (-0.645019)	-0.031992 (-1.206338)	0.026080*** (3.673530)
$\delta_{5i}$	-0.067939*** (-4.803744)	-0.006594 (-1.004912)	-0.097141*** (-5.251236)	-0.258265*** (-8.526530)	-0.283210*** (-16.76699)
$\gamma_{di}$	-0.000441 (-1.060097)	-0.0000598 (-0.327865)	-0.001071* (-1.759307)	-0.002071** (-2.097845)	-0.000337 (-0.774659)

Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels. \*\* signify statistically significant at 5 and 10 percent. \* represents statistically significant at 10 percent.  $d_t$  = the dummy variable representing Greece crisis in the variance and covariance equation.

**Table 8. The Variance and Covariance Equation - Greece Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
w <sub>1i</sub>	0.000000722*** (8.084058)	0.0000000297 (0.248222)	0.000000723*** (7.445849)	0.00000296*** (7.847054)	0.000000759*** (5.60492)
w <sub>2i</sub>		0.00000353*** (31.43618)	0.0000000474 (0.293698)	-0.000000445 (-1.235709)	0.0000000577 (0.328203)
w <sub>3i</sub>			0.00000111*** (6.823342)	0.00000372*** (7.139324)	0.000000762*** (4.844389)
w <sub>4i</sub>				0.0000204*** (8.887334)	0.00000143*** (3.108949)
w <sub>5i</sub>					0.00000342*** (6.022961)
a <sub>1i</sub>	0.205078*** (38.06536)				
a <sub>2i</sub>		0.365671*** (48.81145)			
a <sub>3i</sub>			0.195359*** (32.18485)		
a <sub>4i</sub>				0.36476*** (33.55439)	
a <sub>5i</sub>					0.20088*** (24.31128)
b <sub>1i</sub>	0.972699*** (673.5348)				
b <sub>2i</sub>		0.872785*** (254.55)			
b <sub>3i</sub>			0.975059*** (627.6242)		
b <sub>4i</sub>				0.905769*** (141.0785)	
b <sub>5i</sub>					0.964599*** (277.7606)

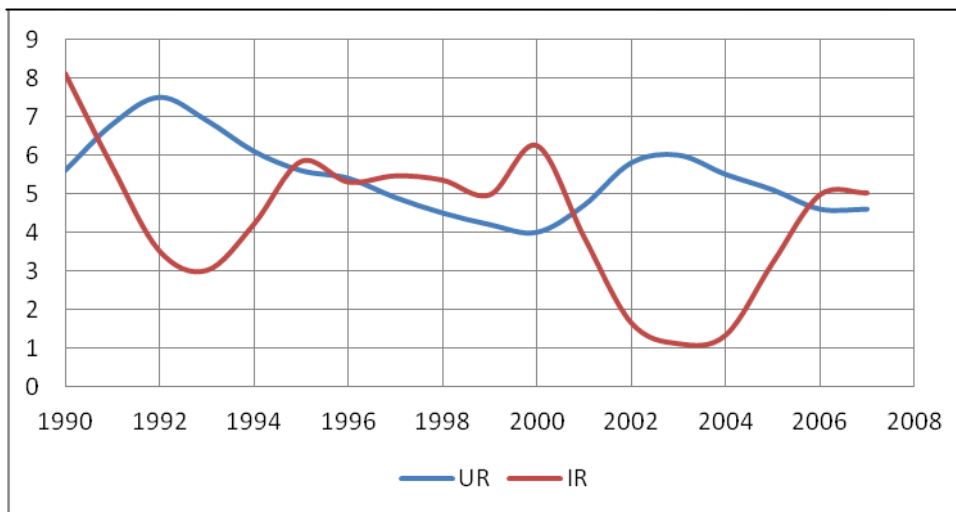
Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels. \*\*signify statistically significant at 5 and 10 percent. \* represents statistically significant at 10 percent.

**Table 9. The Impact of the Crisis on the Volatilities-Greece Crisis**

	RN_ACW	RN_AFR	RN_EU	RN_LA	RN_PACI
d <sub>d1i</sub>	0.0000012*** (4.24987)	-0.000000297 (-1.279001)	0.00000189*** (4.738477)	0.00000404*** (3.313189)	0.000000677** (2.3466)
d <sub>d2i</sub>		-0.00000138*** (-13.86759)	-0.000000468 (-1.460858)	0.000000012 (0.017014)	-0.000000133 (-0.486674)
d <sub>d3i</sub>			0.00000302*** (4.879656)	0.00000593*** (3.23004)	0.00000102*** (2.513947)
d <sub>d4i</sub>				0.000019*** (6.981191)	0.00000214* (1.761238)
d <sub>d5i</sub>					-0.000000241 (-0.675348)

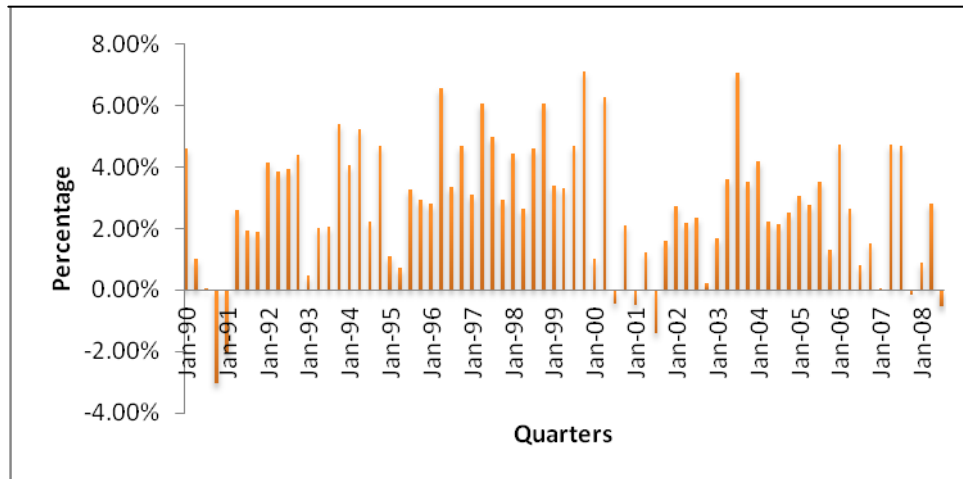
Note: The results in parenthesis are the t-ratios. \*\*\* stands for statistically significant at all levels. \*\* signify statistically significant at 5 and 10 percent. \* represents statistically significant at 10 percent. d<sub>d</sub>= the dummy variable representing Greece crisis in the variance and covariance equation.

**Figure 1. Unemployment Rate and Federal Funds Rate 1990-2008**



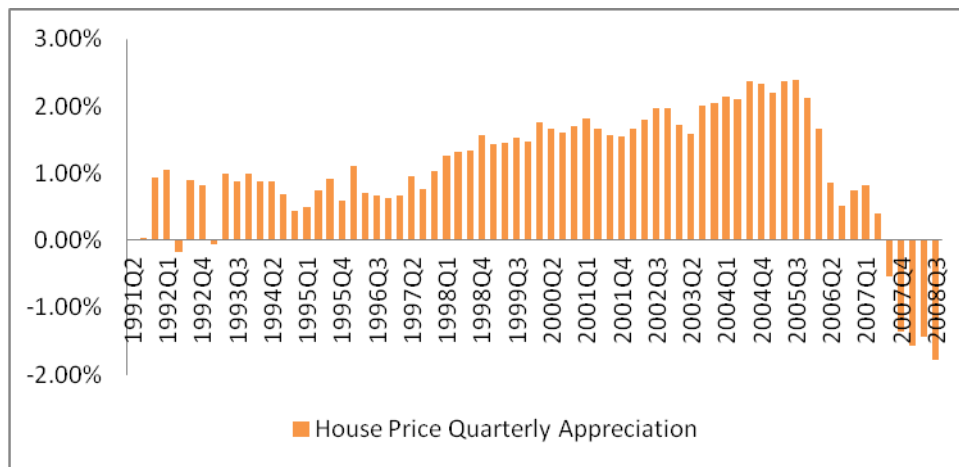
Source: data collected from [http://www.bls.gov/cps/prev\\_yrs.htm](http://www.bls.gov/cps/prev_yrs.htm) and [http://www.federalreserve.gov/releases/h15/data/Annual/H15\\_FF\\_O.txt](http://www.federalreserve.gov/releases/h15/data/Annual/H15_FF_O.txt) and then transformed in to figure using Microsoft Excel.

**Figure 2. U.S real GDP from 1990 - 2008**



Source: data collected from [http://www.data360.org/dsg.aspx?Data\\_Set\\_Group\\_Id=354](http://www.data360.org/dsg.aspx?Data_Set_Group_Id=354) and then transformed in to figure using Microsoft Excel.

**Figure 3. The growth of U.S. housing prices from 1990 to 2008**



Source: data collected from <http://www.ofheo.gov/newsroom.aspx?ID=487&q1=0&q2=0> and then transformed in to figure using Microsoft Excel