Chapter 12

Volatility Spillover Between Developed and Developing Markets During Crisis Period

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ABSTRACT

The purpose of this chapter is to determine how the volatility spillover between developed and developing markets behaved during times of crisis. For this purpose, daily returns of indices from the Group of Seven countries and the fragile five countries between 2004 and 2016 are used. The volatility spillover between the markets is examined by the Lagrange multiplier-based causality-in-variance test. As a result of the study, it is determined that the volatility of emerging markets is less influenced by the developed markets in the crisis period than before the crisis and after the crisis. Furthermore, in the post-crisis period, an increase in the volatility spillover to the developed markets from the developing markets is detected.

INTRODUCTION

When investors turn their savings into an investment, they prefer the highest return at a given risk level or the lowest risk at a given return level. Markowitz (1952, 1959) discloses this preference with efficient frontier. Investors prefer their portfolios on the point upon the efficient frontier. So the level of risk is also determinative as well as the expected return in making a new investment decision. Risk is generally defined as the probability of encountering unexpected outcomes in the future, in other words risk is a deviation from expected situations. That is, risk shows the probability of deviation from the expected outcome within the uncertainty state. Volatility is used as a measure of risk. Volatility measures the...
extant to which changes in prices occur, and the magnitude of the difference between price movements of financial products. The high volatility of a financial asset return indicates that the asset is risky, while the low volatility indicates existence of low risk.

It is possible to classify volatility in two ways as historical and implied. If volatility is calculated using a historical dataset, this is called historical volatility. Historical volatility does not give information on how an asset will behave in the future while giving information about past price behavior. Option pricing models include the expected volatility of the underlying assets until the due date. Since the other parameters in the option pricing models are known, the volatility value that gives the market price of the option can be determined and is called implied volatility. In other words, implied volatility refers to the volatility of the underlying asset for an option which investors expect to realize to the maturity.

It is known that as a risk measure, financial asset volatility has increased considerably during times of crisis when uncertainty has increased. The mortgage crisis in the US in 2008 caused significant increase in volatility for US stock market as well as other markets because US market is the largest economy in the World and has the potential to affect other economies. The fact that rising of volatility, or riskiness, causes investors to increase their expectations of returns, leading to significant decreases in the value of financial assets during times when volatility is increasing. Value of the S&P 500 index which are the primary indicators for the US stock market, the historical volatility of index returns and Chicago Board Options Exchange Volatility Index (VIX), which represents the implied volatility of the S&P 500 index are shown in Figure 1. In Figure 1, it is seen that between 2008 and 2009, the S&P 500 index values showed a serious decline and in the same period both the historical volatility and the implied volatility have reached very high values.

The effects of the 2008 US mortgage crisis were not limited to just the US. Since the American economy is of a size that guides the world economy, this crisis affects the world economy negatively. Developing countries, along with developed countries, were significantly affected by this crisis. Many variables, such as growth, imports, exports, unemployment, stock market indexes, have shown that this

*For a more accurate representation see the electronic version.

Figure 1. S&P 500 index, its historical volatility and VIX index: 2004-2016