Global Economic Crisis and Stock Markets: Impact and Recovery*

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This paper investigates the impact of global economic crisis and its recovery for the stock markets of sixteen countries. Specifically, this paper analyzes stock markets of eight developed countries (i.e., the U.S., the U.K., Germany, France, Italy, Spain, Japan, and Australia) and eight emerging countries (i.e., China, India, Russia, Brazil, Korea, Taiwan, Indonesia, and Mexico) using their daily rate of returns on the market indices for the period from July 15, 2004 to July 31, 2010. To examine the impact of global economic crisis and its recovery the period of study is divided into two parts: crisis period from September 15, 2008 to July 31, 2010 and normal period from July 15, 2004 to June 30, 2007. The main results are summarized as follow. First, there were significant changes in the stock return patterns after the crisis by observing decrease in mean return, increase in volatility, increase in skewness, and increase in kurtosis. Second, this paper finds that although the short-term impact of the crisis triggered by collapse of Lehman Brothers is nearly the same between emerging and developed markets, the crisis continued to affect stock markets of developed countries for 6 months whereas the emerging stock markets were no longer affected by the crisis beyond 3 months. In the country level, Italy, Russia, Japan, the U.S., India, France, and Germany (in order) are countries that are more affected by the crisis. Third, in the investigation of the market recovery from the crisis, this study finds that on average the emerging markets made a quicker recovery from the crisis as compared with the developed markets. In the country level, Indonesia, Mexico, Brazil, India, the U.K., Korea, and Taiwan (in order) are countries that made a quicker recovery from the crisis.

Field of Research: Global economic crisis, Stock markets, Emerging countries, Developed countries

1. Introduction

Unprecedented financial turmoil, triggered by the sub-prime mortgage crisis in the U.S., erupted in the aftermath of the collapse of Lehman Brothers in September 2008. The crisis rapidly escalated into the economic crisis of all

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the nations in the world. The crisis could be ascribed to the persistence of large global imbalances, which have been manifested through twin deficit in the U.S. However, even though their direct exposures to impaired assets were limited, emerging markets were also pulled into the unfolding turmoil. In particular, the stock markets of emerging countries were severely affected by the global financial crisis.

This paper investigates the impact of global economic crisis and its recovery for the stock markets of sixteen countries. Specifically, this paper analyzes stock markets of eight developed countries (i.e., the U.S., the U.K., Germany, France, Italy, Spain, Japan, and Australia) and eight emerging countries (i.e., China, India, Russia, Brazil, Korea, Taiwan, Indonesia, and Mexico) using their daily rate of returns on the market indices for the period from July 15, 2004 to July 31, 2010. To examine the impact of global economic crisis and its recovery the period of study is divided into two parts: crisis period from September 15, 2008 to July 31, 2010 and normal period from July 15, 2004 to June 30, 2007. More specifically, the following questions are investigated in this study:

1) Which countries were severely affected by the global economic crisis? And comparison between developed and emerging markets.
2) Are there any significant changes in the stock return patterns after the crisis? Particularly, which countries?
3) Which countries fast recovered from the global economic crisis? And comparison between developed and emerging markets.
4) To what level the recovery from the crisis was made? Any systematic difference across countries?

The rest of the paper is organized as follows. The next section provides literature review. Section 3 describes the data used in this study. Empirical results are divided into three parts; ⅰ) daily return patterns before and after crisis, ⅱ) impact of crisis, ⅲ) recovery from crisis and presented in section 4. Finally, discussions and concluding remarks are presented in the last section.

2. Literature Review

The cross-national analysis of stock markets is an important issue because it may have significant implications for the question of possible diversification gains from international investments and the development of international asset pricing theory. The easing of barriers to the flow of capital across national boundaries in the 1970s and the 1980s stimulated a widespread interest in the study of international capital market relationships (see Levy and Sarnat (1970), Hilliard (1979), and Joy, Panton, Reilly, and Martin (1976)). Furthermore, the October 1987 market crash gave a sense

of urgency to such investigations (see Leland and Rubinstein (1988), Roll (1988), Shiller (1988), and Malliaris and Urrutia (1992)).

However, due largely to the higher importance of the financial markets of the developed countries to the global markets and due partly to the ease of availability of data, extant research regarding relationships among international capital markets has focused, primarily, on the financial markets of developed countries (see Eun and Shim (1989), Becker, Finnerty, and Gupta (1990), and Hamao, Masulis, and Ng (1990)). Despite the growing importance of emerging capital markets, spurred by the phenomenal economic growth, researchers have paid relatively less attention to these markets (see Park and Fatemi (1993) and Wei, Liu, Yang, and Chaung (1995), and Ghoshi, Saidi, and Johnson (1999)).

3. Data

The Data utilized consist of daily rates of return, measured in terms of the local currency unit, on the market indices of sixteen countries including eight developed countries (i.e., the U.S., the U.K., Germany, France, Italy, Spain, Japan, and Australia) and eight emerging countries (i.e., China, India, Russia, Brazil, Korea, Taiwan, Indonesia, and Mexico). The indices chosen to represent the stock markets of the eleven countries are as follows: S&P500 for the U.S., FTSE100 for the U.K., DAX30 for Germany, CAC40 for France, FTSE MIB for Italy, IBEX35 for Spain, Nikkei225 for Japan, All Ordinary Index for Australia, Shanghai Composite Index for China, BSESN for India, RTSI for Russia, BOVESPA for Brazil, KOSPI for Korea, TWII for Taiwan, JKSE for Indonesia, and INMEX for Mexico.

To examine the impact of global economic crisis and its recovery and compare the results with the data during the normal period, this paper covers the period from July 15, 2004 to July 31, 2010. The global financial crisis begins in earnest from the collapse of Lehman Brothers on September 15, 2008. Thus the period after September 15, 2008 is selected as crisis period. For comparison purpose, the period from July 15, 2004 to June 30, 2007 is assumed as normal period. Because even before the collapse of Lehman Brothers the global financial markets were affected by sub-prime mortgage crisis started in 2007, this paper assumes that the normal period ends on June 31, 2007. The data sauce is FnGuide.

4. Empirical Results

4.1 Daily Return Patterns Before and After Crisis

The descriptive statistics for the daily rates of return on the market indices of the eight emerging countries (i.e., China, India, Russia, Brazil, Korea, Taiwan, Indonesia, and Mexico) and the eight developed countries (i.e., the U.S., the U.K., Germany, France, Italy, Spain, Japan, and Australia) for the period before and after the global economic crisis are reported in Table 1 and Table 2, respectively. The period before the crisis covers three and half years from July 15, 2004 to the end of 2007 and the period after the crisis covers 22 months from September 1, 2008 to July 31, 2010.

Table 1. Daily Stock Return Patterns of Emerging Markets before and after Crisis (%)

Country	Period	Mean	Std. Dev.	Skewness	Kurtosis
China	before	0.168	1.657	-0.368	3.018
	after	0.041	2.022	0.023	2.065
India	before	0.173	1.364	-0.298	2.885
	after	0.069	2.277	0.733	8.640
Russia	before	0.173	1.649	-0.564	4.258
	after	0.045	3.673	0.214	6.152
Brazil	before	0.136	1.561	-0.241	0.634
	after	0.076	2.649	0.382	5.366
Korea	before	0.118	1.219	-0.443	2.357
	after	0.057	1.993	-0.316	6.566
Taiwan	before	0.055	1.065	-0.533	2.754
	after	0.035	1.735	-0.090	1.903
Indonesia	before	0.161	1.275	-0.541	4.452
	after	0.095	1.974	-0.264	4.866
Mexico	before	0.132	1.243	-0.207	2.339
	after	0.070	2.143	0.553	5.113
Emerging Markets Average	before	0.140	1.379	-0.399	2.837
	after	0.061	2.308	0.154	5.084

Table 2. Daily Stock Return Patterns of Developed Markets before and after Crisis (%)

Country	Period	Mean	Std. Dev.	Skewness	Kurtosis
U.S.	before	0.035	0.767	-0.300	2.022
	after	-0.007	2.205	0.050	4.675
U.K.	before	0.049	0.814	-0.378	2.831
	after	0.004	1.930	0.184	5.169
Germany	before	0.088	0.897	-0.300	0.745
	after	0.007	2.167	0.573	5.203
France	before	0.054	0.891	-0.318	1.119
	after	-0.018	2.204	0.490	4.857
Italy	before	0.000	0.008	-0.683	1.988
	after	-0.001	0.023	0.125	2.948
Spain	before	0.077	0.827	-0.404	1.823
	after	0.003	2.251	0.597	6.011
Japan	before	0.040	1.085	-0.260	1.369
	after	-0.040	2.350	-0.036	6.005
Australia	before	0.071	0.782	-0.447	2.994
	after	-0.017	1.593	-0.373	2.764
Developed Markets Average	before	0.052	0.759	-0.386	1.861
	after	-0.009	1.840	0.201	4.704

All the markets in the sample evidence decrease in daily mean returns after the 2008 global economic crisis. However, all the emerging markets in the sample exhibit positive mean returns even after the crisis whereas the mean returns of some developed markets such as the U.S., France, Japan, and Australia are negative. Among sixteen markets in the sample, Indonesia records the highest average after-crisis return of 0.095 and Brazil, Mexico, India, and Korea are next in the order, with mean returns of 0.076, 0.070, 0.069, and 0.057, respectively. On the other hand, Japan records the lowest average after-crisis return of -0.040, followed by France, Australia, and the U.S., with mean returns of -0.018, -0.017, and -0.007, respectively. Overall, the average after-crisis return of eight emerging markets (0.061) is higher than that of eight developed markets (-0.009), indicating that the stock market performance of developed countries after the crisis is low relative to the emerging markets.

In terms of market volatility, as measured by the standard deviation of daily stock market returns, all the markets in the sample evidence significant increase after the 2008 global economic crisis. Among eight emerging markets in the sample, Russia records the highest volatility of 3.673 after the crisis, followed by Brazil, India, Mexico, and China, with standard deviations of 2.469, 2.277, 2.143, and 2.022, respectively. Among eight developed markets in the sample, Japan records the highest volatility of 2.350 after the crisis while Spain, the U.S., France, and Germany exhibit similar level of volatility, with standard deviations of 2.251, 2.205, 2.204, and 2.167, respectively. Overall, the emerging markets are more volatile with average standard deviation of 1.379 before the crisis and 2.308 after the crisis as compared to the developed markets with average standard deviation of 0.757 before the crisis and 1.840 after the crisis.

Another interesting pattern observed in Table 1 and Table 2 is changes in skewness of daily stock market returns after the 2008 global economic crisis. All sixteen markets in the sample show negative skewness before the crisis, indicating that the tail on the left side of stock return distribution is longer than the right side and the bulk of the daily returns lie to the right of the mean. However, skewness of daily stock market returns of these countries increases after the crisis and becomes even positive in some markets including China, India, Russia, Brazil, and Mexico among the emerging countries and the U.S., the U.K., Germany, France, Italy, and Spain among the developed countries. The positive skewness suggests that the tail on the right side of stock return distribution is longer than the left side and the bulk of the daily returns lie to the left of the mean. Overall, average skewness of eight emerging markets changes from -0.399 before the crisis to 0.154 after the crisis. Similar pattern is also observed in eight developed markets with average skewness of -0.386 before the crisis and 0.201 after the crisis.

In Table 1 and Table 2, we also observe that kurtosis of daily stock market returns increases after the crisis in most countries in the sample except China, Taiwan, and Australia. Higher kurtosis means more of the variance is the result of infrequent extreme deviations, as opposed to frequent modestly sized deviations. Thus we know that the increased volatility of the daily returns after the crisis results from infrequent extreme deviations of stock returns from their mean. Overall, average kurtosis of eight emerging markets changes from 2.837 before the crisis to 5.084 after the crisis. While their level is lower relative to the emerging markets, similar pattern is also observed in eight developed markets with average kurtosis of 1.861 before the crisis and 4.704 after the crisis.

4.2 Impact of Crisis

The global economic crisis had a significant impact on the stock markets in the world. Thus it is interesting to investigate which countries' markets were severely affected by the crisis. The global economic crisis has come in

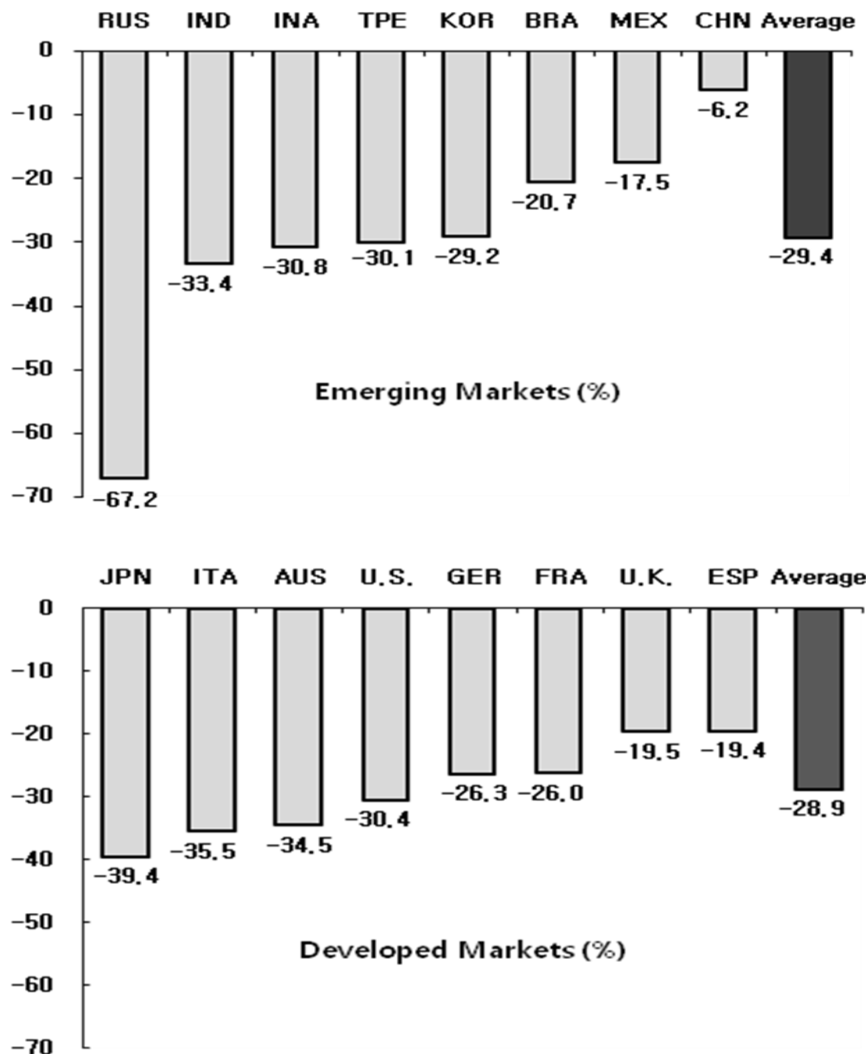
earnest since the collapse of Lehman Brothers on September 15, 2008. To measure the impact of the crisis triggered by the collapse of Lehman Brothers, this paper computes the stock market returns of sixteen countries for 1 month, 3 months, and 6 months from the trading day before September 15, 2008 and reports the results in Table 3 and Figures 1 and 2.

Table 3. Stock Market Returns since Collapse of Lehman Brothers (%)

Country	1 month	3 month	6 month
China	-3.04	-6.22	2.34
India	-16.41	-33.39	-43.52
Russia	-38.48	-67.24	-67.19
Brazil	-15.25	-20.67	-21.59
Korea	-7.75	-29.19	-27.19
Taiwan	-13.44	-30.06	-21.18
Indonesia	-9.98	-30.84	-25.86
Mexico	-10.04	-17.46	-27.39
Emerging Markets Average	-14.30	-29.38	-28.95
U.S.	-17.82	-30.44	-45.52
U.K.	-16.92	-19.54	-32.67
Germany	-15.39	-26.27	-42.78
France	-13.88	-26.03	-43.23
Italy	-15.23	-35.45	-68.31
Spain	-6.39	-19.42	-38.34
Japan	-25.69	-39.41	-47.85
Australia	-12.28	-34.50	-39.18
Developed Markets Average	-15.45	-28.88	-44.74

Russia records the lowest 1 month return of -34.48%, followed by Japan, the U.S., the U.K., and India, with 1 month returns of -25.69%, -17.82%, -16.92%, and -16.41% respectively. The average 1 month return of eight emerging markets (-14.30%) is close to that of eight developed markets (-15.45%), indicating that the short-term impact of the crisis triggered by collapse of Lehman Brothers is nearly the same between emerging and developed markets. For 3 month return Russia remains the lowest one with -67.24%, and Japan, Italy, Australia, and India form a next order with 3 month returns of -39.41%, -35.45%, -34.50, and -33.39%, respectively. The results are illustrated in Figure 1. The difference in average 3 month returns between emerging and developed markets (-29.38% vs. -28.88%) is still minor.

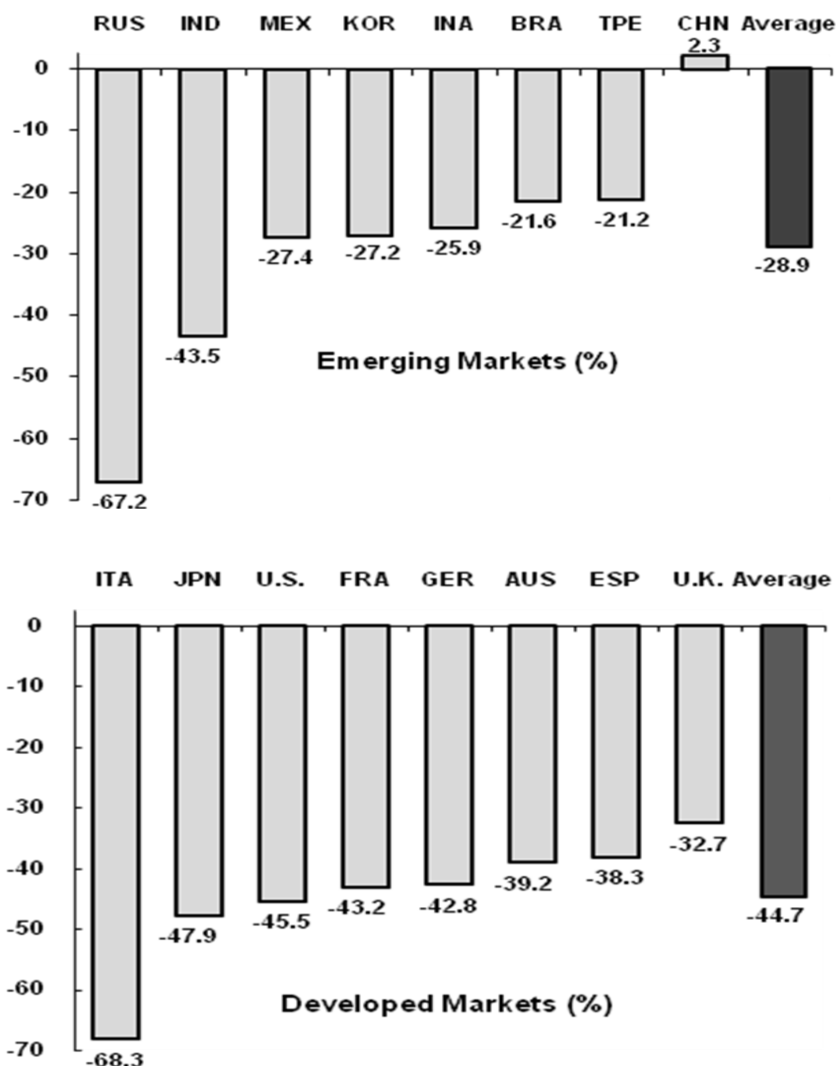
Figure 1. Profile for Impact of Crisis (based on 3 month returns)



However, the average 6 month return of eight developed markets (-44.74%) is much lower than that of eight emerging markets (-28.95%), implying that the global economic crisis continued to affect stock markets of developed countries for 6 months whereas the emerging stock markets were no longer affected by the crisis beyond 3 months. Actually, all the developed markets in the sample experienced drop in stock prices for the period between 3 and 6 months after the collapse of Lehman Brothers with the largest drop in Italy. On the other hand, for the same period most emerging markets except Mexico and India avoided significant drop in stock prices. Overall, Italy records the lowest 6 month return of -68.31%, followed by Russia by a whisker with -67.19%, and Japan, the U.S., India, France, and Germany form a next order with 6 month returns of -47.85%, -45.52%, -43.52%, -43.23% and -42.78% respectively. The results are illustrated in Figure 2. Interestingly, the Chinese stock market was little affected by the crisis

triggered by the collapse of Lehman Brothers, showing 1 month return of -3.04%, 3 month return of -6.22%, and 6 month return of 2.34%.

Figure 2. Profile for Impact of Crisis (based on 6 month returns)



As another way to examine the impact of the global economic crisis on the stock markets, this paper computes the stock market returns using the price changes between peak before the crisis and bottom after the crisis and reports the results in Table 4. Consistent with the result in Table 1, Russia records the largest drop in stock market index from 2,488 on May 19, 2008 to 498 on January 23, 2009, resulting in -160.82% during 8 months. China is ranked the second with return of -127.24% from 6,092 on October 16, 2007 to 1,707 on November 4, 2008. Combined with the result in Table 1, this result for China indicates that the Chinese stock market began to plunge long before the collapse of Lehman Brothers. Italy, Japan, India, and Indonesia form a next order with the maximum losses of -125.71%, -95.11%, -93.92%, and -93.48%, respectively. Relatively, the U.K., Mexico,

Korea, and Australia exhibits less drop in stock market with the maximum losses of -65.07%, -73.63%, -78.83%, and -78.96%, respectively.

Table 4. Stock Market Returns Computed from Peak before Crisis to Bottom after Crisis

Country	Peak before Crisis		Bottom after Crisis		Return (%)	
	Date	Price Index	Date	Price Index	Plain	Log
China	2007-10-16	6,092.06	2008-11-04	1,706.70	-71.98	-127.24
India	2008-01-08	20,873.33	2009-03-09	8,160.40	-60.91	-93.92
Russia	2008-05-19	2,487.92	2009-01-23	498.20	-79.98	-160.82
Brazil	2008-05-20	73,516.81	2008-10-27	29,435.11	-59.96	-91.53
Korea	2007-10-31	2,064.85	2008-10-24	938.75	-54.54	-78.83
Taiwan	2007-10-29	9,809.88	2008-11-20	4,089.93	-58.31	-87.49
Indonesia	2008-01-09	2,830.26	2008-10-28	1,111.39	-60.73	-93.48
Mexico	2007-06-05	1,893.68	2009-03-09	906.84	-52.11	-73.63
U.S.	2007-10-09	1,565.15	2009-03-09	676.53	-56.78	-83.88
U.K.	2007-06-15	6,732.40	2009-03-03	3,512.09	-47.83	-65.07
Germany	2007-07-16	8,105.69	2009-03-06	3,666.41	-54.77	-79.34
France	2007-06-01	6,168.15	2009-03-09	2,519.29	-59.16	-89.54
Italy	2007-05-18	44,364.00	2009-03-09	12,621.00	-71.55	-125.71
Spain	2007-11-08	15,945.70	2009-03-09	6,817.40	-57.25	-84.97
Japan	2007-07-09	18,261.98	2009-03-10	7,054.98	-61.37	-95.11
Australia	2007-11-01	6,853.60	2009-03-06	3,111.70	-54.60	-78.96

4.3 Recovery from Crisis

The stock markets have recovered from the global economic crisis, but the question is a matter of degree. Thus it is interesting to investigate which countries' markets recovered fast and how much they recovered from the crisis. In this investigation the method measuring the degree of recovery is an important issue. First, this paper compares the average market index in the month of July 2010 with index at the peak before the crisis and index at the bottom after the crisis. The results are shown in Table 5.

Table 5. Stock Market Recovery between July 2010 and Peak or Bottom around Crisis

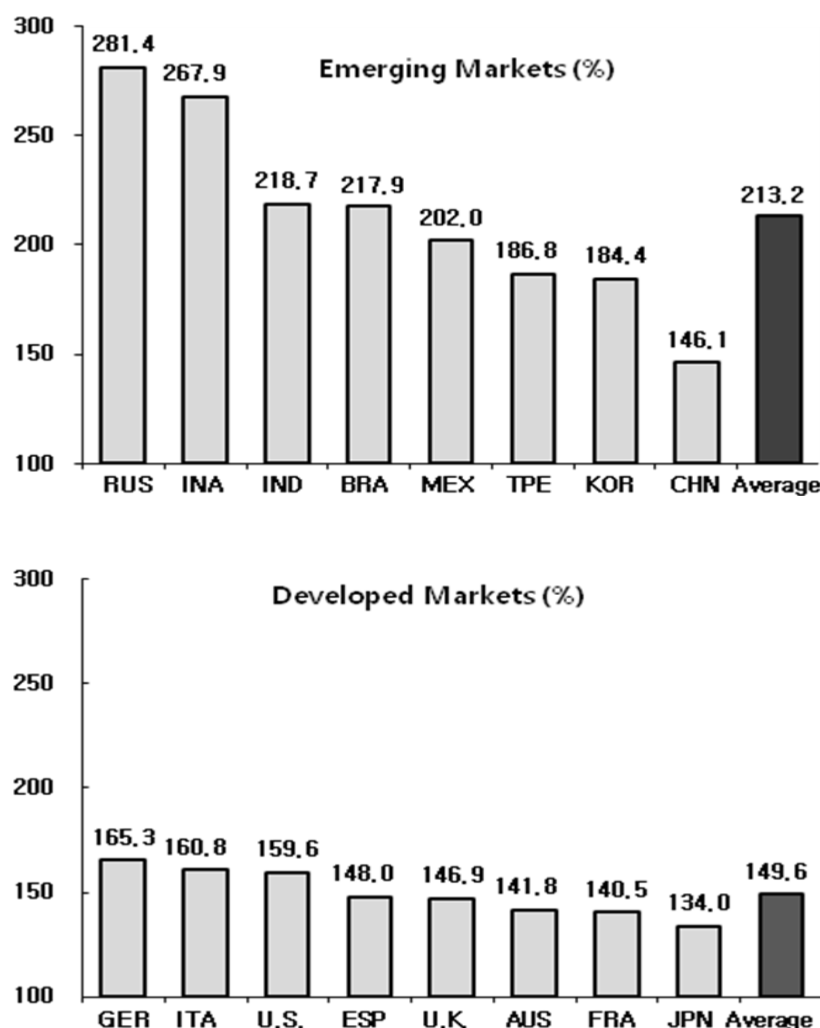
Country	Peak before Crisis	Bottom after Crisis
China	40.9 %	146.1 %
India	85.5 %	218.7 %
Russia	56.4 %	281.4 %
Brazil	87.3 %	217.9 %
Korea	83.8 %	184.4 %
Taiwan	77.9 %	186.8 %
Indonesia	105.2 %	267.9 %
Mexico	97.0 %	202.5 %
Emerging Market Average	79.2 %	213.2 %
U.S.	69.0 %	159.6 %
U.K.	76.6 %	146.9 %
Germany	74.8 %	165.3 %
France	57.4 %	140.5 %
Italy	45.7 %	160.8 %
Spain	63.3 %	148.0 %
Japan	51.8 %	134.0 %
Australia	64.4 %	141.8 %
Developed Markets Average	62.9 %	149.6 %

As compared to the peak before the crisis, among sixteen countries in the sample, Indonesia records the most recovery showing that the average market index in the month of July 2010 slightly exceeds the index at the peak before the crisis (105.2%). Mexico, Brazil, India, and Korea form a next order with recovery levels of 97.0%, 87.3%, 85.5%, and 83.8%, respectively. On the other hand, China is ranked as the least recovery country (40.9%), followed by Italy, Japan, Russia, and France, with recovery levels of 45.7%, 51.8%, 56.4%, and 57.4%, respectively. The average recovery level of eight emerging markets (79.2%) is higher than that of eight developed markets (62.3%), indicating that the emerging markets recovered almost 80% as compared to the peak before the crisis whereas developed markets recovered little bit more than 60%.

When the average market index in the month of July 2010 is compared to the bottom after the crisis, similar patterns are observed, showing Russia, Indonesia, India, Brazil, and Mexico (in order) recovered more than 200% as compared to the bottom after the crisis. Other emerging countries such as Taiwan and Korea also exhibit the recovery levels of 186.8% and

184.4%, respectively. Among eight emerging countries, China shows exceptionally low recovery level (146.1%). On the other hand, most developed markets show recovery level of less than 160% as compared to the bottom after the crisis. As a result, the average recovery level of eight developed markets (149.6%) is much lower than that of eight emerging markets (213.2%). These results are illustrated in Figure 3.

Figure 3. Profile for Recovery of Crisis (against bottom after crisis)



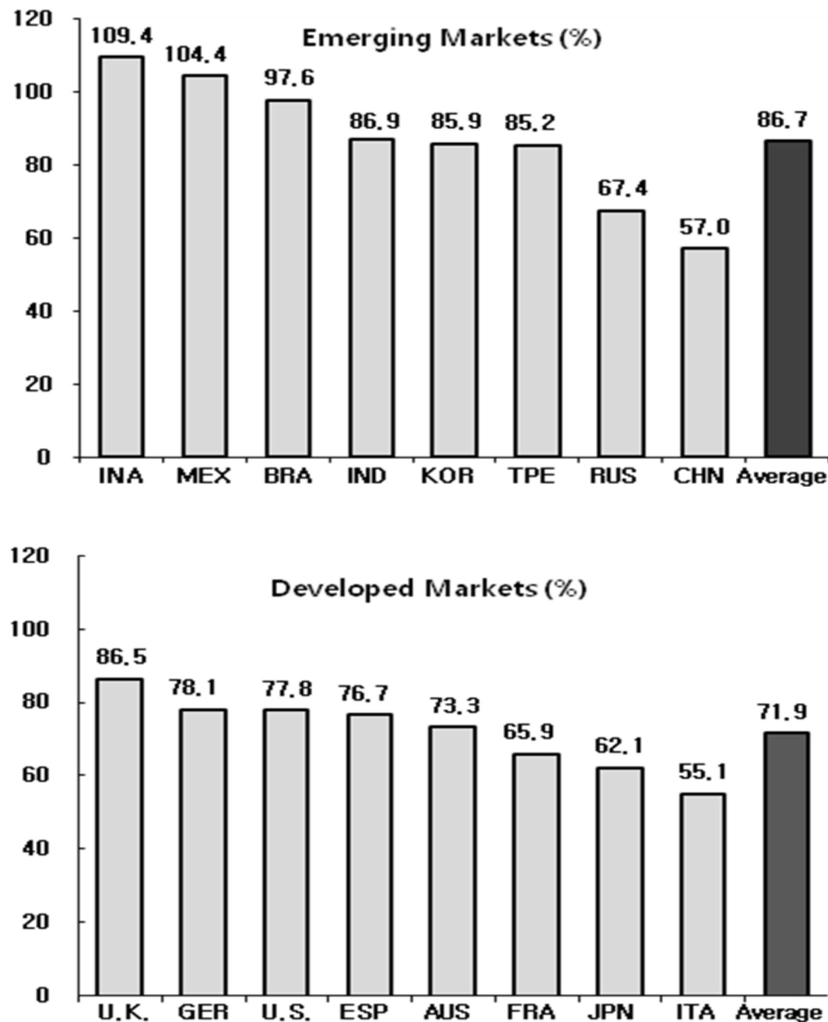
As another measurement for the stock market recovery from the global economic crisis, this paper compares the market index at the peak after the crisis with that at the peak before the crisis and reports the results in Table 6. We find that the peak before the crisis of sixteen countries in the sample spreads over the period from May 2007 to May 2008. Interestingly, the peak after the crisis clusters on April 2010 (nine out of sixteen countries). Among other seven countries, Italy and China reached the peak in 2009 while Korea, India, and Indonesia reached the peak recently in July 2010.

Table 6. Stock Market Recovery Comparing Peak after Crisis with Peak before Crisis

Country	Peak before Crisis		Peak after Crisis		Ratio (%)
	Date	Price Index	Date	Price Index	After / Before
China	2007-10-16	6,092.06	2009-08-04	3,471.44	57.0
India	2008-01-08	20,873.33	2010-07-23	18,130.98	86.9
Russia	2008-05-19	2,487.92	2010-04-15	1,676.27	67.4
Brazil	2008-05-20	73,516.81	2010-04-08	71,784.78	97.6
Korea	2007-10-31	2,064.85	2010-07-28	1,773.47	85.9
Taiwan	2007-10-29	9,809.88	2010-01-15	8,356.89	85.2
Indonesia	2008-01-09	2,830.26	2010-07-29	3,096.82	109.4
Mexico	2007-06-05	1,893.68	2010-04-14	1,977.93	104.4
U.S.	2007-10-09	1,565.15	2010-04-23	1,217.28	77.8
U.K.	2007-06-15	6,732.40	2010-04-15	5,825.01	86.5
Germany	2007-07-16	8,105.69	2010-04-26	6,332.10	78.1
France	2007-06-01	6,168.15	2010-04-15	4,065.65	65.9
Italy	2007-05-18	44,364.00	2009-10-19	24,425.98	55.1
Spain	2007-11-08	15,945.70	2010-01-06	12,222.50	76.7
Japan	2007-07-09	18,261.98	2010-04-05	11,339.30	62.1
Australia	2007-11-01	6,853.60	2010-04-15	5,024.10	73.3

Among sixteen countries in the sample, Indonesia and Mexico made a full recovery from the crisis, showing their market index at the peak after the crisis surpasses the index at the peak before the crisis. Also, Brazil almost recovered from the crisis with the recovery ratio of 97.6%. India, the U.K., Korea, and Taiwan form a next order, showing the recovery ratios over 85%, and the recovery ratios of Germany, the U.S., Spain, and Australia (in order) range from 78.1% to 73.3%. Russia, France, and Japan (in order) show their recovery ratios in the range of 60s. Italy records the lowest recovery ratio of 55.1%, followed by China with 57.0%. Overall, the average recovery ratio of eight emerging markets (86.7%) is higher than that of eight developed markets (71.9%), implying that on average the emerging markets made a quicker recovery from the crisis as compared with the developed markets. These results are illustrated in Figure 4.

Figure 4. Profile for Recovery of Crisis (peak before and after crisis)



5. Summary and Conclusions

This paper investigates the impact of global economic crisis and its recovery for the stock markets of sixteen countries. Specifically, this paper analyzes stock markets of eight developed countries (i.e., the U.S., the U.K., Germany, France, Italy, Spain, Japan, and Australia) and eight emerging countries (i.e., China, India, Russia, Brazil, Korea, Taiwan, Indonesia, and Mexico) using their daily rate of returns on the market indices for the period from July 15, 2004 to July 31, 2010. To examine the impact of global economic crisis and its recovery the period of study is divided into two parts: crisis period from September 15, 2008 to July 31, 2010 and normal

period from July 15, 2004 to June 30, 2007. The main results are summarized as follow.

First, all the markets in the sample evidence decrease in daily mean returns after the 2008 global economic crisis. However, all the emerging markets in the sample exhibit positive mean returns even after the crisis whereas the mean returns of some developed markets are negative. In terms of market volatility, as measured by the standard deviation of daily stock market returns, all the markets in the sample evidence significant increase after the 2008 global economic crisis. All sixteen markets in the sample show negative skewness before the crisis, but the skewness of these markets increases after the crisis and becomes even positive in some markets. We also observe that kurtosis of daily stock market returns increases after the crisis in most countries in the sample, implying the increased volatility of the daily returns after the crisis results from infrequent extreme deviations of stock returns from their mean.

Second, the investigation of the impact of the crisis triggered by the collapse of Lehman Brothers on the global stock markets shows that the crisis continued to affect stock markets of developed countries for 6 months whereas the emerging stock markets were no longer affected by the crisis beyond 3 months. In the country level Italy records the lowest 6 month return, followed by Russia, Japan, the U.S., India, France, and Germany. Interestingly, the Chinese stock market was little affected by the crisis. In the stock market returns using the price changes between peak before the crisis and bottom after the crisis, Russia records the largest drop and China is ranked the second. Then, Italy, Japan, India, and Indonesia form a next order. Relatively, the U.K., Mexico, Korea, and Australia exhibit less drop in stock market.

Third, in the investigation of market recovery from the crisis Indonesia records the most recovery showing that the average market index in the month of July 2010 slightly exceeds the index at the peak before the crisis. Mexico, Brazil, India, and Korea form a next order in terms of recovery level. On the other hand, China is ranked as the least recovery country, followed by Italy, Japan, Russia, and France. The average recovery level of eight emerging markets (79.2%) is higher than that of eight developed markets (62.3%). When the average market index in the month of July 2010 is compared to the bottom after the crisis, similar patterns are observed, showing Russia, Indonesia, India, Brazil, and Mexico (in order) recovered more than 200% from the bottom after the crisis. The average recovery level of eight developed markets (149.6%) is much lower than that of eight emerging markets (213.2%). When the market recovery is measured by comparing the market index at the peak after the crisis with that at the peak before the crisis, Indonesia and Mexico made a full recovery from the crisis. Also, Brazil almost recovered from the crisis, India, the U.K., Korea, and

Taiwan form a next order, showing the recovery ratios over 85%. The recovery ratios of Germany, the U.S., Spain, and Australia (in order) range from 78.1% to 73.3%. Russia, France, and Japan (in order) show their recovery ratios in the range of 60s. Italy records the lowest recovery ratio of 55.1%, followed by China with 57.0%. Overall, the average recovery ratio of eight emerging markets (86.7%) is higher than that of eight developed markets (71.9%).

In conclusion, there were significant changes in the stock return patterns after the crisis by observing decrease in mean return, increase in volatility, increase in skewness, and increase in kurtosis. This paper finds that although the short-term impact of the crisis triggered by collapse of Lehman Brothers is nearly the same between emerging and developed markets, the crisis continued to affect stock markets of developed countries for 6 months whereas the emerging stock markets were no longer affected by the crisis beyond 3 months. In the investigation of the market recovery from the crisis, this study finds that on average the emerging markets made a quicker recovery from the crisis as compared with the developed markets. In the country level, Italy, Russia, Japan, the U.S., India, France, and Germany (in order) are countries that are more affected by the crisis triggered by collapse of Lehman Brothers among sixteen countries in the sample. On the other hand, Indonesia, Mexico, Brazil, India, the U.K., Korea, and Taiwan (in order) are countries that made a quicker recovery from the crisis.

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