An Analysis of the Crisis Transmission in the Global Financial Network to Iran

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Abstract:
According to studies, a financial market based on the power law as According to the literature, a financial market based on the power law as a dynamic system can reach a critical point (i.e., a financial crisis) and even go up to the infinity. In this study, four stock exchanges in Tehran, Moscow, Abu Dhabi, and New York were selected based on the availability of credible statistics and the observation of important economic areas in the global geography. Two questions were then formulated as follows. Firstly, did the four markets face crisis and how much was the magnitude of each one? Secondly, if the crisis affected the markets in 2007- 2009, how much was the value-at-risk and the expected shortfall in the crisis? The results indicated that financial crises occurred in the four markets based on the power law and Wakeby distributions and the magnitude of each one was also determined. It was also found that the financial crisis in 2007- 2009 affected all four stock exchanges. The crises that occurred in the Tehran Stock Exchange, respectively included: the first privatization impact of the stock exchange in 2003, the United Nations Security Council's sanctions in 2010, the devaluation of the national currency in 2012, the global financial crisis in 2007, the implementation of the nuclear deal between Iran and the Group 5+1 in 2016, the decline in oil prices in 2014, the nuclear negotiations in 2015, the first nuclear negotiations in 2013, the beginning of the Second Gulf War in 2003, the Russia conflict in 2013 and the Lausanne nuclear deal in 2015. The four crashes in the Russia’s market, respectively were: the

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global financial crisis in 2007-2009, the economic crisis in Asia in 1997, the Russian financial crisis in 1998 and the Russian Ruble collapse in 2014-2016. Two financial earthquakes occurred in the United Arab Emirates' market, respectively included: the global financial crisis in 2007-2009 and the effects of the decline in oil prices in 2014. In turn, the crises affected the United States' stock market were the global financial crisis in 2007, the crash in 1987, the stock markets fall in 2011, the stock market downturn in 2002, the economic crisis in Asia in 1997, the Russian financial crisis in 1998, the September 11 attacks in 2001, the spring in 2001, the flash crash in 2010, the technology bubble collapse in 2000, the stock market selloff in 2015-2016, respectively. Moreover, the worst losses in each market were determined by the value-at-risk and the expected shortfall in the recent global crisis based on the duration. The value-at-risk and the expected shortfall represented the worst possible loss at the end of the next trading day at 95% and 99% confidence levels. The goodness-of-fit statistic (KS) showed that GPD fitted well with the returns up to the given thresholds. Besides, the results of the estimation of value at risk during the period of financial crisis in 2009-2009 showed that the worst daily loss will not exceed 1.1%, 16.1%, 4.2% and 9.1% in the next trading day in 95% of the time in the Iran's, Russia's, United Arab Emirates' and United States' markets, respectively. Further, it will not exceed 2.5%, 26.3%, 6.9% and 11% in the next trading day in 99% of the time in the markets. Based on the estimation of the expected shortfall, the worst daily expected loss will not exceed 2.3%, 22.8%, 5.9% and 10.2% in the next trading day in 95% of the time. In addition, the worst daily expected loss will not exceed 5.1%, 35.7%, 8.9% and 11% in the next trading day in 99% of the time in the four markets, respectively. It was also found that in the 2007-2009 Russia's and United States' stock markets experienced the greatest loss compared to the crash in 1998. Indeed, the financial shocks can lead to relatively great values of the worst expected loss; however, their severity is different in each market studied. The results also revealed that the financial crisis with the highest magnitude in 2007- 2009 created a large potential loss and damage in all markets.

JEL classification: C10, G01, G15

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