An Agent-Based Approach For Forecasting Early Warning Signs In A Financial Market: The Case Of Currency Crisis

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Abstract:

The rapid expansion of financial liberalization has led to a new financial market-oriented economy in many regions all over the world. However, this financial system transformation has been accompanied by many financial crises affecting especially emerging economies.

The last decade has witnessed a large number of financial crises in emerging market economies with often devastating economic, social and political consequences. These successive crises are usually triggered by a sharp depreciation of the exchange rate of national currency leading to questioning about the foreign exchange market functioning in these countries.

Since the breakout of the various currency crises in the 1990s, there have been several attempts devoted to the construction of an early warning system for predicting the probability of the next crisis in order to avoid its recurrence. The European currency crises in 1992, the Mexican peso crisis in 1994, the Asian crises in 97-98, the Russian currency crisis in 1998 and later the Argentine crisis are concrete examples in this way. In order to prevent (or at least to better manage) such damage in the world economy, the finding of an effective early warning system has become an important issue. The different generations of currency crises models have therefore enabled the development of several tests on choosing the optimal monetary policy in such situations.

Early detection of potential crises in developing countries has become more important. However, according to some more recent works, the forecasting results for the out-of-sample data for Asian crisis case are disappointing for most of the theoretical models. It appears that the problem of finding an effective early warning system remains an outstanding issue and still needs further investigation. The possibility of extensive nonlinear relationships among the relevant variables motivates us to explore the problem from an artificial intelligence perspective based on the neural networks models.

From this perspective, as far as the nonlinear problem is concerned, the progress in artificial intelligence approach can now provide a possible alternative that deserves further exploration. This study proposes a neural network learning paradigm to predict financial crisis events for early-warning purposes. In the proposed neural network learning process, currency exchange rate - a typical financial indicator usually reflecting economic fluctuations - is chosen.

The aim of this work is to try to establish a successful model in forecasting that can detect the emergence of problems on the foreign exchange markets to prevent crisis. It aims to present recent contributions of the artificial intelligence in finance and economic.

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Key Words: Emerging Markets - Exchange Crisis - Neural Network - Early Warning System.