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The Causal Relationship Between Exchange Market Volatility And The Futures Market

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Extensive Summary

Introduction

Economic developments such as the rise of globalization in the financial markets, the rise of international trade between countries, and the increase in transaction volumes in financial markets have also increased the risk and rendered the risk management important. For this reason, financial institutions and individual investors have begun to widely use futures contracts to manage the risk better by hedging against the risks they face. This has played a role in the rapid development of futures markets.

Since there is a limited number of of studies in Turkey regarding the relationship between the futures market and the foreign exchange market volatility, it is considered that this research will be the basis for future work by filling the gap this particular reserach filed. The research has the potential to be beneficial for investors in their decisions in creating less risky portfolios by considering investing in exchange as well as futures markets, given that the futures market prices affect the foreign exchange market prices are linked with each other.

In this study, the causality relationship between the exchange market volatility and the futures market is specified by using the dollar selling rate and the dollar based futures contract data covering the period from May 2, 2005 to July 30, 2010. The exchange market volatility will be modelled by applying two symmetric models (ARCH-GARCH) and one asymmetric model (EGARCH) from the autoregressive conditional variance models. Then the Granger causality test will be used to see if there is a relationship between the exchange market volatility and the futures market.

Methods

Modeling the Volatility

The most commonly used nonlinear financial models in the literature for modeling and predicting fluctuations in time series are autoregressive conditional

heteroskedasticity (ARCH) models. In order to be able to adequately define the conditional variance equation for the majority of cases in ARCH models, the number of lags must be considerably large. As an alternative to this, a model structure with a more flexible lag structure was developed by Bollerslev (1986). This model is called the generalized ARCH, or GARCH (Bollerslev, 1987). Unlike the ARCH model, this model type developed by Bollerslev is the variability models in which the conditional variance is also dependent on its lagged values along with the lagged values of the squares of the error terms (Johnston and Scott, 2000).

One of the most important deficiencies of GARCH models is that it assumes that the volatility reacts symmetrically to the positive and negative shocks. Also, in these models, only the size of the fluctuations is concerned; the sign of the variance is ignored. However, it is frequently observed that negative shocks cause higher volatility than the positive shocks. For this reason, the exponential GARCH (EGARCH) model was developed by Nelson (1991), which allows more appropriate analysis of the time series in the presence of specified features.

Causality Test

Causality analysis explores whether the lagged values of a variable can be used to explain the change in another variable. If, for example, the lagged values of variable X have a significant effect on variable Y, X is called the granger cause of Y (Granger, 1988). There are four possibilities in the causality analysis to determine the relation between two variables, X and Y. X may affect the variable Y, Y may affect the variable X, the X and Y variables may mutually affect each other, or the two variables may not affect each other.

Findings

The ARCH, GARCH, and EGARCH models of the autoregressive conditional variance models for the dollar return series are estimated for various lag lengths. Among the estimated models, the EGARCH (1,1) model is found as the most suitable model for the dollar series. The Granger causality test was applied to investigate the causality relationship between the dollar market volatility and the dollar futures market return series. The result of the Granger causality test reveals that there is causality to the dollar market volatility from the the dollar futures market return series, and vice versa. This finding shows that the causality relationship between the exchange market volatility and the futures market is bidirectional.

Conclusion

The findings of the study revealed a bidirectional causality relation between the foreign exchange market volatility and the futures market. In line with this result, it is plausible to think the futures market and the exchange market as complementary markets in Turkey. Moreover, the basis risk appears to have potential in explaining the relation between the foreign exchange market volatility and the futures market.