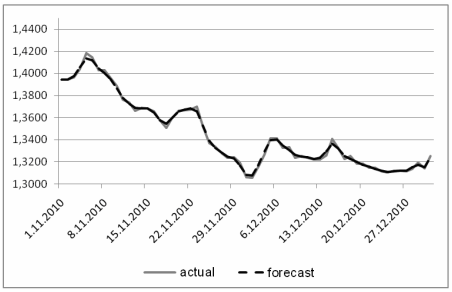

Fig. 4: Actual (solid) and forecast (dotted) values of the EUR/USD exchange rate forecast (Neural alternative of ARIMA(1,1,1) + PGARCH(1,1) model).

Table: 2: The statistical summary measures of model´s forecast accuracy (neural alternative**)**.

Measures	RMSE	MAE	MAPE
Models: (1) + (2)	0.00185	0.00145	0.00107

4. Empirical Comparison

From Tables´1, 2 it is shown that both forecasting models used are very accurate. The development of the error rates on the validation data set showed a high inherent deterministic relationship of the underlying variables. Though promising results have been achieved with both approaches, for the chaotic financial time markets a purely linear (statistical) approach for modeling relationships does not reflect the reality. For example, if investors do not react to a small change in exchange rate at the first instance, but after crossing a certain interval or threshold react, then a non-linear relationship between Δy_t, Δy_{t-1} and ε_{t-1} exists in model (1). The neural approach based on granular RBF network not only detected the functionality between the underlying variables and the EUR/USD exchange rates as well as the short-run dynamics. Moreover the RBF neural network has such attributes as computational efficiency, simplicity, and ease adjusting to changes in the process being forecast. ARCH-GARCH models require more costs of development, installation and operation in a management system, management comprehension and co-operation, and often a lot of computational time. A serious drawback of ARIMA-GARCH models is the investment in time and other resources required to build a satisfactory model.

5. Conclusion

Overall, the study indicates that there is a great deal of linearity to be extracted from the data. Our study also proved that it is possible to achieve significant risk reduction in managerial decision-making by applying modern forecasting models based on information technology such as neural networks developed within artificial intelligence.

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