

Statistical Modeling of Mutual Influence of the EU and Russia Industrial Growth in Conditions of Economic Instability

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In recent times inter country interaction has largely determined the strengthening of macroeconomic instability, especially if the economic shocks of individual countries coincide with recession in the dependent countries. The investigations of export-import dependence of EU and RF economic growth are widely represented in literature. However, the mediated inter country effect of changes in sectors and branches can manifest itself through different information channels of international economic integration. Among them - financial market signals, market reaction for the conjuncture expectations of producers in real sector and changes in the economic behavior of households. Their inter country influence was not sufficiently explored in theoretical and applied research. For the purpose of statistical modeling and analysis of the EU and RF real sectors interaction, the data base was formed from the sources of Eurostat and Rosstat by the combination of monthly industry production indexes (IPI) and industry price production indexes (IPPI) of different branches. The initial time series consisted of 187 points. All indexes were presented in seasonally adjusted form. The plan of the research included several stages: firstly - decomposition of the time series and extracting their trend, cyclical and random components; secondly - statistical estimation of the time series cointegration on the following levels: for the IPI and IPPI of industry on the whole, as well as manufacturing of the EU countries and Russia, and for interdependence between Russian oil and gas production indexes and European industry indexes. The third point of the research plan was dedicated to the influence of economic shocks on the statistical evaluation of the identified dependencies of the time series. And on the last stage of the study the models of industry growth with the factors of inter country interdependence were developed for the purposes of the scenario forecast. The results of the empirical calculations have shown: close correlation between the speed of industry growth and the length of phases and amplitude of industry business cycles; the difference of the external shocks prolonged effect for the industry growth of the more and less developed countries; significant reciprocal influence of the fluctuations of the gas and oil production in Russia and industry production dynamics of European Union countries. The derived models and statistical evaluations were used for forecasting the inter country impact of the macroeconomic turbulence for the expected economic growth.

Keywords: time-series, inter country economic interdependence, deterministic trend, business cycle, cointegration.