Econometric evaluation of the foreign-trade elasticity by bispectral analysis

(abstract)

Subject of this article is the elasticity of foreign trade towards the currency exchange rates evaluated for six Central- and East European countries: The Czech Republic, Hungary, Poland, Slovakia, Slovenia and Bulgaria.
The renewed during the last years scientific interest towards the elasticity of foreign trade is directly connected with the processes of economic integration and globalisation on the one hand and the new tendencies in the development of the econometry and the real   opportunities for more precise econometric evaluations on the other hand. The elasticity of foreign trade towards the currency exchange rate expresses the sensibility of the national economies to the demand and supply of export and import. It serves for indirect expression of the competitive power of the domestic production ,the ability of the economy to self-adapt and self-balance in case of removing tariff and non-tariff limitations ,etc. To a great extent it determines   even the success of the economic integration of the studied countries to big economic unions like WTO,EU and others

Spectral analysis and in particular bispectral analysis is used as a technique to evaluate the relation among import, export and currency exchange rate.
The modern econometric theory offers various methods of evaluation of correlative dependencies. Common feature of all used techniques is that the delay in the reaction of the elasticity of foreign trade towards the currency exchange rate is examined indirectly and in an unclear way. Bispectral analysis, however, provides real opportunities for clear evaluation of direction and intensity of dependency on the one side and its delay on the other side.

Major goal of this research is the econometric evaluation of the dependency between foreign trade and currency exchange rate for the period 1992 to 2000 made by bispectral analysis. A related review and summary of econometric studies of elasticity of foreign trade for the last decades is done in parallel; the essence and parameters of bispectral analysis are presented in

the framework of a vector process; the meaning and parameters of bispectral analysis for the expression of elasticity are analyzed; solutions of information problems related to the concrete empiric research are presented.

The evaluations of the dependency of the foreign trade towards the currency exchange rate made by bispectral analysis are presented in tabular form.

The results of the experiments made in this work can be most generally summarized as follows:

1) With reference to econometric techniques it is established that the bispectral analysis can be successfully used to evaluate the foreign-trade elasticity towards the currency exchange rate. It is proven that bispectral analysis possesses the potential needed for a research of elasticity because it combines measuring of direction, intensity and delay of dependency. This work offers a combined   application of the coherent, cross-amplitude and phase spectra to clearly outline those frequencies (delays respectively), for which the import and export most strongly react to currency exchange rate changes and it also allows for interpretation of the demonstrated elasticity of foreign trade towards the currency exchange rate for those cross-section points, which have simultaneously highest values of coherent analysis and cross-amplitude.

2) For all studied countries, except for Hungary, a specific demonstration of the dependency is observed , known as "the income effect", i.e. the elasticity of import is many times higher than the elasticity of export. This is due to the limited competitive power of the export on the one side and the limited ability of the national market to accept import on the other side. 'The income effect " is more strongly demonstrated   in Poland, the Czech Republic and Slovakia; in fact, the export and import coefficients for these countries differ approximately twice.

3) It is established that the delay in the demonstration of elasticity varies from two to eight months, depending on the type of transaction and the country. The average delay reaction to the changed currency exchange rate is three months for the import and 3.5 months for the export for the six studied countries. With reference to the export it is observed that this dependency is fastest demonstrated in Bulgaria and Slovenia and slowest in

Slovakia. With reference to the import it is established that this dependency is fastest demonstrated in the Czech Republic and slowest demonstrated in Bulgaria and Hungary.

4) The evaluated elasticity coefficients vary within comparatively wide ranges: most strongly the dependency is demonstrated in Hungary where the coefficients reach to 5-6%;most weakly the dependency of export on the currency exchange rate is demonstrated in Slovakia and Bulgaria where the elasticity coefficients do not exceed 1.4-1.5%.Most weakly the import reacts to currency exchange rate changes in Poland and the Czech Republic. The elasticity coefficients for these countries reach 5-9%.Most weakly the import reacts to currency exchange rate changes in Bulgaria and Slovenia where the elasticity coefficients do not exceed 2%.The best adaptation of the export and import to the changed relative prices, showed by Hungary, Poland and the Czech Republic, corresponds to their level of economic development and readiness for economic integration.

Conclusion*:* With reference to the obtained evaluations , the foreign trade of the Czech Republic, Hungary, Poland, Slovakia, Slovenia and Bulgaria, as a whole, can be characterized as elastic and capable to self-regulate and self-balance when the currency risk is changed. The presence of that feature of the export and import can be also interpreted as readiness of the national economies to react to the challenges of the processes of economic integration and globalization.

Resumed and translated by Vera Todorova.