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ELASTICITIES IN BULGARIA'S FOREIGN TRADE

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Abstract: In recent decades, we witness an increase in global economy growth rates. Most often this process is measured by comparing the growth rates of trade to those of production, which shows this ratio is gradually but steadily increasing. Although the ratio is a good indicator when measuring the openness of economy (whether global or of a specific country), it may cause confusion when exploring the relation between trade and production (income). Sometimes this ratio is incorrectly deemed equal to income elasticity of trade. Certainly, the similarity in the calculation of the two indicators accounts for that, but their economic significance is rather different. Trade elasticities are extremely important in the process of economic policy formulation and more particularly in forecasting of foreign trade flows. Very often debates and different opinions as to whether to conduct one or another foreign trade policy ultimately boil down to a choice among different evaluations of the behaviour of trade elasticities. This article provides a short overview of the increasing and changing role of international trade. It discusses the theoretical foundations and empirical challenges in using models describing trade flows, and more specifically in calculating trade elasticities. It offers estimates of long-run (price and income) elasticity of Bulgarian export and import, and provides recommendations from an economic policy perspective.

Key words: foreign trade; economic policy; trade elasticities.

1. On the nature of trade elasticities and the need to estimate them

One of the most important elements in the external sector analysis is to estimate the effect on the volumes of trade flows in case of an exogenous change of various factors, i.e. elasticities measure the resilience to changes in market conditions. From importers' point of view, elasticities reflect the competition between domestic and foreign producers in case of change in demand. The traditional approach assumes that trade elasticities are only and solely determined by end consumers' preferences, i.e. only by the demand side. However, some of the latest studies advance the idea that elasticities can be also related to supply, outlining the relation between manufacturers' individual decisions and volumes of foreign trade flows. This is the rationale: due to the existence of various tariff

and non-tariff barriers, prices of internationally traded goods are not always regulated by the Law of One Price, and consequently companies are forced to make specific decisions whether to enter or exit a particular market depending on all the information available. In such cases, trade volumes are impacted by any change in relative prices (in the form of tariffs or other additional expenses) – i.e. we have a case of trade elasticity, but elasticity caused by supply and not by demand. This approach is interesting and promising, but it is difficult to apply due to the need of highly disaggregated statistical information. Further on in this study, elasticities will be considered only from the perspective of demand, as this approach is simpler and provides satisfactory results.

The effects of national currency depreciation or appreciation on the balance of payments are of great significance for economic policy implementation. In the conditions of a currency board arrangement, the issue of the nominal exchange rate is not relevant, as far as the value of the national currency is pegged to the reserve currency. However, this does not eliminate the effects of *real* depreciation or appreciation. It is long since the Marshall-Lerner rule has been established in applied economy. It postulates that the effects of the exchange rate are only felt when the absolute sum of the export and import elasticities is greater than 1. This is an extremely important aspect, which turns attention away from nominal changes in the exchange rate and to the structure and characteristics of foreign trade flows, for which elasticities play an important role.

Using the exchange rate as an economic policy tool has been practiced for a long time, particularly actively by the International Monetary Fund (IMF) in formulating and implementing economic policies based on IMF-supported stabilization programs. In particular, the policy of depreciation (devaluation) of a national currency as a basis of a stabilization program has been frequently pursued, but its effects have often been contradictory. Supporters of this approach believe that a change in the nominal exchange rate would result in suppression of import demand and stimulation of export demand (improvement of competitiveness), which on its part would redirect expenditures to higher consumption of goods produced within the national economy (expenditure switching policy) and would respectively act in support of higher rates of economic growth in the medium-term. In other words, if monetary policy is sufficiently restrictive, so that it would not allow for abrupt upward shift of the price level, the net effect of the devaluation would have an expansionary impact on the economy. Critics note that most often devaluation results in stagflation, as it leads to reduction of the real volume of production at a higher price level, thus in the long run the effect on the current account of the balance of payments is negative. Both advocates and critics provide sufficiently convincing empirical evidence in support of their propositions. What economists are unanimous about is that where export and import elasticities are low, the effects of devaluation would have a much stronger impact on import demand, than on export demand. From this perspective, export-boosting policies in various forms (including subsidies, if not in breach of international treaties) are preferable to seeking competitiveness by exchange rate manipula-

tion. From the perspective of restrictions imposed by the currency board rules, the above conclusion means that adjustments to the real effective exchange rate are more important than adjustments to the nominal one, which on its part underscores and strengthens the importance of trade elasticities.

2. Theoretical and Empirical Challenges

A prevailing part of empirical research in relation to calculation of foreign trade elasticities falls into one of the two approaches: the first – of imperfect substitution, and the second – the so-called gravity approach. As far as the latter is used primarily in regional research studies, further in this study we will make use only of the first approach.

The main assumption in the imperfect-substitution model is that neither exports nor imports are perfect substitutes of domestically produced goods and services. If this condition is not met, then a country would be only an importer, or only an exporter. As practice indisputably indicates, the existence of bilateral trade and simultaneous trade of imported and domestic goods on the domestic markets, we may confidently reject the assumption of perfect substitution in relation to foreign trade. Actually, it turns out that calculations made by a number of researchers[1] indicate the existence of great price differences for one and the same product in different countries, as well as between the domestic and international price of a commodity in a given country. This questions the validity of the "Law of One Price", but on the other hand allows for calculation of price elasticities for a prevailing part of traded goods and groups of goods.

The main features of the imperfect-substitution model can be described as follows: along with the traditional theory of demand, it is assumed that a representative economic agent maximizes utility in the conditions of budget constraints. Thus, the demand for imports and exports is given as a function of the importing country's income, the price of the imported product, and the price of the substitutes in the national economy. When using a model with more than two sides, the symmetry between the function of the import and export demand is lost, as the imported goods compete only with the domestically produced goods, while exports compete both with the goods domestically produced in the importing country, and with goods exported by third countries. On their part, the functions of export and import supply depend on both the prices of exported and domestic goods, and on subsidies. Price elasticities of exported and domestic goods are expected to be positive, while the price elasticities of substitutes theoretically should be negative. The implicit hypothesis is that prices are changing in a manner and into a direction ensuring balancing between demand and supply.

From a purely theoretical point of view, the model of imperfect-substitution, describing both demand and supply, allows for identifying the interrelations between quantities and prices. In practice, however, things look different. The standard methodology for calculation of export and import demand is based on

[1] [**Giovannini, 1988**: 45-68], [**Wolf, H. and J. Haskelp, 2000**: 167-178].

the assumption of infinite price elasticity of exports and imports in relation to supply. According to this assumption, prices of exports and imports are deemed exogenous and are calculated outside the model by means of single equations. Assuming that price elasticities of supply are not infinite, then the elasticities for the whole model should be calculated, or as an alternative the reduced form of the model (in terms of quantities and prices) should be calculated, as a function of the exogenous variables in the system. In recent years, researches more frequently turn to using the technique of cointegration analysis to eliminate the problems with the non-stationarity of variables.

A simpler variation of the imperfect-substitution model (applied only to imports), which would be used further in the specific calculations, would look as follows:

$$M_i = f(Y_i, PM_i, P_i), \tag{1}$$

where M_i is the real import demand for country i, Y is nominal income, PM is the import price index (in the national currency), P is the price index of domestically produced goods (PPI is usually used). If the homogeneity condition is met[2], the above equation can be presented as follows:

$$M_i = f\left(y_i, \frac{PM_i}{P_i}\right), \tag{2}$$

where y_i is real income.

The preceding function is the most often used in studies of imports behavior.[3] It should be noted, however, that there are several issues relating to the practical implementation of this function. The first refers to the *dynamic specification*. In almost all empiric studies this function is estimated in a log-linear form. Having in mind the specifics of the foreign trade process (expenses for change and rechanneling of flows; the time required for delivery, etc.) a particular lag structure should always be included in the estimates and be estimated. The traditional approach is related to using polynomial or geometrical distribution of lags, which itself poses the question of the maximum allowable number of lags and the arising issue of multicollinearity.

The second issue relates to the use of the *cointegration approach*, and the use of an error correction mechanism in particular. Even a cursory glance at the theoretical sources in recent years unmistakably indicates that a prevailing part of estimates of foreign trade elasticities are made in this way, which has become extremely popular since 1990s. This approach of calculating long-run and

[2] In this case homogeneity is understood as follows: traded goods are identical, or are deemed identical by consumers. More particularly, consumers cannot identify the manufacturer of particular goods judging by their appearance and/or qualities.

[3] The function of export demand is analogical, with the only difference that the income variable applies to global income.

short-run relations emerged from the works of Johansen[4] and became widely used in practice. Issues that may potentially arise concern the way to approach cases where traditionally calculated elasticities differ significantly from those obtained through cointegration analysis. We will deal with this issue later in the study, when discussing the results obtained.

The third issue is as much methodological as theoretical. It refers to the purely economic interpretation of the numeric values of income elasticity in the context of a dynamic specification. Where global foreign trade models are considered, there is an understandable, yet confusing, contradiction between the economic theory and empirical results. Global dynamic models of trade assume that the income elasticity of trade demand is always equal to one – an assumption which ensures a long-term solution to the model. In this type of models, if the income elasticity of import demand, for example, is higher than one (i.e. imports grow at a higher pace than income), in practice this means that in a longer-term perspective domestic production will cease to exist. By analogy, income elasticities less than one will mean gradual shrinking of imports to total nonexistence and emergence of autarchy.

3. Methodology

Specific calculations of trade elasticities in Bulgaria are based on the traditional equations describing export and import demand in combination with the cointegration analysis technique. The choice of the cointegration approach is accounted for by the opportunities it offers in terms of seeking a long-term equilibrating relationship between two or more variables. The economic interpretation of this approach is quite simple – short-term deviations from the long-run trend are not of considerable importance if there is a strong long-run relation. From a more technical perspective, two (or more) stationary variables may be in a long-run relationship if the deviation of the long-run trend is also stationary, which would mean that the variables are cointegrated. There are various methods of estimation of cointegrational dependencies. This particular research uses the ARDL (Auto Regressive Distributed Lag) method developed by Pesaran and Shin.[5] Preferences to this method are explained with its applicability irrespectively of the order of integration of variables – they may be both I(0) and I(1). Practically, this means it is not absolutely mandatory (though recommendable) the variables to be tested for the order of their integration and to observe the rule that this degree should be identical for all variables in the equation in question. The ARDL-method allows for relatively more accurate estimates in case of smaller samples – that is frequently an issue in calculations of a developing economy with frequent structural changes (Така е добре). Furthermore – if all variables are first-degree integrated, I(1), then it is not necessary in the calculation of long-run elasticities to increase the number of regressors in order to correct the residual autocorrelation.

[4] [**Johansen, 1991**: 1551-1580].
[5] [**Pesaran and Shin, 1995**].

In general, the ARDL-method can be characterized as a two-phase one. The first phase comprises two steps. First, testing for a long-run relation between the variables. For the purpose, a specific error-correction model (ECM) for the ARDL model is evaluated. The second step consists of testing for existence of a cointegrating vector. If there is a cointegrating vector, we proceed with the second phase, which is reduction of the model by tests for the optimal number of lags and calculation of the coefficients of long-run and short-run relationships. More specifically, it boils down to this: if the equation is with one explanatory variable, it may be written down as:

$$y_t = \alpha + \beta x_t + \varepsilon_t, \tag{3}$$

where y_t and x_t are the dependent and the explanatory variables, respectively (e.g. imports (променен е и българския мексм) volume and income, or exports volume and relative prices), α and β are the coefficients to be calculated, while ε_t is the vector of the residual values (error), then the ARDL-model (p,q) resulting from equation (3) would look like this:

$$\Delta y = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta y_{t-i} + \sum_{j=0}^{q} \beta_{2j} \Delta x_{t-j} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \varepsilon_t, \tag{4}$$

where the first half of the equation, where coefficients β are estimated, describes the short-run relation between the dependent and the explanatory variables, and the second half, where coefficients λ are estimated, describes the long-run relationship. Coefficient estimation are made at varying lag values (p,q) taking into consideration occurrence of possible problems with autocorrelation. The second step is testing for the existence of a long-run relationship, which would be established by testing the null hypothesis H_0: $\lambda_1 = \lambda_2 = 0$[6]. Provided the null hypothesis is eliminated, we proceed to the second phase – selection of an optimum ARDL-model, i.e. selection of an optimal lag length and calculation of long-run and short-run relationship coefficients. The latter is done based on equation (4)[7], which also sets the adjustment mechanism, or in other words – the speed with which the dependent variable returns to the equilibrium (steady state).

4. Equation Specifications, Data and Results

The following equations for export and import demand will be used for calculation of price and income elasticities:

$$lnX_t = \alpha_0 + \alpha_1 \ln WGDP_t + \alpha_2 \ln RPX_t + \varepsilon_t; \tag{5}$$

$$lnM_t = \beta_0 + \beta_1 \ln DGDP_t + \beta_2 \ln RPM_t + \varepsilon_t, \tag{6}$$

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[6] Rejection of the null hypothesis is based on the critical values of the so-called F-statistics, which has differing values depending on whether the variables are I(0), or I(1).

[7] Equation (4) is just by way of example and includes only one variable. Particular elasticity calculations for imports and exports are made based on equations (5) and (6), which include two explanatory variables. Quarterly data for Q1:2001 – Q2:2012 were used for all estimations.

where X_t and M_t are the real volumes of exports and imports, $DGDP_t$ and $WGDP_t$ are respectively the real volumes of GDP produced domestically and globally, and RPX_t and RPM_t are the relative prices of export and import, respectively[8], α_1 and β_1 are the income elasticities of export and import, respectively, and α_2 and β_2 are the price elasticities of export and import, respectively.

Real export and import (in Euro) are calculated by deflating the volume values by the respective price indices. The domestic real GDP is calculated by deflating the nominal values for the respective period by the GDP deflator. As regards global GDP, values of deflators for the respective countries and respective periods are used. Relative prices of export are calculated as a ratio of the index of export prices in Bulgaria (as per NSI data) to global prices, using for the purpose the IMF statistics data base of commodity prices. Relative import prices are calculated as a ratio of the import indices (as per NSI data) and consumer price indices (as per NSI data).

4.1. Stationarity

The variables in equations (4) and (5) are tested for the order of integration (presence of a unit root - i.e. integrated of at least order one) using ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) tests from the econometric package EViews 7.2. The results are shown in **Table 1**.

In using the ADF test, the Schwarz-Bayesian criterion for determining the optimal number of lags is used, and in the PP test, the Newey-West criterion is used. As was natural to expect, a prevailing part of the variables are non-stationary, which necessitates repeating the test, but in relation to the first differences between the variables.

Table 1
Stationarity of the levels of variables

Variable	ADF test				PP test			
	Optimal lag	t – stat.	Critical value at 1%	Order of integration	Newey-West	Z(t) - stat	Critical value at 1%	Order of integration
LX	0	-3.5413	-4.1611	I(1)	1	-3.5686	-4.1611	I(1)
LM	4	-2.5045	-4.1809	I(1)	6	-3.0217	-4.1611	I(1)
LDGDP	4	-1.4534	-4.1809	I(1)	6	-5.0856	-4.1611	I(1)
LWGDP	1	-2.8640	-4.1657	I(1)	1	-1.8888	-4.1611	I(1)
LRPX	1	-4.7431	-4.1657	I(0)	7	-2.8358	-4.1611	I(1)
LRPM	0	-2.6363	-4.1611	I(1)	0	-2.6363	-4.1611	I(1)

[8] RPX_t is calculated as the ratio of domestic prices of exports to global prices, and RPM_t is calculated as the ratio of international prices of imports to domestic prices.

Table 2
Stationarity of the first differences residuals of variables

Variable	ADF test				PP test			
	Optimal lag	t – stat.	Critical value at 1%	Order of integration	Newey-West	Z(t) - stat	Critical value at 1%	Order of integration
ΔLX	1	-7.6231	-4.1706	I(0)	20	-13.5969	-4.1657	I(0)
ΔLM	3	-2.4003	-4.1809	I(1)	4	-12.6295	-4.1657	I(0)
ΔLDGDP	5	-3.2898	-4.1923	I(1)	11	-14.5657	-4.1657	I(0)
ΔLWGDP	1	-6.8939	-4.1705	I(0)	13	-4.4184	-4.1657	I(0)
ΔLRPX	3	-6.8939	-4.1809	I(0)	13	-7.4794	-4.1657	I(0)
ΔLRPM	0	-6.8277	-4.1657	I(0)	5	-7.0586	-4.1657	I(0)

Data in **Table 2** indicate that a prevailing part of variables are integrated of order one I(1). From the perspective of constructing and calculation of the ARDL model, this hardly matters[9], but it matters in the selection of the F-statistics critical values in testing the hypothesis of presence of a long-run relation between the volumes of exports and imports (dependent variable), on the one hand, and income and prices (explanatory variables), on the other.

4.2. Presence of a Cointegrating Vector

After the stationarity tests, and provided there are no variables integrated of order two I(2), we may proceed with the construction of the ARDL-model. This model is used to estimate the relations between export volumes, relative export prices and income in the rest of the world, and is constructed on the basis of equation (5). Similar is the model based on equation (6) for estimating the relations between import volumes, relative import prices and domestic income. Further on, only the methodology of the last equation will be discussed, and all notes and comments will be valid with regard to the equation for export demand, respectively elasticities of exports. The results of these calculations will be given in tables with no comments on the methodology.

Determining the number of lags is an important issue. Econometric theory postulates that in case of use of quarterly data it is recommendable to start with tests with 4 lags, which may be subsequently reduced to a smaller number. There are different diagnostic tests[10], which facilitate more accurate determination of the optimal number of lags, the rule of thumb being to seek the greatest possible degree of model compactness. Based on these tests, the value of the maximum lag both for export demand and for import demand was set at 3.

[9] It is actually important, as far as a mandatory requirement for the construction and assessment of the ARDL-model is that none of the variables is I(2).

[10] Among the best known and most widely used are: Bayes Information Criterion (BIC); Schwarz Information Criterion (SIC); Hannan-Quinn (HQ) IC; Akaike Information Criterion (AIC).

In the quest for a long-run relationship by an ARDL-model, it is of paramount importance that parameters should be estimated on the basis of a full model (with no restrictions on individual variables) including error correction (Unrestricted Error Correction Model). Following the methodology proposed by Banerjee[11], with the help of simple linear transformations, equation (6), which is in practice a Vector Autoregressive Model (VAR), can be reformulated in the form of a Vector Error Correction Model (VECM):

$$\begin{aligned} &\Delta LM_{t-1} + \beta_{12}\Delta LM_{t-2} + \beta_{13}\Delta LM_{t-3} + \beta_{21}\Delta LDGDP_{t-1} + \beta_{22}\Delta LDGDP_{t-2} \\ &\beta_{23}\Delta LDGDP_{t-3} + \beta_{31}\Delta LRPM_{t-1} + \beta_{32}\Delta LRPM_{t-2} + \beta_{33}\Delta LRPM_{t-3} \\ &\lambda_1 LM_{t-1} + \lambda_2 LDGDP_{t-1} + \lambda_3 LRPM_{t-1} \end{aligned} \quad (7)$$

Equation (7) is estimated under the ordinary least squares method (OLS). After the usual tests for normality of distribution of the residuals and time series correlation, we proceed to testing the hypothesis of existence of cointegration between variables LM, DGDP, RPM. As already mentioned above, the null hypothesis is H_0: $\lambda_1 = \lambda_2 = \lambda_3 = 0$. Its confirmation or rejection is done based on estimation of equation (7), imposing a constraint on coefficients λ_1, λ_2 and λ_3 in line with the null hypothesis. The values of F-statistics of the Wald test are compared with the upper and lower bound of the earlier calculated critical values[12]. If F-statistics does not fall between the upper and lower bound, a conclusion can be made regarding the existence or nonexistence of cointegration. Where the value of F-statistics is higher than the upper bound, the null hypothesis is rejected, i.e. the variables have long-run relation. Where the value of F-statistics is below the lower bound, the null hypothesis cannot be rejected. Where the value of F-statistics falls between the upper and lower bounds, the null hypothesis can neither be rejected nor confirmed categorically. **Table 3** presents the results of the F-statistics of the Wald test together with the critical values as per Narayan and Pesaran and Shin.

Table 3

Cointegration test results

Null hypothesis	Wald test		Narayan's critical values		Pesaran and Shin's critical values	
H_0: $\lambda_1 = \lambda_2 = \lambda_3 = 0$	F-statistics	Probability	Lower bound I(0)	Upper bound I(1)	Lower bound I(0)	Upper bound I(1)
	5.7256	0.0030	3.048	4.002	3.7891	4.8664

[11] [**Banerjee Anindaya et al., 1986**].

[12] The specific study uses the critical values calculated by Paresh Kumar Narayan in *Reformulating Critical Values for the Bound F-statistics Approach to Cointegration* [**Narayan, 2004**]; and of Pesaran, M.H. and Shin, Y. *An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis* [**Pesaran, Shin, 1997**].

The results in **Table 3** categorically reject the null hypothesis, which means presence of a cointegration relationship between the variables and allows for further work on equation (7) with a view to its reduction. Again diagnostic tests are used to determine the optimum number of lags (BIC, AIC, SIC and H-QIC). According to the tests, the full ARDL (3, 3, 3) model can be reduced to ARDL (1, 1, 1), thus equation (7) is reduced to:

$$LM_t = \beta_0 + \beta_1 LM_{t-1} + \beta_2 LDGDP_t + \beta_2 LDGDP_{t-1} + \beta_4 LRPM_t + \beta_5 LRPM_{t-1} \quad (8)$$

On the basis of equation (8) long-run coefficients of income elasticity (β_2) and price elasticity of imports (β_4) are estimated. The results are shown in **Table 4** (as regards imports) and **Table 5** (as regards exports).

Table 4

Long-term coefficients of import demand function based on a ARDL (1, 1, 1)

Variable	Coefficient	Standard error	t-statistics	Probability
Dependent variable: LM (logarithm of imports); 52 observations (Q1 2001 – Q4 2013)				
LDGDP	1.627	0.502	3.241	0.008
LRPM	-0.566	0.354	-1.956	0.067

Table 5

Long-term coefficients of export demand function based on a ARDL (1, 1, 1)

Variable	Coefficient	Standard error	t-statistics	Probability
Dependent variable: LM (logarithm of exports); 52 observations (Q1 2001 – Q4 2013)				
LWGDP	0.911	0.174	5.221	0.000
LRPX(-1)	-0.132	0.050	-2.626	0.011

5. Interpretation of the Results Obtained and Conclusion

Bulgarian economy is characterized by high degree of openness and external economic factors have always been extremely important for development. This feature of the national economy (generally inherent in small economies) has been preserved, and even enhanced, in the recent two and a half decades. As much as this is to a great extent predetermined both by its historic development and geographic location, and by a number of economic

factors, practically our country has no reasonable alternative to the greater and yet greater integration in the European and global economy. Although this fact is understood and shared both by all economists and all politicians, this unanimous consent hardly makes the task of optimally using the external sector less complex.

It is obvious that in a restrictive domestic market any export-oriented economy needs broad access to international markets, and foreign trade (and particularly export growth) turns into one of the most important factors of economic growth. For a national economy to be able to avail of its natural characteristics and production specialization, it needs an adequate foreign economic policy. This, on its part, necessitates accepting the requirements and rules of globalization, and the trade system related to it. A large part of the issues related mainly to trade flow liberalization were resolved with Bulgaria's accession to WTO and EU. Another part, however, probably the more important one, relating to the formulation and implementation of the specific state policy in the foreign trade area – has not been resolved at all.

Empirical data categorically prove that an economy's openness and export-oriented growth brought significant benefits to a number of developing countries. There are multiple examples, both in Southeast Asia and Central and Latin America. In the recent decades, there was no case of an economy, which registered high and stable economic growth rates, without this being accompanied by significant increase in foreign trade volumes. No matter how undisputable the success of export-oriented economies may look from growth perspective, the issues – subject of continuing discussions – deal mainly with the long-term sustainability of this model of development and the emergence of a new type of dependency of developing countries upon the developed ones along the lines of demand. Fears that a new type of colonialism is transpiring were strengthened after the onset of the global financial crisis, when world trade volumes shrunk, mainly due to the shrinking demand in developed countries, which provided grounds to numerous economists to predict the rebirth of protectionism as an economic policy.

If we assume that adhering to the export-oriented model of growth (with all its deficiencies) in the coming years is inevitable, the question coming to the fore is how we are to ensure optimum diversification of trade flows (and of export in particular) in a way that would provide high and steady growth rates. Global practice has long proven that the relation between the degree of openness of an economy and the volatility of economic growth is as much weaker as is diversification stronger. From this perspective, it is of paramount importance to keep up a high degree of diversification in terms of both the products and the markets we trade in. Unfortunately, recent years' data indicate the existence of a clearly determined downward trend of diversification and increasing concentration of Bulgarian export – a problem that goes beyond the scope of this study, yet is of vital importance. From this perspective, studying trade elasticities by group of goods and by different geographical orientation attains further significance and merits researchers' more serious attention.

Based on the results of the application of ARDL and VECM techniques, as presented in **Tables 3, 4 and 5**, we may assert with a high degree of confidence that there is a long-run relation between the export and import dynamics, on the one hand, and incomes and relative price levels, on the other hand. This conclusion can seem trivial (to the extent such a relation can be found practically in all open economies), but what is more momentous in the research is to find out the quantitative dimensions of these interrelations, not just their existence or absence.

As could be expected, data about Bulgaria in the recent 15 years are in discord with the neoclassical understanding valid for global models, which predicts coefficients of income elasticity approximating one. It should be admitted that economic interpretation is impeded by both relatively short time series and the effects of the global financial crisis, which had an exceptionally adverse impact on international trade volumes. As evidenced in a number of other countries, income elasticity of demand for imports has values above one. This can be interpreted as a confirmation of the hypothesis of underrating the effect of price factors. Yet, to the extent price elasticity is lower, this may be assumed to be owing to the absence in the domestic market of respective substitutes, which can replace imports. The greater the difference between the two types of elasticities, the stronger this lack of substitutes. As regards the income elasticities of exports, a significantly lower coefficient is evidenced, which is somewhat surprising for a small and relatively open economy. Same as with imports, price elasticity is lower, and it turns out that price elasticity with a lag of one period (three months) is statistically significant – i.e. importers react more promptly to price changes than exporters, which seems logical and justified by the severe competition in the international markets. However, it is worth noting the low price elasticity of exports, which probably is also owing to the high competition. More unfavourable, though, is the explanation that the low price elasticity is due to exporters' inability to promptly respond to increases in export prices because of the limited volumes of production. This hypothesis could not be verified, but it is quite tenable and is in line with the stagnation in the economy evidenced in the recent five years.

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