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**CURRENCY RATE EFFECT ON FOREIGN
TRADE IN POST-SOCIALIST COUNTRIES
OF THE BLACK SEA ORGANIZATION
FOR ECONOMIC COOPERATION**

Abstract

The paper analyses the effect of differences in inflation rate and rise of national currency exchange rate on foreign trade in the countries of transition economy – members of the Black Sea Organization for Economic Cooperation (BSOEC).

The technique is developed to calculate profitability indices of different variants of international exchange of commodities taking into consideration the variable share of imported component in the price of export.

Comparison of annual rates of exports and import growth in nine BSOEC countries with the dynamics of correlation between price and inflation rates proves the concluded dependence.

Key words

Black Sea Organization for Economic Cooperation (BSOEC), foreign trade of post-socialist countries, transition economy, GDP, level of price, exchange rate.

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Introduction

Currency rate is one of the basic instruments of foreign trade, and monetary policy of any country under conditions of rapidly changing state of the global market should be corrected regarding the interests of all managing subjects on the adequate and scientific basis. Peculiarities for defining optimal currency exchange rate of national currencies in post-socialist countries of the Black Sea Organization for Economic Cooperation are not sufficiently studied. Frequent changes of exchange rate in BSOEC transition economies during the whole period of market transformation prove it.

Changes in currency practice of post-socialist BSOEC countries

First years of market reforms in post-socialist Black Sea countries legitimately fixed multiple exchange rates of national currency were used in regards of types and aims of currency operations. That created unequal conditions for different businesses, distorted relative prices and profit distribution, and impeded rational use of resources for economic growth [1; 244–245] [4; 75–78]; [3; 48].

When obligations to convert national currencies in current transactions were accepted in accordance with the clause VIII of IMF Statute [3; 45], multiple exchange rates in post-socialist BSOEC countries were unified, the transition process for fixing foreign currency prices started in a market way based on supply and demand ratio. In 1995–1996 Albania, Azerbaijan, Armenia, Bulgaria, Moldova, Romania and Ukraine pursued the policy of free floating exchange rate, while Georgia and Russia had regulated floating exchange rate, the same was in Greece before drachma was replaced with euro. To prevent sharp currency exchange rate fluctuations in a number of countries – Russia, Ukraine and others – the currency corridors were introduced with rather wide margins. Within them, these national currency changes were admissible as they provided for maneuvering in macroeconomic sphere for the government and Central National Bank freedom [3; 51; 56].

Stable correlation between formally declared parameters of currency corridor and real inflation index at the final period of its effectiveness also allowed to make more accurate evaluation of capital investment attractiveness [2].

Insufficient level of new monetary and financial systems in post-socialist BSOEC countries still determines necessity for state periodic regulation of the currency exchange rate (compulsory sale of significant share of export returns, enforced interruption of interbank currency market tenders when the national currency rate goes down undesirably for the government, etc.). To avoid un-

wanted consequences of such intervention, the effect of planned changes in national currency exchange rate should be evaluated in advance on economic development of the country, and specifically on production and trade growth.

The effect of frequency for price and currency rates fluctuations on foreign trade and economic growth

We will analyze how the differences in price changes in a country, and in currency exchange rates influence the foreign trade oriented companies in choosing the methods for export sales either through direct conversion into national currency or through importing goods from export returns for subsequent sales on the domestic market; and the dynamics effect of exports and imports.

We will consider the correlations between the pace of changes of nominal value for domestic prices and currency exchange rates regardless of their effective values calculated on the basis of purchasing power [3; 42–45]. This will simplify to state equations for foreign trade operations retaining its universality.

We would like to stress that the analysis based on relative numerical indices leads to simple and objective results, while based on values of calculated effective rates depends upon subjective choice of data for comparison. Hence, the application of IMF technique according to which «natural» exchange rate is calculated on the basis of standard basket comprising 300 commodities and services (5; 145) is still unacceptable for the majority of post-socialist BSOEC countries due to rather great divergence between standard and national consumer baskets both in quantity and assortment of goods.

In our further analysis, in addition to the main principles of neo-classic theory of foreign trade by E. Heksher – B. Ollin taking into consideration elaborations of alternative conception by S. Linder – M. Kemp – P- Krugman [1; 72–78; 122–132], we shall assume the following:

- Level of world prices shall remain invariable during the period under consideration;
- relative factor capacity of exported goods during the considered period shall not change;
- exported goods are excessive on the national market while there is shortage in imported goods;
- transport, trade, customs and other costs are the same for exports and imports;
- duration of production cycle of export commodities is comparable with that of the examined period;

- all costs shall be covered when the cycle «production – sale» is completed.

Now we shall formulate equation of price for one item of exported goods (in incalculable relative values):

$$1 = \alpha \text{ int} + \alpha \text{ ext} + t + p \quad (1)$$

where $\alpha \text{ int}$ is share of price including payment for raw materials, power, manpower, depreciation deductions and other manufacturing costs inside the country; $\alpha \text{ ext}$ is share of price including all expenses on purchasing imported parts; t – transport, trade, customs and other costs for one way commodity flow; p – share of profits.

Apparently, the share of all production costs (resource coefficient) makes

$$\alpha = \alpha \text{ int} + \alpha \text{ ext}.$$

Let's assume that T items of goods is sold on the foreign market by world price $C \text{ US\$/item}$. At the moment of payment for costs, the national prices changed ξ times while exchange rate dollar to national currency changed β times.

Value ξ is determined by the equation as

$$\xi = (1+i/100)$$

where i is inflation during the examined period (in %).

It is preferable to apply absolute GDP deflator than consumer price index (5; 145–146).

Value β is calculated as ratio of official exchange rate of national currency ErY (exchange rate) at the end of examined period to $ErY-1$ exchange rate at the end of preceding period with duration of Y (year, quarter, etc.).

M is determined co-efficient of overtaking rise of domestic prices with regards of various inflation rates and changes in foreign currency exchange rate in the country:

$$M = \xi / \beta \quad (2)$$

Now we shall deduce the condition for export profitability assuming that all export returns are converted into national currency at official exchange rate and bought back to the country. Note that for recurring production cycles in contrast to one-time produced exported commodity, actual cost payment does not affect in principle the logic of reasoning. For exporters, average costs (in prices of basic year) during the examined period are actually the same for manufactured products for raw materials, power and other invariable costs needed for a new production cycle.

Apparently, export will be profitable if the following **inequality** is observed:

$$TC \beta - \alpha \text{ int} TC \xi - \alpha \text{ ext} TC \beta - t TC \xi - p TC \beta \geq 0 \quad (3)$$

After changing formula (3) we have:

$$\beta - \alpha \text{ int} \xi - \alpha \text{ ext} \beta - t \xi - p \beta \geq 0 \quad (4)$$

Substituting values of ξ from statement 2 into formula 4 we shall have:

$$\beta - \alpha \text{ int} M \beta - \alpha \text{ ext} \beta - t M \beta - p \beta \geq 0$$

or

$$1 - \alpha \text{ int} M - \alpha \text{ ext} - t M - p \geq 0$$

in this way, the maximum value of ratio M at which needed profit is assured inheres:

$$M = (1 - p - \alpha \text{ ext}) / (\alpha \text{ int} + t). \quad (5)$$

The share of profit is defined in the following way:

$$p = 1 - \alpha \text{ ext} - M (\alpha \text{ int} + t) \quad (6)$$

Differentiating the statement (6) we shall get:

$$dp / dM = -(\alpha \text{ int} + t) \quad (7)$$

Multiplier [7] indicates that the rise of M by one point diminishes export profit by $(\alpha \text{ int} + t)$ points which is undesirable for exporters of raw materials and less processed products and with high resource coefficient $(\alpha \text{ int} + t)$. Non-monetary factor $\alpha \text{ int}$ effects economic efficiency of exports no less than M , and in the long-term perspective to insure competitiveness on the world market the export producers should reduce consumption of raw materials, power and manpower.

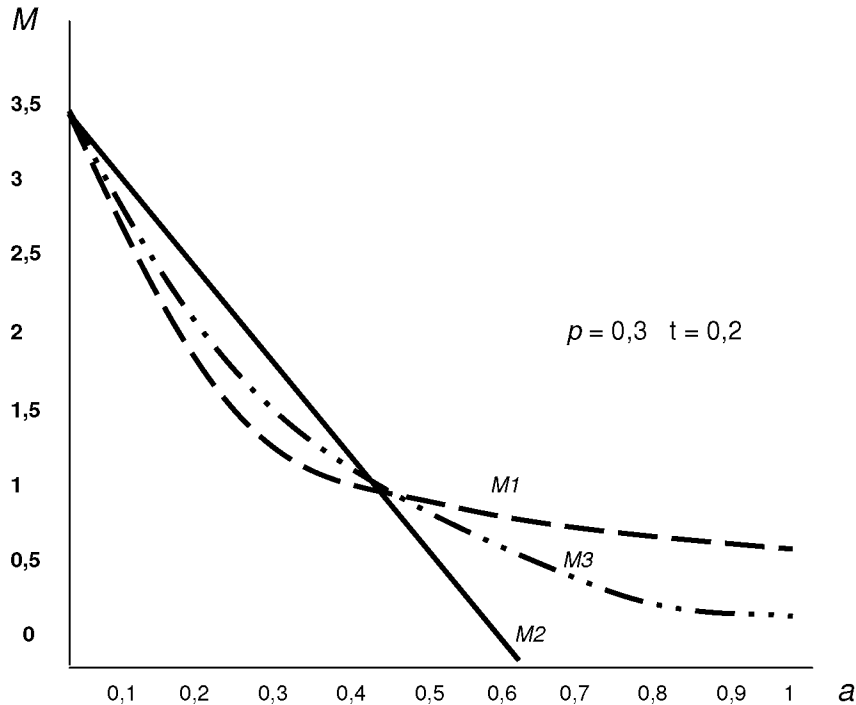
Fig.1 illustrates dependence of coefficient M upon resource ratio α calculated with invariable values of rate profit $p = 0,3$ and share of cost $t = 0,2$ for three variants of correlations between α , $\alpha \text{ int}$ and $\alpha \text{ ext}$. As is seen on fig.1 lag of foreign currency exchange rate falling behind the rise of domestic prices affects adversely most of all mainly exporters of home made products without imported parts (lower curve). When re-exporting ($\alpha = \alpha \text{ ext}$) this lag effects profitability less. Formulated by equation (5) hyperbola in this case changes into a straight line $M = (1 - p - \alpha \text{ ext} / t)$, always taking place above curves that represent the rest of variants. Intermediate curve represents the lag effect of foreign currency exchange rate against rises of domestic price on export profitability under equal shares of internal and external costs ($\alpha \text{ int} = \alpha \text{ ext} = 0,5 \alpha$) with commodity price of T. Close to the cited correlation is typical for such industrial economies of BSOEC countries, as Ukraine, in exports of which the share is big in imported power supply and expensive hi-tech spare parts.

We will note that all curves start from one point on axis M with coordinates $\alpha = 0; M = (1 - p) / t$.

Fig.1 also illustrates that to retain the profitability with increasing M , the share of production costs in the price of exported commodity should be reduced disproportionately much more which is unrealizable for most exporters as it requires technological renovation of production.

Fig.1.

Correlation Effect of price and currency exchange rate fluctuations on export profitability.



With domestic prices rising faster than foreign currency exchange rate ($M > 1$) the export with currency returned to the country becomes non-profitable for all industries that have big share of production costs α in the price of product; therefore, failing to ensure the required profit. This forces the exporting businesses instead of returning currency to the country to buy abroad highly liquid goods for further sale on the domestic market.

We shall induce the condition for export profitability when all currency returns are exchanged into imported goods T_{imp} bought at the world price C_{imp} US\$ / unit and then resold on the domestic market where prices changed ξ times. Apparently, $TC = T_{imp}C_{imp}$.

The share of costs t in this case doubles as both direct flow of goods T and reverse flow of goods T_{imp} are paid. Taking into consideration that in recur-

rent production cycle of export goods T nominal costs in national currency to cover internal expenses will change by ξ times and to pay for imported parts by β times omitting intermediate transformations we shall have:

$$\xi = \alpha \text{ int} \xi + \alpha \text{ ext} \beta + 2t \xi + p\xi. \quad (8)$$

Substituting in statement value $\beta = \xi / M$ from formula (2) we shall have:

$$\xi = \alpha \text{ int} \xi + \alpha \text{ ext} \xi / M + 2t\xi + p\xi. \quad (9)$$

from statement (9) the maximum possible share of profit is calculated as:

$$p = 1 - (\alpha \text{ int} + 2t) - \alpha \text{ ext} / M. \quad (10)$$

It follows from formula (10) that the share of profit from export returns in the form of purchasing goods abroad with their subsequent sale on the domestic market is determined both by manufacturing, transportation and other costs and by differences in inflation rate and foreign currency exchange rate fluctuations. If the price of exported goods ($\alpha \text{ ext} = 0$; $\alpha = \alpha \text{ int}$) doesn't include the imported part, the share of profit does not depend on inflation rate and currency exchange rate fluctuations. As explained above, in this case, the goods are traded with doubled transportation, customs, trade and other costs [7; 98–103].

The proposed solution is more general as taking into consideration the imported part as a component of the goods price allows us to analyze all possible variants from export of solely domestic made products ($\alpha \text{ ext} = 0$; $\alpha = \alpha \text{ int}$) to re-export ($\alpha \text{ int} = 0$; $\alpha = \alpha \text{ ext}$).

As it follows from formulas [5], [6] and [7] lessening between the rise disparity of foreign currency exchange rate and inflation rate in a country stimulates exports. The reduction of the share costs M ($\alpha \text{ int} + t$) in the price of good increases its competitiveness on the world market which is especially important for export oriented industries with high resource coefficients of $\alpha \text{ int}$.

With decreasing coefficient M (foreign currency exchange rate rises faster than inflation rate in a country), the national currency undergoes actual devaluation, which makes relatively more expensive imported goods. Decreasing import due to the shift of consuming home made goods helps to reduce the trade balance deficit and increase real GDP. A great deal of other macro- and microeconomic indices also changes. The logic of the most important interrelations can be formulated as following:

$$M \downarrow \rightarrow \{Exp \uparrow \rightarrow \{(Y \uparrow; L \uparrow) \rightarrow Inc \uparrow \rightarrow S \uparrow \rightarrow Inv \uparrow \rightarrow \{(Y_1 \uparrow; L_1 \uparrow) \rightarrow Inc_1 \uparrow \rightarrow T \uparrow \rightarrow \{Imp \downarrow \rightarrow DTB \downarrow,}$$

where Exp – export ; Imp – import; DTB – trade balance deficit, Y – real GDP, L – employment rate of labor force; Inc – household income; S – savings; Inv – investments; T – tax revenues into budget.

It should be noted that at $M < 1$ export is indirectly subsidized through additional expenses paid by importers forced to buy increased in price foreign currency. However, judicially this kind of state support of national producers does not lead to imposing antidumping sanctions on importer countries.

We also point out that after some time (duration of lag depends on elasticity of demand for imported goods and on many other factors), GDP and household cash income grow, the former volume of imports also can be restored and even exceeded.

Dynamics of GDP and Foreign Trade in BSOEC Post-Socialist Countries in 1998–2000

We shall compare the annual rates of GDP and volumes of foreign trade in commodities and services with these of inflation rate and fluctuations of currency exchange rate (Table 1). Since in all post-socialist countries of BSOEC monetary reforms were completed only in 1996 (after introduction of hryvna in Ukraine) we shall take 1997 as the starting point.

As Table 1 illustrates that all nine post-socialist countries underwent actual devaluation. Value of hard currencies rose faster than prices rose ($M1999 < M1998$). It was brought about, first of all, by cessation of foreign loans to support raised too high national currencies exchange rates during the preceding period, and by financial crises in South-East Asia in 1997, and in Russia in 1998, which affected the world. Substantial drop in imports that followed devaluation of national currencies created conditions for development of production in BSOEC countries, for considerable growth of exports and improvement of trade balance.

In 2000, for the very first time since transition market started, the economic growth was recorded in all nine post-socialist BSOEC countries without exception; and, in Albania, Azerbaijan, Armenia, Bulgaria, Russia and Ukraine annual growth of GDP surpassed the world average rate by more than twice (8).

It should be noted that such devaluation resource can be employed only to cope with gripping recession, is brief, and cannot be the tool for lasting economic growth. After eradication of deformations committed earlier in monetary and credit policy the most optimal for country's whole economy would be, transition to policy of flexible currency exchange rate regulated solely with market methods.

Export and import are closely interrelated, and creation of specific preferential conditions for exporters could hinder the growth of import. Whereas, to achieve sustainable economic development the BSOEC countries must increase import of modern technology and manufacturing equipment. It is possible if revaluation of national currency is steady and matches the growth rate of real GDP. Such revaluation also contributes to reduce the of nominal cost of settling the foreign debt (in national currency), to raise the country's investment rating, and extension of market capitalization of economy.

Obviously, conflicting interests of exporters and importers can be observed equally only when fluctuations in general price rate in the country and national currency exchange rate are the same, i.e. with equilibrium $M = 1$.

As shown in Tabl.1 in all post-socialist BSOEC countries except Russia and Ukraine deviation from equilibrium value M did not exceed 8% already in 2000.

We might expect that the liberal monetary policy pursued in Russia and Ukraine since 2000 will stimulate market methods aimed to level currency exchange rates and price fluctuations. At present, this is greatly restrained by undeveloped banking system (almost half of money stock engaged in manufacturing and trade is circulating bypassing banks), low level of monetization (less than 20% of GDP), and being bound too close to dollar (more than 40%) after August 1998 (9; 26).

Table 1

Dynamics of GDP and foreign trade in commodities and services in BSOEC post-socialist countries in 1998–2000.

Country	Growth (reduction). % as to preceding year									Coefficient M		
	GDP			Export			Import			1998	1999	2000
	1998	1999	2000	1998	1999	2000	1998	1999	2000			
Albania	8.0	7.3	7.8	20.9	48.6	19.0	20.1	31.1	5.3	1.24	1.12	0.95
Azerbaijan	10.0	7.4	11.1	-12.2	26.9	67.3	15.4	-20.9	5.5	1.07	0.89	1.04
Armenia	7.2	3.3	6.0	8.2	6.4	25.0	-0.4	-8.1	22.0 ¹	1.08	0.94	0.98
Bulgaria	3.5	2.4	5.8	-11.6	-3.8	20.6	-0.2	8.5	16.7	1.18	0.99	0.92
Georgia	2.9	3.0	1.8	6.7	2.6	54.5	5.0	-12.3	11.3	0.97	0.77	1.03
Moldova	-6.5	-3.4	1.9	-25.5	-24.0	4.2	-13.7	-39.1	27.2	0.85	0.72	1.08
Russia	-4.9	5.4	8.3	-14.7	-3.3	35.9	18.0	-29.4	17.6	0.68	0.64	1.20
Romania	-4.9	-2.3	1.6	-4.4	3.6	22.9	3.6	-11.3	23.6	1.36	0.85	1.03
Ukraine	-1.9	-0.2	5.8	-13.4	-7.9	15.1	-14.0	-19.1	18.9	0.79	0.73	0.84

¹ Foreign trade in services not included.
Calculated on the basis of sources (8).

Conclusion

Monetary and credit policy of BSOEC post-socialist countries underwent profound changes in recent years. Gradual renunciation of administrative regulation and started transition to market methods of fixing exchange rates of national currencies fostered the growth of exports and GDP in BSOEC countries.

The proposed in this paper method to analyze how differences in national currency exchange rate and price fluctuations affect export profitability, helps to

choose optimal for the whole national economy parameters of monetary regulation for short and medium run planning of anti-inflationary policy.

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