

TOPICAL RESEARCH AND HIGHLIGHTS

POTENTIAL EFFECTS OF THE USD/EUR EXCHANGE RATE CHANGE ON THE BULGARIAN ECONOMY

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BULGARIAN NATIONAL BANK

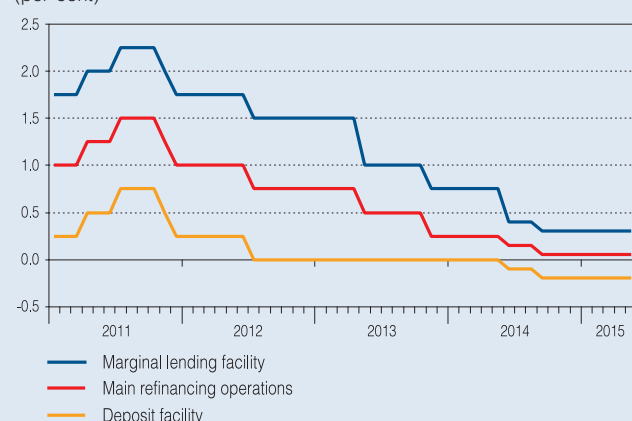
Potential Effects of the USD/EUR Exchange Rate Change on the Bulgarian Economy

From the beginning of the second quarter of 2014 the euro depreciated dramatically against the US dollar, a result of the opposite signals about economic developments in the euro area and the USA and divergent monetary policies pursued in both regions. Stronger growth of the US economic activity created expectations for an increase in interest rates, while the slow economic activity and low inflation in the euro area entailed the pursuit of an expansionary monetary policy by the ECB cutting the interest rates on the main refinancing operations and on deposit and lending facilities in several steps (in June and September 2014 and in January 2015). As a result in the January–May 2015 period the euro depreciated against the US dollar by 18.8 per cent on an annual basis. Since Bulgaria is not a member of the euro area, the ECB monetary policy has no direct effect on Bulgaria's monetary conditions and the banking system. Concurrently, the currency board, the Bulgarian monetary system using the euro as a reserve currency, and the strong linkage of the Bulgarian economy with the euro area economy is a prerequisite for a partial ECB monetary policy transmission to the Bulgarian economy. The present analysis studies the major channels through which the euro depreciation against the US dollar may influence the Bulgarian economy. The effects on Bulgaria's foreign trade and inflation are studied in details and an attempt of a quantitative assessment is made.

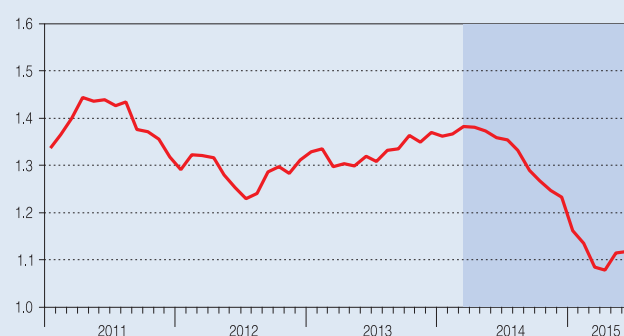
Chart 1. The ECB Monetary Policy and USD/EUR Exchange Rate Movements

A. ECB key interest rates

(per cent)



B. USD/EUR Exchange Rate



Source: ECB.

In accordance with the theory the USD/EUR exchange rate change may have an effect on the Bulgarian economy through several channels. The main channel through which the exchange rate depreciation would have an effect is on competitiveness due to a change in the real effective exchange rate assuming that price developments in Bulgaria and in Bulgaria's major trading partners are similar. The appreciation of the US dollar has a direct effect on the nominal value of imports and exports. From the point of view of the Bulgarian economy the appreciation of the US dollar leads to an appreciation of the price of imports (in US dollars), and to a depreciation in the price of exports for the countries to which Bulgarian firms export in US dollars. Furthermore, depending on the degree to which the euro depreciation contributes to the decline in the real exchange rate of the Bulgarian lev, it may be expected that households will substitute more expensive imported goods by domestic goods. Thus, the euro depreciation would have an effect on the volume of net exports. On the other hand, depending on the degree of the past-through of higher import prices in Bulgaria through the supply chain, end-user prices may increase and/or firms' profits decrease. An additional channel through which the depreciation of the euro against the US dollar

may have an effect on the economy is indebtedness: if the share of USD-denominated claims on corporations and households is large, debt burden will increase.¹ This analysis encompasses only the effects of the euro depreciation which are considered to have the strongest effect on the Bulgarian economy.

Effects on External Trade

The classical economics suggests that the depreciation of the euro against the US dollar and other major currencies will make exports of euro area countries, and Bulgaria accordingly, more competitive. Concurrently, the price of imports will appreciate which will stimulate consumption of goods and services produced at home. Materialisation of this assumption will depend on the currency structure of export and import transactions of the respective country. Eurostat publishes in two years information about the currency structure of import and export transactions of EU Member States in their trade with non-EU countries. Commodity groups under the Standard International Trade Classification are aggregated in three major groups: primary goods, processed goods and petroleum products.²

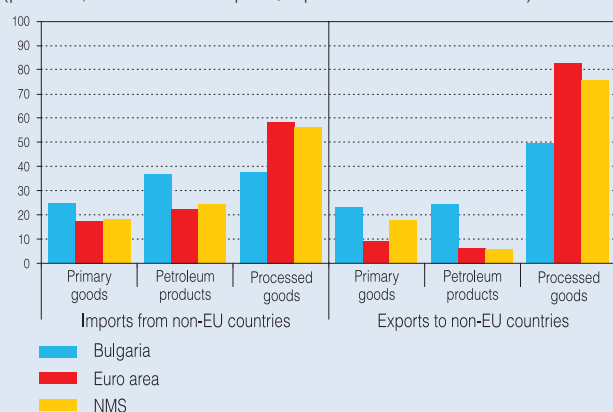
Due to a lack of latest data on the currency composition of foreign trade among EU Member States, we suppose that trade transactions of Bulgarian exporters and importers with EU partners are settled in euro. This means that Bulgaria's trade with non-EU countries is the major channel through which the euro depreciation may affect Bulgaria's foreign trade. Correspondingly, the degree to which the euro depreciation will have an effect on a particular EU Member State depends on the significance of this state's trade with non-EU countries.

Given the small size and openness of the economy and the structure of Bulgarian exports/imports the share of trade with third countries is relatively higher than the average share of the EU, the euro area and New Member States (NMS)³ with similar historical and economic development.

Chart 2. Foreign Trade of Bulgaria and the EU with Non-EU Countries and the Trade Balance of the EU and NMS with Non-EU Countries (Average for the 2010–2014 Period)

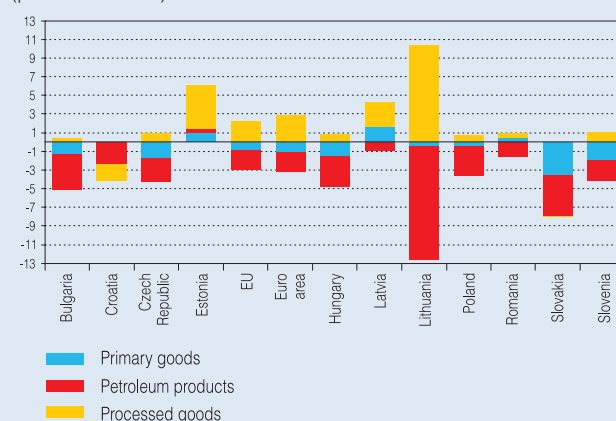
A. Structure of imports and exports

(per cent, share of total imports/exports to non-EU countries)



B. Trade balance with non-EU countries

(per cent of GDP)



Source: Eurostat, own calculations.

¹ This factor is considered to be insignificant for Bulgaria given the small share of claims on the internal and external market denominated in currencies other than leva and euro.

² The group of primary goods includes commodity groups from 0 to 4 of the Standard International Trade Classification with the exception of group 33; the group of processed goods includes commodity groups from 5 to 8 of the Standard International Trade Classification; the group of petroleum products includes group 33 of the Standard International Trade Classification.

³ New Member States mean central and eastern European states which acceded the EU after 2004: the Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovakia.

The share of imported petroleum products and primary goods from non-EU countries is larger than the average levels for the EU, euro area and NMS similar to Bulgaria. Major Bulgaria's exports to non-EU countries include processed goods. Concurrently, the share of exported petroleum products and primary goods in total exports to non-EU countries is higher in Bulgaria than in other similar EU economies.

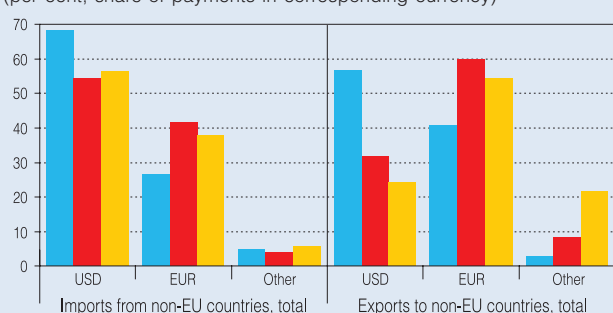
It should be noted that on average most EU countries were net importers of goods from non-EU countries in the 2010–2014 period. Bulgaria ranked fifth among Member States by trade deficit with non-EU countries as a percentage of GDP. A similar common feature of reviewed countries is that the deficit in the trade with non-EU countries was mainly due to imported petroleum products, and to a lesser extent to primary goods, while most EU Member States were net exporters of processed goods.

Eurostat data on the currency structure of trade payments with non-EU countries suggest that Bulgaria's trade transactions with third countries are most often settled in US dollars, with their share exceeding significantly the average for the euro area and NMS. In addition, the share of USD payments in imports is higher than that in exports. With this in mind and the fact that Bulgaria is a net importer of goods from non-EU Member States (Bulgaria's trade deficit with non-EU countries amounted to about 5 per cent of GDP), the appreciation of the US dollar against the euro is expected to worsen the terms of trade in Bulgaria if raw material prices remain unchanged. It is worth noting that historically a feedback between prices in US dollars and USD exchange rate *vis-à-vis* other major currencies is observed in primary goods (metals and food) and petroleum products. Consequently, the negative effect of the USD appreciation on the terms of trade is partially offset by the response of US dollar prices to the downward USD exchange rate dynamics.

Chart 3. Bulgaria's Foreign Trade with Non-EU Countries (Average for the 2010–2014 Period)

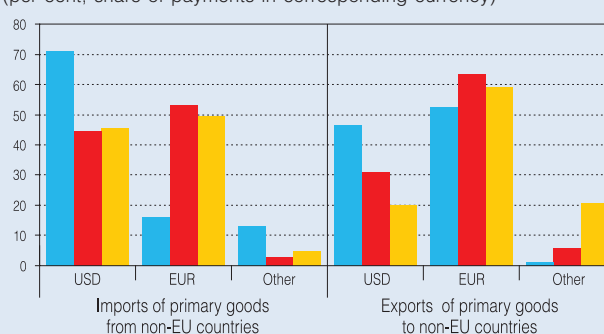
All goods, total

(per cent, share of payments in corresponding currency)



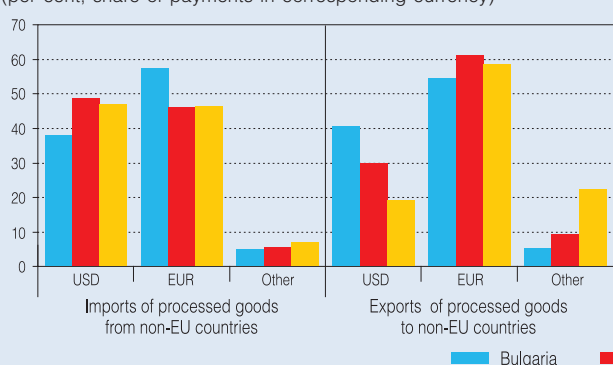
Primary goods

(per cent, share of payments in corresponding currency)



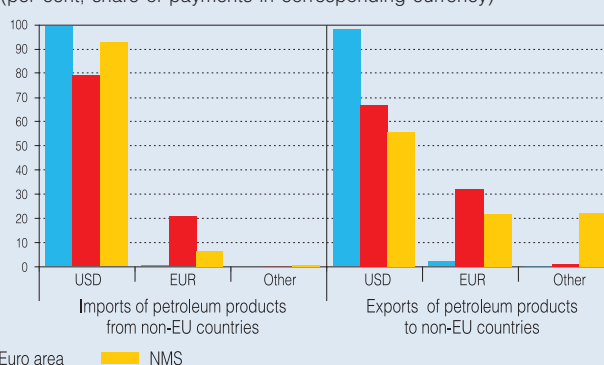
Processed goods

(per cent, share of payments in corresponding currency)



Petroleum products

(per cent, share of payments in corresponding currency)



Note: The scale shows the share (per cent) of payments in the respective currency in total import/export payments of a particular commodity group in trade with non-EU countries. Eurostat data published on the currency composition of payments are available for 2010, 2012 and 2014 and the shares shown in the chart are averaged for the three surveys. The result of the NMS is obtained by averaging the shares of payments in the respective currencies of the countries from the group in the corresponding period.

Source: Eurostat, own calculations.

Bulgaria imports primary goods mostly in US dollars and exports mostly in euro. The share of payments in US dollars in imports of primary goods from non-EU countries is significantly larger in Bulgaria than the average for the euro area and NMS. Imports of primary goods in Bulgaria is concentrated in several product groups, with imported natural gas accounting for the largest share followed by copper ore, coal and metal ores. These commodity groups comprise about 70 per cent of primary goods imported from non-EU countries. Primary goods exported to non-EU countries are paid mostly in euro but the share of payments in US dollars is higher than that in the EU and NMS. Similar to imports, exports of primary goods from Bulgaria to non-EU countries is concentrated in a small number of commodity groups, with wheat, tobacco, copper ore and electricity accounting for the largest share in the group in 2014. Taking into account that Bulgaria is net importer of primary goods and the share of payments in US dollars is higher in imports than that in exports, the appreciation of the US dollar against the euro is expected to worsen the terms of trade for Bulgaria in this commodity group.

As regards processed products, the currency composition of Bulgaria's import and export payments in extra-EU trade was nearly the same, with most of the trade denominated in euro. Processed product export payments from Bulgaria also show a higher share of the US dollar payments compared to the EU and NMS. Bulgaria's imports of processed goods from non-EU countries was broadly evenly distributed by commodity group, unlike exports where copper occupied the largest share (around 21 per cent in 2014) followed by pharmaceuticals and machines. The similar currency composition of import and export payments and the positive, though low, processed goods trade balance with non-EU countries indicate that the US dollar appreciation against the euro would have a similar effect on exports and imports. Thus, the terms of trade in processed goods are likely to stay comparatively unchanged for Bulgaria.

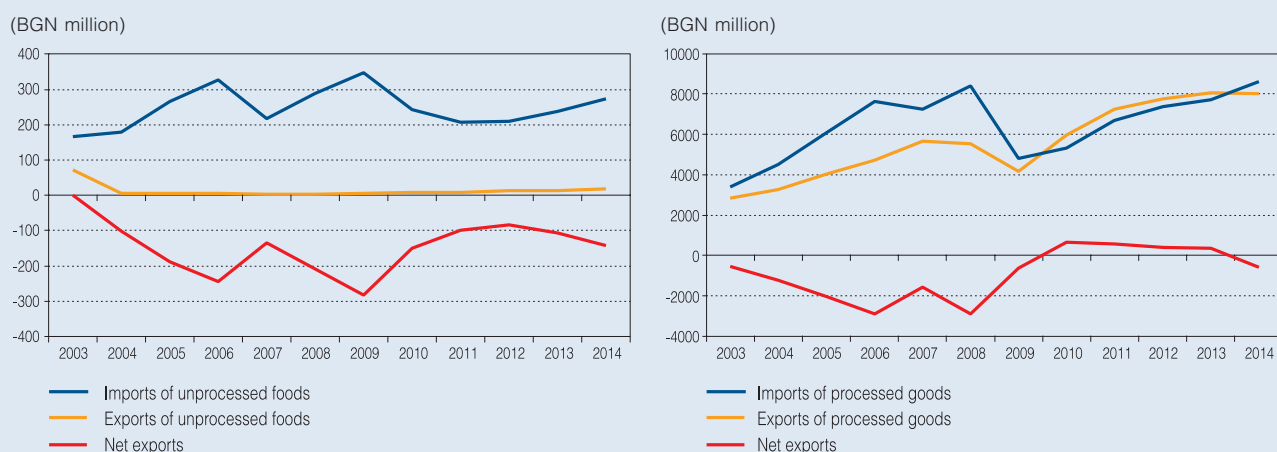
As for petroleum products, Bulgaria's trade is almost entirely in dollars, with their share in payments exceeding significantly that of the EU and NMS, especially in exports. Given the similar currency composition of petroleum product import and export payments, the terms of trade in Bulgaria are unlikely to worsen as a result of the stronger dollar against the euro. At the same time, the large trade deficit of Bulgaria in oil product trading with non-EU countries may lead to a deterioration in the nation's nominal trade balance.

Effects on the Real Economy and Inflation

The euro rate fluctuations affected price developments in Bulgaria through a number of channels. The first channel concerned imports which had a direct effect and reflected price increases in imported finished consumer goods. The second channel also referred to imports but it had an indirect effect of higher expenses on raw materials which raised production costs of firms and drove the rise in end-user prices. The third channel with an indirect effect is related to the positive influence of the weak euro on Bulgaria's net exports and income which might put some upward pressure on end-user prices.

A direct effect of the euro rate movements on end-user prices could be seen in foods and non-food products. In unprocessed foods, a component of HICP, Bulgaria is traditionally a net importer in trade with non-EU countries. This is a precondition for the pass-through of higher import prices to end-user prices. A similar effect may be expected in some non-food goods, as motor vehicles, computer, communication and office equipment.

Chart 4. Net Exports of Unprocessed Foods (Fruit and Vegetables, Meat, Fish) and Processed Goods in Trading with Third Countries



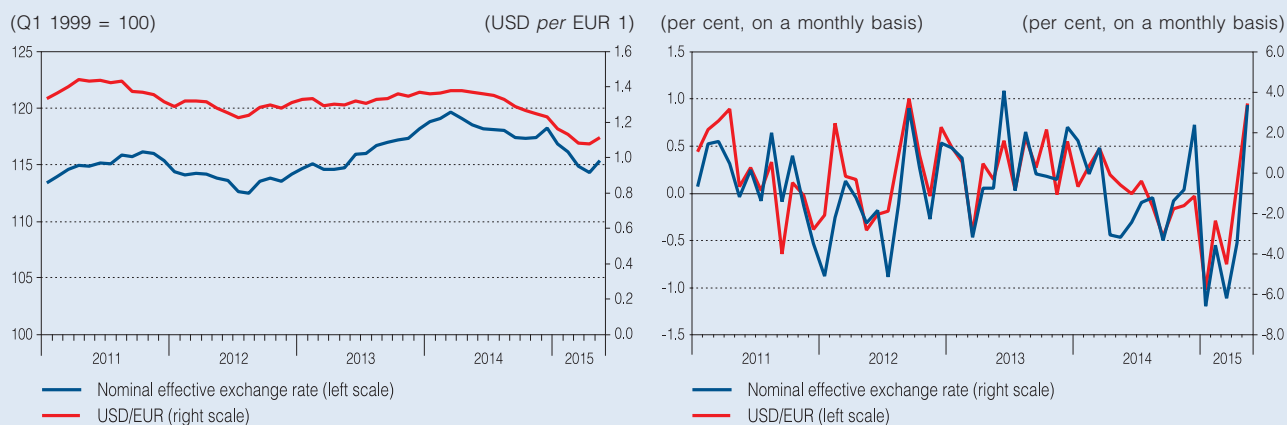
Note: The group of processed goods includes 5 to 8 commodity groups according to SITC.

Source: Eurostat, own calculations.

Effects for the Bulgarian economy are estimated below through the nominal effective exchange rate, rather than the USD/EUR rate. This allows for an assessment of the effect of euro exchange rate movements against the currencies of Bulgaria's major trading partners.

From the beginning of 2014 the nominal effective exchange rate of the lev against 38 major trading partners largely followed the USD/EUR exchange rate developments, particularly in the period between January and May 2015. Divergences may be seen in the periods of strong movements in these currencies' rates against the euro.

Chart 5. The Nominal Effective Exchange Rate of the Lev against the Currencies of 38 Major Trading Partners and the USD/EUR Exchange Rate



Source: ECB, own calculations.

Among Bulgaria's trading partners whose currencies depreciated against the euro in 2014 and early 2015, of note are Russia, Turkey, Romania and Poland having a stronger effect on the nominal effective exchange rate of the lev. The Russian rouble depreciated against the euro and US dollar due to the Ukraine crisis and subsequent sanctions of a number of countries on Russia, as well as the dramatic fall in oil prices and economic implications for the Russian economy.

Chart 6. The Nominal Exchange Rate of the Lev against Selected Currencies

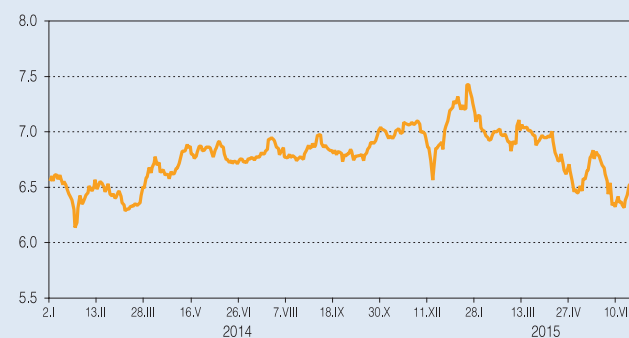
BGN/USD



BGN/RUB



BGN/TRY



BGN/RON



BGN/PLN



*The Nominal Effective Exchange Rate of the Lev
(against Currencies of 38 Trading Partners)*



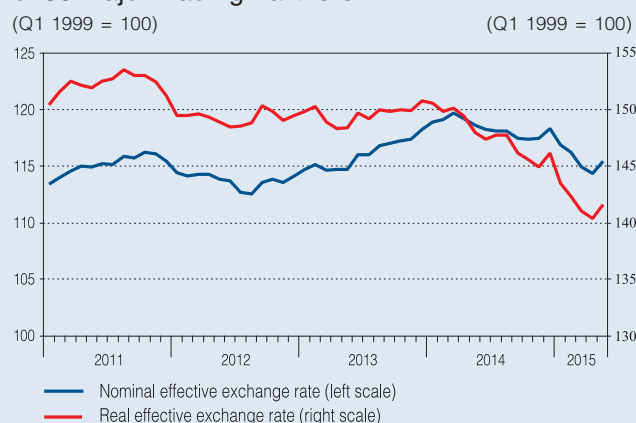
Source: BNB.

From December 2014 the Turkish lira also depreciated against the dollar and euro due to concerns that the US Federal Reserve System would raise its reference interest rate which might lead to capital flights from developing countries as Turkey. The Turkish central bank cut the reference rate in February 2015, thus contributing to early 2015 trend of depreciating Turkish lira against the euro and the lev. Concurrently, interest rate cuts by central banks of Romania and Poland in 2014 and early 2015 resulted in a depreciation of the national currencies against the euro.

Reflecting the similar price processes in Bulgaria and its trading partners and competitors, the nominal and real exchange rates of the lev against 38 major trading partners' currencies have followed a similar pattern since early 2014. If the real exchange rate is considered as an indicator of competitiveness, the depreciation would have a positive effect on Bulgaria's competitive positions *vis-à-vis* other countries. It is essential to note, however, that the euro depreciation and hence the lev depreciation against the US dollar counteracted the fall in the price of petroleum whose imports are almost entirely invoiced in US dollars. In this context, the positive effects of oil price declines were somewhat neutralised by euro exchange rate movements *vis-à-vis* the US dollar.

The impact of the lev nominal effective rate changes on domestic supply-side prices are estimated quantitatively⁴ using the Hahn methodology (2003).⁵ The pass-through of the exchange rate is explicitly modelled by including indicators of import prices (imported goods deflator), producer prices and consumer prices. In addition, an economic activity indicator (real GDP) has also been included. The effects are estimated on the basis of impulse responses at a one percentage point decrease in the exchange rate.

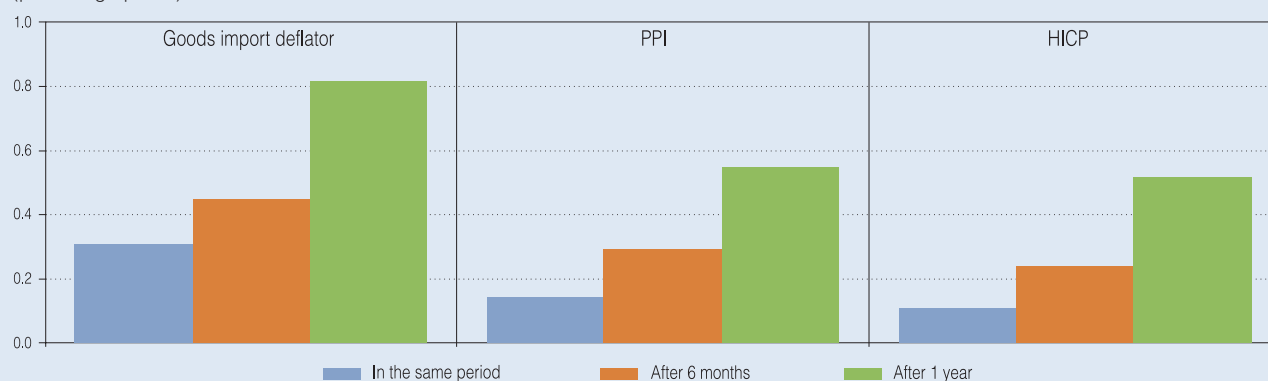
Chart 7. Nominal and Real Effective Exchange Rates of the Lev against the Currencies of 38 Major Trading Partners



Source: ECB.

Chart 8. The Cumulative Response of Prices along the Distribution Chain at a One Per cent Depreciation of the Nominal Effective Exchange Rate of the Lev

(percentage points)



Source: ECB.

Results show that the response along the distribution chain is smallest for consumer prices and largest for import prices. If the nominal effective exchange rate decreases by 1 percentage point in a given quarter, consumer prices would increase by around 0.1 percentage point. This may be interpreted as an instantaneous elasticity of approximately 10 per cent in consumer prices *vis-à-vis* the exchange rate. It is clear that the more time passed since the shock, more effects are accumulated, and in almost a year, the cumulative effect on consumer prices is estimated at about 0.5 percentage points.

In analysing the effect of real exchange rate changes on real exports and imports of goods and services and on GDP, the Goldscheine and Hahn theory has been followed (1985).⁶ Real imports and exports are modelled using indicators of external and internal demand, competitiveness (real effective exchange rate) and import prices. The effects are again estimated on the basis of impulse

⁴ A vector autoregression model estimated using Bayesian methods for quarterly data and a Choleski decomposition for identification of the shocks are used.

⁵ Hahn, E., Pass-through of External Shocks to Euro Area Inflation, 2003, European Central Bank Working Paper No. 243: 14–23.

⁶ Goldstein, M., Khan, M., Income and Price Effects in Foreign Trade, 1985, Handbook of International Economics, Vol. 2, Chapter 20: 1041–1105.

responses at a one percentage point depreciation in the real exchange rate, *i. e.* a positive shock on competitiveness is observed.

Chart 9. The Cumulative Response of Real GDP, Exports and Imports at a One Per cent Depreciation of the Real Effective Exchange Rate of the Lev

(percentage points)



Source: ECB.

The results suggest that in the period of the depreciation, goods exports respond by an increase of around 0.6 percentage points. Goods imports post growth since exported goods have a significant import component. After six months, the response of imports and exports is identical to that over the first period: exports rise cumulatively faster than imports. Subsequently, after a year, the effect on GDP becomes stronger by around 0.2 percentage points. This reflects the positive effect of net exports on income in Bulgaria and the corresponding increase in domestic demand. Hence, even after a year, goods imports increase cumulatively more significantly than goods exports since imports are stimulated by the expanded domestic demand.

Through various channels, the effects of the euro depreciation have both positive and negative implications for the Bulgarian economy. In terms of price and cost competitiveness, the depreciation of the real effective exchange rate of the lev against the currencies of Bulgaria's major trading partners would have positive implications for goods exports. At the same time, the euro depreciation is a factor fuelling domestic price increases along the supply chain. Deterioration of Bulgaria's terms of trade as a result of the currency structure of imports and exports with third countries would have a negative nominal effect on the trade balance, and balances on trade in primary goods and petroleum products would have been most affected. The estimation for the total economy shows that the positive effects of the euro depreciation against the US dollar are stronger than the negative ones.

THE SCULPTURAL COMPOSITION BY KIRIL SHIVAROV DEPICTING HERMES AND DEMETER ON THE SOUTHERN FAÇADE OF THE BULGARIAN NATIONAL BANK BUILDING IS USED IN COVER DESIGN.