

Exchange rate pass-through effect and monetary policy in Russia

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An example of an external shock for an open economy can be depreciation of the domestic currency, which results directly in an increase in national prices of imported goods and, consequently, in an increase in national prices of all other goods and overall inflation in a country (pass-through effect - PTE). The existing literature suggests that PTE is significant (that is, depreciation of domestic currency leads to inflation), although is incomplete (less than 100%) in most cases. The literature also concludes that the degree of PTE depends greatly on the country and types of goods under consideration. One important conclusion of the authors is that PTE is higher in smaller economies and in developing countries with high import shares.

Since Russia can be described as a developing country with relatively high imports, it can be predicted that PTE in Russia is pretty high. And if this is so, then Russia is highly dependent on world markets and depreciation of Rouble will result in significant increase in domestic prices. To prevent such a situation the government can use its monetary policy to eliminate PTE on prices. In particular, in case of exogenous domestic currency depreciation, the government can conduct contractionary monetary policy in order not to allow prices to rise, thus reducing PTE. Empirical literature on western economies (Parsley and Popper (1998)) concludes that the monetary policy counteracts exchange rate changes and reduces pass-through. Is this the case for Russia? Especially since monetary policy and exchange rates are interdependent because the exchange rate is not freely floating in Russia.

Thus, the goal of this research is to estimate and analyze PTE on consumer and producer prices in Russia and to estimate and analyze the influence of government monetary policy on PTE. So, this is an empirical research which is important from the theoretical point of view and has some

practical implications. In particular, this research may be useful for the government and the Central bank for forecasting inflation in Russia on aggregate level and in different industries, for determination of monetary and exchange rate policies and regulation of national industries. For example, if PTE on consumer prices in a country is large, then in order to maintain the targeted inflation rate and to reduce prices volatility (also to reduce different costs which arise from volatile prices) the Central bank should adjust money supply in response to exchange rate fluctuations since changes in both money supply and exchange rate affect the country's inflation.

The theoretical model of monetary policy influence on PTE was proposed by Parsley and Popper (1998). They conclude that if monetary policy during domestic currency depreciation is not taken into account while estimating pass-through, the effect of the exchange rate on prices may appear to be biased and smaller than the underlying effect, since the government aims at maintaining the inflation rate and smoothening consequences of exchange rate changes. The authors supported this theoretical result by the evidence from the American market.

In this paper we propose that this theoretical result will not hold in Russia. We observed that while Rouble was depreciating sharply during the crisis of 1998, the Central Bank conducted expansionary monetary policy, what had additional effect on rising prices. What was the aim of such a policy? Before the crisis of 1998, government budget deficit was financed by state bonds (GKO) which led to accumulation of government debt to domestic and foreign investors. When the government defaulted on GKO, demand for Roubles from the side of foreign investors fell remarkably, what resulted in sharp depreciation of Rouble on FOREX market. The direct effect of this depreciation was significant rise of domestic prices. Therefore, Russian economy needed more money for transactions at higher prices and financing the budget deficit. This led to necessity of money emission, while it would be more logical to decrease money supply in order not to allow prices rise so sharply, what happens in western economies and supports the finding of Parsley and Popper. So, our hypothesis

contradicts the hypothesis of western authors. In this paper we test the hypothesis that Russian monetary policy makes exchange rate PTE on domestic prices stronger.

The test is conducted on State Statistical Committee and IFS monthly data from January 1995 till December 2002 using Error Correction Model (ECM), as the time series are not stationary. We estimate two ECMs with and without money supply of the following specification:

$$\Delta(LN_P_t) = \sum_{i=0}^5 \alpha_{1i} * \Delta(LN_NEERI_{t-i}) + \sum_{i=0}^2 \alpha_{2i} * \Delta(LN_MONEY_t) + \alpha_3 * \Delta(LN_RCONS_t) + \alpha_4 * \Delta(LN_OIL_t) + \alpha_5 * AR(1) + \alpha_6 * \varepsilon_{t-1} + v_e$$

where LN_P is consumer or producer price index, LN_NEERI is nominal effective exchange rate index, LN_MONEY is money supply M1, LN_RCONS is real consumption as a proxy for real income, LN_OIL is the price of oil and ε_{t-1} is the lagged residuals from the following cointegration equation:

$$LN_P_t = \alpha_0 + \alpha_1 * LN_NEERI_t + \alpha_2 * LN_MONEY_t + \alpha_3 * LN_RCONS_t + \alpha_4 * LN_OIL_t + \varepsilon_t$$

All indices are transformed to the base period January 1995 and all variables are expressed in natural logarithms.

The main results of the research are the following.

First, PTE on prices studied in this paper is incomplete even in the long run, what proves irrelevance of Purchasing Power Parity in Russia. On the other hand, even 1-month PTE is significant.

PTE on consumer prices is quite high and equals approximately 50%, what corresponds to the results for other developing countries and is higher than PTE in developed countries. This characterizes Russia as a small economy, which is highly dependent on shocks in the world markets. Therefore, in order to decrease price volatility, monetary policy in Russia should be endogenous and should eliminate the effect of exchange rate changes on prices, if the exchange rate is fully flexible, or the exchange rate should be in a corridor. Almost all PTE on consumer prices occurs during one month, what supports the idea of flexible prices in Russia.

Second, PTE on CPI is higher than that on PPI and CPI adjusts more quickly than PPI, which adjusts with some time lags. This is partially explained by presence of imported goods in CPI, PTE on which should be high.

Third, estimation of PTE without taking into account monetary policy shows that monetary policy in the studied period did not smooth PTE, but made it stronger, what supports our hypothesis and contradicts the results for western economies. This is explained by monetary expansion during the crisis of 1998, which was required in order to perform transactions at higher prices. When Russian economy stabilizes, Central Bank of Russia should adopt another tactics and should aim its monetary policy at reducing price volatility and maintaining inflation rate constant.

These results may be interesting for development of inflation and exchange rate policies as we have shown that it is impossible to manipulate inflation solely through changes in money supply when exchange rate is flexible and has an additional effect on domestic prices. If the aim of the government is to maintain constant inflation rate, then monetary policy should be endogenous (should adjust to exchange rate changes) since Russian prices are highly exchange rate elastic during periods of Rouble depreciation.

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