Economic Growth, Real Exchange Rate, and Inflation

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I. State of the Art

The literature on the impact of inflation on economic growth is extremely diverse. In 1960-th, many economists believed in permanent output-inflation trade-off due to Phillips curve. Theoretical arguments, presented by M. Friedman and E. Phelps in 1968, undermined this belief, and subsequent econometric investigations did not found any tight relationship between inflation and unemployment (see Romer (2001, Ch . 5), Bullard, Keating (1995), Lucas (1996)).

However, quite recently a number of empirical researches detected long run nonlinear relationships between inflation and economic growth (see Полтерович, 2006, for a survey). They demonstrated that inflation has a negative impact on growth only if it exceeds a certain threshold. Otherwise inflation has no impact or even accelerates growth. The level of the threshold varies from one paper to another depending on a samples of countries, time periods, and estimation methods. It was estimated as 40% per year in Bruno, Easterlly (1995), 8% -in Sarel (1995), 2%-3% -in Ghosh, Phillips (1998). Robert Barro conducted a very scrupulous and detailed study of the problem, and has found a threshold level at 15% yearly inflation rate (Barro (1997)).

Why may the threshold depend on the country sample? A reasonable answer follows from the paper by Sepehry and Moshiri (2004). They consider four groups of countries in accordance with the World Bank classification: low income, lower middle, upper middle, and OECD countries. It was found that the threshold is 11%-16% for the first group, 15%-21% - for the second group, 4%-5% - for the third one. For OECD countries there was no significant impact of inflation on growth.

Which economic mechanisms are responsible for these nonlinear relationships? This is a goal of our project to answer this question. First of all one has to take into account standard costs and benefits of inflation.

Textbooks refer to the “shoe leather costs” of inflation associated with additional efforts that people make to reduce their holding of cash, and to “menu costs” that arise from a necessity to change prices more often. Besides, inflation distorts the tax system, and it is disliked by the people due to money illusion. The level of inflation is positively correlated with its volatility. Greater inflation volatility that goes hand in hand with higher inflation rates increases uncertainty and discourages long-term investment (Romer,2001, Ch. 10; Driffill, Mizon, Ulph , 1990).

However, inflation has benefits as well. There are three main arguments in favor of positive inflation. First, there is a tradeoff between inflation tax and other indirect taxes, so that government tax optimization implies positive inflation (see references in Мовшович (2000)). Second, a commitment to keep very low inflation restricts the central bank ability to respond to adverse supply shocks. This may be an important cause of stagnation of the Japanese economy during deflation of 1990-th (Krugman (1998)). Third, and probably, the most important, inflation serves as a lubricant making nominal prices and wages more flexible (Lucas (1973), Kiley (2000), Itskhoki (2004))). It was found in a number of researches that prices and wages are more rigid in the downward direction than in the upward one (Cover (1992), Holden (2004)). Trade union pressure may be a cause of wage rigidity asymmetry that entails the asymmetry of price stickiness. Inflation simplifies the process of price regulation.

We hypothesize that the lubricant inflation is particularly important for fast modernization periods when quick structural changes require adequate changes in price proportions. In this case strong disinflation efforts may hamper economic growth.

The need to carry out industrial and social policies can also create tradeoffs between inflation and growth. Both kinds of policies may be necessary to promote sustainable growth, and both of them bring a risk of inflation

Real exchange rate dynamics, being the result of inflation and nominal exchange rate change, brings additional dimensions into the picture. The traditional theory treats real exchange rate[1] as endogenous: the equilibrium level of real exchange rate is the one that ensures the equilibrium of the balance of payments (Obstfeld, Rogoff, 1996, Ch.4; Calvo et al, 1995)

In the long term, the real exchange rate is believed to be a function of the level of development of a country. There are several explanations why equilibrium exchange rate in poorer countries is well below PPP rate (Froot, Rogoff, 1995). References are usually made to Balassa-Samuelson effect (smaller productivity gap between developing and developed countries in non-tradable goods sector than in tradables, but equal wages in both sectors) and to Bhagwati-Kravis-Lipsey effect (non-taradables, which are mostly services, are more labor intensive, so if labor is cheap in developing countries, prices for services should be lower)[2].

The Balassa-Samuelson effect states that, if productivity grows faster in sectors producing tradable output (mainly goods) than in sectors producing non-tradable output (mainly services), and if wage rates are equalized across sectors — with the result that economy-wide real wage increases lag behind productivity growth, — then the real exchange rate (RER) can appreciate without undermining business profits. For transition economies, the processes of RER appreciation were studed in Grafe and Wyplosz (1997), Halpern and Wyplosz (1997), Economic Survey of Europe (2001).

However, there is a lot of evidence that many countries maintain what could be called "a disequilibrium real exchange rate" that is overpriced or underpriced as compared to the equilibrium level. Resource rich countries often maintain overpriced exchange rate that is imposing constraints on their economic growth.

On the other hand, many developing countries (including those rich in resources) pursue the conscious policy of low exchange rate as part of their general export orientation strategy. By creating a downward pressure on their currencies through building up foreign exchange reserves (FOREX), they are able to soften import competition with domestic production and stimulate export, investment, and growth.

In a number of researches, indicators of the RER overvaluation were including into standard growth regressions, and it was shown that overvaluation of the exchange rate is detrimental for economic growth of developing countries (Dollar, 1992; Easterly, 1999; Polterovich Popov, 2002).

The argument against a policy of low exchange rate is that it leads to monetary expansion and hence – to inflation. Calvo, Reinhart and Vegh (1995) argue that undervaluation of the exchange rate is inflationary in theory and was inflationary in practice for Latin American countries in the 1980s. It appears, however, that the effect depends on the instruments used to support low exchange rate. If a country uses FOREX accumulation to reach this purpose then it has a good chance to escape high inflationary pressure (Polterovich, Popov, 2002).

Rodrik (1986) and Polterovich, Popov (2002, 2005) developed models demonstrating how disequilibrium exchange rate in the presence of foreign trade externalities could lead to the

[1] Recall that real exchange rate is a relative national price level; it may be also thought as ratio of price levels of nontradable goods to tradable ones.

[2] For the general description and references see Obstfeld, Rogoff, 1996, Ch. 4.

acceleration of growth[3]. However, these studies did not consider the problem of inflation in detail.

A related problem concerns the impact of inflation and real exchange rate on the volatility of growth rates of output. It is well documented (see Aghion, Angeletos, Banerjee, Manova, 2004 for a survey of the literature) that the relationship between volatility and growth is negative, i.e. rapid growth is associated with lower volatility. So policies to promote growth, if successful, are likely to reduce volatility as well, even though the mechanism of such spin-off is not well understood. There are empirical evidences that fluctuations in real exchange rate are crucial for explaining the volatility in open economies (Popov, 2005). Calvo and Reinhard (2000) and Aghion et al (2006) argue that this volatility is much more harmful for developing countries than for developed one so that fixed exchange rate regime is preferable for developing economies. But one has to study how to combine this recommendation with the need to maintain disequilibrium RER and to change RER policy during modernization.

Inflation and real exchange rate overvaluation trade-off as well as inflation and industrial and social policy tradeoffs are crucial at much debated issues of modern Russian economic development. It would be very important to make a progress in understanding of these phenomena. .

II. Goals of the Project and Methodology

The general research question of the project is about the optimal (maximizing welfare) inflation and real exchange rate policies in the long run. The main hypothesis is that developing countries with distorted markets and strong import and/or export externalities generally have to maintain disequilibrium real exchange rate and higher rates of inflation than developed countries. Therefore regimes of foreign exchange reserve accumulation, internal and external debt policies, and capital market regulations have to change in the process of development. This evolutionary approach requires studying sophisticated strategies based on rational balance of inflation costs and benefits depending on the stage of modernization. The strategies have to take into account general catching up goals as well as interests of different social groups. It is quite plausible that optimal inflation and real exchange rates depends on scale of distortions, institutional quality, and relative strength of export and import externalities.

It would be very important also to take into account the impact of inflation and real exchange rate on the volatility of growth rates of output. One may suppose that currency devaluation or appreciation policies (each of the two may be optimal for different stage of modernization) have to be very gradual

To what extent the sophisticated growth promoting macroeconomic policy is compatible with democratic or authoritarian decision making? Is it merely by chance that "economic miracle countries " - Japan, Korea, Taiwan, Singapore, Hong Kong and recently China - restricted democratic freedoms for a considerable period of time? To answer this important question one needs to use methods of the New Political Economy (Persson, Tabellini (2000)). It looks plausible that, to be sustainable, changing growth promoting policy requires political stability and long-term planning horizon of median voter or ruling elite. These conditions are rare in developing countries, and this may explain why so few countries were able to find successful catching up strategies.

Having in mind a synthetic nature of the project, we intend to make use of theoretical and empirical approaches combining macroeconomics of endogenous growth (see Aghion, Howitt. (1998)), institutional theory, and econometrics models. An interesting direction of the econometrics work is cross-country analysis of different hypotheses and comparison of policy effects dependently on the technological level and the institutional environment.

[3] In this early paper Rodrik assumes import externality, which is used via the overvaluation of the exchange rate to stimulate imports of machinery and equipment. In Polterovich, Popov (2002, 2005) export externality is assumed, and RER undervaluation is reached by FER accumulation.

We start our research seminar with studying data and different models explaining results of inflation and real exchange rate policies of developing countries. Then students are expected to report their own findings.

III. Tentative topics for Master Theses

1) **Optimal inflation rates in developing countries.** Empirical researches (mentioned above) show that moderate inflation is good for growth. Why?
2) **Growth promoting exchange rate regimes.** The impact of dollarization, currency board, fixed and flexible exchange rates on growth. Edwards and Magendzo (2003) found that dollarized economies and currency unions have lower inflation, lower growth and higher volatility than countries with a currency of their own.
3) **When accumulation of foreign exchange reserves spurs inflation?** It is widely believed that sterilization of the increases in money supply resulting from positive terms of trade shocks and capital inflows is a self-defeating policy. Why countries that rapidly accumulate FER do not usually have high inflation?
4) **A curse of resource abundance: inflation and real exchange rate overvaluation tradeoff.** Comparing several options for managing trade shocks in a resource abundant country – (a) borrowing capital abroad, (b) accumulating foreign exchange reserves in the CB/ Stabilization Funds, (c) adjusting the real exchange rate.
5) **Is it reasonable to create Stabilization Funds?** A study of various countries' experiences (Chile, Nigeria, Norway, Russia, etc.) to develop a theory.
6) **Inflation targeting: is it appropriate for developing countries?**
   Inflation targeting is quite a new approach to monetary policy (Bernanke, Mishkin, 1997) that accepted now by a number of countries. It would be interesting to study the experience and develop a theory.
7) **Explaining real exchange rate dynamics in the long run.** Balassa-Samuelson effect vs. changes in terms of trade vs. capital flows vs. accumulation of reserves (see Дынникова (2001).
8) **Why prices for tradables differ across countries?** According to the Balassa-Samuelson effect prices for non-tradables are connected with the relative level of development– this is supported by data. Prices for tradables should differ only due to transportation costs and trade barriers, but in fact they exhibit a similar correlation with the levels of development. Why?
9) **Evolution of monetary policies.**
   One has to build a dynamic model that generates different monetary regimes for different stages of modernization. See Aghion (2006) for initial ideas.
10) **Industrial policy: a tradeoff between growth promotion and inflation.**
    Government can not be sure that subsidies to firms increase output. If not, then inflation may accelerate. This work has to combine game theory and macroeconomics. See Laffont (1996) for a hint.
11) **Social policy: populism, growth sustainability, and inflation.**
    To what extent does social policy influence economic growth? Is it an inflationary deduction from investment, or investment into social stability and human capital? The topic calls for both theoretical and econometrics approach.
12) **Inflation-output tradeoff and political regimes.**
    Under which conditions are democratic and authoritarian states are able to choose optimal inflation regime? This is a political economy topic (see Persson, Tabellini (2000)).

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