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Conceptualizing interdependences between regulatory and monetary policies. Some preliminary considerations

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Abstract. In this paper we investigate the interplay between regulatory and monetary policies. We analyze how changes in institutional settings modify the functioning of various channels of monetary transmission. The paper begins with a brief presentation of the main channels of monetary transmission, including credit channel, exchange rate channel, Tobin q theory, and the credit channel. After that we define a positive institutional change and we check how such adjustments can be put into the logic of monetary transmission. We show that the most profound way institutions impact the monetary transmission is via its effect on the elasticity of investments to changes in interest rates.

Key words: monetary transmission channels, monetary policy, regulatory policy, institutional change, financial globalization

JEL codes: E02, E44, E52, F41, O43

1. Introduction

There is a widespread consensus among economists that the impact of monetary policy on the real economy depends on the kind of fiscal policy that is implemented by the government. The interplay between fiscal policy and the monetary one is conceptualized in many theoretical models of which the textbook IS-LM is the best known. Accordingly, if one wants, for instance, to evaluate the impact of lowering an interest rate on the investment activity in a given economy, he must take into account the government economic policy, e.g., if corporate taxes are cut, then lower interest rates should stimulate the investment activity more than in the situation of unchanged taxes. However, in recent years there has been a growing amount of literature suggesting that the real economy is not only influenced by the monetary/fiscal policy mix, but also by the institutional factors, i.e., the law regulating the functioning of the economy, culture (social and moral norms), the quality of governance, the level of corruption, and others (e.g., North 1990, 2005, Acemoglu et al. 2004, Acemoglu et al. 2005, Rodrik et al. 2004). Nevertheless, what lacks in the literature is a theoretical conceptualization of the interplay between monetary and regulatory policy as well as a precise definition of "good" (growth stimulating) regulatory reforms. A search for such a "monetary/regulatory policy mix model" motivates the research presented in this paper. The analysis proceeds as follows. First, we present the basic transmission channels of monetary policy or, in other words, we ask how monetary policy can influence the real side of the economy. Second, we define regulatory policy as well as we conceptualize a positive regulatory reform. Third, we show how regulatory changes can influence the strength with which the monetary policy impacts the economy (through various channels of transmission). Conclusions follow.

2. Monetary policy and its transmission channels[2]

One of the main research questions in monetary economics is how the changes in money aggregates affect the prices, interest rates, and output (Walsh 2010). That is important for at least two reasons. First, most economists would agree that at least in the short run monetary policy can affect the real side of a given economy (Bernanke et al. 1995, 27). Second, in order to decide on the appropriate set of monetary policy instruments, the monetary authority needs to know how these instruments can affect the economy. Last but not least, the post-2008 crisis proved that financial disturbances, deeply intertwined with monetary policy, influenced profoundly the real economy, causing the so-called Great Recession. Although there is a consensus that monetary policy matters, there is an ongoing discussion on how monetary policy affects the real economy. That is even more visible if one takes a look at very basic relationships between monetary variables, e.g., nominal US federal funds rate, and macroeconomic ones, e.g., growth in aggregate activity and expenditure. It appears that the correlations shifted from negative in the periods from 1962Q1 to 1979Q3 to positive form 1984Q1 till 2008Q4 (Boivin et al. 2010, 2). We are to touch upon that issue in our discussion on the interplay between monetary and regulatory policy. Now, we simply present the basic transmission channels, i.e., interest rate effects, exchange rate effects, other asset price effects, and the so-called credit channel[3].

2.1. The Interest Rate Channel

The mechanism of interest rate transmission is the most well known and is present in economic literature for over 60 years. It is also well known to the public under the simple heuristic that lower interest rates positively stimulate the economy. Also, that mechanism is included in every macroeconomics textbook presentation of basic Keynesian framework. It proceeds as follows:

$$M \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow,$$

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[2] That part of paper is based on the description of monetary transmission mechanisms presented in Mishkin (1995) and Boivin et al. (2010).

[3] Although we are conscious that nowadays monetary authorities use primarily interest rate targeting, here we assume that monetary impulse comes from a change in money supply. The discussion why currently central banks use mainly interest rate targeting is beyond the scope of this paper.

where $M \downarrow$ indicates the contractionary monetary policy leading to a rise in real interest rates ($i \uparrow$), which by rising the cost of capital causes a decline in investment spending ($I \downarrow$) and hence a general fall in output ($Y \downarrow$).

The above described mechanism matters for both producers' and consumers' decisions. Interestingly, the interest rate mechanism does not only influence consumers'/producers' spending via changes in short-run interest rate but also by changing the long-run interest rate through a combination of sticky prices and rational expectations (Taylor 1995).

2.2. The Exchange Rate Channel

Changes in M in open economies also influence Y by affecting the exchange rate. It goes as follows: a rise in i makes domestic deposits more attractive vis-à-vis foreign ones and hence attracting the inflow of foreign capital leading to a raise in the value of domestic currency, i.e., its appreciation ($E \uparrow$), and therefore a fall in net exports ($NX \downarrow$). Schematically, it can be presented as follows:

$$M \downarrow => i \uparrow => E \uparrow => NX \downarrow => Y \downarrow.$$

Since most developed economies are open ones that transmission channel matters and should be taken into account while deciding on appropriate monetary policy actions (Obstfeld et al. 1995).

2.3. Other asset price effects

As Meltzer (1995) points out, a basic shortcoming of the above described channels is their focus only on one relative asset price, the interest rate. According to his contribution adding another relative price, namely exchange rate changes nothing. Instead, monetarists postulate to take into account the universe of relative asset prices and real wealth. However, among many, two channels are worth emphasizing here: Tobin's q theory and wealth effects on consumption.

Tobin's q theory conceptualizes the monetary transmission through its effects on the valuation of equities. In his approach, we have $q = \dfrac{MVF}{RCC}$, where MVF stands for market value of firms and RCC for replacement cost of capital. If q is high, MFV is high relative to RCC, and new plant and equipment capital is cheap relative to the market value of firms. Thus

companies can easily issue equity and get a high price for it relative to the cost of the plant and equipment they are to buy. Therefore, investment spending will rise, because firms can buy a lot using only a small amounts of stocks. If q is low, companies can hardly buy any new capital and instead they would buy existing firms and thus acquiring old (existing) capital. Investments will be low.

How the monetary authority can influence q or alternatively how it can affect equity prices? As often the story begins with the changes in money supply. If monetary authority decreases M, then there is a lack of money in the economy, so the public diminishes their expenses. People can spend less for instance in the stock market what results in the lower equity prices. This story can be seen also from a more Keynesian like side where lower I (the result of $M \downarrow$) makes bonds more attractive than equity, so we have $P_e \downarrow$, where P_e stands for equity prices. Consequently, the above described mechanism can be written down as follows:

$$M \downarrow => P_e \downarrow => q \downarrow => I \downarrow => Y \downarrow.$$

Changes in equity prices not only influence q but also consumers' wealth and hence their consumption as F. Modigliani in his MIT-Penn-SSRC (MPS) model claims. If equity prices fall, then the value of financial wealth decreases, thus decreasing the lifetime resources for consumption and hence inducing a fall in consumption spending (Modigliani 1971). So, if $M \downarrow$, then $P_e \downarrow$ and hence consumption falls as well, i.e.:

$$M \downarrow => P_e \downarrow => \text{wealth} \downarrow => \text{consumption} \downarrow => Y \downarrow.$$

The Modigliani approach offers an explanation for many empirical phenomena the previously described transmission channels could not explain, e.g., the impact of monetary policy on Japanese economy in the 1980s and 1990s through its effect on land and property values. However, what integrates all these channels is the assumption of perfect financial markets (Boivin et al. 2010, 5). If we ease that neoclassical assumption, then a new perspective arises.

2.4. Credit channel

In case of asymmetric information and problems in enforcing contracts in financial markets, the agency problems are created. Also, the government intervention can strongly disrupt the functioning of financial markets. In general, the transmission channels arising from market imperfections are present in credit markets and hence they are called credit channels or more generally non-neoclassical transmission channels. There are three basic channels of that kind,

i.e., changes in credit supply resulting from government interventions, the bank lending channel, and balance-sheet channel.

Effects on credit supply from government interventions. Governments often try to influence the functioning of credit markets in order to achieve some policy objective, e.g., encouraging particular types of investments. The typical case of that kind of intervention is the policy of US government which aims at making ownership of private houses more common, for instance, they helped saving and loan association. These kind of policy mechanisms are present everywhere in developed countries, including Poland where the regulations issued by the Polish Financial Supervision Authority proved to have an important impact on the functioning of housing credit market.

Bank lending channel. Banks play a significant role in financing investment activity of firms. That is more important in case of small and medium seized enterprises that do not have an easy access to stock markets. Also, banks are well suited to deal with problems arising from asymmetric information that are more persistent in the case of SMEs. The lending ability of banks can have an enormous effect on functioning of that group of firms. Therefore, an expansionary monetary policy which increases banks' reserves and deposits will have an impact on banks' behavior. In standard notation the process goes as follows:

$$M \uparrow \Rightarrow \text{bank deposits} \uparrow \Rightarrow \text{bank loans} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow.$$

As was mentioned earlier, the above described process will have a greater effect on SMEs.

Balance-sheet channel. Another interesting way the monetary policy can influence the real side of the economy is through the so-called balance-sheet channel. Here, the transmission mechanism operates through the net worth of business firms (and other potential borrowers). When potential borrowers' net worth falls, then adverse selection and moral hazard problems increase in credit markets. If there is a decrease in equity stakes of firms, then they are more willing to engage in risky investment projects. If so, then also banks become more cautious in giving credits and hence a decrease in lending leads to a decrease in investment activities.

Monetary policy by affecting the prices of equities lowers the net worth of firms what leads to lower investments and a decrease in aggregate demand, because of the increase in adverse selection and moral hazard problems. Schematically that mechanism is presented below:

$$M \downarrow \Rightarrow P_e \downarrow \Rightarrow \text{adverse selection} \uparrow \& \text{moral hazard} \uparrow \Rightarrow \text{lending} \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow.$$

2

Therefore, asset prices seems to have an important role in transmitting monetary signals to the economy.

Another way the contractionary monetary policy affects firms' balance sheets is through its effect on cash flow. If firms are to pay higher interest payments, the result of a rise in i, then they cash flow diminishes. Since external funding is subject to adverse selection and moral hazard problems, additional reliance on external sources of capital leads to cuttings in investments. Here what matters is the nominal interest rate rather than the real one as in the case of neoclassical channels. Moreover, short terms interest rates are even more important here since they usually have a profound effect on firms' cash flow. It works as follows:

$$M \downarrow \Rightarrow i \uparrow \Rightarrow \text{cash flow} \downarrow \Rightarrow \text{adverse selection} \uparrow \text{\& moral hazard} \uparrow \Rightarrow \text{lending} \downarrow \Rightarrow I \downarrow \Rightarrow Y\downarrow.$$

As Bernanke and Gertler (1995) suggest the credit channel does not affect only firms but also households. Declining bank lending causes a decline in durables and housing purchases by consumers whose only source of capital is from the banks' credit action. Also, an increase in i deteriorates the balance sheet of a consumer in the same vein as in the case of firms.

As Mishkin (1978) proposes in his liquidity-effects view, balance sheet affects consumers' desire to spend. If consumers are afraid of finding themselves in financial distress, then they would hold more liquid assets and hence reducing their spending on illiquid ones such as houses. If stock prices fall, then consumers' expenditures on durables will also fall, because consumers' financial position deteriorates since there is a growing risk of financial distress on their side. Therefore:

$$M \downarrow \Rightarrow P_e \downarrow \Rightarrow \text{financial assets} \downarrow \Rightarrow \text{likelihood of financial distress} \uparrow \Rightarrow \text{consumer durable and housing expenditures} \downarrow \Rightarrow Y\downarrow.$$

The importance of housing prices for the functioning of credit markets depends on how difficult it is to withdraw housing equity and that is the function of a quality of mortgage markets. We will come back to that issue in our discussion on the interplay between institutions and the monetary policy.

3. Do institutions really matter for monetary transmission? Some empirical and theoretical insights

What follows from the above presentation of transmission channels, is that a raise in *M* generally positively affects aggregate demand and hence the growth of GDP. Since the aim of this paper is not to analyze the very mechanism(s) of transmission alone, we would like to concentrate now on investigating more deeply the interplay between access to capital (here: a rise in money supply) and output, but in the international context. So, instead of asking whether there is a correlation between changes in *M* and output in a given country, we ask whether financial globalization contributes to the GDP growth. We switch to international perspective since we want to check how the same monetary mechanisms work in different institutional settings. Therefore, we present below the debate on financial globalization, then we analyze how institutions define the way financial globalization works, and finally we offer a conceptualization of growth stimulating institutions.

3.1. Lessons from financial globalization debate

Since the source of excess money supply may be the import of the capital we should present here the results of policies aiming at opening local financial markets. The underlying assumption in that literature is that opening borders to the capital flows usually results in boosting investments in countries lacking of capital (e.g., Fischer 1997). Consequently, many opts for a greater capital mobility, e.g., as Dornbusch puts it: "The correct answer to the question of capital mobility is that it ought to be unrestricted" (1998, 20). The argument for financial globalization is the following: since many countries, especially developing ones, do not have enough capital to grow, they have to open their borders for capital flows, however, since lenders are usually quite risk-averse the capital importing countries must undertake appropriate macroeconomic policies/reforms. In his well-known book *The Next Globalization* F. Mishkin claims that

"the emerging countries to reach the next stage of development and get rich, financial globalization must go much further that it already has. In particular, the financial systems in emerging economies must be more tightly integrated with those in the developed countries in order to partake in the benefits of financial investment, the lifeblood of the industrialized world" (Mishkin 2006, ix).

However, empirical studies show that there is an absence of any direct relation between financial globalization and growth. It means that access to capital (money supply) alone does

not guarantee the rise in the investment activity[4]. The simple correlation between financial globalization and growth is presented in Figure 1.

There is a good set of literature investigating the lack of a significant relation between financial globalization and growth. First, Henry (2007) argues that in modeling the effects of financial globalization researchers focus on permanent growth effects rather than on temporal ones and also that they do not make any difference between developed and developing countries. Second, as Kose et al. (2006) argues, there is not a direct link between access to capital and growth but an indirect one, namely that financial globalization requires developing countries to undertake institutional and macroeconomic reforms. However, as Rodrik and Subramanian (2009) rightly points out, financial globalization may ease the ineffective governments to postpone necessary reforms by enabling them to function on a soft budget constraint[5]. Third, despite the fact that Mishkin stresses the need of complementary reforms, including getting institutions right, he simply believes that the financial globalization alone would stimulate these reforms. That is a quite naïve assumption and also a contradictory one: "But there is, of course, a tension, even contradiction, in implicitly calling for greater FG to deliver the broader collateral benefits that are in turn prerequisites for FG reform to be successful in the first place" (Rodrik and Subramanian 2009, 125). So, what are the reasons for such disappointing effects of financial globalization? We subscribe here to the answer given by Rodrik and Subramanian (2009) that the lack of investment in the economy can be caused not only by the lack of access to capital but also by low perceived returns. So, we may have plenty of financial institutions wanting to give money to prospective entrepreneurs, but, at the same time, firms do not want to undertake any investments. Why? Simply because they do not see any investment opportunities. These kind of economies are not saving constrained but investment constrained. It means that the access to capital is easy and its price (interest rate) is low. The economy is investment constrained when returns are not protected by the legal system or the institutional structure of the economy is so corrupted that making any transaction is simply impossible (or costly). Investment constrained economies are the ones with high transaction costs (TCs). We will present our understanding of investment constrained economy later in our discussion of regulatory reforms.

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[4] It should be mentioned here that financial globalization while not stimulating investments may foster economic growth by raising domestic consumption. However, what follows from various Rodrik's contributions (e.g., 2008b) is that in the long run what matters for economic growth are investments, especially in technical infrastructure as well as in human capital (also Romer 1986, Lucas 1988). Consumption alone can have an important effect only in the short run. Therefore, in this paper we use 'investments' and 'economic growth' interchangeably, since we focus on the impact of financial globalization on investments as such, and we assume that investments generally stimulates growth.

[5] Another unintended consequence of financial globalization could be an exodus of domestic capital, since the owners of capital resources would simply search for better institutional settings as well as higher returns abroad.

Figure 1. Financial globalization and growth (1970-2004)
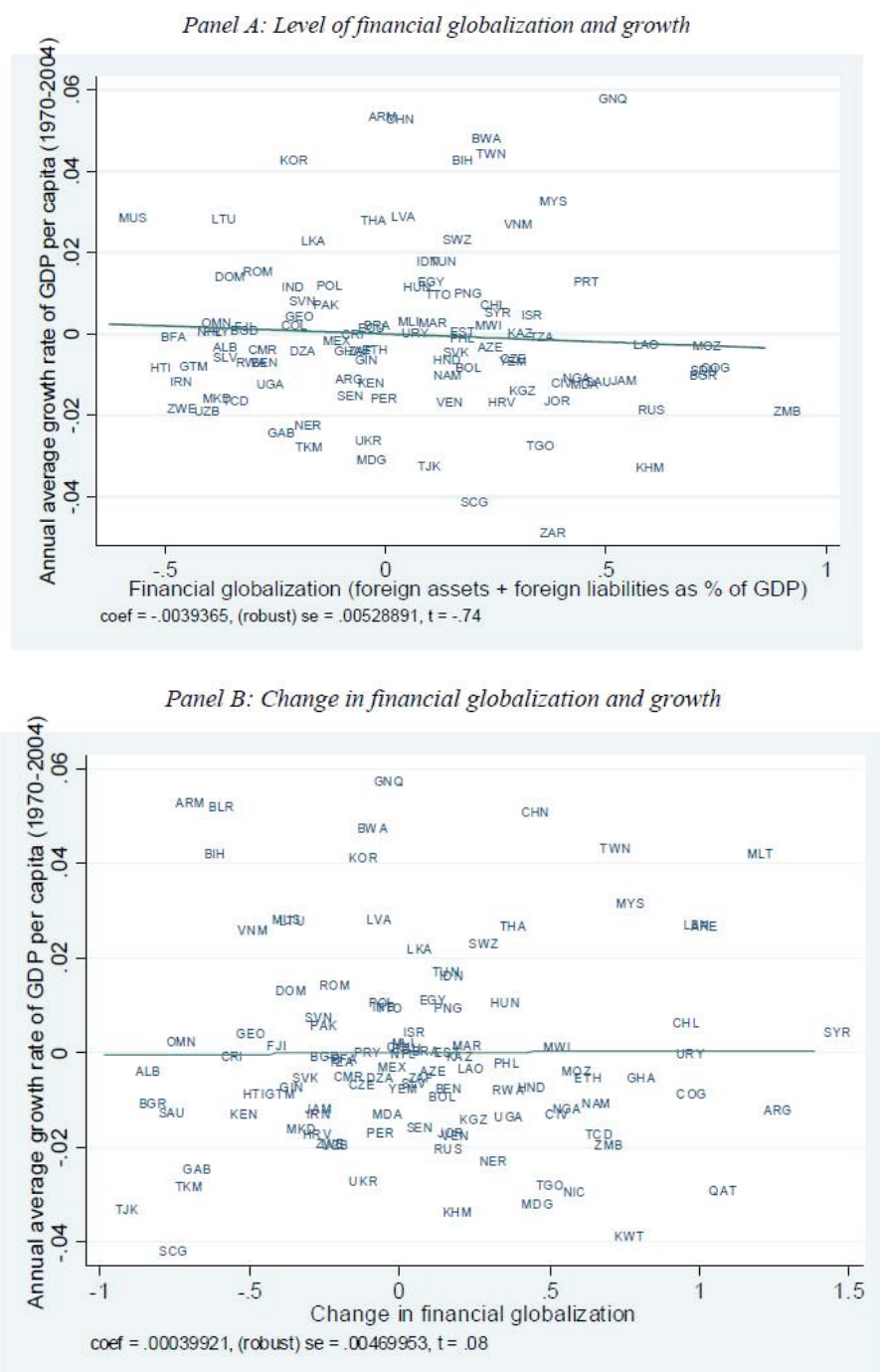
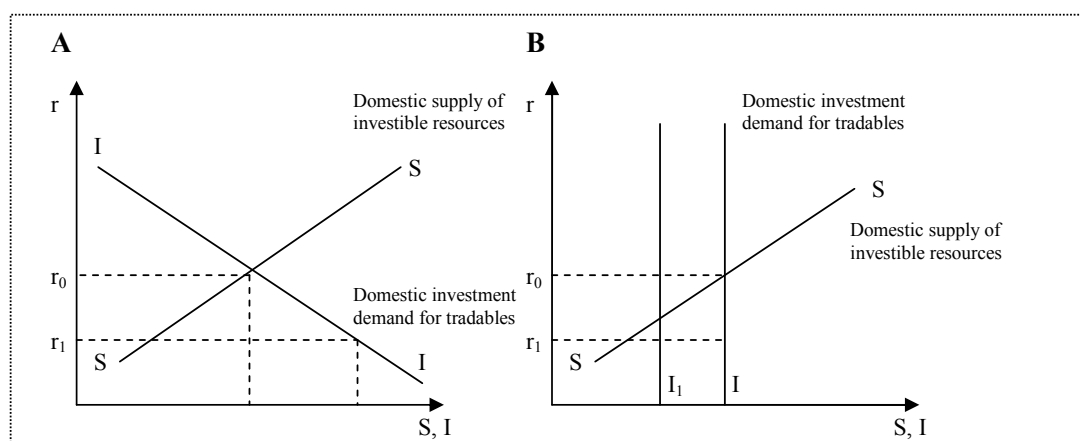Source: Rodrik and Subramanian (2009, 119-120)

What happens if we open investment constrained economy and on the other hand we do the same with saving constrained one. In the case of the latter this is a textbook story: a reduction in the interest rate and increase in the availability of capital increase firms' investments. Consumers are buying more due to a change in intertemporal relative prices.

Thus investments are growing and savings are declining; the difference is financed by the external capital (Figure 2a). The situation is much more interesting in the case of investment constrained economy where the demand schedule is vertical, so a change in the interest rate does not affect the level of investments (Figure 2b)

Figure 2. Investment and saving constrained economies

Source: Rodrik and Subramanian (2009, 132)

However, the situation of an investment-constrained economy is even worst in the presence of financial globalization, since inflow of capital appreciates local currency and that is bad for the producers of tradables. They simply reduce their investments (shift of the investment schedule from I to I_1 in Figure 2b). On the other hand, an appreciation is a good news for the producers of non-tradables, however, from the economic growth standpoint what is important is the situation of the producers of tradables. For the sake of simplicity, in this paper, we are not to analyze the effects of appreciation as a response to the financial globalization (i.e., shifts of investment schedule without changing its slope), but rather we are interested in the impact of institutional settings on the elasticity of investments to the changes in interest rate (i.e., the slop of the investment schedule).

The lesson from the Rodrik's study is straightforward: the response of a given economy to the financial globalization depends largely on the quality of its institutional framework. However, at least two issues should be clarified. First, in the real world most economies are in-between the two extremes described by Rodrik. Second, what is lacking is a clear conceptualization of a positive institutional change which may contribute for making investments' demand more elastic with respect to the changes of the interest rate (access to capital). In the next part of the paper we first try to show how a positive institutional change can be conceptualized in the Rodrik's framework and second we analyze the very

characteristics of such a change. In other words, we want to add institutions into the mechanics of transmission channels.

3.2. Between investment and saving constrained economies

The majority of countries are not 100% investment constrained nor saving constrained, they simply vary in terms of the elasticity of domestic investment demand to the changes in interest rate (access to capital). In other words, they differ in the slope of domestic investment demand curve. The more vertical the investment demand schedule, the more investment constrained the economy is. Since the slope of that schedule depends on the availability of investment opportunities, one can conclude that the higher the number of such opportunities, the more horizontal that schedule is. Here we claim that the number of business opportunities depends partly on the quality of institutional environment in which firms and individuals function. The higher the quality is, ceteris paribus, the more elastic the investment schedule (Figure 3).

Figure 3. Quality of institutions and the elasticity of investments
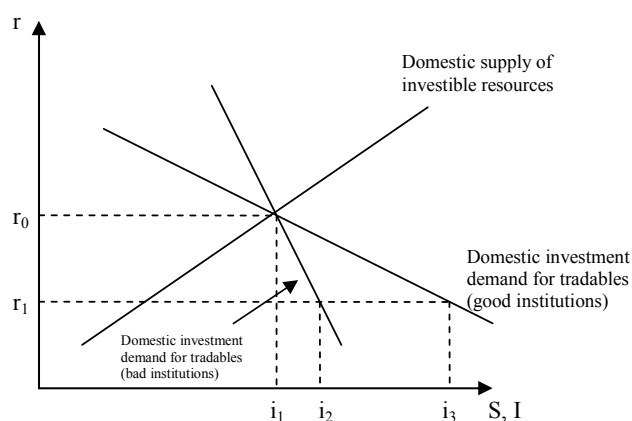
Source: Own reseach

Initially the economy is in (r_0, i_1), after a decline in the interest rate $r_0 \rightarrow r_1$ the economy can arrive at (r_1, i_2) or (r_1, i_3); in the latter case investments are more elastic to the changes in interest rate. We may say that, ceteris paribus, what causes the divergence is the difference in the quality of institutions: better ones simply make investments more elastic. That offers an interesting perspective to those responsible for making economic policy. If in a nearly totally investment constrained economy we want to boost our investments, we should make investments more elastic to the growing access to capital (lower interest rate). That is not the

issue only of developing countries, but also of countries facing a growing inflow of external funds, e.g., Poland with its EU's transfers[6]. But also of Poland as a prospective member of the EMU, since what is often claimed is that one of the advantages of Polish accession to the Euro zone is the integration of EU's financial markets[7]. However, if Poland is closer to the investment constrained economy than to the saving constrained one, then the GDP stimulating effect of joining the EMU (due to financial "globalization") would not be significant[8]. A detailed analysis and econometric estimation of the elasticity of investments to the changes in access to capital is beyond the scope of this paper, however, such a study is more than advisable. Here our aim is just to offer a conceptualization of the interplay between monetary and regulatory policy, however, before doing so we need to conceptualize the interplay between institutions and TCs. We do it in the next section.

3.3. Conceptualizing the interplay between institutions and transaction costs

We have stated earlier that what makes an economy an investment constrained is the low quality of its institutions and regulations. A necessary condition for good institutions is that they should "reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction" (North 1990, 6); also "institutions, together with the standard constraints of economic theory, determine the opportunities in a society" (ibid., 7). However, one can have a stable institutional structure which is at the same time not efficient. Thus the stability of that structure is only a necessary condition for efficiency of institutions. Therefore, a sufficient condition for relative efficiency of a given institution is that it should reduce TCs. Thus, institutions determine the level of transaction costs. This mechanism is twofold: first, high TCs make possible transactions unrealizable; second, by limiting the exchange possibilities, high TCs deteriorate the functioning of the market what in the long-run results in no investment possibilities at all (due to the low number of exchange interactions). In new

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[6] In the public debate in Poland we often discuss the issue of the effectiveness of EU funds absorption, i.e., we are asking whether the allocation of EU funds under given institutional settings is optimal, however, we may ask not only whether the allocation is optimal, but also whether institutional settings are optimal for a given problem to solve. E.g., EU is investing in Polish SMEs in order to create new workplaces. These investments can give, e.g., 100000 new jobs in 5 years perspective. However, in the situation of better institutions (transparent and stable tax system, low administrative costs of running a business, etc.) the same investments can give more jobs. That is why it is useful to distinguish between *technological effectiveness* (getting allocation of resources right) and *institutional effectiveness* (getting allocation of resources right under *optimal* institutional settings) (cf. Green and Sheshinski 1975). We will come back to that issue later.

[7] See, e.g., *Raport na temat pełnego uczestnictwa Rzeczypospolitej Polskiej w trzecim etapie Unii Gospodarczej i Walutowej* [Report on the consequences of full participation of Poland in the third stage of Economic and Monetary Union], National Bank of Poland, 2009, e.g., chapter 3.4.

[8] According to many international studies the quality of institutions in Poland is very low (see e.g., *Doing Business* by World Bank, Economic Freedom Indexes /Fraser Institute and Heritage Foundation/, etc.). E.g., very recently Poland was ranked 41 in The Transparency International Report Corruption Perception Indexes 2010.

institutional economics (NIE) we can find plenty of statements that good institutions are the ones that reduce TCs, e.g.:

"by treating the institutional environment as a locus of parameters, changes in which parameters bring about shifts in the comparative costs of governance" (Williamson 1991, 269).

"Institutions affect economic performance by determining (together with the technology employed) transaction and transformation (production) costs" (North 1993, 2)

"transaction costs are the costs that arise from the establishment, use, maintenance, and change of: 1/ institutions in the sense of law; and 2/ institutions in the sense of rights" (Furubotn and Richter 2000, 43)

"institutions and organizations seek to achieve efficiency, minimizing a comprehensive cost – inclusive not merely of the neoclassical production cost, but also of transaction costs" (Dixit 1996, 58)

However, despite a strong believe that institutions reduce TCs, we find a very limited number of more precise conceptualizations of the interplay between the two. That is due to a quite imprecise nature of the concept of TCs; in fact we have many kinds of TCs (Hardt 2009, 2010). Since we are interested here in the market transaction costs, we will not analyze the managerial costs of running firms, but rather we are to focus on the costs of making transactions between independent enterprises on the market. But again, the notion of *a market transaction cost* is not unambiguous. We define here three kinds of these costs: 1/ ex-ante TCs (costs incurred prior to the transaction); 2/ exchange costs (costs incurred while making the transaction); 3/ ex-post TCs (costs of enforcing a contract). So, the total TCs is the sum of these three. Moreover, there are a lot of interplays not only between TCs and institutions but also between various kinds of TCs. We start building our framework by referring to the very basic conceptualization by Martens (2004) who claims that there is a trade-off between ex-ante and ex-post TCs, and the "shape" of that trade-off depends on the quality of institutions. It simply goes as follows: the more you invest before the transaction (e.g., you employ a very good lawyer who checks the legal status of a parcel you are to buy), the less you pay after

transaction (e.g., the litigation costs). One should note that ex-ante TCs are the paid costs and ex-post TCs are potential costs[9]. In a sense ex-post TCs are treated here as a proxy for risk.

Figure 4. The interplay between ex-post and ex-ante TCs
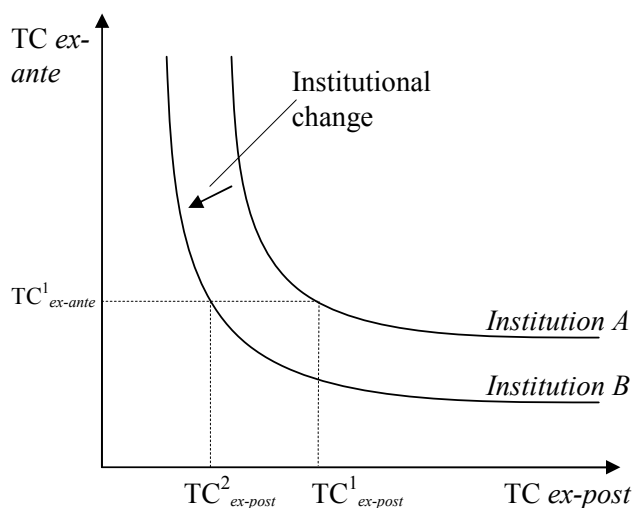
Source: Martens (2004, 112)

In this framework a positive institutional change is conceptualized as a shift of *Institution A* curve (the curve representing a given *institutional framework*) towards the origin (here to the position depicted as *Institution B*). It is worth noting that an institutional change is a move of the curve and not on the curve, e.g., if one invests $TC^1_{ex\text{-}ante}$ for a lawyer checking the legal status of a parcel before transaction, with *Institution A* (e.g., weakly defined property rights), he risks paying $TC^1_{ex\text{-}post}$ after transaction. However, if we have an institutional change (e.g., now property rights are well defined and land registry is accessible via Internet), then investing $TC^1_{ex\text{-}ante}$ enables us to reduce ex-post TCs to $TC^2_{ex\text{-}post}$. Thus what matters is a reduction of total TCs. What clearly follows is an important role for economic policy. As Dixit points out:

"There is clear potential benefit from economizing on transaction costs. Rules and institutions should, and do, evolve to serve this purpose" (Dixit 1996, 61)[10].

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[9] For the simplification of our arguments we treat ex-post TCs as paid costs and also we equalize exchange costs (costs incurred while making the transaction) to zero, e.g., bank transfers' fees.
[10] The same was stated by Adam Smith in his *The Wealth of the Nations*: "Commerce and manufactures can seldom flourish long in any state which does not enjoy a regular administration of justice, in which the people do not feel themselves secure in the possession of their property, in which the faith of contracts is not supported by law, and in which the authority of the state is not supposed to be regularly employed in forcing the payment of debts from all those who are able to pay. Commerce and manufactures in short, can seldom flourish in any state in which there is not a certain degree of confidence in the justice of government" (Book 5, Ch. 3, par. 7).

So, the first conclusion for regulatory actions of the government can be the following: an institutional change which diminishes ex-post TCs for a given level of ex-ante TCs can be treated as a positive regulatory reform. Importantly, if we put into our framework exchange costs (expenses paid at the moment of transaction), a very common kind of TCs on the financial markets, then a change in the amount of these costs per se does not necessarily signifies an institutional change (e.g., a decline in bank's commission for transferring money). However, such a change can result from institutional change in the financial market, e.g., a new law introducing a more competitive financial markets and hence making reductions of banks' commissions more probable.

Now, let's make our model a bit more complex, however, we still subscribe to our idealization of zero exchange costs in the very moment of transaction. The question we ask now is the following: if we have a set of agents in a given economy making transactions using a given institution, do each of them face the same *institutional framework* curve? The answer is no, since each has a different experience. So, let's have two agents: an experienced one and the second inexperienced. In a buying a parcel example an experienced one is the one with many years in this business, he knows possible risks very well, since many times in the past he incurred high ex-post TCs resulting from bad deals. Thus the more transactions he made in the past, the less ex-post TCs he has to pay, for a given ex-ante TCs, in the future. His

Figure 5. Ex-post TCs as a function of institutional framework and the experience of an agent
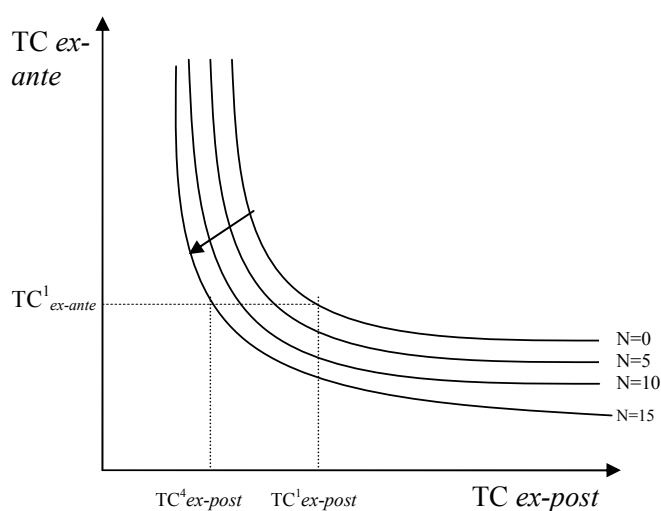
Source: Own research

We may have agents who cope relatively well with bad institutional settings, since they use well the principle of learning by doing. Now, let's imagine that an inexperienced agent wants

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to make a transaction (here his trade-off between ex-ante and ex-post TCs is described with a curve N=0). He knows that there is an agent with trade-off N=15, so he may try not to make a transaction on his own but rather he may buy transaction services from the experienced one. If he makes his transaction without intermediation, he pays $TC^l_{ex\text{-}ante} + TC^l_{ex\text{-}post}$, so for him it is better to pay the experienced agent *TC for intermediation* (TCI) with

$TCI < (TC^l_{ex\text{-}ante} + TC^l_{ex\text{-}post})$ (we call $TC^l_{ex\text{-}post} - TC^4_{ex\text{-}post}$ as *a transaction premium due to experience*; so the experienced agent pays $TC^l_{ex\text{-}ante} + TC^4_{ex\text{-}post}$ and he can charge an inexperienced one with a fare that is less than *transaction premium due to experience*)[11]. Transaction experienced agents are easily findable in the market economy and they range from individuals helping people in buying used cars to the big law firms. They make huge profits for high values of *transaction premium due to experience*. Unfortunately, in low quality institutions countries these transaction experienced agents quite often use illegal methods for transactions' intermediary. Consequently, they oppose any regulatory reforms aiming at lowering the general level of TCs in a given economy[12]. Another argument explaining the ineffectiveness of building good formal institutions in developing countries was given by Dixit (2004), who claims that costs of building such institutions are quite high and hence it is often better to leave the agents with relational contracting as the only possibility. That argument is also present in Rodrik's 2008 paper where he claims that in developing countries:

"it is more effective to enhance relational contracting—for example by improving information gathering and dissemination about the reputation of firms—than to invest (at the current stage of a country's development at least) in first-class legal institutions" (Rodrik 2008a, 5)

In our framework "improving information gathering and dissemination about the reputation of firms" simply means to ease the access to transaction experienced agents. Thus transacting parties do not need to establish personal relations between them but rather to use services of an entity specialized in organizing transactions. Law merchants in medieval Europe served that role (North 1990) and now various institutions collecting information about dishonest contractors do pretty much the same.

In the case of developed countries, with low level of corruption, the situation is different: the government can reform the institutions (a move of an institutional framework

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[11] Here we assume that there is no costs of transferring goods between two agents.
[12] Also, in case of developed countries the transaction experienced agents may use legal methods (e.g., lobbying) in order to stop regulatory changes aiming at making institutions more efficient.

curve to the origin) or it can ease the access of transacting parties to the transaction experienced agents[13]. Reforming institutions is often costly, since the government has to buy a consent of many groups of stakeholders losing revenues as a result of the reform. So, sometimes the better idea is to make the market of transaction experienced agents more effective, e.g., by guarantying the competition between them. Another possibility the government can have is to stimulate the accumulation of social capital, however, the results of this are in the long-run[14]. In most cases the governments should do the three simultaneously: 1/ reforming institutions; 2/ making the market of transaction experienced agents more effective; 3/ mobilizing social capital.

Now, let's make a step further. What we claim is that not only the TCs per se matter, but what matters is their size in the relation to the budget constraint of the consumer. If TCs are relatively small in relation to the price of good the consumer is to buy, then they do not pose a huge constraint on the consumer. Therefore, what we need is to put TCs into a standard decision problem of a consumer. We do it using a modified conceptualization from Niehans (1971). We assume that there is only one consumer choosing between two goods; he is facing a budget constraint (Figure 6). His initial endowment is *E*. Trade can take place along the straight line through *E* whose slope measures the market price of good 1 in terms of good 2. However, with positive TCs, the commodity bundle resulting from trade is not fully available for consumption. The exact consumption frontier is *AEB*. TCs, if paid in good 2, are measured as a vertical distance between the consumption frontier and the trade line. The point consumer is choosing is *C* (the point of tangency of U1 to the segment EB). If TCs are high enough (higher than the price of good 1 in terms of good 2), then no trade occurs.

What happens if we have a change in the level of TCs? If TCs are diminished (consumption frontier changes to *A`EB`*), then consumer is better-off (he moves from C to C`, where C` is the point of tangency of U3 to the segment EB`). What follows is that institutional reforms should be performed in situations of high TCs and especially when TCs are so high that they block the trade at all. Using the Figure 6 the no-trade situation can be modeled as follows: the initial endowment is *E* and TCs are so high (budget constraint is *AES*) that the optimal point, after a change in institutions, is still *E*, a non-trade point.

For the sake of simplicity we assumed that ex-post TCs are in fact paid costs and that agents do not differ in their risk aversion. Also, we made an assumption that intertemporal interest rate is zero (interest rate between the time when incurring ex-ante and ex-post TCs).

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[13] We do not claim here the high level of GDP per capita alone guarantees the low level of corruption. However, in most cases, there is a statistically significant positive correlation between corruption perception index (e.g., the one measured by Transparency International) and the GDP growth rates, i.e., the lower level of perceived corruption, the higher GDP growth (see, e.g., Svensson 2005).

[14] Here the assumption is that high levels of social capital are negatively correlated with TCs.

Figure 6. TCs and the welfare of the consumer

good 2

good 1
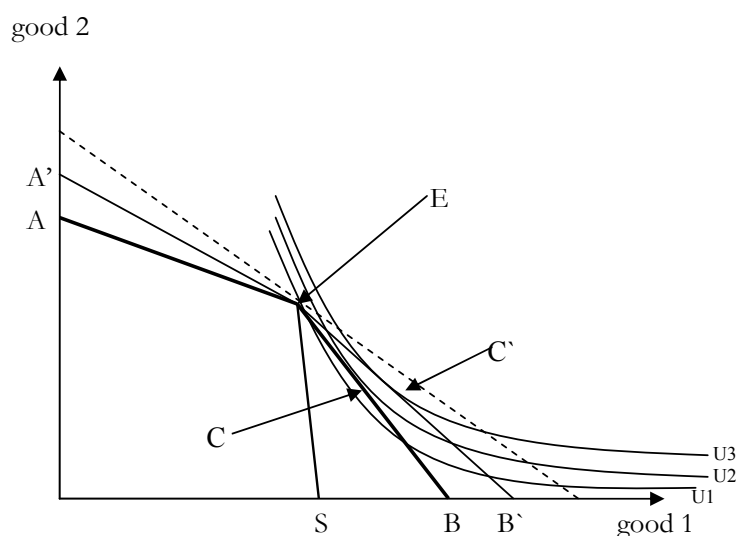
Source: Modified analysis from Niehans (1971)

What happens when we have a positive and high interest rate, and there is a possibility that ex-post TCs would not realize (e.g., I can be a lucky buyer and I can buy a parcel without any law defect)? Now, an agent thinks as follows: I want to make a transaction, so I have to pay some TCs, however, since interest rate is high maybe it would be better not to pay high ex-ante TCs but rather to invest money into profitable capital assets. Let's have an intertemporal interest rate of 30%. In order to make a deal our consumer should pay some TCs. He knows that if he invests 100$ before transaction (ex-ante TCs), then he will face ex-post TCs of 20$ with probability, p=0,2, and 0$ with p=0,8 (instead of 20$ with p=0,8 and 0$ with p=0,2 for ex-ante TCs=0). Thus investing 100$ ex-ante diminishes his expected ex-post TCs from 16$ to 4$, so he saves 12$, however, investing 100$ on the market with 30% interest rate gives him 30$. For sure it is better to put money into the bank account and not to pay high ex-ante TCs. Now, what happens if there is a decline in the interest rate to 10%? If he is a risk-lover, he should invest and not to pay ex-ante TCs. However, if the majority of consumers are risk-averse (or neutral), then they move from investing money into bank accounts (or some capital assets) to pay ex-ante TCs. Let's assume that people generally do not like risk, so a decline in the interest rate makes them use the institutions enabling transactions. That matters especially for the saving-constrained economies. If interest rates are high, then people may not be interested in the shape of the trade-off between ex-ante and ex-post TCs, because they are better-off while putting money into the bank account even if they have to pay ex-post TCs. If it is so, then institutional fabric of the society may deteriorate. Therefore, financial

globalization may have a positive effect on the saving-constrained economies, since it often makes using transaction services necessary and hence it stimulate people to think why a trade-off is such or such. What follows is that they will try to induce, or at least think of, regulatory reforms. Now, after discussing the role of institutions and their potential effects on the extent to which monetary policy affects economy, we come back to basic transmission mechanisms described in section 2 and we show how institutional changes can be integrated into that framework.

3

4. Putting institutions into transmission mechanisms

The interest credit channel. Here we want to check to what extent the transmission mechanisms presented earlier are sensitive to changes in institutional settings. In fact, in our discussion on financial globalization we referred to the interest rate channel. So, the effect of a decline in M can be more negative to changes in Y in case of deteriorating institutions. And, on the contrary, a decline in M but combined with a positive regulatory reform does not necessarily lead to a decline in Y (subscript u stands for an unchanged variable and the number of arrows describes the magnitude of change of a variable in question) and even can be associated with a rise in Y. Systematically, we can write it down as follows:

Deteriorating institutions: $M \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow\downarrow \Rightarrow Y \downarrow\downarrow,$

No change in institutions: $M \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow,$

Positive regulatory reform: $M \downarrow \Rightarrow i \uparrow \Rightarrow I_u$ (or $I \uparrow$) (or $I \downarrow$)[15] $\Rightarrow Y_u$ (or $Y \uparrow$) (or $Y \downarrow$),

We claim here that institutional changes matter for firms' and consumers' behavior. If, for instance, there is a rise in M leading to a decline in i and hence making consumers more willing to buy houses, but, if, simultaneously, government is introducing a new law making acquisition of private property by a public authority easier (e.g., when government wants to acquire land for a new road), then a positive effect of monetary policy may be offset by a negative one resulting from regulatory changes. The same holds for firms. If a decline in i is accompanied by a radical shift in government policy towards private companies, e.g., a deterioration in tax law making it less transparent and predictable, then companies may not increase investment activities.

The Exchange Rate Channel. We have shown earlier that in the case of economies with bad institutions an appreciation of domestic currency may shift investment schedule to the left lowering the investment spending of the producers of tradables (see, Fig. 2b). In case of a non-totally-investment-constrained-economy an appreciation would counteract the positive effect of a decrease in interest rate. How does that relate to the exchange rate channel? First, we should analyze how institutions can affect the sensitivity of exchange rate changes to interest rate movements. Second, we should focus on an extent to which exchange rate matters for net export.

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[15] Here positive changes in regulatory framework can offset a small rise in i. However, if a rise in i is huge enough then a positive change in institutional settings won't change the behavior of investments.

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As for the first issue, we should notice that an appreciation is caused by an inflow of foreign capital leading to a rise in deposits denominated in local currency. However, what investors take into account is not only a higher interest rate, but also a perceived risk of such an investment. That risk is primarily defined by the government actions towards financial system. If the system is transparent and stable with high quality supervisory institutions, then investors generally are more willing to invest. In our framework, for a given ex-ante TCs associated with transaction, they are confronted with a lower ex-post TCs. We can state also that a "real" interest rate a foreign investor is facing is a "nominal" exchange rate minus marginal TCs she is to pay. As the second effect is concerned, what matters is the institutional framework for international trade. Let's assume that a foreign supplier of a given good is not only interested in its relative price but also he takes into account a risk associated with trading. Therefore, a low quality juridical system which makes enforcing the contracts a time consuming and costly activity may make foreign contractors less wiling to export what can result in higher prices they have to offer in order to offset that risk. The situation can be reversed with a positive institutional change abroad and a negative one or a status quo domestically. Schematically, we can write these interdependencies as follows:

(1) $M \downarrow \Rightarrow i \uparrow \Rightarrow$ [in case of well functioning financial markets] $E \uparrow \Rightarrow$ [no change in domestic institutions defining risk associated with trading] $NX \downarrow \Rightarrow Y \downarrow$

(2) $M \downarrow \Rightarrow i \uparrow \Rightarrow$ [in case of well functioning financial markets] $E \uparrow \Rightarrow$ [a change towards domestic institutions non-diminishing risk associated with trading] $NX_u \Rightarrow Y_u$

(3) $M \downarrow \Rightarrow i \uparrow \Rightarrow$ [in case of high TCs in financial markets] $E_u \Rightarrow$ [no change in domestic institutions defining risk associated with trading] $NX_u \Rightarrow Y_u$

(4) $M \downarrow \Rightarrow i \uparrow \Rightarrow$ [in case of high TCs in financial markets] $E_u \Rightarrow$ [a change towards domestic institutions diminishing risk associated with trading] $NX \downarrow \Rightarrow Y_u \downarrow$

Here (1) sequence of events is textbook like. The remaining three are worth commenting on. In case of (2) the government by worsening the institutions (i.e., for the same ex-ante TCs a raise in ex-post TCs) may offset the effect of an appreciation. It means that domestic institutional change can influence the functioning of an exchange rate channel, namely foreign suppliers are no more willing to sell goods for a country with a bad quality institutional settings. As (3) is concerned, there is no change in exchange rate due to high TCs in financial

markets. And in (4) even with no change in exchange rate we may have a change in net export. A quite surprising conclusion, in (4), could thus be that a positive regulatory change can increase *NX* by making foreign investors more willing to sell goods for such a country.

Tobin's q theory. Here monetary policy influences the real side of economy by its effects on the valuation of equities, e.g., falling P_e makes q diminishing and hence firms lower investment spending. Here we should investigate the three steps in that transmission mechanism where institutions can (potentially) matter. First, whether institutions can affect the magnitude by which P_e reacts to changes in M. Second, the role of institutions in defining the interplay between P_e and q. And thirdly, between q and I.

As for the first step, the impact of changes in M on P_e depends on the consumers' reallocation of spending. In monetarist view there is an assumption that consumers are to reduce purchases of equities since they have less money to allocate (an effect of $M\downarrow$). Also, a fall in M leads to an increase in i which makes investments in equities less profitable relatively to bank deposits. An interesting question could be whether by changing institutions consumers can keep their spending on equities unchanged in the presence of a decline in M. In other words, whether they can reduce their non-equity spending. It seems that in a short run for relatively small changes in M government by changing institutions can keep public spending on equities unchanged, e.g., a decline in tax on profits from capital investment can occurred or by an appropriate change in law the government can ease stock trading and makes new entities enter the stock market. However, it is hardly imaginable in practice that public authorities would counteract small changes in M with institutional changes in law defining the functioning of a market for equities. Therefore, institutions do not have an important role in defining the elasticity of changes in P_e to moves of M at least in the short run, however, in the long run, by making the business environment more friendly to business firms, the government can have a positive impact on their profits and hence prices of equities.

Now, how changes in institutional structure of market can affect the impact of changings of P_e on q? As q is defined as market values of firms divided by replacement cost of capital, we should ask how changes in institutions can influence *MVF* and *RCC*. Since *MVF* is just a function of P_e, there should not be a direct role for institutions in defining market values of firms. However, as we have just written above, in the long run the government can positively stimulate the growth of *MVF*. The value of *RCC* is here an "exogenous" variable and is defined internally by a given firm willingness (and need) to acquire new capital.

As for the third step, namely the interplay between q and I, there is an important role for institutions to play. Diminishing q signifies less money companies have to make

investments. However, in the basic Tobin q model there is an assumption that firms in their investment activities are constrained by lack of money, however, we have shown earlier in our debate on financial globalization that in case of investment constrained economies firms are somehow constrained by "bad" institution and not by the lack of financial resources. We can assume that in the situation of growing elasticity of investment schedule of a given economy to changes in i we may have also a growing elasticity of I with respect to q. Thus institutions matter for Tobin q monetary transmission channel. Schematically, we can present that as follows:

$M \downarrow => P_e \downarrow => q \downarrow =>$ [no change in institutions] $I \downarrow => Y\downarrow$.

$M \downarrow => P_e \downarrow => q \downarrow =>$ [positive regulatory reform] I_u (or $I \uparrow$) $=> Y_u$ (or $Y \uparrow$).

Credit channel. In credit channel of monetary transmission institutions are per se important since government interventions have a huge effect on credit supply. However, they are also important in balance-sheet channel where decreasing P_e leads to growing problems of adverse selection and moral hazard and hence to a decrease in lending. Here the role of institutions can be to reduce the problems of adverse selection and moral hazard, i.e., institutions should be used here to diminish informational gap between banks and firms (or private customers) (problem of asymmetric information). If banks can cheaply get information about financial condition of firms (consumers), then they should relatively well cope with adverse selection and moral hazard issues. There are plenty of institutional innovations aiming at reducing asymmetric information between banks and prospective borrowers, e.g., easily accessible registries of debtors, various quality standards the firms can acquire in order to signal external partners about their transparency and quality of management, ethical codes of conduct the firms can introduce, and last but not least an efficient legal system of enforcing contracts, etc. With such institutions, diminishing P_e does not have to lead to a decrease in banks' lending activities, i.e.:

$$M \downarrow => P_e \downarrow => \text{adverse selection} \uparrow \& \text{moral hazard} \uparrow => \text{[better regulations] lending}_u$$
$$\text{(or even} \uparrow) => I_u \text{ (or even } I \uparrow) => Y_u \text{ (or even } Y \uparrow).$$

Also, institutions matter for the way the so-called liquidity-effects channel works. Here it is assumed that in the presence of a growing likelihood of financial distress on the side of consumer he would diminish spending on illiquid assets, e.g., houses. Having in mind that particular markets are naturally characterized by low liquidity, there is however a place for institutional innovations aiming at making such markets more liquid, e.g., by easing the

access to information about possible trading deals, by making land registry and notarial system more efficient, etc. Schematically, it can be noted as follows:

$M \downarrow$ => $P_e \downarrow$ => financial assets $\downarrow$ => likelihood of financial distress $\uparrow$ => [introduction of institutions making housing market more liquid] consumer durable
and housing expenditures$_u$ (or even $\uparrow$) => Y_u. (or even $\uparrow$)

The fact that institutions matter for monetary transmission can have an important effect for economic policy, since by changing institutions one can largely influence the effects of monetary policy. In that sense different institutional settings can explain different results of the same monetary actions in different time periods characterized by diverse regulatory regimes. Some empirical analysis support conclusions of this sort, e.g., Calza et al. (2007) show that the correlation of consumption growth with changes in house prices is higher in countries with more developed mortgage markets; Iacoviello et al. (2008) present evidence that balance sheet channel affects households more in countries with less developed mortgage finance systems[16]. However, the extent by which regulatory policy can be used to offset the effects of monetary actions is limited in the short run since it is difficult to change institutions overnight. Here lies an important difference with fiscal policy which can be changed more quickly. On the other hand, in the medium run, many regulations influencing the ways monetary transmission mechanisms work can be change, including law regulating credit markets where an important role is played by the rules defined by supervisory authorities. That is why while crafting economic policy a due attention should paid to regulatory changes. The post 2008 global crisis proved that regulations matter and that monetary authorities cannot neglect the role institutions play in financial markets.

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[16] A survey of that literature is presented in Boivin et al. (2010).

5. Conclusions

Although we have shown the most important channels of monetary transmission, we are conscious that there are many more to investigate. However, the aim of the paper was just to introduce the issue of the interplay between monetary and regulatory policies. It turned out that the extent to which monetary policy affects the real side of the economy is largely influenced by its institutional fabric. However, in order to be significantly important institutions must not change only not for its own sake but in order to reduce the sum of various transaction costs resulting from an exchange. We have shown also that what particularly matters is the impact of institutions on the elasticity of investments to changes in interest rate or broadly speaking access to capital. That is why we made a reference to the financial globalization debate where the notions of saving and investment constrained economies are used. In the case of the former the monetary mechanism is of a textbook character – a lower interest rate positively stimulates investments. However, in the case of the latter "bad" institutions make a transmission mechanism to stop working – even with low interest rate companies do not want to invest. We think that further research is needed in order to investigate the role of institutions in the way transmission mechanisms are working.

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References:

Acemoglu D., Johnson S. (2005), 'Unbundling Institutions', *Journal of Political Economy*, vol. 113(5): 949-995.

Acemoglu D., Johnson S., Robinson J. (2004), 'Institutions as the Fundamental Cause of Long-run Growth', NBER Working Paper 10481.

Boivin J., Kiley M. T., Mishkin F. S. (2010), 'How Has the Monetary Transmission Mechanism Evolved Over Time?',

Bernanke B. S., Gertler M. (1995), 'Inside the Black Box: The Credit Channel of Monetary Policy Transmission', *Journal of Economic Perspectives*, vol. 9(4): 27-48.

Calza A., Monacelli T., Stracca L. (2007), 'Mortgage Markets, Collateral Constraints, and Monetary Policy: Do Institutional Factors Matter?', CEPR Discussion Papers 6231.

Dixit A K. (2004), *Lawlessness and Economics : Alternative Modes of Economic Governance*, CUP, Cambridge.

Dixit A. K. (1996), *The Making of Economic Policy*, The MIT Press, Cambridge MA.

Dornbusch R. (1998), 'Capital Controls: An Idea Whose Time is Past', in: S. Fischer et al. (eds.), *Should the IMF Pursue Capital-Account Convertibility? Essays in International Finance*, No. 207, Princeton University.

Fischer S. (1997), 'Capital Account Liberalization and the Role of the IMF', speech at the IMF Annual Meetings, September 19, 1997.

Furubotn E. G., Richter R. (2000), *Institutions and Economic Theory*, The University of Michigan Press, Ann Arbor.

Green J., Sheshinski E. (1975), 'Competitive Inefficiencies in the Presence of Constrained Transactions', *Journal of Economic Theory*, vol. 10(3): 343-357.

Hardt Ł. (2009), 'The History of Transaction Cost Economics and its Recent Developments', *Erasmus Journal for Economics and Philosophy*, vol. 2(1): 29-51.

Hardt Ł. (2010), *Ekonomia kosztów transakcyjnych – geneza i kierunki rozwoju*, WUW, Warszawa.

Henry P. B. (2007), 'Capital Account Liberalization: Theory, Evidence, and Speculation', *Journal of Economic Literature*, vol. 65: 887-935.

Iacoviello M., Minetti R. (2008), 'The Credit Channel of Monetary Policy: Evidence from the Housing Market', *Journal of Macroeconomics*, vol. 30(1): 69-96.

Kose M. A., Prasad E., Rogoff K., Wei S. J. (2006), 'Financial Globalization: A Reappraisal', Harvard University.

Lucas R. (1988), 'On the Mechanics of Economic Development', *Journal of Monetary Economics*, vol. 22: 3-42.

Martens B. (2004), *The Cognitive Mechanisms of Economic Development and Institutional Change*, Routledge, London.

Meltzer A. H. (1995), 'Monetary, Credit and (Other) Transmission Processes: A Monetarist Perspective', *Journal of Economic Perspectives*, vol. 9(4): pages 49-72.

Mishkin F. S. (1978), 'The Household Balance-Sheet and the Great Depression', *Journal of Economic History*, vol. 38: 918-937.

Mishkin F. S. (1995), 'Symposium on the Monetary Transmission Mechanism', *Journal of Economic Perspective,* vol. 9(4): 3-10.

Mishkin F. S. (2006), *The Next Great Globalization: How Disadvantaged Nations can Harness their Financial Systems to Get Rich*, Princeton University Press, Princeton NJ.

Modigliani F. (1991), 'Monetary Policy and Consumption', in: *Consumer Spending and Monetary Policy*, Federal Reserve Bank of Boston, Boston, 9-84.

Niehans J. (1971), 'Money and Barter in General Equilibrium with Transaction Costs', *American Economic Review*, vol. 61(5): 773-783.

North D. C. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge MA.

North D. C. (1993), 'Institutions, Transaction Costs, and Productivity in the Long Run', Washington University in St. Louis.

North D. C. (2005), *Understanding the Process of Economic Change*, Princeton University Press, Princeton NJ.

Obstfeld M., Rogoff K. (1995), 'The Mirage of Fixed Exchange Rates', *Journal of Economic Perspectives*, vol. 9(4): 73-96.

Rodrik D. (2008a), 'Second-Best Institutions', NBER Working Papers 14050.

Rodrik D. (2008b), *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*, Princeton University Press, Princeton NJ.

Rodrik D., Subramanian A., Trebbi F. (2004), 'Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development', *Journal of Economic Growth*, vol. 9(2): 131-165.

Rodrik D., Subramanian A. (2009), 'Why Did Financial Globalization Disappoint?', *IMF Staff Papers*, vol. 56(1): 112-138.

Romer P. (1986), 'Increasing Returns and Long-run Growth', *Journal of Political Economy*, vol. 94: 1002-1037.

Svensson J. (2005), 'Eight Questions about Corruption', *Journal of Economic Perspectives*, vol. 19(3): 19-42.

Taylor J. B. (1995), 'The Monetary Transmission Mechanism: An Empirical Framework', *Journal of Economic Perspectives,* vol. 9(4): 11-26.

Tobin J. (1970), 'Money and Income: Post Hoc Ergo Propter Hoc?', *The Quarterly Journal of Economics*, vol. 84(2): 301-317.

Walsh C. E. (2010), *Monetary Theory and Policy*, The MIT Press, Cambridge MA.

Williamson O. E. (1991), 'Comparative Economic Organization: The Analysis of Discrete Structural Alternatives', *Administrative Science Quarterly*, vol. 36(2): 269-296.