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THEORY AND POLICY. CLASSICAL APPROACH
TO INTEREST RATE AND ITS
CONTINUATIONS

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**CONTROVERSY OVER THE INTEREST RATE THEORY AND POLICY.
CLASSICAL APPROACH TO INTEREST RATE AND ITS CONTINUATIONS.**

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Abstract

Interest rate policy is one of the oldest and at the same time most controversial tools with which central bank affects the economy. In fact, it comes down to the central bank initiated changes in the levels of the so-called official interest rates (discount rate, rediscount rate, lombard rate, and others) or influencing the market interest rates through open market operations. A frequent paradox which appears in the historical approach to interest rates is questioning of the causative role of interest rate changes introduced by central banks with reference to dynamics of the so-called real sphere as well as frequent use of this stabilization instrument. In the last few decades, several turnabouts occurred in economic policies (especially, monetary policies) of the industrialized countries. Each time, a new interpretation of interest rate policy was responsible for that [Bednarczyk, 1990, Hubbard, 2002].

One of the trends which appeared in the discussion was an attempt to return to classical roots of the interest rate theory. The concept of the natural rate of interest became the focus of attention. This paper refers to this concept and is an attempt to present the author's own interpretation of it. The final part of the paper presents a study case of the natural interest rate policy of the National Bank of Poland (NBP) in the years 1999-2003. It shows that finding an optimum rate of interest in the transforming economy can be even more difficult than it appears from purely theoretical discussions.

JEL Classification: F, F3, F36

1. Interest rate and actual economic processes

Classical economics considered economy to be a system in which both labor and other resources are fully used; thus, it focused exclusively on explaining in what way the allocation of a given (total) volume of resources for manufacturing applications follows and how the income resulting from production is redistributed among individual production factors. Classical economists discussed the issue in real terms in the sense that money served them to express the processes occurring in economy in the terms of value. However, money could neither influence the magnitude of real terms nor the relations occurring among them.

The pivotal element of classical theories was Say's law of markets which claimed that supply of products always creates its own demand for products as every manufacturer who supplies products to the market does it only in order to substitute them for some other products. In monetary economy it means that each income achieved from production is spent. As refers to savings which appear due to the fact that some participants refrain from expenditures, classical economics treats them as a basis for future spending which, when "shifted" to the producer, is used for investments. In this way the economic circulation is closed at the same time ensuring the full use of factors of production (see Figure 1).

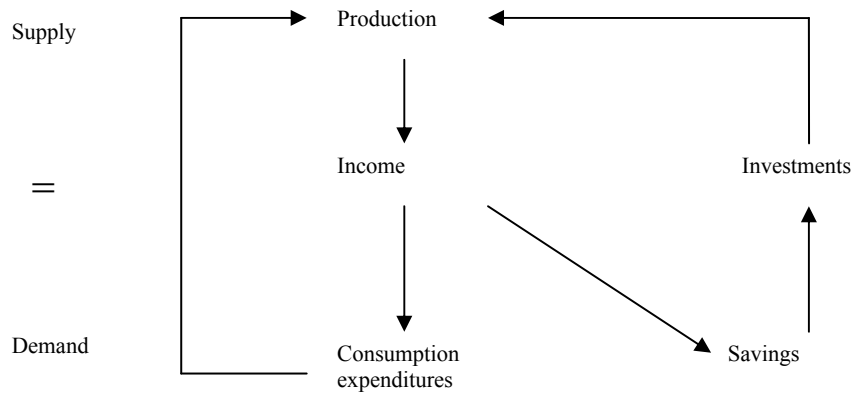


Figure 1. Economic circulation in classical economics

Source: author's own development.

In this system, the interest rate plays the role of a mechanism which equalizes savings and investments. If the magnitude of savings turns out too high in relation to expenditures incurred by entrepreneurs on producer goods, then adjustment processes act towards reduction of savings and at the same time increase in investments (see: Figure 2). The basis of these processes is dependence of savings (O) and investments (I) on changes in interest rates (r) in such a way that the lower the interest rates, the higher the investment expenditures are.

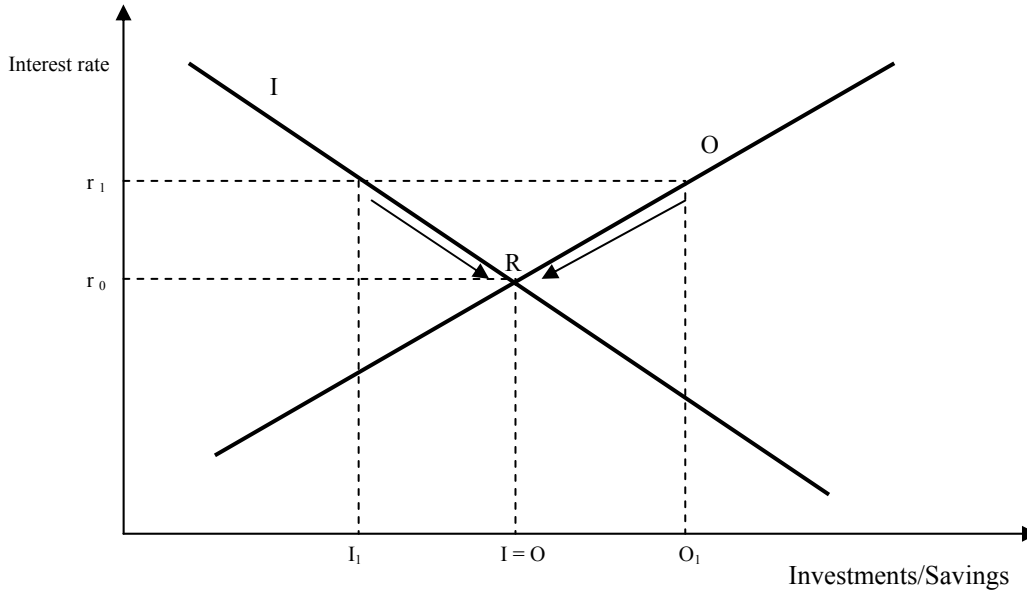


Figure 2. Investments-Savings equilibrium according to classical economics

Source: author's own development

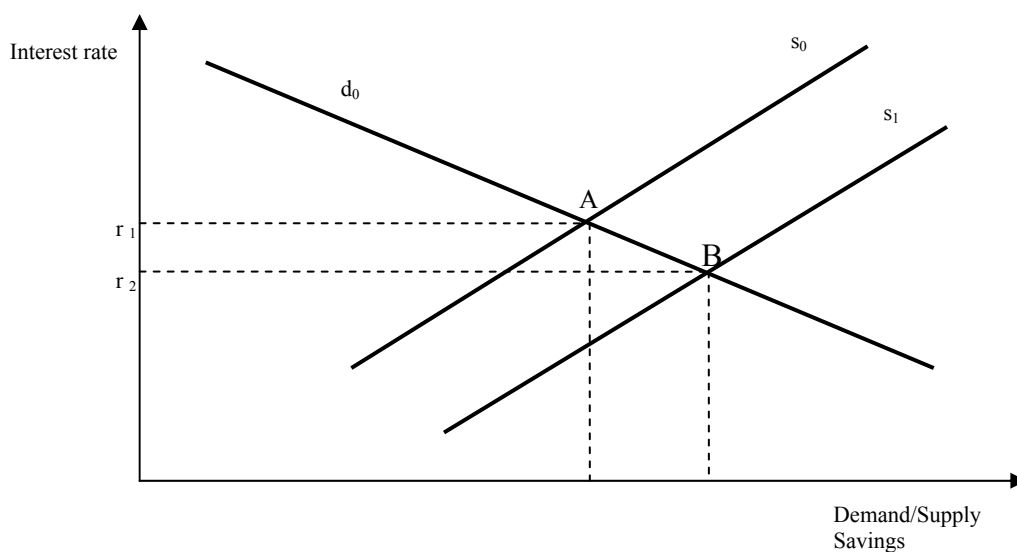
As a result of adjustment processes the equilibrium is established at the point investments equal savings (R) at the interest rate (r_0) which refers to this equilibrium and full employment.

The mechanism which assists interest rates in equalizing savings and investments is the price mechanism. For example, in the situation when investment demand grows, a price rise

follows and, consequently, profits of producers of these goods fall. This leads to the shift of part of resources from consumer goods production to investment goods production, which allows to meet the extra demand appearing there.

From the point of view of modern economics, classical equilibrium restoring mechanisms are not fully convincing. For example, it is difficult to imagine the policy increasing investment expenditures in the situation of declining consumption demand. For the classics, this practical experience would not have been internally contradictory as they believed that decisions concerning a lower consumption now translate directly into a higher consumption in future (Dillart, 1948).

Equally problematic are classical assumptions concerning dependencies of savings and investments on interest rate changes. They were justified by intuition rather than science. According to the classical theory each increase in savings supply (s_0) at given demand (d_0) must lead to a drop in the rate of interest (see: Figure 3). Thus, existence of a positive interest rate is assumed. However, it is possible to imagine a situation in which a rise in savings will occur without changes in interest rates as well as a situation when an increase in the interest rate will not be accompanied by higher savings but just the contrary, lower savings. We can encounter the former situation in the periods of economic slumps, whereas the latter may occur when economic subjects find it advantageous to use the earlier accumulated savings to attain higher incomes (e.g. in the period of economic boom).



Rysunek 3. Savings growth effect - classical theory

Source: author's own development

Equally problematic is direct linking of investment activities with the interest rate. The interest rate can be certainly considered a crucial factor determining investment activity as it defines investment credit costs. It must be borne in mind, however, that enterprises, while making decisions, take into account other, equally important factors, such as, for example expected production costs and prices, possible markets, etc. As a result, especially in the situations of extremely pessimistic expectations concerning the business cycle development, it may happen that the interest rate will play the role of a savings/investments equalizing factor at full employment of factors of production [Tease, Dean, Elmeskow, Hoeller, 1991].

2. K. Wicksell's approach

K. Wicksell's theory develops the classical interest rate theory. Wicksell differentiated between the market interest rate and the so-called natural rate of interest. The market interest rate is established as a result of the supply-demand game in the market of credits. On the other hand, the concept of the natural rate of interest is very similar to the concept of the interest rate presented in classical literature. Namely, it is the interest rate ensuring the equilibrium between demand for investment credits and savings supply which satisfies this demand. The natural rate of interest responds to the income expected from new investments. Economy is in equilibrium only when the market interest rate equals the natural rate of interest (the situation of the so-called normal interest rate).

We deal with a deviation of the market interest rate from the natural rate when the central bank decides to run an expansionary monetary policy (increased money supply). In such a case, side by side with money supply matching the savings, additional supply appears matching the bank created credit. An increase in money supply leads to reduction in the market interest rate which, at unchanged investment productivity, leads to improved production conditions, increased demand for factors of production and consequently – a price rise.

The theory of economics embraced so-called Wicksell's process [Issing, 1984, Amato, 2005] which makes economic fluctuations conditional on the relations occurring between the market and the natural rate of interest. Both a price rise and price drop can result from this process. Interdependencies occurring in Wicksell's process are shown in Figure 4. Lines I and O indicate investments and savings respectively, r_n – natural rate of interest, while r_1 and r_2 – market interest rates. When the market interest rate goes downwards from the natural level and reaches the value of r_2 - the effect of increased money supply. – then it can entail a tendency toward investment growth (I_2) above the I level at which investments will equal the savings (O). Investment growth ($I_2 > I_1$), however, encounters a barrier in the form of reduced savings ($O_2 < O_1$). More savings would be possible at increased interest rates, which, in turn, could result in limited investments. Equilibrium is possible at the moment investments equal savings and the market interest rate equals the natural rate of interest.

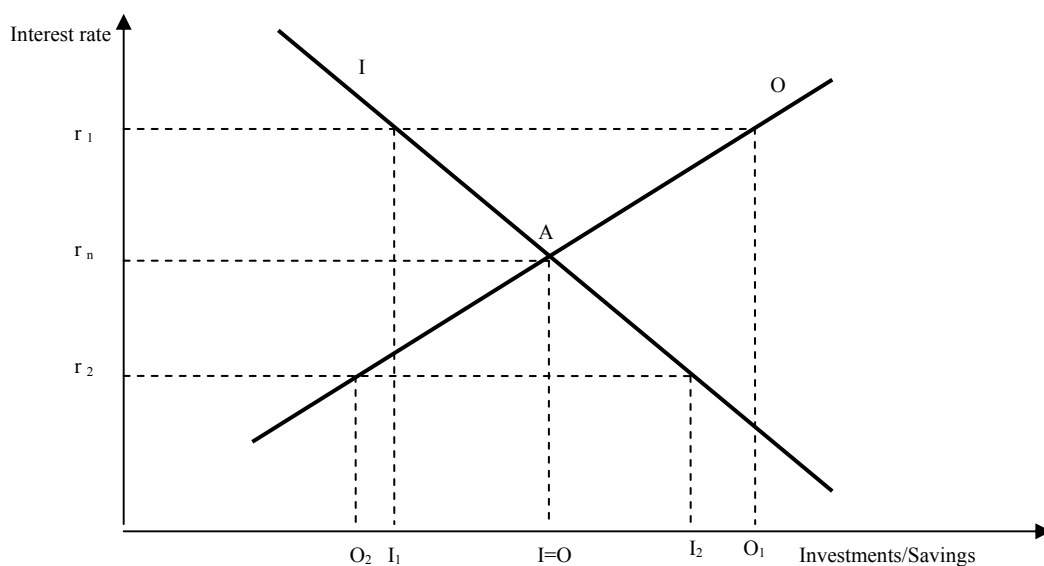


Figure 4. Wicksell's process
Source: author's own development.

From the point of view of Wicksell's process it is important that in the situation of full price elasticity, an increase in money supply actually does not cause any change in the magnitude of real savings (savings, investments, employment) but only the price rise. The price rise will follow as long as the market interest rate is lower than the natural rate of interest ($r_2 < r_n$). Analogical Wicksell's process will occur in the situation of the limited money supply. Here an increase in the market interest rate will be accompanied by reduced prices of the factors of production as well as the goods and services produced by them.

In the last few years, Wicksell's doctrines have also been an inspiration for many theoreticians involved in the theory as well as policy of interest rates. It is a result of the growing significance of the interest rate regulation as a tool of fighting and stabilizing inflation. At the same time the concept of the natural rate of interest underwent significant evolution. Economists involved in this problem named it in different ways as well as interpreted it differently [Blinder, 2001, Laubach, Williams, 2001, Ferguson Jr. 2004, Berge, 2003] and as a result they had different opinions concerning its place in the transmission mechanism of monetary impulses to economy.

3. Natural rate of interest and its limitations

One of the more commonly accepted modern definitions of the natural rate of interest is the one put forward by A. S. Blinder, who defines it as a real interest rate stabilizing inflation at the production size matching the potential level [Laubach, Williams, 2001]. The so defined natural rate of interest is a category defining both changes occurring in the nominal sphere (price changes) as well as in the real sphere (potential production – real production). Thus it can be used for the analysis and interpretations of changes occurring in the entire economy¹.

In an attempt to assess practical usefulness of the modified and modernized version of the natural rate of interest, let us assume that the central bank wants to change interest rates in order to curb inflation. The problem is the scale of activities which would allow to attain the goal and at the same time would not contribute to limiting economic activities or growing unemployment. To prevent these, the central bank should be aware of the interest rate levels which match a long-term equilibrium of the main macroeconomic categories (production, employment, inflation, etc.) and should control the changes in interest rates in such a way as to make them identical with the equilibrium assuring rates. The problem, however, lies in the fact that the central bank regulates nominal interest rates and only indirectly affects real interest rates which have an influence on the dynamics of economic processes.

The search for real interest rates assuring equilibrium at which inflation tends to stabilize while production potential is fully used can be conducted in two ways. The central bank can assess the interest rate ex post by the method of time series analyses applied for interest rates and key macroeconomic quantities or find its magnitude as a result of the analysis of econometric models defining interrelationships occurring in a given economic system. It is interesting that so calculated values of the natural rate of interest do not have to be equal to one another. What is more, they can change in time depending, for example, on changes in labor productivity, forecasts concerning changes in business with reference to prospective activities or changes in fiscal policy.

The natural rate of interest is a category not observed in practice, changing in time and difficult to grasp by means of available research instruments. Nevertheless, the central bank can treat it as an indicator of the monetary policy character and can observe effects which

such a policy causes in economy. The principles of using this concept for the monetary policy analysis is presented in Figure 5. The real interest rate (r) is laid off on the vertical axis, while the production level and inflation are on the horizontal axis. In point A, for which the real interest rate matches the natural rate level (r_n), economy is characterized by stable inflation and fully used production capacity. Production matches the potential magnitude (P_p), unemployment coincides with natural unemployment.

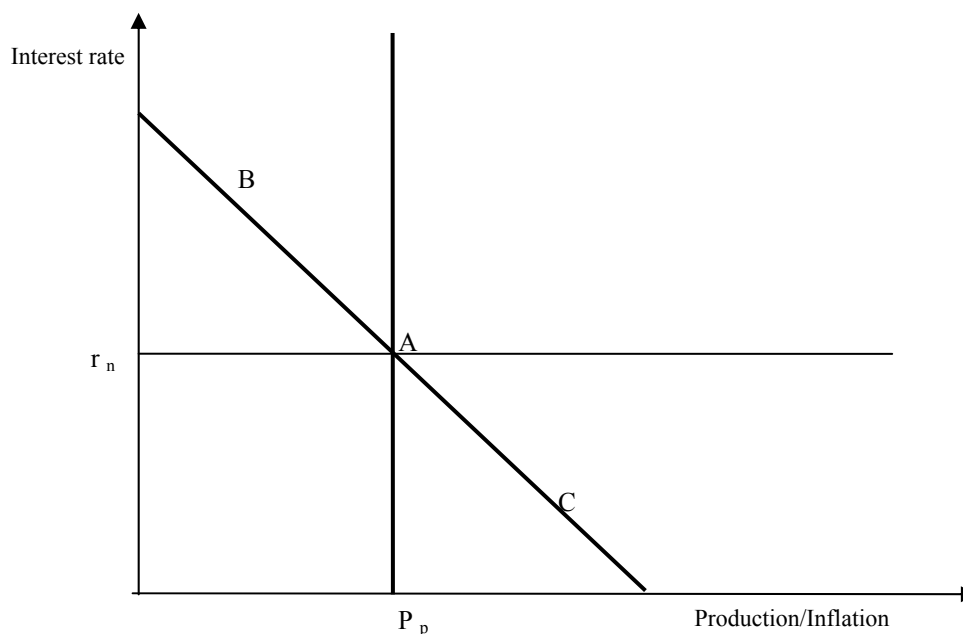


Figure 5. Natural rate of interest and effects of central bank's monetary policy

Source: author's own development.

Each activity of the central bank which results in making the economy lose its equilibrium in point A is harmful for this economy. A shift towards point B means that the central bank's monetary policy is too restrictive, which entails increased real interest rates, growing savings, reduced spending and, consequently, a drop in production and employment. On the other hand, a shift of economic equilibrium towards point C indicates too expansive monetary policy which entails decreased real interest rates, lower savings, higher spending, growth in production and consequently higher inflation.

The analysis of Figure 5 suggests that an attempt on behalf of the central bank to keep the economic equilibrium in point A can be quite difficult and resembles balancing on a tightrope where the position is unstable and the only method of keeping the balance is actually the hit-and-miss style. Establishment of the economic equilibrium in this very point is possible only with some probability (never 100% certainty) on account of numerous factors affecting changes in the natural rate of interest.

Although maintaining economic equilibrium in point A can turn out to be very difficult (a normal situation is rather a departure from the equilibrium), yet – as the advocates of this concept claim – what is important here for monetary policy is the very definition of the actual standing of the economy with reference to point A. In their opinion, this determines practical usefulness of the concept of the natural rate of interest [Brzoza-Brzezina 4/2004].

It must be stated, however, that in different economic situations restoring equilibrium will require different intensity of activities on behalf of a central bank. The scale of these activities determines sensitivity of the production scale to changes in interest rates. Figure 6 shows two different situations of an economy - B and B'. Situation B refers to the situation of low production sensitivity to interest rate changes, whereas situation B' refers to higher sensitivity. Let us assume that both situations meet the condition $P < P_p$. If we treat B as the starting point, reaching equilibrium in point A requires a much larger reduction of interest rates than in the case of B'. Bigger oscillations of interest rates which accompany their reductions create a risk of "overshooting" the reductions and temporary shifting of the equilibrium below point A towards point C and more intense inflation processes.

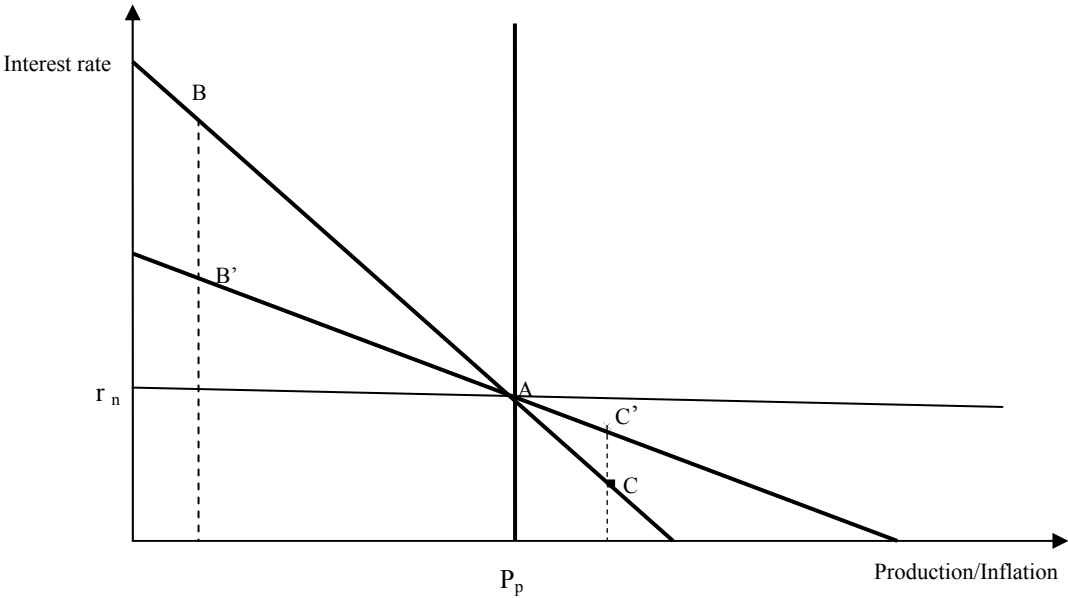


Figure 6. Natural rate of interest and production sensitivity to changes in real interest rates
 Source: author's own development.

The central bank's knowledge of real production reactions to interest rate changes is of crucial importance here. This reaction can change as the real interest rate approaches the natural level as well as after this level has been exceeded. In both situations when the real interest rate is higher than the real level and in the situation when it is lower, its reduction can bring about different reactions in relation to production and inflation, hence the effects can be asymmetrical. To the left from point A reductions in real interest rates can be accompanied by higher than proportional increase in production. On the other hand, to the right from point A – higher than proportional price rise. The latter phenomenon can make the central bank overreact by excessive "tightening" of monetary policy, which can turn economy back to the situation when real production is again lower than the potential value.

A factor which makes using the concept of the natural rate of interest more difficult in practice can be changes in economy which trigger off permanent or sustainable changes in the real sphere. Such changes can be brought about by persistent anti-inflation policy insisting on inflation close to zero in the situation of external supply-side shocks disturbing economic equilibrium (Japan, Germany). In such a case, at a given natural rate of interest there is high probability that production will stay permanently below the potential level. In Figure 7, this

matches a shift of line a to position a', where point B indicates a given level of the natural rate of interest but a lower production level and higher unemployment rate.

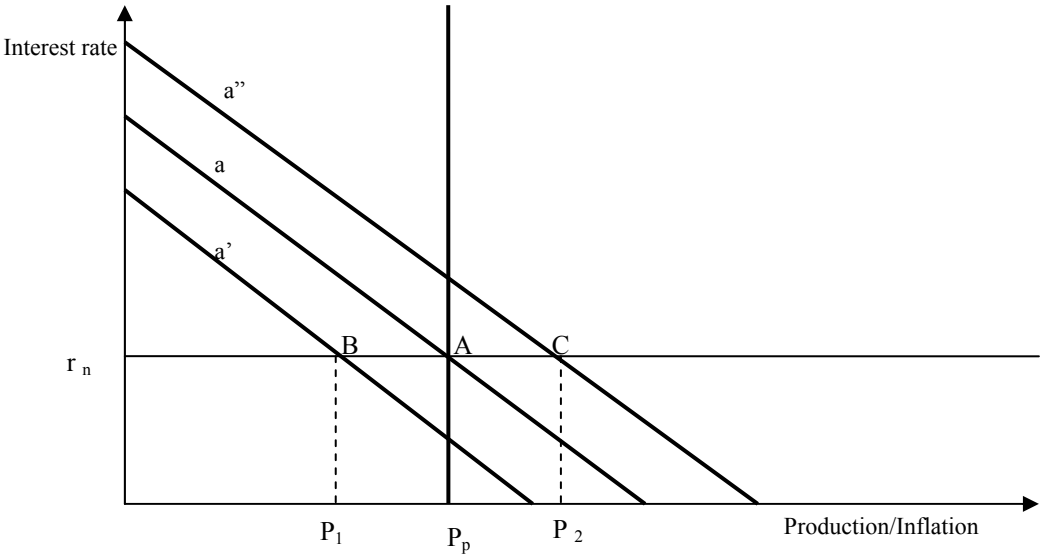


Figure 7. Natural rate of interest and fiscal impulse
 Source: author's own development.

Authorities can revive economy by, e.g. tax reduction. However, they are not able to determine the influence of these reductions on production and price stability. Because the tax reduction effect is not absolutely certain, one can assume a situation when economic equilibrium is shifted along the line indicating the natural rate of interest to point C, lying on the upper curve defining the relationship between the real interest rate and production output (a''). The economic situation in point C is characterized by a higher production output but also by higher inflation, which may be not tolerable for society. In this case authorities' last resort is implementation of de-inflationary policy by raising interest rates in such a way that the real interest rate reaches the value $r_1 > r_n$. In point D economy functions in the situation of a full use of production capacity (at potential production output and natural unemployment), but at a higher equilibrium rate. The central bank faces a dilemma: which level of the real interest rate should be treated as the reference point in its monetary policy.

Thus, the ease in formulating the concept of a natural rate of interest does not go hand in hand with an easy of application of this concept in economic practice. Despite problems with a precise definition of the natural rate of interest at a given time, the central bank referring to this concept may make wrong decisions distancing the economic system from the permanent equilibrium situation in the point where the natural rate of interest equals potential production output at stable inflation. It may result, among others, from different production sensitivity to interest rate changes in different economic situations (real production close to or distinctly different from the potential status) or be connected with the influence of fiscal impulses on real economic processes. As a result, it is possible to imagine a situation when economic equilibrium never or only accidentally is in the point determined by the assumptions of the concept. This weakens usefulness of the natural rate of interest as a long-term instrument of stabilization².

4. Specificity of interest rate policy

As a rule, the interest rate policy conducted by the central bank is not a target in itself, i.e. the central bank does not tend to maintain a specific interest rate level (whether nominal or real) in the long-term but tries to affect the level and structure of interest rates in such a way as to achieve a desired degree of accomplishment of the so called ultimate objectives of economic policy, which usually means inflation indices and economic growth. Achieving a specific level of interest rates is treated as the so-called intermediate target which may play a crucial role in achieving the ultimate goals.

Frequently, the interest rate policy is implemented in the context of other tools of monetary policy such as changes in required reserves, direct control of banks' credit activities, changes in the so-called rediscount rates and others that affect its course and effectiveness. Despite a relatively wide range of tools of interest rate policy to influence economy (and support from other instruments of monetary policy), its effectiveness in achieving ultimate goals is limited from a start due to the fact that it is orientated on modification of decisions of financial intermediaries (mainly commercial banks) and not the subjects on which, the inflation or scale of economic activities ultimately depend (enterprises, households). The way in which financial intermediaries respond to changes in interest rates depends on many factors which include, among others, "monopoly power" of banks and financial institutions, financial innovation processes, using the possibilities which are given to financial intermediaries by the global market and others [Bednarczyk, 2002, Dąbrowska, Gruszczyński, 2002].

A specific barrier which financial intermediaries create for the interest rate policy does not entirely separate a central bank from the decisions of subjects of the real economy sector. The linking element are expectations. Changes in interest rates introduced by a central bank are perceived as a forecast of future decisions which can change the economic climate quite distinctly. Even if they do not have a significant influence on the current situation in economy, they may have a significant influence on decisions which determine future economic activities, just through a change in the character of expectations [Alleese, 2001].

Interest rate fluctuations affect the real sphere through both investors and consumers' decisions. Probably, investors are more sensitive to changes in interest rates than consumers. Despite the fact that the tax system reduces the real influence of higher interest rates on credits on costs of enterprises, investors – by treating interest rates as a sort of a barometer indicating future conditions of economic activities (growing demand prospects) - react to growing interest rates by limiting demand for credits and limiting the scope of their business activities. Modern researchers are quite reserved in the matter of the scale of direct influence of changes in interest rates on investments in fixed capital or working capital. They only emphasize the unquestionable influence of interest rate changes on housing industry [Mishkin, 2002, Mishkin, 2001]. This type of business activity requires long-term investments and significant initial outlays which make interest on capital an important cost component.

It is even more difficult to show the relationships between changes in interest rates and consumers spending as spending changes pro-cyclically, i.e. it grows in the period of economic boom (higher employment and higher wages) and declines in the recession period (higher unemployment, lower wages). Also pro-cyclical behavior of interest rates (they grow in the boom period and go down in the recession period) seems to indicate that consumers' expenditures respond to changes in interest rates to a small degree but they depend on other parameters rather, such as individual incomes, availability of jobs (job security), etc.

Nevertheless, the influence of changes in interest rates on the structure of household net assets and consequently on the demand for securities, shares, fixed assets (houses, flats) etc. is no longer questioned. These changes, in turn, have a long-term influence on both company investments and household expenditures.

A variety of channels through which interest rates affect economy causes that the interest rate policy effects on the so called ultimate targets are delayed and varied in intensity. Delay and intensity change depending on the financial infrastructure development, business cycle, external environment and others. In some cases changes in interest rates can cause desired changes in inflation or employment in the course of just few quarters of the year. In some other cases the scale of changes (in response to similar changes in interest rates) can be insignificant and much delayed in time (by two or even more years). This changeable reaction of economy to stimuli of interest rate policy imposes special responsibilities on a bank in the field of this policy planning and implementation.

One can distinguish at least four aspects of activities preceding a central bank's decision concerning changes in interest rates. They include: 1/ analysis of the economic situation and forecast concerning its changes, 2/ diagnosis of the economic situation from the perspective of the targets to be achieved by the interest rate policy, 3/ making a decision about changes in interest rates, 4/ choice of time (date) to implement the decision. Even without a detailed analysis of particular aspects it must be emphasized that at each stage of preparing a decision about changes in interest rates, a central bank should communicate with the market in order to prepare the stage for this decision. Only then is there a chance to initiate changes conformable with the targets of the conducted policy and avoid market reaction contrary to authorities' policy. It refers mainly to economies functioning in the situation of a significant market openness. Decisions concerning interest rates and affecting exchange rates and international capital flows can, in some circumstances, be a cause of violent financial shocks if other countries understand them as an expression of a fundamental weakness of economy (e.g. increased interest rates to save exchange rates).

Thus, an appropriate interest rate strategy is the basis of its success. It must combine not only a central bank's deep knowledge about the mechanisms by which interest rates influence the economic system but also take the influence of expectations into account as well as something that may be defined as market psychology which is a sphere in which a game between the central bank and economic life participants is played. J. Tobin presents the nature of this game in an excellent way when he writes about the American Federal Reserves System's (FED) policy with reference to interest rates. "At scheduled meetings eight times a year – and occasionally at other times – the Federal Reserves System's "Federal Open Market Committee" (FOMC) reconsiders and sometimes changes the intervention rate, generally by 25 or 50 basis points, rarely by more. The tail wags the dog. By gently touching a tiny tail, Alan Greenspan wags the mammoth dog, the great American economy. Isn't that remarkable? The federal funds rate is the shortest of all interest rates, remote from the rates on assets and debts by which businesses and households finance real investment and consumption expenditures counted in GDP. Why does monetary policy work? It's a mystery, fully understood by neither central bankers nor economists" [Tobin].

5. In search of appropriate interest rates – the case of the National Bank of Poland (NBP) in the years 1999-2003

For many reasons it is impossible to compare the American economy to the Polish one. First of all, it is much bigger; secondly, market mechanisms have been the basis of its functioning

for centuries; thirdly, the institutions of the American economy (for instance, FED) have a well- and long established tradition of good co-operation with the business sector, and business has placed trust in these institutions. Therefore, FED is perceived not only as an independent element of the state but also as an informal leader in economy.

Despite evident differences in the scale and structure, there are some elements in FED policy which deserve a special mention and should be analyzed from the point of view of their possible use by other economies, also the Polish one. These elements include ability of a balanced attitude to goals which economy is targeting and stability of instruments used in order to achieve the goals. Despite changes in the economic situation, changes in the doctrine of the economic policy foundations, disturbances of shock nature (wars, energy crises, exchange rate crises, etc.), FED formulates its targets in compliance with the 1946 Employment Act which obliges it to run such policy which safeguards “maximum employment, production and purchasing power” [Tobin]. At the same time the main instrument of this policy implementation is (except a short break in the years 1979 – 1982) the interest rate regulation. The United States is a country which traditionally reports high indicators of economic growth, employment and low inflation indicators.

The National Bank of Poland (NBP), like a number of other central banks (including the European Central Bank) focuses on different elements in its policy. In 1998 it rejected a balanced approach to the so-called ultimate targets of economic policy and opted for one target only, namely fighting inflation. A theoretical basis of this strategy are assumptions of new classical economy and monetarism which treat price stability as a sine qua non and sufficient condition of economic development at full employment of the factors of production. The official doctrine the NBP referred to in its documents of the said period was that of inflation targeting, which was a less one-sided plane of economic and monetary policy than the above mentioned theoretical systems (i.e. not only price stability-orientated)³. This doctrine postulates a wide band of the inflation target specification and a longer time range to beat inflation. In fact it is an attempt to find a compromise between fighting inflation and relieving the unemployment problem. The central bank which follows this doctrine should attach also much attention to “overshooting” of the inflation target (i.e. achieving inflation higher than the upper bound of the target range) as well as “undershooting” of the target (i.e. achieving inflation lower than the lower range of the target). This type of policy is to convince economic subjects that the central bank will, on the one hand, dampen a price rise consistently, but on the other hand will not allow a significant production (employment) drop. Creating the climate of mutual understanding between a central bank and the economic life participants seems to be a cornerstone of the inflation targeting doctrine and strategy. Consistent application of this doctrine should result in: achievement of real inflation indices approaching the assumed inflation target, practically no conflicts between the government and the central bank (as government shows understanding for the anti-inflation policy of the central bank, and the central bank understands the necessity of sustainable economic growth) and, what is equally important, a stronger social support for the central bank, strengthening of its authority and independence. The relevance of the last aspect of the inflation targeting policy is so great because it affects reduction of total costs of the anti-inflation policy. Inflation targets are achieved more quickly and at lower production losses⁴.

Although the strategy targets seem to be clear, the analysis of the NBP’s monetary policy (practically interest rate policy) in the years 1999-2003 seems to be incompatible with its assumptions. In particular the years 2001-2003 are sort of a strange phenomenon in the central banks’ practice and deserve an in-depth analysis. What is meant here are the inflation targets set annually by the Monetary Policy Council and real price changes. For example, in

2002 the departure from the average inflation target value was 84% (!). In the course of three years (2001-2003), the arithmetic mean of deviations (undershooting) amounted to 58.6%. What is more, this policy was conducted in the situation of stagnant economic growth, significant drop in investments in constant capital, reduced GDP share of gross outlays on fixed assets from 23.9% in 2000 to 19.2% in 2002 (i.e. 4.7 percentage points) and a significant increase in foreign debt of enterprises (by 13.8 billion USD) in the period from 2001 to 2003.

An increase in foreign debt of enterprises resulted directly from the NBP implemented policy of interest rates. Although since the beginning of 2001 the Monetary Policy Council had reduced interest rates (until June 2004), the pace of reductions was definitely too slow in relation to the progress in inflation fighting, economic growth in economy and situation in the labor market (see: Table 1).

Table 1:

Inflation targeting strategy in NBP's policy in the years 1999 – 2003 (%)

Specification	1999	2000	2001	2002	2003	2004 ⁵	2005	2006	2007 ⁶
Inflation target ¹	6.6–7.8	5.4- 6.8	6.0-8.0	5.0±1.0	3.0±1.0	2.5±1.0	2.5±1.0	2.5±1.0	2.5±1.0
Real price changes	9.8	8.5	3.6	0.8	1.7	4.4	0.7	1.4	2.3
Inflation target overshooting (+), undershooting (-) ²	+36.1	+39.3	-48.6	-84.0	-43.3	+76.0	-72.0	-44.0	-8.0
Real rediscount rate ³	9.2	13.0	10.4	6.7	4.1	2.6	4.1	2.9	2.7
Real interest rate on credits for enterprises ³	9.9	10.1	12.3	10.1	8.8	3.4	5.7	4.3	6.1
Gross outlays on fixed assets ⁴	6.6	2.7	-9.7	-6.3	-0.1	6.4	6.5	16.5	14.8
Real GDP growth rate	4.5	4.3	1.2	1.4	3.9	5.3	3.6	6.1	6.7
Unemployment rate ⁵	14.0	16.1	18.2	19.9	19.6	19.0	17.7	13.8	11.2

1) December to December inflation. 2) Calculated as a percentage deviation of the real inflation rate from the mean value of the inflation target. 3) Respective nominal interest rates minus December to December inflation index. 4) Previous year = 100, stable prices. 5) The year 2004 was the one when Poland joined the European Union. 6) Data for August/September 2007.

Source: GUS, <http://stat.gov.pl>, OECD, <http://www.oecd.org>.

As a result, in 2001, real interest rates on bank credits for enterprises reached the level of 12.3% and undoubtedly, in this way they became one of the main reasons for the above mentioned regression in investment markets. In the following years, the regression translated into the highest unemployment rate (20%) reported in the whole period of transformations in Poland and in the whole group of OECD countries. In the 1990s only Slovakia was temporarily close to this level [OECD, 2004, Tables 13, 14].

In the years 2001-2003, when the Monetary Policy Council declared the application of the inflation targeting strategy as a basis of monetary policy, it actually implemented the scenario close to the orthodox monetarism which resulted in excessive tendency to “sacrifice” production and employment⁵. Instead of being an active instrument of macroeconomic

stabilization, the interest rate policy played a totally passive role and due to this the Polish economy paid unproportionally high costs for temporary attainment of almost full price stability (0.8% in 2002).

6. Conclusions

The whole epoch has passed and the issues concerning interest rates presented by classical economics and K. Wicksell are still open. Theoretical discussions though not decided have become a valuable inspiration for economic practice and, in particular, for the central banks' policies treating the interest rate as a key instrument in their activities aimed at the financial and real sector. The models of economic interrelations developed by these theories which used interest rate mechanisms allow to consider consequences of potential business activities, yet they do not allow to avoid mistakes, as the principles of economy functioning are not entirely identical with those on which purely theoretical models rely.

Notes:

1. Interesting attempts of applying the concept of the natural rate of interest were undertaken by M. Brzoza-Brzezina. See: by the same author: Issues of the natural rate of interest, *Ekonomista* No 4/2003; The Role of the natural rate of interest in the Polish monetary policy.
2. A similar objection can be formulated with reference to the interest rate policy based on the so-called "monetary rules". See: J.B. Taylor, Using Monetary Policy Rules in Emerging Market Economies, Stanford University, December 2000 and A. Khan, R.G. King, A. Wolman, Optimal Monetary Policy: NBER Working Paper Series No 9402.
3. See: Medium-term strategy of monetary policy for the years 1999 – 2003., Annex to the resolution of the Monetary Policy Council., MP of 25.10.98., as well as Monetary policy strategy after 2003, NBP., Dep. Kom. Społ., Warszawa February 2003.
4. On the subject of the essence of the BCI strategy see. Drop J., Wojtyna A., Strategy of direct inflation target: theoretical premises and experiences of selected countries. NBP Materiały i Studia, Zeszyt No. 118, Warszawa February 2001. and Mishkin S.F. Structural issues in effective policy of inflation target planning in the countries undergoing system transformations in: XXII Scientific Conference NBP, „Structural versus monetary policy”, Falenty 2002, www.nbp.pl.
5. On the subject of the influence of high unemployment on effectiveness of monetary policy see: Dornbusch R. Debt and Monetary Policy. The Policy Issues. NBER Working Paper Series. Working Paper 5573 May 1996 p. 25 and onwards.

Bibliography

1. Amato J.D., The Role of the Natural Rate of Interest in Monetary Policy. BIS Working Papers, No. 171, March 2005.
2. Bednarczyk J., Polityka pieniężna przeciw inflacji. Studium gospodarki kapitalistycznej, PWN Warszawa 1990.
3. Bednarczyk J.L., System bankowy a gospodarka. Uwagi o polskiej transformacji., IV Symposium Instytutu Ekonomii i Zarządzania PŚK(*Banking system and economy. Remarks on Polish transformation, IV Symposium of the Institute of Economics and Management*), Kielce 27.01.2003., w: *Ekonomia Technika Zarządzanie*, cz. II, PŚK Kielce 2002.

4. Bednarczyk. J.L., Polityka pieniężna przeciw inflacji. Studium gospodarki kapitalistycznej (*Monetary policy against inflation. A study of capitalist economy*). PWN Warszawa 1990.
5. Bergo J., The Role of Interest Rate in the Economy. BIS Review 46/2003.
6. Blinder A.S., Bankowość centralna w teorii i praktyce (*Central banking in theory and practice*), CeDeWu, Warszawa 2001.
7. Brook A-M., Recent and Prospective Trends in Real Long – Term Interest Rate: Fiscal Policy and Other Drivers., OECD Economics Dep. Working Papers, Nr 3,6,7, <http://www.oecd.org/eco>.
8. Brzoza-Brzezina M., Rola naturalnej stopy procentowej w polskiej polityce pieniężnej (*The role of the natural rate of interest in Polish monetary policy*), Ekonomista nr 5/2003.
9. Brzoza-Brzezina M., Zagadnienie naturalnej stopy procentowej (*Issues of the natural rate of interest*), Ekonomista nr 4/2003.
10. Dąbrowska K., Gruszczyński M., Kapitał zagraniczny w polskim sektorze bankowym a efektywność polityki pieniężnej (*Foreign capital in the Polish banking sector*), in: XXII Konferencja Naukowa NBP – Reformy strukturalne a polityka pieniężna, Falenty 2002.
11. Dillart D., The Economics of J.M. Keynes, The Theory of a Monetary Economy, Prentice- Hall, Inc. Englewood Cliffs, N.J., 1948.
12. Dornbusch R. Debt and Monetary Policy. The Policy Issues. NBER Working Paper Series. Working Paper 5573 May 1996.
13. Drop J., Wojtyna A., Strategia bezpośredniego celu inflacyjnego: Przesłanki teoretyczne i doświadczenia wybranych krajów (*Direct inflation target strategy: theoretical premises and experiences of selected countries*). NBP Materiały i Studia, Zeszyt nr. 118, Warszawa luty 2001.
14. Ferguson R.W. Jr, Equilibrium Real Interest Rate – Theory and Applications, BIS Review 64/2004.
15. Główny Urząd Statystyczny, <http://stat.gov.pl>.
16. Hubbard G.R. Money, the Financial System and the Economy, IV ed. Pearson ed, INC, New York 2002.
17. Issing O., Einführung in die Geldtheorie, Auflage. Verlag Vahlen, München, 1984
18. Khan A., King R.G., Wolman A., Optimal Monetary Policy. NBER Working Paper Series No. 9402
19. Laubach T., Williams J.C., Measuring the Natural Rate of Interest, Board of Governors of FRS, November 2001.
20. Mc Alleese D., Economics for Business. Competition, Macro – Stability and Globalisation, II ed, Prentice Hall. London 2001.
21. Mishkin F.C., The Economics of Money, Banking and Financial Markets, VI ed. Addison Wesley Longman 2002.
22. Mishkin F.C., The Transmission Mechanism and the Role of Assets Prices in Monetary Policy, NBER Working Paper Series, Working Paper nr. 8617, Dec. 2001, <http://www.nber.org/papers/w8617>.
23. Mishkin S.F. Zagadnienia strukturalne w skutecznej polityce planowania poziomu inflacji w krajach transformacji ustrojowej (*Structural issues in effective planning of the inflation level*), [in:] XXII Konferencja Naukowa NBP, „Reformy strukturalne a polityka pieniężna”, Falenty 2002, www.nbp.pl.
24. OECD. Economic Outlook. Statistical Annex Tables, nr. 75/2004, <http://oecd.org>.
25. Średniookresowa strategia polityki pieniężnej na lata 1999 – 2003, Załącznik do uchwały RPP, MP z dnia 25.10.98.

26. Strategia polityki pieniężnej po 2003 roku. (*Medium-term strategy of monetary policy*), NBP., Dep. Kom. Społ., Warszawa February 2003.
27. Taylor J.B., Using Monetary Policy Rules in Emerging Markets Economies, Stanford University, December 2000
28. Tease W., Dean A., Elmeskow J. and Hoeller P., Real Interest Rate Trends. The Evidence of Saving, Investment and Other Factors. OECD Economic Studies, No. 17, Autumn 1991
29. Tobin J. Monetary Policy: Recent Theory and Practice, <http://cowles.econ.yale.edu>.

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