

---

---

## MONETARY POLICY UNDER CONDITIONS OF NAIRU “FLATTENING”\*

***Adam P. Balcerzak***

Chair of Microeconomics  
University of Warmia and Mazury in Olsztyn

**Key words:** globalisation, NAIRU, monetary policy, inflation.

### Abstract

The last decades represent a period of global economy fast transformation, which is reflected in the real life and leads to changes in relations between the situation in the labour market and the inflation processes. Those changes are frequently referred to as „NAIRU” flattening. It can be expected that it will bring important consequences for the process of national monetary policy development in individual countries. The aim of the paper is to present analysis of the influence of NAIRU flattening on the effectiveness of the national monetary policy and effectiveness of its tools.

### POLITYKA MONETARNA W WARUNKACH „SPŁASZCZENIA” NAIRU

***Adam P. Balcerzak***

Katedra Mikroekonomii  
Uniwersytet Warmińsko-Mazurski w Olsztynie

**Słowa kluczowe:** globalizacja, NAIRU, polityka monetarna, inflacja.

### Abstract

Ostatnie dekady stanowią okres szybkiej transformacji światowej gospodarki, która ma odzwierciedlenie w sferze realnej oraz prowadzi do zmian relacji między sytuacją na rynku pracy oraz procesami inflacyjnymi. Zmiany te są często określane jako „spłaszczenie” NAIRU. Można oczekiwać, że będą one wywoływać istotne konsekwencje dla procesu kształtowania narodowej polityki monetarnej poszczególnych krajów. Celem niniejszego opracowania jest przeanalizowanie prawdopodobnego wpływu „spłaszczenia” NAIRU na efektywność narodowej polityki monetarnej oraz skuteczność jej narzędzi.

---

\* The initial version of the paper was presented during the III Jubilee Conference “Problems of global economy” Makro 2009, organised on the jubilee of 40-years of scientific work by Prof Ordinary, Dr. Hab. Marian Noga, organised by the Chair of Macroeconomics, Wrocław University of Economics on 02–03 April 2009.

## Introduction

Monetary policy effectiveness and efficiency of its tools are currently considered the key condition for achievement of the goals of the state in the area of product and inflation stabilisation. The last decade was a period of increasing optimism among monetary decision-makers related to the success of the majority of highly developed countries in combating inflation that in most cases did not involve high costs in the labour market and on the side of the product. Very frequently this is linked to rapid diffusion of knowledge related to the so-called good monetary policy practices and the opinion concerning high effectiveness of monetary tools. On the other hand, positive consequences of changes in the relation between the labour market situation and inflation processes that are frequently defined as “NAIRU” flattening are reported.

This paper aims at analysing the probable influence of “NAIRU” flattening on the effectiveness of the national monetary policy and efficiency of its tools.

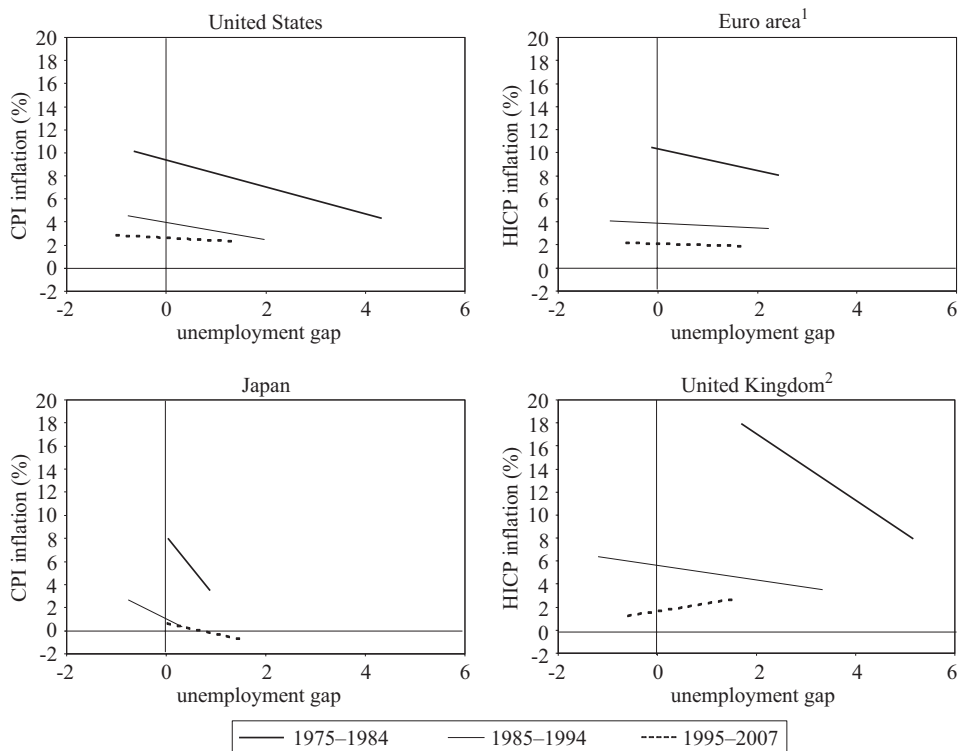
### **NAIRU flattening during the years 1975–2007 and its causative factors**

According to the dominating orthodoxy the decrease of the unemployment level below the natural unemployment rate<sup>1</sup> leads to stimulating the inflation pressure. As a consequence, it is a factor forcing monetary policy tightening. However, since the mid nineties of the past century, in many highly developed countries, simultaneous decrease of unemployment, frequently below the estimated natural rate, and retaining the stability of inflation, or frequently even its decrease, were recorded. That phenomenon was particularly well visible in the United States, but it also applied to the European Union countries (STROH 2002). As a consequence, we can talk about, at least short and medium term, modifications of the traditional relations between the phenomena of inflation and the product that are reflected by NAIRU flattening. This is presented in figure 1 in relation to the highest developed economies of the world.

Analysis of empirical studies concerning the sources of changes in monetary transformation mechanisms in highly developed countries allows indicating three channels that could lead to NAIRU flattening. Those are:

---

<sup>1</sup> That term has been proliferated by Milton Friedman, although economists with Keynesian background much more frequently use the term NAIRU (*non accelerating inflation rate of unemployment*). Currently economists are generally in agreement that the differences between both concepts are mainly limited to the issue of terms used and rhetoric in describing the same phenomenon. See B. Snowdon, H. Vane, *Rozmowy z wybitnymi ekonomistami*, Dom Wydawniczy Bellona, Warszawa 2003, p. 159.



Where:

Unemployment gap is the difference between unemployment level and NAIRU (estimated according to the OECD methodology). The graphs show straight regression lines computed for quarterly data.

<sup>1</sup> For the Euro zone, CPI until 1991. The Federal Republic of Germany is used in place of the entire Germany for the purpose of estimating the aggregated Euro zone before 1991.

<sup>2</sup> Trend line grade for the United Kingdom from 1995 to 2007 should not be interpreted as a hint that deeper recession is linked to higher inflation. Award of operational independence to the Bank of England in May 1997 changed the relations between the British level of unemployment and inflation significantly. That change indicates that the regression analysis from 1995 to 2007 might be burdened by an error.

Fig. 1. NAIRU in the most important world economies during the years 1975–2007  
 Source: *OECD Economic Outlook 2007*.

- increasing productivity of labour resulting mainly from progress in teleinformation technologies;
- changes in the labour market structure resulting from the increase in importance of high quality human capital, increased mobility of labour and labour markets deregulation processes;
- globalisation.

The first and the second channel are tightly linked with each other. According to the majority of economists, both progress in teleinformation

technologies and structural changes in contemporary labour markets and higher quality of human capital form an important source for labour productivity growth rate acceleration. When the dynamics of labour productivity is significantly ahead or similar to the dynamics of nominal wages, which are strongly negatively correlated with the unemployment level, this allows maintaining a relatively constant level of actual wages despite an increase in nominal wages driven by the “tight” labour market. As a consequence the unit labour costs for companies remain relatively stable thanks to which the risk of inflation coming from increasing production costs is eliminated.

Focusing on structural changes in the labour markets we can talk about two opposite phenomena. In case of highly developed countries the demand for highly skilled employees and the relatively inflexible supply of them resulting from demographic changes as well as increasing costs of education and increasingly lengthy educational path can lead to increasing the bargaining power of employees in payroll negotiations. This phenomenon may contribute to increasing the NAIRU gradient and shifting it upwards. On the other hand, during the recent decades phenomena such as increasing employment rotation in case of the majority of economic sectors, increasing importance of new, flexible forms of employment and temporary employment as well as limitation of the traditional power of trade unions started appearing in the labour markets of the OECD countries<sup>2</sup>. The literature frequently indicates that the process of increasing global competition is one of the major causative forces of those phenomena. Those factors can influence in a significant way the labour market dynamics and can decrease the NAIRU level, at least in the medium-term perspective. The influence of teleinformation technologies and Internet on decreasing the job search costs and increase in labour markets transparency is another important factor leading to structural changes in the labour market.

---

<sup>2</sup> Those issues are widely discussed by Paul Osterman. see P. Osterman, *Labor Market Intermediaries in the Modern Labor Market* [in:] R. P. Giloth (ed.) *Workforce Intermediaries for the Twenty-first Century*, Temple University Press – The American Assembly, Columbia University, Philadelphia 2004, pp. 155–169; P. Osterman, *Work Reorganization in an Era of Restructuring: Trends in Diffusion and Effects on Employee Welfare*, *Industrial and Labor Relations Review*, 2000, Vol. 53, No. 2, p. 179–196. Robert Gordon highlights the important influence of the decrease in the power of trade unions on NAIRU in case of the USA. See: R. J. Gordon, *The Time-Varying NAIRU and its Implications for Economic Policy*, *Journal of Economic Perspectives*, 1997, Vol. 11, No. 1. pp. 11–32. Sushill Wadhvani comes to the same conclusion in case of the British economy. See: S. Wadhvani, *Is Inflation Dead?*, Lecture at the National Council of Applied Economic Research in New Delhi, India 17 December, Bank of England 1999. That phenomenon was recorded generally in the majority of the OECD countries during 1990;s. This is confirmed by studies of Michael Dumont, Glean Rayp and Peter Willeme, who verified empirically the significant negative influence of increasing internationalisation on the power of trade unions in Belgium, France, Germany, Italy and the United Kingdom. See: M. Dumont, G. Rayp, P. Willeme, *Does Internationalization Affect Union Bargaining Power? An Empirical Study for Five EU Countries*, *Oxford Economic Papers*, 2006, Vol. 58, No. 4, pp. 77–102.

As a consequence, improved effectiveness of labour markets in linking the demand side with the supply side can influence decreasing long-term unemployment level and the natural unemployment level (*Wider on the subject see*, 1998, pp. 16–24).

Coming to the third probable source of lowering the NAIRU it should be pointed out that changes in inflation processes resulting from globalisation can have twofold nature. Currently the economists agree that teleinformation revolution has contributed significantly to limiting the transaction costs included in the traditional menu costs models. This translated into an increased potential for applying dynamic price strategies and higher frequency of price changes in micro-entities<sup>3</sup>. As a consequence, the higher frequency of price adjustments in case of an increasing part of the economy forming an element of the global competitive market may lead to higher variability of prices related to changes in economic activity. This should translate into increase in the gradient of NAIRU (*OECD Economic Outlook*, 2007). There are, however, a number of important factors related to the globalisation process that may lead to flattening of NAIRU. Already in mid-nineties of the previous century Joseph Stiglitz indicated that an increase in intensity of competition in global market might form a factor eliminating former limitations of the supply side and as a consequence lead to long-term decrease of NAIRU. It should be highlighted, however, that he did not model that mechanism (STIGLITZ, pp. 3–14). The econometric verification of that phenomenon in the United Kingdom can be found in the analysis by Nicoletta Batini, Brian Jackson and Stephen Nickell, whose studies confirm the influence of globalisation on limiting the potential for increasing the margins by companies even in the situation of increasing domestic demand (BATINI, JACKSON, NICKELL, 2005, pp. 1061–1071). Increased importance of international links among economies, increasing specialisation in international trade, lead to weakening the traditional sources of inflation stimuli such as the increasing domestic demand and results in increasing the importance of factors of global nature. Under such conditions equilibrium in global, relatively flexible and competitive markets is an increasingly important factor determining the level of prices in individual countries<sup>4</sup>. That phenomenon gained in power in particular during the nineties of the previous century and it undoubtedly can contribute to NAIRU flattening (BORIO, FILARIO 2007).

---

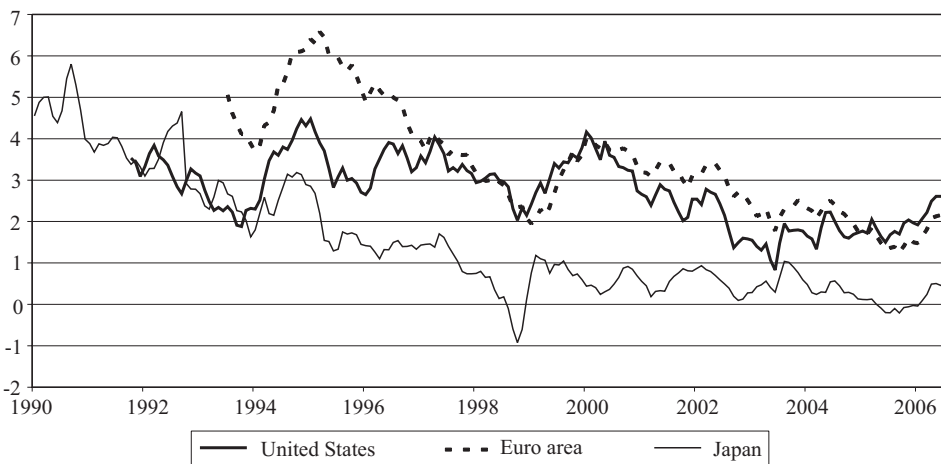
<sup>3</sup> Lonard Nakamura analyses that issue in very detail in the American trade sector. See: 1998, pp. 3–14.

<sup>4</sup> Sectors of industrial goods and services that are subject to international trade, characterised by relatively high flexibility of supply will be, in particular, the source of higher stability of prices. On the other hand raw materials sectors and agriculture with relatively rigid flexibility of supply can be included among global factors that may form the global sources of inflation stimuli.

## Monetary consequences of NAIRU “flattening”

Explaining to what extent the discussed factors translate into changes in the NAIRU course is an important problem for empirical studies. Nevertheless, the consequences of the influence of a change in NAIRU for economic policy and the potential of the State to influence the economic situation in a given country remains the key issue.

According to some commentators, lowering of NAIRU and limitation of variability of prices resulting from the domestic demand size may create conditions for central banks to conduct “milder” medium-term monetary policy that would allow maintaining lower than possible until recently unemployment without excessive risk of building up inflation pressure (Compare: *OECD Economic Outlook*, 1999, p. 93). Figure 2 confirms the global trend to decrease the real interest rates, which is consistent with the above analytical pattern.



The difference between the nominal rates and inflation expectations. The expected average inflation level of CPI during the next 10 years for the United States based on the Survey of Professional Forecasters (SPF) by the Federal Reserve Bank of Philadelphia. The expected average inflation level of HICP during the next 5 years for Euro Zone based on the SPF by the European Central Bank. The expected average inflation level of CPI within the next 6–10 years for Japan based on the Consensus Forecasts.

Fig. 2. Level of real interest rates in the United States, Japan and countries belonging to the Euro Zone during the years 1990–1997

Source: *OECD Economic Outlook* 2007, p. 196.

On the other hand, the analysed change in NAIRU development may make conducting such a “mild” monetary policy rather difficult, increase the risk related to it and limit the effectiveness of actions undertaken by monetary authorities.

In case of the first and second channel that may influence NAIRU, a change in the very delicate and difficult to capture relation between: wages, prices, productivity and unemployment level is strongly stressed. The opinion that thanks to the higher productivity of labour, which, as a result of time delay, might not be followed by the increase in nominal wages, despite a very low unemployment level it is possible to maintain the constant level of unit costs represents a common element of both those approaches. This may be treated as a positive supply shock that is supportive for low inflation level. By the same the conditions are created for conducting a milder monetary policy in the environment of expansion without the risk of overheating the economy. According to optimists, this may be supportive for long-term, stabile and sustainable economic growth.

The analysed changes, however, do not have to be the base for the durable mechanism facilitating conducting the monetary policy. Durable acceleration in labour productivity increase rate and retaining it at a high level is not of key importance for maintaining low inflation under conditions of fast economic expansion. The more important thing is whether at a given moment acceleration in labour productivity increase rate takes place. This is the condition for appearance of the time delay in adjustment of real wages to the higher labour productivity increase rate. Under conditions of rapid economic growth that is accompanied by low unemployment level, limiting the increasing labour productivity increase rate and stabilizing it at even a high level, after eliminating the time delays, can lead to return of the inflation pressure and represent the beginning of serious problems for the monetary policy (Wider see: KOENING 2000). As a consequence, that mechanism should be treated as short or, at the most, medium-term source of anti-inflation pressure. That issue can be presented by applying the following simplified approach. According to the dominating theory and historical data for the majority of highly developed countries it can be assumed that the real increase of wages representing the difference between the nominal increase of wages and the inflation is tightly linked to the increase in productivity of labour. This can be represented as:

$$\frac{dy}{dw} - \frac{dy}{dp} = \frac{dy}{dq}$$

where:

$w$  – wages,

$p$  – prices,

$q$  – productivity.

After reversing that relation we can see that the increase of prices is related to the increase of the unit labour cost, i.e. the difference between the increase of wages and increase of productivity:

$$\frac{dy}{dp} - \frac{dy}{dw} = \frac{dy}{dq}$$

As a consequence, when sufficiently fast increase in labour productivity increase rate takes place the level of inflation may be stable or even the inflation can decrease despite low unemployment level forcing an increase in the level of wages. Shortly speaking, increasing labour productivity increase rate linked to the delay in adjustment of wages to the increasing labour productivity increase rate may balance or even overweight the inflation effects resulting from the low level of unemployment. Unfortunately, that does not have to mean permanent liquidation of inflation pressure. The labour productivity increase rate may stay permanently high but one cannot that it will permanently accelerate. At a certain moment it must stabilize. Although that situation may occur even at a high level, it is synonymous with elimination of anti-inflation stimulus. Lack of adequate reaction by monetary authorities at that moment would be equivalent to building up the inflation pressure requiring “tight” labour market (KOENING 2000, pp. 7–9, 12).

Considering that accurate determination of the time and direction of labour productivity trend is all the time one of the most difficult tasks for economic forecasting the above analysis shows what important challenges the monetary authorities are facing in the situation of NAIRU “flattening”. It also proves that anti-inflation influence of changes related to labour productivity increase rate increase might be of temporary character. The moment that positive influence is extinguished it may make conducting adequate monetary policy more difficult (see also: MELJERS, 2006, pp. 1–23; CETTE, MAIURESSE, KCOGLU, 2004).

The ability of the central bank to influence the size of the domestic product gap and its influence on the inflation processes is one of the foundations of anti-cyclic monetary activities effectiveness. Meanwhile, the possibility of appearance of a significant limitation in relations between inflation dynamics and the size of the domestic product gap and at the same time increase in the dependence of inflation on the global balance of demand and supply is an important consequence of NAIRU flattening. Under favourable circumstances that phenomenon may prevent appearance of domestic inflation pressure. However, in certain situations it may represent a very serious problem for the national monetary authorities (See: BEAN 2006, p. 472).

Tight links between local inflation processes and factors of global character makes determining the gap in the domestic GDP more difficult for the



monetary authorities. For the central bank this means limiting the effectiveness of the inflation control tool. As a consequence, under conditions of NAIRU flattening excessively loose monetary policy may take place during the times of changing mechanisms of monetary transmission. Under such circumstances the central bank may refrain from tightening the monetary policy despite increasing inflation pressure pointing at its absence or its minor symptoms in the labour market. In a longer time perspective making that mistake may result in permanent increase of inflation expectations and inflation. The necessary, but late reaction of the central bank will take place under conditions of low sensitivity of inflation to the central bank interest rates level and high dependence of inflation on exogenous global factors. In extreme case, when the inflation is independent of the size of the domestic supply gap, monetary restrictions may nor bring anti-inflation results and on the other hand, may result in already strong slowdown in the domestic economic activity. As a consequence, those activities may lead to a high increase of unemployment. This would mean lack of traditional direct influence of monetary authorities on inflation dynamics. The influence of restrictive monetary policy could be limited to the exchange rate mechanism only. Higher domestic interest rates could favour higher inflow of foreign capital and appreciation of the currency resulting in limiting the inflation pressure (See: YELLEN 2006). The limitation of activities of the exporters would, however, be the additional side effect of that. This would increase further the costs of anti-inflation activities. That situation is equivalent to very high costs of returning to the stability of prices. Additionally, even that indirect channel of monetary authorities influence on inflation pressure might be endangered. Under conditions of strongly integrated global financial markets, when market participants find out that monetary authorities do not focus on maintaining long-term stability of prices this may cause mass resignation from maintaining resources denominated in the currency of a given country. This would lead to its major weakening, which in turn would translate into the additional increase of inflation pressure<sup>5</sup>.

Similarly, in such a case low effectiveness and very high costs of monetary authorities reaction to the global exogenous negative supply shocks could be expected. This proves that NAIRU flattening may limit the effectiveness or, at least hinder the control of economic processes by monetary authorities.

Studies conducted by the International Monetary Fund confirm a significant decrease in the influence of the domestic GDP gap on inflation in the majority of countries. During the last twenty years the increase in production above the trend by 2 percent points for the period of one year caused the

---

<sup>5</sup> The possibility of appearance of such risk is discussed wider by Donald Kohn. See: D. L. Kohn, *Globalization, Inflation, and Monetary Policy*, At the James R. Wilson Lecture Series, The College of Wooster, Wooster, Ohio, October 11, 2005, <http://www.federalreserve.gov/boarddocs/speeches/2005/20051011/default.htm> (28.04.2008).

increase of inflation by 0,4% during the consecutive year in the individual countries while during the earlier decades that effect was 0,6%. Currently, after three years from appearance of the demand shock the effect on inflation disappears entirely while twenty years ago still around a half of the influence on inflation would have to be visible (after: RYBIŃSKI 2007, pp. 283–284).

## Conclusion

The analysis conducted proves that monetary decision-makers should be aware of the possible risks related to NAIRU “flattening”. That element should be considered during formulation of the national monetary policy. Additionally, a lot indicates that global networking of the economy, development of global markets of services, knowledge, labour and other products that until recently had been treated as products that had not been the subject of international exchange, will in the future lead to further loosening of relations between the domestic GDP gap and inflation processes. As a consequence, it can be expected that NAIRU “flattening” represents a factor increasing the risk of making serious mistakes in the monetary policy area. Those mistakes may result in building up the inflation pressure, which under conditions of NAIRU “flattening” may prove difficult and costly to control. The consequences of appearance of that negative scenario gain even more importance if the direct costs related to appearance of inflation and its indirect negative consequences will lead in a given country to the negative disturbance in the long-term economic growth path.

Translated by JERZY GOZDEK

Accepted for print 11.02.2009

## References

- BATINI N., JACKSON B., NICKELL S. 2005. *An Open-Economy New Keynesian Phillips Curve for the UK*, Journal of Monetary Economics, 52(6).
- BEAN C. 2006. *Globalisation and Inflation*. Bank of England Quarterly Bulletin, 4.
- BORIO C., FILARIO A. 2007. *Globalization and Inflation: New Cross-Country Evidence on the Global Determinant of Domestic Inflation*. Bank of International Settlements, BIS Working Papers, 227.
- CETTE G., MAIURESSE J., KCOGLU Y. 2004. *ICT Diffusion and Potential Output Growth*. Economic Letters, 87.
- DUMONT M., RAYP G., WILLEME P. 2006. *Does Internationalization Affect Union Bargaining Power? An Empirical Study for Five EU Countries*. Oxford Economic Papers, 58(42).
- GOMME P. 1998. *What Labor Market-Theory Tells US about the “New Economy”*. Federal Reserve Bank of Cleveland Economic Review, Quarter, 3.
- GORDON R.J. 1997. *The Time-Varying NAIRU and its Implications for Economic Policy*. Journal of Economic Perspectives, 11(1).

- KOENING E.F. 2000. *Productivity, the Stock Market, and Monetary Policy in the New Economy*. Federal Reserve Bank of Dallas Southwest Economy, January/February.
- KOHN D.L. 2005. *Globalization, Inflation, and Monetary Policy*, At the James R. Wilson Lecture Series, The College of Wooster, Wooster, Ohio, October 11.  
<http://www.federalreserve.gov/boarddocs/speeches/2005/20051011/default.htm> (28.04.2008).
- MEIJERS H. 2006. *Diffusion of the Internet and Low Inflation in the Information Economy*. Information and Economics and Policy, 18.
- NAKAMURA L.I. 1998. *The Retail Revolution and Food-Price Mismeasurement*. Federal Reserve Bank of Philadelphia Business Review, May/June
- OECD *Economic Outlook*. 2007. OECD, 1(81).
- OSTERMAN P. 2004. *Labor Market Intermediaries in the Modern Labor Market*. In: *Workforce Intermediaries for the Twenty-first Century*. Ed. R.P. GILOTH, Temple University Press – The American Assembly, Columbia University, Philadelphia.
- OSTERMAN P. 2000. *Work Reorganization in an Era of Restructuring: Trends in Diffusion and Effects on Employee Welfare*. Industrial and Labor Relations Review, 53(2).
- RYBIŃSKI K. 2007. *Globalizacja w trzech odstępach. Offshoring – globalne nierównowagi – polityka pieniężna*. Diffin, Warszawa.
- SNOWDON B., VANE H. 2003. *Rozmowy z wybitnymi ekonomistami*. Dom Wydawniczy Bellona, Warszawa.
- STIGLITZ J.E. 1997. *Reflections on the Natural Rate Hypothesis*. Journal of Economic Perspectives, 11(1).
- STIROH K. 2002. *New and OLD Economics in the “New Economy”* In: *Economic Policy in the “New Economy”*. Ed. H. SIEBERT. Springer-Verlag, Berlin.
- STIROH K.J. 1999. *Is there a New Economy*. Challenge, July-August.
- WADHWANI S. 1999. *Is Inflation Dead?* Lecture at the National Council of Applied Economic Research in New Delhi, India 17 December, Bank of England.
- YELLEN J.L. 2006. *Monetary Policy in a Global Environment*. FRBSF Economic Letter, November.