INFLATION VS. UNEMPLOYMENT - SOME POLEMIC ISSUES

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Abstract
The relationship between the rate of inflation and the rate of unemployment is one of the most discussed macroeconomic issues in economic theory and business practice. A. W. Phillips published in 1958 his pioneering article and for the first time pointed to this relationship. Later the issue was addressed by other prominent economists: P. Samuelson, R. Solow, M. Friedman and E. Phelps. The original Phillips curve, as a part of the Keynesian theory instruments, formed the basis of Keynesian economic policy. The monetarist interpretation of Phillips curve is based on so-called natural rate of unemployment and inflation expectations. Currently there are turbulent debates, often contradictory and conflicting, under way over the validity of the Phillips curve and over the various factors that affect the relationship between unemployment and inflation. The paper deals with the polemic issues of mutual relationship between unemployment and inflation and presents European perspectives as well. Both inflation and unemployment belongs to the convergence criteria relevant for a successful monetary union. Eurozone countries have relevantly different trends in the competitive position due to different inflation and wage growth.

Keywords: Inflation, unemployment, Phillips curve, convergence, expectations

Introduction
The relationship between the rate of inflation and the rate of unemployment is one of the most discussed macroeconomic issues in economic theory and business practice. Over the long term theoretical and practical research in economics has been devoted to inflation-unemployment relationship. At the same time it is an issue that is causing contradictory and conflicting perspectives. And it also affects the current development of European economies. The relevance of the relation between unemployment and inflation has been emphasized in the process of European integration as well. One of the optimum currency area criterion is the similar inflation rate. Furthermore, unemployment rate belongs to the parameters of real convergence. The paper deals with the relations between two relevant macroeconomic parameters: inflation and unemployment from theoretical point of view and European perspective too. In theory we have witnessed many debates and different opinions on this issue.

Relationship between inflation and unemployment
In 1958 the New Zealand economist A. W. Phillips in his famous article ´The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957´ analyzes the behavior of wages and unemployment rates in the UK. He states that "there is a clear tendency for the rate of change of money wage rates to be high when unemployment is low and to be low or negative when unemployment is high" (Phillips, 1958, p. 290). He concluded that low inflation and at the same time low

unemployment cannot coexist. Two years later Nobel Prize laureates P. Samuelson and R. Solow demonstrated a consistent inverse relationship between inflation and unemployment based on data collected in the United States. They concluded that such a situation occurs because low unemployment is associated with high aggregate demand, and that increases wages and prices throughout the economy. Samuelson and Solow termed this inverse relationship between inflation and unemployment the ´Phillips curve´. During that period economists glorified these findings and considered them an important discovery of economic science. The original Phillips curve, as part of the Keynesian theory instruments, formed the basis of Keynesian economic policy. Economic policy representatives would naturally like to achieve low inflation and low unemployment at the same time. Historical experiences as well as current developments show that such combination is unattainable. Currently we do not anymore encounter the original interpretation and orthodox reading of this relationship. Already the 1970s were characterized by stagflation which meant the increase in both inflation and unemployment together with economic performance decline. The position of Keynesianism and its economic policy implications was weakened.

The monetarist interpretation of Phillips curve emerged as a reaction to the Keynesian concept. This interpretation of the Phillips curve is based on so-called natural rate of unemployment and inflation expectations.

For the functioning of a market economy long-term Phillips curve is important according to the monetarist view. It is based on natural rate of unemployment and inflation expectations. The discrepancy between expected and actual inflation is for Friedman the reason for accelerating inflation explained by so-called acceleration theorem. According to him a rapid rise in prices is caused by the difference between the expected and actual inflation. When business entities find out that their inflation estimates were erroneous they adjust their activities to the actual (higher) rate of inflation which leads to a further inflation acceleration. It is a case of so-called adaptive expectations that vary based on experience.

Inflation expectations discussed by Friedman have so-called adaptive nature since the errors are rectified based on experience and therefore in the learning process they provide the monetarists with a new explanation of the inflation process. The classic Phillips curve proceeds from the inflation-unemployment relationship. Monetarist view is based on the changes in money supply (as a result of monetary policy) and these changes accelerate the entire process. Increase in the money supply leads after a lapse of time to price rise which in turn with a certain time lag affect unemployment and production.

Monetarists admit the possibility of so-called natural or equilibrium unemployment rate that is determined by labor market situation and its imperfections. The natural unemployment rate includes structural and frictional unemployment and also so-called voluntary unemployment. Any economic policy is according to monetarists powerless against the natural unemployment. They do not allow the existence of involuntary unemployment.

Natural rate of unemployment can be in their view reduced in several ways: by removing the monopoly of trade unions, which restricts the free game of automatically active forces on the labor market, by increasing the labor mobility, by removing the minimum wage etc.

Long-term Phillips curve is vertical and intersects the horizontal axis at point of steady-state equilibrium, or the natural rate of unemployment. With his concept of the natural rate of unemployment Friedman tried to release the macroeconomic analysis from its Keynesian contents. In 1970s, however, Friedman's theory of inflation and unemployment was not confirmed. Higher rate of inflation was not accompanied by the same rate of unemployment as predicted by theory of the natural rate of unemployment, in fact, it was accompanied by a much higher unemployment rate. According to Friedman, a trade-off between inflation and unemployment, their interdependence, expressed by the Phillips curve,

is therefore of extremely short-term nature. Long-term trade-off does not exist. As the expectations are adapted, short-term curves are shifted upwards. It draws on so-called adaptive expectations. Under these expectations it is assumed that the business entities learn from experience, while it is monitored how their latest assessment differed from reality. According to this interpretation the Phillips curve is valid only in the short term when inflation expectations deviate from the actual (higher) inflation and adapt to it subsequently. Government intervention (fiscal and monetary policy) can affect the unemployment rate (and hence the shape of the curve) only in the short term, while in the long run equilibrium natural rate of unemployment is established.

The criticism of the Phillips curve by two Nobel Prize laureates, M. Friedman and E. Phelps, is based on these assumptions. According to Phelps, the curve has a simple statistical significance and it does not in any way consider the impact of consumer and business expectations. Phelps assumed that inflation depended not only on unemployment but also on what price and wage rise employees and entrepreneurs expected. While analyzing these issues, Friedman and Phelps suggested the use of so-called expected inflation. Originally Friedman did not examine inflation with respect to unemployment.

Inflation is according to Friedman a purely monetary phenomenon and therefore the money supply growth is to be maintained at the same rate as the growth of the nominal gross domestic product. Inflation is caused by flawed government policy (monetary policy included), in particular by irresponsible increase in government spending and excessive growth of money supply.

Inflation rate (%, 2001 - 2012)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU 28	3,2	2,5	2,1	2,3	2,3	2,3	2,4	3,7	1,0	2,1	3,1	2,6
USA	2,8	1,6	2,3	2,7	3,4	3,2	2,8	3,8	-0,4	1,6	3,2	2,1
Japan	-0,7	-0,9	-0,3	0,0	-0,3	0,3	0,0	1,4	-1,4	-0,7	-0,3	0,0
Slovakia	7,2	3,5	8,4	7,5	2,8	4,3	1,9	3,9	0,9	0,7	4,1	3,7
Czech Republic	4,5	1,4	-0,1	2,6	1,6	2,1	3,0	6,3	0,6	1,2	2,1	3,5
Poland	5,3	1,9	0,7	3,6	2,2	1,3	2,6	4,2	4,0	2,7	3,9	3,7
Hungary	9,1	5,2	4,7	6,8	3,5	4,0	7,9	6,0	4,0	4,7	3,9	5,7

Source: Eurostat

There is always only temporary trade-off between inflation and unemployment, not a permanentone."The temporary trade-
off comes not from inflation per se, but fromunanticipated inflation, which generally means, f rom a rising rate of inflation" (Friedman, 1968, p. 11). The widespread belief that there is a permanent trade-off demonstrates confusion between ´high´ and ´rising´ inflation. "A rising rate of inflation may reduce unemployment, a high rate will not" (Friedman, 1968, p. 11).

Based on the aforementioned theoretical background monetarists explain the mechanism of inflation in their own version: inflation emerges when the quantity of money in circulation is increased. This means that the amount of cash available to entrepreneurs and consumers (money supply) is higher than needed (demand for money). Therefore the owners of ´excess´ cash (at a given price level) get rid of it. This increases the part of income spent on consumption and thereby decreasing savings. And this in turn increases the overall demand for money while raising the overall level of prices. Whereas the increase in the cost of living objectively reduces the real purchasing power of money balances, the market participants have a higher need for cash. This process continues until the money supply is matched with the demand of businesses and consumers. A new level of equilibrium can be reached by the increase in overall level of prices.

This can happen in the long run. Friedman and Phelps argued that the inverse relationship between unemployment and inflation is valid only in the short run and it cannot be assumed to be valid in the long run. When the expected inflation is taken into account (which changes over time) it means that the relationship between inflation and unemployment also changes over time. The expected inflation affects prices and wages (which result from expectations among consumers and businesses). This can affect the money supply which in turn causes fluctuations in real GDP growth, unemployment and inflation. According to Friedman and Phelps this can only happen in the short run. Phelps argued that by raising inflation the unemployment can be reduced only temporarily, in the short run, since it has a tendency to return to its natural level. This is in the economic literature known as the natural rate hypothesis. It states that unemployment always returns to the natural rate regardless of the rate of inflation.

When the monetary expansion induces an increase in aggregate demand and as a consequence a general increase in the prices of goods (while the nominal wage rates remain unchanged), the demand for labor will increase while the labor supply remains unchanged. Compared to the starting point, unemployment rate is reduced. The analysis concludes that there are exogenously given price level expectations by workers behind a modified Phillips curve (Felderer and Homburg, 2005).

Unemployment rate (%, 2001-2012)

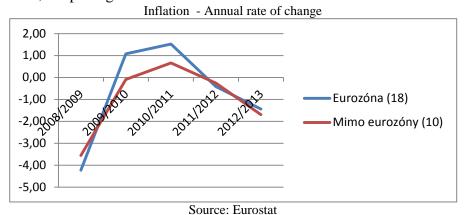|	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU 28	8,6	9,0	9,2	9,3	9,1	8,3	7,2	7,1	9,0	9,7	9,7	10,5
USA	4,8	5,8	6,0	5,5	5,1	4,6	4,6	5,8	9,3	9,6	8,9	8,1
Japan	5,0	5,4	5,3	4,7	4,4	4,1	3,9	4,0	5,1	5,1	4,6	4,3
Slovakia	19,5	18,8	17,7	18,4	16,4	13,5	11,2	9,6	12,1	14,5	13,7	14,0
Czech Republic	8,1	7,3	7,8	8,3	7,9	7,1	5,3	4,4	6,7	7,3	6,7	7,0
Poland	18,3	20,0	19,8	19,1	17,9	13,9	9,6	7,1	8,1	9,7	9,7	10,1
Hungary	5,6	5,6	5,8	6,1	7,2	7,5	7,4	7,8	10,0	11,2	10,9	10,9

Source: Eurostat

Monetarists tend to think that inflation threatens the economic growth. Thereby they take a critical stand toward the Keynesian monetary policy. In particular they reject the regulatory role of the interest rate. In the Keynesian concept the money supply is influenced from the demand side: changes in interest rates cause changes in demand for money. In the monetarist approach the amount of money is regulated from the supply side: the money supply is affected by the central bank using indirect instruments of monetary policy.

An optimal solution for monetarists would be to replace discrete (conscious) regulation (which supposedly causes uneven development of money supply and thus overall economic imbalance) by introducing a special rule of steady increase in the amount of money in circulation and this to such an extent that corresponds to the increase in gross domestic product. According to monetarists such a steady growth of money supply would remove or reduce fluctuations in the economic development. Therefore the government should not seek to prevent short-term fluctuations by temporary changing the quantity of money in circulation. On the contrary, it must strive to increase the amount of money in circulation in correspondence to the rate of economic growth.
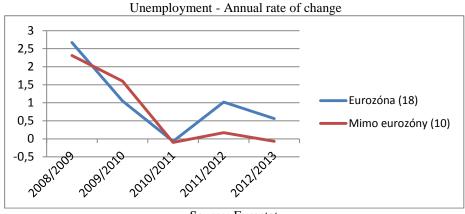
Inflation vs. unemployment - European context
The euro area countries have relevantly different trends in the competitive position due to different inflation and wage growth, thereby worsening their internal and external balance. It was pointed out that only countries with almost the same rate of inflation may

enter and remain fixed exchange rates (Fleming, 1971). Different rates of inflation are the main cause of current account imbalances. The same rate of inflation between countries enables the maintenance of relative purchasing power parity and, consequently, leads to the stabilization of business conditions. In the long run the stable foreign trade relations lead to current account balance and the need to use the exchange rate change is minimized. If inflation diverges too much a system of fixed exchange rates between countries can not be maintained in the long-term. It means that the candidates for a monetary union membership must undergo the steps towards convergence of inflation rates. Prior to joining monetary union all EU-15 countries reduce inflation differentials. Currently a divergence of competitive positions in the euro area is also the result of varying trends of structural reforms in member states. The sources of divergence are results of existing differences in national political systems, which generate potential to divergence movements in employment and output.

Situation that preceded the financial crisis was characterized by expansion in all EU countries. Economic growth affected the growth of wages in various sectors of the economy, input prices and prices of goods and services. Until 2008, the government, the ECB and other central banks in the monetary union focused on the objective of price stability, price level grow by an average 2.1% per year. After the shock, which occurred in 2008 by the financial crisis in the U.S., the price growth slowed down in 2009.

Inflation - Annual rate of change

Source: Eurostat

One of the indicators that responds to economic development with a time lag is unemployment. In terms of unemployment rate in the euro area it may be said that unemployment rising in 2009 in all euro area countries except for Germany. The period 2007-2013 can be evaluated as significantly negative for the development of the labor market in Spain. The relevant increase in unemployment was recorded in Ireland, Greece and Spain.

Unemployment - Annual rate of change

Source: Eurostat

Final comments

Different view on the current problems of inflation and unemployment promotes P. Krugman. According to him, high unemployment could be solved by higher inflation rate (of 3 to 4 %) which would mean not only higher prices but also higher wages and thus it would help to repay the debt and apply for new loans. And that would in turn contribute to an increase in production and economic performance.

Many economists argue that by reducing inflation government causes economic growth to fall and unemployment to rise. On the other hand, reducing inflation has its costs. To estimate these costs the so-called ´sacrifice ratio´ is used. The sacrifice ratio is defined as the change in unemployment rate over the change in inflation for the given period. Since the drastic reduction in inflation can cause a large drop in economic growth, this process needs to be spread over several years.

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