



Joanna Stawska

University of Łódź, Faculty Economics and Sociology, Department of Central Banking and Financial Intermediation, joanna.stawska@uni.lodz.pl

Fiscality, Economic Growth and the Level of Unemployment in Poland in the Context of the Fiscal-Monetary Game¹

Abstract: The central bank and the government are pursuing different goals so finding the best mix of monetary and fiscal policies is not easy. At the same time, the decisions the two authorities make during the fiscal-monetary game exert a strong influence on economic variables. This article focuses on the level of revenues and expenditures of the public finance sector, economic growth and the unemployment rate in Poland in the years 2000–2016. Its aim is to present the level of fiscality and the rates of economic growth and unemployment in the context of monetary and fiscal decisions made by the economic authorities. To this end, the following research methods are employed: statistical analysis methods and graphical presentations of economic developments. As found, in the years 2000–2016 in Poland the general government deficit and the rate of GDP growth influenced the unemployment rate that in turn determined the expenditures of the public finance sector. This research is original in that the changes in fiscality, the rate of unemployment and the dynamics of GDP are studied with respect to interactions between the monetary and fiscal authorities, including factors influencing their decisions, particularly those arising from the last financial crisis.

Keywords: fiscality, unemployment, fiscal policy, monetary policy, economic growth

JEL: E02, E24, E62

¹ The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the views and opinions of the National Bank of Poland. The project entitled *Discussion Forum – Measurement and Evaluation of Economic and Social Phenomena (MASEP2017)* is implemented in cooperation with the National Bank of Poland within the framework of economic education.

1. Introduction

The meaning of the word ‘fiscality’ is complex and defining it is not easy because fiscality understood as the State’s participation in the primary income yielded by production factors should be considered against the utility of goods (public, quasi-public and private) funded by the State from the fiscal revenue obtained. When the utility is known, fiscality can be defined as the amount of value added redistributed by institutions making up the general government sector (Grądałski, 2004: 23). The word ‘fiscality’ derives from the Latin word *fiscalis* denoting a State’s policy aimed to collect as much revenue from taxes and charges as possible. It is, therefore, quite natural that fiscality is associated with restrictive fiscal measures imposed by tax institutions (Szczęsny, 2001: 49). Given their power over the economy, the fiscal authorities should cooperate with the monetary authorities in order to effectively stimulate economic growth, reduce unemployment and stabilise the financial system.

In this article, the level of fiscality and the rates of economic growth and unemployment in Poland are studied in the framework of the monetary and fiscal authorities’ decisions based on the statistical analysis of the 2000–2016 data sample. A hypothesis is tested that the general government deficit and the rate of GDP growth influenced Poland’s rate of unemployment in that period and that the latter had an effect on general government expenditures. The article also analyses changes in fiscality, the rate of unemployment and GDP dynamics, with a view to determining what caused the changes, most of which can be attributed to interactions between the monetary and fiscal authorities and decisional circumstances relating mainly to the most recent financial crisis.

2. Fiscality, unemployment and economic growth in Poland

There are many measures with which the level of fiscality in the economy can be assessed. According to Dynus (2007), the broadest of them is public revenue and expenditure as a percentage of GDP. The measure is based on levies paid by economic agents, so it shows the share of the income generated by the economy in the framework of the public finance system. The range of fiscality measures includes also tax rates, fiscal burden (mainly public levies such as direct and indirect taxes and social insurance contributions) in relation to GDP, the share of GDP generated by the public finance sector (customs duties, property held by the State Treasury, profits transferred by the National Bank of Poland, stamp duty and administration charges, tax on civil-law actions, inheritance and donation tax, real estate tax and agricultural and forestry tax), the ratio between public expenditures and public

revenues, the tax scale, differences between nominal and effective taxes, and the extent of the grey economy (Dynus, 2007: 35).

According to Owsiak (2005), excessive fiscality tends to slow down economic growth, thus making it more difficult for a country to solve its socio-economic problems. Rational fiscality is therefore recommended, which means that the government should carefully consider its share of economic entities' incomes, i.e. set it so moderate demand for public money can be met without preventing firms from carrying on their business activity and thriving and households from meeting their consumption needs and having savings. Rational fiscality is the basis of sustainable growth (Owsiak, 2005: 35). Excessive fiscality frequently leads to an informal sector (grey economy), the emergence of which is usually attributed to relatively high taxes, declining real incomes of the population, readily available supply of labour and a relatively low risk of being prosecuted for non-registered business activity. Most authors blame this phenomenon mainly on fiscal factors, i.e. high taxes and substantial social insurance contributions (Bednarski et. al., 2008; Kraj-Gabryś, 2012: 203).

A fiscal policy and a monetary policy are important tools of macroeconomic strategy aimed at shaping supply and demand in the economy (Jarmołowicz, Woźniak, 2006: 121). Today, the neo-Keynesians are particularly inclined to stress that a monetary policy is effective in controlling the supply and demand aspects of equilibrium unemployment². The main problems with balancing the labour market are related to numerous "rigidities", most of which are associated with long-term pay arrangements. Discretionary changes to money supply are usually more frequent than adjustments to pay arrangements. As a result, a monetary policy affects real wages and the level of employment through the level of prices (Bludnik, 2004: 132–138). A fiscal policy operating on the supply side of the economy can significantly contribute to reducing equilibrium employment, for instance, when the State chooses to make direct investments in economic infrastructure, education or science. An expansionary fiscal policy affects employment by determining employers' readiness to make changes to their workforce. When taxes and labour costs go up, companies have less money to invest and make cuts to employment. An interesting regularity is that also rising transfers from the state budget (mainly unemployment benefits or pre-retirement benefits) increase unemployment (Wilczyński, 2005: 28).

The recent financial crisis revealed that many countries tend to solve their problems by resorting to the traditional Keynesian solutions designed to stimulate economies. Despite the long-standing promotion of monetarist thought and new classical macroeconomics, many governments still find interventionist tools, such as an expansionary fiscal policy, to be handy (Kryńska, Kwiatkowski, 2010: 6). P. Krugman (2012)

² Equilibrium unemployment does not "go away" even when the economy is expanding and employment is full. Equilibrium unemployment can be frictional, structural or institutional.

argues that a fiscal stimulus spurring the economy helps create new jobs and that the reduction of the budget deficit has a decelerating effect on economic growth in the short term. He also concludes that in the near-zero interest rate economy the government should respond to a financial crisis by increasing public expenditures (Krugman illustrates his point by referring to the Great Depression that the US government defused by rapidly increasing government spending) (Krugman, 2012).

The above dependencies make all countries carefully investigate public revenues, expenditures, deficit and debt from the fiscal perspective. The participation of the public finance system in the economy **is measured by** the sum of public revenues and expenditures (Krajewska, 2010: 36). Table 1 shows the revenues and expenditures of the Polish public finance sector and the general government (GG) deficit/surplus and debt in relation to GDP, as well as the GDP dynamics (%) and the rate of registered employment in Poland between 2000 and 2016.

The data show that public expenditures were moderate in those years, ranging from 36.4% to 39.3% of GDP. The only years when they exceeded the level of 40% were 2007 and 2008. Their 2016 rate of 37.9% implies that the government refrained from significantly increasing the fiscal burden.

Table 1. Statistical data on Poland's economic policy – the selected fiscal policy variables

Year	Public finance sector's revenue as a share of GDP	Public finance sector's expenditures as a share of GDP	Deficit/surplus of the GG sector	Debt of the GG sector	GDP, constant prices (%)	Registered unemployment (year-end; %)
2000	36.4	39.2	-3.00	36.50	4.60	15.1
2001	37.4	42.3	-4.80	37.30	1.20	17.5
2002	37.6	43.3	-4.80	41.80	2.00	20.0
2003	37.8	43.2	-6.10	46.60	3.70	20.0
2004	37.1	41.6	-5.10	45.00	5.10	19.0
2005	38.6	41.6	-4.00	46.40	3.30	17.6
2006	39.3	41.4	-3.60	46.90	6.20	14.8
2007	40.8	40.7	-1.90	44.20	6.70	11.2
2008	40.1	41.7	-3.60	46.30	5.00	9.5
2009	39.3	43.0	-7.30	49.40	1.80	12.1
2010	38.1	44.0	-7.50	53.10	3.80	12.4
2011	38.7	42.3	-4.90	54.10	4.30	12.5
2012	39.6	42.0	-3.70	53.70	1.90	13.4
2013	39.3	42.2	-4.00	55.70	1.60	13.4
2014	39.3	41.6	-3.30	50.20	3.40	11.5
2015	38.2	40.7	-2.6	51.1	3.60	9.7
2016	37.9	40.4	-2.4	54.4	2.70	8.3

Source: Central Statistical Office database: <http://stat.gov.pl/wskazniki-makroekonomiczne/> [accessed: 25.07.2017]

The fiscal burden (i.e. the ratio between public expenditures and GDP; 2014 data) does not make Poland distinctly different from the other CEE countries (Central and Eastern Europe). In most of them, the burden is lower than in the so-called “old” EU. Based on the fiscality criterion, the CEE countries can be divided into three groups with (Sawulski, 2016: 4):

- 1) relatively high fiscality, amounting to around ca. 50% of GDP (Hungary, Slovakia and Croatia);
- 2) fiscality ranging between 40 and 45% (the Czech R., Bulgaria, Poland and Slovakia);
- 3) fiscality below 40%, i.e. similar to that noted in the non-European OECD countries (the Baltic States and Romania).

The EU and OECD countries increased fiscality in the wake of the financial crisis in 2008. In the EU, from 2007 to 2009 the average level of fiscality rose by 5.6 percentage points. The Polish rate of around 2.4 p.p., much smaller than in other countries, implies that the crisis had much less effect on public expenditures in Poland than in the other EU member states (Sawulski, 2016: 5).

The general government deficit in Poland proved particularly vulnerable to the crisis. In 2009 it rose to 7.3% of the country’s GDP and in 2010 to 7.5% (let us recall that the deficit is one of the main indicators of fiscal policy). A crisis usually reduces tax revenues and increases budget expenditures (particularly high increases in expenditures were noted in Poland in 2009 and 2010), consequently raising the level of public debt. Dynus (2007) argues, however, that larger deficit may be associated with reduced fiscality because it may indicate that the government prefers borrowing money to meet its expenditures to increasing the fiscal burden. Nevertheless, governments tend to handle budget deficits by extracting money from the private sector, although by doing so they increase the cost of capital and slow down economic growth (Dynus, 2007: 39). In the crisis-affected Poland, public debt increased in the wake of rising budget deficit and public debt, GDP reduction caused by the turmoil in financial markets, budget expenditures increased to boost consumption and investment activity, and swelling liabilities related to anti-crisis measures (Table1).

The economic growth rates in Poland were brought down to their lowest levels by economic problems (1.2 and 2.0% in 2001 and 2002, respectively), the financial crisis (1.8% in 2009) and the resulting public finance crisis (1.9% in 2012 and 1.6% in 2013). Between 2000 and 2014 Poland had a two-digit rate of unemployment, excluding 2008 when the rate improved to 9.5%. The turmoil in the financial markets (2008–2009) increased it from 11.2–9.5% in 2007/2008 to 12.10% in 2009. The increase was insubstantial compared with other European countries; in 2015 and 2016 the rate of unemployment in Poland even declined to 9.7% and 8.7%, respectively.

Figure 1 shows variations in public revenues and expenditures in Poland vis-à-vis the rate of unemployment from 2000 to 2016.

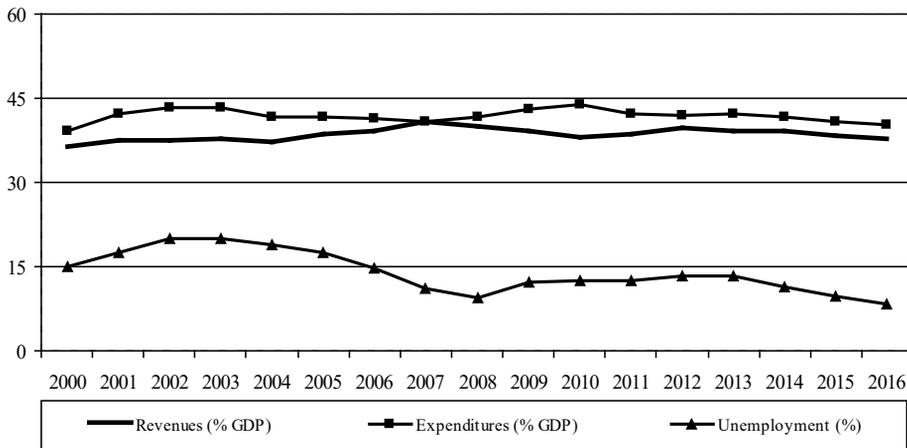


Figure 1. Revenues and expenditures of the public finance sector in Poland (% of GDP) and the rate of registered unemployment (%) in the years 2000–2016

Source: created by the author based on the Central Statistical Office data: <http://stat.gov.pl/wskazniki-makroekonomiczne/> [accessed: 25.07.2017]

The data show that in the period of recession unemployment kept rising, finally reaching 20% in the years 2002–2003. Public expenditures in relation to GDP increased too and exceeded 43%, but revenues improved insignificantly, to around 38% of GDP. Rising unemployment and higher expenditures of the public finance sector were probably due to the crisis-induced developments in the Polish economy. Between 2002–2003 and 2007–2008, the GDP share of public revenues rose to ca. 40%, while expenditures slightly declined to above 40–41%. The rate of unemployment fell to 9.5% in 2008. The situation changed in 2009. Public revenues shrank to slightly above 39% of GDP (compared with 2007–2008) and public expenditures rose steeply to above 43% of GDP; in 2010 they amounted to as much as 44%. The rate of unemployment also started rising in 2009, mainly due to the financial crisis, but from 2011 to 2016 it fell to 8.3%. Public revenues and expenditures accounted then for around 38–39.6% and 40–42% of GDP, respectively.

Table 2 shows general government expenditures in the EU and total revenues from taxes and social insurance contributions (a measure of fiscal burden) in Poland and the EU. There are several reasons why the ratio of fiscal burden has been widely adopted as a measure of fiscality, namely (Siwy et al., 2004: 100):

- 1) it shows all taxes and quasi-taxes in relation to GDP;
- 2) it is increasingly believed that high taxes and quasi taxes contribute to the expansion of the grey economy;
- 3) comparative analyses of tax revenues and tax systems that omit the fiscal burden of social insurance are likely to produce wrong results.

Table 2. General government expenditure in the EU and total revenues from taxes and social contributions in Poland and the EU in the years 2000–2016

Year	Total general government expenditure in the EU (% GDP)	Total revenues from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed as unlikely to be collected in Poland	Total revenues from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed as unlikely to be collected in the EU
2000	44.1	33.8	39.8
2001	45.1	33.8	39.1
2002	45.5	34.0	38.5
2003	46.2	33.4	38.6
2004	45.7	32.8	38.5
2005	45.8	33.8	38.7
2006	45.2	34.5	39.1
2007	44.7	35.4	39.1
2008	46.2	34.9	39.0
2009	50.1	32.0	38.4
2010	49.9	32.3	38.4
2011	48.6	32.7	38.9
2012	49.0	32.9	39.6
2013	48.7	32.8	40.0
2014	48.1	32.9	40.0
2015	47.2	33.3	39.9
2016	46.6	n/a	n/a

Source: Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=gov_10a_main&lang=en [accessed: 22.07.2017]

It is interesting to note that while in 2007–2008 Poland was reputed to be a country with relatively high fiscality, in 2009–2015 Polish fiscality was considered moderate. This change was exogenous, brought about by the intensifying economic crisis after 2009 and not by a reform of public finances. Most EU countries chose to respond to the crisis by resorting to strong fiscal incentives in the Keynesian style, which increased their total expenditures in relation to GDP and public debts. This caused a relative improvement in Poland's position in the fiscality ranking (Balcerzak, 2013: 251) (Table 2).

3. The fiscal-monetary game and decision-making by the central bank and the government

A frequent tool for studying interactions between fiscal and monetary authorities is a game based on the Nash equilibrium or the Stackelberg game that is equally popular. In the fiscal-monetary game with the Nash equilibrium (there can be more

equilibria than one) two equivalent players select a strategy on the assumption that they know the partner's strategy. Neither of them can one-sidedly improve their situation, as they believe that they have adopted an optimal strategy (Marszałek, 2005: 223–234).

The fiscal-monetary game shown as a matrix in Table 3 emphasises the importance of the monetary authorities and the fiscal authorities cooperating with each other, but also demonstrates that achieving such cooperation is not easy because the central bank usually pursues price stability, while the government seeks to keep economic growth high and unemployment low. These distinct goals and preferences lead to a situation in which economic authorities take different actions. In the game, particular goals are assigned weights to formally express variations in the authorities' preferences. What makes the game more complicated is that players are not willing to abandon their strategy but try to maximise their payoffs and wait for the partner to make a decision (Marszałek, 2005: 223–234).

Table 3. The monetary-fiscal game: results and payoffs

	Restrictive monetary policy of the central bank	Expansionary monetary policy of the central bank
Restrictive fiscal policy of the government	Result: low inflation and low employment Payoff: central bank: $6 + 1 = 7$ government: $3 + 1 = 4$	Result: moderate inflation and moderate employment Payoff: central bank: $4 + 2 = 6$ government: $2 + 4 = 6$
Expansionary fiscal policy of the government	Result: moderate inflation and moderate employment Result: central bank: $4 + 2 = 6$ government: $2 + 4 = 6$	Result: high inflation and high employment Payoff: central bank: $1 + 3 = 4$ government: $1 + 6 = 7$

Source: developed by the author based on Bennett, Loayza, 2001: 301

Table 4. The payoffs matrix for the monetary-fiscal game

	Payoffs		
Result	low	average	high
Inflation			
Central bank	6	4	1
Government	3	2	1
Employment			
Central bank	1	2	3
Government	1	4	6

Source: developed by the author based on Bennett, Loayza, 2001: 301

In the fiscal-monetary game, the central bank's payoffs for low, medium or high inflation are 6, 4 and 1 respectively, and for low, medium and high employment 1, 2 and 3. The government's payoffs for low, medium and high infla-

tion are 3, 2 and 1, and for low, medium and high employment 1, 4 and 6 (Bennett, Loayza, 2001: 301). In response to the central bank adopting an expansionary monetary policy, the government may change its fiscal policy to an expansionary one. Then the central bank earns the lowest score of 4. Guessing what the government's strategy may be, the central bank goes for a restrictive monetary policy. To improve its situation, the government adopts an expansionary policy and then both authorities receive the same payoff of 6 (Table 4). The fact that none of these options is optimal and that the authorities might prefer other cells in the matrix of the fiscal-monetary game illustrates well the degree of communication and collaboration problems caused by the authorities' different goals (Marszałek, 2005: 223–234). It is because of these different goals that the government prefers a loose fiscal policy and the central bank's gravitates towards a strict monetary policy. According to Działo (2012), a restrictive fiscal policy may be a better option for the monetary authorities, which have then more freedom in carrying out a loose monetary policy. In some situations, however, one of which is an economic crisis, an expansionary fiscal policy may prove handy. The discretionary, anti-cyclical measures of the fiscal authorities have the potential for mitigating the negative impacts of recession, including mass bankruptcies and fast-rising unemployment (usually at the cost of higher public deficit and debt) (Działo, 2012: 36). The question of restrictive monetary policy and expansionary fiscal policy are illustrated by macroeconomic IS-LM models (Investment/Saving equilibrium – Liquidity/Money supply). The IS curve consists of points where total expenditures in the economy are in equilibrium with the product of the economy and real GDP is determined by the interest rate. The LM curve represents the interest rate and real GDP combinations for which the money market is in equilibrium. The recent crisis resulted in more frequent analyses of IS-LM models with respect to a liquidity trap and an investment trap. It has been found, for instance, that in the case of liquidity trap (high sensitivity of demand to interest rate changes) an expansionary fiscal policy is conducive to product and employment growth (Szymańska, 2014: 331–349), but an expansionary monetary policy coinciding with an investment trap (insensitivity of investment to interest rate variations) will change neither employment nor production.

Summing up, both fiscal and monetary authorities can influence the level of unemployment and the degree of fiscality in the economy, thus determining the rate of economic growth. It was probably the awareness of this that encouraged the Polish economic authorities to take coordinated actions during the financial crisis of 2008. A regulatory package stabilising the banking sector and a confidence package protecting bank deposits were designed to increase the credibility of the financial market. The regulatory package contained the Act on the Financial Stability Committee and the Act on the Bank Guarantee Fund. In 2008, the central bank made deep cuts to interest rates and introduced the “Confiden-

ce package” to relax tensions in the interbank market; in 2009 the “Pact for the development of lending activity” was announced. The “Plan for stability and development” that the government launched in 2008 was intended to strengthen the Polish economy in the face of the financial crisis (*Przegląd stabilności systemu finansowego*, 2008: 10; *Polski rynek finansowy...*, 2010: 33–37; *Plan stabilności i rozwoju...*, 2008). The government also made efforts to reduce red tape, to create solutions improving the accessibility of the EU funds and the operation of public-private partnerships. Social contributions were reduced in 2008 by as much as 3.8 p.p. (most other countries made cuts of less than 1 p.p.). The State Treasury increased the availability of sureties and guarantees for entrepreneurs, small business taxpayers and firms starting up in the years 2008–2010 were granted tax reliefs, and the “Concept for the development of Special Economic Zones” was adopted (*Plan stabilności i rozwoju...*, 2008). To help enterprises retain jobs, the Act on the Mitigation of Economic Crisis Consequences for Workers and Employers was passed in 2009 (Ustawa z dnia 1 lipca 2009 r.; *Koniunktura...*, 2011: 42–43).

Faced with high volatility in international financial markets and having to protect the national economy from the impacts of the financial crisis, the Polish fiscal authorities and the central bank chose to coordinate their policies. It is very likely that their efforts aimed at economic growth, the rate of unemployment and financial stability made the crisis impacts in Poland less severe (Stawska, 2014: 676).

4. Analysis of relationships between unemployment and fiscal policy variables

This part of the article discusses regressions obtained for fiscal policy variables (expenditures of the public finance sector, the rate of unemployment, the rate of GDP growth and the general government deficit in Poland). The regressions were performed to obtain statistically significant dependencies, mainly between unemployment and other variables influenced by the fiscal policy, necessary to test the research hypothesis. Prior to the regression analysis, variables were tested for stationarity (with the ADF (Dickey-Fuller) test) and normality. Variables transformed into first differences yielded stationary series and variables with a near-normal distribution. The analysis was performed on the 2000–2016 data sourced from the website of the Polish Central Statistical Office.

Table 5 contains the regression results for the dependent variable ‘first differences of expenditures of the public finance sector’ (d_EXP) and the independent variable ‘first differences of the rate of unemployment’ (d_UNEMP).

Table 5. Regression results: dependent variable (Y): d_EXP and independent variable (X): d_UNEMP

Variable	Coefficient	Standard error	t-Student	p-value
Const.	0.234695	0.254566	0.9219	0.3722
d_UNEMP	0.381250	0.137128	2.780	0.0147**
Selected regression statistics and analysis of variance: N = 16 observations from 2001–2016				
SD of the dependent variable = 1.193031; Standard error of residuals = 0.991219				
R-square = 0.355723				
F(1, 14) = 7.729781 p-value for F test = 0.014742				

** means that p-value < 0.05.

Source: developed by the author with the GRETLL software package

The data show that from 2000 to 2016 public expenditures were statistically significantly influenced by the rate of unemployment. The t-Student statistic of 2.780 at p-value of 0.0147 ($< p = 0.05$) indicates a 95% probability that in that period the first differences of the rate of unemployment statistically significantly determined the first differences of the expenditures of the public finance sector.

The regression results in Table 6 concern the dependent variable ‘first differences of the rate of unemployment in Poland’ (d_UNEMP) and the independent variable ‘first differences of the GG deficit (% of GDP)’ (d_DEF).

Table 6. Regression results for dependent variable (Y): d_UNEMP and independent variable (X): d_DEF

Variable	Coefficient	Standard error	t-Student	p-value
Const.	-0.401974	0.415461	-0.9675	0.3497
d_DEF	-0.614031	0.276513	-2.2206	0.0434**
Selected regression statistics and analysis of variance: N = 16 observations from 2001–2016				
SD of the dependent variable = 1.866369; Standard error of residuals 1.661325				
R-square = 0.260479				
F(1, 14) = 4.931163 p-value for F test 0.043388				

** means that p-value < 0.05.

Source: developed by the author with the GRETLL software package

In this case, the t-Student statistic is -2.2206 at p-value of 0.0434 ($< p = 0.05$), meaning that in the period under consideration the general government deficit exerted a statistically significant influence on the rate of unemployment. The numbers also point to a 95% probability that the first differences of the general government deficit statistically significantly influenced the first differences of the unemployment rate.

Table 7 contains regression results for the dependent variable ‘first differences of the rate of unemployment in Poland’ (d_UNEMP) and independent variab-

les ‘first differences of the GDP growth rate’ (d_GDP) and ‘first differences of the GDP growth rate lagged by one year’ (d_GDP_1).

Table 7. Regression results for dependent variable (Y): d_UNEMP and independent variables (X): d_GDP and d_GDP_1

Variable	Coefficient	Standard error	t-Student	p-value
Const.	-0.606362	0.357629	-1.6955	0.1157
d_GDP	-0.426065	0.20905	-2.0381	0.0642*
d_GDP_1	-0.534525	0.187497	-2.8508	0.0146**
Selected regression statistics and analysis of variance; N = 15 observations from 2002–2016				
SD of the dependent variable 1.767511; Standard error of residuals = 1.382266				
R-square = 0.475782				
F(2, 12) = 5.445614 p-value for F test = 0.020753				

* means that p-value < 0.10.

** means that p-value < 0.05.

Source: developed by the author with the GRETLL software package

Now the t-Student statistics are -2.0381 and -2.8508 at p-values of 0.0642 ($< p = 0.10$) and 0.0146 ($< p = 0.05$). Therefore, in the years 2000–2016 the rate of unemployment responded statistically significantly to the rate of GDP growth and to its counterpart lagged by one year; the probabilities of the first differences of GDP growth rate and of the first differences of GDP growth rate lagged by one year having a statistically significant influence on the first differences of unemployment rate are 90% and 95%, respectively.

The regression results imply that from 2000 to 2016 the rate of unemployment statistically significantly determined the expenditures of the public finance sector in Poland, being itself shaped by the rate of GDP growth, its counterpart lagged by one year and the general government deficit. As far as the impacts of these interactions are concerned, in the wake of expanding unemployment, the public finance sector increased its expenditures; the increasing general government deficit, GDP growth rate and GDP growth rate lagged by one year were instrumental in reducing unemployment.

5. Conclusions

The State needs revenue to accomplish its goals but a tax system should not discourage organisations from investing in R&D or creating new jobs. A government that seeks to keep unemployment low and to stimulate economic growth needs to cooperate with the monetary authorities (the central bank), but because of both authorities’ different goals it is easier said than done. This article presented the re-

sults of an investigation into the degree of fiscality and the rates of economic growth and unemployment in Poland in the years 2000–2016, including the impacts of the monetary and fiscal authorities' decisions. The decisions were strongly influenced by the financial crisis that contributed to a higher rate of unemployment, decelerated economic growth, decreased revenues and increased expenditures of the public finance sector, as well as expanding public deficit and debt.

Because it is difficult to estimate how fiscality alone could have affected the 2000–2016 rate of unemployment in Poland, changes in the degree of fiscality, the rate of unemployment and GDP dynamics were analysed. The analysis showed Poland as a country with a moderate level of fiscality, declining unemployment and GDP dynamics above the EU average. The regressions revealed that in the years of analysis the general government deficit and the rate of GDP growth (the measures of fiscal policy) had a statistically significant effect on the rate of unemployment in Poland that, in turn, statistically significantly influenced the expenditures of the public finance sector (the measure of fiscality).

References

- Balcerzak A. (2013), *Poziom obciążeń fiskalnych w Polsce po globalnym kryzysie finansowym na tle pozostałych krajów Unii Europejskiej*, [in:] W. Olkowska (ed.), *Ekonomika i finanse w procesie rozwoju gospodarki rynkowej. Aspekty globalne i lokalne*, Wydawnictwo Uczelniane Wyższej Szkoły Informatyki i Ekonomii TWP w Olsztynie, Olsztyn.
- Bednarski M., Kryńska E., Pater K., Walewski M. (2008), *Przyczyny pracy nierejestrowanej w Polsce*, Departament Rynku Pracy i Ministerstwa Pracy i Polityki Społecznej, Warszawa.
- Bennett H., Loayza N. (2001), *Policy biases when the monetary and fiscal authorities have different objectives*, Central Bank of Chile Working Papers, no. 66.
- Bludnik I. (2004), *Keynes a neokynesiści*, "Ruch Prawniczy, Ekonomiczny i Socjologiczny", no. 2, pp. 132–138.
- Central Statistical Office database, <http://stat.gov.pl/wskazniki-makroekonomiczne/> [accessed: 25.07.2017].
- Dynus M. (2007), *Fiskalizm w Unii Europejskiej*, "Bank i Kredyt", February, ss. 34–45.
- Działo J. (2012), *Dlaczego trudno jest prowadzić "dobrą" politykę fiskalną?*, "Gospodarka Narodowa", no. 1–2, ss. 25–40.
- Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=gov_10a_main&lang=en [accessed: 22.07.2017].
- Grądalski F. (2004), *Wstęp do teorii opodatkowania*, SGH, Warszawa.
- Jarmołowicz W., Woźniak B. (2006), *Polityka państwa wobec bezrobocia*, "Zeszyty Naukowe PTE", no. 4, ss. 113–130.
- Koniunktura gospodarcza w wybranych krajach w okresie kryzysu finansowego* (2011), Ministry of Economy, Warsaw.
- Kraj-Gabrys I. (2012), *Fiskalizm w Polsce na tle Unii Europejskiej*, "Zeszyty Naukowe Wyższej Szkoły Ekonomii i Informatyki w Krakowie", no. 8, ss. 195–204.
- Krajewska A. (2010), *Podatki w UE*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- Krugman P. (2012) *End the depression now!*, <http://natemat.pl/20625,noblista-paul-krugman-wywa-zakonczenie-ten-kryzys-teraz> [accessed: 19.07.2017].

- Kryńska E., Kwiatkowski E. (2010), *Polityka państwa wobec rynku pracy. Idee ekonomiczne i rzeczywistość*, "Polityka Społeczna", no. 5–6, ss. 1–7.
- Marszałek P. (2005), *Zastosowanie teorii gier do badania koordynacji polityki pieniężnej i polityki fiskalnej*, [in:] W. Przybylska-Kapuścińska (ed.), *Studia z bankowości centralnej*, "Zeszyty Naukowe Akademii Ekonomicznej w Poznaniu", no. 56, ss. 223–227.
- Owsiak S. (2005), *Finanse publiczne. Teoria i praktyka*, Wydawnictwo Naukowe PWN, Warszawa.
- Plan stabilności i rozwoju – wzmocnienie gospodarki Polski wobec światowego kryzysu finansowego* (2008), Ministry of Finance, Warsaw, http://www.mf.gov.pl/_files/_aktualnoci/2008/12/plan_stabilnosc_i_rozwoju.pdf [accessed: 19.07.2017].
- Polski rynek finansowy w obliczu kryzysu finansowego w latach 2008–2009* (2010), Urząd Komisji Nadzoru Finansowego, Warszawa.
- Przegląd stabilności systemu finansowego* (2008), Komisja Nadzoru Finansowego, Warszawa.
- Sawulski J. (2016), *Finanse publiczne w Polsce – diagnoza na tle innych krajów*, IBS Policy Paper, no. 04.
- Siwy A., Adamczyk A., Lubińska T., Tarczyński W. (2004), *Poziom fiskalizmu a bezrobocie i tempo zmian PKB w krajach Unii Europejskiej i w Polsce w latach 1990–2000*, "Ekonomista", no. 1, ss. 99–115.
- Stawska J. (2014), *Wpływ policy-mix na wzrost gospodarczy i poziom bezrobocia w Polsce*, "Zeszyty Naukowe" no. 804, "Finanse, Rynki finansowe, Ubezpieczenia", no. 67, Uniwersytet Szczeciński, Szczecin, ss. 667–677.
- Szczęsny W. (2001), *Firma w otoczeniu fiskalnym*, Difin, Warszawa.
- Szymańska A. (2014), *Efekty polityki fiskalnej w warunkach niskich stop procentowych – przegląd literatury*, "Studia Prawno-Ekonomiczne", t. XCIII, ss. 331–349.
- Ustawa z dnia 1 lipca 2009 r. o łagodzeniu skutków kryzysu ekonomicznego dla pracowników i przedsiębiorców (Dz.U. z 2009 r. Nr 125).
- Wilczyński W. (2005), *Polski przełom ustrojowy 1989–2005. Ekonomia epoki transformacji*, Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu, Poznań.

Fiskalizm a poziom bezrobocia w Polsce w kontekście gry fiskalno-monetarnej

Streszczenie: Z jednej strony odmienne cele stojące przed bankiem centralnym i rządem nie ułatwiają prowadzenia optymalnej polityki pieniężnej i fiskalnej, z drugiej zaś decyzje podejmowane w grze monetarno-fiskalnej władz gospodarczych w sposób istotny oddziałują na zmienne ekonomiczne w gospodarce. Stąd w zależności od przyjętych strategii banku centralnego i rządu kształtują się zmienne ekonomiczne w danej gospodarce. W niniejszym artykule szczególną uwagę zwrócono na poziom dochodów i wydatków sektora finansów publicznych, wzrost gospodarczy i stopę bezrobocia w Polsce w latach 2000–2016. Celem artykułu jest próba przedstawienia poziomu fiskalizmu w polskiej gospodarce oraz stopy wzrostu gospodarczego i bezrobocia w kontekście monetarno-fiskalnych decyzji władz gospodarczych. Do osiągnięcia postawionego celu wykorzystano statystyczne metody badawcze oraz metody graficznej prezentacji zjawisk gospodarczych. W rezultacie zauważono, że na stopę bezrobocia oddziałuje deficyt instytucji rządowych i samorządowych oraz dynamika PKB. Poza tym dostrzeżono, że stopa bezrobocia wpływa na wydatki sektora finansów publicznych. Oryginalność badania przeprowadzonego w niniejszym artykule polega na analizie zmian poziomu fiskalizmu, stopy bezrobocia i dynamiki PKB w polskiej gospodarce w latach 2000–2016, zachodzących w wyniku interakcji monetarno-fiskalnych oraz czynników wpływających na decyzje władz gospodarczych, w szczególności związanych z kryzysem finansowym.

Słowa kluczowe: fiskalizm, bezrobocie, polityka fiskalna, polityka monetarna, wzrost gospodarczy

JEL: E02, E24, E62

	© by the author, licensee Łódź University – Łódź University Press, Łódź, Poland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license CC-BY (http://creativecommons.org/licenses/by/3.0/)
	Received: 2017-08-20; verified: 2018-03-03. Accepted: 2018-05-02