

THE IMPACT OF EXTERNAL FACTORS ON THE GROWTH OF BUDGET DEFICIT AND PUBLIC DEBT OF POLAND IN THE YEARS 2005 - 2022

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Abstract: *It can be assumed that the budget deficit has become an integral part of the state's public finances. Although it may not be fully understandable, it is taken into account already at the stage of budget creation. In this way, the state tries to estimate, based on internal needs, what negative budget balance may occur in a given financial year. The amount of the budget deficit as well as the public debt in particular years is influenced by the internal needs of the state, but also by independent external factors. The subject of the study in this article is an attempt to demonstrate that the emergence of an independent external factor negatively affects the state budget and deepens the budget deficit. The study focuses on the analysis of the level of budget deficit and public debt over the years in relation to 2020, when the COVID-19 pandemic was officially announced, and 2007-2009, when the global economic crisis occurred.*

Keywords: *public finances, public debt, budget deficit, budget*

JEL Codes: *H5, H6, H7*

1. Introduction to public finances

Public finances are closely related to the process of collecting and spending money. The course of these processes is legally regulated through various types of provisions, and the basic document regulating this topic is the Act of August 27, 2009 on public finances. Pursuant to this Act, the subject of interest of public finances in general are phenomena, processes and

public institutions that decide on the acquisition and allocation of public funds, and the aim of these activities is to ensure the best possible functioning of the public sector.

It should be mentioned that in a market economy, in addition to the public sector, we can also distinguish the private sector, which, although different from the public sector in that the first includes public institutions and units that provide public services, and in the second one we are dealing with enterprises, consumers and households, the common denominator for these sectors is the financial system of the economy. This correlates at the level of the basic activities of all entities in the monetary sphere and formulates the basic activities of all entities in this area. Additionally, the financial system, due to its function, stabilizes the activities of both public and private entities and the relationships between them.

In addition to the division of the economy into the public sector and the private sector, we are faced with the division of the economy into public finances and private finances. Similarly to the division into public and private sectors, there are differences in this division. The main difference between these spheres is that private finances in the sense of obtaining and spending them are decided by an individual, and in the case of public finances, decision-making lies with public administration entities. For this reason, which is very important, public finances are always prepared through public entities and supervision over their management is based on administrative procedures (Miklaszewicz 2012).

Therefore, focusing our attention on generally understood public finances, it must be assumed that the task of the state's financial policy is to use the available tools, methods and instruments in such a way that it will be possible to achieve the assumed goals with a positive result for the entire country's economy. This can be achieved through appropriate action of public entities and effective use of the country's economic potential, stimulating economic growth, ensuring both internal and external security, meeting basic social needs, etc. (Ostaszewski 2003).

The above state activity related to collecting and spending money is closely related to the budget deficit, which is the surplus of state budget expenditure over its revenues, in other words, it shows a negative balance in the state budget. It is a kind of absurdity that the budget deficit is recognized already at the stage of budget creation, which violates the budget principle in the strict sense, which constitutes on budget balance (Jarocka 2003).

2. Characteristics of the budget deficit and public debt

The word deficit itself in terms of the state's economy has negative connotations. It brings to mind actions that did not produce the intended effect or planned goal. The deficit may be the result of incorrect decisions, inappropriate actions, but also failure to perform specific, planned activities, or the occurrence of unforeseen factors affecting changes in the planned budget for a given year.

Although in general financial terms, the budget deficit is a negative balance in the institution's budget, it must be remembered that it belongs to a more complex category and the causes of its formation are not so easy to estimate and require in-depth analyses. Only such an approach provides a chance to correctly diagnose the cause of the budget deficit and to learn about the factors directly influencing its occurrence, and thus opens the possibility of taking appropriate steps to restore budget balance, which is nothing else than balancing the state's expenditures with its revenues.

To balance the budget, the state is forced to take out public debt. This is an action that has some disturbing consequences, although not always negative. It may happen that they will result in an improvement in the country's economic situation, e.g. when debt is incurred for investment purposes. Nevertheless, the state must be careful not to exceed the deficit limit of 3% of GDP, which is defined as a safe debt level (Filipiak 2008).

Public debt, which is also called national or public debt, is nothing more than a form of borrowing money from citizens by the state, which consequently, it increases the debt to society. In other words, public debt policy is a conscious action of the state aimed at financing above-budget expenses (Marchewka-Bartkowiak).

However, public debt does not always have to be linked to the budget deficit. It may occur as a consequence of various decisions and actions taken in a given year with an obligation to repay in subsequent years. In such a case, it is the result of debt from previous years. The main reason for the formation of public debt is, as previously mentioned, the financing of the state budget deficit. Undoubtedly, public debt arises on the basis of decisions made by the state and, in addition to those mentioned above, they also include: rollover of loans - issuance of treasury securities in order to repay previous liabilities, granting sureties and guarantees by the government, or irregular repayment of liabilities of public sector entities (Marchewka-Bartkowiak).

3. Methods of calculating the budget deficit

The main approach to the budget deficit is to present it in the form of a type of deficit called the real deficit. This is one of the three basic divisions of the budget deficit and also the most popular. The other two types of deficit are: cyclical deficit and structural deficit. The actual deficit shows, as mentioned earlier, the actual difference between state budget expenditures and state budget revenues in a given year.

It must be admitted, however, that this is not a perfect approach to defining the causes of the budget deficit, because it does not take into account aspects such as the impact of business cycles and inflation phenomena that affect the final budget balance. There is also a lack of attention to the direction of the state's fiscal policy.

There are two methods of calculating the budget deficit. One of the methods is the method used by the International Monetary Fund, and the second used by the European Union. The method used by the IMF is a method that calculates the official, classic deficit. It defines the budget deficit as the difference between budget expenditures and budget revenues. (Gradoń 2004).

According to this method, the budget deficit is calculated using the formula:

$$Def_{t_0,t_1} = \sum D_{t_0,t_1} - \sum W_{t_0,t_1}$$

Where:

t_0 – beginning of period,

t_1 – end of period,

Def – budget deficit,

D – budget revenues,

W – budget expenses.

The budget deficit calculated using the European Union method is understood as the increase in net debt, i.e. less the increase in receivables. According to this method, it is calculated as follows:

$$PZn = PZb - PNs_b - PS\acute{S}RBsb + / - SOMsb$$

Where:

PZn – increase in net debt,

PZb – increase in gross debt,

PNSb – increase in receivables from the budget sector,

PSŚRBsb – increase in funds on bank accounts of the budget sector,

SOMsb – balance of property operations in the budget sector.

4. Analysis of the increase in Poland's budget deficit and public debt

Having data on the budget deficit and public debt over the years, a study can be carried out and on its basis, it is possible to identify periods of increase in deficits that differ significantly from the average and to indicate with great precision the causes of their occurrence.

Table 1 includes the deficit and debt of the government sector from 2012 to 2022. There you will find detailed data broken down into individual areas, i.e. sectors and sub-sectors of central government and local ones presenting the budget deficit or surplus and their percentage share in relation to gross domestic product. This data will serve as the main source of information on the development of the budget deficit over the years and will allow us to determine in which years the budget deficit and public debt recorded the greatest deviations.

Tab. 1 Deficit and debt of the government sector in 2012-2022 (PLN million).

Specification	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Gross Domestic	1 629	1 656	1 719	1 798	1 851	1 989	2 115	2 288	2 337	2 631	3 078
Product (GDP)	392	842	704	302	171	314	672	492	672	302	325
General government	-60	-67	-58	-45	-44	-30	-7	-17	-161	-48	-115
deficit/surplus	138	130	980	976	735	404	987	009	834	195	137
%GDB	-3,7%	-4,1%	-3,4%	-2,6%	-2,4%	-1,5%	-0,4%	-0,7%	-6,9%	-1,8%	-3,7%
Central government	-59	-59	-38	-39	-48	-72	-13	-25	-183	-49	-101
subsector	042	575	803	435	157	556	394	208	725	006	673
deficit/surplus											
%GDB	-3,6%	-3,6%	-2,3%	-2,2%	-2,6%	-3,7%	-0,6%	-1,1%	-7,9%	-1,9%	-3,3%

Deficit/Surplus of	-4	-2	-3	50	4 523	1 182	-7	-4	4 463	14	-12
the local	556	926	240				369	686		918	804
government											
subsector											
%GDB	-0,3%	-0,2%	-0,2%	0,0%	0,2%	0,1%	-0,4%	-0,2%	0,2%	0,6%	-0,4%
Social Security	3 460	-4	-16	-6	-1	40	12	12	17	-14	-660
Funds Subsector		629	937	591	101	970	776	885	428	107	
Deficit/Surplus											
%GDB	0,2%	-0,3%	-1,0%	-0,4%	-0,1%	2,1%	0,6%	0,6%	0,7%	-0,5%	0,0%
Dług sektora	875	922	863	919	1 006	1 005	1 034	1 046	1 336	1 410	1 512
instytucji	085	563	810	660	282	722	358	022	558	500	227
rządowych											
i samorządowych											
% GDB	53,7	55,7	50,2	51,1	54,4	50,6	48,9	45,7	57,2	53,6	49,1
	%	%	%	%	%	%	%	%	%	%	%

Source: Central Statistical Office data - Communication on the deficit and debt of the general government sector in 2010 – 2022

The data in table 2 are limited only to showing the size of the budget deficit and public debt from 2005 to 2011. As in Table 1, they are presented as a percentage of GDP. For the purposes of conducting the study in question, this is sufficient information to enable analysis.

Tab. 2 Deficit and debt of the government sector in 2005–2011.

Criterion	2005	2006	2007	2008	2009	2010	2011
Budget deficit in % of GDP	4,1	3,6	1,9	3,7	6,3	7,9	5,0
Public debt in % of GDP	47,1	47,7	45,0	47,2	51,2	54,9	56,2

Source: Central Statistical Office, Department of National Accounts

Comparing the data in terms of the percentage share of the budget deficit and public debt to the gross domestic product, it can be easily noticed that in 2009-2010 and in 2020 the percentage deviation in relation to GDP was the largest both in the budget deficit and public debt (see Table 3.).

Tab. 3 Changes in the growth of the budget deficit and public debt from year to year.

Year	Budget deficit % of GDP	Year-on-year growth	Public debt % of GDP	Year-on-year growth
2005	4,1		47,1	
2006	3,6	0,5	47,7	-0,6
2007	1,9	1,7	45,0	2,7
2008	3,7	-1,8	47,2	-2,2
2009	6,3	-2,6	51,2	-4,0
2010	7,9	-1,6	54,9	-3,7
2011	5,0	2,9	56,2	-1,3
2012	3,7	1,3	53,7	2,5
2013	4,1	-0,4	55,7	-2,0
2014	3,4	0,7	50,2	5,5
2015	2,6	0,8	51,1	-0,9
2016	2,4	0,2	54,4	-3,3
2017	1,5	0,9	50,6	3,8
2018	0,4	1,1	48,9	1,7
2019	0,7	-0,3	45,7	3,2
2020	6,9	-6,2	57,2	-11,5
2021	1,8	5,1	53,6	3,6
2022	3,7	-1,9	49,1	4,5

Source: Own study based on data from the Central Statistical Office - Communication on the deficit and debt of the general government sector in the years 2012 - 2022, and the Central Statistical Office of the Department of National Accounts data for the years 2005 -2011

Interesting conclusions can also be drawn based on the year-to-year change in the size of deficits. Both for the budget deficit and public debt in 2009-2010 and 2020, the values deviate significantly in the negative, i.e. they deepen the deficit (see Table 3.).

In 2009, the budget deficit was higher by 2.6% than in 2008 and the budget deficit in 2010 was higher by 1.6% than in 2009. This gives a cumulative increase in the budget deficit in two years at the level of 4.2% until 2008. In turn, the public debt increased year by year by 4.0% in 2009 compared to 2008, 3.7% in 2010 to 2009 and 1.3% in 2011 to 2010. However, in 2020 the deficit increased budget year on year was 6.2% higher than in 2019, and public debt was 11.5%.

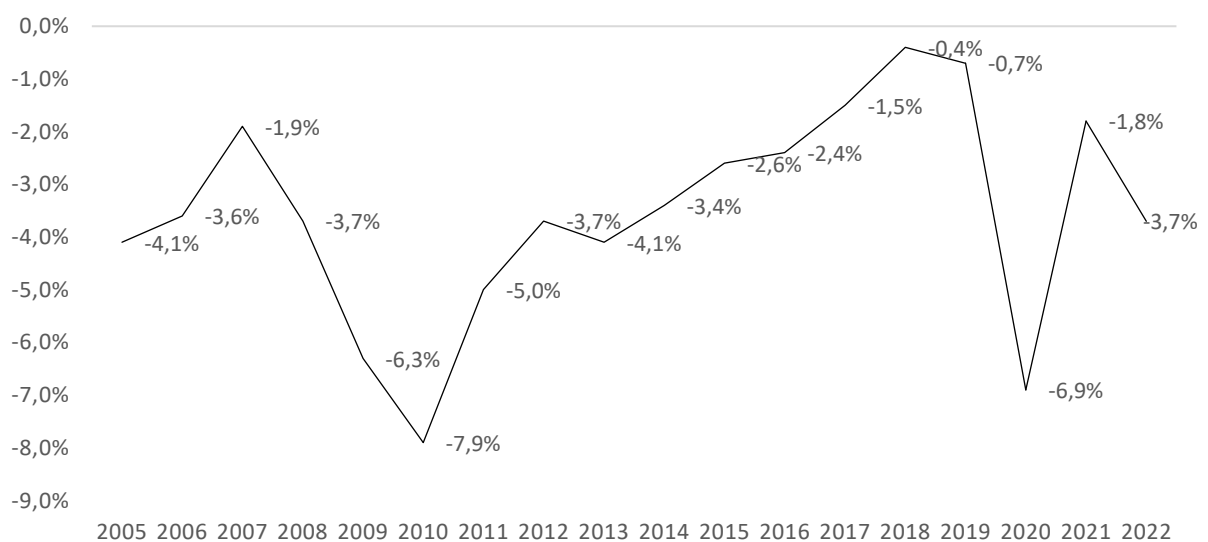
Such significant deviations only in some years may indicate that they were caused by external factors unplanned by the government. To prove this, you need to analyze the economic

situation in the world or in the country in that period and find the source that could have caused it.

Based on reports, information and various government data, we know that on March 20, 2020, the COVID-19 pandemic was officially announced in Poland. The first cases of SARS-CoV-2 virus infection were detected in November 2019 in Wuhan, the capital of China's Hubei province. It was the beginning of global problems that translated into the functioning of world economies. Undoubtedly, the pandemic had a direct impact on the economic consequences of the crisis, which only confirms the thesis that external factors, and unforeseen ones, have a significant impact on the increase in the budget deficit and public debt. To meet the challenges resulting from the current situation, the government must take actions that were not included in the budget and try to save the situation to minimize the effects caused by the pandemic in this case. The effect of these actions are changes in the budget deficit and public debt, which will be felt for years to come.

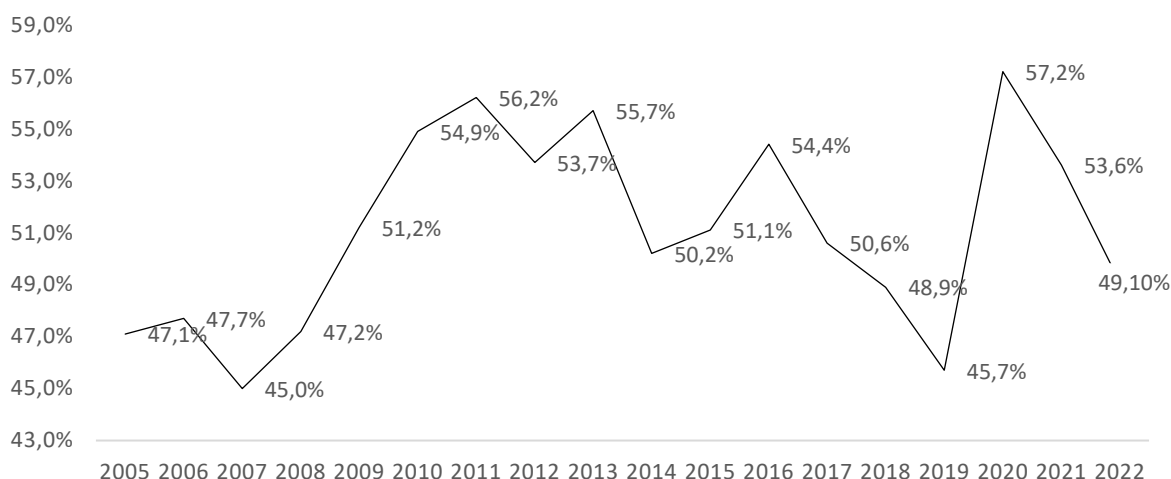
The charts below clearly show the peaks of deficits in individual years, which deviate significantly from years with a relatively stable economic situation.

Fig. 1. Deficit of the general government sector in % of GDB



Source: Central Statistical Office data - Communication on the deficit and debt of the government sector and local government in the years 2012 - 2022, and the Central Statistical Office, Department of National Accounts, data for the years 2005 - 2011

Fig. 2. Debt of the general government sector in % of GDP



Source: Central Statistical Office data - Communication on the deficit and debt of the government sector and local government in the years 2012 - 2022, and the Central Statistical Office, Department of National Accounts, data for the years 2005 - 2011

In the years 2007 - 2009, there was a global economic crisis on financial and banking markets. Its peak occurred in 2008-2009, and in Poland even later (see Table 3 and Graph 1). The overall cause of the crisis was the breakdown of the global financial system caused by the boom in the mortgage loan market in the United States, where banks granted loans with a high risk of repayment, i.e. loans were given to people with insufficient financial resources. This was the beginning of problems that became deeper and deeper over time.

When we look at the data in Table 1 or Chart 1, we will notice that the financial crisis that began in 2007 did not have a direct impact on the domestic economy. There was a shift at this point and the crisis began to be felt in Poland much later. This was influenced by phenomena such as high state debt, high share of imports in production and dangerous dependence of the Polish zloty on speculative short-term investments.

The above analysis of the existing situations very eloquently shows how crisis situations affect the state budget, which translates into the size of the budget deficit and public debt. The situation is even more uncomfortable when the action of unfavorable external factors is unforeseen, because it does not give the government the opportunity to prepare in an appropriate manner and in a timely manner and take actions that will not eliminate the crisis, then minimize its effects.

5. Conclusions from the study

Having the data included in Table 3, it is possible to determine the average deviation of the budget deficit and public debt in Poland for a sample of 18 years and estimate the average annual value of the budget deficit and public debt as a coefficient using the interval method, assuming the value of 0.95.

Calculations were made using formulas.

For the confidence interval:

$$P\{\bar{X} - t_{\alpha} \cdot \frac{s}{\sqrt{n}} < m < \bar{X} + t_{\alpha} \cdot \frac{s}{\sqrt{n}}\} = 1 - \alpha$$

and for standard deviation:

$$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

Where:

m – unknown mean value in the population,

s – standard deviation calculated in the sample,

n – sample size,

$\bar{X}$ – average of the sample,

$1 - \alpha$ – confidence factor,

t_{α} – value read from student's t-tables for $n-1$ degrees of freedom and significance level α .

For the purpose of calculating the standard deviation, the average value from the sample was calculated, which for the budget deficit is 3.53 based on the data from Table 3. Then the standard deviation was calculated in such a way that the squared deviation from the mean value was first calculated for all observations: $(x_i - \bar{x})^2$ and they were added up. Later, the value of this sum was divided by $n-1$, which gives a result of 2.04. We know that n is 18 because these are all the years in which we analyze the budget deficit. t_{α} was read from the student's

t-distribution tables, for a significance level of α 0.05. We remember that the value of 0.95 was assumed for $1-\alpha$. So, the value 2.10 was read from the student's t-distribution tables.

Having the above calculations in hand, we began to calculate the confidence interval, where the values from the previous calculations were substituted into the formula. In this way, the following range for the budget deficit was obtained:

$$2,52 < m < 4,55$$

Calculations were carried out in a similar way for public debt and obtained values in the range:

$$49,2 < m < 52,95$$

The above calculations show that we can state with a probability of 95% that the unknown average values of the budget deficit and public debt are in the range for the budget deficit from 2.52 to 4.55 and for the public debt from 49.2 to 52.95.

Based on the above calculations, it should be concluded that in 2009-2010 and 2020, there was a significant deviation of the budget deficit and public debt from average values.

Therefore, the scale, size and strength of the external factor may determine the size of the budget deficit. The bigger the crisis and the larger the area it affects, the more money is consumed by the actions taken to counteract its effects.

Nevertheless, as Agnieszka Przybylska-Mazur noted in her work, following fiscal rules may be effective in reducing public debt and deficit. Fiscal policy based on these fiscal rules is strengthened by prudence of fiscal policy and objectivity in the implementation of budget policy. Fiscal rules help in making budget decisions that take into account deficit and debt reference values in accordance with the Treaty on the Functioning of the European Union and take into account multi-annual budget planning perspectives, including compliance with the medium-term budgetary objectives of a given EU Member State. In the context of different phases of the business cycle, it is important to know the fiscal rules thanks to which it is possible to make optimal decisions.

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