



## STABILITY OF TAX REVENUE IN POLAND'S NATIONAL BUDGET IN 2004-2020

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### Abstract

Both the amount and structure of tax revenue may change in time as they depend on numerous variables, including factors of the business cycle. However, the stability of tax revenue affects the balance of public finances and the ability to meet public obligations. The aim of this study is to evaluate the stability of tax revenue in Poland's national budget in 2004-2020. The research results indicate that both the amount and the structure of tax revenue in the national budget in 2004-2020 were stable.

**STABILNOŚĆ DOCHODÓW PODATKOWYCH BUDŻETU PAŃSTWA W POLSCE  
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Sł o w a k l u c z o w e: podatki, budżet państwa, stabilność dochodów podatkowych, cykle koniunkturalne.

**Abstrakt**

Zarówno wysokość, jak i struktura dochodów podatkowych mogą się zmieniać w czasie, zależą bowiem od wielu czynników, w tym czynników o charakterze koniunkturalnym. Od stabilności dochodów podatkowych zależy tymczasem stabilność finansów publicznych i możliwość wypełniania zadań publicznych. Celem badań stała się więc ocena stabilności dochodów podatkowych budżetu państwa w Polsce w latach 2004-2020. Na podstawie przeprowadzonych badań wykazano, że zarówno poziom, jak i struktura podatkowych dochodów budżetu państwa w latach 2004-2020 były stabilne.

**Introduction**

The national budget is the main instrument for public authorities to achieve their social and economic objectives. The revenue of the national budget consists of monies collected by the state from economic entities and households in order to finance public expenditure. It should be noted that currently only a small percentage of the state's financial needs is covered with non-tax revenue. Tax revenue is the main source of the national budget and the foundation of the state's policy.

Public authorities use various types of taxes which contribute to the achievement of social and economic objectives to a varying degree, as part of the fiscal policy implemented by the state. The authorities are obliged to use taxes in a rational manner, properly combining the state fiscal interest with the economic interest of taxpayers, and to manage the social policy so as to avoid unfavorable effects of taxation (Alińska & Woźniak (Eds.), 2015, p. 115).

The most important sources of tax revenue in the national budget are the VAT, excise tax, personal income tax and corporate income tax. The amount of revenue from each source and its share in the overall tax revenue may vary in time, similarly to the share of tax revenue in the aggregate income in the national budget. Fluctuations in the amount and structure of the tax revenue in the national budget may follow from changes in the legal regulations concerning specific types of taxes, e.g. in the scope and the base of taxation, the level of taxation or reductions and exemptions. As S. Owsiak indicates (2011, p. 25), the stability of tax revenue in the national budget may also be at risk from an economic recession, which entails a decrease in the public revenue caused by the slowdown of the economic growth.

In the light of the above, the aim of this research was to evaluate the stability of the tax revenue in Poland's national budget in 2004-2020. The investigation concerned the stability of the amount and the structure of tax revenue in Poland in that period. It was assumed that the income from a given source is more stable in time when it is subject to fewer and smaller fluctuations, and vice versa (Garsztka & Cieślukowski, 2014, p. 193-209).

The stability of the tax revenue was estimated using a coefficient of variation calculated with the following formula (Panek & Zwierzchowski, 2013, p. 21):

$$V = \frac{s}{|\bar{x}|},$$

where:

- $s$  – level of standard deviation,
- $\bar{x}$  – arithmetic mean, assuming that  $\bar{x} \neq 0$ .

The evaluation of tax revenue stability was conducted along with the interpretation of the coefficient of variation proposed by P. Garsztka & M. Cieślukowski (2014, p. 201):

- $V < 0.1$  – very stable,
- $0.1 \leq V < 0.2$  – stable,
- $0.2 \leq V < 0.3$  – moderately stable,
- $0.3 \leq V < 0.4$  – unstable,
- $V \geq 0.4$  – very unstable.

The research was based on the data from 2004-2020. The selection of this period followed from the fact that many changes in the Polish tax law have been implemented since 2004, the year marked by Poland's accession to the European Union, and their goal has been to harmonize the Polish tax law with that of the European Union. Moreover, this period is long enough to conduct an analysis of the changes in the stability of the tax revenue in the national budget, both during an economic expansion and economic slowdown.

The study employed the following research methods: analysis of the relevant literature, analysis of the sources, statistical method, and induction method.

## Literature review

The national budget is the main instrument for public authorities to achieve their social and economic objectives. These objectives take the form of specific policies implemented by the government, and they are financed from the state revenue, in which taxes have the largest share (Alińska & Woźniak (Eds.), 2015, p. 115).

The Polish Constitution of 2 April 1997 is the supreme and the most general legal act which regulates the national revenue (Dziennik Ustaw of 1997, no. 78, item 483, with subsequent amendments). According to Article 216, the funds towards public objectives are collected and spent according to the law, namely the Act on Public Finances, of 27 August 2009 (Dz.U. 2017, item 2077, consolidated). The collection of the national budget revenue is the foundation of the state's financial policy and is a public responsibility. The correct distribution of the budget revenue constitutes the basis of the proper structure of the budget (Bitner *et al.*, 2017, p. 84).

The national budget revenue is made of funds collected in various forms, both from domestic and foreign economic entities. It should be noted that this revenue does not create any financial obligations of the state towards its citizens, except for the political obligation towards the electorate to spend it properly (Żyżyński, 2009, p. 87). The main source of revenue are public levies, seen as a classic charge imposed on households and enterprises. Its main feature is the fact that the entity being levied does not obtain any direct benefits in return (Kosidłowska, 2013; Ważna, 2018).

The revenue of the state originates from tax and non-tax income. The tax income comes from indirect taxation, such as the VAT, excise, gambling and lottery tax, as well as from direct taxation, mostly from the personal income tax (PIT) and corporate income tax (CIT), tonnage tax, and mining tax on some extracted resources. The non-tax revenue includes non-tax public and legal income, such as charges, civil law income following from ownership rights to public funds and other assets, duties resulting from guarantees and warranties granted by the State Treasury, income from the surplus in current assets of executive agencies, duties imposed by the state budget units and those collected by units of the local government during the performance of delegated tasks (Bitner *et al.*, 2017, p. 150). The list of sources of revenues to the budget is not finite as the budget can be supplied with income from other sources, defined in separate laws or international agreements (Juja, 2011, p. 57).

Currently, non-tax revenues cover only a small share of the financial needs of the state. The main source of income to the budget is tax revenue, which constitutes the foundation for the achievement of the objectives adopted by the state. Public authorities take advantage of many types of taxes, which contribute to the implementation of the adopted social and economic policies in various

degrees, as part of the overall fiscal policy (Stecula, 2018, p. 574). In an adequately rational taxation policy, it is assumed that the amount of taxes should not suppress the economic activity. On the other hand, the amount of tax should ensure the necessary supply, for social reasons, of funds in the national budget. The most important function of taxes is their fiscal role, which involves the supply of funds towards the implementation of the adopted state policy.

The concept of tax is defined by the provisions of Article 6 of the Tax Code Act of 29 August 1997 – (Dz.U. item 800, consolidated). According to this definition, a tax is a public-law, gratuitous, mandatory and non-refundable financial charge for the sake of the State Treasury, and for all units of the state's administrative division (provinces, districts and municipalities), as stipulated in the Tax Act (Borodo, 2014, p. 136). According to the OECD definition, the term "taxes" refers to mandatory and non-refundable payments towards the sector of national and local government institutions (OECD, 2020, p. 224). R. Rybarski (2015, p. 12) maintains that "a tax is a compulsory charge in money or other financial assets, which is imposed by the state on their subordinates". According to Article 217 of the Constitution of the Republic of Poland of 2 April 1997 (Dz.U. 1997, no. 78, item 483, with subsequent amendments), the imposition of taxes and other public duties, definition of subjects, objects and levels of taxation, as well as principles for granting reliefs and redemptions, and the categories of subjects entitled to tax exemptions are all regulated exclusively by acts of law.

The amount of taxes from specific types of taxation and their share in the total tax revenue depend on many factors, and as such can vary in time. It is important then that such changes are not too rapid and allow for smooth implementation of the state policies. It is therefore understandable that the issue of stability in the budget revenue, including tax revenue, is considered essential and draws attention of scholars both in Poland and abroad (cf. Dye & Merriman, 2004; Carroll, 2009; Yan, 2012; Czudec, 2014; Klank, 2014; Wójtowicz, 2014; Galiński, 2015). Many authors emphasize that the security of revenue sources plays a key role in the proper achievement of public objectives, both nationally and locally, in local government units. It is a prerequisite for the efficient attainment of these objectives (Bożek, 2016, p. 34; Śmiechowicz, 2016, p. 173; Dworakowska, 2018, p. 53; Wichowska & Ostrowska, 2018). It should be noted that the wider the range of objectives and the higher their importance to the public and to the proper functioning and development of the country, the more important the issue of revenue stability (Śmiechowicz, 2016, p. 173).

The notion of revenue stability has not been clearly defined in the literature. Some authors stress that the revenue which bears the burden of a properly structured system of public finances should have specific attributes, such as (Wójtowicz, 2014, p. 138, 139; Poniatowicz, 2016, p. 9, 10):

– fiscal efficiency – allowing for the effective implementation of basic public policies;

- anti-cyclical – allowing for the implementation of these policies regardless of an phase in the business cycle;
- stability – involving the relative legal stability of this revenue.

Some authors indicate, however, that the public revenue can only be considered stable if it supplies the national budget with adequate funds regardless of an phase in the business cycle (cf. Cattoir, 2004; Owsiak, 2011). Others stress that in fact stable public revenue is properly correlated with economic cycles (cf. Fox, 2004; Kawecka-Wyrzykowska, 2008). And some scholars propose a more universal approach to the research of public revenue stability. They investigate the stability of revenue exclusively in the context of income fluctuations, with no reference to the fiscal efficiency and business cycle (see Garsztka & Cieślukowski, 2014). In this approach, the revenue from one specific source is treated as more stable when it is subject to fewer fluctuations, and vice versa. This understanding and manner of measuring stability has been adopted in this research.

It is worth mentioning that national governments which try to prevent the instability of budget revenue strive to determine the optimal contents of their tax portfolio. They want to own a mix of tax revenue that enables them to grow their income during an economic expansion, so as the planned spending can be done with no major changes of tax rates. At the same time they try to maintain the relative stability of tax revenue so as not to suffer major financial limitations during an economic contraction (Felix, 2008, p. 63). It is without doubt that the business cycle affects the income, consumption, and investment, and thus the amount of tax revenue (Schunk & Porca, 2005; Lubieniecka, 2013). The diminished budget income during an economic slowdown is then a difficult fiscal problem to national governments (Mikesell & Mullins, 2010, p. 246). For the local government units, it may mean a decrease in financial independence (cf. Heller, 2006; Heller & Farelnik, 2013; Bisogno *et al.*, 2017; Dziemianowicz *et al.*, 2018; Wichowska & Wierzejski, 2019).

## Results

Tax revenue constitutes the most important source of the overall national budget. The tax revenue in Poland in the studied period included taxes collected through the VAT, excise duties, gambling and lottery tax, personal and corporate income tax, mining tax levied on some extraction enterprises, and taxes from some financial institutions. Table 1 shows the amount of tax income for the national budget from these taxes in 2004-2020.

The amount of tax revenue increased in the studied period from PLN 135.6 bn to PLN 370.3 bn, which means that is nearly trebled. Changes in the amount of tax revenue in following years showed an evident increasing tendency. A drop in the tax revenue in the national budget was only reported in two years: 2009

Table 1

Tax revenue of the national budget in 2004-2020 (in bn PLN)

Year	Total revenue	VAT	Excise duty	Gambling and lottery tax	CIT	PIT	Mining tax on some extraction	Tax on some financial institutions
2004	135.6	62.3	37.9	0.8	13.1	21.5		
2005	155.9	75.4	39.5	0.8	15.8	24.4		
2006	174.9	84.4	42.1	0.9	19.3	28.1		
2007	206.4	96.3	49.0	1.1	24.5	35.4		
2008	219.5	101.8	50.5	1.4	27.2	38.7		
2009	214.9	99.5	53.9	1.6	24.2	35.8		
2010	222.6	107.9	55.7	1.6	21.8	35.6		
2011	243.2	120.8	57.9	1.5	24.9	38.1		
2012	248.3	120.0	60.4	1.4	25.1	39.8	1.4	
2013	241.7	113.4	60.7	1.3	23.1	41.3	1.9	
2014	254.8	124.3	61.6	1.2	23.3	43.0	1.4	
2015	259.7	123.1	62.8	1.3	25.8	45.0	1.6	
2016	273.1	126.6	65.7	1.4	26.4	48.2	1.3	3.5
2017	315.3	156.8	68.3	1.6	29.8	52.7	1.8	4.3
2018	349.4	174.9	72.1	1.9	34.6	59.6	1.7	4.5
2019	367.3	180.9	72.4	2.3	40.0	65.4	1.5	4.7
2020	370.3	184.6	71.8	2.3	41.3	63.8	1.7	4.8

Source: developed by the authors, based on reports of national budget execution in years 2004-2020.

and 2013, both due to cyclical factors and the slowdown of the economic growth. The lower tax revenue in 2009 also resulted from the decrease in the rates of personal income tax, implemented in that year.

An analysis of the collected data suggests that the main source of tax revenue in Poland are consumption taxes, namely the VAT and excise duties. The highest revenue is collected from the VAT, with the revenue from this tax growing from PLN 62.3 bn in 2004 to PLN 184.6 bn in 2020, which constitutes a nearly threefold increase. It is also evident that the revenue from this tax was subject to fluctuations. In 2004-2008, the revenue from the VAT was on the rise, but in 2009, most likely due to the global financial crisis, the VAT revenue decreased. Other years when the VAT revenue declined were 2012, 2013, and 2015.

Another significant source of tax revenue is the excise duty. The budget revenue from this tax stood at PLN 37.9 in 2004 and surged to PLN 71.8 bn, which is an increase by 89.4%. It should be noted that the income from this tax was increasing all through the period of 2014-2019. A slight decrease in the excise duty revenue took place only in 2020.

The third significant source of revenue for the national budget is the personal income tax (the PIT). In the studied period, the income from this tax increased from PLN 21.5 bn to PLN 63.9 bn, or by 196.7%. Moreover, the income from this tax had seen the rise in nearly every analyzed year. The PIT revenue dropped only in years 2009-2010, which followed from the implementation of lower tax rates for this tax.

Another important source of income for the national budget is the corporate income tax (the CIT). There was a threefold increase in tax revenue from this charge, from PLN 13.1 bn in year 2004 to PLN 41.3 bn in 2020. It should be noted that the revenue from this tax was not free from some fluctuations.

A much less significant amount of revenue comes from the gambling and lottery tax, and from the mining tax on some extraction, which was introduced in 2012, or the tax on some financial institutions, introduced in Poland's tax system in 2016.

What follows from the above is that the budget revenue from the analyzed taxes obviously expanded over the studied period. For these taxes, periods of fluctuations were evident in specific years. It should be noted that such fluctuations resulted from a variety of factors, including the current phase of the business cycle, changes in retail prices, Poland's foreign trade balance and changes in the tax system.

To determine how stable the tax revenue was in Poland in years 2004-2020, an analysis was made of the income stability of each of the enumerated taxes. This stability was measured using a classic variation coefficient, which must be interpreted as inversely correlated to the stability of income: the more stable the income, the lower value of the coefficient should be expected. The values of the variation coefficient for the total and particular tax revenue are presented in Table 2.

Table 2

Analysis of the tax revenue stability in Poland in years 2004-2020

Specification	Arithmetic mean (in PLN bn)	Standard deviation (in PLN bn)	Variation coefficient
VAT tax	120.76	34.64	0.287
Excise duty	57.78	10.76	0.186
Gambling and Lottery tax	1.44	0.43	0.297
Personal Income Tax	25.89	7.18	0.277
Corporate Income Tax	42.14	12.30	0.292
Mining tax on some extractions	1.59	0.19	0.120
Tax on some financial institutions	4.36	0.46	0.106

Source: developed by the authors, based on the data presented in Table 1.



In line with the interpretation of the variation coefficient, years 2004-2020 witnessed a stable level of income from the excise duty, mining tax on some extractions, and tax on some financial institutions. The coefficient of variation for these taxes did not exceed the value of 0.2. For other taxes, namely the tax on gambling and lottery, VAT, PIT, and CIT, the coefficient of variation assumed values between 0.2 and 0.3, which is interpreted as moderate stability.

Different amounts of revenue to the national budget from specific types of taxes translate into the structure of tax revenue. Table 3 shows the share of specific types of taxes in the total amount of tax revenue in years 2004-2020

Table 3

Structure of the national budget tax revenue in years 2004-2020 (%)

Year	Total tax revenue	VAT	Excise duty	Gambling and lottery tax	CIT	PIT	Mining tax on some extractions	Tax on some financial institutions
2004	100	45.9	27.9	0.6	9.7	15.9	0.0	0.0
2005	100	48.4	25.3	0.5	10.1	15.7	0.0	0.0
2006	100	48.3	24.1	0.5	11.0	16.1	0.0	0.0
2007	100	46.7	23.7	0.5	11.9	17.2	0.0	0.0
2008	100	46.4	23.0	0.6	12.4	17.6	0.0	0.0
2009	100	46.3	25.1	0.7	11.3	16.7	0.0	0.0
2010	100	48.5	25.0	0.7	9.8	16.0	0.0	0.0
2011	100	49.7	23.8	0.6	10.2	15.7	0.0	0.0
2012	100	48.3	24.3	0.6	10.1	16.0	0.6	0.0
2013	100	46.9	25.1	0.5	9.6	17.1	0.8	0.0
2014	100	48.8	24.2	0.5	9.1	16.9	0.5	0.0
2015	100	47.4	24.2	0.5	9.9	17.3	0.6	0.0
2016	100	46.4	24.1	0.5	9.7	17.6	0.5	1.3
2017	100	49.7	21.7	0.5	9.5	16.7	0.6	1.4
2018	100	50.1	20.6	0.5	9.9	17.1	0.5	1.3
2019	100	49.3	19.7	0.6	10.9	17.8	0.4	1.3
2020	100	49.9	19.4	0.6	11.2	17.2	0.5	1.3

Source: developed by the authors, based on reports on the national budget execution in years 2004-2020.

The VAT tax generates the largest share of the tax revenue. In 2004, its share in the total tax revenue amounted to 45.9%, and it had grown to 49.9% by 2020, which was not its highest value in the analyzed period. The VAT reached the highest share in the total tax revenue in 2018, when it amounted to PLN 174.9 bn, which constituted 50.1% of the total revenue. It can be concluded

that the VAT is the most efficient tax, in addition to which it is the state which budget income in its entirety. Its average share in the total tax revenue in 2004-2020 stood at 48%.

A large portion of the national budget revenue is the income from excise duties. The share of this tax reached 27.9% at the beginning of the studied period, but dropped to 19.4% in 2020. This resulted from the much weaker dynamics of growth of the income from this tax than those from the VAT or the personal income tax. The average share of the excise duty in the total tax revenue during the analyzed period reached 23.6%.

The largest share in the tax revenue for the national budget was from the personal income tax, ranging from 15.9% in 2004 to 17.2% in 2020, which was not its highest level within the analyzed years. The PIT reached the highest share of 17.8% in 2018.

Another significant position in the overall tax revenue is the corporate income tax, whose share ranged from 9.7% in year 2004 to 11.2% in 2020, a slight increase over the years. Its average share in the tax revenue in years 2004-2020 amounted to 10.4%.

The structure of tax revenue in the national budget is therefore diverse, but dominated by four types of taxes. The impact of other taxes is slight. For example, the revenue from the tax on gambling and lottery was between 0.5% and 0.7% of the total tax revenue. Similarly, the share of the mining tax on some extractions ranged between 0.5% and 0.8% of the total revenue. The tax on some financial institutions, introduced in 2019, constituted between 1.3% and 1.4% of the total tax revenue.

As mentioned above, the structure of the tax revenue in the national budget is diverse, but is it stable? To answer this question, an analysis of the stability of the tax revenue structure in the national budget was carried out for years 2004-2020. The results of this analysis are presented in Table 4.

Table 4

Analysis of the stability of tax revenue structure in Poland in 2004-2020

Specification	Arithmetic mean (in %)	Standard deviation (in percentage points)	Variation coefficient
VAT	48.04	1.37	0.029
Excise duty	23.60	2.11	0.090
Gambling and lottery tax	0.57	0.08	0.131
CIT	10.36	0.89	0.085
PIT	16.73	0.70	0.042
Mining tax on some extractions	0.55	0.10	0.191
Tax on some financial institutions	1.30	0.03	0.024

Source: developed by the authors, based on the data presented in Table 3.

The analysis of the data presented in the table above leads to the conclusion that the structure of the tax revenue was stable in 2004-2020. The variation coefficient for the VAT, excise duty, CIT and the tax on some financial institutions assumed values below 0.1, which indicates their very stable share in the total revenue. On the other hand, the same coefficient for the mining tax and the tax on gambling and lottery reached above 0.1, which, in line with the assumed interpretation of this indicator, meant their stable share in the total tax revenue.

It is worth noting that the variation coefficient achieved a very low value for the VAT revenue, which means that the share of this tax in the overall mix of the revenue is very stable. This may result from the fact that the VAT is a charge on consumption, which is less sensitive to the business cycle than taxpayers' income, which affects the revenue from income taxes.

## Conclusions

The revenue from particular types of taxes, and its share in the total tax revenue may change in time, along with the changes in legal provisions concerning specific tax regulations, and with the factors of cyclical nature. At the same time, the stability and the structure of tax revenue are very important for the balance of public finances and the ability of the state to fulfil its responsibilities. Stable tax revenue protects the state during periods of economic slowdown, ensuring predictable supply of funds in the national budget, which is therefore easier to adopt in the parliament. Hence, the above study was conducted to evaluate the stability of tax revenue in Poland's national budget in 2004-2020. The results of our analyses can be summarized as follows:

1. The value of tax revenue in 2004-2020 in Poland nearly trebled. The largest revenue flow came from the VAT, the value of which increased nearly threefold, from PLN 62.3 bn in 2004 to PLN 184.6 bn in 2020. This tax was the most efficient one, generating the largest part of the tax revenue. Its share in the total tax revenue stood at 45.9% in 2004 and increased to 49.9 in 2020, which was not the highest value during the studied period. The average share of the VAT revenue in the analyzed years was 48% of the total tax income.

2. The second important source of tax income was the excise duty. The revenue from this tax went up from PLN 37.9 bn in 2004 to PLN 71.8 bn, which constitutes an 89.4% increase. It should be noted that the revenue from this tax was constantly rising, while its share in the total tax revenue decreased from 27.9% in 2004 to 19.4% in 2020. The average share of the excise duty in the national tax revenue in the analyzed period amounted to 23.6%.

3. Another significant tax resource for the national budget was the personal income tax. The income from this tax rose from PLN 21.5 bn in 2004 to PLN 63.8 bn in 2020, i.e. by 196.7%. Moreover, the income from this tax increased

in nearly every analyzed year. The share of this tax in the total revenue also increased, from 15.9% in 2004 to 17.2% in 2020.

4. The corporate income tax was another important source of tax revenue for the national budget. The revenue from this source rose by over three times – from PLN 13.1 bn in 2004 to PLN 41.3 bn in 2020. The share of the CIT in the total tax revenue increased from 9.7% in 2004 to 11.2% in 2020.

5. Despite some fluctuations observed in 2004-2020 in the amount of revenue from particular types of taxes, the level of income from the excise duty, mining tax on some extractions, and tax on some financial institutions proved to be stable. In turn, the level of revenue from the gambling tax, VAT, PIT and CIT can be characterized as moderately stable. It should be noted that a change in the stability of the personal income tax was most likely due to changes in the tax rates which were introduced during the analyzed period.

6. The structure of the tax revenue in Poland in 2004-2020 appears even more positive. For the VAT, excise duty, PIT, CIT, and the tax on some financial institutions, the structure turned out to be particularly stable. As for the gambling tax and the mining tax on some extractions, it was stable. One might even venture the opinion that the global financial crisis, which ensued in 2008, did not throw the tax revenue in Poland off balance.

To sum up, the stable level and structure of tax revenue in Poland is beneficial to the Polish economy, as reliable income to the national budget protects the state during an economic recession and ensures a predictable supply of funds to the state treasury.

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