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## The Determinants of Economic Growth in Poland in 2018-2023

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Submitted 22/01/25, 1st revision 07/02/25, 2nd revision 20/02/25, accepted 10/03/25

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**Abstract:**

**Purpose:** The aim of this article is to answer the question, how did the main economic determinants influence economic growth in Poland in the period of 2018-2023, and to formulate some recommendations for economic policy supporting long term economic growth in the future.

**Design/Methodology/Approach:** During the research period and, more broadly, in 2016-2023, the monetary and fiscal policies were both subordinated to political goals and were not based on economic principles or consistent over time. Voluntarism was omnipotent. Government activity in the field of economic policy largely resembled the principles of the so-called modern monetary theory, but no one will confirm that policy – the makers at that time had no idea about this theory. The study has used the Keynesian equation concerning the open economy, known from the literature. It proposes 3 models to evaluate the performance of the Polish economy in the study period using quarterly data from the base “Metadata by countries” (IFS) – IMF Data.

**Findings:** The estimation results indicate a good model fit. All the variables are statistically significant. The variability of GDP growth ( $ld\_GDP$ ) is most strongly affected by the variability of households’ consumption growth ( $ld\_C$ ), followed by the variability of investment growth ( $ld\_GFCF$ ) and government consumption growth ( $ld\_GC$ ). The growth of exports ( $ld\_EX$ ) variability has a lower impact on GDP growth variability than the variables mentioned above.

**Practical Implications:** The period of 2018-2023 was specific in the functioning of the Polish economy. It was characterized by a lack of coordination of fiscal and monetary policies and voluntarism in making macroeconomic decisions based on political calculations. In addition, the pandemic crisis affected the global as well as the Polish economies, leaving a significant impact on economic growth processes.

**Originality/Value:** This was exacerbated by the energy and raw materials crisis caused by the war in Ukraine. The above factors significantly undermined Poland’s economic growth and, together with an expansionary macroeconomic policy, led to a relatively high, double-digit inflation compared to other EU countries.

**Keywords:** Macroeconomic policy, fiscal policy, monetary policy, inflation, consumption expenditure, government consumption, investment, econometric model.

**JEL codes:** C10, E1, E3, E5, E6.

**Paper type:** Research article.

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## 1. Introduction

The period of 2018-2023 was specific in the Polish economy. It was characterized by a fiscal expansion, especially concerning social expenditure. The pandemic crisis affected both the world and Poland in 2020-2021. The pandemic situation and lockdowns gravely affected the economy and, as a result, those years experienced recession combined with a rapid slowdown of the GDP growth and other macroeconomic variables.

The aim of this article is to answer the question, how did the main economic determinants influence economic growth in Poland in the period of 2018-2023, and to formulate some recommendations for economic policy supporting long term economic growth in the future. The key hypothesis is that economic growth in Poland in the period studied relied mostly on fiscal and consumption expansion and, to a lower degree, on investment and export.

We use econometric models estimated by OLS and the VAR model to measure the main determinants' impact on economic growth.

## 2. Literature Review

### 2.1 The Keynesian Model, Fiscal Policy, and Non-Keynesian Reactions of the Economy

The most popular Keynesian model by P. Samuelson, following J.M. Keynes, assumes that demand growth in the public sector leads to product growth, whereas a decline in this demand (contractionary fiscal policy), on the contrary, leads to a product drop. It is assumed, among others, that the aggregate product is below its potential level and prices are characterized by perfect rigidity. In these circumstances, the product magnitude is determined by aggregate demand. It is a short-run model.

Increased state expenditures, *ceteris paribus*, result in global demand growth and product growth; on the other hand, a drop in state expenditures *ceteris paribus* leads to a drop in global demand and product drop. Increased savings, *ceteris paribus*, lead to a fall in demand, whereas their decrease leads to demand growth (the savings paradox). Do modern economies behave in such a way? Most probably not.

Nevertheless, the conclusions drawn from these models are very attractive for economic politicians. Firstly, they are relatively simple and easy to understand. Secondly, they meet politicians' expectations which are connected with a tendency to achieve success (product growth) during one term in power. Thirdly, throngs of economists have been educated on the basis of these models. As J.M. Keynes himself wrote, "(...) the ideas of economists and political philosophers, both when they are right and they are wrong, are more powerful than is commonly understood.

Indeed the world is ruled by little else. Practical men who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. (...) the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest. But, soon or late, it is ideas, not vested interests, which are dangerous for good or evil" (Keynes 1985, 414).

Simple or more complex Keynesian models (orthodox Keynesianism, neo-classical synthesis, post-Keynesianism) suffer from this drawback of being suitable for a short-run economic process analysis only. Short-run product growth, as a result of fiscal expansion (understood as the growth of budget spending), does not usually mean product growth in the long-run.

The rate of long-run economic growth is usually influenced by the following fiscal factors, the structure and levels of public spending, the rates and types of taxes, and the scale of imbalance in public finances (Rzońca 2007, 32-46). In the long term, increased budget expenditures result in the growth of budgetary deficit, public debt, and tax burden.

The structure of public spending is relevant here. If these are expenditures on education, scientific research or creation of infrastructure, they are usually correlated positively with the rate of long-run economic growth, but government expenditures understood as government consumption are negatively correlated with the economic growth rate (Bukowski 2009).

This is confirmed by empirical investigations of such authors as, among others R.J. Barro and X. Sala-I-Martin (1997, 521-541), J.S. Guseh (1997, 175-192), and Hetiger (2005).

A deficit of public finances and a related public debt have an adverse effect on the rate of long-run economic growth due to the crowding-out effect, uncertainty with regard to future tax burden and inflation, and limited capital accumulation.

The negative effect of a public finance deficit and public debt on the rate of long-run economic growth was confirmed by research of R. Levine and D. Renelt as well as W. Easterly, C.A. Rodriguez, K. Schmidt-Hebbel (the research covered, among others, Argentina, Chile, Morocco, Pakistan and Zimbabwe) (Levine and Renelt 1992, 942-963; Easterly *et al.*, 1994).

High taxes, including high income tax progression, have a similarly negative impact on the rate of long-run economic growth. High tax burdens impede decisions of economic subjects, raise labor costs (hike extra-wage costs), increase the rate of private savings, reduce effectiveness of the factor of production utilization. This is again confirmed by empirical results obtained, among others, by Easterly and Rebelo (1993).

On the other hand, fiscal tightening does not have to cause a product drop in the short term but, in both short- and long-run, it can stimulate economic growth. Two types of fiscal tightening results are distinguished: Keynesian and non-Keynesian.

The Keynesian approach assumes that a change in the public sector demand is stronger or higher than a change in private demand, which entails a drop or, in the case of fiscal policy tightening, a product drop. The non-Keynesian approach assumes that a change in the public sector demand is weaker and smaller than a change in the private sector demand. Owing to this stimulation of product growth through state spending, growth is not effective, whereas a reduction of these expenditures (the public sector demand) causes product growth (Rzońca 2007, 19-31).

Non-Keynesian approach is confirmed more and more often by empirical investigation results. F. Gavazzi and M. Pagano analyzed the results of fiscal policy tightening in Denmark after 1982 and in Ireland after 1989. In the first case, cuts were implemented in public consumption and taxes were raised, in the second instance, only public expenditures were reduced. In both countries, the average rate of GDP growth in the period of fiscal policy tightening was higher than in previous years (Gavazzi and Pagano, 1990).

A. Alesina and R. Perotti analyzed the results of fiscal policy tightening in 20 OECD countries in the period 1960-1994. Their results indicate that improvement in public finances was of a more durable nature when fiscal consolidation was accomplished by a reduction of state expenditures on wages and transfers, not when taxes were raised. What is more, in the period of a more durable fiscal consolidation through budget cut and of budget deficit reduction, private consumption, private investments, and product rose (Alesina and Perotti, 1996).

A. Rzońca studied the effects of fiscal policy tightening in post-communist countries (Hungary, Estonia, Latvia, and Lithuania) in the 1990s (Rzońca 2007, 159-294). His results also confirm the thesis about the non-Keynesian effects of fiscal consolidation. Non-Keynesian behavior of product dynamics was more frequent in the countries examined than in highly-developed countries. The author also comes to the conclusion that the stronger integration of Central and East European countries after 2000 offers a chance that the influence of a positive supply-side shock resulting from fiscal policy tightening on the product should prevail over the shock in domestic demand (Rzońca 2007, 292).

Another vital issue is the problem of fiscal policy incoherence and instability. The time incoherence of fiscal policy is connected with its time-related and procedural constraints. The problem is that fiscal policy instruments cannot be applied at any time. Each change in the magnitude or structure of budget expenditures as well as a change in taxes usually cannot be implemented in a fiscal year; first and foremost, such changes are connected with lengthy legal and political procedures.

What is more, a possibility of changes is limited by the share of the so-called rigid expenditures which are related to relatively durable privileges of specific social groups (structural budget deficits). These groups, in turn, usually have an influence on future parliamentary elections (Bukowski, 2009).

The changeability of fiscal policy in time is connected with subsequent parliamentary elections (and presidential ones in, among others, the United States and France) and changes in economic policy guidelines. This indicates that the changeability of fiscal policy in time exerts a relatively negative impact on the rate of long-run economic growth (Fatas and Milhov, 2004). Similar conclusions are formulated on the basis of empirical investigations by N. Roubini, J. Sachs and A. Alesina (Alesina *et al.*, 1996, 189-211; Roubini and Sachs, 1989).

Provided that a central bank is independent and price stability is the goal, then monetary policy is stable whereas fiscal policy is changeable.

Thus, is it possible at all to use fiscal policy as an effective tool of growth stimulation and economy stabilization? Would it not be better to ascribe it a role in raising budget revenues only instead of a role of an active instrument affecting the economy?

The problem here consists in limiting the state functions to those which are indispensable from the point of view of civilizational and economic development (which create conditions of long-run economic growth).

## **2.2 Monetary Policy, Inflation and Long-Run Economic Growth**

In a majority of highly developed countries, especially in the European Union, the goal set to monetary policy is price stability and the application of monetary policy instruments is subordinated to this goal. Thus, the thesis about money neutrality in the long-run and non-neutrality in the short-run is adopted, which says monetary expansion in the short run may possibly lead to a growth of product but in the long run economy returns to an equilibrium at the potential product level but at higher prices.

Consequently, inflation will be a result of monetary expansion. For this reason, expansionary monetary policy is abandoned in favor of a current “adjusting” of money processes to the processes occurring in the real sphere so as to stabilize prices (Bukowski, 2009; Hakim *et al.*, 2022; Hakim and Thalassinou, 2023).

The problem of price stability as the monetary policy objective and its effect on economic growth can be summarized in the following questions: must economic growth be accompanied by high inflation and does the policy of maintaining low inflation pose a barrier to economic growth?

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As A. Wojtyna puts it *“Economists agree that moderate inflation is better than high inflation and low inflation is better than moderate. Moreover, theoretical arguments against inflation are much more convincing than conclusions from empirical studies. Although the latter seem to confirm it more and more that low inflation is beneficial for economic growth, the level on which its adverse effects start clearly to grow is still a matter of dispute”* (Wojtyna, 2004, 41).

High inflation has an adverse effect on the processes of long-run economic growth (a lower rate of economic growth, a gap between the potential and actual rates of economic growth), which consists, among others, in the following consequences mentioned in literature:

- A negative effect of “inflation tax” on real income and savings, uncertainty concerning price changes and reduced rates of investment in GDP (a decline in the share of investments in fixed assets in GDP and a substitution between investments in fixed assets and short-term financial investments),
- Disturbances in financial markets (increased speculation),
- Decline in labor productivity.

Consequently, the above-mentioned factors lead to a low rate of long-run economic growth.

The results of most empirical studies point to a negative influence of inflation on long-run economic growth. Thus, R. Barro showed that the relationship between inflation and economic growth is of a non-linear nature and inflation has an adverse effect on the rate of long-run economic growth (Barro 1995; 1997). R. Barro investigated relationships between inflation and economic growth basing on statistical data from 100 countries for the period 1960-1990.

The results of his studies reveal that, at the inflation rate growth of 10 p.p., the real GDP growth drops by 0.2-0.3 p.p. annually and the investment to GDP ratio by 0.4-0.6 p.p. (percentage points). An increase of average annual inflation by 10 percentage points causes the real GDP level to be 4-7% lower in 30 years' time (Barro, 1995).

A negative influence of inflation on economic growth is pointed to by empirical results from such authors as, Sarel (1995), Andres and Hernando (1997), Gosh and Philips (1998), Fischer (1993), Thalassinou and Kiriazidis, (2003).

The results of empirical studies concerning the relationship between inflation and economic growth in OECD countries carried out by J. Andres and I. Fernando reveal a harmful influence of inflation on economic growth and a non-linear relationship between inflation and economic growth. They also show that an inflation rate reduced by 1 percentage point could increase production by 0.5-2.5% (Andres and Fernando, 1997).

A. Gosh and S. Philips based their investigations on 30,603 annual observations concerning the real GDP growth per capita and average annual inflation concerning 145 countries in the period 1960-1996. Their results demonstrate a positive correlation between low interest rates (2-3%) and the rate of economic growth. These authors indicate that the inflation rate of 2.5% is the threshold whose overstepping always causes a negative correlation between inflation rate and the rate of economic growth (Gosh and Philips, 1998).

S. Fischer based his studies on a dozen or so macroeconomic variables, including consumer price index (CPI), in 93 countries. He showed that inflation affects economic growth reducing investments and productivity growth rate (Fisher, 1993). The research results quoted indicate that a low inflation rate fosters long-run economic growth. However, there are no reasons to claim that maintaining inflation at a low level (1-2.5%) is a factor holding up economic growth.

A sustainable high unemployment rate in the long run is unlikely to be a result of a low inflation rate. If we treat the inflation rate as a parameter, then a high unemployment rate in the long-run is a result of other factors, including labor market overregulation and rigid wages, a low mobility of labor force (geographically and vocationally), excessive fiscalism, an extensively developed social policy, etc., (Bukowski, 2009).

### **3. Economic Growth Versus General Government Deficit, Public Debt and Inflation in Poland**

During the research period and, more broadly, in 2016-2023, the monetary and fiscal policies were both subordinated to political goals and were not based on economic principles or consistent over time. Voluntarism was omnipotent. Government activity in the field of economic policy largely resembled the principles of the so-called modern monetary theory, but no one will confirm that policy – the makers at that time had no idea about this theory.

They were unaware of practicing primitive chartalism (I am not sure they knew what it was) and relied on the belief in the omnipotence of the government (state), known from the communist period. Observing the mentality of the oldest politician and other elderly people of the Law and Justice party, one can say they were chips off the old block.

The L&J politicians had a very good starting point as they inherited a stabilized economy on the path of growth, with sustainable public finances, low inflation, and relatively low unemployment. The statistics in EUROST, AMECO etc., before L&J came to power show the rate of inflation was 2.6 % as measured by HICP (Raport, 2023), budget deficit/GDP (-2.6 %) – public debt/GDP – (51.3%) in 2015, in 2023, respectively, the budget deficit/GDP (5.8%) public debt/GDP – (53.5%), the rate of inflation (6.5%) (AMECO online).

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Of course, we should take into account that the pandemic crisis sorely affected the economic situation both globally and in Poland.<sup>2</sup> Most countries implemented fiscal expansion and monetary easing to help companies survive.

In Poland, a lot of mistakes were made. First of all, the pandemic situation indicates the government had no policy-making capability and skills to effectively act against the crisis.<sup>3</sup> Inflation has come suddenly, but a lot of economists had warned against this.

The inflation in Poland was the effect of the rising prices of limited resources, especially energy and sources of energy after the Russian aggression against Ukraine. However, basic inflation, a result of bad monetary and fiscal policies (concentrated on politically dictated budgeted expenditure for potential L&J voters), has continued to play the key role in Poland.

The relatively high rate of inflation in Poland in comparison with other EU member countries is the result of mistakes in the monetary and fiscal policies. The lack of coordination and economic knowledge, ignoring the voices of expert economists, the belief that a parliamentary card gives wisdom, and voluntarism in the policy making decisions, those are the main sins of the previous government.

One of the main factors of inflation in Poland was the monetization of budget deficit (general government deficit). The growth of the monetary aggregate accelerated suddenly after 2018. The National Bank of Poland also purchased treasury bonds the government had trouble placing (Raport, 2023, pp. 69-132). The National Bank of Poland raised the interest rates so late in comparison to other countries, especially in the EU. Why? Because of political interests.

The nationalization of banks and the protection of state-owned companies instead of privatization set a very harmful trend. PKN Orlen S.A. is an example of strategy based on political, not economic criteria. All for the authority power, nothing for economy, for the public, and for long-run economic growth.

A declining relation of investment to GDP is a major problem of the Polish economy. Its main causes are political uncertainty, uncertainty concerning fiscal instability, and inflation (Raport, 2023, pp. 69-132, pp. 281-312).

The space constraints of this article do not allow a precise presentation and analysing of historical data, which can be reviewed in “Raport SGH i Forum Ekonomicznego 2023”. It is the first in-depth analysis of the Polish economy now and of its future prospects.

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<sup>2</sup>See more: *Raport 2023*.

<sup>3</sup>See more: *Raport 2023*.



### 3.1 Data and Models

The base to construct models is the Keynesian equation concerning the open economy, known from the literature:

$$Y = C + I + G + NX$$

where: Y - GDP, C - consumption, I - investment, NX - net export.

We use quarterly data from the base “Metadata by countries” (IFS) – IMF Data. The data concern the following variables:

GDP – real gross domestic product (prices = 2010),  
 C - consumption of households (prices = 2010),  
 GC – government consumption (prices = 2010),  
 GFCF – gross fixed capital formation as a proxy of investment (private and government, prices = 2010),  
 EX – exports (prices 2010),  
 DF – deflator of GDP as a measure of the inflation,  
*ld* – operator of log differences,  
 u – random factor,  
 S1, S2, S3 – seasonal dummies.

To calculate the variables’ rates of growth, we use log differences (*ld*). All the models are estimated using GRETL. To construct the model, we use the backward stepwise regression method.

We construct three models. The first is given below:

#### Model 1:

$$ldGDP_t = a_0 + a_1 ldGFCF_t + a_2 ldC_t + a_3 ldGC_t + a_4 ldEX_t + u_t$$

This model is estimated by using OLS (ordinary least squares).

The second model, VAR, has the following form:

#### Model 2:

$$ldGDP_t = a_0 + a_1 ldGDP_{t-1} + a_2 ldGFCF_{t-1} + a_3 ldGC_{t-1} + a_4 ldEX_{t-1} + S1 + S2 + S3 + u_t$$

$$ldGFCF_t = a_0 + a_1 ldGDP_{t-1} + a_2 ldGFCF_{t-1} + a_3 ldGC_{t-1} + a_4 ldEX_{t-1} + S1 + S2 + S3 + u_t$$

$$ldGC_t = a_0 + a_1 ldGDP_{t-1} + a_2 ldGFCF_{t-1} + a_3 ldGC_{t-1} + a_4 ldEX_{t-1} + S1 + S2 + S3 + u_t$$

$$ldEX_t = a_0 + a_1ldGDP_{t-1} + a_2ldGFCF_{t-1} + a_3ldGC_{t-1} + a_4ldEX_{t-1} + S1 + S2 + S3 + u_t$$

Seasonable dummy variables are applied after the test results as follows:

Test on VAR: Null hypothesis: no seasonal effects,  
Wald test: Chi-square(12) = 29.6533, p-value 0.00314811, critical value 21.0261.

The above test result indicates seasonal effects exist. Seasonal dummies are used in the model for this purpose.

We have constructed an additional, third model concerning inflation impact on GDP growth, as below:

**Model 3:**

$$ldGDP_t = a_0 + a_1ldGFCF_t + a_2ldEX_t + a_3ldDF_t + u_t .$$

**4. The Results of the Models' Estimation**

**Model 1:**

The Engle-Granger cointegration test is applied to each model. For Model 1, its results are presented below.

**Table 1.** Engle-Granger cointegration test

Augmented Dickey-Fuller test for uhat
testing down from 1 lag, criterion AIC
sample size 19
unit-root null hypothesis: a = 1
test without constant
including 0 lags of (1-L)uhat
model: (1-L)y = (a-1)*y(-1) + e
estimated value of (a - 1): -1.43099
test statistic: tau_ct(5) = -6.7336 with critical value = 1,95 ( with significant level 0,05)
asymptotic p-value 1.812e-05
1st-order autocorrelation coeff. for e: -0.135

*Source:* The author's calculation using GRETL

The test indicates that the time series used in the model are cointegrated. The results of Model 1 estimation are presented in Table 2.

**Table 2.** Model 1: OLS, using observations 2018:2-2023:1 ( $T = 20$ )  
 Dependent variable:  $ld\_GDP$   
 HAC standard errors, bandwidth 2, Bartlett Kernel

	Coefficient	Std. Error	t-ratio	p-value	
const	0.000855897	0.00268654	0.3186	0.7544	
ld_GFCF	0.255605	0.101170	2.526	0.0233	**
ld_C	0.290702	0.130030	2.236	0.0410	**
ld_GC	0.230543	0.0156386	14.74	<0.0001	***
ld_EX	0.180858	0.0676998	2.671	0.0174	**
Mean dependent var	0.008944		S.D. dependent var	0.031850	
Sum squared resid	0.003252		S.E. of regression	0.014724	
R-squared	0.831287		Adjusted R-squared	0.786297	
F(4, 15)	233.2809		P-value(F)	2.62e-13	
Log-likelihood	58.86391		Akaike criterion	-107.7278	
Schwarz criterion	-102.7492		Hannan-Quinn	-106.7559	
rho	-0.361849		Durbin-Watson	2.704091	

**Note:** \* - significance level 10%, \*\* - significance level 5%, \*\*\* - significance level 1%.

**Source:** Own study.

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity is not present

Test statistic: LM = 11.4616

with p-value =  $P(\text{Chi-square}(14) > 11.4616) = 0.649451$

LM test for autocorrelation up to order 1 -

Null hypothesis: no autocorrelation

Test statistic: LMF = 2.63383

with p-value =  $P(F(1, 14) > 2.63383) = 0.126904$

Test for the normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 21.4206

with p-value =  $2.23142e-05$

Test for ARCH of order 1 -

Null hypothesis: no ARCH effect is present

Test statistic: LM = 3.57129

with p-value =  $P(\text{Chi-square}(1) > 3.57129) = 0.0587867$

**Source:** The author's calculation using GRETL.

The estimation results indicate a good model fit. All the variables are statistically significant. The variability of GDP growth ( $ld\_GDP$ ) is most strongly affected by the variability of households' consumption growth ( $ld\_C$ ), followed by the

variability of investment growth (ld\_GFCE) and government consumption growth (ld\_GC). The growth of exports (ld\_EX) variability has a lower impact on GDP growth variability than the variables mentioned above.

**Model 2:**

For Model 2, the results of cointegration test are presented below.

**Table 3. Engle-Granger cointegration test**

Augmented Dickey-Fuller test for uhat
testing down from 1 lag, criterion AIC
sample size 19
unit-root null hypothesis: a = 1
test without constant
including 0 lags of (1-L)uhat
model: $(1-L)y = (a-1)*y(-1) + e$
estimated value of (a - 1): -1.20369
test statistic: $\tau_c(4) = -5.22055$
asymptotic p-value 0.00123
1st-order autocorrelation coeff. for e: 0.010
In the case of model 2, the time series are also cointegrated.

Source: The author’s calculation with using GRETL

The test indicates that the time series used in the model are cointegrated. The results of Model 2 estimation are presented in Table 4.

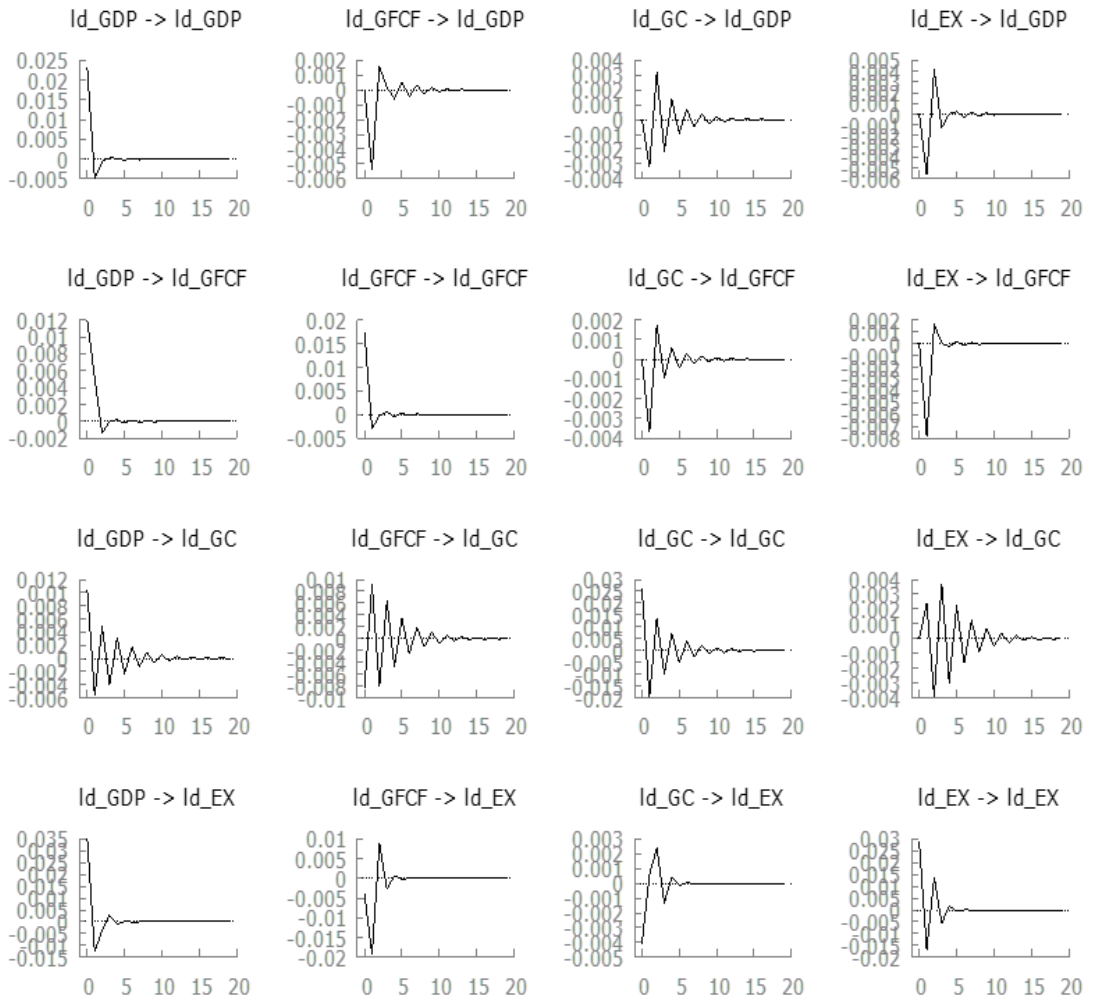
**Figure 1. VAR inverse roots in relation to the unit circle**



Source: The author’s calculation using GRETL.

The inverse roots in relation to the unit circle indicate there are no explosive reactions to the impulses and the time series are stationary.

**Table 4. Impulse responses**



**Source:** The author's calculation using GRETL.

The analysis of impulses indicates that the GDP growth response to the changes of government consumption growth (Id\_GC) expires after the 12th quarter, GDP growth response to export growth changes expires after the 5<sup>th</sup> quarter. Generally, the changes of government consumption growth represent the most influential shock to GDP growth in comparison to the changes of export growth (Id\_EX) and investment growth (Id\_GFCF).

**Table 5.** *The decomposition of variance for ld\_GDP*

period	std. error	ld_GDP	ld_GFCF	ld_GC	ld_EX
1	0.0231011	100.0000	0.0000	0.0000	0.0000
2	0.0250479	88.7103	4.5907	1.6330	5.0660
3	0.0256452	84.6906	4.7677	3.1147	7.4270
4	0.025766	83.9132	4.7290	3.7584	7.5995
5	0.0258098	83.6331	4.7660	4.0268	7.5741
6	0.0258357	83.4790	4.8023	4.1507	7.5680
7	0.0258507	83.3932	4.8245	4.2133	7.5690
8	0.025859	83.3464	4.8369	4.2463	7.5703
9	0.0258635	83.3211	4.8437	4.2640	7.5712
10	0.0258659	83.3074	4.8473	4.2736	7.5717
11	0.0258672	83.3000	4.8493	4.2787	7.5719
12	0.0258679	83.2961	4.8503	4.2815	7.5721
13	0.0258683	83.2939	4.8509	4.2830	7.5721
14	0.0258685	83.2927	4.8512	4.2838	7.5722
15	0.0258686	83.2921	4.8514	4.2843	7.5722
16	0.0258687	83.2918	4.8515	4.2845	7.5722
17	0.0258687	83.2916	4.8515	4.2847	7.5722
18	0.0258687	83.2915	4.8516	4.2847	7.5722
19	0.0258687	83.2914	4.8516	4.2848	7.5722
20	0.0258687	83.2914	4.8516	4.2848	7.5722

**Source:** *The author's calculation using GRETL.*

The standard error of GDP growth rate (ld\_GDP) depends primarily on the variability of GDP growth itself (more than 83%) and only 4.8 % on the variability of investment growth rate (ld\_GFCF ), 4.28 % on the variability of government consumption growth rate (ld\_GC), and 7.5 % on exports growth rate (ld\_EX).

Inflation has an adverse effect on GDP growth and investment growth.

### **Model 3:**

**Table 6.** *Engle-Granger cointegration test*

Augmented Dickey-Fuller test for uhat
testing down from 1 lags, criterion AIC, sample size 19
unit-root null hypothesis: $a = 1$
test without constant, including 0 lags of $(1-L)uhat$
model: $(1-L)y = (a-1)*y(-1) + e$
estimated value of $(a - 1)$ : -1.05068
test statistic: $\tau_{ct}(4) = -4.42423$
asymptotic p-value 0.05069
1st-order autocorrelation coeff. for e: 0.006

**Source:** *The author's calculation using GRETL.*

The results of the test above indicate that time series are cointegrated.

**Table 7. Model 3: OLS, using observations 2018:2-2023:1 (T = 20)**  
 Dependent variable: *ld\_GDP*, HAC standard errors, bandwidth 2, Bartlett Kernel

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.0128054	0.00471230	2.717	0.0152	**
ld_GFCF	0.371197	0.0595486	6.234	<0.0001	***
ld_EX	0.296483	0.0172235	17.21	<0.0001	***
ld_DF	-0.721059	0.113420	-6.357	<0.0001	***
Mean dependent var	0.008944		S.D. dependent var	0.031850	
Sum squared resid	0.002303		S.E. of regression	0.011997	
R-squared	0.880517		Adjusted R-squared	0.858114	
F(3, 16)	362.5969		P-value(F)	6.47e-15	
Log-likelihood	62.31420		Akaike criterion	-116.6284	
Schwarz criterion	-112.6455		Hannan-Quinn	-115.8509	
rho	0.276058		Durbin-Watson	1.334850	

**Note:** \* - significance level 10%, \*\* - significance level 5%, \*\*\* - significance level 1%.

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 6.10956

with p-value =  $P(\text{Chi-square}(9) > 6.10956) = 0.728904$

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 3.05917

with p-value = 0.216626

LM test for autocorrelation up to order 1 -

Null hypothesis: no autocorrelation

Test statistic: LMF = 1.58436

with p-value =  $P(F(1, 15) > 1.58436) = 0.227372$

**Source:** The author's calculation using GRETL

The analysis of the estimation results above indicates that inflation influences the changeability of GDP growth to a great degree. Generally, inflation changes of one percentage point reduce GDP growth by more than 0.7 percentage point in the research period.

## 5. Conclusion

In the period of 2018-2023, the economic growth in Poland was mainly stimulated by internal demand, triggered in turn by government consumption expenditure and household consumption expenses, and, to a much lower extent, by investment and export. It is very disturbing for the future, because the relation of investment to GDP, needed for long run economic growth and development, has been radically low in comparison to the years before 2016.

This is accompanied by very low savings in the economy. If we also take into account a relatively high budget deficit, we have a recipe for stagflation. The low relation of investment to GDP and savings to GDP were the effects of political and economic uncertainty during the period of 2016-2023. The economic uncertainty sprang from such causes as the pandemic situation, a relatively high rate of inflation, increasing minimum wages, and the unpredictability of monetary and fiscal policy.

For the future, it is very important to implement the proprietary supply-side economics rules of monetary and fiscal policy. Monetary and fiscal policies against inflation and aimed at balancing public finances, a simplified tax system, and an inflow of funds as part of the National Reconstruction Plan could probably trigger non-Keynesian behaviours and their effects in the economy.

Especially one effect could increase the private sector investment – privatization. It is crucial to implement a privatisation program involving companies that are state owned in full or in large part, both in the goods and service production and the finance sectors (especially banking). That process is necessary to allow natural market factors to act, determining the economic efficiency of management and allocation of resources in the economy.

In Poland, the share of state-owned companies is very high. It exposes the economy to decisions based not on economic but political calculations. Consequently, the economy allows a very broad margin for mistakes in the use of limited resources and for inefficiency. We believe the poorly coordinated stimulation of the consumption demand and government investment (usually ineffective), typical in the short term, have exhausted their opportunities to stimulate economic growth.

To offer a general conclusion, the Polish economy needs a tightening in the monetary and fiscal policy, the privatization of state-owned companies, a lower tax burden, and much more economic freedom. We should come back in economic policy to the principles of the supply side economics. The only question is, who will have the courage and social support to do it?

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