The impact of fiscal instruments on indicators economic security of the State: evidence from Ukraine

Wpływ instrumentów fiskalnych na wskaźniki bezpieczeństwa ekonomicznego Państwa (na przykładzie Ukrainy)

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Summary
The current macroeconomic condition of Ukraine and its development trends are analyzed. The influence of fiscal policy instruments on the level of economic security of Ukraine is assessed. The impact of VAT and Corporate income tax (CIT) on GDP, government debt and unemployment dynamics, as well as on consumer price index (CPI), and balance of payments are investigated. Interdependence is established and regression equations are constructed between fiscal policy instruments and indicators of economic security of the state, which allowed quantifying the impact of these instruments on the macroeconomic development of the country.

Keywords: Economic security of the State, fiscal policy, macroeconomic situation in Ukraine, value added tax, corporate income tax, gross domestic product, unemployment, consumer price index, public debt, economic growth.
Introduction

Contemporary geoeconomic space is characterized by rapid processes of globalization, followed by integration of economic activity, economic and social policy. However, the fierce among countries for control over limited economic resources, transport corridors and new technologies keeps on going combined with backing up their own economic interests.

Signing on 27 June 2014, the Association Agreement between Ukraine and the EU further intensified the relevance of issues regarding the scientific search for ways and means to increase the competitiveness of Ukrainian goods on the domestic, European and world markets, ensuring sustainable economic growth and economic security of the state as a whole. As the process of economic integration into the EU envisages the maximum elimination of trade barriers to international trade, fiscal instruments remain among the main factors influencing these processes. World experience has shown that most countries that de jure declare maximum assistance to international trade, continue to protect domestic markets through fiscal leverage among other methods. The neglect of the problems of finding fiscal levers to increase the level of economic security of the state can ultimately turn any state into a raw material appendix and a low quality goods dump market.

Macroeconomic situation in Ukraine: current state and trends

At the end of 2018, it will be exactly 10 years since Ukraine entered a protracted global financial crisis, the consequences of which are still tangible. It was due to this crisis that Ukraine’s GDP fell by more than 20%, and since then it has not reached its historic maximum of 200 billion USD (as of January 1, 2018, Ukraine’s GDP amounted to 112.1 billion USD). Although GDP growth rates were gradually increasing in 2009–2013, the political crisis and the beginning of the war in the east of Ukraine led to a spectacular decline of Ukraine’s GDP in 2014 by 28%\(^1\), thereby leading to a halt in economic development and a depreciation of the national monetary unit. The long-term consequences of the financial crisis have adversely affected the social sphere, reducing the state expenditures on education, health care and social protection of the population. During the last three years, the country’s political life has undergone radical changes, but the economic development level remains relatively low and amounts to 3% of GDP growth per year. For comparison, during 2002–2008 the GDP of Ukraine grew by an average of 7.5–12% per year [1]. If such growth rates were maintained at least by half, the current GDP would amount to 350–400 billion dollars. USA. Assuming that the

average salary growth rate is consistent with that of GDP, its level could reach 700–800 USD per month, compared to its current amount of 300 USD.

One of the most important reasons for the deterioration of the macroeconomic situation in Ukraine was the decline in exports and the growth in imports, which was accompanied by a depreciation of the national currency and a decrease in the competitiveness of the country’s economy. The deterioration of the social sphere has only exacerbated existing problems. The government, whose policy was limited just to maintaining its own political rating, was not interested in investing in education and medicine, as the results of such a contribution are visible only in the long run.

During 2002–2017, the volume of imports significantly exceeded the volume of exports. The largest gap was observed during 2011–2013, at a time when macroeconomic problems were aggravated to such an extent that their effects became apparent in virtually all sectors, which ultimately led to the Revolution of Dignity. Over the past three years, the dynamics of foreign trade volumes has declined significantly, while imports continue to dominate Ukraine’s foreign economic activity. Fig. 1 shows the dynamics of exports and imports of goods and services for the period 2002–2017.

**Figure 1.** Dynamics of exports and imports of goods and services by Ukraine in 2002–2017, billion USD.

Source: Built by the authors on the basis of the World Bank data [1].

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2 The Ukrainian revolution of 2014 (also known as the Euromaidan Revolution or Revolution of Dignity) took place in Ukraine in February 2014, when a series of violent events involving protesters, riot police, and unknown shooters in the capital, Kiev, culminated in the ousting of the elected Ukrainian President, Viktor Yanukovych, and the overthrow of the Ukrainian Government.
An important stage in the development of Ukraine’s foreign economic activity was the introduction of preferences for national producers for the export of certain product groups to the EU countries. However, judging by the dynamics of foreign trade operations over the past three years, this practically did not affect the state of foreign trade. Positive effects can be seen only in the change in the geographical structure of foreign trade. The main items of domestic exports are commodities, agricultural products and some types of services, in particular, in the field of high technologies.

In our study, we tried to predict the dynamics of export and import volumes in Ukraine based on the application of trend lines, the results of which are presented in Fig. 2.

**Figure 2.** Expected dynamics of export and import volume in Ukraine for the period 2018–2019.

![Graph](image)

**Source:** Built by authors.

Based on the data in Fig. 2, it can be concluded that the dynamics of exports and imports in 2018–2019 will most likely preserve its tendency for a slight fall. This is in line with the expectations of the Cabinet of Ministers of Ukraine, which took this into account during the formation of the State Budget of Ukraine for 2018, by defining the average annual exchange rate at 29.3 UAH / USD. For comparison, the value of the average annual exchange rate in 2017 amounted to 27.2 UAH / USD.

It should be noted that the Government policy, however, remains incomprehensible, as despite the increase in the expected exchange rate, a policy of economic restraint is still being pursued, by increasing the NBU discount rate, which is between 16 and 17% in January-April 2018, (in 2017, the average annual value of this indicator was 13.5%). An increase in the discount rate is appropriate when...
The economy is in a fast-growing phase, then, in order to smooth economic cycles, a policy of reducing money supply in the economy is carried out. The question of the expediency of such a decision at the stage of the birth of the “first symptoms” of economic recovery after a prolonged crisis goes beyond the scope of this study, but it is important from the point of view of the impact on the condition of foreign economic relations in Ukraine.

For a more detailed assessment of the state and prospects of the development of foreign economic relations in Ukraine, an analysis of the dynamics of trade balance and balance of payments during the investigated period is necessary. Fig. 3 shows the dynamics of the trade surplus for the period 1989–2017.

As can be seen from Fig. 3, the dynamics of trade surplus for Ukraine during 1989–2017 is extremely unfavorable. Only 1995– should be considered successful. Although the GDP growth continued during 2006–2008, the export and import ratios began to deteriorate sharply, which led to the devaluation of the national currency in 2008–2009. One of the reasons for the deterioration of the economic situation can be considered to be an increase in energy dependence on the Russian Federation together with political and economic confrontation, which in 2014 turned into a military conflict that continues to this day.

**Figure 3.** Trade balance of Ukraine in 1989–2017, billion USD.

![Graph showing trade balance](attachment:trade_balance.png)

**Source:** Built by authors.

The smallest trade balance value was observed in 2012, during which imports exceeded exports by 36.8 billion USD, which is 21% of GDP in 2012 and more than half of the State Budget of Ukraine\(^3\), approved in 2012 at the level of 46.7

\(^3\) According to the total value of the revenue part of the budget according to the Law of Ukraine „On the State Budget 2013“.
billion USD. The policy of artificial support of the exchange rate at the level of 7.99 UAH / USD due to the reduction of gold and foreign exchange reserves created an illusion of stability, although in reality the state of economy was probably the worst of all the years of Ukraine’s independence. Such an unscrupulous government policy gives reason to believe that the reasons for such actions were foreign political intervention aimed at the systematic destruction of Ukraine’s economy, education, medicine, etc., which in general significantly reduced the level of economic security of the national economy.

Over the past three years, the trade surplus remains negative and remains at the level of 2–6 billion USD, which for comparison with 2012 makes up 2.2% – 6.6% of GDP and about 5–15% of the volume of the State Budget of Ukraine. However, the state of development of foreign economic relations remains unfavorable for Ukraine, in particular for its economic security level.

At the next stage of the study, we will analyze the dynamics of Ukraine’s balance of payments, which reflects not only the difference between exports and imports, but also takes into account input and output cash flows (loans, investments, etc.). Fig. 4 shows the dynamics of Ukraine’s balance of payments for the period 1994–2016.

As we see from Fig. 4, the dynamics of the balance of payments correlates with the dynamics of the trade surplus. According to this indicator, the most unfavorable for the domestic economy was 2013, when Ukraine “parted” with 16.5 billion USD (~ 18% of GDP, ~ 38% of the State Budget of Ukraine4).

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4 According to the total value of the revenue part of the budget according to the Law of Ukraine „On the State Budget 2013“.
The most successful for Ukraine, taking into account the investigated period, was 2004. Then the balance of payments indicator value amounted to 6.9 billion USD, but the maintenance of hryvnia exchange rate at the level of 4.99 UAH / USD did not allow Ukrainian citizens to “feel” improvement of living standards during this period. Since 2004, the balance of payments has been decreasing, due to increased dependence on the Russian Federation and the global financial crisis of 2008–2009.

One of the most important reasons for a significant reduction in the balance of payments for the period of 2005–2013 was an increase in public debt, a decrease in the inflow of foreign direct investment and the lack of sound decisions on the part of the political leadership of the state. Ukraine’s economy produces goods with low added value, which, in a global decline in business activity, leads to a sharp decline in domestic consumption and export value. These and other reasons led to an increase in public debt and resulted in the devaluation of the national currency from 2013. Thus, from 2013 to 2014, Ukraine’s public debt increased by 25%. According to the World Bank [1], in 2017 the value of this indicator amounted to 68.439 billion USD (Fig. 5).
An increase in Ukraine’s state debt leads to a reduction in social spending and worsening living standards in the country. It also adversely affects the value of the national monetary unit. However, it should be noted that devaluation of the hryvnia can still have a positive effect on the dynamics of foreign trade operations. Reducing the value of a national monetary unit leads to a devaluation of resources in Ukraine, and it can act as an incentive to increase entrepreneurial activity, increase domestic producers’ competitiveness and increase the inflow of foreign investments.

The next stage of the study logically is the analysis of the influence of the mechanism of fiscal regulation on economic security in Ukraine. The level of tax revenues largely depends on tax rates and, in turn, affects the state of macroeconomic development of the country both in the short-term and in the long-term perspective. Reducing tax revenues can lead to an increase in public debt, a reduction in public spending on social financing, a slowdown in economic development, which in the long run leads to a decrease in the competitiveness of domestic production, a devaluation of the national monetary unit, rising unemployment and worsening of the country’s demographic and socio-cultural situation.

We will try to simulate the impact of tax rates on tax revenues and analyze the impact of tax revenues on macroeconomic trends in Ukraine. This, in turn, involves a search for the relationship between tax rates and tax revenues in the first stage of computation, and the relationship between the values of macroeconomic indicators and the amount of tax revenues in the second stage of the calculations.
This sequence makes it possible to determine how rational the selected tax rates are, and how tax revenues influence the economic situation of the country. Ultimately, this will enable us to determine how the fiscal adjustment mechanism affects Ukraine’s economic security.

It is expedient to conduct a mathematical analysis on the basis of the determination of the dependence between the investigated indicators, which can be made on the basis of the least squares method. On the basis of this method it is possible to obtain a regression equation, which will reflect the mathematical relationship between several investigated indicators. Based on the results, we will draw conclusions about the impact of a tax on the state of the macroeconomic situation in Ukraine. Regression equations can be based on different types of dependencies (linear, polynomial, power, logarithmic, etc.). Since this analysis deals with the indicators that describe the behavior of the economic system from the point of view of general indicators at the macro level, which excludes the influence of the irrational component of the behavior of the thinking subjects, who are participants of this system, it is expedient to use the most simple, in terms of mathematical calculations, linear dependence. Then the desired equation of dependence will have the following form:

\[ y = a_0 + \sum_{i=1}^{N} a_i x_i, \]  

where \( y \) – the resultant parameter (dependent variable); \( a_0, a_i \) – coefficients of the regression equation; \( x_i \) – the meaning of independent variables; \( N \) – is the number of independent variables or factors taken into account when constructing a regression equation.

Appendix to the Methodological Recommendations on Calculating the Level of Economic Security of Ukraine, presents indicators, on the basis of which the level of economic security of Ukraine is assessed. For the most part these are macroeconomic indicators that allow performing a comprehensive assessment of the state of the national economy. At this stage of the study, we will use the main ones: gross domestic product, inflation rate, unemployment rate, public debt. The choice of these indicators is due to the objectives of this study.

Since the value added tax (VAT) gives the largest financial revenues to the State Budget of Ukraine, we will begin with the analysis of the impact of the fiscal

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5 It is intended to determine the linear coefficients of the change of the resulting parameter (dependent variable) and regressor (independent variables) in the regression equation.

regulation on the economic security of the state. Fig. 6 shows the comparative dynamics of the growth rate of tax revenues from VAT on imported goods and GDP of Ukraine.

**Figure 6.** Comparison of GDP and growth rate of tax revenues from VAT on imported goods in Ukraine, %.


Based on the analysis of Fig. 6 we see that the dynamics of GDP and VAT revenues from imported goods are highly correlated:

\[ PKB = 35.6 + 8.39 \text{ VAT}, \]  \hspace{0.5cm} (2)

where GDP – Gross Domestic Product value, USD; VAT – tax receipts to the State Budget of Ukraine from VAT from the goods imported into the customs territory of Ukraine, USD.

The equation (2) shows that the growth of Ukraine’s GDP by 1% takes place when tax revenues from VAT on imported goods increase by 8.4%. This enables us to conclude that the growth of the level of entrepreneurial activity in Ukraine as well as the growth of GDP occurs with the growth of import volumes. This once again confirms the significant dependence of Ukrainian economy on imports, as many business projects depend heavily on imported goods: machinery, technology, fuel, etc. Therefore, it is expedient to reduce the tax burden on imported goods as an instrument for accelerating economic growth.

The next indicators of the country’s economic security, which were selected for the research, were unemployment level and inflation rate. Figure 7 shows the
comparative dynamics of the growth rate of VAT receipts from imported goods and the level of unemployment and the consumer price index (CPI) for the period 2010–2017.

**Figure 7.** Comparative dynamics of growth rates tax revenues from VAT on imported goods, unemployment rate and consumer price index for the period 2010–2017 in Ukraine, %.

![Graph showing comparative dynamics of growth rates tax revenues from VAT on imported goods, unemployment rate, and consumer price index for the period 2010–2017 in Ukraine.](image)

**Source:** It was built by the authors on the basis of data from the State Statistics Service of Ukraine [3] and the Office for Financial and Economic Analysis in the Verkhovna Rada of Ukraine [2].

As we see from Fig. 7 between VAT receipts from imported goods and the level of unemployment and inflation, there is an inverse proportional relationship with the several years’ time lag. The increase in VAT revenues does not immediately result in significant changes in the level of unemployment and inflation. However, positive changes in these basic indicators of economic security start to be noticeable in 2–3 years. In view of this, the link between these indicators can be considered as mediated and with no high correlation. Dependence between the investigated parameters can be represented by the following regression equation:

\[
U = 11,13 - 1.75 \times 10^{-10} \text{VAT};
\]

\[
\text{CPI} = 143,36 - 2,56^{-9} \text{VAT},
\]

where \(U\) – unemployment rate,\%; \(\text{CPI}\) – Consumer Price Index,\%.

The obtained regression equations of the dependence of the unemployment rate and the consumer price index on the dynamics of VAT revenues from the
goods imported into the customs territory of Ukraine show that the growth of revenues from this tax is accompanied by a decrease in inflation and unemployment. This agrees with an earlier assumption that economic growth, and hence the level of economic security in Ukraine, depends on the availability of imported goods in domestic markets.

Equations (3) and (4) show how important is the VAT for the Ukrainian economy and the economic security of the state. Due to this tax, losses from import growth are compensated by an increase in tax revenues, which helps to smooth unfavorable fluctuations in foreign economic activity in the short term. In the long term, to provide the necessary level of economic security it is expedient to develop the domestic production of competitive goods.

One of the most important indicators that characterize the level of economic security in Ukraine is public debt. The dynamics of this indicator has already been presented above, from which it was concluded that its volumes are increasing and it is most likely that in the short term (1-3 years) this trend will continue. Fig. 8 shows the comparative dynamics of the growth rates of the state debt and VAT receipts from the goods imported into the customs territory of Ukraine.

**Figure 8.** Comparison of the growth rate tax revenues from VAT on imported goods and the growth rate of public debt in Ukraine, %.

![Comparison of the growth rate tax revenues from VAT on imported goods and the growth rate of public debt in Ukraine, %](image)

**Source:** It was built by the authors according to the World Bank [1] and the Financial and Economic Analysis Office of the Verkhovna Rada of Ukraine [3].

From Fig. 8, it is evident that the dynamics of VAT revenues from imported goods is low-correlated (correlation coefficient less than 0.1) with the dynamics of Ukraine’s public debt. This indicates that the growth of entrepreneurial activity,
which is usually accompanied by an increase in the volume of import operations, corresponds to a slowdown in the growth of public debt. As the correlation level of these indicators is not significant, the construction of the regression equation is inappropriate.

**Corporate Income Tax (CIT).** In addition to the value added tax, one of the most significant taxes in the system of fiscal regulation of foreign economic activity is the CIT paid by the exporters. Fig. 9 shows the dynamics of income tax revenue for the period 2009–2017.

**Figure 9.** Dynamics of tax revenues from CIT for the period of 2009–2017 in Ukraine, billion USD.

![Dynamics of tax revenues from CIT for the period of 2009–2017 in Ukraine, billion USD.](image)

**Source:** built by the authors according to the Office of Financial and Economic Analysis of the Verkhovna Rada of Ukraine [2].

Fig. 9 shows that current income from CIT is significantly lower than in 2011–2013. However, the value of this indicator has increased over the past three years, indicating an increase in entrepreneurial activity. The CIT rate for 2011–2016 has decreased from 23% to 18%, and it remained unchanged over the past 3 years. This, and the growth of tax revenues, indicates that the rate of this tax is optimal. In addition, it should be noted that the lack of a change in the rate of this tax allows entrepreneurs to plan their activities more efficiently, and therefore a stable rate may also be a factor that stimulates the growth of revenues to the state budget. Since the rate of this tax has changed only a few times its regression analysis is impossible, but it is expedient to investigate the effect of income from CIT on the level of economic security of the state.

Fig. 10 shows the growth rates of the dynamics of revenues from the CIT and GDP of Ukraine for the period 2010–2017, %.
Figure 10. Comparative dynamics of growth rates tax revenues from CIT and GDP of Ukraine for the period 2010-2017,%

Source: It was built by the authors according to the World Bank [1] and the Financial and Economic Analysis Office of the Verkhovna Rada of Ukraine [2].

Based on Fig. 10 it can be concluded that the dynamics of changes in CIT revenues are more volatile than the dynamics of GDP change. Also, as logically follows from statistical data, the growth of CIT revenues corresponds to overall economic growth. To better understand the interdependence between these indicators, we construct a regression equation:

\[ PKB = 66.14 + 15.48 \, DP_{CIT} \]  

where CIT – tax revenues from CIT, USD.

On the basis of equation (5), we can confirm a preliminary assumption that the growth of CIT revenues corresponds to the growth of Ukraine's GDP. With an increase in GDP by 1%, revenue is rising by 15.48%. We will investigate the effect of CIT revenues on other indicators of economic security of the state (unemployment and inflation rate, measured in the form of a consumer price index). The dynamics of these indicators is presented in Fig. 11.
Figure 11. Comparative dynamics of growth rates of tax revenues from CIT, consumer price index and unemployment rate for the period 2010–2016 in Ukraine,%.

Source: built by the authors according to the data of the State Statistics Service of Ukraine [3] and the Office for Financial and Economic Analysis of the Verkhovna Rada of Ukraine [2].

As we see from Fig. 11, the change in CIT revenues usually corresponds to a decrease in the consumer price index and unemployment rate. This proves that the increase in revenues from the payment of this tax corresponds to the growth of the economy and increased business activity. The regression equation of dependence between these indicators will look like this:

\[
U = 10,55 - 0,33 \, DP_{CIT} \\
CPI = 136,57 - 5,28 \, DP_{CIT}
\]

As noted above, one of the most significant indicators of the level of economic security in Ukraine is the volume of public debt. The comparative dynamics of the growth rate of this indicator and CIT revenues is shown in Fig. 12. The correlation level between these indicators is quite low, which makes it impossible to use regression analysis.
Figure 12. Comparative dynamics of growth rates of the state debt and growth rates of tax revenues from CIT for the period 2010-2017 in Ukraine, %.

Source: It was built by the authors according to the World Bank [1] and the Financial and Economic Analysis Office of the Verkhovna Rada of Ukraine [2].

Based on the data in Fig. 12 it can be concluded that the growth of income tax revenues usually corresponds to a reduction in public debt, but no significant correlation was found between these two indicators.

Summarizing the research, it should be noted that we have analyzed the impact of fiscal adjustment instruments on the main indicators of Ukraine's economic security. In particular, the impact of two major taxes (VAT and income tax) on the following indicators of the country's economic security has been investigated: GDP dynamics, consumer price index, unemployment rate, and the size of public debt. Based on the analysis of the dynamics of tax revenues and macroeconomic indicators, as well as by constructing regression dependencies, we have established:

1. Economic growth, as well as the level of economic security of Ukraine, largely depends on the import of means of production and objects of labor. The results of the study showed that GDP growth by 1% is due to an increase in tax revenues from VAT on imported goods by 8.4%.

2. There is an inverse proportional relationship with the time lag over several years between the amount of VAT receipts from imported goods and the level of unemployment and inflation. The rapid growth of tax revenues is not immediately accompanied by significant changes in the level of unemployment and inflation. However, positive changes in these basic indicators of economic security are beginning to be noticeable in 2–3 years.
3. The research conducted showed that the growth of tax revenues from VAT and income tax usually corresponds to the reduction of public debt, however, contrary to economic logic, a significant correlation between these indicators in Ukraine has not been established.

References