

UDC 330.567.2:330.55

**Ruslan Mudrak**

D.Sc. (Economics), Professor,
Uman National University of Horticulture
1 Institutaska Str., Uman,
Cherkasy region, 20305, Ukraine
mrp1974@ukr.net
ORCID ID:
<http://orcid.org/0000-0003-1189-5463>

**Volodymyr Lagodiienko**

D.Sc. (Economics), Professor,
Odesa National Academy of Food Technologies
112 Kanatna Str., Odesa,
65039, Ukraine,
volodymyr@wiktoriya.com
ORCID ID:
<http://orcid.org/0000-0001-9768-5488>

**Nataliia Lagodiienko**

PhD (Economics), Senior Lecturer,
Mykolayiv National Agrarian University
9 Georgii Gongadze Str., Mykolayiv,
54020, Ukraine,
besedina77@gmail.com
ORCID ID:
<http://orcid.org/0000-0002-8472-1395>

Impact of aggregate expenditures on the volume of national production

Abstract. Ukrainian economy, which is recovering after the severe crisis in 2009, has shown obvious signs of macroeconomic instability over the last five years, namely the slowdown of economic growth in 2012–2013 and the recession during the 2014–2015 period. One of the main reasons for this is the irrational structure of national consumption. The present study allows finding out that the biggest defects of the structure of the aggregate expenditures of the Ukrainian economy are the reduction in the share of gross capital formation and an increase in the share of net export with minus. The main factors hampering private capital formation in Ukraine are the reduction of national savings and excessive market concentration. Rapid inflation rates and an extremely low level of confidence in financial intermediaries from the part of Ukrainian households to buy foreign currencies, which they save as non-performing assets (cash). This is an extraction of resources from the «profits-expenditures» flow, which do not work for the economy and are extremely scarce. The chronic negative net export of Ukraine is connected with unsatisfactory terms of trade, because high-tech science-intensive products and excessive amounts of hydrocarbons are imported, and the products with a low level of processing are mainly exported. This is explained by the insufficient tempo of technological modernisation of the Ukrainian economy and innovation lag: 40% of workers employed in the industry are engaged in the production at the low technological level, about 20% - at the average level and only 2.5% - at the high level. The increase of GDP due to the introduction of new technologies in Ukraine is estimated at 0.7–1%, while in developed countries it reaches 60% and more. Comparison of Ukraine with other European countries in terms of aggregate expenditures structure in 2012–2017 substantiated the need for deep structural change in the country.

Keywords: Aggregate Expenditures; Recessionary Gap; Gross Capital Formation; National Savings; Net Exports; Monopolies; Ratchet Effect; Economic Restructuring; Withdrawal; Technological Level; Lagging

JEL Classification: E12; E20; F14

DOI: <https://doi.org/10.21003/ea.V172-08>

Мудрак Р. П.

доктор економічних наук, професор, завідувач кафедри економіки,
Уманський національний університет садівництва, Умань, Україна

Лагодієнко В. В.

доктор економічних наук, професор, завідувач кафедри маркетингу, підприємницької діяльності і торгівлі,
Одеська національна академія харчових технологій, Одеса, Україна

Лагодієнко Н. В.

кандидат економічних наук, старший викладач, кафедра обліку і оподаткування,
Миколаївський національний аграрний університет, Миколаїв, Україна

Вплив сукупних витрат на обсяги національного виробництва

Анотація. Українська економіка демонструє очевидні ознаки макроекономічної нестабільності – уповільнення темпів економічного зростання в 2012–2013 рр. та рецесію в 2014–2015 рр. Однією із головних причин цього є нераціональна структура національного споживання. Дослідження дозволило з'ясувати, що найбільшими недоліками структури сукупних витрат української економіки є зменшення частки валового нагромадження капіталу та збільшення частки чистого експорту із знаком мінус. Основними факторами, що ускладнюють формування приватного капіталу в Україні, є скорочення національних заощаджень та надмірна ринкова концентрація. Швидкі темпи інфляції та надзвичайно низький рівень довіри до інституту фінансових посередників змушують українські домогосподарства купувати іноземну валюту, яку вони зберігають у вигляді бездоходних активів (готівки). Це вилучення ресурсів, які не працюють на економіку, хоча є дуже дефіцитними, із потоку «витрати-доходи». Хронічний від'ємний чистий експорт України пов'язаний із незадовільними умовами торгівлі, оскільки імпортується високотехнологічна наукомістка продукція та надмірна кількість вуглеводнів, експортуються переважно продукти з низьким рівнем переробки. Основною причиною цього є недостатній темп технологічної модернізації української економіки.

Ключові слова: сукупні витрати; рецесійний розрив; валове громадження капіталу; національні заощадження; чистий експорт; монополії; ефект храповика; реструктуризація економіки; вилучення; технологічний рівень; відставання.

Мудрак Р. П.

доктор экономических наук, профессор, заведующий кафедрой экономики, Уманский национальный университет садоводства, Умань, Украина

Лагодієнко В. В.

доктор экономических наук, профессор, заведующий кафедрой маркетинга, предпринимательской деятельности и торговли, Одесская национальная академия пищевых технологий, Одесса, Украина

Лагодієнко Н. В.

кандидат экономических наук, старший преподаватель, кафедра учета и налогообложения, Николаевский национальный аграрный университет, Николаев, Украина

Влияние совокупных затрат на объемы национального производства

Аннотация. Украинская экономика демонстрирует явные признаки макроэкономической нестабильности – замедление темпов экономического роста в 2012–2013 гг. и рецессию в 2014–2015 гг. Одной из главных причин этого является нерациональная структура национального потребления. Исследование позволило выяснить, что наибольшими недостатками структуры совокупных расходов украинской экономики является уменьшение доли валового накопления капитала и увеличение доли чистого экспорта со знаком минус. Основными факторами, затрудняющими формирование частного капитала в Украине, являются сокращение объема национальных сбережений и высокая рыночная концентрация. Быстрые темпы инфляции и чрезвычайно низкий уровень доверия к институту финансовых посредников, заставляют украинские домохозяйства покупать иностранную валюту, которую они хранят в виде бездоходных активов (наличных). Это подразумевает изъятие ресурсов, которые не работают на экономику, хотя очень дефицитны, из потока «затраты-доходы». Хронический отрицательный чистый экспорт Украины связан с неудовлетворительными условиями торговли, поскольку импортируются высокотехнологичная наукоемкая продукция и избыточное количество углеводородов, экспортируются преимущественно продукты с низким уровнем переработки. Основной причиной этого является недостаточный темп модернизации украинской экономики.

Ключевые слова: совокупные расходы; рецессивный разрыв; валовое накопление капитала; национальные сбережения; чистый экспорт; монополии; эффект храровика; реструктуризация экономики; изъятие; технологический уровень; отставание.

1. Introduction

The Ukrainian economy, which is recovering after the severe crisis in 2009, has shown obvious signs of macroeconomic instability over the last six years, namely the slowdown of economic growth in 2012–2013 and the recession during the 2014–2015 period. Over that period GDP losses made up UAH 179.2 billion or 15.8%. The downfall in the production volume was followed by a shocking increase in market prices, which was more than a threefold increase in the period between 2014 and 2015 (2010 = 100%). Therefore, social and economic consequences of the crisis were especially grave: arise in unemployment combined with a drastic cost-of-living increase.

In 2016, social production ceased to slow down and began recovering. The annual increase was 2.3%, though market prices continued growing with the GDP deflator making up 242.2% (2010 = 100%) in 2016.

The analysis of such unstable dynamics of national production has become more complicated because of the on-going Russian-Ukrainian military conflict. The latter has greatly intensified the impact of crisis factors. Since 12.8% (47 thousand km²) of Ukrainian territories remain occupied, their economic resources are blocked. However, the crisis and slow rates of recovering have deep rooted reasons. This is proved by 15.1% GDP downfall of Ukraine in 2009, which is the worst index among all those countries that experienced financial global crisis and economic dynamics in 2012–2013 when GDP growth was only 100.2 and 100.0%, respectively.

In our opinion, when investigating the reasons why the Ukrainian economy is vulnerable, we should pay attention to the irrational structure of national consumption, which is described by the category of aggregate expenditures.

2. Brief Literature Review

The analysis of qualitative and quantitative aspects of the connection of aggregate expenditures, volumes and dynamics of national production was presented in the works by many foreign scientists. In particular, the following scientists devoted their studies to this issue: A. K. Dutt and J. Ros (2007) [10], M. Hohnisch and F. Westerhoff (2008) [20], E. Palazuelos and R. Fernández (2009) [32], J. A. Makin (2010) [24–25], G. F. Davanzati and A. Pacella (2013) [7], P. Beaudry and F. Portier (2014) [2], P. Michaila and E. Saez (2015) [27], J. Hartwig (2015) [19], F. Serrano and R. Summa (2015) [36], M. Setterfield and Y. K. Kim (2016) [37], M. Setterfield and S. G. Suresh (2016) [38], A. S. M. Neto and G. Porcile (2017) [29], X. Giroud and

H. M. Mueller (2017) [17], C. Schoder (2017) [35], and J. Bivens (2017) [4]. Regarding the Ukrainian expert environment, the problem of the impact of total expenditures on public production was in the focus of scientific research by N. Dekhtyar, I. Boyarko and O. Deyneka (2013), I. Radionova (2015), M. Skrypnychenko et al. (2012), T. Prykhodko (2012), I. Stemblianko (2015), M. Chekh and G. Semiv (2017) and others.

3. The purpose

The purpose of the research is to test the hypothesis about the irrational structure of the aggregate expenditures in the Ukrainian economy and clear out its reasons. To achieve the stated objectives the following tasks should be solved:

- to identify the natural rate of unemployment in Ukraine and compare it with the actual one;
- to carry out a comparative analysis of the structure of the aggregate expenditures;
- to reveal the reasons for the existence of the irrational structure of the aggregate expenditures in the Ukrainian economy.

4. Results

Reasons and consequences of the deviation of actual aggregate expenditures from planned expenditures are the object of the research by Keynesian theory [22], which is a methodological basis of our investigation.

A deviation of public production from equilibrium production under full employment is characteristic of the unstable national economy. A distinction is made between the recessionary and the inflationary gaps [21; 41]. This is why an important methodological aspect of our research is to identify in which zone of the short-run aggregate supply curve the national economy is [11–12], since it affects the character of stabilising measures which differ considerably. It being in the intermediate zone of aggregate supply curve, the anti-inflation policy of the state aimed at the reduction of aggregate expenditures will cause a recession.

To identify the place of the national economy on a short-run aggregate supply curve, it is necessary to clarify whether the condition of full employment is fulfilled. Full employment is achieved under condition that actual unemployment rate the natural unemployment rate. Thus, if the actual unemployment rate is higher than the natural, then actual GDP lags behind potential GDP and there is a recessionary gap in the economy, caused by the deficit of aggregate expenditures.

In the world practices, there hasn't been a uniform way of calculating the index of a natural unemployment rate up to the present day. Three methods have become the most widespread.

The first method is based on the Phillips curve in a long-run period [16, 33]. The main idea of the method consists in the fact that the inflation, which is equal to the sum of potential inflation and supply inflation, indicates the absence of cyclic unemployment, i.e. this inflation can be regarded as full employment inflation that corresponds with the natural unemployment rate.

Since there is an inverse relationship between inflation and unemployment, reduction in actual unemployment rate compared to natural unemployment rate will result in speeding up inflation compared to an anticipated level. From this, follows the method of identifying natural unemployment rate that equals the non-acceleration inflation rate of unemployment, therefore the natural rate of unemployment is also called NAIRU (the non-acceleration inflation rate of unemployment).

The second method is based on the statement that the average rate of actual unemployment over a long-run period smoothes its cyclic fluctuations around the natural rate [18]. Thus, the measurement of the natural unemployment rate lies in its calculation as an annual average rate of unemployment over a long period.

According to the third method suggested by G. Mankiw (1994), the number of people leaving jobs should equal the number of people finding jobs to achieve equilibrium on the job market:

$$fU = s(L - U), \quad (1)$$

where:

fU - the rate of found jobs, which shows the fraction of unemployed workers who find jobs among unemployed workers;

s - the rate of job separation that shows the number of employed workers who lose jobs among employed workers;

$(L - U)$ - the number of employed workers [26].

To measure the natural unemployment rate in the Ukrainian economy, applying the Philips method of a long-run curve doesn't seem to be possible. According to the statistical data relevant to the period between 2001 and 2017, the calculated correlation coefficient (r) equals -0.257, which proves a minor correlation between unemployment and inflation.

To measure the natural rate of unemployment according to the second method, we use statistical data relating to the national labour market (Figure 1).

The average rate of actual unemployment over the investigated period made up 8.2%. It is necessary to mention that it is a critically high index for the natural unemployment rate. However, it should be mentioned that a high level of shadow employment in the Ukrainian economy hampers calculations.

To check the accuracy of the performed calculations, it is necessary to apply the third method. To analyse the Ukrainian labour market from the mathematical standpoint, the method was used by O. Vasilyev [43]. On the basis of a synergetic model, the scientist calculated the natural unemployment rate for the Ukrainian economy, which makes up 7.7%.

The obtained data allow us to assume, that the natural unemployment rate for the Ukrainian economy falls within $7.7\% < NRU < 8.2\%$.

In 2017, the actual unemployment rate in Ukrainian economy made up 9.5%. It is higher than the natural unemployment rate within the range of 7.7-8.2%. From which we can conclude, that there is underemployment in the Ukrainian economy. Consequently, the actual GDP of Ukraine lags behind a potential GDP, resulting from the aggregate expenditures deficit.

An international comparative analysis of the structure of aggregate expenditures in the groups of countries according to the classification of the World Bank and Ukraine revealed serious problems in the Ukrainian economy (Table 1).

Tab. 1: Structure of aggregate expenditures in the groups of countries according to the classification by the World Bank and Ukraine, % of GDP

| Type of expenditure | Years | | | | |
|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
| | 1991-1995 | 1996-2000 | 2001-2005 | 2006-2010 | 2011-2016 |
| High-income countries | | | | | |
| Final expenditures of households | 58.77 | 59.05 | 59.65 | 59.49 | 59.81 |
| Government final expenditures | 17.66 | 16.85 | 17.50 | 18.17 | 18.28 |
| Gross capital formation | 23.14 | 23.54 | 22.51 | 22.15 | 21.11 |
| Net export | 0.42 | 0.56 | 0.34 | 0.18 | 0.79 |
| Middle-income countries | | | | | |
| Final expenditures of households | 57.14 | 57.91 | 55.31 | 52.12 | 53.52 |
| Government final expenditures | 13.70 | 14.49 | 14.27 | 13.93 | 14.34 |
| Gross capital formation | 29.16 | 26.28 | 27.85 | 31.26 | 31.88 |
| Net export | -0.01 | 1.30 | 2.54 | 2.68 | 0.25 |
| Lower middle-income countries | | | | | |
| Final expenditures of households | 66.32 | 66.65 | 65.03 | 62.79 | 64.42 |
| Government final expenditures | 11.69 | 11.76 | 11.07 | 11.05 | 11.23 |
| Gross capital formation | 24.15 | 23.12 | 24.85 | 29.27 | 28.18 |
| Net export | -1.85 | -1.60 | -0.98 | -3.13 | -3.87 |
| Low-income countries | | | | | |
| Final expenditures of households | 83.33 | 80.82 | 81.86 | 78.74 | 77.19 |
| Government final expenditures | 13.92 | 12.03 | 12.67 | 13.12 | 13.62 |
| Gross capital formation | 14.46 | 15.12 | 16.70 | 19.74 | 26.80 |
| Net export | -14.09 | -10.54 | -13.82 | -14.61 | -17.72 |
| Ukraine | | | | | |
| Final expenditures of households | 50.34 | 56.16 | 56.35 | 62.15 | 70.08 |
| Government final expenditures | 18.31 | 22.90 | 18.75 | 18.81 | 19.07 |
| Gross capital formation | 31.82 | 20.42 | 21.52 | 23.46 | 18.91 |
| Net export | -0.48 | 0.52 | 3.39 | -4.41 | -8.07 |

Source: [42]

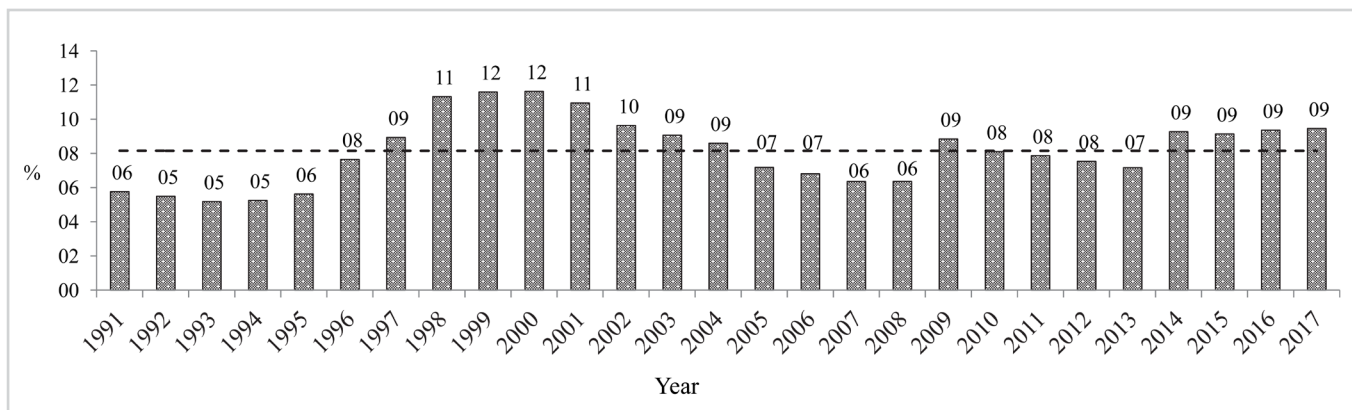


Fig. 1: Actual and average unemployment rate in Ukraine (by ILO methodology), %
Source: [42]

First of all, it should be noted that the increase in the share of final expenditures of Ukrainian households is approaching the low income group by value. If this indicator is stable in the group of high-income countries, then in other groups it decreases.

In Ukraine, the share of government final expenditure exceeds similar indicators in all the analysed groups of countries, including the same indicator in the group of the richest countries.

Thus, almost 90% of Ukrainian GDP is directed to the final consumption fund. For comparison, the final consumption fund was on average 78% in the group of high-income countries, 68% in the group of middle-income countries, 76% in the group of lower middle-income countries and 91% in the group of low-income countries within the period between 2011 and 2016.

The growth of the share of net exports with a minus sign indicates that in the Ukrainian economy, final consumption, among other things, increases due to the growth of imports. The latter is a seizure of resources from the income-expenditure flow, which is not offset by the revenues from exports and reduces the potential of the Ukrainian economy.

In our opinion, the most dangerous trend in the Ukrainian economy is an increase in the share of final consumption by reducing the share of gross capital formation. Unlike all the analysed groups (except for the first one), where the share of gross capital formation is increasing, the relevant indicator for Ukraine shows a tendency to decrease. This indicates the domination of the strategy of survival over the development strategy in the Ukrainian economy: in the conditions of negative economic expectations, the propensity to consumption is increasing and the propensity to saving is decreasing. It is also necessary to reduce the government final expenditure to the level that is relevant for the group of countries with lower middle income, which includes Ukraine.

Reducing the share of gross capital formation in the structure of the aggregate expenditure of an emerging economy means its gradual degradation - the material and technical potential generated by previous generations is gradually being destroyed as a result of physical and moral depreciation.

Sufficient volumes of gross capital formation are a non-alternative condition for the modernisation and increase of economic growth rates of the Ukrainian economy. Actual growth in Ukraine's real GDP amounted to 2.5% in 2017. In order to achieve the socio-economic indicators determined by the Strategy on Sustainable Development «Ukraine-2020» [8], the annual increment of public production should be at least 5-7%. The gross capital formation should be at least 30% of GDP, so that the Ukrainian economy reached the target of economic growth of 105-107% (Table 2).

The key factor that affects the amount of gross capital formation is the volume of national savings (Table 3). As expected, the economies of the countries of the first three groups have a strong correlation between the gross capital formation and gross national savings. In contrast, this correlation is average in poor countries and Ukraine.

This is confirmed by the second regularity which is connected not with the quantity but with the efficiency of using national savings. The country's economy grows only when national savings are transformed into useful forms of capital. From which we can conclude:

Tab. 2: Relation between the indicator of economic growth and gross capital formation, average values for 1991-2016

| Country | Economic growth, % | Gross capital formation, % of GDP |
|--|--------------------|-----------------------------------|
| China, Bhutan, India and others. | more than 106% | 33.2 |
| Panama, Singapore, Lebanon, Malaysia, Bangladesh, Sri Lanka, Tanzania, Korea, Chad, Indonesia, Chile, Mauritania, Botswana, Turkey, Thailand, Uzbekistan, Nepal, Philippines, Mongolia and others. | from 104 to 106% | 23.9 |
| Tunisia, Morocco, Iran, Saudi Arabia, Hong Kong, Mauritania, Guyana, Slovakia, Azerbaijan, Honduras, Nicaragua, Ecuador, Australia, Congo, Algeria, New Zealand, Albania, USA, Norway, Gabon, Belarus, Armenia, Suriname, Sweden, Spain and others | from 102 to 104% | 22.7 |
| Austria, Belgium, Czech Republic, Romania, Germany, Switzerland, Finland, France, Portugal, Bulgaria, Macedonia, Brunei, Kyrgyzstan, Japan, Greece and others | from 100 to 102% | 21.0 |

Source: [42]

- 1) the Ukrainian economy is experiencing a shortage of savings;
- 2) savings that are converted into capital are distributed among the sectors and branches of the Ukrainian economy relatively inefficiently.

To test the second conclusion, a correlation analysis was conducted. The productivity of labour is taken as a function (production of GDP per person employed, in constant prices according to purchasing power parity, USD), fixed capital per worker (gross fixed assets per person employed, at constant prices, USD) is taken as a factor (Table 4).

Unlike all the groups of countries included in the analysis, in which the economies have a strong correlation between labour productivity and fixed capital per worker, the investigated relation is average in the Ukrainian economy. Therefore, the efficiency of capital utilisation is the lowest. Labour productivity increases only by 0.211% with the increase in fixed capital per worker by 1%, which confirms our conclusion

The reasons for the low efficiency of capital use in Ukraine lie in the specific features of the sectoral structure of the country's economy. This concerns mainly the level of market concentration. There are enough reasons to assert that the non-competitive environment in Ukraine was created and artificially supported by its main beneficiaries which are monopolistic formations represented by financial-industrial groups. The latter raise existing barriers to enter the following industries: the mobile and fixed telephony services

Tab. 3: Relation between gross capital formation (% of GDP) and total domestic savings (% of GDP)

| Group of countries | Correlation coefficient, <i>r</i> |
|----------------------------------|-----------------------------------|
| High income countries * | 0.974 |
| Middle income countries ** | 0.934 |
| Lower middle income countries ** | 0.960 |
| Low income countries *** | 0.696 |
| Ukraine **** | 0.714 |

Notes: * for the 1970-2016 period; ** for the 1960-2016 period; *** for the 1990-2016 period; **** for the 1989-2016 period

Source: [42]

Tab. 4: Relationship between productivity and fixed capital per worker

| Group of countries, country | Correlation coefficient, <i>r</i> | Coefficient of elasticity, <i>E</i> |
|---------------------------------|-----------------------------------|-------------------------------------|
| High income countries * | 0.889 | 0.995 |
| Middle income countries * | 0.990 | 0.667 |
| Lower middle income countries * | 0.979 | 0.818 |
| Low income countries ** | 0.988 | 0.338 |
| Ukraine * | 0.544 | 0.211 |

Notes: * for the 1991-2016 period; ** for the 2001-2016 period

Source: [42]

market, regional electricity markets, fertilizer production, construction market, ferroalloy production, television, petroleum products market, pipe production, metallurgy, domestic air transportation, production of chicken, eggs, sugar, oil, tobacco products, storage of agricultural products, parking business, construction materials market, etc. [1; 5; 44]. Domination of monopolies on the markets of Ukraine is confirmed by the ratchet effect. It means that market prices are inflexible to go down. In developed countries, the reason why the ratchet effect occurs is inflexibility of wages to decrease because of the influence of trade unions and unwillingness of companies to lose qualified workers. In the countries with excessive market concentration and insufficient protection of competitiveness, the main reason for the ratchet effect is the dominance of monopolies. As we can see from Figure 2, market prices in Ukraine never showed deflation over the period between 2001 and 2016, even in the years when deficit of aggregate expenditures caused stagnation (2012-2013) or economic crises (2009, 2014-2015).

The domination of monopolies explains the low efficiency of capital use. They hinder the restructuring of public production, i.e. the free flow of capital between sectors and branches of the economy. At the moment, a critical mass of Ukraine's national capital is in such forms that it does not allow changing its sectoral purpose upon changing the market situation. For example, according to the World Bank, the market capitalisation of Ukrainian companies as a share of GDP makes up 15.7% (2011). For comparison, in the group of high-income countries, this figure is 120.8%, with the relevant 58.4% in the group of middle-income countries and 51.3% in the group of lower middle income countries (2016).

Monopolies block the entry of new players into the markets, drive them out of the markets and absorb or make small and medium-sized enterprises bankrupt. As the result, the actual volumes of gross capital formation in the national economy are considerably lower than the potential ones.

Along with the assets that enterprises direct into the restoration of capital, savings of households are no less important as a component of national savings. However, unlike the savings of enterprises that always turn into investments for the restoration of capital, household savings can be withdrawn from the income-expenditure flow for a long period, reducing the resource base of the national economy and causing a recessionary gap and the lag of actual GDP from potential. The largest volume of household savings was recorded in 2012 - UAH 150.2 billion. In 2015, this index dropped tenfold to UAH 15.1 billion, and in 2016 there was an effect of negative savings. The average propensity to savings was the highest in 2012 - 12.9%, in 2015 it was less than 1%, and in 2016 it was lower than 0. The effect of negative savings that worked in the economy of Ukraine in 2016 is the evidence of negative expectations

of consumers, further price increase resulting in devaluation of profits.

Rapid inflation rates and an extremely low level of confidence in financial intermediaries has created another problem: Ukrainian households, trying to protect their savings from devaluation, are among the main buyers of foreign currencies (US dollars and Euros), which they save as non-performing assets (cash). Constant demand for a foreign currency from the part of Ukrainian households enhances its shortage at the domestic market and makes its contribution in devaluation of national currency. In 2014, the National Bank of Ukraine released data of International Investment Position according to which in Ukraine there were 92 billion of freely convertible currency (US dollars, Euros), including UAH in cash, which is equivalent to approximately UAH 2.5 trillion in the extra-bank shadow turnover [31]. This sum is larger than Ukraine's GDP was in 2016 (UAH 2.4 trillion).

Under conditions of critically low volumes of gross capital formation, the savings that do not convert into investments create a very serious economic problem. In our opinion, it is caused by a total distrust, which is one of the determining characteristics of modern Ukrainian society. Persistent mistrust in financial institutions is provoked by several events, the main of which was the loss of savings by depositors of «Oshchadbank» in the first half of the 1990s. Later this mistrust only aggravated due to resounding bankruptcies of financial pyramids, fraud in the construction business and loss of savings in bankrupt banks. The worst is that in most cases the reason for bankruptcy was obvious fraud rather than a low qualification level of the administration. Moreover, the state wasn't able to protect property rights of its citizens and, in some cases, representatives of authorities were accomplices of financial fraud, causing irreparable reputational damage to the state authorities. This generated total mistrust and blocked one of the most important macroeconomic mechanisms - conversion of savings into investments.

To define the reasons of net export reduction we should analyse the volumes and structure of foreign trade activity. To make a comparison, we choose the followings periods: 2004 - the highest index of economic growth in 2000-2016, 2009 - the economic crisis, 2014 - the beginning of crisis in political and economic relations between Ukraine and Russia, and 2017 - the reporting period.

Mineral products such as crude oil and natural gas make up the largest share in the structure of Ukrainian import (Table 5).

The economic crisis and Russian-Ukrainian military-political conflict have served as a catalyst for reducing energy dependence of the national economy, yet expenditures on payment for hydrocarbons still made up more than 25% of all import expenditures in the reporting period. The reason is the same - the low level of energy efficiency of the

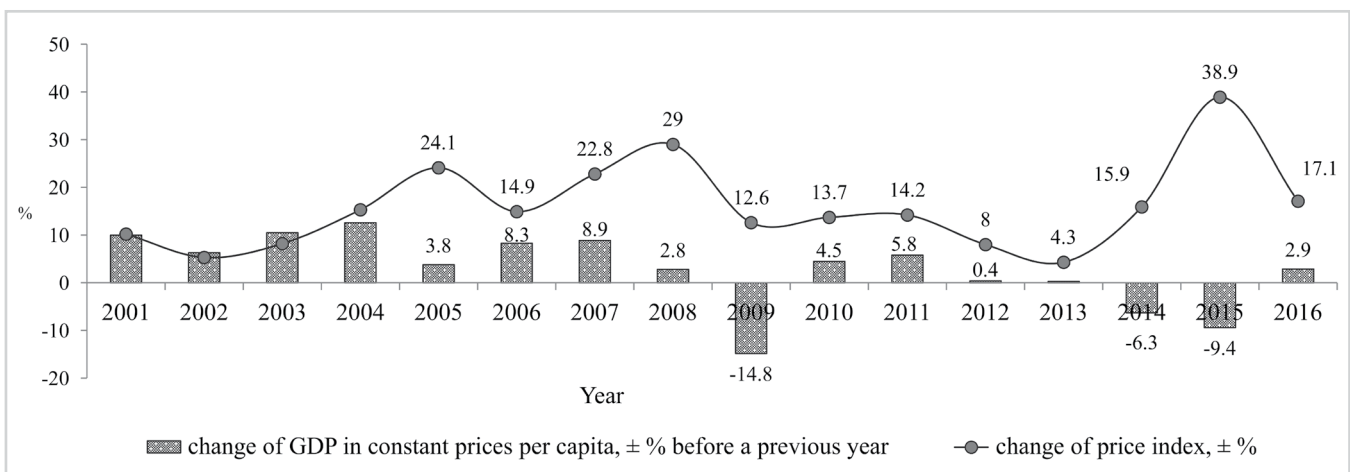


Fig. 2: Dynamics in the change of physical volumes of GDP and market prices in Ukraine in 2001-2016
Source: [39]

Tab. 5: Commodity Pattern of Foreign Trade of Ukraine, USD billion

| Commodity code and title by Ukrainian Classification of Commodities in Foreign Trade | 2004 | | 2009 | | 2014 | | 2017 | |
|--|---------|---------|---------|---------|---------|---------|---------|---------|
| | imports | exports | imports | exports | imports | exports | imports | exports |
| Total | 28.9 | 32.7 | 45.4 | 39.7 | 54.4 | 53.9 | 49.6 | 43.3 |
| Live animals and livestock products | 0.3 | 0.6 | 1.3 | 0.6 | 1.1 | 1 | 0.7 | 1.1 |
| Plant products | 0.4 | 1.1 | 1.3 | 5 | 2 | 8.7 | 1.4 | 9.2 |
| Animal or plant fats and oils | 0.1 | 0.5 | 0.4 | 1.8 | 0.3 | 3.8 | 0.3 | 4.6 |
| Finished food industry products | 1 | 1.1 | 2 | 2.1 | 2.6 | 3.1 | 1.9 | 2.8 |
| Mineral products | 10.8 | 4.3 | 15.7 | 3.9 | 16.1 | 6.1 | 12.5 | 3.9 |
| Products of chemical and allied industries | 2.2 | 2.8 | 5.3 | 2.5 | 6.8 | 3.1 | 6.5 | 1.7 |
| Polymeric materials, plastics and articles of them | 1.4 | 0.4 | 2.7 | 0.6 | 3.6 | 0.6 | 3.2 | 0.6 |
| Wood and articles of wood | 0.2 | 0.5 | 0.3 | 0.7 | 0.3 | 1.3 | 0.2 | 1.2 |
| Textiles materials and articles of textiles | 1 | 0.9 | 1.4 | 0.7 | 1.9 | 0.8 | 1.7 | 0.8 |
| Base metals and preparations thereof | 1.8 | 13.1 | 2.7 | 12.8 | 3.3 | 15.2 | 3.0 | 10.1 |
| Machines, equipment and mechanisms, electric and technical equipment | 4.7 | 3 | 6.3 | 5 | 8.7 | 5.7 | 9.9 | 0.1 |
| Ground, air and water transport facilities | 2.5 | 2 | 2.2 | 1.6 | 2.6 | 1.5 | 4.2 | 0.6 |
| Others | 2.5 | 2.4 | 3.8 | 2.4 | 5.1 | 3 | 3.9 | 6.5 |

Source: [39]

Ukrainian economy because of operation of outdated equipment and technology. To compare specific consumption of natural gas we choose European countries with GDP similar to that of Ukraine (in fixed prices and according to purchasing-power parity), with Germany as a benchmark of the European economy (Table 6).

As we can see, the specific level of natural gas consumption in Ukraine exceeds the manifold similar indexes for the abovementioned EU member-states. In 2016, the Ukrainian economy consumed 34 billion m³ of gas, of which 11.08 billion m³ (32.6%) were imported. Simple calculations show that under the reduction of gas capacity of Ukraine's GDP by 41% to 4.1 kg of gas in oil equivalent per 100 US dollars of GDP, there will be no need to spend currency on the import of natural gas. In 2016, such expenditures made up USD 1.6 billion [28]. And under the reduction of gas capacity of Ukrainian GDP by 56.5% - to 3.0 kg of gas in oil equivalent per 100 US dollars of GDP, Ukraine will not only completely meet its own demand for natural gas due to own extraction but also due to the fact that it can also export 5 billion m³. In the prices of 2016, the hypothetical export earnings would make up USD 722.2 million. Thus, only due to the optimisation of natural gas consumption, the negative trade balance equal to USD 2,888.1 million could be reduced to USD 565.9 million in 2016.

Machines, equipment and mechanisms and electric machinery occupies the second ranking according to the level of import spending. Their share in 2017 reached the maximum size over the analyzed period - 20% of all import spending. This group includes products such as nuclear power reactors, boilers and machines - 11.7% and electric machines - 8.3%.

According to the size of import expenditures, the third place is occupied by the products of chemical and related industries. In 2017, its share made up 13.1%.

The common feature of these two groups of goods is that it comprises hi-tech science-intensive produce. This reminds us of the problem of innovation lag of the national economy. Over 40% of workers employed in the industry are engaged in the production at the low technological level, about 20% - at the average level and only 2.5% - at the high level [23]. The increase of GDP due to the introduction of new technologies in Ukraine is estimated at 0.7-1%, while in developed countries this index reaches 60% and even 90% [13].

This specific feature of the Ukrainian export structure is a mirror reflection of the problems with its import structure (Table 5). Ukrainian exports have an expressed raw-material

Tab. 6: Efficiency of using natural gas in Ukraine and selected EU member states in 2016

| Country | GDP in fixed prices, purchasing-power parity, bln. USD | Gross domestic consumption of natural gas, thousand tons in oil equivalent | Gas capacity of GDP, kg in oil equivalent per 100 USD GDP |
|----------------|--|--|---|
| Ukraine | 370.8 | 25603.3 | 6.9 |
| Austria | 376.9 | 7181.9 | 1.9 |
| Czech Republic | 323.8 | 7016.3 | 2.2 |
| Belgium | 466.2 | 14300 | 3.1 |
| Norway | 312.8 | 5536.2 | 1.8 |
| Sweden | 448.4 | 825.2 | 0.2 |
| Germany | 3553.4 | 70330.3 | 2.0 |

Source: [14; 30; 42]

orientation. The first place in its structure belongs to the group of goods «Non-precious metals and their products» - 23.2% of export earnings. The second place belongs to plant products, which increased their share by 17.9 percentage points over the analysed period. In the reporting period, they provided 21.3% of export earnings, including 13.1% due to the agricultural crops and 4.2% due to the seeds of fruits of oil plants. Both groups provided 43.5% of export earnings in 2017.

The problem with such goods lies in the fact that such products have a low level of processing. As a result, they have the lowest share of added value and therefore, in price, they are inferior to the goods with a higher level of processing, especially to finished and science intensive goods. This has a negative impact on the trade conditions and reduces the index of net export.

It the global market, Ukraine trades mainly with goods of the lowest technological levels. If it continues to increase their export, then the effect of the so called impoverishing growth will threaten the country [3]. The current trends in functioning of the industrial complex of Ukraine hamper its development and make domestic produce uncompetitive in both the domestic and global markets [15].

5. Conclusions

In 2017, the actual unemployment rate in Ukraine made up 9.5%. It is higher than the natural unemployment rate which remains within 7.7-8.2%. Thus, the Ukrainian economy has underemployment. Actual GDP of Ukraine lags behind potential GDP because of the aggregate expenditures deficit.

The international comparative analysis has shown that the structure of aggregate expenditures in the Ukrainian economy is irrational: an increase in the share of final consumption of households and the government is accompanied by a decrease in the share of gross capital formation and an increase in the share of net exports with a minus.

The main reasons why the irrational structure of aggregate expenditures in the Ukrainian economy occur are the lack of savings, the domination of monopolies and the innovative backwardness of national production.

References

1. Antimonopoly Committee of Ukraine (2017). *Report of the Antimonopoly Committee of Ukraine for 2016*. Retrieved from <http://www.amc.gov.ua/amku/doccatalog/document?id=133712&> (in Ukr.)
2. Beaudry, P., & Portier, F. (2014). Understanding Noninflationary Demand-Driven Business Cycles. *NBER Macroeconomics Annual*, 28(1), 69-130. doi: <https://doi.org/10.1086/674592>
3. Bhagwati, J. N. (1958). Immiserizing Growth: A Geometrical Note. *The Review of Economic Studies*, 25(3), 201-205. doi: <https://doi.org/10.2307/2295990>
4. Bivens, J. (2017, December 12). *Inequality is slowing US economic growth: Faster wage growth for low- and middle-wage workers is the solution*. Washington, DC: Economic Policy Institute. Retrieved from <https://www.epi.org/publication/secular-stagnation>
5. Brovynskaia, M. (2016). *In one hands: who is behind the 10 largest monopolies of Ukraine*. LihaBiznes. Retrieved from <http://www.svb.ua/news/v-odnikh-rukakh-khto-stoit-za-10-naibilshimi-monopoliyami-ukraini?page=51> (in Ukr.)
6. Chekh, M., & Semiv, G. (2017). Shocks of the aggregate demand and balance of payment equilibrium in dependent economy. *Economic Annals-XXI*, 163(1-2(1)), 47-51. doi: <https://doi.org/10.21003/ea.V163-10> (in Ukr.)
7. Davanzati, G. F., & Pacella, A. (2013). The profits-investments puzzle: A Post Keynesian-Institutional interpretation. *Structural Change and Economic Dynamics*, 26, 1-13. doi: <https://doi.org/10.1016/j.strueco.2013.03.003>
8. Decree of the President of Ukraine (2015). About the Strategy of Sustainable Development «Ukraine-2020» No. 5. *Ofitsiyniy visnyk Ukrainy (Official Bulletin of Ukraine)*, 4, 8 (in Ukr.)
9. Dekhtyar, N., Boyarko, I., & Deyneka, O. (2013). *Government expenditures in the economy of the state*. Monograph. Retrieved from https://essuir.sumdu.edu.ua/bitstream/123456789/50072/2/Boiarko_Dekhtiar_Deineka.pdf (in Ukr.)
10. Dutt, A. K., & Ros, J. (2007). Aggregate demand shocks and economic growth. *Structural Change and Economic Dynamics*, 18(1), 75-99. doi: <https://doi.org/10.1016/j.strueco.2005.11.002>
11. Dutt, A. K., & Skott, P. (1996). Keynesian theory and the aggregate-supply/aggregate-demand framework: a defense. *Eastern Economic Journal*, 22(3), 313-331. Retrieved from <https://www.jstor.org/stable/40325721>
12. Dutt, A. K., & Skott, P. (2005). Keynesian Theory and the AD-AS framework: a reconsideration. *Economics Department Working Paper Series*, No. 47. Retrieved from https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1057&context=econ_workingpaper
13. Dybuk, V. Ya., & Osidach, O. B. (2014). Activization the participation of Ukraine in the new technological order as innovative breakthroughs way and capacity of profitability. *Innovatsiina ekonomika (Innovative economy)*, 51(2), 31-39 (in Ukr.)
14. Eurostat (2017). *Database*. Official web-site. Retrieved from <http://ec.europa.eu/eurostat/data/database>
15. Fedorova, Yu. V. (2016). Prospects of innovation development of Ukraine: technological levels. *Visnyk Khmelnytskoho natsionalnoho universytetu (Herald of Khmelnytsky National University)*, 1, 123-126 (in Ukr.)
16. Friedman, M. (1968). The Role of Monetary Policy. *The American Economic Review*, 58(1), 1-17. Retrieved from <http://www.jstor.org/stable/1831652>
17. Giroud, X., & Mueller, H. M. (2017). Firm Leverage, Consumer Demand, and Employment Losses During the Great Recession. *The Quarterly Journal of Economics*, 132(1), 271-316. doi: <https://doi.org/10.1093/qje/qjw035>
18. Gordon, R. J. (1981). Inflation, Flexible Exchange Rates, and the Natural Rate of Unemployment. *NBER Working Paper No. 708*. Cambridge MA. Retrieved from <https://www.nber.org/papers/w0708.pdf>
19. Hartwig, J. (2015). Structural change, aggregate demand and employment dynamics in the OECD, 1970-2010. *Structural Change and Economic Dynamics*, 34, 36-45. doi: <https://doi.org/10.1016/j.strueco.2015.06.001>
20. Hohnisch, M., & Westerhoff, F. (2008). Business cycle synchronization in a simple Keynesian macro-model with socially transmitted economic sentiment and international sentiment spill-over. *Structural Change and Economic Dynamics*, 19(3), 249-259. doi: <https://doi.org/10.1016/j.strueco.2008.04.001>
21. Jahan, S., Mahmud, A. S. (2013). What Is the Output Gap? *Finance & Development*, 50(3), 38-39. Retrieved from <https://www.imf.org/external/pubs/ft/fandd/2013/09/basics.htm>
22. Keynes, J. M. (1936). *The General Theory of Employment, Interest, and Money*. London: Macmillan Publishing Company. Retrieved from https://www.files.ethz.ch/isn/125515/1366_KeynesTheoryofEmployment.pdf
23. Kulykov, H. (2016, April 8). *How to break up a vicious circle of low wages*. ZN.ua. Retrieved from: <https://dt.ua/macrolevel/yak-rozrivati-porochne-kolonizkih-zarobitnih-plat-.html> (in Ukr.)
24. Makin, J. A. (2010). Did Australia's Fiscal Stimulus Counter Recession?: Evidence from the National Accounts. *Agenda: A Journal of Policy Analysis and Reform*, 17(2), 5-16. Retrieved from <https://www.jstor.org/stable/43199629>
25. Makin, J. A. (2010). How Should Macroeconomic Policy Respond to Foreign Financial Crises? *Economic Papers: A Journal of applied economics and policy*, 29(2), 99-108. doi: <https://doi.org/10.1111/j.1759-3441.2010.00065.x>
26. Mankiw, N. G. (1994). *Macroeconomics* (2nd edition). New York: Worth Publishers.
27. Michailat, P., & Saez, E. (2015). Aggregate Demand, Idle Time, and Unemployment. *The Quarterly Journal of Economics*, 130(2), 507-569. doi: <https://doi.org/10.1093/qje/qjv006>
28. Ekonomichna pravda (2017). «Naftogas» bought gas worth 1.6. *bln US Dollars in 2016*. Retrieved from <https://www.epravda.com.ua/news/2017/01/19/618072> (in Ukr.)
29. Neto, A. S. M., & Porcile, G. (2017). Destabilizing austerity: Fiscal policy in a BOP-dominated macrodynamics. *Structural Change and Economic Dynamics*, 43, 39-50. doi: <https://doi.org/10.1016/j.strueco.2017.07.002>
30. OECD (2017). *Statistics*. Official web-site. Retrieved from <http://stats.oecd.org>
31. Okhrymenko, A. (2015, April 6). *NBU has calculated how much each Ukrainian keeps «under the pillow»*. UBR. Retrieved from <https://ubr.ua/business-practice/personal-property/nbu-podschital-skolko-kajdyi-ukraintec-hranit-pod-podushkoi-334684> (in Ukr.)
32. Palazuelos, E., & Fernández, R. (2009). Demand, employment, and labor productivity in the European economies. *Structural Change and Economic Dynamics*, 20(1), 1-15. doi: <https://doi.org/10.1016/j.strueco.2008.08.001>
33. Phelps, E. S. (1967). Philips Curves, Expectations of Inflation, and Optimal Unemployment over Time. *Economica*, 34(135), 254-281. doi: <https://doi.org/10.2307/2552025>
34. Prykhodko, T. I. (2012). Structural transformation and macroinstability. In M. I. Skrypnychenko (Ed.), *Factors of macroeconomic instability in the system of economic development* (pp. 123-201). Retrieved from <http://ief.org.ua/docs/mg/99.pdf> (in Ukr.)
35. Schoder, C. (2017). Are Dynamic Stochastic Disequilibrium models Keynesian or neoclassical? *Structural Change and Economic Dynamics*, 40, 46-63. doi: <https://doi.org/10.1016/j.strueco.2016.11.004>
36. Serrano, F., & Summa, R. (2015). Aggregate demand and the slowdown of Brazilian economic growth in 2011-2014. *Nova Economia*, 25(n. especial), 803-833. doi: <https://doi.org/10.1590/0103-6351/3549>
37. Setterfield, M., & Kim, Y. K. (2016). Debt servicing, aggregate consumption, and growth. *Structural Change and Economic Dynamics*, 36, 22-33. doi: <https://doi.org/10.1016/j.strueco.2015.10.002>
38. Setterfield, M., & Suresh, S. G. (2016). Multi-agent systems as a tool for analyzing path-dependent macrodynamics. *Structural Change and Economic Dynamics*, 38, 25-37. doi: <https://doi.org/10.1016/j.strueco.2016.03.001>
39. State Statistics Service of Ukraine (2017). *Official web-site*. Retrieved from <http://www.ukrstat.gov.ua> (in Ukr.)
40. Steblianko, I. O. (2015). Gross domestic product of Ukraine: spatial and structural dynamics. *Ekonomika ta Derzhava (Economy and State)*, 51-54. Retrieved from http://www.economy.in.ua/pdf/11_2015/15.pdf (in Ukr.)
41. Tcherneva, P. R. (2008). Keynes's Approach to Full Employment: Aggregate or Targeted Demand? *The Levy Economics Institute Working Paper*, No. 542, 15-17. Retrieved from http://www.levyinstitute.org/pubs/wp_542.pdf
42. The World Bank (2017). *Indicators*. Official web-site. Retrieved from <https://data.worldbank.org/indicator>
43. Vasilyev, O. (2012). The forecast of the unemployment rate in Ukraine. *Ekonomika Ukrainy (Economy of Ukraine)*, 4, 41-46 (in Ukr.)
44. Zaslavska, M. (2012, August 20). Paradise for the oligarchs. Ukraine has the ideal opportunity for the prosperity of monopolies. *Tyzhden.ua*. Retrieved from: <http://tyzhden.ua/Economics/57500> (in Ukr.)

Received 15.07.2018

Reddit site

On the popular bookmarking site Reddit, people share interesting articles in sections dedicated to a wide range of topics, including specific scientific fields.

This is a way to communicate with a wider audience on your research topic.

by Elsevier