



Gross domestic product in the categories of production, income and end use

Abstract

Introduction. The ongoing crisis in the social, economic, military and political domain in Ukraine has resulted in the reduction of real gross domestic product (GDP), with increasing negative structural shifts in its shaping and distribution.

Purpose. To identify consistent patterns of dynamics, qualitative and quantitative changes in the GDP structure by the category of production, income and end use.

Methods. Systemic approach, elimination, analysis and synthesis, evaluation of dynamics structure.

Results. The author has analysed the dynamics of nominal and real GDP of Ukraine (Q1 2013 - Q2 2015). The calculation of GDP by the production method determined the most significant types of economic activity, while its assessment by end use categories revealed the inefficient structure of the national economy with prevailing consumer spending, poor gross accumulation, and negative balance for export and import of goods and services. The dynamics of the GDP structure by income category mirrors the real reduction of the household income and the growing tax burden.

Conclusion. Recommendations as to increasing GDP and improving its structure were developed. It has been suggested that the gross accumulation should be increased on an innovative basis, especially in the agricultural and industrial sector; the tax burden should be evenly distributed among the factors of production, based on differential characteristics of the national economy branches; and the conditions for growth of real household income should be created.

Keywords: Gross Domestic Product; Income; Production; End Use; Household; Ukraine

JEL Classification: D20; D24; E20; E21; E27; L11; P44

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Валовий внутрішній продукт у категоріях виробництва, доходу, кінцевого використання

Анотація. У статті проаналізовано динаміку номінального та реального валового внутрішнього продукту України. Надано оцінку динаміці структури валового внутрішнього продукту за виробничим методом у розрізі окремих видів економічної діяльності. Визначено співвідношення окремих складових валового внутрішнього продукту за категоріями кінцевого використання: споживчі витрати, валове нагромадження, сальдо експорту-імпорту товарів і послуг. З'ясовано закономірності динаміки структури валового внутрішнього продукту за категоріями доходу: оплата праці, податки, валовий прибуток, змішаний дохід, встановлено внесок в них окремих видів економічної діяльності.

Ключові слова: внутрішній валовий продукт; дохід; кінцеве використання.

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Валовой внутренний продукт в категориях производства, дохода, конечного использования

Аннотация. Проанализирована динамика номинального и реального валового внутреннего продукта Украины. Дана оценка динамике структуры валового внутреннего продукта производственным методом в разрезе отдельных видов экономической деятельности. Определено соотношение отдельных составляющих валового внутреннего продукта по категориям конечного использования: потребительские расходы, валовое накопление, сальдо экспорта-импорта товаров и услуг. Выявлены закономерности динамики структуры валового внутреннего продукта по категориям дохода: оплата труда, налоги, валовая прибыль, смешанный доход, установлен вклад в них отдельных видов экономической деятельности.

Ключевые слова: валовой внутренний продукт; доход; конечное использование.

1. Introduction

The ongoing crisis in the social, economic, military and political domain in Ukraine, which started in 2014, has resulted in reduction of real GDP, devaluation of the national currency, accompanied by the growth of consumer prices. This, in its turn, has led to a chronic shortage of resources across all sectors of the national economy and, therefore, to a growth in the internal and government external debt (I. V. Kriuchkova, 2013) [1, 25]. Consequently, the negative structural shifts in shaping and distribution of the GDP are increasing, which impedes the overall structural development of the national economy. Under such conditions, given the immature domestic markets and the reforms in progress, identification of tools that define the macroeconomic instability becomes even more (I. F. Radionova, 2015) [2, 12].

2. Brief Literature Review

The issues of improving the national accounting, shaping of macroeconomic indicators of the gross domestic product, employment and unemployment, growth and accumulation of wealth, inflation, monetary and debt policy of the state have been studied by foreign researchers, such as R. Cooper, H. Edey, A. Peacock (2003); T. Dunne, B. Jensen, M. Roberts (2009); P. Gutmann (2005) and S. Sivasubramonian (2001). At the same time, statistic modelling of the degree of reliance upon the macroeconomic indicators while shaping GDP of Ukraine overtime has been a subject of domestic research (O. I. Kulynych, R. O. Kulynych, 2009). The research is focused on top-priority activities, aimed at stabilising the gross domestic product (GDP) and forecasting its dynamics (R. O. Madiar, 2014). The researchers model joint GDP dynamics, number

of the economically active population and available workplaces, and assess the GDP losses of Ukraine from labour migration (A. V. Zhuravka, V. O. Timofeyev, Eleodzhо Okeme, 2015; B. I. Myhailyshyn, 2014; L. Grynevych, O. Zirko, 2014).

3. The purpose of the article is to identify consistent patterns of dynamics, qualitative and quantitative changes in the GDP structure by the category of production, income and end use.

4. Results

Identification of consistent patterns of the GDP dynamics is based on the comparison of its values in nominal and real prices, which eliminates the effect of inflation (Table 1).

In 2013, Ukraine's real GDP, in prices as at December 2012, totalled UAH 1,464.5 billion, and UAH 1,363.0 billion in 2014, which is UAH 101.5 billion (or 6.93%) below the figure of the previous year. In 2015, given the accelerated decline rate, the real GDP in the first six months totalled UAH 498.2 bln, which is UAH 140.1 bln (or 21.95%) below the real GDP of the first six months of 2014.

In 2013, the US dollar value of GDP was USD 183.4 billion; in 2014, GDP was USD 122.1 billion, which is 33.4% below the figure of the previous year. In 2015, the real GDP in the first six months totalled USD 37.1 billion, which is 38.6% below the figure of the previous year.

Dialectics of the interdependence between production, income and end use was determined with reference to the GDP calculation data from three different methods. When GDP is calculated based on the added value (production method), the amounts of value added at each stage of production of the end product or service are summed up. Table 2 presents the dynamics of the GDP structure by the production method. In terms of specific weight in the GDP structure, the greatest importance is assigned to the following types of economic activity: wholesale and retail trade, maintenance of motor vehicles and motorcycles (14.35%), manufacturing industry (11.43%), agriculture, forestry and fishery (8.16%), transport, warehousing, postal and courier services (7.18%), real estate activity (6.63%), mining and excavation (5.36%).

At the end of 2014, the biggest contraction of the real GDP, in prices of 2010, was reported in the following industries: construction (-19.9%); water supply, sewerage and waste handling (-12.1%); mining and excavation (-14.2%); wholesale and retail trade, maintenance of motor vehicles

Tab. 1: Nominal and real GDP dynamics in Ukraine

Year	Quarter	Gross value added, UAH million		Deflator, %	Official exchange rate of 1 UAH to 1 US Dollar	Nominal Gross value added, USD million
		Nominal	Real, prices as at Dec 2012			
2013	Q1	303,753	303,450	100.1	7.99	38,016.6
	Q2	354,814	354,106	100.2	7.99	44,407.3
	Q3	398,000	400,402	99.4	7.99	49,812.3
	Q4	408,631	406,598	100.5	7.99	51,142.8
2014	Q1	313,568	302,964	103.5	10.95	28,636.3
	Q2	375,903	335,328	112.1	11.82	31,802.3
	Q3	434,166	371,717	116.8	12.94	33,552.2
	Q4	443,091	353,061	125.5	15.76	28,114.9
2015	Q1	367,577	243,590	150.9	23.44	15,681.6
	Q2	449,575	254,572	176.6	21.01	21,398.1

Source: Calculated by the author based on [12]

and motorcycles (-12.8%), manufacturing industry (-12.0%). The GDP dynamics were positively influenced by the following types of activity: healthcare and social benefits (a growth of 3.9%), agriculture, forestry and fishery (2.9%); state management and defence, mandatory social insurance (2.6%). Agriculture, forestry and fishery are clearly seasonal industries. By their specific weight in the GDP structure, the quarters can be ranked as follows: Q3 (max), Q4, Q2, Q1 (min). Mining and excavation showed a reduction in their share in the GDP structure below 5% during Q3 2014 - Q1 2015. Throughout Q3-Q4 2014 and Q2 2015, financial and insurance activity demonstrated a below-average indicator (4.57%), with the lowest level of 3.8% in Q4 2014.

In Q2 2015, a reduction in the output down to the level of the corresponding quarter in the previous year, in prices of 2010, was observed in all industries. The biggest decline rates were reported in construction (-25.6%); art, sports, entertainment and recreation (-22.3%); mining and excavation (-22.2%); manufacturing industry (-21.8%); other services (-20.9%); wholesale and retail trade, maintenance of motor vehicles and motorcycles (-20.4%); water supply and sewerage, waste handling (-18.3%); power, gas, steam and conditioned air supply (-16.6%); financial and insurance activity (-14.4%); agriculture, fishery and forestry (-11.7%).

According to the expenditure calculation method (end use method), GDP is calculated as the total of individual household spending on end use of goods and services, government spending on purchase of goods and services,

Tab. 2: Structure dynamics of Ukrainian GDP, by the production method

Type of economic activity	2013				2014				2015		Avg.
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
Agriculture, forestry and fishery	3.1	5.0	13.4	11.8	3.3	5.0	18.1	11.9	4.3	5.7	8.16
Mining and extraction	5.8	5.9	5.3	5.4	5.7	5.8	4.7	4.4	4.9	5.7	5.36
Manufacturing industry	11.5	12.7	10.5	10.5	11.0	13.1	10.5	11.1	10.6	12.8	11.43
Power, gas, water and conditioned air supply	3.7	3.0	2.5	2.7	3.7	2.8	2.5	2.8	3.5	3.0	3.02
Water supply, sewerage, waste handling	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.47
Construction	2.1	2.5	2.4	3.0	2.3	2.3	2.0	2.4	1.7	2.0	2.27
Wholesale and retail trade, maintenance of motor vehicles and motorcycles	14.2	14.8	14.2	14.7	14.3	14.7	13.5	14.4	14.3	14.4	14.35
Transport, warehousing, postal and courier services	7.6	7.5	6.9	6.7	7.7	7.0	6.5	6.9	7.2	7.8	7.18
Temporary accommodation and catering	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.65
Information and telecommunication	3.5	3.4	3.2	3.2	3.5	3.2	2.8	2.8	3.4	3.3	3.23
Financial and insurance activity	5.3	4.3	4.2	4.4	5.7	4.6	4.1	3.8	5.1	4.2	4.57
Real estate activity	6.9	6.7	6.1	6.4	7.5	6.8	5.9	6.3	7.1	6.6	6.63
Professional, academic and technical activity	3.1	3.3	3.5	3.1	2.8	2.9	2.9	2.6	2.5	2.6	2.93
Administrative and auxiliary services	1.3	1.2	1.2	1.2	1.3	1.2	1.0	1.0	1.2	1.1	1.17
State management and defence, mandatory social insurance	5.0	4.7	4.4	4.6	5.0	4.7	4.3	5.1	5.0	4.6	4.74
Education	6.2	5.9	4.8	4.7	6.1	5.3	4.4	4.3	5.1	4.5	5.13
Health care and social benefits	3.6	3.3	3.1	3.1	4.0	3.7	3.2	3.3	3.8	3.6	3.47
Art, sports, entertainment and recreation	0.9	0.9	0.8	0.9	0.9	1.0	0.7	0.8	0.7	0.7	0.83
Other services	1.0	1.0	0.9	0.9	1.0	0.8	0.7	0.7	0.7	0.6	0.83
Product tax	14.2	12.9	11.7	11.9	13.1	14.1	11.3	14.5	17.9	15.9	13.75
Product subsidies	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.17
Gross domestic product	100	100	100	100	100	100	100	100	100	100	100

Source: Calculated by the author based on [12]

Tab. 3: Gross domestic product of Ukraine, by end use category, %

Expenditure items	2013				2014				2015		Avg.
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
Final consumer spending:	94.1	93.1	85.9	90.9	96.2	92.3	79.8	93.5	92.9	87.9	90.7
households	72.7	72.4	69.9	71.3	76.2	71.2	64.5	72.5	72.9	67.4	71.1
non-commercial organisations which serve the households	0.8	0.7	0.6	0.6	0.8	0.7	0.6	0.6	0.8	0.8	0.7
overall state management sector	20.6	20.0	15.4	19.0	19.2	20.4	14.7	20.4	19.2	19.7	18.9
Individual consumer spending	14.3	14.0	9.9	12.6	13.4	13.9	8.9	12.1	12.6	12.5	12.4
Collective expenditure	6.3	6.0	5.5	6.4	5.8	6.5	5.8	8.3	6.6	7.2	6.4
Gross accumulation:	13.6	12.9	26.9	18.8	8.1	10.6	23.4	12.2	10.3	11.7	14.9
gross accumulation of fixed assets	17.1	15.1	15.8	19.2	13.6	13.3	12.4	16.5	11.8	12.4	14.7
change in stock of tangible current assets	-3.5	-2.2	11.1	-0.4	-5.5	-2.7	11.0	-4.3	-1.5	-0.7	0.1
Goods and services export and import balance:	-7.7	-6.0	-12.8	-9.7	-4.3	-2.9	-3.2	-5.7	-3.2	0.4	-5.5
export of goods and services	49.2	43.0	40.7	40.5	48.2	53.7	47.2	47.9	67.4	55.5	49.3
import of goods and services (-)	56.9	49.0	53.5	50.2	52.5	56.6	50.4	53.6	70.6	55.1	54.8
Gross domestic product	100	100	100	100	100	100	100	100	100	100	100

Source: Calculated by the author based on [12]

gross investments and net export (see Table 3). The average specific weight of final consumer spending in Ukraine totalled 90.7%. Its greater share (71.1%) fell on household expenditures, and on the overall state management sector (18.9%). Household expenditures include purchasing of consumer goods and services with own funds, as well as consumption of goods and services supplied in kind and produced for own end use. The average share of gross accumulation makes 14.9%, including fixed capital of 14.7%. In the first six months of 2015, the gross accumulation indicators (10-12%) were significantly below average. The negative balance of goods and services export and import, save for Q2 2015, is also an adverse sign. The indicators of Q3 2014 are appreciably different from the overall trend, when the historical minimum of final consumer spending was reported at 79.8%, and the share of gross accumulation totalled 23.4%, including 12.4% of fixed capital and 11.0% of current assets.

For the purposes of GDP calculation based on income (distribution method), various types of income received by investors of own human and financial resources in production of specific goods are added up. The main categories of income include: employees' remuneration, taxes net of production and import subsidies, gross profit and mixed income.

The period from 2013 until Q1 2015 witnessed considerable shifts within the GDP structure (see Table 4). The specific weight of employee remuneration went from 53.8% down to 42.9%, which constitutes a 10.9% decrease. On the other hand, growth was reported for the taxes net of production and import subsidies (14.5% to 17.5%) and gross profit and mixed income (from 31.7% to 39.6%). The structure of the sources of income shows notable differences in terms of specific types of activity. In 2014, the gross value added for agriculture, forestry and fishery was reported at 10.2%, with taxes and remuneration amounting to 0.7% and 4.1%, respectively.

At the same time, the gross profit and mixed income share were considerably larger, amounting to 20.5%. Similar indica-

tors are reported for trade, being 14.2%, 1.9%, 13.0% and 19.6%, respectively, as well as for real estate activity, where the relevant figures are 6.5%, -1.1%, 2.5% and 13.8%.

The opposite trend is observed in the manufacturing industry, which reports 11.4% in the gross value added and 16.7% in employee remuneration. Similarly, in Q2 2015 the greatest share of gross profit and mixed income was comprised of wholesale and retail, maintenance of motor vehicles and motorcycles (21.2%), real estate activity (13.7%) and manufacturing industry (13.0%). The latter has retained its leading position by unit weight in terms of employee remuneration (16.8%).

5. Conclusions and prospects for future research

1. GDP calculation by the production method revealed the most significant types of economic activity, such as wholesale and retail trade, maintenance of motor vehicles and motorcycles, manufacturing industry, agriculture, forestry and fishery, transport, warehousing, postal and courier services, real estate activity, mining and excavation. Despite their high potential, education, R&D, financial sector and construction, an absolute leader of 2014-2015 in terms of reduced output/scope of activity, have all been poor contributors to GDP. While, in comparative prices at year the end of 2014, the growth was ensured by industries such as healthcare and social benefits, agriculture, forestry and fishery, state management and defence, while mandatory social insurance and all types of economic activity reported a drop of real production output in 2015.

2. The assessment of GDP by end use category revealed the inefficient structure of the national economy with prevailing consumer spending, poor gross accumulation and a negative balance for export and import of goods and services.

3. The dynamics of the GDP structure by income category testifies to a reduction in unit weight of the employee remuneration share, to increasing taxes, gross profit and mixed income. This mirrors the real reduction of the household income with growing tax burden. The greatest share of gross profit and mixed income is comprised of wholesale and retail trade, maintenance of motor vehicles and motor cycles, real estate activity, agriculture, forestry and fishery with a relatively low share of taxes and remuneration. The leader by specific weight in employee remuneration is the manufacturing industry.

4. According to the research findings, recommendations as to increasing the GDP and improving its structure have been developed to suggest that the gross accumulation be increased on an innovative basis, especially in the agricultural and industrial sector; that tax burden be evenly distributed among the factors of production based on differential characteristics of the national economy branches; and that conditions for growth of real household income be created, etc.

The prospects for further research lie in evolution of foreign economic integration vectors for Ukraine and their impact on structural development of the country's economy.

Tab. 4: Structure dynamics of Ukrainian GDP, by income category, %

Year (by quarters)	Total	Including		
		Employee remuneration	Taxes, net of production and import subsidies	Gross profit, mixed income
2013	100.0	53.8	14.5	31.7
	100.0	51.7	13.0	35.3
	100.0	45.2	11.9	42.9
	100.0	49.9	11.5	38.6
2014	100.0	53.8	13.0	33.2
	100.0	49.5	13.9	36.6
	100.0	43.2	11.8	45.0
	100.0	43.1	13.5	43.4
2015	100.0	44.8	20.9	34.3
	100.0	42.9	17.5	39.6

Source: Calculated by the author based on [12]

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