CHAPTER 3
MODERN MANAGEMENT TECHNOLOGIES

MANAGEMENT OF THE SECTORAL COMPOSITION OF THE ECONOMY IN TRANSFORMATIONAL COUNTRIES

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Abstract. *The investigation of the management of the economy's sectoral composition in transformational countries requires substantiation for the development of priority sectors of economic growth. The industries with the largest share of value added are a top-priority in terms of the use of state management and regulatory tools; consequently, they require the introduction of an innovative model of development. The purpose of the academic paper lies in identifying the features of the management of the economy's sectoral composition in transformational countries, revealing the best practices and formulating proposals for their adaptation in Ukraine. The object of the research is the management of the sectoral composition of the Ukraine's economy in 2015-2019. The research methodology is based on quantitative design and statistical analysis of the sectoral composition with application of data from the State Statistics Service of Ukraine on costs and output of various economic sectors in 2015-2019. The results demonstrate the stability of output share by the secondary and tertiary sectors (total share 78%), a decrease in the output of the primary sector (share 16%); growth of gross value added share and the wages share formed in the tertiary sector (from 51% to 54% of GVA and 49% to 54% of wages). The academic paper has identified the transition of Ukraine from industrial to post-industrial direction of economic development and the consumer model due to a high share of consumer expenditures in the tertiary sector (44-43%), the raw material-based structure of the economy. It has been established that capital accumulation occurs only in the secondary sector, and the accumulation rate of 33% indicates the potential for composition modernization. The practical effect of the scientific work lies in the formation of proposals for the management of the sectoral composition of the Ukrainian economy with an emphasis on the introduction of tools for the technological development of the secondary sector and stimulation the tertiary sector's innovative services for their transfer to other sectors of the economy.*

Keywords: *sectoral composition, management of sectoral composition of economy, regulation of sectoral proportions, innovative model of development, smart specialization, transformational countries.*

JEL Classification: P34, P52, O11

Formulas: 0; fig.: 3; tabl.: 2; bibl.: 17

Introduction. The sectoral composition of the economy in transformational countries depends on institutional governance and the level of implementation of technological changes. They influence the share of industries, determining their efficiency and stability in times of crisis. Ukraine, as a transformational country, requires an investigation of the sectoral composition state in order to identify the potential for modernization in the industries with the largest share in the production output.

The approximation of Ukraine to the EU laws and regulations in 2014-2020 has led to an increase in the level of government accountability, the democracy development, institutional changes and the introduction of innovative methods and tools for managing economic development in various sectors of the economy. The recent tendencies are privatization, decentralization of management, implementation of regional sustainable development concepts based on the paradigm of smart specialization. The outlined tendencies call forth the need to identify how democratic processes affect the management of the sectoral composition of the economy.

Literature review. The sectoral composition of Ukraine characterizes the economic structure by activity spheres of economic entities. Sectoral composition and changes distinguish the evolution of the national economy (Bogdanov, Rodić & Vittuari, 2017). The industrial composition of the economy provides rapid economic growth due to the significant share of manufacturing industries in GDP (Zhao & Tang, 2018). The post-industrial composition of the economy is characterized by the predominance of the service sector over the manufacturing sector (Dauth & Suedekum, 2016), which ensures economic growth through the transfer of service sector innovations to other industries (Zhao & Tang, 2018). This is explained by the fact that the service sector ensures the development of technologies and innovations that are implemented in the manufacturing sector (Quatraro, 2016). Apart from technologies, economic growth is affected by institutional changes determining transaction expenditures (North, 2018). There is a shortage of institutional changes in countries with economies in transition as well as their replacement by institutional imitations that do not lead to democratic development, increase of freedoms and entrepreneurship, governance stability (Draskovic, Popov & Peleckis, 2017).

The economy structure determines the national system stability to the crisis and the ability to recover economically after recession (Martin, Sunley, Gardiner & Tyler, 2016). The basic proportions of the sectoral composition are the ratio of the number of interested parties involved in different sectors of the national economy (in the primary, secondary, tertiary, quaternary, fifth ones) (Dergaliuk, 2019). According to the viewpoint of Trubnik, the basic levels of the sectoral composition (2012) are as follows: the sectoral (primary, secondary, tertiary), reproductive, regional and institutional. The sectoral composition changes in the process of transformation: "Structural transformation is defined as the transition of an economy from low productivity and labour intensive economic activities to higher productivity and skill intensive activities" (United Nations, n. d.). Sectoral composition is managed through the mechanisms of industrial, agricultural, innovation, investment, institutional policy of the state.

The following indicators are used for statistical assessment of the disproportions in the national economy's sectoral composition, namely: volume indices and deflator indices; development rates of basic leading economic branches; the ratio between GVA indicators and intermediate consumption; structure of exports of goods and services; share of service sector industries; the share of output of the primary sector and industries for primary processing of raw materials; the ratio between the

indicators of final consumption and gross accumulation; accumulation rate; ratio between exports and imports (Trubnik, 2014).

Thus, the theoretical and methodical fundamentals of studying the economy's sectoral composition and influence of economy structure on growth of the country are defined in the scientific literature. Herewith, the investigation of the economies' sectoral composition of countries during the transition to developed market relations is limited.

Aims. The purpose of the academic paper lies in identifying the features of the management of the economy's sectoral composition in transformational countries, revealing the best practices and formulating proposals for their adaptation in Ukraine.

Methods. The method of statistical analysis of indicators of the Ukrainian economy's sectoral composition for 2015-2019 has been used in the research in the context of four sectors, namely: primary, secondary, tertiary, quaternary. In order to conduct the statistical analysis, the data of the State Statistics Service of Ukraine on "Expenditures - Output in basic prices" for 2015-2019 have been used. They make it possible to identify the features of the sectors' structures on the basis of the following indicators: output, intermediate consumption, gross value added, gross profit, wages, final consumption expenditures, gross capital formation. The dynamics of the deflator of Ukraine's gross domestic product in 2016-2020 has been used in order to assess the contribution of each economic sector.

Results. Table 1 reflects the deflator dynamics of Ukraine's gross domestic product in 2016-2020, which allow dividing the economy by stable or problematic issues. Consequently, the physical volumes of production of goods and services in the primary economy's sectors increased in 2016-2018. In 2019, agriculture, forestry and fisheries reduced production volumes; however, there was an increase in the index in 2020, while the production volumes of the extractive industry decreased. In the secondary sector, the release volume of the processing industry has been increasing steadily with a slowdown of productive capacity in 2019-2020. In the tertiary sector, the largest increase in volume of output is observed in the field of temporary accommodation and catering, wholesale and retail trade; repair of motor vehicles and motorcycles; transport, warehousing, postal and courier activities.

In the quaternary sector of the Ukrainian economy, the output volumes in the field of public administration and defense, health care and education are increasing most of all.

Analysis of the output structure, intermediate consumption, gross value added, gross profit, wages, final consumer expenditures, gross capital formation by Ukraine's economic sectors in 2015-2019 (in terms of types of economic activity of Ukraine in the tables "Expenditures - Output in basic prices") (State Statistical Service of Ukraine, 2021b) indicates the tendencies as follows (Figures 1-2):

1. Stability of output volumes by secondary and tertiary sectors of the economy (share in 2015 38% and 38% respectively, in 2019 - 38% and 40% respectively), decrease in primary sector output (the output share in 2015 was 18%, in 2019 - 16%). The share of the quaternary sector was only 6% of the output, which means the

absence of progressive changes that form the V and VI technological economic structures (creativity, education, science, professional services).

Table 1. Gross domestic product deflator of Ukraine in 2016-2020 by economic sectors

Economic sector	Gross domestic product deflator	2016	2017	2018	2019	2020
	Gross Domestic Product	17,1	22,1	15,4	8,2	9,8
	The composition of gross domestic product					
	1. According to the production method					
Primary	Agriculture, forestry and fisheries	9,7	11,3	10,0	-2,2	23,1
Primary	Mining and quarrying	39,0	43,4	18,0	5,7	-11,6
Secondary	Processing industry	18,8	17,8	13,1	3,6	5,1
Secondary	Supply of electricity, gas, steam and conditioned air	36,8	25,0	26,3	15,9	-0,9
Secondary	Water supply; sewerage, waste management	27,1	26,4	15,9	23,3	20,8
Secondary	Construction	5,9	8,1	16,3	6,7	6,4
Tertiary	Wholesale and retail trade; repair of motor vehicles and motorcycles	11,3	25,6	10,0	7,7	6,1
Tertiary	Transport, warehousing, postal and courier activities	12,6	17,0	17,6	12,2	18,4
Tertiary	Temporary accommodation and catering	23,3	15,5	25,1	28,2	6,6
Tertiary	Information and telecommunications	15,5	14,0	18,3	23,2	11,5
Tertiary	Financial and insurance activities	7,0	4,9	9,2	10,6	14,4
Tertiary	Real estate transactions	16,1	15,4	10,4	9,6	9,5
Quaternary	Professional, scientific and technical activities	16,9	19,6	23,7	20,6	9,9
Quaternary	Activities in the field of administrative and support services	25,9	19,1	31,2	20,1	8,8
Quaternary	Public administration and defense; compulsory social insurance	28,3	40,9	30,8	15,2	12,0
Quaternary	Education	12,6	48,0	19,2	7,4	10,1
Quaternary	Health care and provision of social assistance	18,0	29,5	5,6	18,3	16,2
Quaternary	Arts, sports, entertainment and recreation	11,5	27,3	15,0	12,9	8,6
Quaternary	Provision of other types of services	15,1	24,8	21,4	17,7	13,5

Source: compiled by the author on the basis of State Statistic service of Ukraine (2021).

2. Stability of the share of intermediate goods' consumption of other industries by the secondary sector and the tertiary sector (50% and 30-31%, respectively).

3. Increase of the gross value added share formed in the tertiary sector (from 51% to 54%), which indicates the transition of Ukraine to the post-industrial direction of economic development.

4. Growth of the gross profit share of the tertiary economic sector (from 52% to 54%), reduction of the gross profit share of the primary economic sector (from 30% to 26%).

5. Increase in the share of wages in the tertiary sector (from 49% to 53%), no growth in the share of wages in the primary sector, decrease in the share of wages in the secondary sector.

6. High share of consumer expenditures of the tertiary sector (44-43%), increase of final consumption of the secondary sector and decrease of final consumption of the primary sector.

7. Gross capital accumulation actually occurs only in the secondary sector (the share of capital accumulation in the sector was 82% in 2015 and 96% in 2019, respectively).

8. Dominance in the tertiary sector of sections of transactional industries, namely: trade, financial industry, real estate transactions.

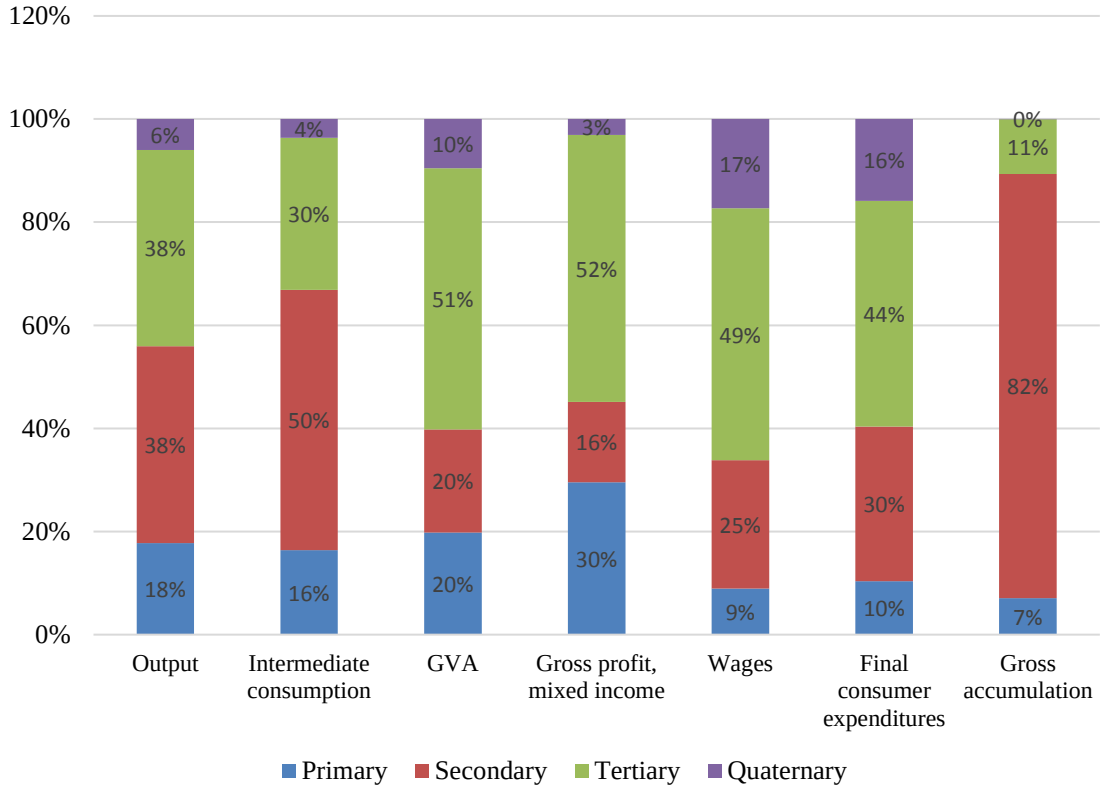

Figure 1. Sectoral distribution of macroeconomic indicators of Ukraine, 2015

Source: compiled by the author on the basis of State Statistic service of Ukraine (2021)

The primary sector is classified as a problematic one, forasmuch as the sectors have stable signs under crisis conditions. The secondary sector is relatively stable with signs of problems. The tertiary sector has a stable positive effect on the macroeconomics of Ukraine due to the service industries, which are ahead of other industries in terms of GVA share. The tertiary sector is considered to be a dominant one for Ukraine's economy and characterizes the post-industrial management type.

The accumulation rate (the ratio of gross accumulation towards gross profit) in 2015 and 2019 was 33%; this is typical for the industrial economy, which has been built on the basis of the third and fourth technological modes. This modifies the consumption possibilities, corresponds to the post-industrial type of economy and creates the preconditions for structural modernization.

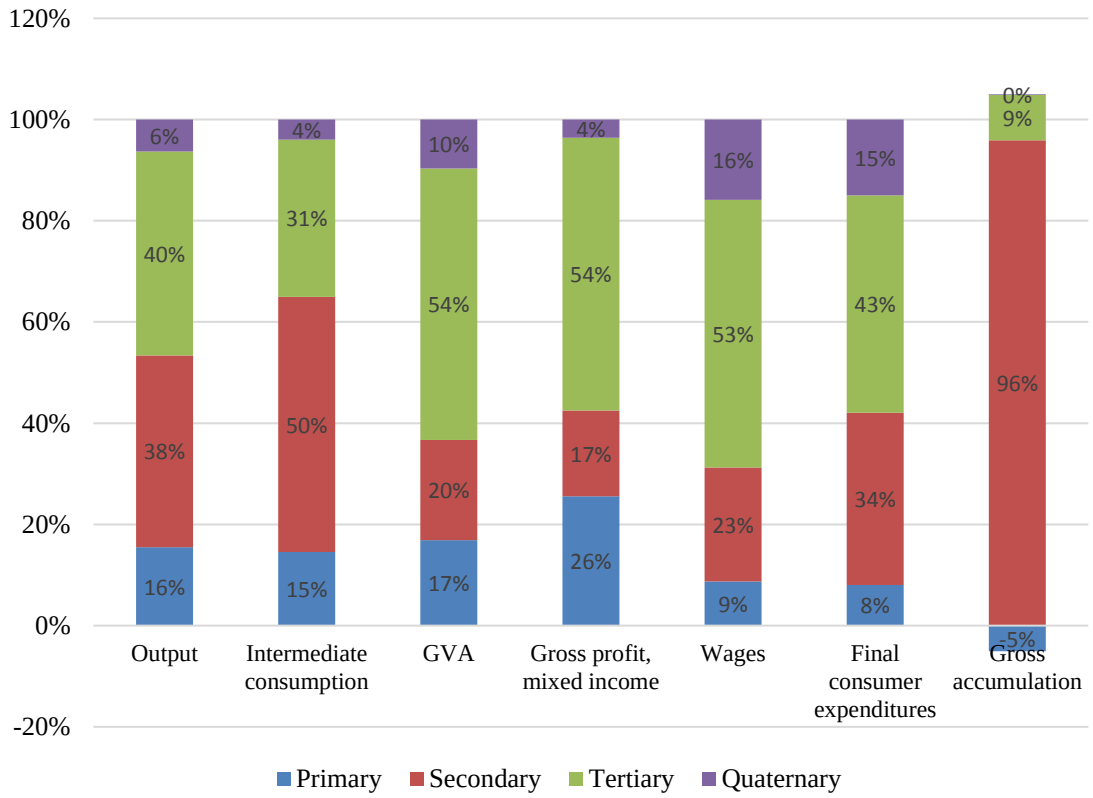

Figure 2. Sectoral distribution of macroeconomic indicators of Ukraine, 2019

Source: compiled by the author on the basis of State Statistic service of Ukraine (2021)

The exports share of the primary sector from the output volume of the primary sector was 32% in 2015 and 33% in 2019; the secondary sector - 35% and 25% respectively; the tertiary sector - 15% and 12% respectively; the quaternary sector - 2% in 2015 and 2019 respectively. Thus, the Ukrainian economic structure remains raw materials-based, given the significant volumes of exports of raw materials economic industries. The lack of shifts in the exports structure (reducing the exports share of raw materials and natural resources in favor of the export of processing industries) indicates regressive changes shaping the development of Ukraine as a raw material appendix of the economy.

The ratio between GVA and intermediate consumption (Figure 3) indicates the formation of the expenditure-based type of economy: in general, the indicator was 0,69 in 2015-2019, in particular, the secondary sector consumes most of all (27% is GVA of volume consumption), while the primary sector accounts for 80% of expenses (80% is GVA of volume consumption).

The ratio between final consumption and gross capital accumulation indicates the formation of a consumer-based model of Ukraine's economy.

During 2015-2019, final consumption exceeded gross savings. Consequently, this does not contribute to the renewal of the technological structure, and restrains investment activity.

The ratio between exports and imports points at the predominance of import dependence over the export-oriented orientation of Ukraine, especially in the secondary and quaternary sectors, where imports predominate significantly.

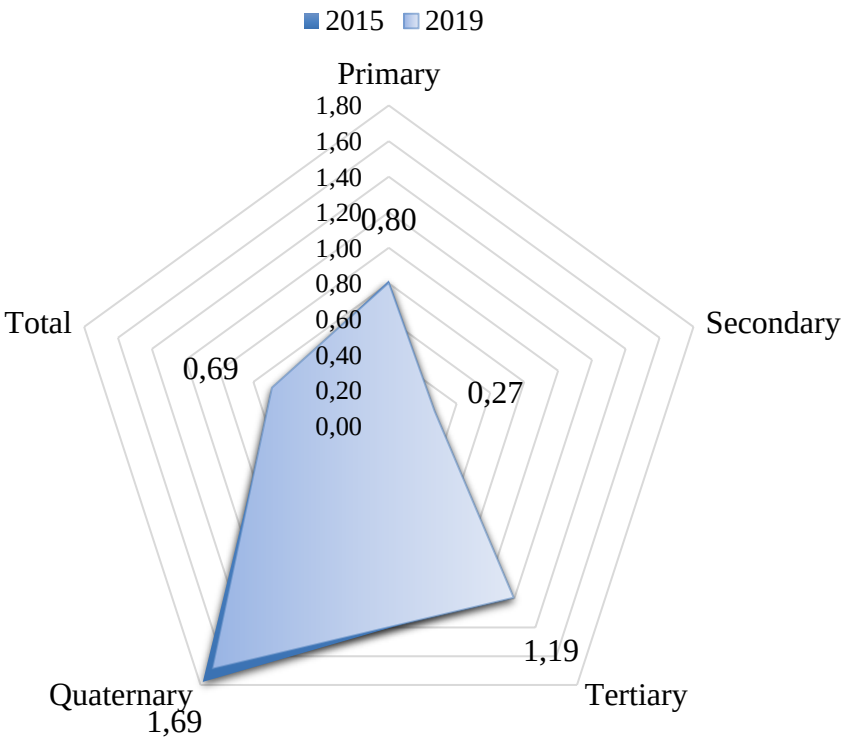

Figure 3. The ratio of GVA towards intermediate consumption of Ukraine's economic sectors, 2015, 2019

Source: compiled by the author on the basis of State Statistic service of Ukraine (2021)

Table 2. The ratio between final consumption and gross accumulation, between exports and imports by Ukraine's economic sectors, 2015-2019

Sector	The ratio between final consumption and gross accumulation		The ratio between exports and imports	
	2015	2019	2015	2019
Primary	7,47	-9,53	-1,15	-1,81
Secondary	1,85	2,11	-0,78	-0,56
Tertiary	21,05	28,58	-1,44	-1,45
Quaternary	1713,09	628,38	-0,51	-0,44
Total	5,09	5,97	-0,94	-0,83

Source: compiled by the author on the basis of State Statistic service of Ukraine (2021)

Features of the sectoral structure of highly developed countries are as follows: reduction of the gross value added share of the agricultural sector in GDP (for instance, the indicator was 1,71% in 2020 within the EU compared to 2,35% in 2000); decrease of gross value added of industry in GDP (for instance, within the EU, the indicator was 21,90% in 2020 compared to 25,439% in 2000); increase of gross value added in the service sector (for instance, the indicator was 66,132% in 2020 within the EU compared to 61,811% in 2000); reduction of employment in the agricultural sector (for instance, within the EU, the indicator was 8,973% in 2000 and 4,379% in 2019, respectively); decrease of employment rate in industry, including

construction (for instance, the indicator was 30,013% in 2000 within the EU and 24,997% in 2019); increase of employment rate in the service sectors (for instance, within the EU, the figure was 61,014% in 2000 and 70,63% in 2019, respectively). Transformation of the sectoral composition within the EU provides an increase in the life quality: GDP per capita was 16 661, 00 EUR in 2000 and 33 927, 00 EUR in 2020, while in Ukraine it was 635, 00 EUR in 2000 and 3 726, 00 EUR in 2020 (State Statistic service of Ukraine, 2021a).

Discussion. The sectoral composition of Ukraine's economy provides evidence of a post-industrial type of development, consumer model of the economy, absence of changes in technological structure and restraint of investment activity, import dependence, raw materials-based type of economy due to the high exports share. Apart from that, prerequisites for structural modernization are being formed in Ukraine due to an increase in the accumulation rate to 33% in 2015-2019, in particular, in the secondary sector of the economy. According to the investigation of Trubnik (2014), the accumulation rate was 22% and hindered the transition to a post-industrial type of management in 2004-2010. The change in the volume of gross capital accumulation in 2015-2019 introduces the potential for modernization, and a high output share, a high gross value added share; wages in the secondary and tertiary sectors form the production and service potential of the Ukrainian economy. Zhao, J., & Tang, J. (2018) have proven China's economic growth due to the high share of manufacturing industries.

Herewith, in Ukraine, these two sectors, together occupying 76% of output, 71% of GVA, 68% of gross profit, 74% of wages, providing an accumulation rate 33%, allow ensuring economic growth. Therefore, the sectoral composition management should include mechanisms for state regulation of these leading sectors.

There are causal links between structural adjustments (changes in gross value added and employment) and economic growth. Olczyk & Kordalska (2018), using the example of eight countries with economies in transition for the period 1995-2011, have revealed the heterogeneity of these interrelationships in their scientific work. For instance, a strong two-way interrelationship between these indicators was revealed in Latvia, Lithuania and Estonia; no links were observed in Hungary, and a one-sided impact of GDP on employment was identified in Poland. This indicates the necessity to take into account the features of the sectoral composition of Ukraine's economy in the formation of state structural policy in order to ensure long-term economic growth. Taking into consideration the predominance of the secondary and tertiary sectors in Ukraine, it is advisable to stimulate the development of services, which will ensure the growth of the secondary sector through the development of innovations. For instance, it is important to provide public funding for research institutions and the implementation of their technological developments by the private sector (Veugelers & Schweiger, 2016). Ukraine is one of the countries where technologies are acquired and there is a small amount of companies purchasing technologies (Veugelers & Schweiger, 2016). Therefore, it is advisable to stimulate the production and acquisition of technologies, R&D and knowledge at the state level. Biscione, Caruso & de Felice (2021) have proven the influence of public

administration on the implementation of innovations in transition economies in the case of high turnover. The basic management tool is tax rates, the reduction of which occurs with the introduction of technology and leads to the firm's growth.

The sectoral composition management of Ukraine's economy on the basis of innovation policy should ensure the implementation of smart specialization strategies through the measures as follows (Kleibrink, Larédo & Philipp, 2017):

1) formation of a trusted center of competence for a comprehensive analysis of industries, their structure and coordination of the process of implementing smart specialization strategies;

2) implementing strategies in one of the most powerful industries in which interested parties are involved working with government agencies towards identifying common priorities and actions;

3) implementing strategies in one region and increasing others in order to identify the effectiveness of different approaches to be introduced based on territorial experiments;

4) sequential distribution of sectoral composition management processes in order to identify the effectiveness of each process and focus on the basic areas of industrial activities with high potential in the mid-term as well as the potential for R&D implementation.

Conclusion. The following features of the sectoral composition of Ukraine's economy have been revealed in the research, namely: stability of output volumes by the secondary and tertiary sectors of the economy, output reduction in primary sector, high share of the tertiary sector; growth of gross value added share and the wages share being formed in the tertiary sector (from 51% to 54%), which indicates the transition of Ukraine from the industrial to the post-industrial direction of economic development; high share of consumer expenditures in the tertiary sector (44-43%), which indicates the consumer-based economic model; growth of final consumption of the secondary sector; the raw material-based structure of the economy through the volume value of raw materials exports by the primary sector; capital accumulation only in the secondary sector; a problematic primary sector, a relatively stable secondary sector and a positive impact of the tertiary sector on economic growth due to service industries, which are ahead of other industries in terms of GVA share.

Further investigations should be directed on studying the most effective state instruments for regulation and management of the post-industrial economic type with a predominance of consumption in the tertiary sector, with an emphasis on technologies and innovations in the secondary and tertiary sectors.

References:

1. Biscione, A., Caruso, R., & de Felice, A. (2021). Environmental innovation in European transition countries. *Applied Economics*, *53*(5), 521-535.

2. Bogdanov, N., Rodić, V., & Vittuari, M. (2017). Structural change and transition in the agricultural sector: Experience of Serbia. *Communist and Post-Communist Studies*, *50*(4), 319-330.

3. Dauth, W., & Suedekum, J. (2016). Globalization and local profiles of economic growth and industrial change. *Journal of Economic Geography*, *16*(5), 1007-1034.

4. Dergalyuk, B. (2019). Structural elements of the economy and their proportions. *Entrepreneurship and innovation*, (7), 52-55. https://doi.org/10.37320/2415-3583/7.8

5. Draskovic, V., Popov, E., & Peleckis, K. K. (2017). Modelling of Institutional Changes in Transition Countries-the Gap Between the Theory and Practice. *Montenegrin Journal of Economics*, 1(13), 121-140.
6. Kleibrink, A., Larédo, P., & Philipp, S. (2017). Promoting innovation in transition countries. *A trajectory for smart specialization*.
7. Martin, R., Sunley, P., Gardiner, B., & Tyler, P. (2016). How regions react to recessions: Resilience and the role of economic structure. *Regional Studies*, *50*(4), 561-585.
8. North, D. C. (2018). Institutional change: a framework of analysis. In *Social Rules* (pp. 189-201). Routledge.
9. Olczyk, M., & Kordalska, A. (2018). Growth and structural changes in transition countries: the chicken or the egg?. *Journal of Business Economics and Management*, *19*(3), 544-565.
10. Quatraro, F. (2016). Co-evolutionary patterns in regional knowledge bases and economic structure: evidence from European Regions. *Regional Studies*, *50*(3), 513-539.
11. State Statistic service of Ukraine (2021a). Changing the deflator of gross domestic product. Retrieved from http://www.ukrstat.gov.ua/operativ/operativ2007/vvp/def_vvp/arh_def_u.html
12. State Statistic service of Ukraine (2021b). Cost-output table (at basic prices). Retrieved from http://www.ukrstat.gov.ua
13. Trubnik, T. (2012). Methodological aspects of statistical analysis of the development of the sectoral structure of the national economy. *Economic analysis*, (10 (2)), 76-82.
14. Trubnik, T. E. (2014). Statistical assessment of disparities in the sectoral structure of the national economy. *Bulletin of Kyiv National University named after Taras Shevchenko. Series: Economics*, (157).
15. Veugelers, R., & Schweiger, H. (2016). Innovation policies in transition countries: one size fits all?. *Economic Change and Restructuring*, *49*(2), 241-267. https://doi.org/10.1007/s10644-015-9167-5
16. Zhao, J., & Tang, J. (2018). Industrial structure change and economic growth: A China-Russia comparison. *China Economic Review*, *47*, 219-233. https://doi.org/10.1016/j.chieco.2017.08.008
17. United Nations (n. d.). *Structural transformation in developing countries: Cross regional analysis*. Retrieved from https://unhabitat.org/sites/default/files/download-manager-files/Structural%20Transformation%20in%20Developing%20Countries-FINAL.pdf