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The small and large business interaction within national economy's gross added value reproduction in Ukraine

JEL Classification: *D43; E23; E32*

Keywords: *small businesses; gross value added; economic potential; the interaction of large and small businesses*

Abstract
Research background: The main background of this article is the thesis that sectors of small business and large business respond differently to shifts in macroeconomic conditions.
Purpose of the article: This article is devoted to empirical evidence whether there are signs of small business ability to compensate for negative trends, emerging in the sectors of large and medium-sized business in Ukraine.
Methods: The dynamics of gross value added was chosen as the main indicator of small business potential to create compensatory effect for reduction in employment, share of value added and GDP, observed in sector of large and medium-sized business. For factor analysis of actual gross added value dynamics, the authors have built a multiplicative term, which

expresses the different characteristics of economic activity in small, large and medium-sized business impact on the gross added value dynamics. The authors have also evaluated the specific impact of these factors using the method of chained substitution.
Findings & Value added: The results obtained by factors analysis did not prove the thesis about small business capacity to compensate for the negative trends observed in the sector of large and medium business. The trend of economic activity in small business sector, trend of labor productivity, and trend in dynamics of added value share in small business output were causes of gross value added decreasing in the national economy during the period researched. These results can be interpreted as a sign that in case of unchanged quality indicators of economic activity in small business sector (in the first turn, the labor productivity and share of value added in output) this sector ability to compensate for negative trends in large business will be very doubtful.

Introduction

The role of small business sector in the Ukrainian national economic system is significantly different from the developed countries. In such economic systems, small business traditionally plays the role of powerful counterbalance to the negative trends, appearing in the sector of large business. But in Ukraine, the dynamics of small business economic activity rather aggravates the negative trends of large business activity.

In the Ukrainian economy, fluctuations in the small business economic activity has minimal impact on the large business functioning and the situation in the total economy. The determination of macroeconomic dynamics is still "monopolized" by large enterprises, which are concentrated in export-oriented industries of Ukraine. As a result, the small businesses' economic activity and conditions for its resources reproduction, domestic market capacity and incomes of the vast population lose their importance as the determinants of macroeconomic conditions. Accordingly, the levers of state macroeconomic conditions regulation, directly affecting on mentioned elements of economic reproduction, lose effectiveness.

Therefore, this article is focused on the quantitative analysis of the Ukrainian small business characteristics in the context of that sector ability to compensate for the negative trends, emerging in the sectors of large and medium-sized businesses and enhance (providing cumulative effect) positive trends, arising in these sectors.

The common models, explaining sensitivity of industries to shifts in macroeconomic conditions (see for example Abraham & Katz, 1986), Foerster *et al.* (2011) were not used in our research. We do not try to explain the causes which determine "points of reversal" and differences in economic sectors sensitivity to shifts in macroeconomic conditions. This article is devoted only to refinement of the following thesis: would the increasing of

small business sector's share in the Ukrainian economy (in case of unchanged labor productivity and share of value added in output, inherent to that sector) promote to compensate for the negative trends, observed in sectors of large and medium-sized business. The authors have evaluated the specific impact of three main factors on GDP dynamics, using the method of chained substitution.

The next part of the article contains the literature review and evidence on the specificity of small business role in the Ukrainian economy. The second part reflects the methodology of research. Then, the results and discussion are presented. Finally, conclusion, limitations and perspectives of further research are discussed.

Literature review

The complicated interaction between large and small businesses is investigated by modern Ukrainian and world scientific literature at least in three general contexts. The first context — is the research of conditions and mechanisms, providing forthcoming of production scale to the optimal level and role of market structure in these processes. Such studies are focused on the problems related to finding the optimum compromise between the conflicting priorities of industries structure. On the one hand, the priority of maximally using the economy of scale, allowing to reach technologically achievable minimum of long-term average costs, but also — creates risks and threats of losing the competitive incentives to improve the efficiency of economic activity and weakening of resources allocation effectiveness. On the other — the priority of maximizing competitive incentives, which allow to consider the output, extent of the goods diversity and market prices as "objective result of spontaneous interaction between consumers' preferences and the productive capacity of producers", but does not allow to take advantage of the economy on a full scale. Traditional analytical tools of such studies — principles of decreasing (in most branches) and growing (in industries that are natural monopolies) returns to scale, curves of long-run marginal and the average cost of the company, the industry, and the industry demand curves Mason (1939), Baumol *et al.* (1982), Baumol (1982).

The second aspect — the researching of large and small business as environment of making decisions and forming institutions (traditions, norms, standards, rules, stereotypes), determining the selection and spread of certain methods of human activity (Balcerzak & Pietrzak, 2016). Such an environment depends on how quickly innovation and patterns of behavior are generated and distributed, which are more or less focused on enhancement

of the individual well-being through increasing own contribution to improvement to the social well-being. Such pieces of research provide categories of transaction costs, the size of which is considered as a function of many factors with the leading role of production scale. Famous works by R. Coase have introduced to scientific literature the assessment of the benefits and the costs generated by the shift from the "market" to "internal within the company" transactions and vice versa. Since the works of Harvey Leibenstein were recognized, a number of studies have been based on the concept of "X-efficiency", which reflects the limited ability of corporate management to take over the functions of market structures, displacing (with decreasing returns) market mechanisms of resources allocation Coase (1937), Leibenstein (1966), Alchian and Demsetz (1972).

The third aspect — is research of differences inherent to reaction of small and large business to changing of macroeconomic and institutional conditions (Zygmunt, 2018; Pietrzak *et al*., 2017; Balcerzak & Pietrzak, 2017; Wierzbicka, 2018). In particular, a number of models were built, describing the reaction of large and small businesses to cyclical fluctuations in the economic activity. Many works have been devoted to clarifying the forms of participation of each sector in determining the macroeconomic trends and defining the specificity of large and small businesses participation in the inter-sectoral and intra-industry international trade, interstate economic integration (Cieślik & Wincenciak, 2018; Cieślik, 2017).

With regard to the third aspect, studies of the interaction between large and small companies, both by foreign and domestic scientists, put forward the thesis that small business is more sensitive to negative cyclical fluctuations (industries and markets "cleaning" of entities which are unable to comply with the updated requirements to the efficiency of economic activity, affect especially small business) and more dynamically captures new sectors and market niches, in the times of major structural changes in the economy (Kvasnyuk, 2000; Geyecz, 2010; Amosha, 2014).

However, these rather abstract provisions provide only primary understanding of the interaction between large and small businesses in the process of economic reproduction. We will try in this article to clarify the actual nature of the small businesses contribution — on the one hand, and large and medium-sized enterprises — on the other, to the reproduction of the gross value added of the Ukrainian economy. In particular, we will try to clarifying whether the available statistical base confirms the ability of Ukrainian small business to compensate for and mitigate the negative trends emerging in the sector of large business? Do statistics confirm the ability of this sector to strengthen and create a "cumulative effect" for positive trends, emerging in the sector of large and medium sized enterprises?

Research methodology

The decisive factor for this article is the selection of a dependent indicator, which should, on the one hand — characterize the changes in the economic potential of main sectors of the national economy, on the other — reflect the impact of different groups of factors that determine the formation and using of this potential.

Theoretical background of using GVA as such a parameter is contained in a number of works, both contemporary (Kudinova, 2015; Verba, 2007) and those that have formed the fundamental principles of modern economic research (Schumpeter, 2012; Marshall, 2013). The primary factor incomes (in modern methodology of statistics — gross value added) are traditionally considered as the most informative characteristic of economy's (or its sector) ability to improve the quantity and quality characteristics of its operation.

The second objective of this paper was to form a chain of indicators which would on the one hand — reflect the logic of formation and using of the small businesses' economic potential, on the other — allow to distinguish track leading factors influencing these processes.

The volume of gross value added created by the small business activities, might be considered as the result of the following factors. Firstly, the total number of small enterprises, as the expression of entrepreneurs' economic activity and their preference to working in the official (registered) sector of the national economy. The logic of this factor impact is as follows: all other things being equal, the greater the number of registered small enterprises, the greater the volume of gross added value will be created, thus higher the potential of small business to expand its own resource base and "absorption" of resources that are discharged (idle) in sector of large and medium businesses.

Second, the average number of employees in an enterprise of the small business sector. The logic of this factor's impact — other things being equal, increasing the size of a small business, expanding of employment in a typical small enterprise, will help to increase the volume of gross value added generated by that sector of business. For example, even such reduction in the total number of registered small enterprises, the scope of activities in the relevant sector may be increased due to the trend of employment expand on small enterprise.

Third, the scale of value added, created by small business is under the influence of productivity level of labor resource involved in this sector. Clearly, other things being equal, higher labor productivity leads to a growth of total gross value added created by small businesses.

Fourth, the volume of gross value added is affected by the distribution of the total output between intermediate consumption and the actual added value, i.e. the share of value added in the production value, sold by small enterprises. Conversely, the smaller the share of small business in the "chain of creation the final product value", the fewer factor incomes are produced by activity of this sector, the smaller the share of value added in sector‘s value of output and the worse conditions for reproduction and development of its resource base.

Schematically, the logic of building the chain of indicators for factor analysis of gross value added dynamics observed in the small business is presented in Table. 1.

So, we got a multiplicative term that has the fewest requirements for mathematical tools for dividing the impact of certain factors: suitable for treatment and correct results might be obtained even with the "textbook" method of chain substitutions:

$$GVA = NE \times ANE \times PLPP \times SVA, \quad (1)$$

where:
GVA – gross value added created by economic sector (in this work — the sector of small businesses and sector of large and medium-sized enterprises);
NE – the number of registered enterprises in the sector;
ANE – the average number of employees in the enterprise (the ratio of total employment to total number of registered enterprises);
PLPP – the average productivity per employee (ratio of output by the year to the number of employees);
SVA – the average share of value added in value of national annual production.

Based on the traditional approach of domestic economic statistics to defining the sequence of substitutions (starting with the quantity variable and till the relatively qualitative factors (see, e.g. Bakanov & Sheremet, 1999)), we get a series of calculations, which allow to assess the impact of each factor included in the term on the size of the gross added value created by small business in Ukraine.

These calculations were carried out by method of chain substitutions, which allow us not only to track the dynamics of the real gross value added in each sector of the Ukrainian economy, but evaluate the impact of mentioned above groups of factors on the formation and usage of the economic potential of the both sectors.

The data base was formed with aggregate and sectoral indicators for the period of 2013 — 2015, due to three reasons. First — the data availability, second — the significant fluctuations of economic activity scales in all

sectors of the Ukrainian economy, and third — the used method requires data for pare of years. In the first step, the data on 2013 and 2014 were used (2014 — in price of 2013) and in the second step — the data on 2014 and 2015 (2015 — in prices of 2014 year).

Results and discussions

The calculations, made for the period of 2013–2014, are shown in Table 2.

Indicators of labor productivity in 2014 calculated in the prices of the basic (2013) year; the GDP deflator was used for it.

According to the data, shown in Table 2, in 2014 the real gross value added, generated by small business increased compared to 2013 by 20.4%. A similar index for large and medium-sized businesses was 20.2%.

In the small business sector, changes in the number of registered enterprises (an increase from 1702201 to 1915046 enterprises) caused the increase of sector's value added by 32984 million UAH, or the 12.5% of the base year.

Similar figures for the sector of large and medium-sized enterprises were as follows: absolute reduction on 140736.7 million. UAH, or 13.9% reduction in the percentage of the base year.

The reduction in the average employees' number in small enterprises (from 2.5 to 2.1 employees) have caused a decrease in the value added to 43687.4 million UAH, or by 16.6% of the base year. Similar figures for the sector of large and medium-sized enterprises were 497.5 million UAH of reduction, or less than 0.1% of the base year.

We see that the economic activity of entrepreneurs in the small business sector was expressed in reducing the real value added in this sector. The impact of reducing of employee's medium number in small enterprise was stronger than the impact of the growing of number of such companies, i.e. the tendency to downsize among small businesses amidst the increasing total number of small enterprises, whose interaction has led to a reduction in the number of employees and the real value added in small businesses.

So small business in 2014 was unable to act as a "compensator" for the negative trends related to the scale of employment, emerging in large and medium-sized enterprises — the capacity of small business' employment sphere decreased, compared to the base year, so there is no statistical evidence for the small business ability to compensate for the negative trends of employment in the large and medium business.

Similarly, the dynamics of economic activity in the small business sector has proved unable to offset the negative impact of processes in large and

medium business on the gross value added: factors of economic activity in small business have a negative impact on the gross value added.

A hhange in the average level of productivity in the small business also led to a decrease in the gross added value: related reduction was 13734.3 mill. UAH, or 5.2% of the base year. Accordingly, the dynamics of labor productivity in the small business in 2014 did not contribute to expansion of the economic potential of the sector investigated. The distinction of formation the economic potential of small and large and medium-sized businesses in Ukraine was manifested by those figures. Regarding the large and medium business, in 2014 the growth of average labor productivity increases the real value added by 21947.7 mill. UAH, or 2.2% of 2013.

We see that in the period of 2013–2014 the dynamics of forming the small business's economic potential (the number of small enterprises, the average number of employees of an enterprise, and their average productivity) has not confirmed the ability of small businesses to compensate for the negative trends observed in the sector of large and medium-sized businesses, or even to enhance the positive trends. The reduction of employment was observed in 2014 in both sectors, decreasing of labor productivity — only in small business.

One characteristic of the economic potential reproduction that had a positive trend in both sectors — is the share of value added in the amount of output. Through the influence of this factor, real gross value added in the small business sector increased in 2014 by 77610.6 million. UAH, or 29.5% of 2013, and in the sector of large and medium-sized businesses — by 326607.3 million. UAH, or 32.2% of 2013.

So, increasing of the economic potential, observed in 2014 compared to 2013 in the small business and in the sector of large and medium-sized businesses was the result of the prevalence of increasing the share of value added in the output over all other factors. In particular, for the small business sector the impact of this factor and the increase in the total number of small enterprises outweighed the negative impact of the average number of employees decreasing and the decline of average labor productivity.

The simultaneous growth of the value added share in the output of the small and large business, in our opinion, deserves attention. Such synchronization for both sectors (the whole non-financial sphere of national economy) shows that its most likely reason — the reduction of intermediate consumption of imported products, allowed to keep most of the final product's value in within the national economy. The macroeconomic situation in Ukraine seems to serve as evidence in favor of this explanation. In particular, such dynamics of payments balance (Heyets, 2016): the fall of the national currency, reducing of currency resources of economic entities,

growth of imported energy resources in the system of relative prices, political restrictions on foreign economic activity (the beginning of military conflict with Russia, which traditionally was one of the leading importers) resulted in the reduction of import and, accordingly, a decrease in intermediate consumption of imported components by domestic enterprises.

The results of calculations made by chain substitutions (similar to Table. 2) for the 2014–2015 are shown in Table 3.

According to the table, the dynamics of the real gross value added in 2015 compared to 2014 became negative, both in the small business sector and in the sector of large and medium businesses.

This reduction of the economic potential concerning the small business was the result of the negative impact of two factors. First, the continued downward trend of employees' average number in small enterprise (decreased from 2.15 in 2014 to 1.96 in 2015), which resulted in a decrease in the value added by 329145.3 mln. UAH., or 8.98% of the base year. Second, radical reduction of the share of value added in the output (from 37% to 33%), which resulted in a decreasing of value added by 426448.2 mln. UAH, or 11.64% of 2014.

Reducing the average number of employed in small enterprises was clearly dominated by the growth in the number of small enterprises, so the total number of employees in the small business sector in 2015 decreased compared to 2014. Accordingly, in 2015 the small business was unable to perform the role of compensator for negative trends, emerging in in the sector of large and medium-sized businesses concerning the scope of labor: the reduction of employees' number was observed in both sectors.

Similarly, negative trends of labor productivity observed in 2015 in the sector of large and medium-sized businesses could not be offset by a small business. The real gross value added in this sector also declined (such dynamics were caused not by labor productivity, which increased in small business, amounting to additional 14059.40 million. UAH, i.e. 3.84% increase compared to 2014), but through significant reduction of the value added share in the sector's output.

Recording opposite trends of value added share in sector's output of small businesses and large and medium enterprises in 2015 is also quite revealing. The growth of such share in 2014 was "situational" and not due to the qualitative changes in the pattern of domestic enterprises' economic activity, but caused by only features of macroeconomic conditions (exchange rate, relative prices of imported goods, etc.). Accordingly, positive trend recorded in 2014 was not continued in 2015. Regarding the sector of large and medium enterprises, the influence of this factor remained positive, but fell to just 2.67% increase in the value added (compared to 32.2%

in 2014), and concerning the small business this factor's influence has become negative.

It is important that this negative trend was manifested much more strongly concerning the small businesses. Currently, this sector operates not weakening but powering the negative trends, emerging in the large business sector concerning the economic activity and efficiency of using resources.

Conclusions

The results of the factor analysis revealed that during the period of 2013–2015, small business in Ukraine has not shown their ability to act as compensation and mitigate the social consequences of the negative trends emerging in the sector of large and medium-sized enterprises. Similarly, positive trends of the economic potential reproduction, observed in large business are not strengthened, but were rather weakened by dynamics of similar processes, occurring in the small business sector.

In particular, the downward trend of employment in large and medium-sized enterprises observed in 2014 was not softened by dynamics of scope of labor in small business, due to the decreasing of the employees' average number in small enterprise, which has outweighed the increasing of the number of registered small companies.

In the same year, the Ukrainian small business could not provide a cumulative effect on productivity growth, which was observed in the sector of large and medium-sized enterprises, and vice versa — the dynamics of labor productivity in small business worsened the average for economy performance and has caused a decline in the real added value at 5.2% of the base year.

In 2015 also small businesses' negative impact on gross value added of the national economy was preserved. Reducing the scope of labor (which exacerbated similar negative trends observed in the sector of large and medium-sized enterprises) led to a reduction in sector's gross value added at 6.62%. The common effect of the labor productivity dynamics and value added share in the sector's output led to reducing the real added value by 7.8%.

The causes which determine "points of reversal" and differences in economic sectors sensitivity to shifts in macroeconomic conditions research are not covered by this research. Then, our results only allow to state the need for improvement in the qualitative characteristics of the Ukrainian small business in order to ensure that sector's positive impact on GDP re-

production. Thus, our research does not explain the situation, but only analyzes its characteristics.

The prospects for further research in the selected direction are associated with extension of the retrospective period duration, and forming a database which will be suitable for modeling gross value added of small enterprises' sector dependence on the main characteristics of resources, concentrated in this sector.

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Annex

Table 1. The connections within the multiplicative term for GDP dynamics factor analysis

Factor figures	The number of small enterprises registered (including the microbusinesses)	The average number of employees in the small enterprise	The average productivity per employee	The average share of value added in output
Directly characterizes:	Entrepreneurs' level of economic activity in the small business sector, and their preference to work in the official (registered) sphere	The scale of economic activity and, other things being equal - the amount of resources, accumulated by typical small enterprise	Output per employee	Position of small businesses in the chain of creation value of the final product, and the role of this sector in the creation of factor incomes in the domestic economy
Expresses effects on target characteristic (value added created by small business) by:	Macroeconomic conditions and small business specific capabilities to adapt to changes in it, the nature of the interaction between small and large business	The process of finding the optimal scale of economic activity and structural changes within the small business sector (reallocation of workers between small and micro-enterprises, among small enterprises with different scales of activity)	Effectiveness and efficiency of the formation (as in reporting and in previously periods) and use (during the observed period) resource potential of the small business sector	

Table 2. Factor analysis of value added dynamics by sectors in Ukrainian economy in 2013–2014

Economic sector	Number of enterprises		The average number of employees in the enterprise		Average labor productivity		Average share of GVA in output		GVA, million UAH		Reporting period figure's deviation compared base period	
	2013	2014	2013	2014	2013	2014**	2013	2014	2013	2014**	Mln. UAH.	% of base year
Large and medium business	19869.0	17115.0	273.7	273.5	625.4	641.1	0.30	0.41	1015358.6	1222679.4	207320.8	20,4
Small business	1702201.0	1915046.0	2.5	2.1	217.6	205.7	0.28	0.37	263089.3	316175.2	53085.9	20,2
Calculations for estimating factors' impact												
Substitution for estimating impact:	**Used in calculations**								**Fitted value of dependent variable**		**Factor's impact**	
	2013	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**			**Mln. UAH.**	**% of base year**
Number of enterprises:												
- Large and medium business		17115.0	273.7		625.4		0.30			874621.9	-140736.7	-13.9
- small business		1915046.0	2.5		217.6		0.28			295986.3	32897.0	12.5
Average number of employees												
- Large and medium business		17115.0		273.5	625.4		0.30			874124.4	-497.5	0.0
- small business		1915046.0		2.1	217.6		0.28			252298.9	-43687.4	-16.6
Labor productivity												
- Large and medium business		17115.0		273.5		641.1		0.3		896072.1	21947.7	2.2
- small business		1915046.0		2.1		205.7		0.3		238564.6	-13734.3	-5.2
Share of GVA in output												
- Large and medium business		17115.0		273.5		641.1		0.4		1222679.4	326607.3	32.2
- small business		1915046.0		2.1		205.7		0.4		316175.2	77610.6	29.5
Total factors' impact												
- Large and medium business											**207320.8**	**20.4**
- small business											**53085.9**	**20.2**

Note: ** In prices of base period (2013).

Source: own estimation based on State statistics service of Ukraine (2016).

Table 3. Factor analysis of value added dynamics by sectors in Ukrainian economy in 2014–2015

Economic sector	Number of enterprises		The average number of employees in the enterprise		Average labor productivity		Average share of GVA in output		GVA. million UAH		Reporting period figure's deviation compared base period	
	2014	2015	2014	2015	2014	2015**	2014	2015	2014	2015**	Mln. UAH	% of base year
Large and medium business	17115.0	15933.0	273.53	272.47	743.01	705.28	0.41	0.42	1417085.4	1285247.4	-131838.0	-9.30
Small business	1915046.0	1958385.0	2.15	1.96	238.46	248.27	0.37	0.33	366447.0	313240.03	-53206.97	-14.52
Calculations for estimating factors' impact												
Substitution for estimating impact:	Used in calculations								Fitted value of dependent variable		Factor's impact	
	2013	2014	2013	2014	2013	2014	2013	2014			Mln. UAH	% of base year
Number of enterprises:												
- Large and medium business		15933.0		273.5		743.01		0.41		1319218.3	-97867.07	-6.91
- small business		1958385.0		2.15		238.46		0.37		374739.98	8292.98	2.26
Average number of employees												
- Large and medium business		15933.0		272.5		743.01		0.41		1314107.2	-5111.13	-0.36
- small business		1958385.0		1.96		238.46		0.37		341825.5	-32914.53	-8.98
Labor productivity												
- Large and medium business		15933.0		272.5		705.28		0.41		1247373.9	-66733.29	-4.71
- small business		1958385.0		1.96		248.27		0.37		355884.9	14059.40	3.84
Share of GVA in output												
- Large and medium business		15933.0		272.5		705.28		0.42		1285247.4	37873.49	2.67
- small business		1958385.0		1.96		248.27		0.33		313240.0	-42644.82	-11.64
Total factors' impact												
- Large and medium business											**-131838.0**	-9.30
- small business											**-53207.0**	-14.52

Note: ** In prices of base period (2014).

Source: own estimation based on State statistics service of Ukraine (2016).