Thriving on Future Education, Industry, Business and Society
15–17 May 2019
Piran • Slovenia
make learn
TIIM
Management, Knowledge and Learning
International Conference 2019
Technology, Innovation and Industrial Management

DILEMMA IN VALUE ADDED DEVELOPMENT OF SLOVAK MANUFACTURING

Martin Hudcovsky
University of Economics in Bratislava, Slovakia
martin.hudcovsky@euba.sk

Karol Morvay
University of Economics in Bratislava, Slovakia
karol.morvay@euba.sk

Abstract:
The paper deals with the often-problematic interpretation of value-added indicators development and its impact on understanding the role of value added in the economy. The one-sided view on value added composition can lead to undermining or overstating the importance of value-added development. Paper aims to demonstrate the unequal distribution of the value added across industries in Slovakia and to provide proper conclusions of such performance indicators based on the international comparison in V4 countries in the manufacturing sector. Therefore, it tries to help improve the understanding of value-added based indicators with highlighted pitfalls of its interpretation. The combined view of both perspectives is necessary to fully understand the value-added indicators.

Keywords: Value added, Labour productivity, Manufacturing, Slovakia,

1. INTRODUCTION

The evaluation of economic performance of individual sectors in the economy is a great tool to reveal their ability to compete on international markets, to follow their contribution to the development of entire economy as well as to highlight the importance of the sector in the economic structure. However, the indicators of such performance must be approached with deep care. The commonly used terminology appearing in various analyses, commentaries or statements regarding the performance of manufacturing sector is interpreted too vaguely and often lead to confusing or conflicting conclusions. When assessing the performance and competitiveness of manufacturing in Slovakia, we might be confused whether there is “too little” or “more than enough” value added or whether the productivity of Slovakia outperforms the neighbouring countries or is still lagging. The interesting fact is that both views might be “correct”- depending just on “proper” methodology selection and a looser interpretation of some terminology. The different attitude to these figures is used when evaluated by managers of large corporations and by other academic researchers.

Therefore, the terms such as “too little value added” or “more value added required” are understood in two ways. One meaning is based on the share of value added on output and the other one on the share of value added per worker. Both indicators are essential for economic analysis, however, each of them explains a different approach. Moreover, they may develop in the opposite pattern to each other.

2. LITERATURE REVIEW

The countries in the area of Central Eastern Europe were analysed for an extended period due to reindustrialisation effect appearing in the new decade of the 21st century. At first, the countries faced the phase of deindustrialisation due to lack of competitiveness in global markets. However, it is safe to say that now for more than two and a half decades, CEEs have been subject to enterprise restructuring, privatisation and dramatic inflow of foreign direct investment. Still, with the phase of reindustrialisation came another phenomenon of the establishment of economic activities with the low value-added rate. Pavlinek & Ženka (2010) evaluates the performance of Czech enterprises in direct relation to industrial upgrading between the years 1998 – 2006. They conclude that upgrading is a very selective process with a certain proportion of companies lagging behind the leaders in the industry. Pavlinek (2015) in another paper investigated the impact of the 2008-2009 crisis on automotive sector in Slovakia and Czechia and concluded that due to the nature of automotive industry production, a vast part of the production was unharmed due to low labour intensity of production. Temporal employment decline in the sector, in reality, helped to improve value added per worker indicator. However, the study reveals that long-term regional development consequences of this type of captive value chain and the related industrial development are likely to be limited mostly to jobs in low value-added assembly operations in the supplier sector. Hardy et al. (2011) investigated the topic of upgrading local economies in CEE. They strongly underline the importance of the linkage between the research findings and level of FDI value-added production (especially in business services of FDI). Also, the importance of policy setting is pointed out as an essential factor in the process of FDI upgrading. Radlo & Sass (2012) concluded that Slovakia is in investment development path of FDI only at the beginning of the second stage lagging behind the other V4 countries.
The most advanced in stage development is Hungary. It may be expected that with further stage development a higher rate of value added will be associated in FDI in CEEs.

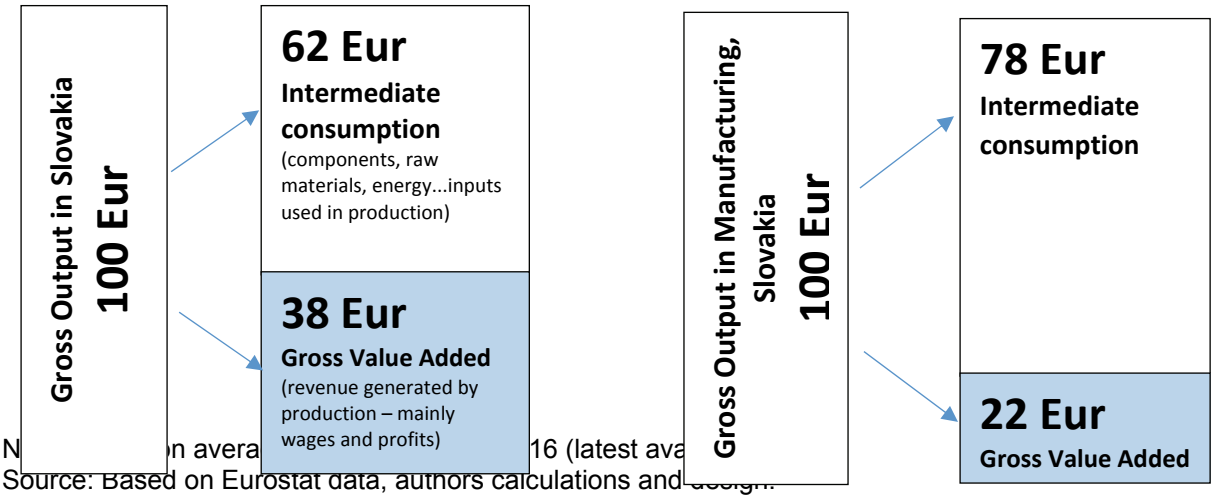
3. METHODOLOGY AND DATA

The paper utilises desk research based on officially published data in Eurostat database. It uses qualitative analysis of National Accounts data in nominal values. The research question is focused on the topic of proper view on the development of value-added indicators with two different perspectives.

3.1. The perspective of "Too Little Value Added"

Regarding the "Value Added Rate", it is a simple ratio indicator: the gross value added is divided by the gross production volume. It is a kind of technical efficiency indicator which represents what value added is created by the production of one output unit. There has been a lot of discussions and papers regarding proving low value added in the Slovak economy. The value of output consists of a large intermediate consumption share, and too low share of generated value added. Scheme 1 shows that during the production of goods and services worth of 100 € in the total economy, the inputs amounting 62 € on average are used, and only 38 € is generated in the form of value added. In the case of manufacturing, this proportion expands even further when the intermediate consumption share is 78 € on average, and only 22 € takes the form of value added. However, such share of intermediate consumption is nothing surprising. It is given by the nature of manufacturing which requires a large proportion of inputs for one output unit (obviously much higher than in services).

Scheme 1: Ratio of Intermediate Consumption and Value Added in Output in Slovakia (Total Economy Average and Manufacturing)



N n avera 16 (latest ava
Source: Based on Eurostat data, authors calculations and design.

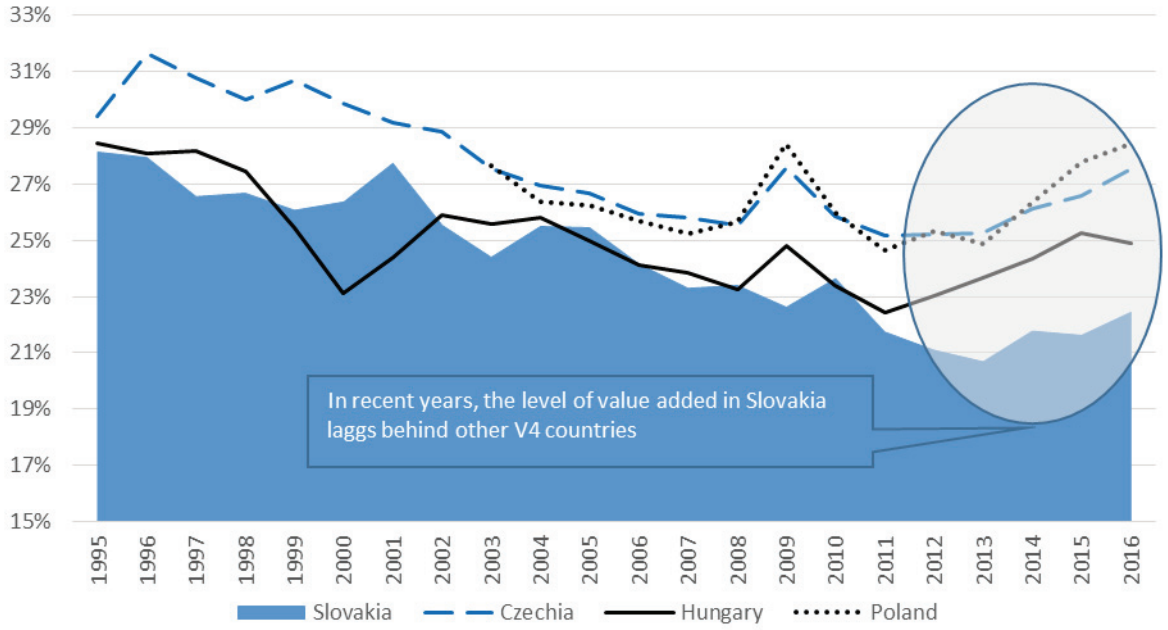
Based on the simple value-added rate we aim to clarify some interpretations of the following hypothesis:

Is it desirable to aim for a higher rate of value added? The answer is obviously affirmative. The higher rate of value added is the desired phenomenon. However, it may not be expected nor enforced in all sectors or production activities.

If some economic activity bears a low rate of value added, could we consider it to be non-perspective or undesired? This is not the case. Some economic activities (in isolated definition only) have a meagre rate of value added. However, their presence allows the development of such activities that bear a significantly higher rate of value added. If the rate of value added remains low or even declines in the long run, we can consider such phenomenon to be problematic. However, expecting that only activities with a high rate of value added will be present in the economy in non-realistic.

In the recent "post-crisis" recovery period, the increase in the manufacturing rate of value added is visible in three out of four V4 countries (Czechia, Slovakia, Poland, and Hungary). Slovakia is an exception. The rate of value added in manufacturing has lagged behind other economies significantly. This will be a challenge for a long-term neglected industrial policy in the country for upcoming years and decades.

Figure 1: Value Added Rate in Manufacturing in V4 Countries

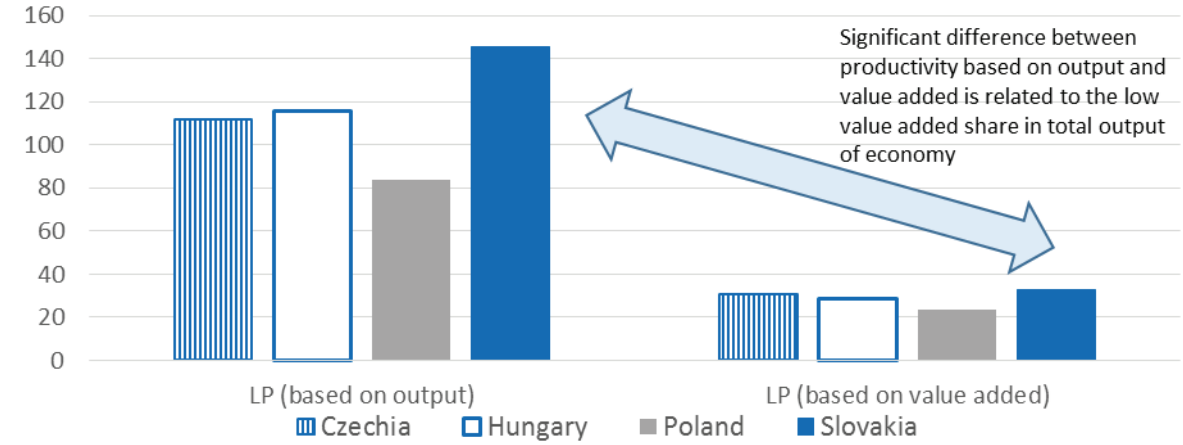


Source: Based on Eurostat data, authors calculations.

3.2. The perspective of "Too Much Value Added"

We get a completely different situation if we do not calculate the value added per unit of output but rather per one worker. This is the way how to obtain one of the many labour productivity indicators.
If the productivity is calculated from the output volume, the Slovak manufacturing sector is a pronounced leader in productivity among all V4 members. However, if we calculate it from the value added (typically preferred method), the Slovak margin is significantly reduced. This is logical as the share of value added in Slovak output is lower than in other countries. Still, no matter what indicator used, the labour productivity in the Slovak manufacturing sector is at the peak of V4 (Figure 2).
Therefore, we arrive to a contradictory situation when in comparison with V4 countries, the Slovak manufacturing production has the lowest share of value added (lowest value added rate) and at the same time reaches the highest level of value added per worker.

Figure 2: Labour Productivity in Manufacturing (computed from output or value added)
(in thousand EUR per employee, 2016)



Note: Gross output and gross value added divided by a number of working persons. Number of working persons based on national accounts.
Source: Based on Eurostat data, authors calculations.

From this point on we employ only the labour productivity measured in the value-added perspective. Table 1 compares the three ways of expressing labour productivity based on added value. The first figure is the year 2008 – the last "pre-crisis" year.
The most important discovery is probably the fact that in comparison with other V4 countries and for each of the three parameters, the relative position of Slovak manufacturing has improved. (Visible in the ratios of other countries values vis-à-vis Slovakia. All of them decreased between 2008 to 2016 representing an improvement in the position of Slovakia vis-à-vis other countries.) In 2016, the manufacturing output in Slovakia achieved the highest labour productivity in V4 (in terms of per working persons and per hours worked.) However, one exception may be found: if we use employment data based on the labour force survey, the productivity in Czechia is higher than in Slovakia. It is a clear signal of how important it is to keep up with the methodology of such calculations. Therefore, it is possible to demonstrate the advantage of Slovakia compared to Czechia at the same time as the advantage of Czechia compared Slovakia. All depends on the methodology of employment reporting.
How does such a difference form? In simplified terms, employment based on a survey does not take into account the territorial principle. Part of the reported working persons work abroad, and they are not involved in value-added formation (which is the numerator of the analysed ratio). In the situation where the value added by the national accounts methodology is used in the numerator of a ratio, it makes more sense to utilise the number of working persons reported by the same methodology instead of survey methodology (i.e. domestic concept). Therefore, the use of employment based on national accounting provides more precise results (see Table 1).

Table 1: Different Approaches to Labour Productivity Computations in Manufacturing (based on value added) (data in thousand € per working person, 2016)

Labour productivity measured as volume of value added per worker (based on the national accounts methodology)				
	2008		2016	
	€	Ratio to Slovakia	€	Ratio to Slovakia
Czechia	25587.4	1.03	30790.1	0.94
Hungary	22572.2	0.91	28762.7	0.88
Poland	18572.7	0.75	23738.6	0.73
Slovakia	24779.1	1	32610.2	1
Labour productivity measured as volume of value added per hour worked				
	2008		2016	
	€	Ratio to Slovakia	€	Ratio to Slovakia
Czechia	14.8	1.06	17.7	0.94
Hungary	-	-	16.4	0.87
Poland	8.8	0.62	11.4	0.60
Slovakia	14.0	1	18.9	1
Labour productivity measured as volume of value added per worker (based on labour market sample survey)				
	2008		2016	
	€	Ratio to Slovakia	€	Ratio to Slovakia
Czechia	26204.8	1.26	30442.8	1.12
Hungary	23469.8	1.12	24099.7	0.88
Poland	18547.3	0.89	23738.6	0.87
Slovakia	20870.3	1	27281.2	1

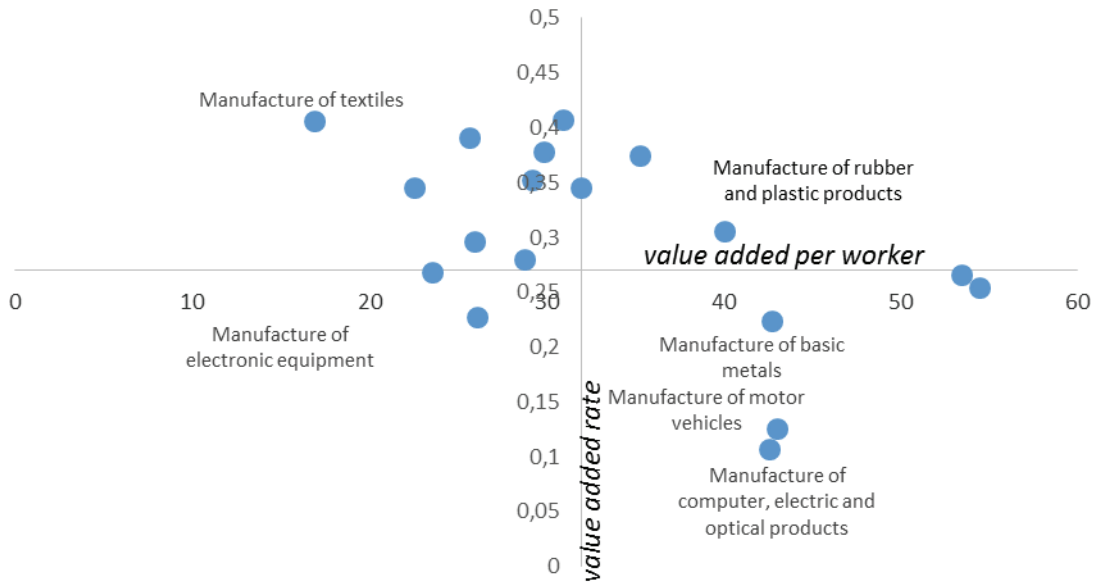
Source: Based on Eurostat data, authors calculations.

"Combined perspective"

The relatively weaker results of Slovakia were achieved in the manufacturing sector when expressed as value added per unit of output. On the other hand, much more favourable results were achieved when expressed as value added per worker. In the next part, we combine these two approaches and extend our interest in individual sectors of manufacturing production.
In Figure 3, we combine two views above on manufacturing productivity: the vertical axis represents the share of added value in output (i.e. the rate of value added) and horizontal axis value added per worker (i.e. labour productivity).

Some sectors (especially the automotive sector) are represented by low value added rate. However, they have a very high value added per worker (high labour productivity).
In order to exercise typical Slovak cases: the hand wood carving craft or hand sewing craft is an economic activity with a very high rate of value added (the primary input is just “labour”), however, it has only a very low level of labour productivity (besides other restrictions like limited demand for the output). In Figure 3, these activities would be located in upper-left quadrant. On the contrary, the final assembly of vehicles is a very low value-added activity with very high labour productivity (lower-right quadrant in Figure 3). Are we able to say based on these facts that hand wood carving or hand sewing is a more desirable activity for the economy just due to their high rate of value added? Hardly. Isolated overview of value added in just one economic activity or sector is not sufficient. We need to bear in mind the links with other activities. Some activities with a low level of added value have the ability to accommodate (use) products of the other sectors with a high rate of value added. Moreover, one of such sectors is already mentioned automotive industry.

Figure 3: Combination of Value Added Shares: Value Added per Output Unit and Value Added per Worker (in Slovakia, manufacturing sector)



Note: The individual points represent the positions of manufacturing sectors in Slovakia, selected sectors are marked by their name.
Value added per worker: Gross value added divided by number of workers, EUR, 2016. The number of workers based on national accounts methodology.
The rate of value added: share of gross value added in gross output.
Oil refinery production is deliberately excluded from this comparison. Due to its technological specifics, it is a sector which value added per worker (horizontal axis) is several times higher than the values in other sectors (outlier). It would be a combination of extremely high values of value added per worker and very low value added per output unit. The position of the sector in the figure would be in far lower-right quadrant.
Source: Based on Eurostat data, authors calculations.

4. CONCLUSIONS

Different approaches to value-added expressions in manufacturing have led us to different conclusions. Still, each one of them has its own meaning despite describing little different phenomena. The use of terms such as value added or productivity, as well as an isolated overview of individual sectors or activities, must be approached with care. These activities have massive links to other activities in the economy, and their evaluation should be applied preferably in the context of complex manufacturing links to other sectors of the economy.

ACKNOWLEDGEMENT

Project VEGA 1/0716/19 „Policies evaluation beyond GDP: impact of unequal distribution of the socio-economic development determinants“ (50 %) and Project VEGA 2/0097/19 Assessment and prediction of changes in the Slovak economy in the context of disintegration tendencies in the EU (50 %).

REFERENCE LIST

1. Hardy, J., Micek, G., & Capik, P. (2011). Upgrading local economies in Central and Eastern Europe? The role of business service foreign direct investment in the knowledge economy.
2. Pavlínek, P., & Ženka, J. (2010). The 2008–2009 automotive industry crisis and regional unemployment in Central Europe. Cambridge Journal of Regions, Economy and Society, 3(3), 349-365.
3. Pavlínek, P. (2015). The impact of the 2008–2009 crisis on the automotive industry: global trends and firm-level effects in Central Europe. European Urban and Regional Studies, 22(1), 20-40.
4. Radlo, M. J., & Sass, M. (2012). Outward foreign direct investments and emerging multinational companies from Central and Eastern Europe: The case of Visegrád countries. Eastern European Economics, 50(2), 5-21.