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# Exports, industries' technological intensity, capital and labour market in Romania

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**Abstract:** *The paper is focused on the export activity in Romania, in relation with labour market and technological intensity of manufacturing industries. At similar technological intensity, we analysed whether labour market segmentation takes place in relation with the form of capital ownership, i.e., higher attractiveness for employment in foreign capital firms due to the benefits of labour payment. The study reveals the existence of advantages; however, they are not significant to produce strong segmentation on the market, based on the often-erroneous perception of the potential and productive intent of foreign capital.*

**Keywords:** *export, productivity, labour market, capital ownership, foreign capital, technological intensity of industry*

**JEL Classification:** D24; F16; F23; F61

## Introduction

The differences in wage level among companies might generate segmentation on the labour market, as small wages do not lead to economic performance and competitiveness, neither at company nor at macroeconomic level. The study highlights the link between wages and capital ownership at the level of firms performing external trade in goods; it also analyses whether foreign capital companies in Romania have the

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highest share of exports in their total turnover, as most of them are active in technology-intensive sectors.

Labour demand generated by large companies trading goods on international markets is one of the criteria for segmenting the labour market in any economy. Different wage, different working conditions than those offered by small national businesses, create barriers that do not overcome this shortcoming. This reality also makes difficult for staff to move between identified segments, directly influencing the mechanism of training and the remuneration system.

Foreign-owned exporting companies have a higher attractiveness for the labour force through higher wage offer, being another criterion for segmentation of the labour market. Thus, the ownership of the capital and the technological intensity of the economic sector in which the company performs its activity generate different degrees of openness to the international markets and represent factors that determine a certain degree of segmentation of the labour market.

## **State-of-the-art**

To provide the determinants of trade, economists developed theories based on fundamental economic aspects. For example, David Ricardo (1971) developed the theory of comparative advantages based on differences in technology existing at the national level. In the Heckscher-Ohlin model, the trade is shaped by production factors, *i.e.*, labour, capital and, last but not least, the natural resources of the country.

Trade can lead to technological spillovers by allowing countries to increase their knowledge and technological expertise. Engaging in trade also helps to strengthen political and economic institutions, according to the findings of 2013 World Trade Report.

Other economists (Kinoshita, 2011, p. 4), when talking about foreign direct investments and their importance to an economy, mentioned that a relative high volume of investments in the financial sector, non-tradable goods and services might stimulate the internal demand and imports, with a negative impact on the trade balance deficit while FDI manufacturing sectors boost imports on short term only. Foreign investors in the manufacturing sectors pay a higher attention to qualification and productivity of the labour force as against a mere lower cost of the labour force, the latter having a secondary role as influence instrument. Changing in direction of FDI from the "non-tradable" to the "tradable" sector contributes on average and long term to a better insertion of the host country's economy into international value chains, to elimination of infrastructure shortcomings, as well as to improved human capital expertise (Zaman Gh., Vasile V., Cristea A., 2012).

When firms migrate abroad with part of their activity, the average production factor intensity of an industry changes (Feenstra and Hanson, 1999). Reducing trade costs allows companies to perform relocation of some production stages abroad. The production factors that remain in the country of origin, register a higher productivity (Grossman and Rossi-Hansberg, 2008).

Reduced trade barriers cause growth in productivity and trade. Experts noticed the stronger effect of trade competition on the manufacturing sector, in parallel with a reduced impact of technological change in the employment composition in the branch (David A. *et al.*, 2015).

By linking technology and trade, many of the jobs that can be performed automatically, at higher costs, are also suitable for being moved abroad (Blinder, 2009). Consequently, part of the low-skill activities could be located in the developing states due to the loss in efficiency in rich countries.

Foreign companies outperform domestic ones as regards labour productivity, wages and employment. Moreover, foreign companies hire to greater extent high-skilled workers and the wages are higher, compared to domestic companies. These differences result in an increased disparity between domestic and foreign companies (Pellufo A., 2015).

Most of the FDI in Romania is directed towards the low-tech economic sectors (such as food industry, wood and wood products, pulp, paper manufacturing, publishing, furniture, wastage recovery, etc.), and medium-low tech industries (coke and petroleum industry, coal, nuclear fuel processing, manufacture of rubber and plastic products, non-metallic mineral products, metals, manufacture and repair of transport equipment, etc.) (Vasile V., Zaman Gh., 2012).

About the real and potential benefits of the developing countries hosting foreign capitals, some authors consider that internal competition and especially the strength of domestic companies are of utmost importance for a sustainable developing of the exports and country (Crisuolo & Narula, 2008; Dunning & Narula, 1996; Narula R., 2017; Yanping L., 2018).

The larger the productive firms are, the greater their performance is. There is much to be gained by reforms that make easier for productive firms to attract the resources required to underpin their growth. More specifically, according to the OECD publication *The Future of Productivity* (OECD, 2015), there are many possibilities to boost productivity and reduce inequality by simply allocating human talent more effectively to jobs. Yet, the research in the mentioned book suggests that around one-quarter of workers report a mismatch between their skills and those required to do their job. A

better use of talent could translate into significant labour productivity gains in many economies.

On the importance of labour, the IMF experts noticed that, after being largely stable in many countries for decades, the share of national income paid to workers has been falling since the 1980s, this trend being driven by rapid progress in technology and global integration (IMF 2017, Drivers of Declining Labour Share of Income).

This happened mainly because of technological changes, some authors seeing the role of capital accumulation and capital-augmenting technical change as determinants of the evolution of the labour share (e.g., Bentolila and Saint-Paul, 2003; Arpaia *et al.*, 2009; Driver and Muñoz-Bugarin, 2010; Raurich *et al.*, 2012; Hutchinson and Persyn, 2012).

## Methodology

To analyse the importance of the export activity for the labour market and the factors that determine the segmentation, statistical data series were used for the reference period 2008-2016. Data on export of goods from the National Institute of Statistics of Romania were extracted and analysed by type of capital (foreign and Romanian) and technological intensity of the economic branch (NACE rev.2 - Statistical classification of economic activities in the European Community).

By type of capital, there were identified companies with wholly Romanian capital and companies with foreign capital. The latter category is composed of mixed capital (Romanian and foreign capital) companies and wholly foreign capital companies.

The following indicators were computed to highlight the differences on the labour market for the identified segments:

- The export intensity (%), *i.e.*, the share of the export of goods in the total turnover of the analysed companies;
- Labour productivity, calculated as companies' turnover / number of employees, expressed in thousands of euros / employee;
- Average wage, *i.e.*, total wage / number of employees, expressed in thousands of euros / employee;
- Wage share (%), which represents the share of the total wage in total turnover of the analysed companies.

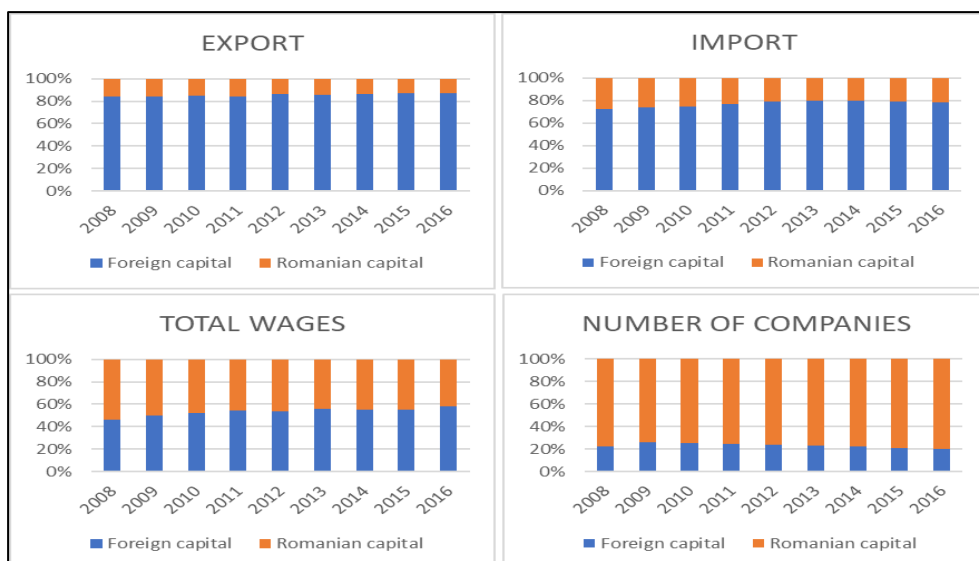
The technological intensity of the economic branch was analysed according to the *High-tech classification of manufacturing industries, based on NACE Rev. 2. 3-digit level* used by Eurostat (Statistical Office of the EU) for Union statistics. This classification was used also for this study, and the following industries are included in each category:

- High-technology - manufacture of pharmaceutical products, computers, electronic and optical products, air and spacecraft and related machinery;
- Medium-high-technology - manufacture of chemical products, weapons, electrical equipment, motor vehicles, transport equipment, medical instruments and supplies;
- Medium-low technology - manufacture of refined petroleum products, plastic products, basic metals, metals products, building of ships and boats, repair of machinery and equipment;
- Low-technology – manufacture of food products, beverages, textiles, leather products, paper and paper products, furniture.

## Results of the research

In an open market, the economic determinants of the labour market segmentation are, among others, the capital ownership and technological intensity of the economic activity. The assumption of the present study is that the higher the intensity, the higher the attractiveness of the sector is; this generates a greater potential for companies to develop on external markets through exports.

**Figure 1. Companies with external trade activity<sup>\*)</sup> in Romania, by capital ownership (% in total national indicator)**



<sup>\*)</sup>Note: Exports and imports of goods by Romania (services not included).

Source: Authors' calculations based on NIS data, Romania.

Export and import of Romania are dominated by foreign capital, but the number of employees is very small in these firms. In 2016, companies with foreign capital performed 85.3% of export and 77.5% of import.

As regards the number of firms, foreign capital represents only 20% of the total number of companies performing external trade in goods. There is a relative balance between foreign and domestic companies in terms of relative wage level. In 2016, 58.3% of the total wages were paid to employees in foreign companies while 41.7% were paid to employees in domestic companies.

When a company exports goods it is most likely to benefit from technological inputs necessary for production, as the goods destined to foreign markets must cope with higher standards in terms of quality; they also have to be competitive in terms of price compared with similar goods already existing in external offers. Some of the problems of the Romanian companies are related to their small size, their low level of export intensity (about 8% compared to 25% in case of foreign companies) and consequently a high vulnerability to market changes/shocks. Most of them belong to the SME (small and medium enterprises) category: the average number of employees is 22, compared to 62 in foreign companies.

**Table 1. Average share, minimum and maximum recorded by exports, imports, wages and number of foreign capital companies**

Foreign capital companies	Average share in RO national figures 2008-2016 (%)	Max		Min	
		Year	Share (%)	Year	Share (%)
Export	82.6	2012	85.4	2009	75.7
Import	75.6	2014	79.7	2009	68.1
Wages	50.9	2016	58.3	2008	43.4
Number of companies	22.2	2011	24.2	2016	19.6

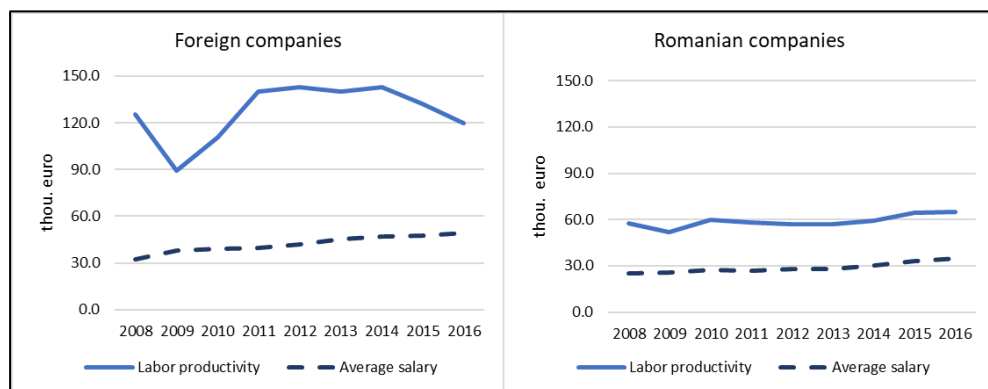
Source: Authors' calculations based on NIS data, Romania.

The authors of this study consider that the productivity gap between the two types of companies is determined first and foremost by the degree of technology in productive processes, foreign firms benefiting from the results of research and development from the country of origin. Besides technology, this difference stems from knowledge, awareness of companies and their willingness to sustainably develop the business in a globalized world as well as possibilities (financial and human resources) to invest in research at the microeconomic level.

Based on these facts, foreign-owned firms achieve almost double levels of labour productivity (120 thousand euro/employee compared to 65 thousand euro/employee in Romanian firms, in 2016), but wage levels differ less than those recorded in Romanian

companies. The economic sector and the technological intensity are also important aspects influencing the higher level of productivity obtained by foreign companies.

**Figure 2. Labour productivity and average wage during 2008-2016, by type of company (thousands of euro)**



Source: Authors' calculations based on NIS data, Romania.

Thus, in the companies with Romanian capital, the average wage and labour productivity are, for the entire analysed period, 31.6% lower, respectively 51.8%, compared to the values recorded by the foreign firms. The lack of qualification of the Romanian personnel according to the requirements of the foreign companies leads to difficulties in negotiating wages and working conditions. The wage gap between the two types of companies increased in 2016 compared to 2008, while reducing productivity gaps. This represents a process of economic revival of the Romanian firms, the determinant factors being the technological improvement of the production and the supply of export goods. This conclusion is based on the statistical indicators computed by type of company according to the technological intensity of the productive branch (Table 3).

Finally, the economic policy in this area is of utmost importance for supporting companies to produce goods in Romania and to promote their exports to foreign markets.

A high/higher qualified human resource is the main driver for improving companies' position on both the internal and the external market, on the specific sector where they operate and must be specialized. To allow imports to develop in an unknown direction at



the global level, without considering the production potential of the national market for specific goods, causes vulnerabilities by increasing the economic dependence on other countries and markets; consequently, the potential benefits of a strong national industry might be lost in time.

**Table 2. Labour productivity and average wage (2008-2016)**

	Average 2008-2016	Max		Min	
		Year	Value (€ thou)	Year	Value (€ thou)
<b>Foreign capital companies</b>					
Labour productivity	126.9	2014	142.6	2009	89.6
Average wage	42.2	2016	49.0	2008	32.3
<b>Domestic companies</b>					
Labour productivity	58.9	2016	64.9	2009	52.0
Average wage	28.8	2016	34.6	2008	25.1

Source: Authors' calculations based on NIS data, Romania.

Labour productivity is more dynamic than the average wage for both types of companies, which stimulates their economic development. In foreign firms, labour productivity declined during 2014-2015 while in domestic companies it increased. In the companies with foreign trade activities, there might be no significant changes in productivity or the average wage, as they face the competition on the foreign market, characterized by a very intense level.

To increase substantially the productivity, two microeconomic developments are to be taken into account:

1. Technologically progress, respectively, a new generation of technologies or developments on the technological generation;
2. Exports from high and medium high intensity manufacturing industries, by increasing the national production in these branches.

Romanian companies are mainly involved in the low intensity sectors, having a different pattern than foreign firms. This is because foreign companies have ensured the integration into the multinational enterprises' value chain. Therefore, it is necessary to develop Romanian brands in high and medium-high technology-intensive sectors and to identify export niches according to the dynamics of final or intermediate consumption for highly processed products.

**Table 3. Export intensity, wage share, average wage and productivity by capital ownership and technological intensity, in 2016**

	Export Intensity	Wage Share	Average wage	Labour Productivity
	(%)		(€ thou / employee)	
<b>Foreign capital companies</b>				
TOTAL	28.9	140.5	51.6	36.7
High	68.3	90.1	53.0	58.8
medium-high	77.4	105.0	49.0	46.7
medium-low	54.8	119.8	49.0	40.9
Low	49.8	71.5	36.8	51.5
Other*	10.2	187.1	58.5	31.2
<b>Domestic companies</b>				
TOTAL	8.4	64.9	34.6	53.3
high	25.8	54.6	52.5	96.1
medium-high	33.3	44.4	37.7	85.0
medium-low	23.2	49.0	34.3	70.1
Low	25.4	41.5	27.8	67.0
Other*	4.1	73.5	35.9	48.8

Source: Authors' calculations based on NIS data, Romania

The difference between export intensity of all companies and the same indicator computed for manufacturing firms (e.g., for foreign companies on total level the export intensity is 28.9% while for domestic companies is 8,4%) derives from companies working in primary products' sectors like agriculture, forestry, fishing, mining, quarrying and services. In these sectors, the export intensity is very low; companies involved are mainly producers of primary products while export is a secondary activity. Usually these companies sell internally the primary goods, within the national borders, to other companies who performs external trade activities.

The regression analysis of these indicators for foreign companies proved that export intensity, as a dependent variable, is correlated with labour productivity and wage share, as it is presented in Table 4. The model explains 87% of the variability of the response data around its mean.

**Table 4. Regression analysis for export intensity as a dependent variable, labour productivity and wage share as independent variables, in case of foreign-owned companies**

<i>Regression Statistics</i>	
Multiple R	0.937578
R Square	0.879052
Adjusted R Square	0.806483
Standard Error	1.83419
Observations	9

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	122.2571	40.75235	12.11335	0.009905
Residual	5	16.82126	3.364252		
Total	8	139.0783			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-274.26	104.1102	-2.63433	0.046291	-541.884	-6.63649	-541.884	-6.63649
Productivity	2.135092	0.787841	2.710056	0.042273	0.109883	4.160302	0.109883	4.160302
Average wage	-6.44293	2.613102	-2.46563	0.056834	-13.1601	0.274257	-13.1601	0.274257
Wage share	9.14551	3.469096	2.636281	0.046183	0.227915	18.0631	0.227915	18.0631

Source: Authors' analyses based on NIS data, Romania.

For further economic significance, the regression coefficients shall be interpreted. For every 1-unit increase in productivity, the export intensity will increase by 2.13%. For every 1-unit increase in average wage, the export intensity will decrease by 6.44%. For every 1-unit increase in wage share, the export intensity will increase by 9.14%.

Foreign-owned companies are oriented towards export activities especially when labour productivity and wage share are higher. The degree of employee involvement plays a very important role in opening the economy of foreign firms. In case of domestic companies, the tests performed are not statistically significant. This fact implied the need to highlight the main economic sectors having high and medium-high technological intensity, where Romanian companies perform external trade transactions.

**Table 5. Romanian performances in high and medium-high sectors in 2016**

NACE Rev.2 code	Name of NACE Rev.2 code	Share in total RO companies	
		Export (%)	Import (%)
<b>High intensity manufacturing industries</b>			
2651	Manufacture of instruments and appliances for measuring, testing and navigation	27.4	28.3
3030	Manufacture of air and spacecraft and related machinery	27.2	17.4
2120	Manufacture of pharmaceutical preparations	15.0	13.7
2110	Manufacture of basic pharmaceutical products	13.3	15.7
2611	Manufacture of electronic components	10.7	9.6
<b>Medium-high intensity manufacturing industries</b>			
2932	Manufacture of other parts and accessories for motor vehicles	27.0	21.8
2732	Manufacture of other electronic and electric wires and cables	15.1	12.6
2540	Manufacture of weapons and ammunition	9.1	2.6
2931	Manufacture of electrical and electronic equipment for motor vehicles	6.3	7.6
2751	Manufacture of electric domestic appliances	5.6	3.8

Note: NACE = Statistical classification of economic activities in the European Community

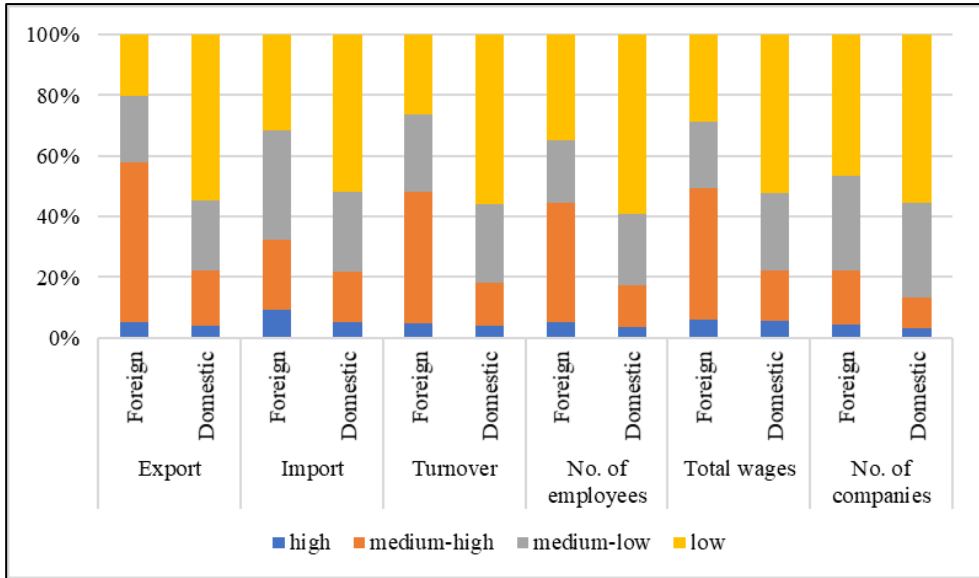
Source: Authors' calculations based on NIS data, Romania.

Beyond statistical data, there are manufacturing sectors where Romanian companies perform well, but these are insignificant after cumulating the results on national level. In the above-mentioned industries deeper analyses are needed to evaluate to what extent the processing activities under contract have a strong or weak impact on the labour force market and on the overall economy.

High-intensity industries are almost negligible, considering their share in total manufacturing industries of less than 4% in total export for foreign companies and 2.5% for domestic firms. The share of all highlighted indicators is very small for these industries.

Foreign companies very well represent medium-high intensity manufacturing sectors. In case of export, 40.4% is performed by foreign capital and only 11.0% by domestic capital. In terms of number of employees, 20.2% are working in foreign companies and 4.1% in domestic companies.

**Figure 3. Technological intensity of manufacturing sectors by capital ownership (share in total national indicator) in 2016**



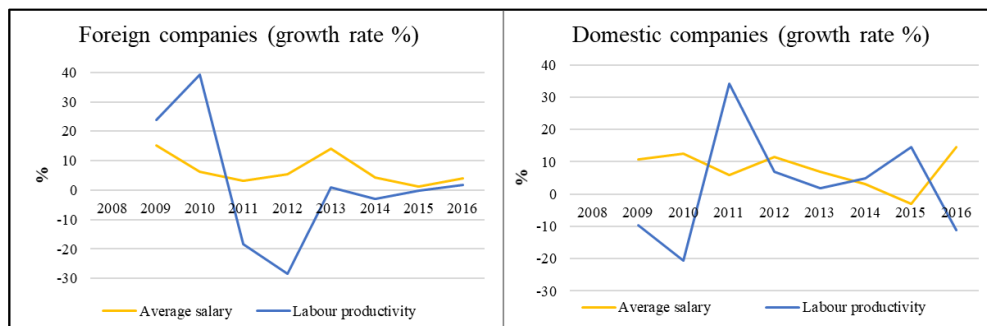
Source: Authors' calculations based on NIS data, Romania.

Domestic enterprises are more active in low-technological manufacturing sectors, where goods like food, beverages, textiles, leather products, paper and paper products, furniture are produced. These are industries where primary products and natural resources are processed, and no big investments or knowledge are needed or possible, due to the nature of the activities performed.

### High technology-intensive industries

Although the degree of openness to international markets is reduced in case of Romanian-owned firms, the increase rate of labour productivity is higher compared to foreign companies; moreover, the difference between the average wages at the level of the two categories remains relatively constant in the years following the economic crisis (2008-2009).

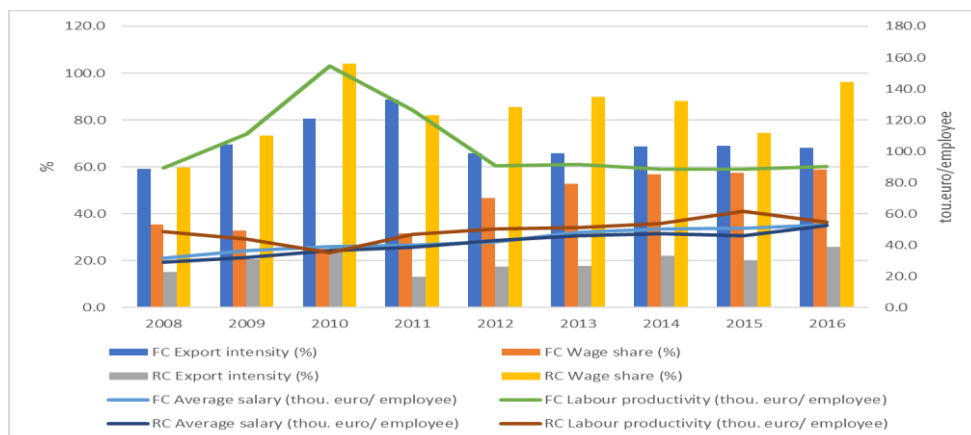
**Figure 4. Growth rate of average wage and labour productivity in high intensity industries, by type of ownership**



Source: Authors' calculations based on NIS data, Romania.

Introducing technology in goods production is not an easy process, it involves significant financial and human resources as well as market conditions for its efficient implementation on company level. This explains the very small percentage of Romanian companies active in high technology-intensive sectors, in terms of value share of exported goods in total national export, of only 0.3% compared to 3.4% as foreign firms in these fields accomplish.

**Figure 5. Performance and productivity indicators by capital ownership, in high intensity manufacturing sectors, in 2016**



Note: FC=Foreign capital companies, RC=Romanian capital companies

Source: Authors' calculations based on NIS data, Romania.

The export intensity was higher for foreign companies, but the productivity increased more at the level of domestic companies exporting goods in 2016 as against 2008. In 2012 there was a decrease in productivity of the foreign companies due to the closing of manufacturing activities by the end of 2011 of one of the most important company in the IT&C sector and one of the largest exporters. In the same time, a very close level of medium wage was registered between the two categories of companies. This suggest that productivity level is not necessary linked with wage level but with other important factors, such technology, working conditions, possibilities to develop professional careers and to gain experience abroad within multinational companies.

During and after the economic crisis, different behaviours characterised the two categories of companies. Foreign companies involved in international transactions in high-tech products, recorded a very high level of productivity and export intensity while the wage share was at the minimum level. The data revealed that, despite a reduction by 5% in the number of employees in 2009 as against 2008, the economic recovery of these companies was mainly based on their export of goods. The increase in export from high intensity sectors was +46.6% in 2009 as against 2008 and it continued to grow in the next year. The total turnover of these companies increased by 24% in the same interval.

In the case of domestic companies active in high-intensity sectors, we found an increased productivity, a slight increase of export intensity, very high wage share, and a reduction by 8% in the number of employees in 2009 as against 2008. The efforts of the Romanian companies to survive during the crisis were very high; companies focussed on incorporating technology in their production achieved good performance indicators, despite some measures characterised by their contribution to an increased unemployment. The fiscal measures applied in the crisis period by increasing the taxes hit strongly the SMEs and did not generate development of the surviving companies. The crisis affected the employment while the average salaries remained at the same level. This confirmed the economic theory that *when average wages increase more rapidly than average labour productivity, the labour/wage share increases. Conversely, when the growth in average wages lags the growth in labour productivity, the result is a decline in the labour/wage share.* (*The Labour Share in G20 Economies, International Labour Organization, Organisation for Economic Co-operation and Development with contributions from International Monetary Fund and World Bank Group, Report prepared for the G20 Employment Working Group Antalya, Turkey, 26-27 February 2015*). The changes in wage shares are based on technological change, globalization, financial markets, product and labour market institutions, the bargaining power of labour and unemployment.

## Medium-high technology-intensive industries

Foreign companies from medium-high intensity sectors perform over 40% of total exports of foreign firms in Romania. The growth rate of productivity is very similar to the growth rate of average wage, which means the remuneration of the employees is very important at the level of these companies.

**Figure 6. Growth rate of average wage and labour productivity in medium-high intensity companies, by type of ownership (%)**



Source: Authors' calculations based on NIS data, Romania.

In domestic companies, the wage level is also a very important factor for stimulating productivity of employees, considering the high level of wage share in these firms. The wage levels outrun the rest of benefits such as better working conditions, possibility to professional and personal development.

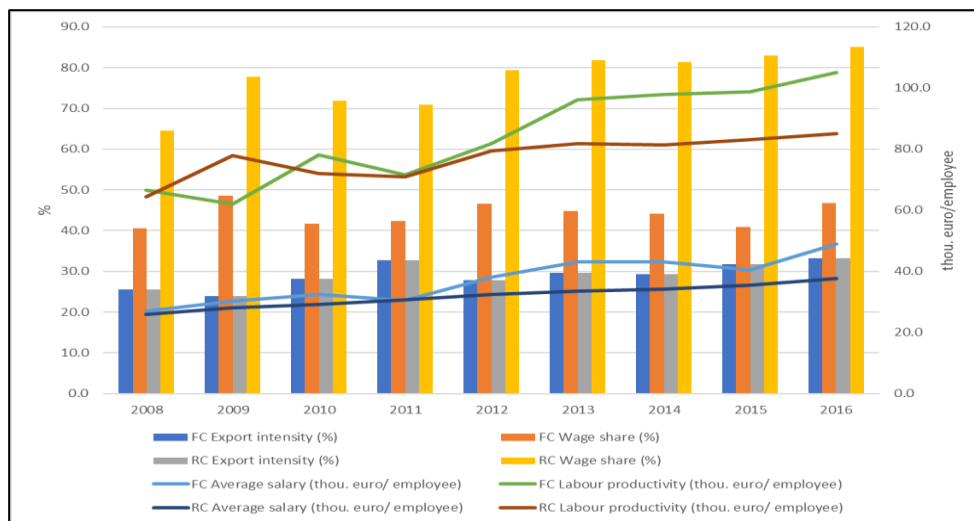
A higher wage share in total turnover in case of domestic companies reveals a low level of processing for exported goods. Wage share at the level of Romanian companies is higher compared to foreign firms, with a gap between the level of labour productivity and the average wage.

Foreign companies have more reserves for wage growth, so they can apply a stronger wage policy, because this does not affect their labour productivity. Although this reserve exists at the level of foreign capital companies, due to the difference between the productivity level and the average wage level, they do not apply the wage growth policy in Romania because they benefit from market opportunities and comparative advantages irrespective of wage policy, which is a determinant for wage growth.



Domestic firms cannot apply this kind of strategy, as labour productivity would be significantly reduced by increasing wages. The structure of the firm's expenses is different, the salaries paid representing an important part for these companies.

**Figure 7. Performance and productivity indicators by capital ownership, in medium-high intensity manufacturing sectors, in 2016**



Note: FC=Foreign capital companies, RC=Romanian capital companies

Source: Authors' calculations based on NIS data, Romania.

Foreign investment is also a multiplication factor in employment. The arrival of foreign capital in Romania after 1989 and the creation of economic activities with a high technological level produce a positive externality, that is the spill over effect through job creation. The difference between the salaries at the level of the two types of companies offer good opportunities for creating jobs even with lower wages. This represents, in fact, the segmentation of the labour market. The performance of foreign firms could not be achieved without the satellite companies created and developed around them. At the level of these small Romanian companies, jobs are created without social protection and without a clear professional perspective, being dependent on big multinational enterprises and their business plan.

Foreign companies do not leave Romania because of advantages, primarily the possibility of outsourcing profits. Romania needs to take measures to negotiate the benefits from the relationship with multinational enterprises because, at least for the

time being, Romania has no capacity to create new technologies, but it can only allow the technological transfer through imports. In the same time, foreign companies, without a correlation between the level of productivity and the level of wage offered to employees, would not be stimulated to create jobs. Therefore, it is necessary to find ways to ensure a balance between the opportunities offered by Romania and the benefits brought by the foreign companies, through their contribution to the national economic development.

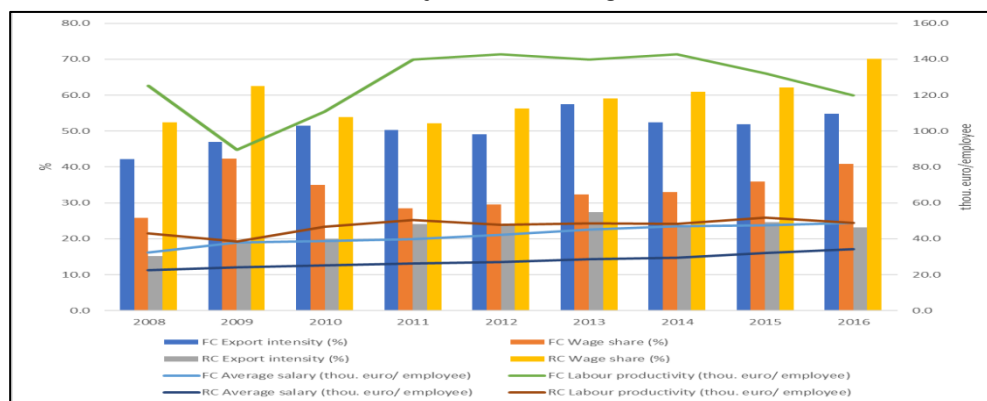
### Medium-low technology-intensive industries

As for the absorption of technological progress, the analysed statistical data reveals that the foreign companies benefit from two main advantages in Romania:

1. the use of cheap labour and the possibility of creating advantages in the value chain of the transnational company and
2. use the technological progress developed at the level of the multinational company in the country of origin (not in Romania) at a level that will ensure their competitiveness on the international market as well as on the national goods market.

Romanian companies functioning in technology-intensive sectors make great efforts to gain niche segments, based on a national technical progress, as they do not have the financial resources to import technology. Foreign firms operate on much larger markets and wages are higher than in Romanian companies, but not as large as they could offer, because they are stuck in the target of efficiency and price competition and of national level.

**Figure 8. Performance and productivity indicators by capital ownership, in medium-low intensity manufacturing sectors, in 2016**



Note: FC=Foreign capital companies, RC=Romanian capital companies

Source: Authors' calculations based on NIS data, Romania.

In Romania, there are no new high technology-intensive sectors, although there is a low level of innovation at national level, for example, the IT industry. Compared to the limited possibilities of Romanian firms, foreign companies apply a different policy and have another cost structure based on technology and much greater openness on the global market. The use of the cheap labour force in Romania, combined with the low wage level compared to other countries, for the same work done, leads to increase of the advantages of these companies at the national level while the national firms only lead the struggle for survival.

Compared to the previous analysed industries (high and medium-high technology-intensive industries), in the case of medium-low industries the differences between labour productivity and average salaries are much higher. In this category, the following industries are included: manufacture of refined petroleum products, plastic products, basic metals, metals products, building of ships and boats, repair of machinery and equipment. These are sectors which rely more on human expertise than technology, and the difference in labour productivity is generated by the much higher export intensity in case of foreign companies compared to domestic ones.

### Low intensity industries

Challenges in the low-tech sectors are huge, but companies do not develop business in line with market opportunities. Romanian companies have to try to change the valuing procedure of the business and how to efficiently combine the factors of production. At national level, not only high-tech intensive industries are needed but also medium-high ones, where national companies can have higher performance on the market from other comparative advantages than technology.

**Figure 9. Performance and productivity indicators by capital ownership, in low technological intensity manufacturing sectors, in 2016**



Note: FC=Foreign capital companies, RC=Romanian capital companies

Source: Authors' calculations based on NIS data, Romania.

The difference in wage share in case of these industries is not as high as in other industries based more on technology but the export intensity is rather low for Romanian companies. A national export strategy would need to consider also the potential of these sectors. Improved education and supporting professional schools by national sustainable programmes might help these sectors improve their competitiveness on national and external market.

## **Conclusions**

The technological intensity of the sector is directly linked with export intensity of the companies involved. External trade of Romania is mainly performed by foreign companies while domestic companies mainly act as satellites of the big multinational enterprises. The dependence of exports on foreign-owned companies is beneficial to the Romanian economy as long as Romania's economic area is part of the development strategy of those foreign companies. When this reality will change, either a reorientation of exports to new markets or a diversification of national supply to foreign markets will be necessary; all these drive the need to stimulate domestic firms to create and produce sustainable goods on the domestic and international markets.

The labour productivity on both types of companies is mainly determined by the level of technology used for production and the intensity of foreign trade activity. Foreign companies registered higher levels for both performance and productivity indicators.

The role of foreign companies in the economic development of a region and even of the economy cannot be disputed, their benefits being proved in time in many domains. However, there is a risk that, when the labour force generate higher costs for firms, either by applying the political and / or fiscal measures taken by decision-makers at national level, when labour supply will no longer be abundant due to its emigration to countries offering bigger wage or when the price of the national primary resources will increase due to their drastic reduction, these firms, which record high levels of productivity in Romania, will relocate their activity on other cheaper and resource-rich states. Then Romania will register spectacular cuts in export of goods, reductions corresponding to foreign trade weights by foreign firms. National policies of protectionist nature against primary resources will be needed to stop their use for the benefit of foreign firms alongside the degradation of the environment and the depletion of the regions where they still exist.

To keep foreign companies interested to develop businesses in Romania, especially in tradable goods and services sectors, requires firstly a good infrastructure, a high level of skilled labour, a stimulating business environment, reduced costs for transportation and other advantages linked with institutional developments and improvements, like good

corporate governance, less bureaucracy and corruption, a friendly business environment and permissive taxes system.

The export activity does not depend on the technological intensity of the economic branch but on the value chain in which the foreign capital companies are integrated. For Romanian companies active in medium-high branches, there is growing opportunity for export. High productivity in foreign firms is not based on a higher labour exploitation but on material consumption, as imports of specific goods to support export is made with higher prices.

Demographic movements affect international trade through its impact on countries' comparative advantage and demand for imports. The process of population aging, labour migration, and modernization of the education system will play a very important role in the coming years from the point of view of foreign trade.

Investments in physical infrastructure can facilitate the integration of new companies into international supply chains. Capital accumulation as well as the accumulation of knowledge and technologies associated with investments, especially foreign direct investment, may also allow the national economy to grow on the value chain by modifying the comparative advantage.

There are great opportunities for policy actions at national and regional level to reduce transport costs - improving the quantity and quality of transport infrastructure, introducing increased competition on transport routes and supporting innovation.

Finally, improving institutional quality, especially in terms of contract execution, can reduce the costs of foreign trade. Institutions are also a source of comparative advantage, and trade and institutions strongly influence each other.

## References

- Arpaia, A., E. Prez and K. Pichelmann. 2009. "Understanding Labour Income Share Dynamics in Europe", European Economy Economic Papers 379, May, European Commission, Brussels.
- Bentolila, S. and Saint-Paul, G. 2003. "Explaining Movements in the Labour Share", Contributions to Macroeconomics, Vol. 3, No. 1.
- Blinder, A.S. (2009). 'How many US jobs might be offshorable?', World Economics, vol. 2(10), pp. 41–78.
- Crisuolo, P., & Narula, R. (2008). A novel approach to national technological accumulation and absorptive capacity: Aggregating Cohen and Levinthal. The European Journal of Development Research, 20(1), 56–73
- David H. Autor, David Dorn and Gordon H. Hanson, (2015) Untangling Trade and Technology: Evidence from Local Labour Markets, The Economic Journal, 125 (May), 621–646. 2015 Royal Economic Society. Published by John Wiley & Sons, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

- Driver, C., and J. Muñoz-Bugarín. 2010. "Capital Investment and Unemployment in Europe: Neutrality or not?", *Journal of Macroeconomics*, Vol. 32, pp. 492-496
- Dunning, J. H., & Narula, R. (1996). *Foreign direct investment and governments: Catalysts for economic restructuring*. London: Routledge.
- Eurostat, High-tech classification of manufacturing industries, based on NACE Rev. 2 3-digit level [http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech\\_classification\\_of\\_manufacturing\\_industries](http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries)
- Feenstra, R.C. and Hanson, G.H. (1999). 'The impact of outsourcing and high-technology capital on wages estimates for the US, 1979–1990', *Quarterly Journal of Economics*, vol. 3(114), pp. 907–40.
- Grossman, G.M. and Rossi-Hansberg, E. (2008). 'Trading tasks: a simple theory of offshoring', *American Economic Review*, vol. 5(98), pp. 1978–97
- IMF, *World Economic Outlook*, April 2017, Drivers of Declining Labour Share of Income, <https://blogs.imf.org/2017/04/12/drivers-of-declining-labor-share-of-income/>
- International Labour Organization, Organisation for Economic Co-operation and Development with contributions from International Monetary Fund and World Bank Group, *The Labour Share in G20 Economies Report prepared for the G20 Employment Working Group Antalya, Turkey, 26-27 February 2015* <https://www.oecd.org/g20/topics/employment-and-social-policy/The-Labour-Share-in-G20-Economies.pdf>
- Kinoshita, Yuko (2011), *Sectoral Composition of FDI and External Vulnerability in Eastern Europe*, „IMF Working Paper”, 11/123, May
- Narula, Rajneesh, *Journal of World Business* (2017), *Multinational firms and the extractive sectors in the 21st century: Can they drive development?* John Dunning Centre for International Business, Henley Business School, University of Reading, RG6 6UD, United Kingdom
- OECD 2015 *The future of productivity* <https://www.oecd.org/eco/OECD-2015-The-future-of-productivity-book.pdf>
- Peluffo Adriana, (2015) *Foreign Direct Investment, Productivity, Demand for Skilled Labour and Wage Inequality: An Analysis of Uruguay*, Institute of Economics, School of Economics, University of the Republic, Uruguay, *The World Economy*
- Raurich, X., H. Sala and V. Sorolla (2012), "Factor shares, the price mark-up, and the elasticity of substitution between capital and labour", *Journal of Macroeconomics*, Vol. 34, No. 1, pp. 181-198.
- Ricardo, D. 1971 "Principles of political economy and taxation" (1971)
- Vasile V., Zaman Gh., „Macroeconomic impact of FDI in Romania”, *Procedia Economics and Finance* 3 (2012) 3 – 11 [https://ac.els-cdn.com/S221256711200113X/1-s2.0-S221256711200113X-main.pdf?\\_tid=ad932f4c-d75a-11e7-b022-00000aab0f01&acdnat=1512217192\\_7a727b467c5eafab4e79cb2ca29216c9](https://ac.els-cdn.com/S221256711200113X/1-s2.0-S221256711200113X-main.pdf?_tid=ad932f4c-d75a-11e7-b022-00000aab0f01&acdnat=1512217192_7a727b467c5eafab4e79cb2ca29216c9)
- Zaman Gh., Vasile V., Cristea A., „Sustainable Development Challenges and FDI Impact In Host Countries”, <http://anale.steconomiceuradea.ro/volume/2012/n1/065.pdf>
- World Trade Report 2013, C. Fundamental economic factors affecting international trade, [https://www.wto.org/english/res\\_e/booksp\\_e/wtr13-2c\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/wtr13-2c_e.pdf)
- Yanping Liu, (2018), *Capital Adjustment Costs: Implications for Domestic and Export Sales Dynamics*, Working Paper 18-04, University of Mannheim / Department of Economics, Working Paper Series