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Abstract

Macedonia, as a less developed post-transition country, has marked a moderate growing economic performance coupled with high and sustained unemployment during the past decade. In this context, fostering FDI has been promoted by the Macedonian government as one of the main instruments for generating employment and providing further economic development. Despite its relevance, the assessment of these policies effectiveness including the FDI effects on employment has received little attention by researchers and policymakers. Having in mind the above considerations, the aim of this paper is to assess the impact of FDI on employment in the Macedonian manufacturing sector.

The main assumption of research is that foreign investor would enter an industry where he anticipates comparative advantages and high returns. Besides FDI, as potential determinants of employment in the manufacturing sector are considered the personnel cost, gross operating surplus and relative personnel cost in Macedonia in comparison with Serbia as major regional competitor in attracting FDI. In order to assess the impact of FDI on employment in the manufacturing sector a single equation error correction model is applied, where dependent variable is differenced once, while independent variables are included both in one differenced and one lagged versions thus accounting for their short-run as well as long-run effects.

The results indicate that FDI and personnel costs are statistically significant factors that positively affect employment in the manufacturing sector, which due to their interaction might indicate higher productivity in the companies with FDI. In addition, the negative impact of the relative personnel cost per employee vis-à-vis Serbia on short-run reaffirms the assertion that FDI in the Macedonian manufacturing sector are mainly driven by efficiency seeking motives. In contrast, the gross operating surplus does not appear as statistically significant factor affecting employment in the manufacturing sector.

The results from the analysis can be used for deriving several policy recommendations. First, given that the relative personnel cost has only an impact in the short run, government should aim for an incomes policy that tries to increase wages in line with productivity and inflation in order to keep competitiveness but also an acceptable level of income. Taking into account that profits have no influence on employment change, it suggests a reconsideration of the actual taxation policy. In this context, a higher tax rate on profits might generate substantial revenues that can be used to subsidise FDI and to exert additional positive effect on employment.

Keywords: FDI, employment, manufacturing

1. Introduction

Although the process of transition has been successfully completed, Macedonia nowadays still struggles to achieve satisfactory economic performance. Following strong economic growth during the period 2002-2008 averaging 4.3%, the average GDP growth has declined to 2.1% per year since 2009. The main drivers of growth since 2009 have been construction, manufacturing and, wholesale and retail trade. In this context, it has been widely acknowledged that country has made significant progress in terms of its economic development, but efforts are still needed across a range of areas to generate economic growth that will create jobs and improve living standard¹. Moreover, the problem of high and sustained unemployment continues to be the most challenging issue which has been translated into substantial erosion of skills and motivation of unemployed workers.

In these circumstances the Macedonian Government has promoted FDI as one of the main instruments for increasing employment and providing further economic development of the country. In this regard, a number of policy measures have been undertaken in order to attract FDI. For instance, the fiscal burden has been gradually alleviated by diminishing the corporate tax rate and social security contributions. Namely, the corporate tax rate has been reduced from 15% in 2006 to 12% in 2007 and further to 10% in 2008. Similarly, during the period 2008-2012 the contribution for Pension and Disability Insurance Fund has dropped from 21.2% to 15%. During the same period the contribution for Health Insurance Fund has dropped from 9.2% to 6%, while the contribution for Employment fund dropped from 1.6% to 1%².

Moreover, in 2010 the Government has established the Agency for Foreign Investments and Export Promotion of the Republic of Macedonia which *inter alia* is in charge of attracting new foreign investments in the country and supporting the expansion of the foreign companies with already established operations. In this context, the Government has designed and promoted the campaign 'Invest Macedonia' and has engaged a dozens of economic promoters in several developed countries³.

In addition, the Macedonian Government has established several Technological Industrial Development Zones (TIDZ) as industrial free zones, whose primary goal is to assist in providing more efficient business climate in the country by attracting foreign and domestic capital, improving the competitiveness and increasing employment. Besides the tax and customs incentives normally associated with free economic zones, Macedonia offers additional investment incentives related to TIDZs. Moreover, TIDZs are considered as extraterritorial and free of most national customs, trade and financial regulations which ease the processing and handling of goods to and from the TIDZs.

With respect to the administrative procedures, the Government has introduced a 'One-Stop-Shop' System that enables investors to register their businesses within couple of hours after submitting application. In this context, one can register a company by visiting one office,

¹ <http://www.worldbank.org/en/country/macedonia/overview>

² Source: Ministry of Finance of the Republic of Macedonia (www.finance.gov.mk)

³ Source: Agency for Foreign Investments and Export Promotion of the Republic of Macedonia (www.investmacedonia.com);

obtaining the information from a single place, and addressing one employee, which significantly reduces administrative barriers and start-up costs.

Regarding the labour legislation, it is worth mentioning that recently enacted Labour Law provides increased flexibility of the labour market by offering and promoting flexible and different employment contracts and working time flexibility. On the other hand, attracting FDI has been criticised as a reason for government's engagement in a race to the bottom deregulation and worsening labour standards. Despite its relevance, the assessment of FDI effects on employment and human capital development in Macedonia has received little attention by researchers and policymakers.

In this context, a dilemma faced by developing countries including Macedonia is whether host authorities should expend public funds to attract manufacturing FDI by offering special support and providing subsidies (Moran, 2007). According to the Balkan Investigative Reporting Network (BIRN), during the period 2007-2015 the Macedonian government has spent about 150 million EUR for attracting FDI. However, the analysis of BIRN's database 'Foreign Investments Uncovered' points out that around one third of the announced investments have not been completed or have failed⁴. In addition, it shows that the number of workers employed as a result of these investments is three times fewer than announced by the government spokespeople.

It has been generally recognised that manufacturing sector is very important for every economy. This is particularly relevant with respect to creation of economic value and supporting additional jobs. In addition, its importance is reflected in the multiplier effect, which justifies why a strong and healthy economy requires a vibrant and growing manufacturing sector. In addition, when assessing the size and impact of the manufacturing sector in developing countries it is vital to recognise its capacity to attract FDI. Although FDI in the Macedonian manufacturing sector is important, there is an obvious gap in the analysis of its determinants as well as its employment implications.

Having in mind the above considerations, the aim of this paper is to assess the impact of FDI on employment in the Macedonian manufacturing sector. In particular, we would like to address the following research questions: What is the composition of FDI in the manufacturing sector in Macedonia? How did FDI in the manufacturing sector affect employment in the short and long run? What policy recommendations can be formulated in order to reshape the role of FDI in direction of improving employment generation in the manufacturing sector? Accordingly, the paper is structured as follows. In section 2 we provide the basic theoretical concepts related to FDI and their determinants with an accent to the FDI in the manufacturing sector. In this context, stylised facts about FDI flows to transition economies will be particularly emphasised. In section 3 we present the results from the empirical analysis. With this regard separate subsections are devoted to explanation of variables, descriptive analysis and econometric analysis. Finally, in section 4 we convey concluding remarks and attempt to formulate recommendations for future policy reforms aiming to attract FDI in the manufacturing sector.

⁴ <http://investicii.prizma.mk/mk>

2. Theoretical background

The FDI is defined as direct investment of a company in facility to produce or market product in a foreign country. Since, the foreign investments mark continuous global increase, they have gradually become one of the central topics in the academic and policy debates (UNCTAD, 2009). The FDI can be viewed as a greenfield investment which involves establishment of new plant in a foreign country or it can occur by acquiring or merging with existing firm in the foreign country. The FDI potentially brings benefits and costs for both host and home country. The main benefits of inward FDI for a host country arise from resource transfer effects, employment effects, balance of payments effects, and effects on competition and economic growth. On the other hand, the costs of FDI which concern the host country are the following: adverse effect on competition, adverse effect on the balance of payment, and possible loss of national sovereignty and autonomy (Hill, 2013).

The FDI are expected to exert shifts in labour demand in receiving countries manifested by higher employment and wages at least in the short-run (Axarloglou and Pournarakis, 2006). However, the net effect of FDI on employment would depend on the type of investments and ultimately on the balance between job-creation and job-displacing forces. Horizontal FDI are generally driven by market seeking motives and in this case there is a shift of production activities due to replacement of exports with host country production. On the other hand, the aim of vertical FDI is to minimise the production costs which improves the competitiveness of the multinational companies and implies their larger market shares (Johnson, 2005; Brincikova and Darmono, 2014).

The beneficial employment effects of FDI for the host countries can be either direct or indirect. The direct effect is considered as a job creation in the multinational affiliates in the receiving countries. Alongside with the direct effect, FDI can exert indirect effect through jobs created in local suppliers as a result of investment or higher level of consumption. For instance, by subcontracting a number of 'value chain' activities to local subcontractors who supply spare parts, components or semi-finished goods to the foreign company is expected a creation of extra jobs, which additionally increase the economic development of a host country (Dunning and Lundan, 2008). However, the theory is not decisive regarding the impact of FDI on the level of employment in the receiving countries. Namely, some authors point out that in the case of acquisitions, the employment might be reduced due to the intentions of multinational companies to restructure operations in the acquired unit and to improve its operating efficiency.

Having in mind the above considerations it becomes obvious the reason why accurately measuring the economic impact of FDI including the effects on employment becomes a challenging task. In order to estimate the impact of FDI on employment it is necessary first, to assess the direct and indirect employment associated with the operation of the foreign affiliates and second, to identify the next best alternative to such investment, and to estimate the employment associated with this alternative. The difference between the two is the employment effect of inward investment.

Apart from quantitative impact measured as net job creation, FDI exert qualitative effects on wages, job security, level of skills and labour productivity in receiving countries. The empirical

evidence shows that foreign affiliates generally pay higher wages than domestic firms in same activities; they tend to offer greater job security than domestic firms; they upgrade employee skills by investing in training; and, they generate technological spillovers for the local firms (Golejewska, 2001; Lipsey, 2004; OECD, 2008). The quality of jobs created by the FDI might be considered from both worker's and country's perspective (Javorcik, 2013). From the worker's perspective relevant characteristics of good jobs are the associated wage, promotion possibilities and job stability. From the country's perspective the quality that brings FDI are the following: technology and knowledge spillovers, increased aggregate productivity and increased competitiveness.

The evidence of both cross-country and over-time heterogeneity of FDI suggests that government policy may play an important role in shaping the size and composition of inward FDI flows. In this context, there is an open debate whether FDI cause a race to the bottom by deregulating employment protection and worsening labour standards in less developed countries striving to attract FDI (Olney, 2013). Moreover, the race to the bottom has been criticised as a reason for increased elasticity of demand for labour, which pushes wages downward toward subsistence levels in the global labour market (Mehmet and Tavakoli, 2003). Hence, the challenging task of the policy reforms that tackle FDI in less developed countries will be reconciliation of two opposed goals *i.e.* attracting FDI by simultaneously maintaining a satisfactory level of labour standards (Agusti-Panareda and Puig, 2015).

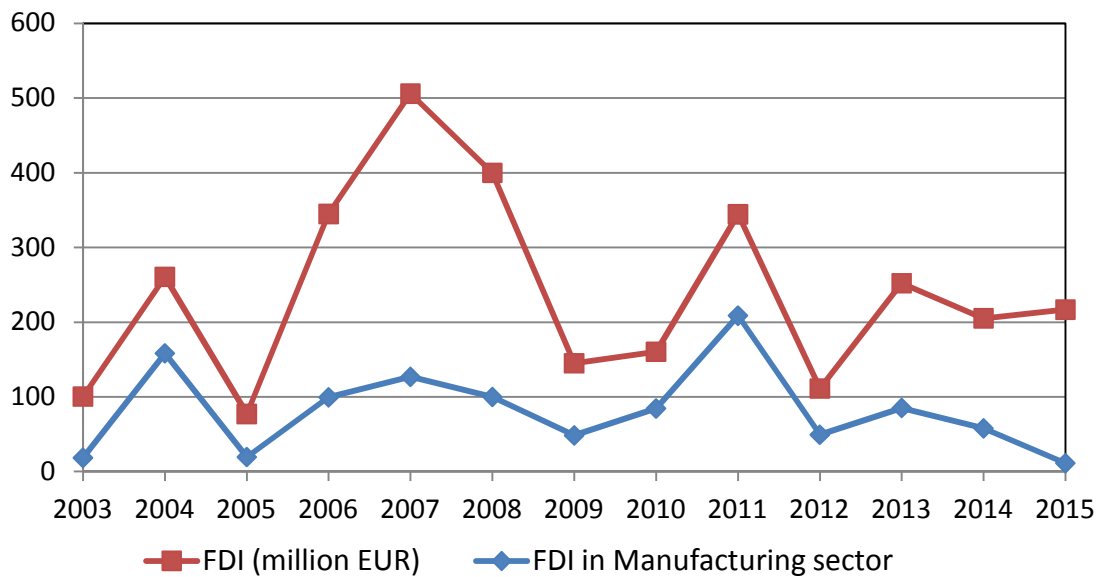
The stylised facts about transition countries show that FDI have been considered as a significant source of development since the outset of transition. However, the transition world has not been homogenous and both the level and growth of FDI differ across countries. For instance, Central and Eastern European countries (CEECs) advanced earlier in the process of transitional reforms and consequently attracted substantial foreign capital. In contrast, South-Eastern European countries also known as 'lagging reformers' in the process of transition lag behind CEECs in attracting FDI. One of the main reasons for low performance of the Balkan countries with respect to FDI inflows is the political instability which had negative economic implications for the whole region (Estrin and Uvalic, 2014). In addition, this group of countries lag behind in the process of EU integration which has been considered as an important precondition for larger FDI inflows (Penev and Rojec, 2014). With respect to the above mentioned race to the bottom hypothesis, in the case of transition countries some evidence shows that FDI flows are significantly higher in countries with relatively low unit labour cost, but statistically significant impact of employment protection legislation has not been found (Leibrecht and Scharler, 2009).

3. Empirical analysis

In spite of the heavily advertised campaign and a long list of incentives, Macedonia continues to score less FDI in comparison to other developing post-transition countries. For instance, the average FDI net inflows in Macedonia for the period 2007-2015 was around 4% of GDP, which is considerably lower compared to more advanced economies. As potential reasons why foreign investors are sensitive to investing in small developing economy such as Macedonia have been identified the following: market size, economic development and general growth prospects, business climate, overall infrastructure, regulatory and administrative issues (Krstevska and

Petrovska, 2012). The dynamics of total FDI inflows and FDI in the manufacturing sector in Macedonia during the period 2003-2015 is presented on Figure 1.

Figure 1. FDI net inflows in Macedonia 2003-2015 (million EUR)



Source: National Bank of Macedonia

From Figure 1 we can notice that the trend of FDI varies considerably from year to year with two noticeable declines from 2007 to 2009 and from 2013 to 2015. The former decline can be attributed to the effects of the global economic crisis, while the later might be due to the recent political instability in the country. From the macroeconomic perspective FDI in Macedonia predominantly occurs in the tradable sector which contributes to increasing the export potential of the economy. For instance, 35 percent of total export in 2011 was attributed to companies with FDI, whereas their participation in total import was around 21 percent. Hence, one can argue that FDI in Macedonia generally have positive impact on the trade balance and increase the coverage of imports by exports.

The dynamics of the FDI in manufacturing sector roughly follows the dynamics of the total FDI net inflows in the country. During the period 2003-2015 its average share in the total FDI inflows was around 38 percent, but in certain years (2004 and 2011) it reached 60 percent. With this regard, Macedonia shares similar characteristics with other Western Balkan countries in attracting FDI such as relatively low labour cost complemented by relatively educated population (Sanfey et al., 2016; Bitzenis et al., 2007). In addition, it is worth mentioning that almost all countries in the region have set up favourable regulation and structural policies for investment promotion which to some extent, make them competitors in attracting FDI particularly in the manufacturing sector (Gabrisch et al., 2016). In this context, having in mind the structural characteristics and geographic proximity, Serbia can be considered as a major regional competitor of Macedonia in attracting FDI in the manufacturing sector.

3.1 Variables under consideration

In our analysis we pay attention to inward FDI in the manufacturing sector defined as investments of legal and natural persons from abroad in domestic business entities with whom it is acquired long-term interest and where, the foreign investor owns at least 10% of total business entity's value. The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise, as well as a significant degree of influence on the management of the enterprise. The direct or indirect ownership of 10% or more of the voting power of an enterprise resident in one economy by an investor resident in another economy is evidence of such a relationship. Since 2003, the statistics of FDI stocks and flows in Macedonia have been in charge of the National Bank of the Republic of Macedonia (NBRM) which provides decomposition of the FDI into the following components: Equity, Reinvested earnings and Debt instruments. In addition, the FDI data are in accordance with the Balance of Payments and International Investment Position Manual (IMF, 2009; OECD, 2008).

As a source of data for employment and other control variables we use the structural business statistics in the manufacturing sector provided by the National Statistical Office. These statistics describe the structure, conduct and performance of businesses according to the NACE rev.2 classification. More precisely, we consider the following variables: Number of employed persons (EMP), Personnel costs (PER), Gross operating surplus (GOS), and Relative personnel cost between Macedonia and Serbia. In what follows we briefly describe each of these variables.

Number of persons employed (EMP) is defined as a number of persons with employment contract and paid a salary or other type of compensation by the employer. This variable represents the stock of employment in the given subsector and encompasses both the domestic firms and foreign affiliates. By considering the entire number of employed in the manufacturing sector we attempt to assess the direct and the indirect effect of FDI on employment.

Personnel costs (PER) are defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the reference period. Personnel costs are made up of wages, salaries and employers' social security costs. They include taxes and employees' social security contributions retained by the employer, as well as the employer's compulsory and voluntary contributions.

Gross operating surplus (GOS) can be defined as a balancing item in the generation of income account representing the excess amount of money generated by incorporated enterprises' operating activities after paying labour input costs. In other words, it is the capital available to financial and non-financial corporations which allows them to repay their creditors, to pay taxes and eventually to finance all or part of their investment.

Relative personnel cost (MK/RS) represents the ratio between the personnel cost per employee in Macedonia vis-a-vis Serbia as a major regional competitor in attracting FDI in the manufacturing sector.

3.2 Descriptive analysis

The manufacturing sector comprises any industry that makes products from raw materials by the use of manual labour or machines and is engaged in the mechanical, physical or chemical transformation of materials, substances or components into new products. The manufacturing sector is very diverse, combining activities with different levels of labour productivity and average personnel costs. According to NACE rev. 2 classification the manufacturing sector is composed of 24 different subsectors. From the point of view of FDI inflows in Macedonia not all subsectors are equally relevant, since in some of them FDI are either negligible or do not occur at all. In addition, the data on FDI in the manufacturing sector are available only on aggregate level for 13 groups of subsectors. The structure of the groups of subsectors used for this analysis is presented in Table 1.

Table 1. Structure of the groups of manufacturing subsectors

Group of subsectors	NACE rev.2 Divisions
1. Food products, beverages and tobacco products	C10 Manufacture of food products
	C11 Manufacture of beverages
	C12 Manufacture of tobacco products
2. Textiles and wearing apparel	C13 Manufacture of textile
	C14 Manufacture of wearing apparel
3. Wood, paper, printing and reproduction	C16 Manufacture of wood an products of wood
	C17 Manufacture of paper and paper products
	C18 Printing and reproduction of recorded media
4. Coke and refined petroleum products	C19 Manufacture of coke and refined petroleum products
5. Chemicals and chemical products	C20 Manufacture of chemicals and chemical products
6. Basic pharmaceutical products and pharmaceutical preparations	C21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
7. Rubber and plastic products	C22 Manufacture of rubber and plastic products
8. Basic metals and fabricated metal products	C24 Manufacture of basic metals
	C25 Manufacture of fabricated metal products
9. Computer, electronic and optical products	C26 Manufacture of computer, electronic and optical products
10. Machinery and equipment	C28 Manufacture of machinery and equipment
11. Motor vehicles, trailers and semitrailers	C29 Manufacture of motor vehicles, trailers and semitrailers
12. Other transport equipment	C30 Manufacture of other transport equipment
13. Total of other manufacturing	C15 Manufacture of leather and related products
	C23 Manufacture of other non-metallic mineral products
	C27 Manufacture of electrical equipment
	C31 Manufacture of furniture
	C32 Other manufacturing
	C33 Repair and installation of machinery and equipment

Source: NACE Rev.2 Statistical classification of economic activities in the European Community

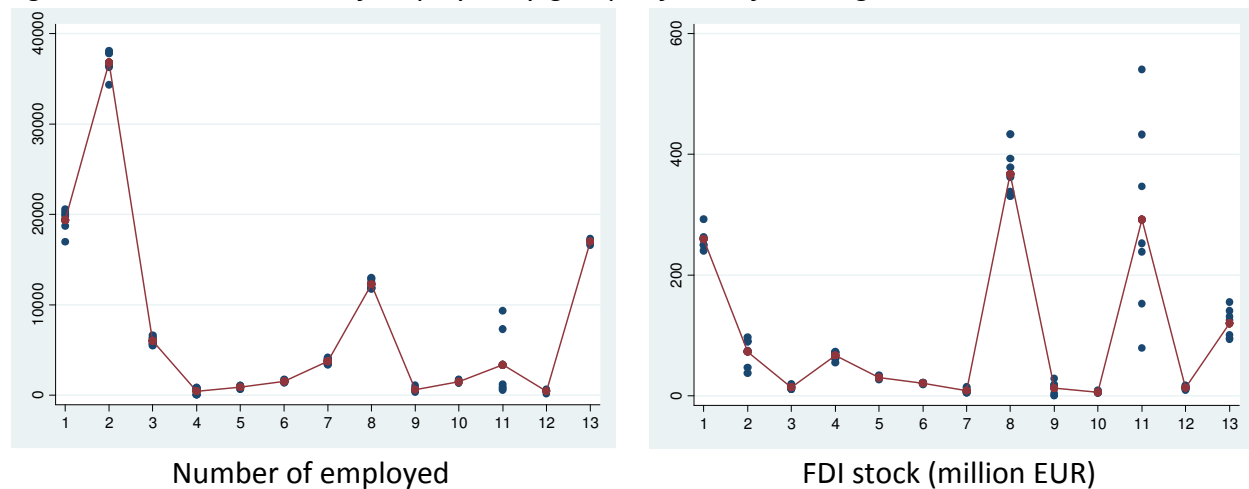
Therefore, the empirical analysis will be based on a balanced panel of 13 groups of manufacturing subsectors over the period 2009-2015. The summary statistics of the variables under consideration are presented in Table 2, while Stata output is given in Appendix 1.

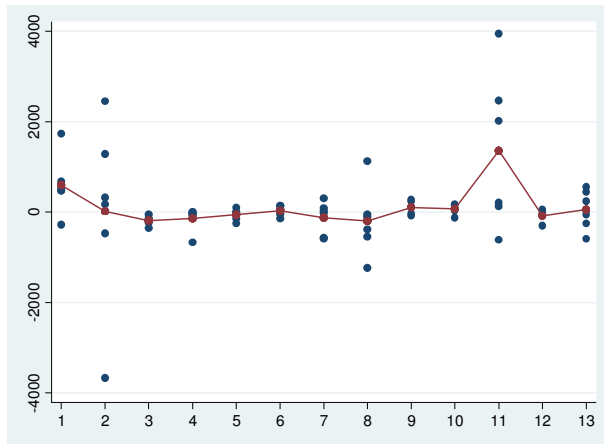
Table 2 Summary statistics

Variable		Mean	Std. Dev.	Min	Max	Observ.
EMP	overall	8004.297	10516.18	40	38105	N=91
	between		10829.24	450	36829.57	n=13
	within		1065.68	5216.725	13994.73	T=7
FDI stock (million EUR)	overall	98.74835	128.2952	0	540.9	N=91
	between		124.8384	6.228571	367.2571	n=13
	within		43.7493	-114.0802	347.7198	T=7
PER (million EUR)	overall	32.92415	36.16954	.1447154	133.4228	N=91
	between		36.65657	3.104065	111.4859	n=13
	within		7.35605	13.92275	66.06724	T=7
GOS (million EUR)	overall	36.57541	42.6561	-21.2374	199.5837	N=91
	between		39.4156	.3261324	129.8623	n=13
	within		19.2231	-27.47755	164.2639	T=7
PER(MK)/PER(RS)	overall	.7408669	.1952774	.1409755	1.392069	N=91
	between		.1713126	.3754406	1.048514	n=13
	within		.1036427	.407992	1.084422	T=7

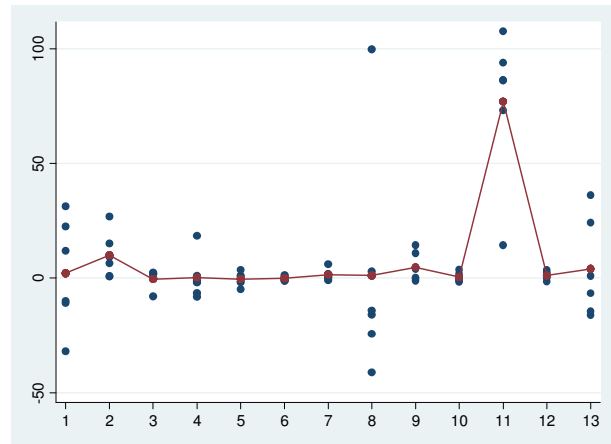
From Table 2, it can be noticed that average annual increase of FDI stock is 7.83 million EUR per group of manufacturing subsectors, while the average annual increase of employment is 113 employed per group of manufacturing subsectors. The average personnel cost is 32.92 million EUR, while the average Gross operating surplus is 36.57 million EUR, the later being characterised with higher heterogeneity, since in some cases it takes negative values. The average relative personnel cost in Macedonia with respect to Serbia is 0.74, which might indicate a regional advantage in attracting FDI in the manufacturing sector. In addition, we graphically present the stocks of FDI and the number of employed, as well as the change in the FDI stock and in the number of employed in each of the 13 groups of manufacturing subsectors for the period 2009-2015.

Figure 2. FDI and Number of employed by groups of manufacturing subsectors





Change of the number of employed



Change of FDI stock (million EUR)

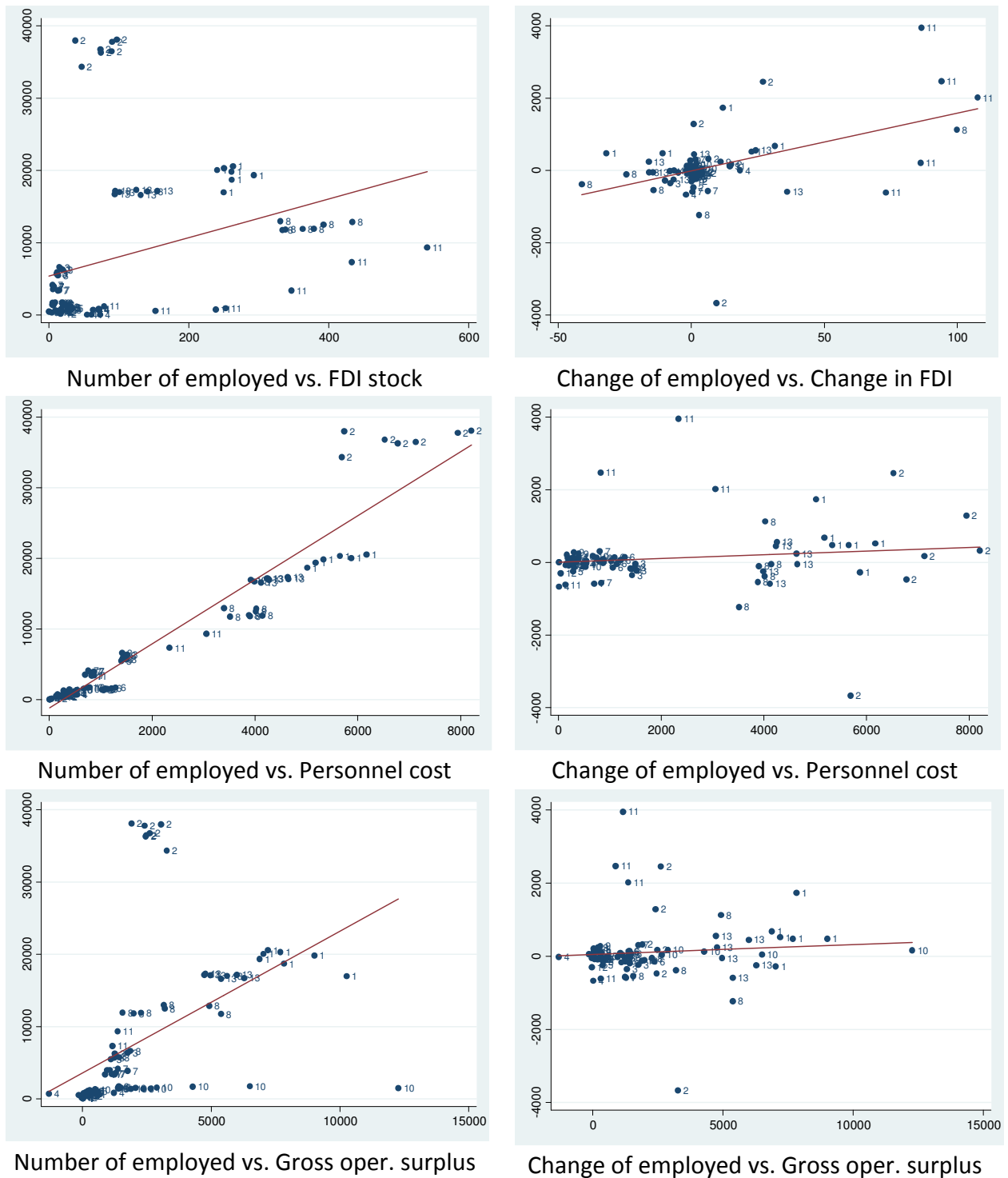
The analysis of employment by groups of subsectors shows that the largest number of employees absorbs the subsector of Textiles and wearing apparel which represents about 44 percent of the total number of employees in the manufacturing sector, followed by the subsector of Food products, beverages and tobacco products; and Basic metals and fabricated metal products. Furthermore, from Figure 2 we observe significant FDI stocks in the following groups of manufacturing subsectors: Basic metals and fabricated metal products; Motor vehicles, trailers and semitrailers; Food products, beverages and tobacco products. However, the highest growth of employment as well as increase of FDI stock has been noticed in the automotive industry mainly due to the openings of dozen foreign subsidiaries during the period 2007-2015⁵.

3.3 Econometric analysis

Taking into account the Macedonian moderate resource endowments and modest market size, we assume that FDI in Macedonia mostly occur as a result of efficiency seeking motives *i.e.* a foreign investor would enter an industry where he anticipates comparative advantages and high returns. Firms will be most likely to invest in industries where labour cost is low relative to producing elsewhere. As elaborated above, we consider the relative personnel cost in Macedonia in comparison with Serbia as major regional competitor in attracting FDI. It is argued that the unit labour cost is a combined influence of wages and productivity what matters for the competitiveness of industries based on high labour intensities. Hence, a relationship between the labour cost and FDI induced employment is complex and needs to be assessed in absolute as well as in relative terms. On the other hand, the profit can be considered as a proxy for general competitiveness. In this context, FDI should be attracted by more profitable firms or the presence of FDI can spill over to higher profits. The relationships between numbers of employed and change in the numbers of employed with respect to the control variables are visualised in Figure 3 by using scatter plots.

⁵ This finding corroborates with the data gathered from BIRN database 'Foreign Investments Uncovered' according to which about one half of the greenfield FDI in Macedonia during the period 2007-2015 occurred in the automotive industry. Moreover, during the same period more than two thirds of new job openings in the companies with greenfield FDI are attributed to this manufacturing subsector.

Figure 3. Scatter plots among the variables under consideration



From the scatter diagrams in Figure 3 we can observe that there is no clear positive association between the number of employment and FDI stock in the groups of manufacturing subsectors, while positive relationship is more evident between the net change of the number of employed and change of FDI stock. In this context, the automotive industry appears as main generator of employment growth which might be attributed to the increase of FDI stock. In contrast, the

relationship between the stock of employment and the value added components (Personnel cost and Gross operating surplus) is positive, while this cannot be observed when it comes to the relationship between the net change in employment and the value added components.

In order to assess the impact of FDI on employment in the manufacturing sector we further apply a dynamic specification by modelling the net change of the number of employed in subsector i in year t as a dependent variable of the amount of FDI and other control variables in the previous year. In this context, we account for the short-run as well as for the long-run effects of independent variables on the change of employment in the manufacturing sector. For this purpose we apply a single equation error correction model, where dependent variable is differenced once and independent variables are included both in one differenced and one lagged versions. The differenced independent variables pick up the immediate effects of their changes, while the lagged variables represent the long-run effects of independent variables on employment change.

In order to choose between a model with fixed or random effects, we run Hausman test where the null hypothesis states that the preferred specification is a model with random effects vs. the alternative model with fixed effects. It basically tests whether the unique errors are correlated with regressors and, according to the null hypothesis they are not. Since the p-value of the Chi-square test-statistics is close to zero, we can reject the null hypothesis and conclude that the correct specification is a model with fixed effects (Appendix 2). We use subsector fixed effects because there are unobserved peculiarities of each subsector that would distort the comparison between subsectors.

Hence, the specification of the model is as follows:

$$\Delta EMP_{i,t} = \alpha + \rho EMP_{i,t-1} + \beta_1 \Delta \mathbf{X}_{i,t} + \beta_2 \mathbf{X}_{i,t-1} + \theta_i + u_{i,t} \quad \dots (1)$$

where,

$EMP_{i,t}$ is the number of employees in subsector i in year t

$\mathbf{X}_{i,t}$ is a vector of control variables in subsector i in year t

θ_i are subsector fixed effects

$u_{i,t}$ is the error term

Besides the FDI, as independent variables for employment in the manufacturing sector will be considered Personnel costs (PER) and Gross operating surplus (GOS). The β_1 is a vector of coefficients for a short-run effects of changes on independent variables, while β_2 is a vector of coefficients for last year's values of the independent variables. In order to calculate the long-run effect of the independent variables, β_2 is divided by $-\rho$ (De Boef and Keele, 2008). The estimation results are presented in Table 3.

Table 3. OLS estimation (dependent variable ΔEMP)

Variable	1	2	3	4	5	6	7	8
Constant	2651.619*** (0.005)	2621.316** (0.020)	3531.959*** (0.000)	2681.639*** (0.000)	2535.168*** (0.000)	2464.574*** (0.000)	3432.806*** (0.000)	2575.925*** (0.000)
EMP _{t-1}	-.7181924*** (0.000)	-.7442917*** (0.000)	-.7522358*** (0.000)	-.6794818*** (0.000)	-.7107404*** (0.000)	-.7124225*** (0.000)	-.7519195*** (0.000)	-.6811818*** (0.000)
ΔFDI_t	8.853344*** (0.000)	8.587094*** (0.000)	4.484242** (0.043)	6.850085*** (0.001)	7.090634*** (0.002)	6.818921*** (0.002)	2.939784 (0.655)	5.178464** (0.019)
FDI _{t-1}	8.124826*** (0.000)	8.19364*** (0.000)	1.50279 (0.500)	7.37162*** (0.000)	7.489195*** (0.000)	7.314493*** (0.000)	.9973699 (0.249)	6.947294*** (0.000)
ΔPER_t	126.2785*** (0.000)	124.2036*** (0.000)	102.577*** (0.000)	141.1209*** (0.000)	138.2789*** (0.000)	138.9494*** (0.000)	113.7918*** (0.000)	151.5776*** (0.000)
PER _{t-1}	64.86235*** (0.000)	68.75065*** (0.000)	48.59789*** (0.000)	64.74174*** (0.000)	69.48838*** (0.000)	70.56776*** (0.000)	54.75499*** (0.000)	70.94192*** (0.000)
ΔGOS_t		2.740638 (0.169)				2.112002 (0.319)		
GOS _{t-1}		3.066343 (0.338)				.9626744 (0.781)		
$\Delta FDI_t \times \Delta PER_t$			1.051727*** (0.000)				1.052945*** (0.000)	
FDI _{t-1} × PER _{t-1}			.1055109*** (0.008)				.1037613*** (0.007)	
$\Delta [PER(MK)/PER(RS)]_t$				-927.0115** (0.014)				-941.5749** (0.012)
$[PER(MK)/PER(RS)]_{t-1}$				-356.0465 (0.401)				-336.764 (0.415)
2011					60.13628 (0.596)	116.6855 (0.326)	37.65171 (0.705)	52.22637 (0.629)
2012					-18.24387 (0.875)	21.14363 (0.862)	-17.31719 (0.864)	-45.14885 (0.684)
2013					12.68378 (0.915)	51.86778 (0.681)	-5.459008 (0.958)	-11.62874 (0.918)
2014					-231.7025* (0.053)	-202.304 (0.113)	-241.6953** (0.022)	-242.2975** (0.035)
2015					-48.21212 (0.711)	-18.04917 (0.892)	-80.02694 (0.486)	-103.353 (0.412)
R ² within	0.9024	0.9059	0.9252	0.9132	0.9145	0.9185	0.9371	0.9255
R ² between	0.0265	0.0263	0.0118	0.0280	0.0268	0.0268	0.0117	0.0286
R ² overall	0.0380	0.0372	0.0252	0.0435	0.0410	0.0414	0.0268	0.0468

Note: p-values are in parentheses; */** indicate significance at 10/5/1 percent level respectively.

From the estimated baseline specification of the error correction model we can draw several conclusions. As expected, the change in FDI stock has positive and statistically significant impact on the change of number of employed, which is observed on the short-run and the long-run as well. An increase of FDI stock by one million EUR in a given group of manufacturing subsectors would increase the number of employed by almost 9. By dividing β_2 coefficient with $-\rho$ we obtain that the long-run effect of FDI, which is about 30 percent greater than the short-run effect on employment. Furthermore, the personnel cost exerts positive and statistically significant impact on employment in both the short and long-run in all specifications. An increase of the personnel cost by one million EUR is associated with an increase of the number of employed by 126. The long-run effect of personnel cost on employment is around 30 percent lower than the estimated short-run effect. Besides the baseline model specification 1, in order to control for robustness we run several other specifications by introducing as control variables Gross operating surplus (specification 2), interaction term (specification 3), relative personnel cost (specification 4) and time dummy variables (specifications 5-8).

From specification 2 of the estimated error correction model we can notice that the gross operating surplus does not appear as statistically significant explanatory variable of the change in the number of employees in the manufacturing sector. In addition, the impact of interaction terms between FDI and personnel cost as estimated in specification 3 is positive and statistically significant. This implies that higher wages are associated with stronger effects of FDI on employment which might reflect greater productivity in the companies with FDI. Moreover, from specification 4 the relative personnel cost in Macedonia with respect to Serbia as expected exerts negative and statistically significant effect on employment in the short-run which confirms the assumption that FDI in the Macedonian manufacturing sector are mainly driven by efficiency seeking motives. However, the relative personnel cost in the long-run does not appear as statistically significant determinant of employment.

The explanatory power measured by the within coefficient of determination in all specifications is more than 0.9. In contrast, the between coefficient of determination is much smaller, which corroborates with the choice of the model with fixed effects. Due to this difference, the overall coefficient of determination is small and varies between 0.025 and 0.04. Moreover, the calculated F-statistics in all specifications point out to the overall statistical significance of the estimated error correction model.

In order to control for the time dimension, we estimate the model specifications 5-8 by including time dummy variables. The quantitative factors in the one-way fixed effects model retain their sign and significance in the two-way fixed effects model. In addition, the time effects are not jointly significant, suggesting that they should not be included in a properly specified model. Otherwise, the model specifications with time dummy variables are qualitatively similar to previous specifications with a sizable amount of variation explained by the individual fixed effect.

The criticism regarding our modelling approach, as stressed by Hale and Xu (2016) arises from the fact that greater productivity in the sectors with higher FDI increase might be due to the so called “cherry-picking effect”. Namely, foreign investors are expected to invest in those sectors that would be more productive regardless of foreign investment. This creates a positive

association between FDI and post-FDI productivity without actually having any casual effect. The problem of cherry-picking further extends to labour market effects of FDI because firms that are more productive also tend to have higher wages and grow faster relative to their peers. Moreover, the cherry-picking effect persists at more aggregate level if industries with faster growing firms are more likely to attract FDI, it would appear that these industries have higher employment and wages than others even if FDI does not have any impact.

4. Conclusions and policy recommendations

Having in mind the identified lack of research in the domain of FDI and their impact on the labour market outcomes in Macedonia, with this research we intend to fill this gap by examining how FDI contribute to generating employment in the manufacturing sector. By using the above outlined methodological approach, we come up with a clearer picture about the effects of FDI on the change of employment in the manufacturing sector for the period 2009-2015. According to the analysis, the conclusions can be summarised as follows.

First, we have identified a considerable heterogeneity among various groups of manufacturing subsectors with respect to FDI attraction and employment generation. In this regard, the diversity of the Macedonian manufacturing sector offers a wide range of opportunities for investors and allows human capital development to expand in many different directions. On the other hand, the development of the so-called 'strategic' branches such as automotive industry helps in building competitive advantage and getting momentum for accelerating FDI inflows.

Furthermore, the FDI and personnel costs are statistically significant factors that positively affect employment in the manufacturing sector, which due to their interaction might indicate higher productivity in the companies with FDI. Generally, firms in the manufacturing sector experience higher productivity growth than in the rest of the economy despite the fact that Macedonian manufacturing sector is largely dominated by low-tech industries. In addition, the negative impact of the relative personnel cost per employee vis-à-vis Serbia on short run reaffirms the assertion that FDI in the Macedonian manufacturing sector are mainly driven by efficiency seeking motives. This is somewhat expected having in mind the labour intensive character of the Macedonian manufacturing sector. In contrast, the gross operating surplus does not appear as statistically significant factor affecting employment in the manufacturing sector.

Although Macedonian government has already undertaken significant policy reforms aiming to attract FDI, there is still room for making further improvements. In this context, we propose several policy recommendations that would improve the employment effects of the FDI inflows in the manufacturing sector. First, given that the relative personnel cost has only an impact in the short run but not in the long run, government should aim for an incomes policy that tries to increase wages in line with productivity and inflation in order to keep competitiveness but also an acceptable level of income. Furthermore, we expect an increase of employment via income effect as a consequence of increased consumption. Taking into account that profits have no influence on employment change, we suggest a reconsideration of the actual taxation policy. In this context, a higher tax rate on profits might generate substantial revenues that can be used

to subsidise FDI and to exert additional positive effect on employment. Hence, more efforts need to be done with respect to setting up the rules for providing fair treatment of domestic and foreign investors. The FDI attraction has to be prudent with respect to their greater absorption potential for intellectual labour and better synergy with the domestic conjuncture.

In addition, we recommend that government policies aiming to attract FDI and increase employment should focus on further improvement of investment climate, but not on the expense of worsening labour standards. Namely, improving the business climate alone is still not sufficient to attract more FDI, which is corroborated by the fact that recent good ranking in the World Bank's Ease of Doing Business has not been associated with substantial FDI inflows. The policies on the supply side of the labour market should embrace appropriate reforms of the education system including both the vocational education and training and higher education that will anticipate the perspective demand for skills and potential skills shortages. By accounting that Macedonia has small market potentials and is not abundantly endowed with resources, the further advancement in the process of EU integration is expected to be the main driver of FDI inflows in the future. Moreover, the long-term prospect of membership generates substantial funding mainly in the form of the Instruments for Pre-Accession Assistance for supporting further reforms.

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Appendix 1

Summary statistics of the variables under consideration

```
. xtsum emp fdi per gos ms
```

Variable		Mean	Std. Dev.	Min	Max	Observations
emp	overall	8004.297	10516.18	40	38105	N = 91
	between		10829.24	450	36829.57	n = 13
	within		1065.687	5216.725	13994.73	T = 7
fdi	overall	98.74835	128.2952	0	540.9	N = 91
	between		124.8384	6.228571	367.2571	n = 13
	within		43.74936	-114.0802	347.7198	T = 7
per	overall	32.92415	36.16954	.1447154	133.4228	N = 91
	between		36.65657	3.104065	111.4859	n = 13
	within		7.356057	13.92275	66.06724	T = 7
gos	overall	36.57541	42.65614	-21.2374	199.5837	N = 91
	between		39.4156	.3261324	129.8623	n = 13
	within		19.22315	-27.47755	164.2639	T = 7
ms	overall	.7408669	.1952774	.1409755	1.392069	N = 91
	between		.1713126	.3754406	1.048514	n = 13
	within		.1036427	.407992	1.084422	T = 7

Appendix 2

Hausman test

```
. hausman fixed random
```

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
L.emp	-.7181924	-.110924	-.6072684	.0565735
dfdi	8.853344	4.54857	4.304774	.
L.fdi	8.124826	-1.345999	9.470825	1.396651
dper3	126.2785	175.6778	-49.39928	.
L.per3	64.86235	27.07472	37.78763	2.931005

```

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

```

```
Test: Ho: difference in coefficients not systematic
```

```

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 135.99
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

```