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THESES OF THE DISSERTATION

Sándor Csengődi
Foreign Capital and Wages in Hungary
Ph.D. dissertaiton

Supervisor:
András BlahóCSc
professor

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I. Background of the research

I.1. The effects of foreign direct investments

At the end of the 20th century the international flow of capital accelerated significantly, with the volume of Foreign Direct Investment (FDI) the role and importance of this type of capital also grew in the host economies. Foreign direct investments may have varying effects on the income-producing ability of the given economy, on its market relations and on the standard of living depending on the characteristics of the host economy, of its markets and the nature of the political-economic regulation. They may ensure additional resources for the investments that promote the development of the host economy, expand the employment opportunities, and through operating capital investments the participants in the host economy – either directly or indirectly – may gain access to new markets or to modern technologies, enterprise management, organisation and marketing know-how. Simai [2000], however, calls attention to that “the interests of the host countries in improving the performance of their economies and the interest of international corporations [...] are not necessarily one and the same. Szentes [1999] highlights that besides the advantages of foreign direct investments outlined previously, they may also carry with them potential disadvantages for the country receiving the foreign capital.

Navaretti and Venables [2004] highlight competition, changes to factor demand and factor price, and technology spillover effects as main “channels”, mechanisms transmitting the effects of the foreign direct investments in the host economy. The effects arising through the above mentioned channels may be both positive and negative depending on the characteristics of the host economy and on the nature of capital invested and the motivation behind the investments.

A significant proportion of the empirical research carried out examining the effects of FDI place the relationship between foreign presence and company productivity at the centre of their field of interest. All of the most recent results confirm the technology spillover effects both vertically (Markusen and Venables [1999], Lin and Saggi [2007], Halpern and Muraközy [2007], Blalock and Gertler [2008]), and horizontally (Javorcik [2004]) in the host economies, providing evidence of the existence of a channel mediating the potential positive effects of FDI.

The effects of FDI, however, may be mediated in parallel by several channels at the same time, so it may happen that the positive effects mediated through the one channel may be damaged by the negative effect realised through a different channel. It is necessary and desirable, therefore, to also examine the other channels as well as the effects of FDI realised through them. This study was written with the aim of identifying the effects realised through the changes to another channel mentioned by Navaretti-Venables [2004] that mediates the effects of FDI, factor prices – and within this the price of labour as production factor.

I.2. FDI and earnings

It has been know of for a long time that foreign-owned companies pay higher wages to their employees. Dunning and Morgan [1980], after correcting for differences at the industry level, confirm the observation published in the 1973 annual report of the U.S. Tariff Commission, according to which the multinational enterprises (MNEs) operating in the United States of America and Canada pay higher wages to their employees than the domestic enterprises. Aitken et al. [1996] show that foreign-owned companies pay higher salaries in Mexico and Venezuela than the domestically owned companies and that the rise in wage level spills over, Lipsey and Sjöholm

[2004] prove that in Indonesia the presence of foreign enterprises causes the aggregate level of wages to grow. The results of investigations¹ performed in several different countries suggest that the foreign wage premium is a real phenomenon irrespective of the level of development of the countries in question.

It can be read frequently that foreign-owned companies are concentrated in more productive sectors with knowledge-intensive production, they use superior technology, and employ highly qualified and productive workers to a higher proportion than their domestically owned competitors. Therefore, research can come to misleading results if – while analyzing the wage premium – one does not control sufficiently for the differences that may be found in the sizes of companies, in sector characteristics and productivity and, over and above these, the differences in employee composition. The majority of research work examining wage differences in a foreign-domestic ownership specific context draw conclusions from enterprise-level observations, due to this during the analysis the possible effects on wage differences of company characteristics may be controlled sufficiently but the difference deriving from employee composition of the individual companies and variations in the individual characteristics of employees are, however, not. As the individual characteristics of employees has a great influence on their productivity and so on the development of their wages, investigations that leave these largely out of consideration and are bases solely on company-level data significantly overestimate the wage premium paid by foreign-owned companies (this is proved in the most illustrative way by the study carried out

¹ Doms and Jensen [1998], and Feliciano and Lipsey [1999] in the United States of America, Globerman, Ries and Vertinsky [1994] in Canada, Conyon et al. [2002] and Girma et al. [2001] in the United Kingdom, Görg et al. [2007] in Ghana, Te Velde and Morrissey [2001] in four other African countries, Huttunen [2007] in Finland, Almeida [2007] in Portugal, and Kertesi and Köllő [2001], Csengódi et al. [2008] and Earle and Telegdy [2008] In Hungary.

by Heyman et al. [2007], presenting that a positive and significant foreign wage premium based on company data controlled for individual characteristics becomes negative.

Linked employee-employer datasets are more suitable for the examination of ownership-specific wage differences. However, analyses performed on these type of data that allows controlling for characteristics of both employees and their employer more in detail, report much lower wage premiums than company-level studies and present mixed evidence. While Heyman et al. [2007] in Sweden show that foreign ownership results in lower wages and a lower rate of wage growth, Huttunen [2007] presents 2-4% wage premium in Finland, Almeida [2007] found a 2-4% foreign wage premium in Portugal, which, however, may only be observed in the manufacturing industry. Csengödi et al. [2008] report a 15-17% foreign wage premium among Hungarian manufacturing industry employees, Earle – Telegdy [2008] show a general foreign wage premium of 14% in Hungary. On the basis unpublished results (most of them working papers) MalchowMoller et al. [2006] in Denmark and Martins [2004] in Portugal do not find significant foreign premiums, contrary to this Pesola [2007] reports an actual foreign wage premium among well-educated workers in Finland.

The Swedish example of Heyman et al. [2006] calls attention to that it is also important to analyse the wage premium distribution among different types of employees, as in their article referred to above (Heyman et al. [2007]) the negative foreign wage premium related to the entire economy only occurs in the case of employees with a low level of education/low skilled employees, while employees with high qualifications/high skilled employees, and top managers realise an actual and significant wage premium.

I.3. The effects of FDI wages in the host economy

In the different wage payment practice of foreign-owned companies we can identify a possible channel that mediates the effects exerted by FDI on the host economy. In order to find the effects and evaluate them it is necessary to perform a more thorough examination, analysis of wage premium, as several theoretical explanations exist for the phenomenon of the wage premium paid by foreign-owned companies, with varying standard-of-living implications.

a.) the positive effects associated with evolution of the wage premium:

- **Structural change and adjustment:** In unison with foreign ownership, new, more productive technology, better production procedures, organisational solutions appear, which for the employees of domestic-owned companies ensure higher productivity for the same amount of investment (individual labour), and so ensure higher wages, in this way the labour force flows over to the foreign-owned enterprises offering higher wages. In this case the wage premium is temporary and partial, in other words it can only be observed during the flow over (adaptation) period and only in the sectors affected by foreign presence.
- **Training²:** Foreign owned companies provide training for their employees to increase their productivity, which also increases the wages that they can earn, therefore the productivity and wages of those working at foreign enterprises grows as time progresses. Due to the time required for the training the wage premium develops only gradually and only for those who take part in the training courses, then stabilises on a level and remains there.

² The link between the training provided by foreign companies for their employees and the wage premium is presented convincingly by Görg et al. [2007].

- **Incentive wages**³: Foreign-owned companies are more likely to use incentive schemes than domestically owned enterprises (for example efficiency wages designed to reduce the costs of employee supervision, or the wage premium designed to reduce the costs of replacing labour due to worker turnover and so providing an incentive for the workers against leaving their workplaces). In this case the wage premium can be observed right from the start of the operation of the foreign-owned company, it remains in a stable way over time and is more probable (although not necessarily true) among production workers than those working in lower positions.
- **Unions, and the reduction of workplace disputes**⁴: In the case of foreign-owned companies it is more characteristic than in the case of domestic-owned companies for such trade unions to be formed that are capable of acquiring a part of the rent formed at the enterprise for the employees, and so providing higher wages for the employees. Foreign-owned companies are more willing to “compensate” their employees in advance in order to avoid workplace disputes and strikes by the distribution of the company rent. In these cases the wage premium develops and grows gradually and is only probable in among production workers and employees in lower positions.
- **Cross-boarder rent-sharing**⁵: Foreign-owned enterprises may be willing to remunerate their employees on the basis of “global”

³ In connection with the so-called efficiency wages theory see: Shapiro-Stiglitz [1994], and in connection with the incentive wages designed to reduce the costs of replacing lost labour force see: Enderwick [1985]

⁴ In connection with the link between foreign companies and trade unions see: Driffield [1996], and in connection with the rent distribution taking place for the purpose of reducing workplace disputes see: Pugel [1980]

⁵ For details see: Budd et al. [2005]

productivity and not on the basis of local labour market impulses. This is mainly characteristic and observable in the upper management of foreign-owned companies, those working in economic and strategic decision-making positions, high-ranking employees from the very start of the operation of the company.

- b.) The negative effect of FDI may be suggested in the examined context:
 - **Incentives against knowledge spillover**⁶: Wage premium is expected to reduce the leakage of superior knowledge to local competitors through worker-turnover. Mainly high-skilled and high-educated workers are expected to recognise the production advantage and to have the ability to transfer the production advantage providing technology and to domestic-owned enterprises, therefore, it high-skilled, high educated workers should realise a wage premium that can be observed from the start of the operation of the company. (Naturally this practice improves the standard of living of those receiving the wage premium, but also the obstruction of the spreading of more developed technology may hinder the development of the host economy.)
- c.) The lack of FDI-effects are assumed when wage differences can be explained through **unobserved heterogeneity** of
- the production technology influencing the productivity of the workers, or
 - the working conditions provided by the companies,
 - the the employees (more precisely their characteristics that influence their productivity and, through this, their wages).

⁶ See: Forfuri et al. [2001], Glass-Saggi [2002], Markusen [2002]

II. Methods applied

The aim of this dissertation is to perform a detailed analysis of the development (in time and among the various type of employee) of the wage premium paid by foreign-owned companies to identify the possible reasons for the payment of the wage premium and to point out the nature of its effect exerted on the FDI host economy through the channel mediating the effects of FDI, in other words the wage premium.

II.1. Data

Our investigation used the basis of a ten-year panel dataset covering the period 1992-2001 containing the detailed characteristics⁷ of more than 5000 Hungarian manufacturing industry companies (employing more than 20 full-time employees) and their employees.

II.2. Estimation methodology

In order to identify the causality between foreign ownership and the wage premium – similarly to other authors (Huttunen [2005], Almeida [2007], Heyman et al. [2007], Earle and Telegdy [2008]) – we take companies that have been acquired by foreigners as a basis, which had previously been in domestic ownership, we trace the development of the wages⁸ paid by them before and following the change of ownership, in comparison with the wages of employees with the same individual characteristics employed at domestically owned enterprises all the way through the period of observation.

⁷ Individual characteristics observed: sex, school qualification, labour market experience, job and position. Observed company characteristics: sector (4-figure sector classification code, of which we use the first two figures for the analysis), premises location, company size (number of employees), significant financial data of the report and company tax return and the “production capital intensity” and “labour productivity” formed from these.

⁸ Workers’ average monthly earnings made up in the following way: worker’s gross earnings for the month of May + bonuses for May + 1/12 part of the premium for the previous year

We identify the wage premium paid by foreign-owned companies controlled for a wide range of individual and company characteristics in wage regressions, in which we isolate the effect of foreign ownership on individual wages and put it in numbers in % form. Besides the OLS estimation we controlled for company-fixed effects and occupation-fixed effects identifiable on 539 occupation group levels, in order to better filter out effects derived from unobserved heterogeneity of the companies and workers.

We traced the evaluation of wages for a period longer than in the cases of other research, we excluded the possibility of selection bias derived from the self-selection of acquired companies and making wage premium interpretation difficult. We analyse the effect exerted by foreign ownership on the wage premium broken down according to the school qualifications of the employees (maximum vocational training school, secondary school, diploma), and according to occupation (blue collar worker, white collar worker without strategic decision making competence, white collar worker with strategic decision making competence), then through the differences of the development of wage premium characteristic of the individual groups we determine the nature of the effects of FDI realised on the host economy through the wage premium.

To test the robustness of the results of the regression estimates run on the entire sample we repeated our estimates on an alternative reduced company control group and acquired company sample created with a nearest neighbour matching procedure.

II.3. The questions to be examined

- 1.) Can the foreign wage premium be identified?
- 2.) Does the wage premium grow or drop in time or stays constant?
- 3.) Is there a wage among all types of employees?

III. Results of the dissertation

III.1. The wage premium exists

The variable indicating the ownership nature of the employer company (the value of which is 1, if the proportion of foreign ownership in the company's subscribed share capital is above 50%, otherwise it is 0) is stated in the Mincerian wage regression, which explains the level of individual wages paid to the employees with company and individual characteristics. The regression coefficient of this variable – the value of which can be interpreted in % - indicates the effect of foreign ownership on individual wages. As a result of our estimation we identify a 15% foreign wage premium.

It may happen that companies in foreign ownership employ a higher proportion of people working in positions where the role of formal schooling is less significant, but the performance of the task still requires a high-level of individual skills, and in accordance with this it results in higher wages besides higher individual productivity. In the case that employees are concentrated in certain positions – related to ownership nature – the higher wages seem to be due to foreign ownership unless we properly control with respect to the differences that can be identified in the composition of the employees of the individual companies in the various positions. Therefore, controlled for occupation-fixed effects in connection with the occupation characteristics of the observed employees (539 HSCO⁹ category) the explanatory power of the estimation increases, however the 15% value of the wage premium does not change.

⁹ HSCO – Hungarian Standard Classification of Occupation. The 4-digit occupation categorisation used by the Central Statistical Office. As the code system changed in 1993 our analysis can only be performed for the period between 1994-2001, if we control in detail for occupation, and for their fixed effects.

In the course of the fixed effects estimation performed in order to filter out the unobserved heterogeneity of the individual companies, the foreign ownership variable's regression coefficient gains new meaning: the 4% value obtained from the estimation indicates that in the case of the company changing ownership the employee earn 4% higher wages on average in the period when the company is in foreign ownership.

This result supports that when analysing the explanation of the wage premium it is worth concentrating on the causality between the change of ownership and the wages of the employees. For this reason in the following we shall concentrate on the time profile of the wages paid by companies registered in the database as companies in domestic possession and then bought up by foreign owners during the observed period (the proportion of foreign ownership within the company's subscribed share capital increases above 50%). The wages are examined by comparing them to the wages paid by companies that are similar to the companies changing ownership in every respect but remaining in domestic ownership during the entire observed period, in the years before and after the change of ownership (the 1st, 2nd, 3rd, 4th and further years before/after the change of ownership), checking in detail both company and employee characteristics.

III.2. Wage premium develops gradually

In order to examine the time profile of wage premium, instead of the majority foreign ownership variable, several dummy variables describing the ownership status of the company employing the given employee are generated in respect of the periods before and after the change of ownership (the value of which is 1, if the company is in foreign ownership in the 1st, 2nd, 3rd or 4th year before/after the change of ownership, otherwise it is 0), and in respect of the year in which the change of ownership takes place. When this group of

variables is applied to the simple and job and company fixed effects wage regressions, a clear picture is outlined (see: table 1).

Table 1: Evolution of foreign wage premium with different specifications

Dependent variable: log monthly gross earnings	OLS (1)	occupation fixed effects (2)	firm fixed effects (3)
4 or more years before ownership change	-0.01 (-0.30)	-	0.06* (1.90)
3 years before ownership change (A)	-0.03 (-0.73)	-0.02 (-0.56)	-0.04 (-1.00)
2 years before ownership change (B)	-0.01 (-.44)	-0.01 (-0.44)	-0.03 (-0.81)
1 year before ownership change (C)	-0.02 (-0.72)	-0.00 (-0.13)	-0.02 (0.62)
year of ownership change (D)	0.12** (2.17)	0.14* (1.83)	0.11** (2.11)
1 year after ownership change (E)	0.05*** (2.58)	0.06*** (2.71)	0.04* (1.73)
2 years after ownership change	0.08*** (3.16)	0.09*** (3.12)	0.06** (2.44)
3 years after ownership change	0.13*** (7.28)	0.12*** (3.47)	0.12*** (6.61)
4, or more year after ownership change (F)	0.16** (10.43)	0.17*** (4.71)	0.15*** (9.67)
Preprogram test: (A)=(B)=(C)	0.05 (0.98)	0.17 (0.85)	1.79 (0.15)
Ho: (C)=(D)	4.50** (0.03)	5.34** (0.02)	3.76* (0.05)
Ho: (C)=(E)	6.99*** (0.01)	15.18*** (0.00)	3.65* (0.05)
Ho: (E)=(F)	19.25*** (0.00)	23.96*** (0.00)	19.00*** (0.00)
R ²	0.57	0.68	0.64
Number of observations	343 450	343 450	275 397

Notes: heteroskedasticity-consistent t values in paranthesis; ***, ** and * refer for significance at 99%, 95% or 90% level; control variables: personal characteristics (education, experience, gender, occupation), firm-characteristics (capital intensity of production, average added value of the workforce), further controls: dummies for firm-size categories, regional characteristics, 2digit industry code, year of observation.

Before the change of ownership companies bought up by foreign owners paid average wages to their employees, so the interpretation of the causal relation between wage premium and foreign ownership is not influenced by the self-selection of companies or employees (the pre-program test comparing the wages paid by companies facing acquisition with the wages paid by other companies in domestic ownership and permanently remaining in domestic ownership is insignificant in the case of all specifications). Wage premium appears after the change of ownership and it increases in time.

The results of the estimates made with 3 different specifications are consistent; the variable coefficients (also interpretable in percentage) indicating the periods following the change of ownership have very similar values. Foreign wage premium builds up gradually progressing in time after acquisition and the change of ownership. A 4-6% foreign wage premium appears already in the 1st year following the change of ownership – it is proved by the value of the test examining the significance of the difference between the wage premium observed in the year before (C) and in the year after (D) the change of ownership, that is the significance of the effect of the change of ownership on the wage premium, which value is stated in table 1. Our estimates indicated a 12-13% foreign wage premium in the 3rd year following acquisition, and 15-17% foreign wage premium in the 4th and further years following acquisition. The amounts of wage premium observed in the year following acquisition (D) and in the 4th and following years after acquisition (E) are significantly differently, the wage premium increases as time progresses. When making the estimates again on the company control group selected using the nearest neighbour matching procedure and on a reduced sample containing the data of the companies bought up and their employees, effects of a similar intensity are observed in respect of fixed

company effects, while in respect of fixed job effects it is found that the intensity of the effect reduces while the increasing tendency of the wage premium persists and the outstanding wage premium level observed in the year of acquisition reduces justifying the use of the matched sample.

The seemingly high wage premium indicated in the year of the change of ownership is only a temporary phenomenon, which is explained by the changes taking place at the company in the course of and due to the change of ownership. After the change of ownership unnecessary and insufficient labour force is discharged, as a result of which the average work efficiency (company efficiency per employee) of the remaining employees increases, which may also increase their wages, and periodical premium paid to the remaining employees is also likely. After the change of ownership new technologies, production procedures may be introduced, and a new type of work organisation is realised, as a result of which the productivity of the employees reduces temporarily – this reduction in productivity is followed by their wages –, and after the company's production system has been set up and the employees have acquired the new production procedures, the company realises a rent due to higher productivity resulting from better technology and production procedures, and the company shares some of this rent with the employees.

III.3. Only employees in lower positions realise wage a premium

The results of Heyman et al. [2006] show that apart from the confirmation of the existence of the wage premium phenomenon it is also necessary to examine the distribution of wage premium among groups of employees identifiable on the basis of different characteristics. So the original estimation functions are re-run on the subsamples created on the basis of the job characteristics and qualifications of the individual employees and the

results are evaluated. We re-run our estimates on subsamples created by splitting the full sample through the employees most important job characteristics (blue collars, white collars without strategic decision making competence, while collars with strategic decision making competence).

Table 2: Results on the full sample, divided by broad occupation categories

Dep. var log gross earnings	Occupation fixed effects			Firm fixed effects		
	blue collar (4)	white collar, nonmana- gerial. (5)	white collar, mana- gerial. (6)	blue collar (7)	white collar, nonamana -gerial. (8)	white collar, mana- gerial.. (6)
before owner change (A)	-0.00 (-0.06)	-0.02 (-0.68)	0.02 (0.25)	-0.01 (-0.67)	0.03 (0.96)	-0.03 (-0.45)
year of owner change (B)	0.09** (2.21)	0.15** (2.19)	0.07 (0.72)	0.10** (2.10)	0.22*** (2.57)	0.15 (0.14)
1 year after (C)	0.04* (1.66)	0.03 (1.27)	0.11 (1.41)	0.05** (3.18)	0.11** (6.45)	0.12* (1.68)
2 years after	0.07*** (2.58)	0.05 (1.48)	0.20** (2.39)	0.08*** (3.26)	0.13*** (4.99)	0.20*** (2.78)
3 years after	0.11*** (6.50)	0.13*** (4.55)	0.20** (2.49)	0.09*** (5.28)	0.16*** (6.49)	0.10 (1.16)
4 or more years after (D)	0.13*** (8.72)	0.19*** (8.41)	0.22*** (4.58)	0.12*** (6.58)	0.24*** (9.77)	0.14* (0.06)
Ho: (A)=(B)	3.70* (0.05)	4.00** (0.05)	0.21 (0.65)	6.61** (0.01)	5.25** (0.02)	3.67* (0.06)
Ho: (A)=(C)	2.51 (0.11)	3.84* (0.05)	0.95 (0.33)	13.19*** (0.00)	8.78*** (0.00)	4.87** (0.00)
Ho: (C)=(D)	12.69*** (0.00)	22.51*** (0.00)	1.78 (0.18)	16.95*** (0.00)	36.09*** (0.00)	0.09 (0.77)
R ²	0.53	0.60	0.42	0.65	0.65	0.81
observations	191 952	77 220	6 225	237 560	98 635	7 255

Notes: heteroskedasticity-consistent t values in paranthesis; ***, ** and * refer for significance at 99%, 95% or 90% level; control variables: personal characteristics (education, experience, gender, occupation), firm-characteristics (capital intensity of production, average added value of the workforce), further controls: dummies for firm-size categories, regional characteristics, 2digit industry code, year of observation.

Controlled estimates relating both to fixed company and job effects indicate significant wage increase among blue-collar workers and white-collar workers without strategic decision making competence. Wage premium realised in the long term is 12% or 13% in the case of the former group of employees, while it is 19% or 24% in the case of the latter group, depending on which type of fixed effects are controlled. However, white-collar workers with strategic decision making competence do not realise wage premium either in the year following acquisition or in the long term (it is demonstrated by the insignificant result of the tests examining $A=C$ and $C=D$ hypotheses). When repeating the estimates on the 3 subsamples created by separating matched sample job characteristics, results consistent with the ones above are obtained: a significant wage increase is observed in the case of the two groups of employees in lower positions, while employees in managing positions do not realise a significant wage premium.

A similar result is obtained if the original estimates are repeated on 3 subsamples created along the groups set up according to school qualifications (skilled workers, employees having secondary school qualifications, employees having a diploma). Although significant wage premium is observed on the entire sample in the long term in the case of all three groups, on the matched sample ensuring a more refined selection of the control group no significant effect can be observed among employees having a diploma, while foreign ownership guarantees higher wages and a steeper profile of wage evolution for employees with secondary school qualifications or lower school qualifications.

III.4. Interpretation of empirical results

As a result of our study we prove the existence of foreign wage premium, identify a causal relation between foreign ownership nature and

wage premium. Earlier on, when examining the phenomenon of foreigners buying up companies in domestic ownership it was demonstrated that – after buying up domestic companies of average performance – foreign wage premium develops gradually in time following acquisition. Wage premium appears in the case of employees with lower school qualifications (with secondary school qualifications at the most) filling lower positions (blue collar worker, white collar worker without strategic decision making competence), while employees holding a degree or white collar workers with strategic decision making competence do not realise wage premium.

Consequently foreign wage premium is an existing channel through which the effect of FDI is asserted. A direct positive effect on welfare is identified, which is realised in the form of higher wages by employees with secondary school qualifications at the most, or blue collar workers and white-collar workers without strategic decision making competence.

As wage premium develops gradually in time and is not characteristic among highly qualified employees in managing position, sharing some of the company's rent with the employees can be presumed as the reason of wage premium. In the background of rent-sharing there may be the employees' bargaining position and the company's readiness to reduce losses deriving from workplace disputes, so our recognition is consistent with Pugel's [1980] conclusions and with the implications of Carmichael's [1992] model.

We identify direct welfare gain from FDI realized by production workers and nonmanagerial blue-collar employees. No possible negative effect can be found through the analysis of the wage premium (that captures the effect of FDI on the price of labour being one of the production factors associated with FDI).

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V. Own publications in the topic of the dissertation

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