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SPECIFIC HUMAN CAPITAL INTENSITY IN TURKISH MANUFACTURING FIRMS: THE ROLE OF FOREIGN OWNERSHIP

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Abstract

Foreign direct investment (FDI) and human capital are considered as essential factors of both firms' and countries' growth. This property made them to be a major focus of policy in many nations. There is a large literature on the relationship between FDI (foreign direct investment) and growth, as well as the relationship between human capital and growth. However, despite its great empirical and policy relevance, the specific link between foreign ownership and human capital is a rather under-researched empirical subject. The main aim of this study is to analyze the relationship between foreign ownership and specific human capital in Turkish manufacturing sector. A micro level analysis is carried out using firm-level data retrieved at World Bank's Turkey Enterprise Survey for the year 2019. Using fractional response regression methodology, several models are estimated to see if foreign ownership has an impact on firm human capital intensity, as well as other firm characteristics, industries, and regions. The key findings can be summarized as follows: i) private foreign ownership has a negative effect on firm-level specific human capital intensity; ii) being a larger or older firm negatively affects firms' specific human capital intensity; iii) export intensity is the only firm characteristic that has a positive effect of specific human capital intensity.

Keywords: Specific human capital, foreign ownership, Turkey

JEL classification: C21, D22, J24

TÜRKİYE İMALAT SANAYİ FİRMALARINDA ÖZELLEŞMİŞ BEŞERİ SERMAYE YOĞUNLUĞU: YABANCI ORTAKLIĞIN ROLÜ

Öz

Doğrudan yabancı yatırımlar ve beşeri sermaye hem ülkelerin hem de firmaların büyümesinde önemli bir faktör olarak değerlendirildiği için birçok ülkede politikaların temel odak noktası olmuştur. Doğrudan yabancı yatırımlar ve büyüme ve beşeri sermaye ve büyüme arasındaki ilişkiyi inceleyen çalışmalar literatürde oldukça yaygındır. Fakat yabancı ortaklık ve beşeri sermaye arasındaki ilişkiyi doğrudan inceleyen çalışmalar, konunun hem ampirik hem de politik önemine rağmen, fazla ele alınmamıştır. Bu çalışmanın temel amacı Türkiye imalat sanayinde yabancı ortaklık ve spesifik beşeri sermaye arasındaki ilişkiyi incelemektir. Dünya Bankası'nın 2019 yılına ait, firma seviyesindeki Dünya İşletme Çalışmaları verisi kullanılmıştır. Birçok firma özelliği, sektör ve bölge değişkenleri ile birlikte, yabancı ortaklığın firmalardaki spesifik beşeri sermaye açısından önem teşkil edip etmediği birçok farklı kesirli yanıt değişkeni regresyon yöntemi tahmin edilerek incelenmiştir. Çalışmanın bulguları şu şekilde özetlenebilir: i) Yabancı ortaklığın firma seviyesinde spesifik beşeri sermaye yoğunluğuna etkisi negatiftir; ii) Bir firmanın daha büyük ya da daha uzun zamandır faaliyette bulunuyor olmasının spesifik beşeri sermaye yoğunluğunu azaltıcı bir etkisi vardır; iii) İhracat yoğunluğu, spesifik beşeri sermaye yoğunluğunu pozitif etkileyen tek firma özelliğidir.

Anahtar kelimeler: Spesifik beşeri sermaye, yabancı ortaklık, Türkiye

JEL sınıflaması: C21, D22, J24

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1. Introduction

Foreign direct investment (FDI) has been a fundamental focus of policy in many countries as it is considered as one of the important factors of both firms' and countries' growth. Particularly developing countries pay more attention to this issue due to their constraints regarding lack of capital. Foreign owned enterprises are expected to perform better than their domestic counterparts in terms of productivity, technology, skills, wages, profitability and growth. Among these performance gaps skill gap can be considered as one of the most important ones indicating the extent to which foreign ownership contributes to creating new and qualified jobs. On the other hand, human capital is another important engine of both firms' and countries' growth, too. Human capital can be categorized as general human capital (acquired through education) and specific human capital (acquired through experience or the skill set of the individual). Both types of human capital represent the knowledge and skills brought to the enterprises by the individuals and contribute to the knowledge of the enterprises.

The separate literatures on the linkages between FDI (or foreign ownership) and growth and human capital and growth exist widely. However, the specific link between foreign ownership and human capital is a relatively under-researched empirical question despite its high empirical and policy relevance. The main aim of this study is to analyze the relationship between foreign ownership and specific human capital in Turkey by undertaking a micro level analysis and using firm-level data retrieved at World Bank's Turkey Enterprise Survey for the year 2019. Several models are estimated by fractional response regression methodology in order to test whether foreign ownership matters for explaining firms' specific human capital along with several firm characteristics, industries and regions. Considering the fact that impact of foreign ownership related issues is researched better at micro level, this approach to investigate the relationship is an appropriate one.

Most of the studies analyzing the effect of foreign ownership in Turkish labor market provide mixed and usually aggregate evidence. The contribution of this study to this limited literature is threefold. First it investigates the effect of foreign ownership on firm-level specific human capital; an indicator which has not been studied before. Therefore, it contributes the scarce literature on this relationship. Second, it provides firm-level evidence. Third, it uses a very recent dataset to explore the relationship.

The paper is organized as follows. Section 2 provides the literature review. Section 3 presents the data and the methodology. Basic summary statistics and estimation results are presented and discussed in Section 4. Section 5 concludes.

2. Literature review

This study is related to the literature on the employment effects of foreign-owned firms. As Lee and Vivarelli (2006) states, both the theoretical and empirical research on the employment effects of foreign-owned firms suggest mixed results. Most of the empirical studies concentrate on the relationship between foreign direct investment (FDI) and specific human capital intensity (sometimes referred to skill intensity). Slaughter (2002), Baldwin (1995), Krammer (2010), Ben-Salha (2013) and Liu et al. (2015) are among the studies that address the outcomes of FDI on labor markets at macro level. However less attention to this relationship is paid in particular at firm-level.

The prominent studies investigating the relationship between foreign ownership and human capital intensity at firm level can be listed as Narula and Marin (2003), Coniglio et al. (2015), Foster-McGregor et al. (2015) and Brannlund et al. (2016) The common argument of these studies is that foreign-owned firms affect both the demand and supply side of skilled labor, and thus they might contribute to skill formation within the firms.

Narula and Marin (2003) attempt to compare the quantity and quality of human capital between domestic and foreign firms in Argentina employing the Innovation Survey for the period 1992-1996. Main findings of the study indicate that multinational enterprises possess a more skilled labor force than domestic firms. Moreover, their findings support the hypothesis that multinational enterprises' training expenses are higher than those of domestic firms'.

Coniglio et al. (2015) analyze the relationship between foreign ownership and employment (especially demand for labor and wages) for 19 Sub-Saharan African countries using data from 2010. Foreign firms are found to create more unskilled labor-intensive jobs compared to the jobs created by domestic firms. Moreover, it is found that the nationality of the ownership is not an important factor for labor demand.

Foster-McGregor et al. (2015) is another study focusing on Sub-Saharan African countries. They use data from UNIDO Africa Investor Survey for 2012 and investigate only the manufacturing firms. The findings indicate that foreign ownership does not have a significant effect in creating skilled employment.

Brannlund et al. (2016) analyze the employment effects of foreign ownership using a panel dataset of manufacturing Swedish firms covering the years 1980 to 2005. No significant effect of foreign ownership on employment is found in their study.

Bellak (2004) provides a good review and summary of the results of the selected studies regarding performance gaps between foreign and domestic firms. The major findings indicate skill gaps between foreign and domestic firms. However, foreign ownership is claimed to have less explanatory power on these gaps than normally assumed. Firm characteristics like size and industry are found to have more explanatory power than firm ownership.

To my knowledge, there is no prior study analyzing employment effects of foreign ownership in terms of specific human capital intensity at firm-level in Turkey. However, there are many studies examining the impacts of foreign ownership in Turkish labor market from different perspectives. Gürbüz and Aybars (2010), Kalaycı (2013), Dalgıç and Fazlıoğlu (2015) and Sönmez (2016) are among the studies analyzing employment effects of foreign ownership in Turkey.

Gürbüz and Aybars (2010) examine the effect of foreign ownership on firms' financial performance using panel data of non-financial listed companies for the period 2005-2007. Main findings indicate that minority foreign-owned firms are more profitable than domestic ones.

Kalaycı (2013) analyzes the relationship between FDI and research and development (R&D) activities in Turkish manufacturing firms. For 2003, the impact of FDI on R&D expenditures is found negative. Positive knowledge spillover effects from foreign firms is found as the domestic firms seem to benefit from the presence of foreign firms.

Dalgıç and Fazlıoğlu (2015) use panel data of firms taken from the Industry and Services Statistics over 2003 and 2012 period. An immediate improving effect of FDI acquisition on employment level is found. This effect is claimed to sustain in the years that follow the acquisition.

Sönmez (2016) analyzes the determinants of human capital intensity in Turkish automotive suppliers with a special emphasize on foreign ownership. The findings indicate that foreign ownership affects a supplier's general human capital intensity more than the specific human capital intensity.

3. Data and methodology

The study is based on the latest available firm-level data retrieved at World Bank's Turkey Enterprise Survey for the year 2019.The main benefit of this dataset is that the sample of the enterprises are nationally representative. Moreover, it provides data on both human capital and firm characteristics. The sample ends up with 853 manufacturing firms depending on the availability of the required variables.

Following the definition of Acemoglu and Pischke (1999) and the methodology of Teixeria and Tavares-Lehmann (2014), the dependent variable is the firm-level specific human capital intensity and calculated by making use of the following survey questions:

- "At the end of the fiscal year, how many permanent, full-time individuals in this establishment were production workers?"
- "At the end of the fiscal year, how many how many permanent, full-time production workers in this establishment were in highly skilled jobs, that is professionals whose tasks require extensive theoretical and technical knowledge?"
- "At the end of the fiscal year, how many how many permanent, full-time production workers in this establishment were in semi-skilled jobs, that is technicans whose tasks require some level of mechanical or technical knowledge?"

Following Wood and Ridoro (1994), Bell and Marin (2004) and Teixeira and Avares-Lehmann (2014), the specific human capital intensity is calculated as the ratio of the number of skilled and semi-skilled production workers to the number of total production workers. As the share of skilled production workers within a firm increases, the specific human capital intensity rises as well.

Several firm characteristics are used as explanatory variables. The variable of interest is the foreign ownership and it is defined as the share of private foreign individuals, companies or organizations in the firm ownership. Firm size is inserted as the logarithm of number of all workers. Firm age is the logarithm of the number of years that the firm has been operating since establishment. Export share is the ratio of direct and indirect exports to total sales[2]. Finally, industry and region controls are included to control for different firms' specific human capital intensities across industries and regions.

[2] The share of Research and Development (R&D) expenditure in total sales is a widely-used determinant of specific human capital intensity in the literature (Laursen and Salter (2004), Galliéand Legros (2012)). However, R&D expenditure variable is missing for most of the firms in the survey. Due to potential sample size problems related with this, R&D intensity is not included in the model as an explanatory variable.

The following empirical models are estimated by fractional response regression methodology in order to test whether foreign ownership matters for explaining firms' specific human capital intensity.

$$S_i = \beta_0 + \beta_1 f_i + \beta_2 \boldsymbol{Z}_i + \varepsilon_i$$

$$S_i = \beta_0 + \beta_1 f_i + \beta_2 \boldsymbol{Z}_i + \beta_3 I_i + v_i$$

$$S_i = \beta_0 + \beta_1 f_i + \beta_2 \boldsymbol{Z}_i + \beta_3 I_i + \beta_4 R_i + w_i$$

where S_i denotes firm's specific human capital intensity, f_i is the firm's private foreign ownership share. $\boldsymbol{X}$ denotes a vector of control variables which are likely to effect specific human capital intensity and represents firm characteristics like size, age and export intensity. In addition to these control variables industry controls, denoted by I_i, and region controls, denoted by R_i are included to control for different firms' specific human capital intensities across industries and regions.

Papke and Wooldrigde (1996) proposes the use of fractional response models when the dependent variable is fractional in nature. The dependent variable in this study, specific human capital intensity, is a fractional continuous variable on a 0 to 1 scale and fractional response model is suitable to predict it. As Papke and Wooldrigde (1996) states, one of the advantages of fractional response model is that takes into account the nonlinearities. Moreover, any specific corrections to the observed values at the boundaries are not required. Finally, under the assumptions of a generalized linear model, it is completely robust.

The form of the log-likelihood function of fractional models is:

$$\ln L = \sum_{j=1}^{N} w_j y_j \ln\{G(\mathbf{x}_j'\beta)\} + w_j(1-y_j)\ln\{1-G(\mathbf{x}_j'\beta)\}$$

where N is the sample size and y_j is the dependent variable. $\ln L$ is maximized using optional weights, w_j. Functional form of $G(\mathbf{x}_j'\beta)$ depends on whether fractional response models are fit by using probit, logit or heteroskedastic probit. In this study, fractional response models are estimated by using logit and the functional form of $G(\mathbf{x}_j'\beta)$ can be written as $\Phi(\mathbf{x}_j'\beta)$, where x_j are covariates of individual j and Φ is the standard normal cumulative density function.

4. Results

Table 1 and Table 2 presents the summary statistics of the variables used in the estimations for firms with and without foreign ownership, respectively[3]. It is observed that the average specific human capital intensity in the firms without foreign ownership is 82%. The average of the logarithm of firm size and firm age are 3.65 and 21.02, respectively. Finally, the average export intensity is 23%. For the firms with foreign ownership, average specific human capital intensity is approximately 70%. Average firm age is 23 with a standard deviation of 16.18. The average export intensity for the firms with foreign ownership is observed as 57%. Comparing the firms with and without foreign ownership indicates that the average specific human capital intensity is lower in the firms with foreign ownership, while the average export intensity is higher.

Table 1: Summary statistics of the variables in use - foreign ownership

	Mean	Std. Dev.	Min	Max
Specific human capital intensity	.698	.239	.283	1
Ln(firm size)	5.123	1.066	2.708	7.938
Firm age	23.10	16.18	6	79
Export intensity	.573	.353	0	1

Table 2: Summary statistics of the variables in use – no foreign ownership

	Mean	Std. Dev.	Min	Max
Specific human capital intensity	.817	.211	0	1
Ln(firm size)	3.652	1.336	1.099	8.006
Firm age	21.02	14.06	2	95
Export intensity	.229	.324	0	1

Table 3 shows the distribution of the firms across regions and sectors for firms with and without foreign ownership. It is observed that most of the firms without foreign ownership are located at Coastal and Central Anatolia regions. On the other hand, most of the firms with foreign ownership are located at Coastal and East Marmara regions.

[3] Distribution of specific human capital intensity by firm size, region and sector are presented in Figures A1-A3 in the Appendix to present more descriptive statistics.

Istanbul is the region with the least fraction of manufacturing firms for both type of firms. The sectoral distribution of manufacturing firms both with and without foreign ownership shows up a more even distribution with closer shares of firms across sectors. Nonetheless, Other Manufacturing and Textiles are the sectors with highest shares of firms. The sector with the lowest relative frequency is observed as the Food sector.

Table 3: Distribution of region and sectors

	Foreign ownership	No foreign ownership
Istanbul	3.57	8.19
East Marmara	32.14	11.76
Coastal	50.00	32.42
Central Anatolia	10.71	33.61
East	3.57	14.01
Food	17.86	13.30
Textiles	21.43	18.29
Garments	10.71	16.86
Fabricated Metal Products	17.86	17.34
Machinery & Equipment	17.86	14.13
Other Manufacturing	14.29	20.07

Table 3 presents the summary statistics of the specific human capital intensity by region and sectors to clearly identify the variation of intensity across regions and sectors. Istanbul is the region with the highest average specific human capital intensity, that is 88%. The region with the second highest average specific human capital intensity is Central Anatolia. East Marmara appears to be the region with the lowest average specific human capital intensity. One striking result from Table-3 is that minimum specific human capital intensity in Central Anatolia and East Marmara is greater than zero. Among the sectors, Machinery and Equipment and Other Manufacturing are the ones with the highest specific human capital intensity. Textiles and Food are the sectors with the lowest specific human capital intensity.

Table 4: Summary statistics of specific human capital intensity by region and sectors

	Mean	Std. Dev.	Min	Max
Central Anatolia	0.845	0.171	0.211	1
Coastal	0.801	0.237	0	1
East	0.77	0.237	0	1
East Marmara	0.765	0.188	0.357	1
Istanbul	0.883	0.219	0.071	1
Fabricated Metal Products	0.824	0.195	0.2	1
Food	0.77	0.266	0	1
Garments	0.817	0.186	0.167	1
Machinery & Equipment	0.877	0.164	0.296	1
Other Manufacturing	0.84	0.209	0.071	1
Textiles	0.754	0.226	0	1

Table 4 and Table 5 show the log odd ratios and marginal effects from fractional response regressions, respectively. Evaluating the results in Table 4, it is observed that except for the effect of export intensity, all firm characteristics' effect on specific human capital intensity is negative. As the log odds ratio only depicts the direction of the relationship between the dependent variable and the covariates, it is more meaningful to evaluate the marginal effects of the covariates presented in Table-5[4]. The results indicate that as the share of private domestic ownership increases by 1%, the firm-level specific human capital intensity decreases approximately by 4% when no industry and region controls are added. When industry and region controls are added, the marginal effect of domestic foreign ownership falls to 5% and 4%, respectively. Overall, it is observed that there is a negative relationship between foreign ownership and specific human capital intensity, a finding in accordance with Coniglio et al. (2015). One potential explanation for this negative relationship is that foreign-owned firms operating in Turkish manufacturing sector are not located mainly in technology-intensive sectors which use high human capital-intensive factors of production. In this respect, this result supports the findings of Huttunen (2007) which states that foreign-owned firms may target low-technology industries in developing countries and demand for unskilled labor increases as a result. Moreover, the decision of foreign-owned firms to decrease the administrative and managerial employment might be a factor which inserts a negative effect on firms' specific human capital intensity.

[4] Predictive margins of private foreign ownership with 95% confidence interval are presented in Figure A4 in the Appendix.

The magnitude of the effect of firm size is similar to that of foreign ownership. As the total number of workers within the firm increases by 1%, the specific human capital intensity falls by approximately 4% and this marginal effect stays more or less the same as the industry and region controls are added. The effect of firm age on specific human capital intensity is negative and the marginal effect of age is around 2% with or without the industry and region controls. Finally, export intensity is the only firm characteristic that has a positive effect of specific human capital intensity. As the export intensity increases by 1%, specific human capital intensity increases by 6% when no controls are added. The inclusion of the industry controls causes this marginal effect to fall to 4%, however the marginal effect jumps to 7% when region controls are added.

Table 5: Fractional response regression (log odds ratios)

	(1)	(2)	(3)
Private foreign ownership	-0.232***	-0.410***	-0.280***
	(0.023)	(0.027)	(0.025)
Log(firm size)	-0.289***	-0.276***	-0.278***
	(0.038)	(0.040)	(0.039)
Firm age	0.08*	0.12*	0.15***
	(0.072)	(0.076)	(0.073)
Export intensity	0.049***	0.018**	0.137***
	(0.016)	(0.013)	(0.017)
Constant	2.570***	2.213***	2.828***
	(0.219)	(0.242)	(0.334)
Industry Controls	No	Yes	Yes
Region Controls	No	No	Yes
Observations	853	853	853

Standard errors are heteroscedasticity-robust and are given in parentheses.

* $p < .10$, ** $p < .05$, ** $p < .01$

Table 6: Fractional response regression (marginal effects)

	(1)	(2)	(3)
Private foreign ownership	-0.048***	-0.051***	-0.039***
	(0.019)	(0.029)	(0.014)
Log(firm size)	-0.041***	-0.039***	-0.038***
	(0.018)	(0.015)	(0.012)
Log(firm age)	-0.021*	-0.023*	-0.032***
	(0.013)	(0.011)	(0.009)
Export intensity	0.064***	0.041**	0.077**
	(0.023)	(0.023)	(0.023)
Observations	853	853	853

Standard errors are heteroscedasticity-robust and are in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

5. Conclusion

This paper examines the relationship between foreign ownership and specific human capital in Turkey by undertaking a micro level analysis and using firm-level data retrieved at World Bank's Turkey Enterprise Survey for the year 2019. Several models are estimated by fractional response regression methodology in order to test whether foreign ownership matters for explaining firms' specific human capital along with several firm characteristics, industries and regions.

In the Turkish manufacturing sector, the results show a negative link between foreign ownership and specific human capital intensity.One possible explanation for this negative link is that foreign-owned enterprises operating in the Turkish manufacturing sector are not primarily concentrated in technology-intensive industries that rely heavily on human resources.In this regard, the findings of Huttunen (2007) are supported by this result, which suggests that foreign-owned enterprises may target low-technology industries in developing nations, resulting in an increase in the demand for unskilled labor. Except for the effect of export intensity, all firm characteristics have a negative impact on specific human capital intensity, which is consistent with the literature.

The results suggest that employment boosting potential of foreign-owned firms should carefully be considered, since the effects might be heterogenous in terms of specific human capital creation. Not all jobs created by foreign-owned firms are intensive in terms of specific human capital. A developing country like Turkey should aim to attract foreign investment towards the ones that are more likely to generate high-skilled jobs.

References

ACEMOGLU, Daron and Jorn-Steffen PISCHKE; (1999), "The structure of wages and investment in general training", Journal of Political Economy, 107 (3), pp. 539–572.

BALDWIN, Robert E; (1995), The Effects of Trade and Foreign Direct Investment on Employment and Relative Wages. NBER Working Paper 5037.

BELDERBOS, Rene; Vincent VAN ROY and Florence DUVIVIER; (2013), "International and domestic technology transfers and productivity growth: firm level evidence" Industrial and Corporate Change, 22 (1), pp.1–32.

BELL, Martin and Anabel MARIN; (2004), "Where do foreign direct investment-related technology spillovers come from in emerging economies? An exploration in Argentina in the 1990s", The European Journal of Development Research, 16(3), pp. 653–686.

BELLAK, Christian; (2004), "How domestic and foreign firms differ and why does it matter?", Journal of Economic Surveys, 18 (4), pp.483–514.

BEN-SALHA, Ousama; (2013), "Does Economic Globalization Affect the Level and Volatility of Labor Demand by Skill? New Insights from the Tunisian Manufacturing Industries", Economic Systems,37 (4), pp. 572–597.

BRANNLUND, Runar; Jonas NORDSTROM and Jesper STAGE; (2016), "Foreign Ownership and Its Effects on Employment and Wages: The Case of Sweden", IZA Journal of European Labor Studies, 5 (8), pp. 1-17.

CONIGLIO, Nicola D.; Francesco PROTA and Adnan SERIC; (2015), "Foreign Direct Investment, Employment and Wages in Sub-Saharan Africa", Journal of International Development, 27 (7), pp. 1243–1266.

DALGIÇ, Başak and Fazlıoğlu, Burcu; (2015), "Foreign affiliated firms and employment: Evidence from Turkey", Yönetim ve Ekonomi Araştırmaları Dergisi, 13 (2), pp. 365-374.

FOSTER-MCGREGOR, Neil; Anders ISAKSSON and Florian KAULICH; (2015), "Foreign Ownership and Labour in Sub-Saharan African Firms", African Development Review, 27 (2), pp. 130–144.

GALLIE, Emilie-Pauline and Diego LEGROS; (2012), "Firms' human capital, R&D and innovation: a study on French firms", Empirical Economics 43, pp.581–596.

GURBUZ, Ali Osman and Asli Aybars; (2010), "The impact of foreign ownership on firm performance, evidence from an emerging market: Turkey", American Journal of Economics and Business Administration, 2 (4), pp. 350-359.

HUTTUNEN, Kristiiana; (2007), "The Effect of Foreign Acquisition on Employment and Wages: Evidence from Finnish Establishments", Review of Economics and Statistics, 89 (3), pp. 497–509.

KALAYCI, Elif; (2013), "Foreign ownership, R&D and knowledge spillovers in developing countries: Evidence from Turkey", The International Journal of Sciences, 8 (1), pp. 29-44.

KRAMMER, Sollins M.S.; (2010), "International R&D spillovers in emerging markets: the impact of trade and foreign direct investment", Journal of International Trade and Economic Development, 19 (4), pp.591–623.

LAURSEN, Kent and Ammon SALTER; (2004), "Searching high and low, what types of firms use universities as a source of innovation?", Research Policy 33(8), pp.1201–1215.

LEE, Eddy and Marco VIVARELLI; (2006), "The Social Impact of Globalization in the Developing Countries", International Labour Review, 145 (3), pp. 167–184.

LIU, Wen-Hsien; Pan-Long TSAI and Ching-Lung TSAY; (2015), "Domestic Impacts of Outward FDI in Taiwan: Evidence from Panel Data of Manufacturing Firms?", International Review of Economics and Finance, 39,pp. 469–484.

NARULA, Rajneesh and Anabel MARIN; (2003), FDI spillovers, absorptive capacities, and human capital development: evidence from Argentina. MERIT-Infonomics Research Memorandum Series, 2003-016.

PAPKE, Leslie E. and Jeffrey M. WOOLDRIDGE; (1996), "Econometric methods for fractional response variables with an application to 401(k) plan participation rates", Journal of Applied Econometrics 11 (6), pp. 619-632.

SLAUGTHER, Matthew, J.; (2002), Skill upgrading in developing countries: has inward foreign direct investment played a role? CEPA Working Paper 2002-08.

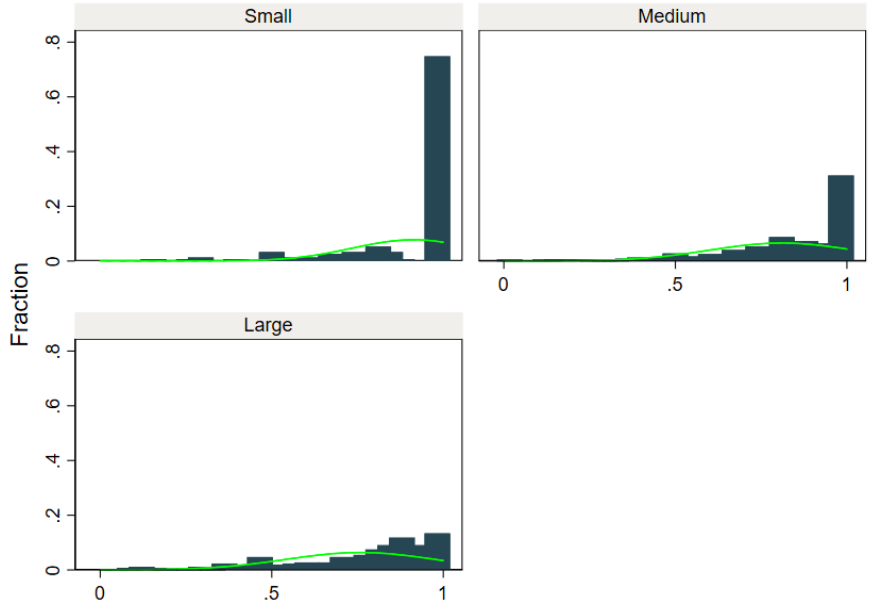
SÖNMEZ, Alper; (2016), "Determinants of human capital intensity : An empirical analysis on automotive suppliers in Turkey", Gaziantep University Journal of Social Sciences, 15 (2), 327-345.

TEIXERIA, Aurora A.C. and Ana Teresa TAVARES-LEHMANN; (2014), "Human capital intensity in technology-based firms located in Portugal: Does foreign ownership matter?", Research Policy, 43, pp. 737-748.

WOOD, Adrian and Cristobal RIDAO-CANO; (1999), "Skill, trade and international inequality", Oxford Economic Papers, 51, pp.89–119.

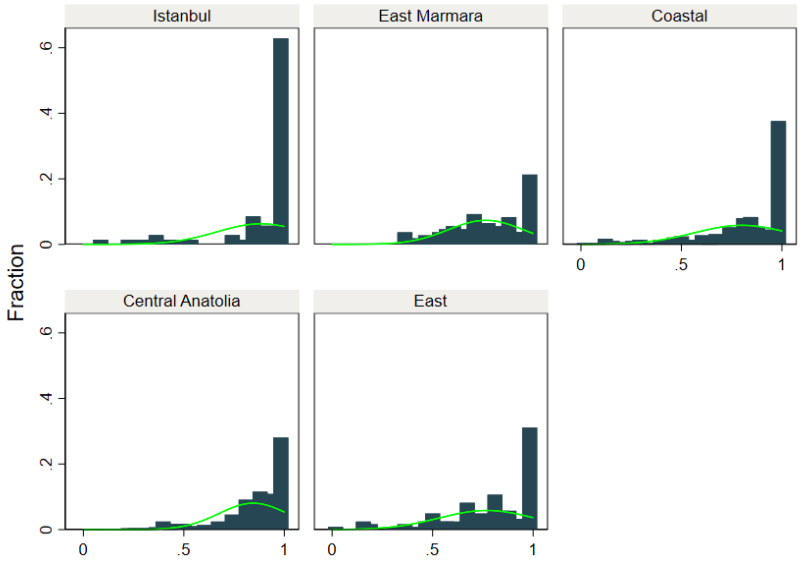
Appendix

Figure A1: Distribution of specific human capital intensity by firm size



Source: World Enterprise Survey 2019, author's own calculations

Figure A2: Distribution of specific human capital intensity by region

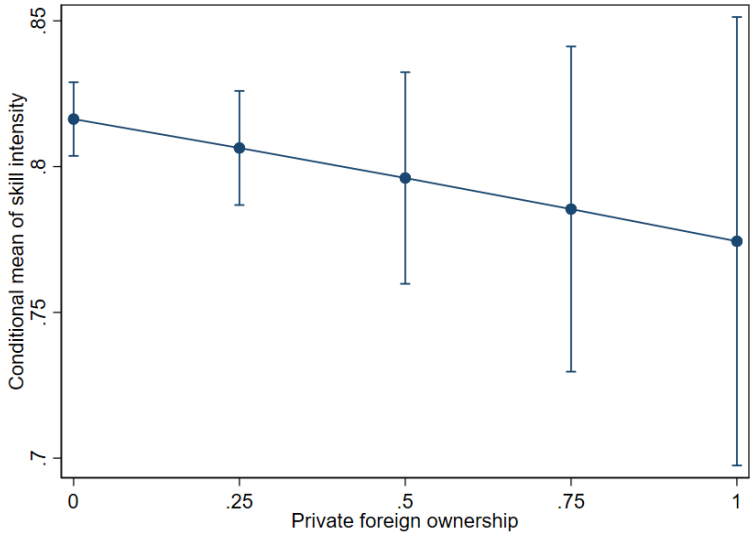


Source: World Enterprise Survey 2019, author's own calculations

Figure A3: Distribution of specific human capital intensity by sector

Source: World Enterprise Survey 2019, author's own calculations

Figure A4: Predictive margins of private foreign ownership with 95% confidence interval



Source: World Enterprise Survey 2019, author's own calculations