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Local determinants of foreign direct investment in Poland: the role of relative distance

JEL Classification: *F23; R15; O18; F21*

Keywords: *foreign direct investment; location determinants; spatial distribution of FDI; distance; special economic zones*

Abstract
Research background: The increasing role of foreign direct investments (FDI) in global, national, regional, and local economies draws the public's attention to the criteria utilised by foreign investors in undertaking locational decisions, owing to the mostly stimulating character of these kinds of investments.
Purpose of the article: The aim of the article is to identify the local determinants of FDI distribution. Particular attention is put on the role of distance to: (i) various transport endowments; (ii) next special economic zone; (iii) different national borders, among other motives studied in empirical papers.
Methods: An important value added over the existing studies is the use of continuous variables representing distances (in km) to selected points of interest (e.g., airport) or minimum distances to lines (i.e., border, road) instead of dummy variables indicating whether particular infrastructure endowment is present in a region. The estimations were run in STATA 14.2 software with the use of a negative binomial approach.
Findings & Value added: The results present new empirical evidence on FDI determinants witnessed at a local level of analysis (LAU 1), fitting into the other research done at a higher

level of data aggregation (NUTS 2, NUTS 3), signalling high intra-regional inequalities and the role of: (i) relative distance to various infrastructure endowments; (ii) heterogeneous border effects; and (iii) the importance of close proximity to special economic zones. Given the presence of counties' auto selection process (i.e., better developed, endowed, urbanised, favourably located) done by FDI investors, we formulate universal implications in terms of FDI promotion policy.

Introduction

Foreign direct investments have significant impacts on the expansion and growth of cities and regions. Knowing their (mostly observed) stimulant role to hosting economies, many local and regional authorities compete among themselves to attract foreign capital. Thus, the FDI influence — in spatial terms — is noticeable in the process of concentration of economic activity, exerting possible positive externalities to other economic entities, and operating in a region, as well as in FDIs' contribution to major regional economic characteristics.

Given the high importance of FDI promotion policy for local authorities willing to increase their FDI attraction, and owing to the insufficient empirical findings on local FDI locational determinants, which till now have been mostly conducted at a high level of regional data aggregation — NUTS 2 regions (Brodzicki, 2012; Cieślik, 2005b, 2005a, 2013; Cieślik & Ryan, 2005; Gauselmann & Marek, 2012; Jones & Wren, 2015; Villaverde & Maza, 2012, 2015) or NUTS 3 regions (Schäffler *et al.*, 2016; Simone & D'Uva, 2017), there is a need for more detailed studies on FDI determinants, especially given the high intra-regional diversification (Nazarczuk, 2015). Thus, we run a study in which local determinants of FDI location are investigated from the perspective of LAU 1 areas (counties) and compare the results to the existing studies on regions. Particular attention is, however, put to the role of relative proximity (calculated in km) to different transport infrastructure endowments and special economic zones, as well as to heterogeneous border effects.

The obtained results provide new empirical findings on the role of relative distance to transport infrastructure, the national border, and special economic zones. The remaining determinants fit into the existing studies done so far. The formulated policy implications are universal in their nature and can be applied by local authorities from various countries.

The remainder of the paper is the following. Section 2 depicts briefly empirical evidence on the location determinants of FDI. Section 3 provides an overview of the dataset and estimation approach utilised, whereas, in section 4, the results of estimations are presented. The discussion is intro-

duced in section 5, while the last section concludes the paper and provides policy implications.

As compared to the working paper version, the article was completely rewritten to bring new perception on the issue of FDI location determinants. Now, it is more founded in the empirical literature and less in the theoretical setting. It uses a different set of explanatory variables in the econometric work, as well as, to a larger extent, focuses on the policy implications and the discussion of the findings.

Determinants of foreign direct investments in empirical studies

A brief overview of FDI motives at a regional scale enables the identification of the most common ones studied in the empirical literature. They were grouped into a series of categories in Table 1, to decrease the size of the literature study section (as a result of the total paper's length restrictions).

The obtained list of the possible determinants was, to a large extent, contextual. However, according to the conducted literature study, covariates describing labour-market situation and characteristics, the size or proximity to markets, agglomeration economies, transportation nodes, economic potential were most frequently utilised in determining FDI locational choices.

Research methodology

Most of the studies on the locational determinants in Poland and other European countries were run at a relatively large level of data aggregation — NUTS 2 (Brodzicki, 2012; Cieślik, 2005b, 2005a, 2013; Cieślik & Ryan, 2005; Gauselmann & Marek, 2012; Jones & Wren, 2015; Villaverde & Maza, 2012, 2015) or NUTS 3 (Schäffler *et al*., 2016; Simone & D'Uva, 2017). Given the relatively high intra-regional variety, and the possibility of losing some degree of intra-regional diversification, we propose a piece of research in which local area units (LAU 1) are analysed in terms of FDI inflow. The approach enables us to grasp inner heterogeneity of areas, described by their relative location, economic structure, the operation of selected institutions, and other factors contributing to FDI absorption.

An important value added over the existing studies is the use of continuous variables representing distances (in km) to selected points of interest (POI) (e.g. airport) or minimum distances to lines (i.e. like in the case of border, road) instead of dummy variables indicating whether particular

infrastructure endowment is present in a region or not. As we deal with continuous variables, the effects of these institutions are assumed to not be constant but diminish with distance. Thus, we are able to better depict their impact on FDI location and assess their potential areas of influence.

The data on the number of FDI entities, together with various local economic characteristics, were obtained from the local data bank, provided by the Central Statistical Office in Poland. The information on the operation of SEZs were acquired from the Ministry of Development, who supervises the issuance of SEZs permits, whereas data on the distances between particular counties' centroids and POIs (e.g., SEZ, railway station, express road/motorway, national road, airport, border) were calculated in the QGIS application (in km).

Table 2 shows the descriptive statistics of variables used in the study. The majority of variables included in estimations stemmed from the critical review of empirical evidence on FDI location determinants. In the case of remuneration (*remun*), their actual value according to constant prices from 2005, was introduced to the model (using the CPI index — Consumer Price Index as a deflator). Data on the education of people in the counties were estimated using National Population and Housing Census data from 2011 and 2002. Covariates were log transformed (excluding variables presenting the percentage share).

In most of the studies on FDI determinants, where count data on the number of FDIs are utilised, two estimation approaches are preferred (Cieślik, 2005a, 2013; Cieślik & Ryan, 2005; Schäffler *et al.*, 2016): Poisson regression/negative binomial regression. Another option is the mixed/nested logit model (Crozet *et al*., 2004). Given the character of the data and the empirical practices, the authors decided to utilise the first approach.

As the issue of excessive dispersion (when the average value is lower than the variation) frequently arises while dealing with count data, it was necessary to verify if it was also the issue in our case. Its potential emergence significantly affected the choice of the econometric modelling method. Owing to the observed excessive dispersion, the negative binomial approach was a better choice as compared to the Poisson regression (more convenient when variance equals the average value). The selection was also founded on the significance of the alpha parameter (see Table 2), as well as the likelihood ratio test. Their statistics both indicated using the adopted approach. The estimates were run in the STATA application.

The general form of the estimated regressions was the following:

$$FDI_{it} = \alpha_0 + \beta_j DIST_{it} + \beta_j BORDER_i + \beta_j ECON_{it} + YearFE_t + \epsilon_{it} \quad (1)$$

where:
FDI_{it} – the number of FDI for ith county in year t,
$DIST_{it}$ – vector of variables j describing counties' distances to POIs (airport, SEZ, seaport, etc.) or infrastructure endowment (railway line, national road, express road/motorway),
$BORDER_i$ – set of covariates j with heterogeneous (country-specific) border effects,
$ECON_{it}$ – set of economic-related counties' characteristics, including population density, remuneration, unemployment rate, share of employed in industry or services, share of population with higher education, agglomeration of firms.
$YearFE_t$ – year fixed effects,
ϵ_{it} – the error term.

However, the above-presented equation includes all of the variables used in the study. One should take into account that in specific regressions the number of covariates may vary. Additionally, two information criteria are utilized, in order to enable the comparison of the equality of the estimated models between particular specifications: BIC (Bayesian Information Criterion) and AIC (Akaike Information Criterion).

Estimation results of local determinants of foreign direct investment in Poland

The estimation results are presented in Table 3. With the use of negative binomial models over the period of 2011–2015 the authors verified the role of different determinants of FDI location, originating from: (i) economic geography (Column 1); (ii) heterogeneous border effects (Column 2); (iii) structural characteristics (Columns 3-5); and finally with all of the variables combined (Column 6).

Among the catalogue of geographical factors, resulting from the distances to different modes of transportation and economic geography itself, the role of closeness to airports, special economic zones, the border, seaports, and good rail or road transport seemed to play the most important role. The results revealed the importance of counties' good transport accessibility, which could be further magnified by the closeness to the border, facilitating low transport cost associated with the access to national and foreign markets. Well-developed transport infrastructure could also be

a stimulus for improving access to skilled labour resources, thus all-in-all enhancing the inflow of FDI. Through operation in SEZs, firms can usually obtain profit tax exemptions (sometimes coupled with other exemptions being within counties' competencies) (Ambroziak, 2016), affecting their financial standings. Thus, given the nature of FDIs, who seek to gain competitive advantages, in the case of the fulfilment of other locational criteria, SEZs may facilitate the inter-regional absorption of foreign capital. The closeness to agglomeration of other foreign-owned entities could be an additional asset in stimulating the FDI inflow.

Proximity to the border facilitated the attraction of foreign capital, yet the effect was heterogeneous, depending on which national border counties were located in close proximity to (Table 3, Column 2). The strongest effect was seen in the case of Germany (stimuli), Slovakia (stimuli), and the Czech Republic (deterrent). To a lesser extent, location close to Russia discouraged FDI inflow, whereas in the case of Ukraine, it stimulated the operation of foreign-owned entities. The results implicate the role of closeness to selected foreign markets that FDI are especially exporting to, revealing the role of gravity forces in trade.

In columns 3–5 (Table 3), selected structural characteristics depicting counties' economies are introduced. Among the important factors enhancing the FDI location are firms' agglomeration, urbanisation (proxied by population density), good situation on the labour market (offering relative high remuneration and low unemployment rate), high road density (as another measure of road accessibility) (Column 3). The structure of the economy, being the other counties' differentiating factor (in terms of counties' total employment) indicated industry and service orientation of regions, to which FDI mostly inflow. These should be equipped with high abundance of a well-educated population (column 5), mostly seen in the inner and the outer sphere of metropolitan areas (column 6).

In column 6 of Table 3, the authors test the robustness of the foregoing results by adding heterogeneous border effects and all of the examined factors till now. The presented results experience the lowest values of two informational criteria (AIC and BIC) while sustaining the highest R^2. Despite the lower significance of particular transport endowments, the direction and the scale of the effects of the other economic-related covariates is usually similar to the one observed in the previous estimations.

In general, the results have proved the role of preferably located (to national and foreign destination markets) metropolitan areas, city agglomerations, and industrial centres in explaining the number of FDI at a local level of the analysis. The high abundance of skilled and well-educated labour, agglomeration economies, closeness to SEZs and infrastructure endow-

ment, and economic structure of the county were the other important determinants of foreign entity locations.

Discussion

The obtained results fit into the empirical evidence obtained for other regions of Europe so far. Villaverde and Maza (2015), who analysed the driving factors of FDI location among EU NUTS 2 regions, proved the positive role of regions' economic potential, the position of the labour market, competitiveness and technological progress. An early study by Villaverde and Maza (2012) of Spanish regions have also revealed the key role of economic potential, competitiveness (road infrastructure, openness, the structure of the economy), and labour characteristics. Our study confirms most of the factors being FDI drivers also on a lower level of data aggregation, which is a proof of significant intra-regional diversification. However, contrary to the above-mentioned authors, we do not use a factor analysis to combine variables used in the econometric work, but instead utilize their real values. Thus, we acknowledge: (i) the role of infrastructure and human capital in FDI motives observed in the Czech Republic (Jáč & Vondráčková, 2017); (ii) agglomeration economies, labour skills, market size for Hungarian NUTS 3 regions (Simone & D'Uva, 2017); (iii) economic performance, technological performance and sectoral structure in East Germany, Poland and the Czech Republic, obtained by Gauselmann and Marek (2012).

Given the increasing importance of cities in the global economy (Csomós, 2017), we also acknowledge the positive stimuli of urbanisation, witnessed by Hecht (2017), for Czech regions or large city orientation (especially in the core) for FDI headquarter locations (Taylor & Ciechański, 2015). The results are also in line with the findings of Kisiel *et al.* (2017), according to whom most of the FDI in Poland is located in close vicinity (up to 15 km) to large urban centres (usually regional capitals). The cities provide agglomeration economies and a sectoral variety stimulating the FDI inflow in China (Chen, 2009) or France (Crozet *et al*., 2004). Through agglomeration externalities and large market size FDIs were also encouraged to locate in developing and transition economies (Alguacil *et al*., 2018).

FDIs' export orientation (Nazarczuk & Umiński, 2018b) in locational decisions, fits into the general picture of regional inequalities, observed in Poland, by selecting more desirable places located closer to national and foreign destination markets (city agglomerations/metropolises) with good transport accessibility (Nazarczuk & Umiński, 2018a).

The heterogeneous effects of the border on the location of FDI are in line with the findings of Cieślik (2005b), witnessing the uneven role of the EU and non-EU border for Polish regions and Schäffler *et al.* (2016), finding similar interconnectedness among German and Czech FDIs over the common border (beyond the sole role of transport costs). The observed effects can be also linked with regions' history or path-dependence, affecting the intensity of relations among regions and countries (Brodzicki & Umiński, 2017).

As far as SEZs' role is concerned, our findings are in line with Ambroziak (2016) who found positive effects of SEZs operation on Polish counties' economic performance (especially less developed), mostly due to the availability of tax exemptions offered within SEZs. Similar positive effects of FDI were acknowledged in the case of Czech regions (Damborský *et al*., 2013). We show that foreign capital is eager to take the use of these privileges, contrary to Cieślik and Ryan (2005), provided that their other locational criteria are satisfied. The findings fall in line with the results of the effects of industrial parks operating in Hungarian NUTS 3 regions (Simone & D'Uva, 2017) and tax exemptions in China (Wang, 2013), stimulating FDI inflow.

Conclusions

The study has analysed the role of different locational criteria on the location of foreign-owned entities within counties (LAU 1) of Poland. The obtained results are in line with the existing research done at a higher level of data aggregation also for regions of other countries (NUTS 2, NUTS 3), and simultaneously present new empirical evidence on significant counties' diversification in terms of FDI inflow. Our main contributions in terms of FDI locational determinants are: (i) the identification of the role of relative proximity to various infrastructure endowments; (ii) the determination of heterogeneous border effects associated with the location of FDIs; and (iii) acknowledging the link between the close location of special economic zones and FDI attraction.

The results prove the existence of the auto-selection process done by foreign investors, who chose better endowed (with high road accessibility, offering abundance of well-skilled labour force), economically developed and preferably located (distance to the markets/big cities) counties, signalling the possible growth of inequalities in the number of FDIs across counties, which will further give rise to the existing socio-economic regional differentiation. The arising policy question is to what extent the govern-

ment can affect this market-oriented selection of FDI locations. To our belief, the existing instruments can have only a minor albeit positive effect in this regard.

One of them is the establishment of special economic zones in less-developed counties. However, according to the obtained results and the actual progress of the SEZ programme, the policy can only be sufficient if most of the other FDIs' locational criteria are satisfied. Thus, a comprehensive policy-package, encompassing significant structural changes, including adjusting the vocational/higher training programmes, providing necessary labour force, improving transport accessibility, well-prepared and located investment plots, coupled with the use other incentives, such as SEZs, may enhance the chances of increasing the number of FDIs within the selected counties — owing to unequal local authorities' attitude towards investment promotion, their present economic situation and practical effects of their efforts (Lizińska, 2009; Źróbek-Różańska *et al.*, 2014). However, there is high probability that, eventually, we would observe a concentration of FDIs within the existing hubs.

The study features a few limitations, mostly originating from the data unavailability for FDIs in Poland. Thus, we do not take into account different motives for locating in Poland (Chidlow *et al.*, 2009) due to the unavailability of the firm-level data. We neither distinguish between manufacturing and service FDI, which may have different locational schemes (Jones & Wren, 2015), nor between the size of the entities (Cieślik, 2013), which may be driven by different motives. Having the data, we would incorporate them into the future analysis. As a result of the nature of the data and possible interconnectedness among counties, the use of spatial modelling techniques could affect higher models' fit to the existing FDI data.

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Annex

Table 1. FDI locational factors in regional studies

Factors	Studies	Expected sign
Proximity to market / market size	Alguacil *et al.* (2018), Faria (2016), Glickman and Woodward (1988), Chen (2009), Jones and Wren (2015), Simone and D'Uva (2017)	+
Large concentration of economic entities	Cieślik (2013), Guimarães *et al.* (2000), Hecht (2017)	+
Labour market conditions/characteristics, including wages and workforce qualifications	Alguacil *et al.* (2018), Cieślik (2013), Chen (2009), Faria (2016), Friedman *et al.* (1992), Gauselmann and Marek (2012), Glickman and Woodward (1988), Hecht (2017), Jáč and Vondráčková (2017), Simone and D'Uva (2017), Villaverde and Maza (2012), Villaverde and Maza (2015)	+
Transportation network / infrastructure endowment	Alguacil *et al.* (2018), Cieślik (2005b; 2013), Chen (2009), Guimarães *et al*. (2000), Jáč and Vondráčková (2017)	+
Urbanisation or total population	Brodzicki (2012), Chen (2009),	+
Agglomeration economies	Cieślik (2013), Chen (2009), Crozet *et al.* (2004), Faria (2016), Hecht (2017), Simone and D'Uva (2017)	+
Border/ distance to border / trade costs / common border	Cieślik (2005b; 2013), Chen (2009), Schäffler *et al*. (2016)	-
Clusters	Brodzicki (2012), Crozet *et al*. (2004)	+
Specialisation	Chen (2009), Gauselmann and Marek (2012)	+
Region's economic performance	Gauselmann and Marek (2012), Villaverde and Maza (2012), Villaverde and Maza (2015)	+
Region's technological performance	Gauselmann and Marek (2012), Villaverde and Maza (2015)	+
Industrial parks / place-based policy/ SEZs	Cieślik (2005b), Cieślik and Ryan (2005), Chen (2009), Damborský *et al.* (2013), Simone and D'Uva (2017)	+
Externalities	Blanc-Brude *et al*. (2014)	+
Dependent on the FDI motives	Chidlow *et al.* (2009)	n/a

Table 2. Descriptive statistics

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
FDI	Number of FDIs	1890	68.4085	436.5515	0	8451
comp10k	Number of companies per 10k inhabitants	1890	6.7660	0.2738	6.0252	7.7686
dist_airport	Distance to airport	1890	4.1514	0.7122	1.0962	5.6577
dist_border	Distance to national border	1890	4.2237	0.9272	1.3956	5.4793
dist_mway	Distance to express road or motorway	1890	3.0159	1.0378	-2.1118	4.8444
dist_nroad	Distance to national road	1890	1.6898	0.8741	-1.8665	3.1233
dist_pl_by	Distance to border PL#BY	1890	5.5205	0.7097	2.5669	6.4048
dist_pl_cz	Distance to border PL#CZ	1890	5.1379	0.9666	1.5488	6.3396
dist_pl_de	Distance to border PL#DE	1890	5.5381	0.8208	1.6279	6.4325
dist_pl_lt	Distance to border PL#LT	1890	5.8631	0.5554	6.4516	6.4516
dist_pl_ru	Distance to border PL#RU	1890	5.6037	0.6948	2.0860	6.3345
dist_pl_sk	Distance to border PL#SK	1890	5.3789	0.8230	1.9128	6.3577
dist_pl_ua	Distance to border PL#UA	1890	5.5368	0.7911	1.5742	6.5244
dist_port	Distance to port	1890	5.5696	0.7567	0.3814	6.4412
dist_railway	Distance to railway line	1890	1.5035	0.8928	-1.8165	3.4785
dist_SEZ	Distance to SEZ	1890	2.3381	0.9703	-1.2933	4.0766
higher_educ	Share of population with higher education	1890	0.3489	0.0411	0.2453	0.4974
industry_sh	Share employed in industry	1890	28.2180	11.5891	2.8058	73.2502
METRO	Metropolis dummy	1890	0.1402	0.3473	0	1
popdens	Population density	1890	4.9323	1.2392	2.9444	8.2860
remun	Remuneration	1890	7.8822	0.1305	7.5298	8.6338
roads	Public roads with hard surface [km]	1890	5.4688	0.7446	2.5649	7.2420
services_sh	Share of employed in services	1890	41.7315	14.9068	14.4218	87.0156
unemp_rate	Unemployment rate	1890	-1.9883	0.4442	-3.7297	-0.9493

Table 3. Results of estimates of local FDI determinants in Poland

Variables	(1)	(2)	(3)	(4)	(5)	(6)
dist_SEZ	-0.670***	-0.694***	-0.160***	-0.149***	-0.142***	-0.104***
	(0.0484)	(0.0507)	(0.0253)	(0.0229)	(0.0230)	(0.0248)
dist_mway	-0.0676*	-0.0150	-0.0598*	-0.0168	-0.0193	0.0193
	(0.0355)	(0.0353)	(0.0153)	(0.0143)	(0.0142)	(0.0145)
dist_nroad	-0.103*	-0.0852	0.0651**	0.0236	0.0235	0.00853
	(0.0555)	(0.0534)	(0.0276)	(0.0252)	(0.0254)	(0.0258)
dist_railway	-0.137***	-0.125***	-0.134***	0.0396	0.0362	0.00882
	(0.0476)	(0.0468)	(0.0269)	(0.0260)	(0.0261)	(0.0251)
dist_airport	-0.691***	-0.817***	-0.177***	-0.115***	-0.106***	-0.156***
	(0.0594)	(0.0712)	(0.0256)	(0.0288)	(0.0297)	(0.0320)
dist_port	-0.189***	-0.0858	-0.105***	-0.0148	-0.0102	0.143***
	(0.0346)	(0.0563)	(0.0239)	(0.0216)	(0.0213)	(0.0351)
dist_border	-0.150***		-0.150***	-0.109***	-0.110***	
	(0.0285)		(0.0161)	(0.0156)	(0.0156)	
pop_dens			0.382***	0.316***	0.307***	0.371***
			(0.0287)	(0.0301)	(0.0305)	(0.0333)
remun			0.676***	0.418**	0.376**	0.495***
			(0.158)	(0.168)	(0.168)	(0.180)
unemp_rate			-1.354***	-2.123***	-2.074***	-2.345***
			(0.299)	(0.340)	(0.339)	(0.323)
roads			0.838***	0.926***	0.922***	0.929***
			(0.0308)	(0.0350)	(0.0348)	(0.0335)
comp10k			2.627***	1.853***	1.823***	1.420***
			(0.0913)	(0.110)	(0.111)	(0.107)
industry_sh				0.0245***	0.0249***	0.0226***
				(0.00174)	(0.00178)	(0.00189)
services_sh				0.0289***	0.0292***	0.0282***
				(0.00236)	(0.00236)	(0.00236)
higher_educ					1.709***	2.462***
					(0.640)	(0.614)
METRO						0.210***
dist_pl_de		-0.444***				-0.380***
		(0.0461)				(0.0386)
dist_pl_cz		0.193***				0.0956***
		(0.0513)				(0.0250)
dist_pl_sk		-0.238***				-0.0509
		(0.0578)				(0.0335)
dist_pl_ru		0.162**				-0.265***
		(0.0716)				(0.0622)

Table 3. Continued

Variables	(1)	(2)	(3)	(4)	(5)	(6)
dist_pl_by		0.117				0.154**
		(0.0803)				(0.0651)
dist_pl_ua		-0.119*				-0.265***
		(0.0710)				(0.0460)
dist_pl_lt		-0.0621				0.174*
		(0.113)				(0.0972)
						(0.0513)
Constant	10.04***	11.37***	-23.59***	-19.60***	-19.63***	-16.60***
	(0.303)	(1.096)	(1.356)	(1.528)	(1.520)	(1.739)
Observations	1,890	1,890	1,890	1,890	1,890	1,890
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE (p-val)	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.119	0.130	0.223	0.239	0.240	0.252
LogPseudoLik	-8284	-8181	-7307	-7152	-7148	-7033
LR	892.9	1631	5489	7277	7342	7569
LR(p-val)	0.000	0.000	0.000	0.000	0.000	0.000
Alpha	0.859	0.782	0.294	0.244	0.243	0.212
Alpha (p-val)	0.000	0.000	0.000	0.000	0.000	0.000
AIC	16594	16400	14650	14344	14337	14122
BIC	16667	16506	14750	14455	14454	14277

Information: The individual year fixed effect is not presented because of limited space. The joint significance of the aggregate time effects is embraced in year FE (p-val). Clustered standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.