FDI trapped in red tape

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The influence of bureaucratic and administrative barriers on the geographic distribution of foreign direct investment

by

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Abstract: Recent figures by the OECD point once more to the importance of FDI in the globalized world of today. Countries put in place numerous incentive policies to attract FDI and benefit from multinational activity fostering the domestic development. Multiple studies were conducted using the gravity model to look at possible determinants and deterrents of FDI. The thrust of this paper is to explore the effect of bureaucratic and administrative impediments on the geographic distribution of US FDI and US foreign affiliate sales. We found that every 1% rise in bureaucratic impediments, has on average a negative effect of 0.477% on the geographic distribution of total volume of FDI flows and a negative effect of 0.814% on the level of sales of majority held US foreign affiliates. Based on our findings we recommend that governments should carefully monitor and improve the domestic public administration and in specific, concentrate on an investor friendly legal system.

1 Introduction

The first point of the 2003 OECD check-list for foreign direct investment attraction policies is as follows: "A predictable and non-discriminatory regulatory environment and an absence of undue administrative impediments to business more generally."[1] Following these guidelines, numerous countries pursue an active incentive policy to attract foreign direct investments. The Netherlands put in place a favourable taxation system with diminished profit taxes to attract foreign investments.[2] Morocco, on the other hand focuses on its cost competitiveness to attract foreign investors and the duty free business possibilities towards the whole of Europe. [3] Turkey emphasized the strategic value of a business located in Turkey and highlights the easiness to start a business, stating that on average it takes 7 days less to open a business in Turkey, compared to the OECD average of 13 days.[4] Thus, it seems to be the common belief that (i) inward FDI is beneficial for the domestic economy and that (ii) lower bureaucratic impediments will lead to more FDI inflows. In this thesis, we will concentrate on the second point and analyze whether lower bureaucratic impediments indeed imply more FDI inflows.

The focus of the research will be on US multinationals. The reason is that the necessary data on the operations of US multinationals is freely available via the website of the US Bureau of Economic Analysis. From this website, we have collected the total volume of US FDI to the 45 biggest investment destinations (based on the figures of 2009) from 2004 until 2009 and the total affiliate sales of majority held US foreign affiliates in the same 45 countries from 2004 until 2008. Afterwards, we regress these data on a number of measures of bureaucratic impediments in the host economy, using the method of a gravity equation. Data on these bureaucratic impediments comes from the International Finance Cooperation, a member institution of the World Bank that precisely reports annually, since 2003, on various types of business regulations in a number of selected countries. These regulations include the documents and procedures,

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[1] OECD, Checklist for foreign direct investment incentive policies, 2003 , p. 7
[2] http://www.nfia.nl/why_invest_in_holland.html Accessed on 25th of June 2011
[3] http://www.invest.gov.ma/?lang=en&Id=77 Accessed on 25th of June 2011
[4] http://www.invest.gov.tr/en-US/investmentguide/Pages/10Reasons.aspx Accessed on 25th of June 2011

time in days and costs of different categories important for investors, ranging from starting a business over taxes to the enforcement of a legal contractual claim. Since the nature of FDI is most of the time very operational, these factors should directly influence a company's business operations and investment decisions. For example, the cost associated with starting a business in 2009 (fees, etc.) were determined at 18.9% of income per capita in Malaysia versus only 5.6% in the Netherlands. Or, it took 1450 days to initiate and pursue a legal contractual claim in India versus only 150 days in Singapore. Intuitively, companies looking for low costs of starting a business or value an efficient and fast legal system, will think twice before investing in Malaysia or India. We hope that by finding a negative relationship we will be able to make recommendations for policymakers and give indication of further research areas.

The theoretical framework for our research was developed by Dunning (1981), who tried to hypothesise why multinationals pursue FDI. The Ownership, Location Framework was the first attempt to formulate the theory of multinational firms. According to this framework, firms will directly invest in a foreign market if they have a product or production technique no other firm has, if the location brings along a competitive advantage (looking at labour costs for instance) and if they can pursue a more international and global competitive advantage through this investment. Many scholars were interested especially in the effect of the location advantage and found that, FDI was pursued in its vertical form to find cheaper production possibilities, and its horizontal form where FDI is used to gain access to a foreign market potential. Recent studies combined these ideas to the knowledge capital model introducing FDI led growth. (Markusen, 1997)

Adding to the relevance of our research, are the latest numbers on the global development of FDI. Due to the consequences of the financial crisis in 2008, the total flow of global foreign direct investment experienced a sharp decline. According to the latest UNCTAD world investment report, there has been an average decline of FDI in developed and transition countries of 44% (UNCTAD, 2010). Nevertheless, the total stock of FDI and the affiliate sales of majority owned foreign affiliates of multinational

enterprises are at an all time high. The global inward FDI stock accounted for 17.7 trillion US $, global affiliate sales for even 29.3 trillion US$ and the figures are expected to start rising again in 2010. (UNCTAD 2010) These facts underline the importance of FDI flow as the major driver for international trade and investment.

The paper will consist of the following structure. First we will give an overview on related literature. Afterwards, in section 3, we will describe our data prior to describing our model in section 4. Section 5 will be used to describe the obtained results, which will be subject to interpretations and extensions in section 6. Finally, section 7 will permit us to formulate concluding remarks on the results and methods as well as for the suggestion of further research.

2 Related Literature

At the heart of nearly all studies conducted on the question about what the determinants of foreign direct investment flows are, we find the gravity equation. For a long time it has already been used when studying the determinants of international trade and Tinbergen (1962) has laid the foundation for the investigation of the effects of administrative and bureaucratic barriers. He was the first to investigate the effects of tariff reductions on trade flows through the model of a gravity equation.

Following the success of the gravity model in the application on trade flows, academics have been using this method to find evidence on the basic determinants of FDI flows. Davis (2008) conducted a broad study using data on bilateral FDI flows from and to the US, and about the stock of FDI in the OECD countries over the periods form 1983 to 1992 and from 1982 to 1992 respectively. Using a gravity equation he finds evidence for the existence of vertical FDI flows through a positive effect of the difference in factor endowments on the stock of FDI between two countries and could strengthen the validity of the KK model (Markusen, Venables, Konan, and Zhang 1996 ; and Markusen , 1997)

Braconier et al. (2005) have build upon Davis' findings and used the gravity analysis once more to strengthen the evidence on vertical FDI. They have primarily

investigated how wage costs for high and low skilled labour in host countries affect the level of affiliate activities. Their findings suggest that vertical FDI is favoured by cheap labour. Further, they also found that horizontal FDI is not untouched by wage differentials. According to them, 20% of US foreign affiliate sales are directly influenced by wage cost.

Since the attraction of foreign direct investment is a quite competitive field, the attention of academics quickly turned from the study of general economic factors, such like wage costs, towards country specific characteristics including the quality of institutions, trade policies, trade rules and regulations as well as business policies that could potentially influence the direction of FDI flows. Gastanaga et al. (1998) investigated if differences in policies and specific characteristics, such as the level of corporate taxes, the level of tariffs or the openness to trade had an influence on the flows of FDI. Although they did not use a gravity equation for their model, their findings are still valuable for our analysis because they were one of the first who investigated the influence of tariffs, intuitional policies and quality on FDI flows and pointed to a significant influence of non-tariff barriers for FDI flows. More attempts have been made to be able to identify other drivers for FDI. Since foreign direct investment are, contrary to trade, many times highly operational, multinationals have to face many other problems than just a trader. Therefore, Henisz (2000) tried to investigate with a two stage bivariate probit estimation, the influence on what he calls level of contractual hazard on the investment decisions of multinational enterprises. Under contractual hazard he included corruption and other indicators of institutional quality and found that the there is a negative effect of these hazards on the investment decisions. Alan and Estrin (2004) have build on Hnesiz notion of hazard and have included a proxy for domestic risk in a gravity model to investigate, among others, the effect of institutional stability on FDI flows and also finding a negative effect of political instability. Farther, by including a variable for distance they argue that they introduce a proxy for transaction costs. These transaction costs not only include transportation costs but also the costs of institutional or legal factors, thus a measure of administration and bureaucracy, and also finding a negative effect.

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Other academics have used the gravity framework for investigating the influence of the openness to trade on the level of FDI flows. Di Mauro (2000) included exchange rate variability, tariff and non-tariff barriers as a proxy for the economic integration. Her results show that non-tariff barriers to trade have a negative impact on the export of FDI. Furthermore, de Mello (2008) integrated non-tariff barriers as a variable in his gravity model to estimate the effect of a country's competitiveness on the geographic distribution of FDI flows. Non-tariff barriers included the in particular for us interesting administrative and bureaucratic rules and regulations and hence her findings are of importance to our study.

The study by Bénassy-Quéré, Coupet and Mayer (2005) is to our knowledge the first study, which is exclusively committed to the analysis of the quality of institutions and its effect on FDI. Through the use of a large database of the French ministry of foreign affairs, they have constructed proxies for the quality of the institutions in a bilateral gravity equation. They include variables like the efficiency of public administration in the host country, easiness of starting a business, efficiency of legal regulations of contracts, lack of corruption. Their analysis showed that the quality of various institutions in the host country has a significant positive effect on inward FDI. The data they used was a ranking of institution. We can take from this study that the effects of bad institutions should in general be negative on outward FDI flows meaning that we can investigate the determinants of the investment decisions of US multinationals. Another study, using indices about country and policy specific effects on the direction of FDI, was conducted by Toubal and Kleinert (2010). Estimating a gravity equation under the inclusion of the host country protectionism and investment indices, they have tried to estimate the influence of these variables on the sales of foreign affiliates, however not finding significant evidence.

An overall problem, which is described by academics when investigating the effects of administrative and bureaucratic barriers on the level of FDI flows, was the availability of representative data. Academics found it difficult to judge on the quality of a country's public administration. Departing from the empirical methods used by di

Mauro and Bénassy-Quéré, Coupet and Mayer (2005), this paper constitutes an attempt to include a new measurement of administrative and bureaucratic barriers. We will use so far to our knowledge unused data from the World Bank Doing Business Group, precisely listing variables about a country's administrative rules and regulations. We will try to find that these rules, fees and procedures have a negative impact on the geographic distribution of US FDI flows and US foreign affiliate sales.

3 Data

3.1 Multinational activity

The data is collected over 45 countries and over a period of 6 years, from 2004 till 2009. The selection of the 45 countries has been made based on their relative importance as a destination of FDI flows coming from the USA. The criteria for selection is based on the 2009 FDI flows in total volume, expressed in US $ on historical cost basis. The most important destination of US FDI flows in 2009 were the Netherlands, receiving 471567 million US $ worth of US FDI. The 45th most important country was Colombia, receiving 6728 million US $ worth of US FDI. The sample was restricted in time and by the availability of the data on bureaucratic impediments. Because this data is only available from 2004 to 2009, we have restricted our sample to these years. Some countries had to be dropped form the 45 priory selected countries because no data on bureaucratic impediments was available and were replaced by countries close to the 45 threshold. The complete list of countries can be found in the appendix.

The data is based on yearly reports of the Bureau of Economic Analysis[5] and the relative importance is determined by the ranking of the destinations of direct foreign US investment. Consequently we have collected the data representing FDI flows in total volume on historical cost basis towards the selected 45 countries. In a second instance we have collected and the total affiliate sales figures of US majority held foreign affiliates in the selected 45 countries from the Bureau of Economic Analysis. These

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[5] Available at http://bea.gov/international/index.htm#trade (retrieved on 20 May , 2011)

figures are presented in million US $ at historical cost basis and were only available up to 2008. Therefore the analysis of the influence of administrative and bureaucratic rules and regulations on the level of foreign affiliate sales will be conducted for one time period less than the analysis of the FDI flows.

3.2 Bureaucratic impediments

In a second step, we have collected the data about administrative rules and regulations for the 45 countries in our sample. The data is obtained form the annual Doing Business Reports from 2004 till 2009, published by the International Finance Cooperation, member of the World Bank group.[6] The database became available in 2004 and the latest report dates from 2009. As pointed out above, this is the main reason for restricting our panel to 6 years. We have chosen eight different variables from different categories to represent the ensemble of country specific procedural requirements for incoming FDI and business activities. The variables can be summarised in the following categories:

1. **Documents:** All documents required by government ministries, customs authorities and legal bodies to start and operate a business in the respective country. We have specifically looked at the number of documents needed to start a business, register a property and issue and pursue a legal claim to enforce a contractual obligation of a third party operator.

2. **Time:** Time measured in calendar days required for dealing with government ministries, customs authorities and legal bodies to start and operate a business in the respective country. In this category, the variables representing the time in days to start a business, the time in days to register a property, the time in days to export and to import goods, and the time in days to issue and to pursue a legal claim to enforce a contractual obligation of a third party operator have been used for our analysis.

3. **Costs:** Cost measured in US $ associated with all fees related to starting a business as percentage of per capita income has been integrated in our study.

The variables are subject to numerous assumptions. The Doing Business organisation is committed to the highest possible quality of their work and the assumption for each individual variable can be found under the description of their research methodology.[7]

3.3   Economic variables

Since most of the previous literature has found a significant impact of the host country's GDP and the GDPpc difference between the source and the host country, we will include these variables as controls as well. Information on the GDP and the GDPpc is from the World Bank's World Development Indicators Database.[8] GDP and GDPpc are measured in constant 2002 US-$ to correct for inflation.

3.4   Descriptive statistics

Table 1 displays the descriptive statistics of our dependant and control variables. In table 2 we display the descriptive statistics of our variables for the bureaucratic impediments. The code for the variables will be given in section 4.

Table 1: Descriptive statistics of the dependant and control variables

	AFFILIATEi	*FDIFLOTOi*	*DISTkm*	*GDPi*	*GDPPCi*	*DIFFGDPPCusi*
Mean	75692,40909	47135,66917	8763,616576	5,07142E+11	14808,31	23029,37517
Standard Error	7114,449892	5030,034054	220,4625239	52557286397	831,3428	831,1617014
Median	27381,5	13097,5	7226,9	2,00131E+11	7156,76	30718,84474
Standard Derivation	105524,345	82037,37275	3622,568923	8,63604E+11	13660,36	13657,38038
Minimum	1911	1105	3030,9	13386737514	426,9993	-17923,5774
Maximum	635073	471567	16350,4	5,20116E+12	56624,73	38227,41819
Observations	220	266	270	270	270	270

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[7] Available at : http://www.doingbusiness.org/methodology (Accessed on 22 May 2011)
[8] Available at www.wdi.org.

Table 2: Descriptive statistics of the variables for bureaucratic impediments

	DOCSAB	COSTSAB	DOCSPROP	TIMEPROP	TIMEEX	TIMEIM	DOCCLAIM	TIMECLAIM
Mean	8,636704	18,46367	5,753363	51,12556	17,1676	19,36872	34,32959	562,5655
Standard Error	0,228609	1,391565	0,206029	3,646137	1,028423	1,103456	0,414953	17,3825
Median	9	10,8	5	33	15	17	35	508
Standard Derivation	3,735503	22,73836	3,076674	54,44844	13,75936	14,76324	6,780389	284,0323
Minimum	1	0,1	1	1	5	4	20	120
Maximum	19	136,7	18	274	89	76	50	1510
Observations	267	267	223	223	179	179	267	267

4 Methodology

For the purpose of this paper, we have narrowed down our analysis to the 45 most important FDI destinations of the USA. Hence our analysis will examine the influence of administrative and regulative rules and regulations of the host country on the inflow of US investment and on the business operation of US multinationals operating in the host countries. As mentioned before, we have chosen the USA as the base country because of the better availability of data, especially about the financial data (foreign affiliate sales) on business operations of US multinationals, and the globally predominant position of the US as the country issuing the biggest amount of foreign direct investment[9].

Because we are interested in the cross sections effects over a period of time, we have constructed a balanced panel constituting of 45 cross sections and 6 time periods. We have chosen the form of a panel data for it to have several advantages for our research. Panel data is used to investigate either static or dynamic patterns (Baltagi, 2005). Using panel data will lead to more variability and less multicollineraity among the variables. (Certo and Semadeni, 2006). Further, our prior aim was to be able to control for unit heterogeneity what is made possible together with controlling for time correlation by using a balanced panel for our analysis (Baltagi,1995). Additionally, we

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[9] UNCTAD world investment report 2010

can make use of the strong explanatory power of a panel study to understand the economic phenomenon we want to test (Kennedy, 2006).

To estimate and test the economic impact of the chosen variables on foreign direct investment and the level of affiliate sales, we have to find a way to describe the pattern of the corresponding FDI flows and affiliate sales. The gravity equation is a widely used empirical method to investigate the patterns of bilateral trade. (Toubal and Kleinert, 2010). The simplest form of the gravity equation concentrates on the description of the trade flows as a function of the trading countries GDPs. (Tinbergen, 1962) Agnès Bénassy-Quéré, Maylis Coupet and Thierry Mayer, have used the gravity equation in a simple form to investigate if the quality of institutions had an effect on the level of FDI stock flowing into the country. [10] In order to be able to do such an analysis, several derivations have to be conducted before arriving at the gravity equation like shown by Toubal and Kleinert (2010) in the case of foreign affiliate sales. This paper will not go into detail for the theoretical foundations and a derivation will be waived.

We will conduct a OLS estimation and transform our data in the form of natural logarithms to achieve a linear function of the relationship and to be able to interpret the estimated coefficients as elasticity.[11] (Bénassy-Quéré, Coupet ,Mayer, 2005) The following equation describes the basic principle of our model:

$$\ln X_i = \ln a_1 + a_2 \ln Y_j + a_3 \ln Y_j + \ln \varepsilon_{i,j} \tag{1}$$

The basic form of the gravity equation will be expanded by the adding the selected variables representing the administrative and bureaucratic rules and regulations that give rise to potential barriers to foreign direct investment. The basic form of the gravity equation will constitute of four control variables that are in line with prior empirical research on this topic.

$$\ln FDIflo_{US,i} = \ln a_1 + a_2 \ln Distkm_{US,i} + a_3 \ln GDP_i + a_3 \ln GDPPC_i + a_3 DIFFGDPPC_{US,i} + \ln V_i \tag{2}$$

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[10] Bénassy-Quéré, Coupet ,Mayer, 2005

[11] This was done for all data points except for the difference in GDP per capita because some of these observations have negative values, and the dummy variables

$$\ln Affiliate_{US,i} = \ln a_1 + a_2 \ln Distkm_{US,i} + a_3 \ln GDP_i + a_3 \ln GDPPC_i + a_3 DIFFGDPPC_{US,i} + \ln V_i \qquad (3)$$

Equation 1 and 2 constitute of the two basic forms of the gravity equation used in the case of total FDI flow and total foreign affiliate sales respectively with $\ln V_i$ representing the vector of control variables given by:

$$\ln V_i = a_4 CommL + a_5 CommB + a_6 \ln Docsab_i + a_7 \ln Costsab_i + a_8 \ln Docsprop_i +$$
$$a_9 \ln Timeprop_i + a_{10} \ln Timeex_i + a_{11} \ln Timeim_i + a_{12} \ln Docclaim_i + a_{13} \ln Timeclaim_i \qquad (4)$$

Two regressions will be conducted on the following dependent variables:

1. *FDIflo$_{US,i}$* is the total volume of FDI the US has invested in country i measured in million US\$ at historical cost basis.

2. *Affiliate$_{US,i}$* are the total sales of all majority owned foreign US affiliates in country i. The sales are measure in million US\$ at historical cost basis.

We have decided to run regressions on the two variables to guarantee robustness and validity for our results. Further, including both will give us the possibility to examine the impact of administrative and bureaucratic barriers on general FDI flows (represented by FDIfloto$_{US,i}$), which includes investments in production facilities and affiliates, and to investigate the effect of these barriers on the direct business operations resulting from FDI (represented by the affiliate sales).

The independent variables we have included in our model are described and presented as follows:

1. *Distkm* is the distance between the capital of the US and the capital of the country of destination of US FDI or the host country to the US majority owned affiliates, measured in km.[12] This has been used as an approximation for transportation costs in different studies on FDI or trade flows before (Bénassy-Quéré, Coupet ,Mayer, 2005/Mitze,Alecke, Untiedt 2009)

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[12] Available at : http://www.chemical-ecology.net/java/capitals.htm (accessed on 22 May 2011)

2. GDP_i is the GDP in country i measured in constant US\$ (2002)[13].

3. $Gdppc_i$ is the GDP per capita in country i measured in constant US\$ (2002).

4. $Diffgdppcus_i$ is the difference between the US GDP per capita and the GDP per capita in country i. This serves as a proxy for the difference in factor endowments between the US and the country of destination of US FDI, or the host country to the majority owned affiliate sales measured in constant US\$ (2002).

5. $CommL$ is a dummy variable for common language. It takes the value 1 in case of the same language, 0 otherwise.

6. $CommB$ is a dummy variable for common border. It takes the value 1 if the US shares a direct border to country i, 0 otherwise.

7. $Docsab$ is the variable expressing the number of documents to be filled out and procedures necessary when starting a business in country i.

8. $Costsab$ is the variable expressing the costs of starting a business in country i as a percentage of income per capita.

9. $Docsprop$ is the is the variable expressing the number of documents to be filled out and necessary procedures when registering a property in country i.

10. $Timeprop$ is the variable expressing the time in days it takes to register a property in country i.

11. $Timeex$ is the variable expressing the time in days it takes to export from country i.

12. $Timeim$ is the variable expressing the time in days it takes to import into country i

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[13] The data on GDP and GDP per capita was retrieved from the world bank development indices database available at http://data.worldbank.org/indicator (Accessed on 25 May 2011)

13.   *Docclaim* is the variable expressing the number of documents to be filled out and necessary procedures when issuing and pursuing a legal claim to enforce a contractual obligation of a third party operator in country i

14.   *Timeclaim* is the variable expressing the time in days it takes to issue and pursue a legal claim to enforce a contractual obligation of a third party operator in country i

For the execution of our gravity approximation we will use an ordinary least squares regression. We have decided not to use any weighting for our regressions because we want to guarantee the most precise results for our model and we are sure that no data errors are presented in our sample. Further we want to achieve the highest possible validity of our outcomes for the model. Hence we want to find the highest values of the R^2 for the effects of administrative and bureaucratic barriers on FDI flows. The R^2, can be maximised when we minimise the sum of the squared residuals and hence the OLS model is most suitable for our purpose.

To control for intercorrelation between time periods we have chosen to control for it with a time fixed effects specification. This was achieved by adding dummy variables for every year. It was per se not necessary to add dummy variables to control for cross section intercorrelation because the values of the *Distkm* variable fulfil this function, thus we have used this to control for possible cross section effects.

To give an additional indication of the representativeness of our variables we will conduct a Wald test for every regression to test if any of the variables can be omitted form the model. The Wald test serves to investigate the hypothesis if all coefficients are jointly zero. If the null hypothesis is accepted we could omit all variables form our model. This test was used before in literature when investigating the effect of administrative barriers on FDI under the application of a gravity theory (de Mello-Sampayo, Felipa;2009). The following section will present the results of our regression analysis.

5   Results

First of all, to address the problem of collinearity we have constructed a correlation matrix of all explanatory variables for the administrative and bureaucratic barriers.

Table 3: Correlation matrix of the exploratory variable for administrative and bureaucratic barriers

Variable	DOCSAB	COSTSAB	DOCSPROP	TIMEPROP	TIMEEX	TIMEIM	DOCCLAIM	TIMECLAIM
DOCSAB	-	0.722763	0.365630	0.303474	0.507595	0.572576	0.534046	0.441584
COSTSAB	0.722763	-	0.397580	0.313055	0.499492	0.567773	0.628675	0.583380
DOCSPROP	0.365630	0.397580	-	0.654299	0.389694	0.470451	0.154912	0.364770
TIMEPROP	0.303474	0.313055	0.654299	-	0.290684	0.337393	0.046341	0.343561
TIMEEX	0.507595	0.499492	0.389694	0.290684	-	0.950269	0.530893	0.369436
TIMEIM	0.572576	0.567773	0.470451	0.337393	0.950269	-	0.541333	0.419873
DOCCLAIM	0.534046	0.628675	0.154912	0.046341	0.530893	0.541333	-	0.512883
TIMECLAIM	0.441584	0.583380	0.364770	0.343561	0.369436	0.419873	0.512883	-

As we can clearly see, there is a very strong correlation between some of the variables, especially when they represent time and documents necessary for a common business procedure. It is therefore not surprising at all and it can be intuitively understood that the more documents to be fill out or procedure to be completed when registering a property, the longer (time in days) it will take to finalise the registration of a property. The same applies for the very strong correlation between the time to import and the time to export. It is natural to assume that a country, which has strict regulations for the import of goods, applies the same for the export of goods, resulting in an approximately same amount of time for both procedures.

Addressing the question how we are going to deal with the collinearity we have to repeat that we have specifically chosen for a panel estimation because it was expected to see collineartiy in the explanatory variable. By the use of a panel study, the problem can be eliminated for the reasons given in section 4. In addition, to overcome the problem of collinearity, we have looked at the full effects and individual effects of the variables.

Table 4: Impact of administrative barriers on total volume of FDI flow from the US to country i measured in million US $ at historical cost basis

Regression variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xiI)
Distkm	-0.6188***	-0.675***	-0.454***	-0.528***	-0.588**	-0.332**	-0.359***	-0.607***	-0.731***	-0.515***	-0.678***	-0.589***
	(0.121)	(0.116)	(0.126)	(0.126)	(0.119)	(0.133)	(0.134)	(0.140)	(0.142)	(0.111)	(0.124)	(0.138)
GDP	0.5065***	0.4889***	0.475***	0.484***	0.479***	0.439***	0.449***	0.491***	0.506***	0.533***	0.492***	0.484***
	(0.042)	(0.041)	(0.042)	(0.045)	(0.041)	(0.044)	(0.044)	(0.048)	(0.048)	(0.040)	(0.041)	(0.046)
GDPPC	-0.0180	-0.0469	-0.044	-0.067	-0.1731*	0.044	0.029	-0.221**	-0.283**	-0.129	-0.102	-0.229**
	(0.096)	(0.093)	(0.094)	(0.095)	(0.094)	(0.102)	(0.099)	(0.110)	(0.111)	(0.086)	(0.091)	(0.101)
DIFFGDPPC	-0.0005***	-0.0005***	-0.0005***	-0.0005***	-0.0005***	-0.0005***	-0.0005***	-0.0004***	-0.0004***	0.0004***	-0.0004***	-0.0003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CommL		0.826***		0.803***	0.638***	0.858***	0.870***	0.925***	0.991***	0.498***	0.901***	0.893***
		(0.173)		(0.176)	(0.170)	(0.174)	(0.175)	(0.192)	(0.191)	(0.163)	(0.163)	(0.201)
CommB			1.356***	1.3063***	1.299***	1.591***	1.453***	1.057**	1.030**	1.286***	1.007***	1.129***
			(0.364)	(0.357)	(0.339)	(0.369)	(0.369)	(0.411)	(0.404)	(0.322)	(0.348)	(0.369)
Docsab				-0.110								0.294**
				(0.133)								(0.146)
Costsab					-0.196***							-0.119*
					(0.046)							(0.063)
Docsprop						0.414***						0.446***
						(0.099)						(0.116)
Timeprop							0.161***					0.060
							(0.043)					(0.053)
Timeex								-0.588***				0.297
								(0.160)				(0.291)
Timeim									-0.616***			-0.865**
									(0.142)			(0.271)
Docclaim										-2.022***		-0.847**
										(0.294)		(0.378)
Timeclaim											-0.494***	-0.373**
											(0.114)	(0.143)
Time and country fixed efFects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R²	0.645	0.673	0.675	0.687	0.701	0.721	0.707	0.715	0.724	0.736	0.708	0.820
Panel Observations	266	266	266	263	263	221	221	177	177	263	263	177
Wald-Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: The regressed is the total volume of US FDI measured at historical cost basis in million of US$ annually. All variables, except the dummies and the difference in the GDP per capita between the US and country i. The table report OLS estimates. The standard errors are given in parentheses .*significant at 10%;**significant at 5%, ***significant at 1%.

Table 5: Impact of administrative barriers on total sales of majority held US foreign affiliates in country i.

Regression variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xiI)
Distkm	-0.257*	-0.290**	-0.158	-0.292**	-0.223*	-0.163	-0.089	-0.251	-0.376**	-0.198	-0.373***	-0.363**
	(0.144)	(0.138)	(0.149)	(0.144)	(0.135)	(0.170)	(0.161)	(0.177)	(0.175)	(0.118)	(0.141)	(0.163)
GDP	0.706***	0.691***	0.681***	0.695***	0.668***	0.641***	0.629***	0.698***	0.716***	0.730	0.680***	0.725***
	(0.048)	(0.046)	(0.048)	(0.048)	(0.040)	(0.054)	(0.053)	(0.062)	(0.059)	(0.040)	(0.046)	(0.053)
GDPPC	0.182*	0.123	0.192*	0.033	-0.132	0.103	0.140	-0.093	-0.200	-0.036	-0.002	-0.270**
	(0.109)	(0.105)	(0.108)	(0.108)	(0.109)	(0.124)	(0.119)	(0.144)	(0.142)	(0.089)	(0.104)	(0.123)
DIFFGDPPC	-0.0002**	-0.0002**	-0.0005***	-0.0002**	-0.0003***	-0.0003***	-0.0003***	-0.0002**	-0.0002*	0.0001**	-0.0002***	-0.0002***
	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CommL		0.885***		0.696***	0.576***	0.858***	0.884***	0.938***	1.021***	0.324*	0.928***	0.636***
		(0.193)		(0.199)	(0.188)	(0.214)	(0.209)	(0.238)	(0.203)	(0.168)	(0.183)	(0.234)
CommB			0.956**	0.824**	0.825**	1.037**	1.025**	0.614	0.514	1.108***	0.531	0.702*
			(0.405)	(0.388)	(0.367)	(0.441)	(0.424)	(0.494)	(0.472)	(0.322)	(0.382)	(0.402)
Docsab				-0.385								0.165
				(0.146)								(0.174)
Costsab					-0.275***							-0.109
					(0.052)							(0.074)
Docsprop						0.101						-0.080
						(0.120)						(0.138)
Timeprop							0.149***					0.130**
							(0.050)					(0.060)
Timeex								-0.617***				1.102***
								(0.233)				(0.380)
Timeim									-0.745***			-1.267***
									(0.180)			(0.313)
Docclaim										-2.802***		-1.751***
										(0.286)		(0.422)
Timeclaim											-0.596***	-0.260
											(0.126)	(0.162)
Time and country fixed efFects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R²	0.630	0.662	0.638	0.680	0.708	0.664	0.680	0.715	0.702	0.774	0.701	0.798
Panel Observations	220	220	220	217	217	174	174	131	131	217	217	131
Wald-Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: The regressand is the total sales of majority hold US foreign affiliates in country i. measured at historical cost basis in million of US$ annually. All variables, except the dummies and the difference in the GDP per capita between the US and country i. The table report OLS estimates. The standard errors are given in parentheses . *significant at 10%;**significant at 5%, ***significant at 1%

Table 4 and 5 summarise the results of our two sets of regression analyses. Generally for both sets, the first regression is carried out under sole inclusion of the basic control variables to explore the explanatory power of the base for our analysis. Subsequently we have repeated the regression 11 times to include the other variables for the reason given above. Regression ii and iii include separately the effect of the dummy variables for common language and common border. Afterwards we have includes these dummies in the general model and they are integrated in all regressions that test, one after another, the explanatory power of only one variable for administrative and bureaucratic barriers in our model (regression iv till xi, the full effects). In regression xii we depict the results of all administrative barriers at once, compromising all eight variables (individual effects).

First, we will go into detail with the description of the results on table 2, representing the Impact of administrative barriers on total volume of FDI flow from the US to country i, measured in million US $ at historical cost basis. Regression i represents the results of our analysis of the base function. Despite the GDP per capita in country i, all variables are significant. The variables for distance and GDP are in line with previous findings (Beva et al., 2004, Davies at all, 2007). The variable for the difference in GDP per capita is significant and has a very small negative impact. The R^2 of 0.645, expresses that our model has a high explanatory power for the basic control variables.

Regressions ii and iii show that the dummy variable for common language and common border are significant and have a positive impact on the level of FDI flows. Adding these dummies, further increases the explanatory power of our model. Looking at the regressions vii to xi, we can insolate the effect of the variables representing administrative barriers. Overall we have expected negative coefficients for our variables and in most cases we have obtained these results. However, the procedures and documents necessary to start a business are proven to be insignificant for the total volume of FDI flows and we find an unexpected positive fore sing.

The costs associated with starting a business are significant and have a negative influence on the total volume of FDI flows. This is what we would have expected. The same applies for the time in days it takes to export from country i, the time in days it takes to

import into country i, the number of documents to be filled out and procedures necessary when pursuing a legal claim to enforce a contractual obligation of a third party operator in country i and the time in days it takes to pursue a legal claim to enforce a contractual obligation of a third party operator in country i. However, the number of documents to be filled out, necessary procedures when registering a property in country i and the time in days it takes to register a property in country i are proven to have a positive impact on the total volume of FDI flows from the US to country i.

Attention needs to be drawn to the fact that when we include the variables *costab, timeex* and *timeim*, the control variable GDP per capita becomes significant and has a negative influence on the total volume of FDI flows from the US to country i. The overall changes of the parameters of the other control variables by adding the independent variables to our model are however of minor nature. The R^2 is generally improved by adding independent variables to our estimation with the regression x (*docclaim* on FDI) having the highest explanatory power of all regressions constituting of one independent variable.

Regression xii shows the results for our estimation when we incorporated all variables. The explanatory power of our estimation is improved by another 27.1% if we compare it to the explanatory power of regression i, which only included the control variables. Yet, we can see that the significance of the variables *timeex* and *timeprop* were compromised. The overall changes on the parameters of the control variables are still of minor nature but for some independent variables we see a strong decline of the coefficient. Looking at the variable *docclaim*, which had the strongest effect of all other independent variables when tested alone, was diminished by 58.1% when included in the regression with others. The results will be subject to more thorough discussion in the next section.

Before we continue with the discussion and the interpretation of the results we will now describe the results from our second set of regressions. As we can see, there are a few differences when we compare the impact of our independent variables on volume of FDI flows and the total sales of foreign affiliates. This is natural since we are dealing with another dependant variable and the impact of the administrative and bureaucratic barriers

can be different on the affiliate sales. If we look at regression i in table 3 we can first of all see that the influence of GDP per capita on the level of total affiliate sales is significant and positive. Further, the distance between the US and country i has a less strong influence than for the estimation of the total volume of the affiliate sales. This is consistent with the stronger effect of the GDP of country i and in line with the results of Toubal and Kleinert[14]. We note that the R^2 (0.630) is of equal magnitude and we can state that for this series of estimations, the explanatory power of our model is once more of strong nature.

As in our first set of regressions, ii and iii show that the dummies for common language and common border are significant and have a positive effect. Over the regressions iv to xi we find in total two insignificant results. The variable *docsab* is as in the first set of regressions, insignificant and would have a positive effect. Additionally the variable *docporp* is insignificant and would have a positive effect. We find that all other variables, except of *timpeprop* which has a significant positive effect, have a significant negative effect. This is the negative effect of administrative and bureaucratic barriers we would have expected. As is the first set of regressions, we find that the effect of the parameter, expressing the number of documents to be filled out and necessary procedures when pursuing a legal claim to enforce a contractual obligation of a third party operator in country i has the strongest negative effect. It is noteworthy that that by adding the independent variables separately we achieve an average improvement of the explanatory power of 10.1% compared to the explanatory power of in the control variables.

The results from regression xii have to be described a bit more in detail because integrating all variable in one regression resulted in changes in the magnitude, direction and significance of some variables. We also see more of these changes compared to the first set of regressions. First of all, the effect of GDP per capita has been reversed compared to regression i and is now negative. Further, the variables *costsab* and *timeclaim* have lost their significance. Looking at the variable *timeex* we see that while the magnitude has been increased by 78% compared to regression viii, the direction has been reversed as well. As we have seen in the first series of regression, the formerly strongest parameter for the variable

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[14] Toubal and Kleinert (2010).

docclaim has also been decreased significantly, this time with 37.5% compared to regression x. Compared to the variation in the independent variables, the variation in the results in regression xii of the magnitude of the parameters for the control variable has been of minor nature (<10%).

The Wald test for all our regressions suggest that the coefficients are non-zero and contribute to the explanatory power of our model.

In both series of regressions we have experienced changes in the magnitude and direction of some variables depending on the inclusion of other variables. This is natural and can be attributed to an interaction effect between variables. By including one variable after another we have produced the full effect caused by the variable itself and other variables through the specific variable. In regression xii for both series, we have been interested in the individual effects of all variables. The reason to investigate the full effects is that we have a chance to statistically enhance the impact of the independent variable that strengthens the effect, and the interpretation of the influence. The independent effects on the other hand bear the weakness of possible interaction effects, yet is also noteworthy for interpretations. For the sake of the discussion and interpretation we will look at the full and individual effects of each variable to ensure the highest representativeness of our interpretations, which will be carried out in the following section.

6   Discussion and Extensions

For the interpretations, discussion and extensions of our results described in the previous section we will compare and evaluate the total and individual effects of all parameters. Additionally, we will simultaneously look at the differences between the influence in the total volume of FDI flows and the impact on the level of US foreign affiliate sales. Overall, we can state that most of the results are satisfactory in the light of magnitude and direction of the effect as well as in the explanatory power of our model (lowest R^2 is 0.63 highest R^2 is 0.82).

6.1   Discussion of the control variables

From our results we can see a high level of robustness regarding our control variables. The variations are minor throughout both series of regressions and we most of the time see significant results. There are however a few exceptions, especially regarding the influences of the GDP per capita. Looking at its effect on the total volume of FDI flows, we obtained the direction of the full effect we were hoping for but there is a problem of significance. We do acknowledge this problem but we can still interpret the impact of it. Our result expresses a negative impact on the total volume of FDI flows by the GDP per capita in the host country. This makes sense because the total volume of FDI incorporates vertical and horizontal FDI. In the case of vertical FDI, a higher GDP per capita is encouraging because of higher productivity, but the normally higher wage levels will discourage FDI that only seeks cheap production facilities. This is the effect we have expected. Looking at the influence of GDP per capita on the total affiliate sales, normally a proxy for horizontal FDI, our results seems more ambiguous. The full effect is significant and as we have hypothesized has a positive effect. Because horizontal FDI serve to access a marked in other countries, the GDP per capita naturally has a positive effect on the size of the market and the sales of foreign affiliates because people can in general consume more. However we see the same problem as in the case of the total volume of FDI flows. When we look at the individual effect, the direction of the impact is reversed to a negative and significant influence. This has to be contributed to an interaction effect with other variables. This is to our knowledge the first study conducted on the influence on administrative and bureaucratic barriers on FDI flows, which included GDP per capita as a control variable. One possible explanation for these ambiguous effects in our sample is that the 45 most important destination of US FDI encompass highly developed and much less developed countries at the same time. While GDP per capita in a less developed country may lead to more sales of US affiliates, this might not be true for strongly developed countries because a high GDP per capita is also a sign for very strong domestic competition, thus negatively influencing affiliates sales. To clarify this issue it would be suitable conduct a study of the influence of GDP per capita on horizontal and vertical FDI under the distinction between developed and undeveloped host countries.

Looking at the other control variables we have obtained satisfactory results. The GDP in a country is another proxy for the market size and has a positive and significant impact on both our dependant variables. As we have expected, the influence is stronger on the level of affiliate sales because a larger market potential would intuitively bear more chances for affiliate sales. The effect is smaller on the total volume of FDI flows because here again, we have to distinguish between horizontal and vertical FDI. The effect of the market size would be less strong on vertical FDI because the issuer is per se not interested in selling the goods in the host country but in exporting them again. A larger marked would be a sign for higher productivity and higher wage cost, which would have a negative influence on vertical FDI.

A very interesting result is the influence of the distance in kilometres between the US and country i. Overall we find a significant negative impact of the full and independent effect on both of our dependant variables. As we have expected the effect is smaller on the total sales of foreign affiliate sales because this is not directly influenced by transportation cost and under the inclusion of some independent variables the effect of the geographical distance is even insignificant. Yet there is an overall negative effect of the distance. This result sheds a critical light on the proximity–concentration hypothesis (Krugman 1983). This hypothesis predicts that FDI will be chosen instead of exporting to access another marked when the distance related cost are high because FDI is not too much influenced by them since much of the investment can be done by financial transactions and telecommunication. However we find a negative influence, which leads us not directly to the rejection of the proximity-concentration hypothesis, but it would be reassuring to see if the effect on trade between the US and the selected countries in the sample is more negative to prove it. However, we can conclude that foreign direct investment also involves transportation costs such as the travel costs incurred by employees, importation of specific necessary materials to build production plats, and that these distances related costs have a negative impact in the geographical distribution of US FDI flows. The influence of the difference in GDP per capita is in both cases negative and significant. However because of it has only a very small influence, we cannot attribute very much explanatory power to this variable.

Looking at the influence of the dummy variables controlling for common border and common language we have to note some problems occurring in our model. The dummy for common border only affects Mexico in our sample as it is the only country sharing a direct border with the US. Hence, instead of estimating the effect of a common border on the geographic distribution of US FDI, it can be seen as a country specific effect, compromising many more variables than simply a common border, which generates bias in our results. The estimator is hence overstated and cannot be fully interpreted. The dummy for common language however does apply to more countries in our model. Although their number is also limited, including the common language dummy is important because a common language can make it significantly easier to deal with another country's public administration. Although the effect might also be overstated, the positive influence we expected appears clearly.

6.2   Discussion of the variables for administrative and bureaucratic impediments

The results of the included variables for administrative and bureaucratic barriers appear at first sight satisfactory because most of them have as we expected, a negative influence. Yet, when investigating some of them more in detail we observe rather ambiguous results. In general we see that for quite a few variables, we have strong variations between the full and individual effects in terms of magnitude and direction. For some variables this makes an adequate interpretation complicated. As pointed out in section 5, this occurs more often in the case of affiliate sales. In total we have 6 results in the two sets combined with this problem. One variable, where we see this problem in the case of total volume of FDI flows and the total affiliate sales is the variable expressing the number of documents and necessary procedure to start a business. In the case of affiliate sales we see a change in magnitude (divided by two) and direction from the full to the individual effect, yet both results are insignificant. This is not what we would have expected because especially the effort to start a business should have a significant impact. In the case of the investigation of the effect of this variable on the total volume of US FDI, the interaction effect between the variables in equation xii more than doubles the effect and makes it positive. If we were to interpret the result in regression xii, we would conclude that the more documents and

procedures have to be completed before starting business, the more FDI is directed to this country. A possible explanation would intuitively be that these documents and procedures would include safety and legal procedure, which would assure a multinational of a regulated business environment and could have a positive influence on their insurance policies. (Melitz, 2003) This interpretation can however not fully be relied on because of the above-mentioned problem.

The next variable, representing the costs affiliated with the administrative procedures of starting a business, has in contrary a very clear effect. These costs negatively influence the total volume for US FDI and the total foreign affiliate sales. This is the result we would have intuitively expected. Although the individual effect of this variable became insignificant for the foreign affiliate sales we can rely in our results to state that there is indeed a negative effect.

The effects of the documents and time necessary to register a property are more puzzling. We expected to find a negative influence of these two variables because intuitively, the time and effort it takes to register a property in another country should directly be influencing the operational decisions of multinationals. We find however the opposite. The necessary documents and procedures to register a property have a positive impact on the volume of FDI flows. The full and individual effects are nearly identical and highly significant. In the case of the influence on the affiliate sales, the effects are more ambiguous. First of all, the effects are insignificant and we find the problem of switching direction when comparing individual and full effects. We conclude that the effect on affiliate sales is not of importance but the since the positive full effect is stronger than the negative individual effect, an interpretation of this is useful for both dependant variables. In line with the interpretation of the effects of the documents to start a business, we can abstain that the number of documents provides legal security in terms of protection of property rights and insurance policies. The results concerning the influence of the time in days it takes to register a property are more complicated to understand. In the case of the influence on the level of total foreign affiliate sales we obtained nearly identical full and individual positive effects. The influence on the total volume of the FDI flows is less strong and insignificant.

We would have expected a negative influence on both dependant variables because the longer it takes to register a property, the longer a multinational has to wait with their business operations. Yet, it is possible to turn this argument around. If we look at this variable from the point of view of a company that already acquired a property in country i, it is actually a competitive advantage. Competing firms take longer to become active in the market because they have to wait extra long until they have registered their property. Under this assumption, the positive impact makes intuitive sense and the fact the influence on the affiliate sales is stronger is accordance with this claim.

Continuing with the interpretation of the results, we will now focus on the influence of the variables affecting the trade across boarder. The influence of the time it takes to export on the geographic distribution of the total volume of US FDI flows and affiliate sales is again ambiguous. For both dependant variables we have a change in the direction and magnitude from the full to the independent effect. The full effects are negative, what we would have expected. However the individual effects appear unclear. The influence on the total volume of US FDI flows became statistically insignificant by including other variables in the regression, while the influence on total sales was strengthened and became positive. If we look back to table 3, we see that these two variables are extremely correlated and although controlling for time correlation, the individual effects are too much influenced to be in interpreted correctly. Looking only at the full effect, it is natural to assume that part of the FDI results in new exports back to the home country or to another country, especially in the case of vertical FDI. However, the affiliate sales are also directly influenced by the time it takes to export because the export of finished products into other countries is part of the sales. Hence the negative impact is logical. Less ambiguity exists concerning the effect of the time to import to country i form the US. All parameters are statistically significant and negative. We would have expected a positive relationship because where it is costly and timely to import, trade is often substituted by FDI to directly produce in this country. The longer it takes to import to a country, the higher are the associated costs of the import because more money has to be spend on additional storage time. Hence firms would prefer to produce directly in this country and save money. The contrary effect can however be explained following the reasoning from the influence of transportation cost.

When constructing this hypothesis, we have underestimated the effect of transportation cost on FDI and affiliate sales. We can conclude that the operations of multinational enterprises in foreign countries are still dependant on imports from the home country, explaining the negative effect of the time to import on the total volume of FDI flows and affiliate sales.

The last set of variables is describing the effect of the legal system in county i on the level of foreign affiliate sales and the total volume of US FDI flows. The results of this section are very clear. For both dependant cases the impact of the variable expressing the number of documents to be filled out and necessary procedures when pursuing a legal claim to enforce a contractual obligation of a third party operator in country i and the variable expressing the time in days it takes to pursue a legal claim to enforce a contractual obligation of a third party operator in country i are highly statistically significant and negative. This indicates that an ineffective and bureaucratic legal system for the protection of investors is highly unattractive to multinationals. A 1% increase in the number of necessary documents to issue and pursue a legal claim, results in a decrease of 2% in the amount of total volume of US FDI flows to this country and of 2.8% in the affiliate sales. The time it takes has a less strong effect but in the same direction. This result leads to the conclusion that if a country wants to attract FDI, it has to carefully put in place an efficient legal system to protect the foreign investor.

The presented tables in the appendix summarise our important findings. The plotted variables are corrected for all other variables in regression xii for both dependant variables. Figures 1 to 6 are summarising the results for the impact of the administrative and bureaucratic barriers on the volume of US FDI flows and figures 7 to 11 summarise the impact on the total foreign affiliate sales.

7 Summary and Conclusion

The thrust of our paper was to contribute to the elucidation of the effect of administrative and bureaucratic barriers on the geographic distribution of foreign direct investment. We have done so by looking at the effect of selected variables for administrative and bureaucratic barriers on the bilateral flows of FDI between the US and a

host country, and the impact on the total sales of US majority owned foreign affiliates. To investigate the impact we have constructed a gravity equation model. The data we have used for the administrative barriers is relatively new and has not been used for this purpose before. We have used the data representing costs and procedures when starting a business in another country, the documents and time when registering a property, the time it takes to import and export and the time and document necessary when filing a legal contractual claim.

Through our analysis we came to several conclusions. First of all, the found effects of administrative and bureaucratic barriers to FDI flows are not uniform. Against our expectation, the variables surrounding the registration of a property have a positive affect on both our dependant variables. Further, some variables administrated ambiguous results when included in a regression with all the other variables. However, looking at the full effects of all administrative and bureaucratic barriers on FDI flows and affiliate sales, the overall average effect was negative. This is in line with our hypothesis and we can conclude that these barriers pose a significant obstruction to the geographical distribution of FDI and the total sales of foreign affiliates.

To illustrate this finding, we present the effect of a reduction in the time of claim and the costs to start a business for the dependant variables based on the full effects in regressions xi and v respectively for some examples in our sample.

- If the Philippines would reduce the days it takes for initialising and pursuing a legal claim from 842 to the sample average of 562 in 2009, in could increase the total volume of US FDI flows by 853 million US $.

- If Venezuela would decrease the cost associated with starting a business by 31% to reach the sample average of 18% of income per capita, affiliate sales of US foreign affiliate could increase by 8.25% or by 1551.8 million us $

Since the attraction of FDI is a widely competitive field, our study holds implications for the ramification of national governments and policy makers at international levels. It appears obvious that the administrative and bureaucratic barriers are comparable to the

effects of tariff barriers and have the same welfare consequences. Hence, governments can improve their attractiveness to foreign investors by improving on the quality and efficiency of their public administration

Our recommendation for further research in this field concerns the exploration of the particular effect of these barriers on vertical and horizontal FDI flows since our study was not able to make a full distinction and the results are prone to be different.

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Appendix

List of countries

Algeria	Luxembourg
Argentina	Malaysia
Australia	Mexico
Austria	Netherlands
Belgium	New Zealand
Brazil	Nigeria
Chile	Norway
China	Panama
Colombia	Peru
Czech Republic	Philippines
Egypt, Arab Rep.	Poland
France	Russian Federation
Germany	Saudi Arabia
Hong Kong SAR, China	Singapore
Hungary	South Africa
India	Spain
Indonesia	Sweden
Ireland	Switzerland
Israel	Thailand
Italy	Turkey
Japan	United Arab Emirates
Kazakhstan	United Kingdom
	Venezuela, RB

Descriptive figures

Figure 1: Influence of the time of claim on the total volume of US FDI to country i, corrected for relevant variables, corrected for relevant variables

Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*LOG(DISTKM) + 0.484209456023*LOG(GDPI) - 0.229358209423*LOG(GDPPCI) - 3.9912234866e-05*DIFFGDPPCUSI + 0.893184846169*COMML + 1.12885136373*COMMB + 0.293565352085*LOG(DOCSAB) - 0.118962729703*LOG(COSTSAB) + 0.446303145299*LOG(DOCSPROP) + 0.0602509530668*LOG(TIMEPROP) + 0.29699657272*LOG(TIMEEX) - 0.865625300659*LOG(TIMEIM) - 0.846925876716*LOG(DOCCLAIM)

Figure 2: Influence of the documents of claim on the total volume of US FDI to country i, corrected for relevant variables, corrected for relevant variables
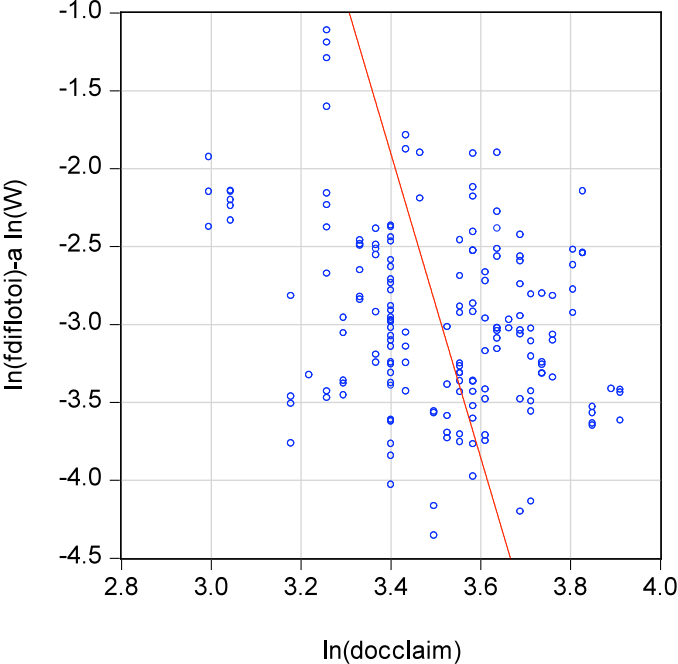
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*$LOG(DISTKM)$ + 0.484209456023*$LOG(GDPI)$ - 0.229358209423*$LOG(GDPPCI)$ - 3.9912234866e-05*$DIFFGDPPCUSI$ + 0.893184846169*$COMML$ + 1.12885136373*$COMMB$ + 0.293565352085*$LOG(DOCSAB)$ - 0.118962729703*$LOG(COSTSAB)$ + 0.446303145299*LOG$(DOCSPROP)$ + 0.0602509530668*LOG$(TIMEPROP)$ + 0.29699657272*$LOG(TIMEEX)$ - 0.865625300659*$LOG(TIMEIM)$ - 0.373063544333*$LOG(TIMECLAIM)$

Figure 3: Influence of the time to import on the total volume of US FDI to country i, corrected for relevant variables, corrected for relevant variables
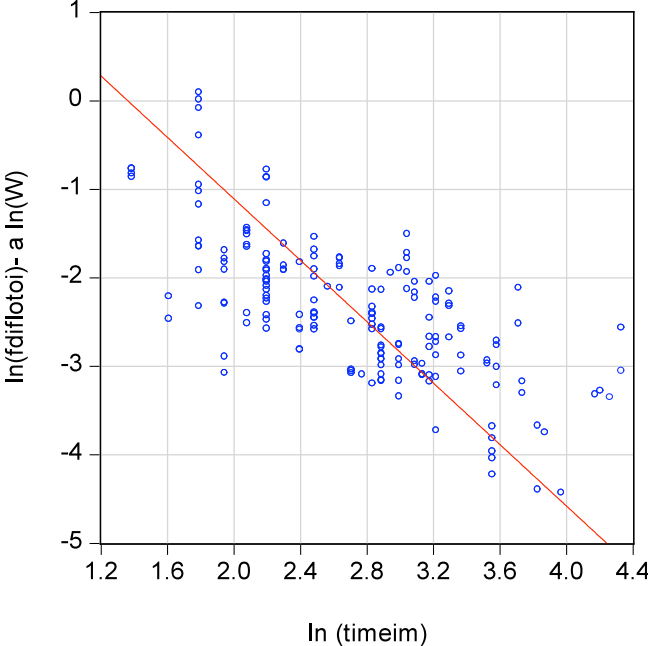
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*$LOG(DISTKM)$ + 0.484209456023*$LOG(GDPI)$ - 0.229358209423*$LOG(GDPPCI)$ - 3.9912234866e-05*$DIFFGDPPCUSI$ + 0.893184846169*$COMML$ + 1.12885136373*$COMMB$ + 0.293565352085*$LOG(DOCSAB)$ - 0.118962729703*$LOG(COSTSAB)$ + 0.446303145299*LOG$(DOCSPROP)$ + 0.0602509530668*LOG$(TIMEPROP)$ + 0.29699657272*$LOG(TIMEEX)$ - 0.846925876716*$LOG(DOCCLAIM)$ - 0.373063544333*$LOG(TIMECLAIM)$

Figure 4: Influence of the time to register a property on the total volume of US FDI to country i, corrected for relevant variables
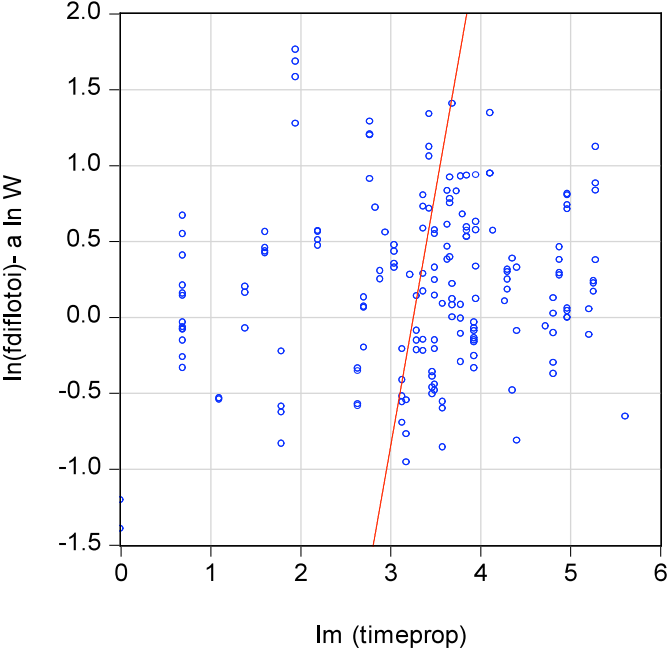
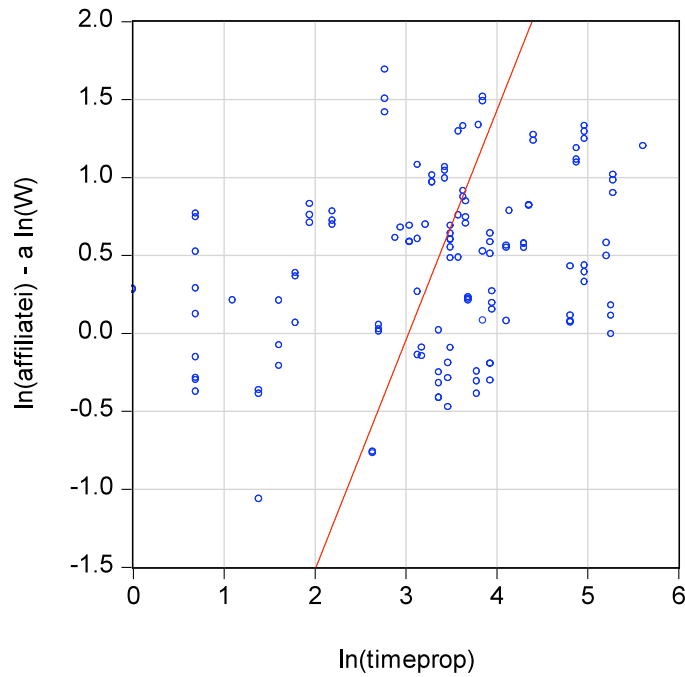Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*$LOG(DISTKM)$ + 0.484209456023*$LOG(GDPI)$ - 0.229358209423*$LOG(GDPPCI)$ - 3.9912234866e-05*$DIFFGDPPCUSI$ + 0.893184846169*$COMML$ + 1.12885136373*$COMMB$ + 0.293565352085*$LOG(DOCSAB)$ - 0.118962729703*$LOG(COSTSAB)$ + 0.446303145299*LOG$(DOCSPROP)$ + 0.29699657272*$LOG(TIMEEX)$ - 0.865625300659*$LOG(TIMEIM)$ - 0.846925876716*$LOG(DOCCLAIM)$ - 0.373063544333*$LOG(TIMECLAIM)$

Figure 5: Influence of the documents to register a property on the total volume of US FDI to country i, corrected for relevant variables
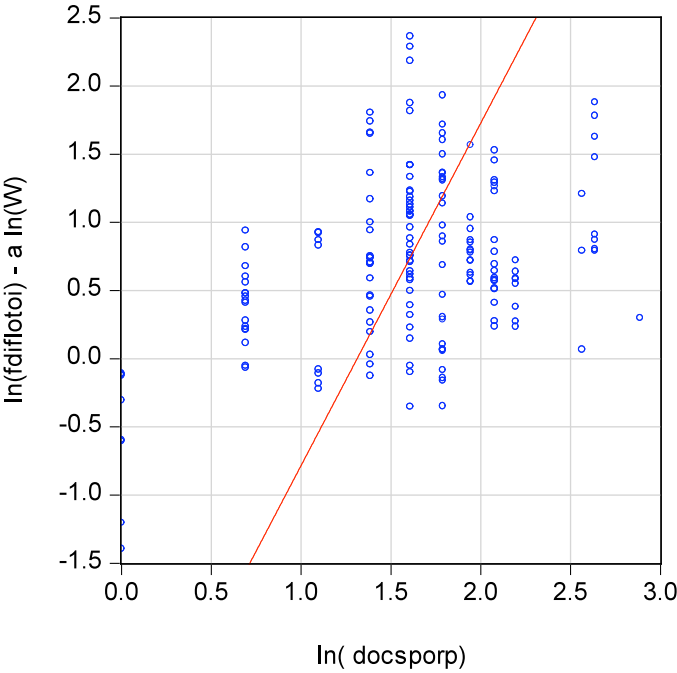
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*$LOG(DISTKM)$ + 0.484209456023*$LOG(GDPI)$ - 0.229358209423*$LOG(GDPPCI)$ - 3.9912234866e-05*$DIFFGDPPCUSI$ + 0.893184846169*$COMML$ + 1.12885136373*$COMMB$ + 0.293565352085*$LOG(DOCSAB)$ - 0.118962729703*$LOG(COSTSAB))$ + 0.0602509530668*LOG$(TIMEPROP)$ + 0.29699657272*$LOG(TIMEEX)$ - 0.865625300659*$LOG(TIMEIM)$ - 0.846925876716*$LOG(DOCCLAIM)$ - 0.373063544333*$LOG(TIMECLAIM)$

Figure 6: Influence of the costs of starting a business on the total volume of US FDI to country i, corrected for relevant variables
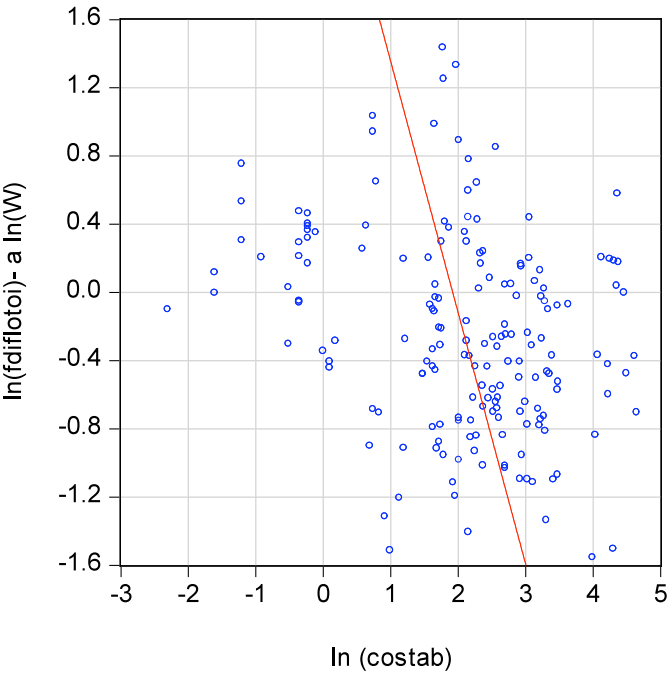
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.5892152589*$LOG(DISTKM)$ + 0.484209456023*$LOG(GDPI)$ - 0.229358209423*$LOG(GDPPCI)$ - 3.9912234866e-05*$DIFFGDPPCUSI$ + 0.893184846169*$COMML$ + 1.12885136373*$COMMB$ + 0.293565352085*$LOG(DOCSAB)$ + 0.446303145299*LOG$(DOCSPROP)$ + 0.0602509530668*LOG$(TIMEPROP)$ + 0.29699657272*$LOG(TIMEEX)$ - 0.865625300659*$LOG(TIMEIM)$ - 0.846925876716*$LOG(DOCCLAIM)$ - 0.373063544333*$LOG(TIMECLAIM)$

Figure 7: Influence of the costs of starting a business on the total sales of majority held US affiliates in country i, corrected for relevant variables
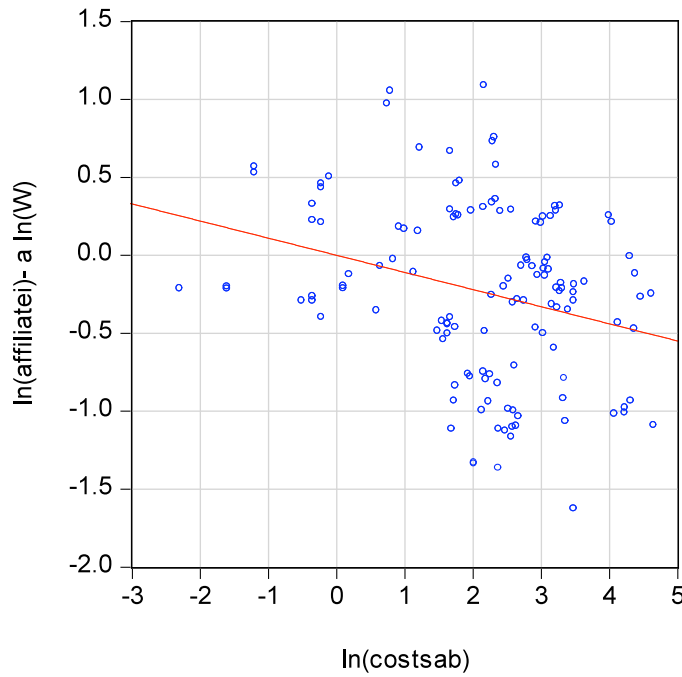
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.363782714497*LOG(DISTKM) + 0.72553888564*LOG(GDPI) - 0.270519834305*LOG(GDPPCI) - 2.55402774609e-05*DIFFGDPPCUSI + 0.636638530932*COMML + 0.702695562769*COMMB + 0.165208632013*LOG(DOCSAB) - 0.0809284818121*LOG(DOCSPROP) + 0.13096915013*LOG(TIMEPROP) + 1.10254356376*LOG(TIMEEX) - 1.26772244088*LOG(TIMEIM) - 1.75138910584*LOG(DOCCLAIM) - 0.260070107079*LOG(TIMECLAIM)

Figure 8: Influence of the time to register a property on the total sales of majority held US affiliates in country i, corrected for relevant variables

Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.363782714497*LOG(DISTKM) + 0.72553888564*LOG(GDPI) - 0.270519834305*LOG(GDPPCI) - 2.55402774609e-05*DIFFGDPPCUSI + 0.636638530932*COMML + 0.702695562769*COMMB + 0.165208632013*LOG(DOCSAB) - 0.109856398517*LOG(COSTSAB) - 0.0809284818121*LOG(DOCSPROP) + 1.10254356376*LOG(TIMEEX) - 1.26772244088*LOG(TIMEIM) - 1.75138910584*LOG(DOCCLAIM) - 0.260070107079*LOG(TIMECLAIM)

Figure 9: Influence of the time to import on the total sales of majority held US affiliates in country i, corrected for relevant variables
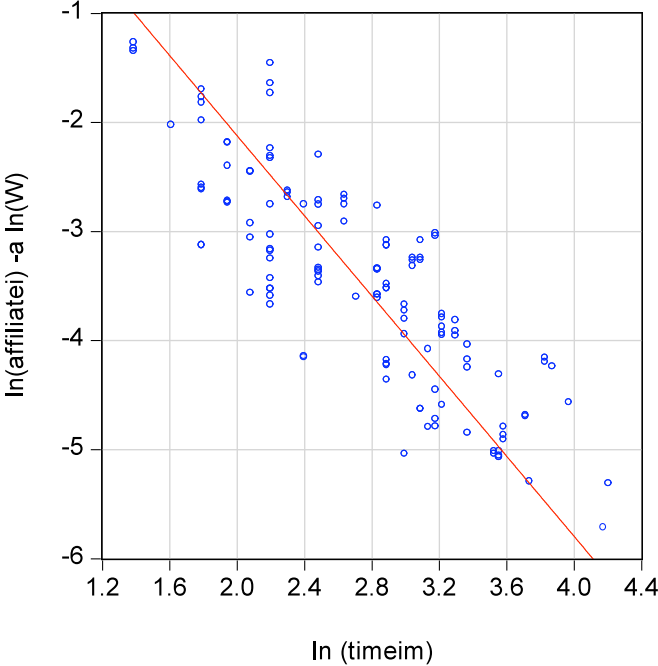
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.363782714497*LOG(DISTKM) + 0.72553888564*LOG(GDPI) - 0.270519834305*LOG(GDPPCI) - 2.55402774609e-05*DIFFGDPPCUSI + 0.636638530932*COMML + 0.702695562769*COMMB + 0.165208632013*LOG(DOCSAB) - 0.109856398517*LOG(COSTSAB) - 0.0809284818121*LOG(DOCSPROP) + 0.13096915013*LOG(TIMEPROP) + 1.10254356376*LOG(TIMEEX) - 1.75138910584*LOG(DOCCLAIM) - 0.260070107079*LOG(TIMECLAIM)
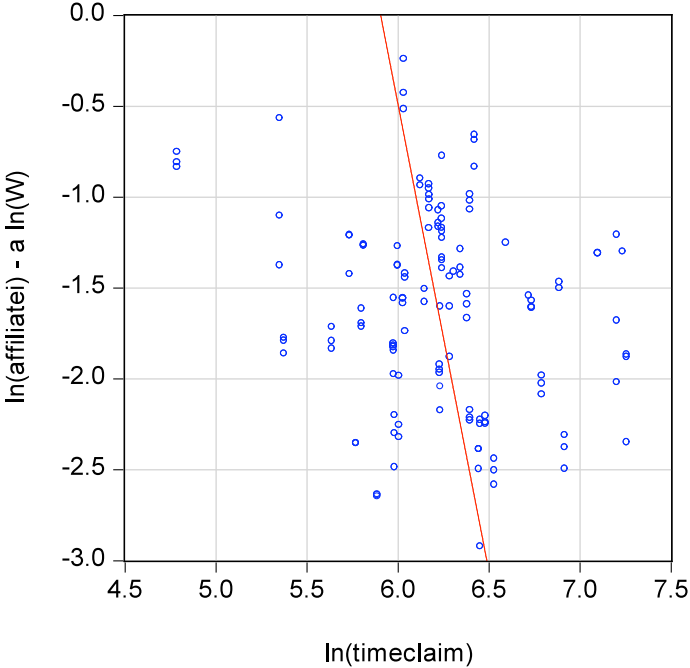
Figure 10: Influence of documents of claim on the total sales of majority held US affiliates in country i, corrected for relevant variables
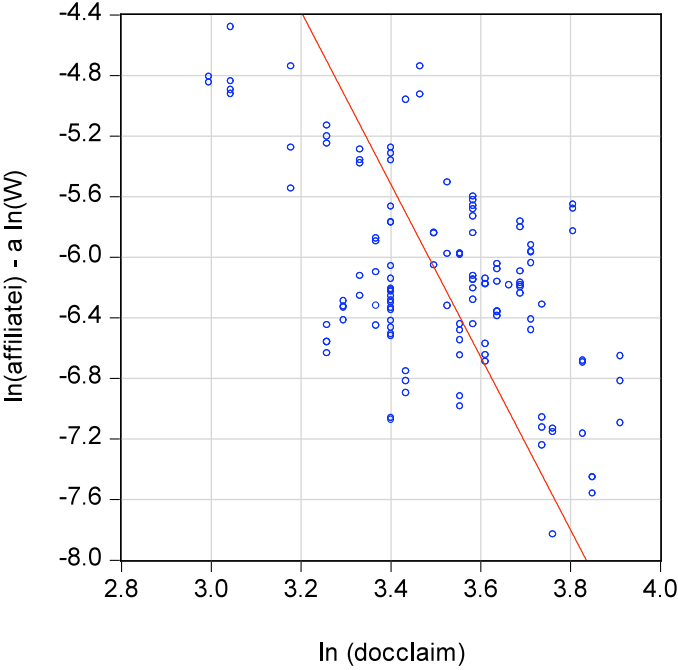
Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.363782714497*LOG(DISTKM) + 0.72553888564*LOG(GDPI) - 0.270519834305*LOG(GDPPCI) - 2.55402774609e-05*DIFFGDPPCUSI + 0.636638530932*COMML + 0.702695562769*COMMB + 0.165208632013*LOG(DOCSAB) - 0.109856398517*LOG(COSTSAB) - 0.0809284818121*LOG(DOCSPROP) + 0.13096915013*LOG(TIMEPROP) + 1.10254356376*LOG(TIMEEX) - 1.26772244088*LOG(TIMEIM) - 0.260070107079*LOG(TIMECLAIM)

Figure 11: Influence of the time of claim on the total sales of majority held US affiliates in country i, corrected for relevant variables

Note: a ln(W) represents the vector of relevant variables give by a ln(W) = -0.363782714497*LOG(DISTKM) + 0.72553888564*LOG(GDPI) - 0.270519834305*LOG(GDPPCI) - 2.55402774609e-05*DIFFGDPPCUSI + 0.636638530932*COMML + 0.702695562769*COMMB + 0.165208632013*LOG(DOCSAB) - 0.109856398517*LOG(COSTSAB) - 0.0809284818121*LOG(DOCSPROP) + 0.13096915013*LOG(TIMEPROP) + 1.10254356376*LOG(TIMEEX) - 1.26772244088*LOG(TIMEIM) - 1.75138910584*LOG(DOCCLAIM)