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Behavioral Finance Approach to Resource Allocation

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Abstract

The three essays that comprise this thesis address the behavioral factors that impact resource allocation, more specifically trade and Foreign Direct Investment (FDI), around the globe.

The first essay analyses the impact of language similarity on trade, measuring the effect on specific types of products. It extends earlier research on common language network externalities by measuring language similarity effect on bilateral trade from the point of view of the 10 most influential global languages. The findings provide evidence that the impact of language similarity is greater than that of language commonality, and both have a significant impact on bilateral trade. The results also show that language effect on trade varies within the 10 languages, and that this impact is product-specific: culturally sensitive products benefit from a greater language effect.

JEL classification: F10; F40

Keywords: Language Similarity; Language Commonality; Foreign Trade; Gravity Model; International Business

The second essay is a macro level study of foreign direct investment (FDI). It uses an extended gravity model, data spanning 12 years (2000–2012), to shed new light on the impact on FDI of linguistic and technological similarities between countries. The model includes technological commonality, as measured by the aggregate production of intellectual property, at the country level. An analysis of 71 309 pairs of FDI relationships showed that language is positively associated with a high level of FDI. Technological differences do impede the flow of FDI between countries, and information flow is crucial for large flows of FDI.

Information flow diminishes the negative impact of distance. The results also show different attitudes toward investment among high income and low income countries' multinational corporations (MNCs) .

JEL classification: C26, D82, F21

Keywords: Language Similarity; Foreign Direct Investment, Gravity Model; Information Flow, Technology, International Business (IB)

The third essay address Chief Executive Officer's (CEO's) demographic characteristics (e.g. age, education) which impact greenfield investment location decisions. Using a hierarchical model (e.g. binomial and linear), data spanning 10 years (2003–2012), the analysis of 49 138 global firm-level greenfield investments shows that CEO's level of education is crucial to the decision of which country to select and the amount invested. The more educated a CEO is the more likely to invest in developing countries. The results also show that CEOs from developing and emerging countries (DECs) are more risk-prone than their peers from developed countries. They are also more likely to invest in countries considered risky. In addition, the results show that CEOs' power is associated with less risky choices, that is, the more powerful a CEOs the more likely to invest in developed markets.

JEL classification: D81, F21, F23

Keywords: CEO's Characteristics, Decision under Uncertainty, Greenfield, Hierarchical Models.

Sumário

Os três artigos que compõem esta tese analisam os factores "comportamentais" que influenciam a alocação de recursos (e.g., comércio e investimento directo estrangeiro (IDE)) a nível global.

O primeiro artigo analisa o efeito da similaridade linguística no comércio mundial e em particular em certos produtos. Esta análise é feita do ponto de vista das 10 línguas mais influentes a nível global. Os resultados desta análise oferecem uma interpretação inequívoca sobre o positivo efeito da língua no comércio. E ainda nos permitiu aferir da superioridade da similaridade linguística sobre a língua comum. Os resultados também demonstram que o efeito da língua é diferenciado entre as 10 línguas globalmente mais influentes e que este impacto é específico a certos produtos. Também verificamos que os produtos "culturais" são mais sensíveis ao efeito da língua.

Classificação JEL: F10; F40

Palavra-chave: Similaridade Línguística; Língua Comum; Comércio Internacional; Modelo Gravitacional.

O segundo artigo é uma análise a nível macro do IDE. Para a análise referida utilizamos o modelo gravitacional, dados de 2000 – 2012 para analisar o efeito da assimetria de informação, similaridade linguística e tecnológica. Para índice de similaridade tecnológica utilizamos dados de propriedade intelectual a nível do país. A análise de 71309 pares de IDE entre países revelou o efeito positivo da língua sobre IDE. Verificamos que a diferença tecnológica impede o elevado fluxo de IDE e que o fluxo de informação é crucial para um elevado nível de IDE. Mais, verificamos que elevado fluxo de informação diminui o efeito negativo da distância. Ainda verificamos que a atitude em relação ao investimento varia consoante o nível de recursos dos países de origem.

Classificação JEL: C26, D82, F21

Palavra-chave: Similaridade Línguística; IDE; Modelo Gravitacional; Fluxo de Informação; Tecnologia.

O terceiro artigo analisa o impacto das características demográficas dos gestores sob a decisão de IDE (i.e. greenfield). Usando modelos hierárquicos, dados de 2003 – 2012, a análise de 49138 dados de greenfield empresarial revela que o nível de educação dos gestores determina a escolha do país e o montante a investir. Também verificamos que quanto mais educado o gestor mais provável é investimentos nos países emergentes e em vias de desenvolvimento. Mais, também verificamos que os gestores originários dos países emergentes e em vias de desenvolvimento assumem mais riscos, i.e., é mais provável investirem em países emergentes ou em vias de desenvolvimento. Também verificamos que os gestores mais poderosos tendem a ter uma atitude mais conservador e assumir menos riscos.

Classificação JEL: D81, F21, F23

Palavra-chave: Características Demográficas dos Gestores; Decisião sob Incerteza, Greenfield, Modelos Hierárquicos.

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1. Introduction

Allocation of resources has been the concern of many over many centuries. This thesis is an attempt to contribute to a discussion to which many other more illustrious minds have devoted their time and intellect – from scholars (e.g., Lucas, Keynes, Adam Smith, Marx), to policy makers (e.g., the IMF, the World Bank) and investors. The reason for this interest, one surmises, is because of its strong and tangible impact in people's life – scarce resources mean constraints to people's development and day-to-day lives, whereas excess resources can mean to less efficient allocation. Consequently, fierce debates and compelling arguments have been going on as to which is the best way to allocate resources.

On the one side are the defenders of policy-oriented allocation (e.g., Keynes, J. D. Roosevelt) which argue that policies can be used to avoid market failure and promote a more efficient allocation of resources.

On the other, the defenders of market-oriented allocation (i.e., neoclassical view (e.g., Freedman, Malkiel)), which argues that free market is the supreme arbiter and resource allocator, and that any misallocation is immediately corrected by markets. The underlying assumption is that the resource allocation's decision is always based on quantifiable and objective factors. The influence of this reasoning meant that trade theory has for the most part postulated frictionless markets and productivity (e.g., price) as the main driver of trade decisions (e.g., Adam Smith, David Ricardo). And for FDI it meant studies mostly focused in host countries' factors that would either promote or hinder the capital flow. Implying that resource' scarcity is due to host countries' structures and not, for instance, inefficient market allocation. These gap in the literature, in turn, meant that different approaches had to be followed in addressing resource allocation issue.

For the case of trade (first essay), we reason that if past colonial history can influence the level of trade between countries (Anderson and Wincoop, 2003), then other behavioral factors may also have similar level of influence. Consequently, we sought for additional evidence behavioral

factors influence on trade (i.e., aggregate, and commodities exports). The factor identified and studied here is language similarity. The argument is as follows: in the absence of any behavioral effect, language should have similar effect on all types of commodities. For instance, language should not influence the level of trade on sugar more than it does on cement. In addition, language has been a neglected factor in the international business (IB) literature (Marschan et al., 1997). And in those cases where language is studied, the use of language as dichotomous variable has prevailed.

Given that FDI is more sensitive and risky than trade (Aggarwal and Ramaswami, 1992), it follows that if trade is strongly impacted by behavioral factors so should FDI be. Consequently, the second essay tried to address behavioral factors that might affect FDI.

The second essay we tried to establish, at a macro level, which factors are more subject to behavioral influences. The main factors identified are language similarity and information flow. Similarly to trade, the study of language as a dichotomous variable as also prevailed in FDI literature. In regards to information and capital flow, most of the studies have been theoretical (Goldstein and Razin, 2006) or concerned with stock market investment (e.g., Coval and Moskowitz, 1999a).

The third essay, at firm level, we considered which CEOs' characteristics influence investment location decisions. This is because the decision to invest in a foreign country is greatly influenced by CEO's idiosyncrasies (characteristics). Most studies on CEOs' effect on FDI have focused on whether it leads to greenfield investment or acquisition (e.g., Slangen and Hennart, 2008a; Slangen, 2011). In this study, we focused on country selection decision.

1.1. Statement of the problem

Although there are two predominant and distinct theoretical views on how to allocate resources, the prevailing view is the neoclassical. It contends strict rationality and a self-regulating market, consequently absence of any behavioral influence in economic decision-making. Their influence can be seen on the studies on trade and FDI. For instance, most trade models have considered frictionless markets, and productivity (e.g., price) as the main deciding factor (e.g., Adam Smith, David Ricardo). Although, recently, this hypothesis has been questioned, it has remained a compelling argument in its simplicity. For instance, Anderson and Wincoop (2003) provided evidence that past colonial history influences the level of trade between countries. Building on this result, the first essay sought for additional behavioral influence by testing the effect of language similarity on trade (i.e. aggregate and commodities export). The underlying reasoning is that absent any behavioral influence, language should have a similar effect on all commodities, regardless of their type or complexity. In other words, the impact of language in the trading of sugar and cement would be the same. In addition, language has not been considered a factor that influences resource allocation (Grin, 1994) and is a neglected factor in IB literature (Marschan et al., 1997). Moreover, those studies that did consider language, studied it from a dichotomous view point, i.e., whether a specific pair of language in analysis are common or not.

In regards to FDI, the neoclassical view's influence meant that concerns shifted from firms to host countries, hence the focus of most studies on host country factors that may hinder/favour its flows (e.g., Asiedu, 2002; Barrell and Pain, 1997). The two FDI essays in this thesis (essays 2 and 3) take a different approach to the conventional view and try to establish the behavioral factor impact on FDI's allocation. The second essay of this thesis, a macro level study, tries to address FDI factors subject to behavioral influence, namely, language similarity, information flow, and level of technological development. Most studies on the effect of information on FDI

are theoretical, concerned with, for instance, the choice between FDI and licensing (e.g., Goldstein and Razin, 2006). The studies on the effect of language on FDI have privileged language as a dichotomous variable. And the studies on the relationship between technology and FDI have focused on technology as the driver of economic growth (e.g., Barrell and Pain, 1997; Borensztein et al., 1998) and as a solution to the underdevelopment problem. Implying, the flow of capital goes from developed to developing countries. The aim of this essay is to fill in this gap in the literature by using a dataset covering most of the world's economies and applying a different research methodology than that of previous studies.

The third essay, a firm level study addresses how CEOs' characteristics influence location decision making. IB research has neglected the role of managers on foreign entry mode decision, despite their acknowledged influence in the internationalization process (Aharoni et al., 2011). By doing so, it implicitly attributes entry mode decision to the firm. In addition, the studies that address CEO's characteristics are mainly concerned with the choice between acquisition and greenfield investment (e.g., Slangen and Hennart, 2008b; Slangen and Hennart, 2008a). This essay studies CEOs' attributes that lead to greenfield location decision around the globe in general, and in Developing, Emerging Countries (DECs) in particular.

The expectation is that these three essays will fill in the identified gaps and thus help explain resource imbalances around the globe, while contributing to the discussion on resource allocation.

1.2. Purpose of the thesis

In the section above, I identified a lack of research on behavioral factors' impact on trade and FDI. This research area is significant because, despite the adoption of market paradigms by most countries, particularly developings countries (Arestis et al., 2005; Stiglitz, 2004) and high growth (e.g., Asiedu, 2002; Pigato, 2000), most of these countries (i.e., DECs) still suffer from a chronic shortage of resources. Consequently, this thesis' purpose is to establish the existence of behavioral factors' influence on trade and FDI and contribute to extend the knowledge on

the geography of capital flow, decision under uncertainty, and how these affect resource allocation around the globe.

1.2.1. Purpose of the Essays

The thesis is comprised of 3 essays, each addressing a specific topic but all contributing to the thesis main purpose, to explain resource allocation around the globe from a behavioral finance perspective. The purpose and contribution of each individual essay to the overall thesis goal is described below. The first essay addresses the role of language similarity on trade (i.e.. aggregate, and commodity export), the second the role of information flow and language similarity and technology on FDI, and the third the effect of CEO's characteristics on investment location decisions.

First Essay

The purpose of the first essay, ***The Effect of Language Similarity on Commodity Specific Trade: A Study of the 10 Most Influential Global Languages***, is to explain how trade between countries is affected by factors other than the stylised (distance and size) and to acknowledge that variables such as language similarity are important for firms and, ultimately, consumers. In addition, it shows that commodities are subject to different language effects, and demonstrates how the 10 most influential globe language performe vis-à-vis different commodity products.

Second Essay

The purpose of second essay, ***What Drives Foreign Direct Investment (FDI): The Role of Language, Geographical Distance, Information Flow and Technological Similarity***, is to analyse the stylised factors crucial to FDI, whether the country of origin of income affects the destination of FDI, and how it interacts with the factors identified. The focus on language similarity and information flow is due to the fact that, according to the literature, these variables

are critical in the relationship between parent firm and subsidiary (e.g., Harzing and Pudelko, 2013; Marschan et al., 1997).

Third Essay

The purpose of the third essay, ***CEOs' impact on Foreign Direct Investment (FDI) decisions***, is to test how CEOs' behavioral characteristics affect FDI decisions. It was established in the previous essays that behavioral factors affect trade and FDI. Building on that and accepting the fact that decision-makers suffer from behavioral biases (e.g., Dutton and Duncan, 1987; Kahneman and Tversky, 1979; Tversky and Kahneman, 1974; Tversky and Kahneman, 1981), the third essay tries to establish which CEO's characteristics are most likely to influence location decision making.

1.3. Delimitations

The thesis focuses on the influence of behavioral factors in resource allocation around the globe. Internationally, resources can be allocated through management contracts, licensing, trade, and capital investment (FDI and portfolio investment). Each of these forms of allocation entail different resource commitment, return and risk for investors (Gatignon and Anderson, 1988; Harzing, 2002). The interest and scope of this thesis is limited to trade and FDI because these involve considerable resource commitment and, as such, have a significant and direct impact on people's day-to-day lives. In addition, FDI represents a stable form of capital investment as it involves negotiations with the host government (Albuquerque 2003; Asiedu 2004; Hausmann and Fernandez-Arias 2000, UNDP, 2011). The other forms of allocation, although important, interesting and worthy of study, are outside of scope of this thesis.

Table 1: The Value of World GDP, Trade and FDI

Indicator Name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP (current US(10^9$)	33,567	33,355	34,636	38,894	43,805	47,429	51,363	57,859	63,462	60,168	65,955	73,280	74,890
Trade (% of GDP) *	51	50	50	51	54	56	59	59	61	52	57	61	61
Trade (current US$ 10^9)	17,229	16,761	17,276	19,865	23,751	26,666	30,124	34,220	38,626	31,513	37,570	44,395	45,375
FDI, net inflows (BoP, current US$10^9)	1,461	796	744	711	1,009	1,543	2,147	3,099	2,451	1,365	1,860	2,283	2,115

Source: The World Bank.* Author's calculation

The delimitations of each essay are outlined in the sections below.

1.3.1. Delimitation: Essay 1

According to Ethnologue, there are as many as 7099 known living languages in the world. And all of these languages are worthy of study and of having their impact on trade evaluated. However, for the purpose of this essay and the study of language similarity effect, the focus is on the 10 most influential global languages (Arabic, English, French, German, Hindi, Japanese, Mandarin Chinese, Portuguese, Russian, and Spanish) because these languages represent in the excess of 70% of the world GDP and 60% of world trade.

Table 2: Languages GDP (10^9 US$)

Languages*	1970	1975	1980	1985	1990	1995	2000	2005	2010
Arabic	27	93	255	268	474	343	501	822	1,450
English	1,340	2,224	3,897	5,428	8,075	10,107	13,247	17,811	20,539
French	149	362	704	555	1,275	1,610	1,368	2,204	2,647
German	230	529	1,148	907	2,189	3,175	2,419	3,586	4,393
Hindi	62	97	184	229	317	355	462	809	1,657
Japanese	212	519	1,100	1,401	3,140	5,449	4,888	4,755	5,700
Chinese	98	179	232	366	477	974	1,486	2,607	6,594
Portuguese	50	143	268	250	541	904	774	1,089	2,447
Russian					517	396	260	764	1,525
Spanish	161	359	721	649	1,169	1,638	2,058	2,918	4,293
Sub-Total	2,329	4,506	8,509	10,053	18,174	24,951	27,462	37,365	51,245
% of World GDP	79	76	76	79	80	81	82	79	78
World GDP	2,958	5,897	11,172	12,689	22,595	30,873	33,567	47,429	65,955

Source: The World Bank. *Author's calculation

Table 3: Languages Trade (10^9 US$)

Languages*	1970	1975	1980	1985	1990	1995	2000	2005	2010
Arabic	12	59	170	137	183	187	249	766	1,347
English	221	508	1,088	1,272	2,169	3,072	4,416	6,117	7,597
French	46	132	304	259	541	697	756	1,171	1,428
German	77	199	567	501	1,147	1,557	1,632	2,721	3,779
Hindi	5	12	29	30	50	82	126	344	823
Japanese	43	131	308	350	621	909	969	1,261	1,631
Chinese	17	48	124	196	393	940	1,268	2,615	4,825
Portuguese	10	32	66	60	121	201	228	365	658
Russian					187	218	177	433	768
Spanish	42	106	238	230	438	685	1,038	1,588	2,270
Sub-Total	471	1,227	2,894	3,035	5,850	8,547	10,859	17,382	25,126
% of World Trade	59	63	67	62	66	64	63	65	67
World Trade	792	1,953	4,333	4,876	8,811	13,447	17,229	26,666	37,570

Source: The World Bank. UNComtrade. *Author's calculation

1.3.2. Delimitation: Essay 2

This essay is a macro level study focused on source countries of FDI. Although we controlled for the host countries characteristics (structures and conditions), they are not the main concern of essay. In addition, we have not concerned ourselves with the benefits of FDI to the host countries. This is very significant for resource allocation and general wellbeing the host countties's population, however it is not within the realm of this thesis.

1.3.3. Delimitation: Essay 3

Market entry mode choice implies a specific type of commitment to control, resources, risk and return (Anderson and Gatignon, 1986; Harzing, 2002). The interest and scope of this essay is limited to greenfield, a high-resource and high-risk venture (Aggarwal and Ramaswami, 1992). Other forms of market entry modes are referenced merely to emphasize differences.

1.4. Definitions and Acronyms

1.4.1. Definition

Foreign Direct Investment (FDI) - The concept of direct investment is based on an investor resident in one economy (direct investor) obtaining a lasting interest in an enterprise resident in another economy (direct investment enterprise). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence in its management. Ownership of ten per cent or more of the ordinary shares or voting stock (or an equivalent equity interest) is regarded as indicative of significant influence by an investor and no exceptions to this rule are currently applied. Branches, subsidiaries, sub-subsidiaries and associates of the direct investor are included in direct investment relationship. According to BPM5 and BMD recommendations, only equity and permanent debt transactions between related financial intermediaries are included in direct investment. This aspect of the definition of direct investment was not adopted in the ABS implementation of BPM4. Its application under BPM5 has resulted in significant reclassifications from direct investment (other capital) to other investment (OECD definition).

Heuristics – Mechanism used to make predictions or judgement under uncertainty. They can sometime yield reasonable judgements, "….but sometimes they lead to severe and systematic errors" (Tversky and Kahneman 1974, pg. 1124).

Language – language means the same language type that is internationally standardized but with local differences in terms of dialect specific vocabulary or grammar tradition.

Schemas – Cognitive representatives of reality used as templates to explain and interpret events (March and Simon, 1958).

1.4.2. Acronyms

Table 4: Acronyms

CEO	Chief Executive Officer
CEPII	Centre d'Études Prospectives et d'Informations Internationales
CES	Constant Elsaticity of Substitution
DEC	Developing and Emerging Country
FBIS	Fixed Broadband Internet Subscriber
FDI	Foreign Direct Investment
FT	Financial Times
GDP	Gross Domestic Product
GNI	Gross National Income
HQ	Headquarter
IB	International Business
ICT	Information and Communication Technology
IMF	International Monetary Fund
JV	Joint Venture
MBA	Business Administration
MIGA	Multilateral Investment Guarantee Agency
MNC	Multinational Corporations
OECD	Organisation of European Cooperation and Development
OLS	Ordinary Least Square
PPML	Poisson Pseudo-Maximum-Likelihood
ROA	Return on Assets
ROE	Return on Equity
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNWTO	United Nations World Tourism Organisation
VIF	Variance Inflation Factors
WDI	World Bank World Development Indicators

1.5. Positioning of the Thesis in the Literature

The thesis draws heavily on the field of behavioral finance as applied to trade and FDI.The main focus is FDI; trade is secondary, but provides valuable insight as to how to address the FDI literature.

1.5.1. Positioning within the Trade Literature

The first essay is positioned within the literature that addresses behavioral factors' impact on the level of trade between countries. It follows closely the findings that past colonial history

(Anderson and Wincoop, 2003), and language commonality (e.g., Frankel and Rose, 2002) influence the level of trade between countries. In this essay, we use language similarity variable to evaluate its impact on trade and the so called cultural products (e.g., books, movies).

1.5.2. Positioning within the FDI Literature

Essay two falls within the macro level studies of FDI, but draws on a different fielsd of research to offer additional insight on the influence of behavioral factors on FDI. Primarily, it is focused on the literature of language and FDI (e.g., Selmier and Oh, 2013). But it also falls within the literature of the geography of capital flow (e.g., Coval and Moskowitz, 1999), in which distance is used to evaluate the investor's behavior. The essay also draws on the literature which assess the impact of information flow on the pattern of investment (e.g., Goldstein and Razin, 2006; Ivkovic and Weisbenner, 2005; Kinoshita and Mody, 2001; Loungani et al., 2002).

1.5.3. Positioning within the Entry Mode Literature

The third essay draws on a diverse range of subjects. It falls within the scope of the entry mode literature which studies the CEOs' characteristics that influence the internationalisation process (e.g., Herrmann and Datta, 2002; Herrmann and Datta, 2006; Nielsen and Nielsen, 2011). It also touches on the literature on decision under uncertainty, and behavioral influence on capital flow (e.g., Tversky and Kahneman, 1974). This essay is closed to studies which evaluate CEOs' characteristics and their attitude toward risk (e.g., Custódio and Metzger, 2013; Custódio and Metzger, 2014). Their results suggest a strong link between CEO's level of education, particularly type of training (e.g., finance specialisation), and the sophistication of the financial decision making.

1.6. Structure of the Thesis

The thesis is divided in two parts: the first part comprises introduction, literature review, and methodology. The second part, the most important of the thesis, comprises the three essays outlined below in table 5.

Table 5: Essays in this Thesis

Essays	Main Focus	Research Question	Method
Essay 1	Language influence on trade, in specific the effect of language on cultural products	How does language influence the level of trade between countries and the specific commodities traded?	Quantitative
Essay 2	The role of language similarity and information flow on the pattern of FDI.	How do information flow, language, and technology affect FDI allocation around the globe?	Quantitative
Essay 3	The influence of CEOs' characteristics in uncertain decisions.	How do CEOs' characteristics impact the choice of location of greenfield investments decision?	Quantitative

2. Background Information

The thesis is focused on how behavioral factors impact two specific forms of resource allocation (i.e. trade and FDI) around the globe. The review of the literature on trade and FDI are meant to show the state of the art and the gaps in the literature.

2.1. Essay 1

Although recently IB literature have highlighted the importance of language (e.g. Davidson and McFetridge, 1985; Marschan-Piekkari et al., 1999), for most part, economists have not deemed language an important factor in resource allocation (Grin, 1994). The rare studies that do, language is used not as a main variable of interest, rather as a control variable. In addition, it is treated as a dichotomous variable, in which sharing a common language is set to one or zero. This approach ignores the possibility of two specific languages allowing for some level of

mutual understanding of each other (for instance, Portuguese and Spanish). In this essay we use language similarity approach to acknowledge the fact that a language can have an impact regardless of whether it is significant outside the home country (Melitz and Toubal, 2014). In addition, language can have a significant impact in reducing the "soft" —or informal— trade barriers (Rauch and Trindade, 2002). For example, a negotiation of complex commercial conditions or the enforcement of contract rules is made easier by cultural and language ties, which allows trade partners to comprehend administrative sensitivities and avoid ambiguities (Ghemawat, 2001).

2.2. Essay 2

Most research on the impact of language in IB has been qualitative, based on firm-level studies (e.g., Neeley et al., 2012). Although important, they are ex-post analysis on the effect of language in IB. Language is most critical ex-ante, in the initial phase of country selection and entry mode and the final phase of investment implementation. This is because language differences between home and host countries increase MNCs'difficulty in identifying market opportunities and negotiating business agreements (Rauch and Trindade, 2002). Given that language barriers can negatively impact the levels of communication (Kang and Kim, 2010), it can be argued that language should be a significant factor to consider in FDI decision making.

Most studies on information asymmetry and capital flow have been conceptual or qualitative in nature (e.g., Goldstein and Razin, 2006; Horstmann and Markusen, 1987), focusing on how information asymmetry can lead to one form of capital investment instead of another (e.g., FDI vs. portfolio flow, and FDI vs. licensing). The empirical studies, on the other hand, have been concerned with information asymmetry's impact on investors' behavior (e.g., Coval and Moskowitz, 1999; Huberman, 2001). The rare empirical research exceptions in FDI field are Kinoshita and Mody (2001) and Loungani et al. (2002).

The conventional view on the impact of technology on FDI has limited the scope of research (Guillén and García-Canal, 2009). Most FDI studies have ignored cultural variables such as language and its essential role in technology transfer. The research in this field have focused in: technology transfer, and spillover mainly to developing countries (e.g., Blomstrom and Kokko, 1994; Blomstrom and Sjoholm, 1999); technology's effect on economic growth (e.g., Barrell and Pain, 1997; Borensztein et al., 1998); human capital dimension (Glass and Saggi, 1998); and productivity increase due to FDI from MNCs (Aitken and Harrison, 1997).

2.3. Essay 3

The overwhelming majority of entry mode literature has focused on the performance between acquisition vs greenfield (e.g., Hennart and Park, 1993; Slangen and Hennart, 2008b; Slangen and Hennart, 2008a). These studies have enhanced our understanding of entry mode choice and established important patterns on the effect of larger macroeconomic factors (e.g., taxes, corruption, rule of law, and information perspective) on the choices faced by firms (e.g., Harzing, 2002). However, they have not addressed the role of individuals within the organization, and implicitly attributed entry mode decision to firms' optimizing actions. The behavioral FDI studies sought to correct these shortcomings, highlighting the negotiations and self-interest involved in the decision process (e.g., Larimo, 1995; Wahab, 1977). In addition, they have provided evidence that investment decisions are not always value maximizing for the firm or shareholders (e.g., Pinheiro-Alves, 2011). Nonetheless, the role of the manager continues to be ignored by the majority of entry mode literature (Aharoni et al., 2011). Recently, attention has been paid to CEOs' influence on the entry mode decision (e.g., Herrmann and Datta, 2002; Herrmann and Datta, 2006; Nielsen and Nielsen, 2011). Nonetheless, the core concern has remained the dichotomous choice of acquisition vs greenfield, neglecting the impact of CEOs' profile on the country selection decision, namely the selection of more *distant*

and riskier markets. This essay fills in this literature gap, contributing to shed light on resource allocation around the globe.

3. Methodology and Data

This thesis is comprised of three quantitative essays, using data gathered from public international organisation such as the UNCOMTRADE, UNCTAD, The IMF, The World Bank. The third essay, additionally, involved hand collection of data from firms' website and annual reports on CEO information. The gravity data (geographical distance, border, colonization history) for the three essays were collected from CEPII and Andrew Rose database. The language similarity variable for the three essays comes from (Melitz and Toubal, 2014). The methodology and data for each essay is outlined below.

3.1. Essay 1

The dataset consists of 248,126 cross-country exports data (aggregate, and commodity products) for the years 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, and 2010 obtained from the UN Comtrade database. The data on commodities started in 1990. The GDP and population data were collected from the UNCTAD database. The 10 influential global languages are: Arabic, English, French, German, Hindi, Japanese, Mandarin Chinese, Russian, and Spanish.

Econometric model

We used Silva and Tenreyro's (2006) approach, estimating the gravity model in its multiplicative form and using the Poisson Pseudo-Maximum-Likelihood (PPML), because of the many zeros in the observations (69%). This procedure is robust in the presence of heteroskedasticity.

The general specification is as follows:

$X_{ijt} = \exp(\beta_0 + \beta_1 K_{1ijt} + \beta_2 K_{2ijt+}. \ldots + \beta_n K_{nijt}) * \varepsilon_{ijt}$ (1),

Where i and j are countries, t is time, and:

X_{ijt} is aggregate or commodity export between countries i and j,

K represents control and variables of interest, and ε_{ijt} the error term.

3.2. Essay 2

The dataset consisted of 71 309 bilateral FDI stock observations of 649 376 country pairs from United Nations Conference on Trade and Development (UNCTAD). It covers 13 years (2000-2012) and 224 countries and/or jurisdictions. About 71% of the FDI stock observations are from high-income countries and 29% are from low-income countries. The tourism flow data is from the United Nations World Tourism Organization (UNWTO). Socioeconomic data —e.g., population, GDP (current US$), patent registration, level of schooling of the workforce— were taken from The World Bank World Development Indicators (WDI).

Econometric Model

The gravity model has been successfully used to explain bilateral FDI (e.g., Bevan et al., 2004; Kleinert and Toubal, 2010). We followed Silva and Tenreyro's (2006) nonlinear specification of the gravity model (PPML) because it deals with the zero observations in the data (89%) and it is robust to different patterns of heteroscedasticity. The general specification is the following:

$$lnDefFDI_{ijt} = \beta_0 + \beta_1 K_{1ijt} + \beta_2 K_{2ijt} + \cdots \ldots + \beta_n Control_{ijt} + ln\varepsilon_{ij} \quad (2)$$

In which *i* and *j* are countries, *t* is time, and $DefFDI_{ijt}$ is the deflated outward bilateral FDI stock between countries *i* and *j* at time *t*. K_{ijt} is a vector of variable of interest. Control is a vector of

control variables as per the current literature on FDI determinants (e.g., GDP, GDP per capita, GDP growth rate, inflation rate, workforce education, legal origin, religion, currency union, and exchange rate) between countries *i* and *j* in period *t*. $\mathcal{E}_{ijt}$ represents the error term.

3.3. Essay 3

The dataset consists of 49 138 greenfield investments undertaken between 2003-2012 from the *Financial Times's FDI markets*. The parent firms are based in 113 countries and target 188 host countries. The 11 343 parent firms were matched with Amadeus, Boardex, Bloomberg, Compustat, and Datastream datasets, to obtain a more detailed information about these firms. The biographical information on CEOs was hand-collected from the above databases and firms' annual reports. The data on population, GDP (current US$), patent registration, level of schooling of the workforce were taken from The World Bank World Development Indicators (WDI).

Econometric Model

We used mixed effect models, because FDI data are not independent from each other and the firm's overall global strategy (Arregle et al, 2006). In other words, there is interdependence in the data (Bryk and Raudenbush, 1988; Raudenbush and Bryk, 2002).

In case where our dependent (response) variables has two categories (choices) we used binomial mixed effect model. We followed closely Leckie's (2008) formulation of two level binomial mixed effect model, no random slope: $\beta_{1j}X_{ijt}$

$$log\left(\frac{\pi ij}{1-\pi ij}\right) = \beta 0 + \sum \beta iXijt + \mu 0j \quad (3),$$

where β_0 is common to all firms, while the random effect μ_{0j} is specific to each firm. The level 1 variables are represented by $\sum \beta iXijt$ and the level 2 by $\mu 0j$.

In the case where the dependent variable is continuous we used hierarchical linear model. The general two level linear hierarchical model is of the form:

$$\ln Yijt = \beta 0j + \sum \beta iXijt + \mu 0jt + \mu 1X1jt + \in ijt \qquad (4)$$

where Yijt is the value outward greenfield or the level of herding behavior, depending on the hypotheses being tested. The level one variables are represented by β1X1ijt, and the hierarchical structures (level one and two) by $\mu 0j \; and \; \mu 1X1jt$, respectively.

The dependent variables

There are three different dependent types of variables. For the hypothesis 1a), for example, the dependent variable, market choice: developed vs. developing. For hypothesis 1b) the dependent variable is the value of the outward greenfield of firm *a* from country *i* to country *j* ($LnCapital_{aijt}$). This variable was computed in log form. For hypothesis 1d) the dependent variable (*H*) was calculated adjusting the model of herd behavior for stock market of Lakonishok et al. (1992). The purpose is to measure CEO's characteristics that affect country level herding. The model is as follow:

$$H(i) = |B(i)/(B(i) + S(i)) - p(t)| - AF(i) \qquad (5)$$

Where B(i) represents CEOs that increase FDI in country i in year t, and S(i) CEOs that increase FDI in other countries, not *i* in year *t*; p(t) is the proportion of CEOs greenfield in year t relative to number of active; AF(i) is the adjustment factor, the expected value of |B(i)/(B(i)+ S(i)) – p(t)|.

4. Findings and Contributions of the Essays

Each essays in this thesis gives a different perspective and are a different approach to the pressing issue of resource allocation around the globe. This chapter presents a brief summary of the contributions and conclusions of the essays.

4.1. Essay 1

The major contribution of essay 1 is to assess the behavioral factors impact on trade. Earlier research based on gravity models has shown that proximity and economic size are powerful magnets for trade between two neighboring countries. However, the impact of language as a trade facilitator has not gone unnoticed. Melitz (2008) provided evidence on the importance of language commonality facilitating international trade. This essay confirmed that language similarity is a strong determinant of cross-country trade. The results show that language similarity increases trade by 67%. Another contribution of the essay is to shed light on the differentiated effect of language on specific commodities. For instance, culturally sensitive products (e.g., books, movies) are subject to stronger language effect. In addition, this essay sheds light on the relative weight of the 10 main global languages as trade facilitators.

The main conclusion from essay 1 is that language similarity is an important factor in trade between countries, and some products are more sensitive to the language impact than others.

4.2. Essay 2

The essay main contribution is to address the geography of capital flows. It provides empirical evidence in a research area that is mostly conceptual or qualitative in nature (e.g., Goldstein and Razin, 2006). From a theoretical perspective, the essay extends the research on information and capital flow (i.e., FDI), in addition to applying a different methodological approach (a gravity model using PPML), and a dataset covering the world economy, whereas most studies use OECD flow/stock data. Another contribution is to show that high-income countries' MNCs

are more sensitive to distance than their low-income counterparts. The other contribution of the essay is to show the impact of language is dependent on country of origin's income. For instance, high-income countries are more sensitive to language similarity than low-income countries. The results also show that information flow is crucial to a high level of FDI.

The main conclusion from essay 2 that language and information flow are crucial for FDI. And distance, despite its strong influence, can be mitigated by language similarity and technology level. Moreover, the results also strongly show the investment patterns of MNCs from developing and developed countries are different.

4.3. Essay 3

The essay main contribution is to address CEO characteristics that influence greenfield investment location decision. Until very recently, most FDI research have focused on firms, industry, and country characteristics to explain the internationalization process. The focus on CEOs is because they are the main decision-makers (e.g., Graham et al., 2013; Schoemaker, 1993; Taylor, 1975) and enjoy great discretionary power in choosing firms' investment projects (e.g., Morck et al., 1990; Williamson, 1963). Importantly, CEOs also influence the internationalization process (e.g., Aharoni et al., 2011; Cyert and March, 1963) and, consequently, the allocation of resources around the globe. Another contribution of the essay is the use of hierarchical models, acknowledging that FDI is not independent from the firm's overall global strategy.

The findings show that the attitude towards risk is age sensitive. And the level of education of determines CEO's risk attitude: the more educated a CEO, the more likely a decision to invest in developing markets. The results also show the more powerful a CEO, the less likely s(he) is to commit to a risky investment.

The main conclusion of Essay 3 is that CEOs' characteristics does influence the location's investment decision. In other words, CEO's type is important for decision making.

5. Contribution

This chapter concludes the introduction to the thesis. It is organized as follows: first a discussion of the overall thesis, second its contribution to wider literature and the practical implications from the managerial perspective. Then, it is followed by a critical view of the thesis limitations and finally the suggestions for further researcher.

5.1. Discussion

The purpose of the thesis as outlined above is to assess the impact of behavioral factors on resource allocation (i.e., trade and FDI). The review of literature pointed to the lack of studies in IB in the field of: language in resource allocation, and CEO's impact in internationalization process. This is counterintuitive, because the complexity of the business environment would suggest strong language and CEO influence in IB arena. Consequently, the strong language result found on trade and FDI was not surprising. For FDI (essay 2), the language effect is stronger for MNCs from developing countries than from developed countries. The result of research on CEO's characteristics was not surprising.

The three essays in this thesis jointly contribute to show that the pattern of resource allocation is greatly influenced by behavioral factors.

5.2. Contribution to the Literature

A gap in the trade and FDI has been identified, and it consists of lack research on behavioral factor's impact on resource allocation. Behavioral factors can significantly influence the resource allocation around the globe (i.e., the level of trade and FDI), but even though the gap in literature is acknowledged, it remains unaddressed. Consequently, the main contribution of the thesis is to address these gaps. The thesis also contributes to a better understanding of language similarity effect on specific commodities trade. Another contribution of the essays is to address empirically the effect of information flow on FDI. Most of the empirical research on

the impact of information on capital flow has been focused on financial markets (e.g., Coval and Moskowitz, 1999).

Lastly, another important contribution to the literature is to address the question of how CEOs' characteristics determine the attitude towards risk, and how it ultimately influences the allocation of resources around the globe

5.3. Managerial Implications

5.3.1. Essay 1

The managerial implications of the findings are clear: location does matter, as is often stressed by corporate strategy researchers, but cultural and language proximity have a larger effect, as they are important facilitators of trade and other forms of cross-border activity. Thus, language plays a significant role in the definition of foreign market entry strategies. Of particular importance are firms operating on culturally-sensitive markets (e.g., book market), as the results show these products are highly influenced by language similarity.

5.3.2. Essay 2

The results of this paper have important implications for countries seeking to attract FDI and for companies searching business opportunities in foreign markets. The findings suggest improving information and access to it on the part of host countries is vital to attract FDI. This study's results are also encouraging for countries distant from the main financial and decision centers, as they show the way to mitigate against any distance barriers. In addition, this research provides a way for customizing policy for specific kinds of FDI, for instance, improving language qualification of the workforce to attract high-income countries' FDI.

5.3.3. Essay 3

The results of this paper have important implications for firms considering investment in *risky markets* and for resource allocation around the world. Importantly, the findings reveal that the CEO's type is important for firm behavior and outcomes. The results support the notion that young and highly educated CEOs are critical for investment in *risky markets*. In addition, the results also show that powerfull CEOs are less likely to invest in perceived risky markets. Finally, the results also suggest CEO's country of origin is essential to the level of risk they are willing to take. These results are significant for an efficient resource allocation around the world, for they show CEO's characteristics influence both the location and the amount invested.

5.4. Limitations of the Study and Suggestions for Further Research

A general limitation stemming from essay 1 and 2 that warrants further study is the absence of firm-level data. Although the results are robust to different type of specifications, a more subtle analysis should focus on the impact of industry and firm-specific variables such as concentration, size, age or governance. The different patterns of high income countries' MNCs and the "new" MNCs from other regions suggest that different capabilities are emerging in complement to the traditional technological, financial and managerial advantages that compensate the liability of foreignness.

As for future research, industry specificity should be investigated. Some industries may be more sensitive to language similarity than others. For instance, cultural and creative businesses should be more language-sensitive than agriculture or mining, whose products can be more easily introduced in countries that do not share a common/similar language with the exporter. Another possible extension within this field of research is the impact of language similarity on FDI, as the coordination of overseas activities and the deployment of international strategies within a multinational corporation is sensitive to the quality of communication among headquarters and subsidiaries.

Regarding essay 3 in particular, the CEO's psychological profile in conjunction with his/hers characteristics warrants new avenues for research. Although the results obtained are robust, confirming the impact of CEO's characteristics, CEO's psychological profiling would improve the findings.

To conclude, from the findings of these essays we can safely argue that behavioural factors do affect and influence resource allocation around the world.

6. References

Aggarwal, S. and Ramaswami, S.N., 1992. Choice of Foreign Market Entry Mode: Impact of Ownership, Location and Internationalization, *Journal of International Business Studies*, (July 1990).

Aharoni, Y., Tihanyi, L. and Connelly, B.L., 2011. Managerial Decision-Making in International Business: A Forty-Five-Year Retrospective. *Journal of World Business*, 46(2), pp.135–142.

Aitken, Bryan J. and Harrison, A.N.N.E., 1997. Do Domestic Firms Benefit from Direct Foreign Investment ? Evidence from Venezuela. *The American Economic Review*, 89 n. 3(1980).

Albuquerque, R., 2003. The Composition of International Capital Flows: Risk Sharing Through Foreign Direct Investment. *Journal of International Economics*, 61 (2003) 353–383.

Anderson, E. and Gatignon, H., 1986. Modes of Foreign Entry: A Transaction Cost Analysis and Propositions. *Journal of International Business*, (Fall November 1985), pp.1–26.

Anderson, J.E. and Wincoop, E. van, 2003. Gravity with Gravitas : A Solution to the Border Puzzle. *The American Economic Review*, 93(1), pp.170–192.

Arestis, P., Nissanke, M. and Stein, H. 2005. Finance and development: Institutional and policy alternatives to financial liberalization theory. *Eastern Economic Journal***,** 245-263.

Arregle, J., Hébert, L. and Beamish, P.W., 2006. Mode of International Entry : The Advantages of Multilevel Methods. *MIR - Management International Review*, 46(September 2005), pp.597–618.

Asiedu, E., 2002. On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa different? *World Development*, 30(1), pp.107–119.

Asiedu, E., 2004. Policy Reform and Foreign Direct Investment in Africa: Absolute Progress but Relative Decline. *Development Policy Review***,** 22, 1, pp. 41 – 48.

Barrell, R. and Pain, N., 1997. Foreign Direct Investment, Technological Change, and Economic Growth in Europe. *The Economic Journal*, (107), pp.1770–1786.

Bevan, A., Estrin, S. and Meyer, K., 2004. Foreign Investment Location and Institutional Development in Transition Economies. *International Business Review*, 13(1), pp.43–64.

Blomstrom, M. and Kokko, A., 1994. Home Country Effects of FDI: Evidence from Sweden., *National Bureau of Economic Research*, Working Paper 4639, p.1 - 39.

Blomstrom, M. and Sjoholm, F., 1999. Technology transfer and Spill Overs: Does Local Participation with Multinationals Matter? *European Economic Review*, 43(4–6), pp.915–923.

Borensztein, E., De Gregorio, J. and Lee, J.-W., 1998. How does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics*, 45(1), pp.115–135.

Bryk, A. and Raudenbush, S., 1988. Toward a More Appropriate Conceptualization of Research on School Effect's: A Three-Level Hierarchical Linear Model. *American Journal of Education*, 97, 1 (Nov., 1988), pp. 65 - 108.

Coval, J.D. and Moskowitz, T.J., 1999. Home Bias at Home: Local Equity Preference in Domestic Portfolios. *The Journal of Finance*, 54(6), pp.2045–2073.

Custódio, C. and Metzger, D., 2013. Financial Expert CEOs: CEO's Work Experience and Firm's Financial Policies. *Journal of Financial Economics*, 114(1), pp.125–154.

Custódio, C. and Metzger, D., 2014. Financial Expert CEOs : CEO s Work Experience and Firm's Financial Policies. *Journal of Financial Economics*, 114(1), pp.125–154.

Cyert, R. and March, J., 1963. A behavioral Theory of the Firm. *Englewood Cliffs, NJ*.

Davidson, W.H. and McFetridge, D.G., 1985. Key Characteristics in the Choice of International Technology Transfer Mode. *Journal of International Business Studies*, 16(2), pp.5–21.

Dutton, J. and Duncan, R., 1987. The Influence of the Strategic Planning Process on Strategic Change. *Strategic Management Journal*, 8, pp.103–116.

Gatignon, H. and Anderson, E., 1988. The Multinational Corporation's Degree of Control over Foreign Subsidiaries: An Empirical Test of a Transaction Cost Explanation. *Journal of Law, Economics, and Organization*.

Ghemawat, P. 2001. Distance still matters - The hard reality of global expansion. *Harvard Business Review*, 79, 137-+.

Glass, A.J. and Saggi, K., 1998. International Technology Transfer and the Technology Gap. *Journal of Development Economics*, 55(2), pp.369–398.

Goldstein, I. and Razin, A., 2006. An Information-Based Trade-Off between Foreign Direct Investment and Foreign Portfolio Investment. *Journal of International Economics*, 70(1), pp.271–295.

Graham, J.R., Harvey, C.R. and Puri, M., 2013. Managerial Attitudes and Corporate Actions. *Journal of Financial Economics*, 109(1), pp.103–121.

Grin, F. 1994. The economics of language: match or mismatch? *International Political Science Review*, 15**,** 25-42.

Guillén, M.F. and García-Canal, E., 2009. The American Model of the Multinational Firm and the "New" Multinationals from Emerging Economies. *Academy of Management Perspectives*, 23(2), pp.23–35.

Harzing, A., 2002. Acquisitions versus Greenfield Investments : International Strategy and. *Strategic Management Journal*, 227(September 2000), pp.211–227.

Harzing, A.W. and Pudelko, M., 2013. Language Competencies, Policies and Practices in Multinational Corporations: A Comprehensive Review and Comparison of Anglophone, Asian, Continental European and Nordic MNCs. *Journal of World Business*, 48(1), pp.87–97.

Hausmann, R. and Fernandez-Arias, E., 2000. Foreign Direct Investment: Good Cholesterol? (March 2000). *IDB Working Paper nº 348*.

Hennart, J.-F. and Park, Y.-R., 1993. Greenfield vs. Acquisition: The Strategy of Japanese Investors in the United States. *Management Science*, 39(9), pp.1054– 1070.

Herrmann, P. and Datta, D.K., 2006. CEO Experiences : Effects on the Choice of FDI Entry Mode Pol Herrmann and Deepak K . Datta. *Journal of Management*, 43:4(June), pp.757–778.

Herrmann, P. and Datta, D.K., 2002. Mode : Choice of Foreign Entry Empirical. *Journal of International Business Studies*, 33(3), pp.551–569.

Horstmann, I. and Markusen, J.R., 1987. Licensing versus Direct Investment: A Model of Internalization by the Multinational Enterprise. *Canadian Journal of Economics*, 20(3), p.464.

Huberman, G., 2001. Familiarity breeds Investment. *Review of Financial Studies*.

Ivkovic, Z. and Weisbenner, S., 2005. Local Does as Local Is: Information Content of the Geography of Individual Investors' Common Stock Investments. *The Journal of Finance*, 60(1), pp.267–306.

Kahneman, D. and Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), pp.263–292.

Kang, J. and Kim, J., 2010. Do Foreign Investors Exhibit a Corporate Governance Disadvantage ? An Information Asymmetry Perspective. *Journal of International Business Studies*, 41(8), pp.1415–1438.

Kinoshita, Y. and Mody, A., 2001. Private Information for Foreign Investment in Emerging Economies. *Canadian Journal of Economics/Revue Canadienne d`Economique*, 34(2), pp.448–464.

Kleinert, J. and Toubal, F., 2010. Gravity for FDI. *Review of International Economics*, 18(1), pp.1–13.

Lakonishok, J., Shleifer, A. and Vishny, R.W., 1992. The Impact of Institutional Trading Stock Prices. *Journal of Financial Economics*, 32, pp.23–43.

Larimo, J., 1995. The Foreign Direct Investment Decision Process Case Studies of Different Types of Decision Processes in Finnish Firms, *Journal of Business*

Research, 2963(94), pp.25–55.

Leckie, G., 2008. Module 11 : Three-Level Multilevel Models. MLWin lesson, 11, pp.1–47.

Loungani, P., Mody, A and Razin, A, 2002. The Global Disconnect: The Role of Transactional Distance and Scale Economies in Gravity Equations. *Scottish Journal of Political Economy*, 49(5), pp.526–543.

March, J.G., & Simon, H.A. (1958). *Organizations*. Oxford, England: Wiley.

Marschan-Piekkari, R., Welch, D. and Welch, L., 1999. In the Shadow: The Impact of Language on Structure, Power and Communication in the Multinational, *International Business Review*, 8(4), pp.421–440.

Marschan, R., Welch, D. and Welch, L., 1997. Language: The Forgotten Factor in Multinational Management, *European Management Journal*, 15(5), pp.591–598.

Melitz, J. 2008. Language and foreign trade. *European Economic Review*, 52(4): 667-699.

Melitz, J. and Toubal, F., 2014. Native Language, Spoken Language, Translation and Trade, *Journal of International Economics*, 93(2), pp.351–363.

Morck, R. et al., 1990. The Stock Market and Investment : Is the Market a Sideshow ? The Stock Market and Investment : Is the Market a Sideshow ? Brookings Papers on Economic Activity, 1990 (2), pp.157– 215.

Neeley, T.B., Hinds, P.J. and Cramton, C.D., 2012. The (Un)Hidden Turmoil of Language in Global Collaboration. *Organizational Dynamics*, 41(3), pp.236–244.

Nielsen, B.B. and Nielsen, S., 2011. The Role of Top Management Team International Orientation in International Strategic Decision-Making: The Choice of Foreign Entry Mode. *Journal of World Business*, 46(2), pp.185–193.

Pinheiro-Alves, R., 2011. Behavioural Influences in Portuguese Foreign Direct Investment. *Journal of Socio-Economics*, 40(4), pp.394–403.

Pigato, M. (2000). *Foreign direct investment in Africa: old tales and new evidence*: World Bank.

Portes, R., and Rey, H. (2005). The determinants of cross-border equity flows. *Journal of International Economics, 65*(2), 269-296.

Rauch, J. E. and Trindade, V. 2002. Ethnic Chinese Networks in International Trade. *Review of Economics and Statistics*, 84(1): 116-130.

Raudenbush, S. and Bryk, A., 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*, (2nd ed.). Thousand Oaks: Sage Publications.

Schoemaker, P.J.H., 1993. Strategic Decisions in Organizations - Rational and Behavioural Views. *Journal of Management Studies*, 30(1), pp.107–129.

Selmier II, W. T. and Oh, C. H. 2013. The Power of Major Trade Languages in Trade and Foreign Direct Investment. *Review of International Political Economy*, 20(3): 486-514.

Silva, J.M.C.S. and Tenreyro, S., 2006. The Log of Gravity. , 88(November), pp.641–658.

Slangen, A., 2011. A Communication-Based Theory of the Choice Between Greenfield and Acquisition Entry. *Journal of Management Studies*. 48. 8, pp. 1699 – 1726.

Slangen, A. and Hennart, J., 2008a. Do Foreign Greenfields Outperform Foreign Acquisitions or vice versa? An Institutional Perspective. *Journal of Management Studies*, 45(7), pp.1301–1328.

Slangen, A. and Hennart, J., 2008b. Do Multinationals Really Prefer to Enter Culturally Distant Countries Through Greenfields Rather Than Through Acquisitions? The role of parent experience and subsidiary autonomy. *Journal of International Business Studies*, 39(3), pp.472–490.

Stiglitz, J. E. 2004. Capital-market liberalization, globalization, and the IMF. *Oxford Review of Economic Policy*, 20**,** 57-71.

Taylor, R.N., 1975. Age and Experience as Determinants of Managerial Information Processing and Decision Making Performance. *Academy of Management Journal*, 6(4), pp.74–82.

Tversky, A. and Kahneman, D., 1974. Judgment under Uncertainty: Heuristics and Biases. *Science (New York, N.Y.)*, 185(4157 (Sept. 27, 1974)), pp.1124–31.

Tversky, A. and Kahneman, D., 1981. The Framing of Decisions and the Psychology of Choice. *Science*, 211(4481), pp.453–458.

UNDP, 2011. Sustaining MDG Progress in an Age of Economic Uncertainty, UTH Resilience - Report of Bureau for Development Policy, pp. 1 – 232.

Vermeulen, F. and Barkema, H., 2001. Learning Through Acquisitions. *Academy of Management Journal*, 44(3), pp.457–476.

Wahab, A., 1977. Foreign Investment Decisions of Western Canadian Firms. *Diss. University of British Columbia*.

Williamson, O.E., 1963. Managerial Discretion and Business Behavior. *American Economic Review*, pp.1032–1057.

ESSAYS

Essay 1

The Effect of Language Similarity on Commodity Specific Trade: A Study of the 10 Most Influential Global Languages

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Abstract

This paper analyses the impact of language similarity on trade, in general, and in particular its effect on specific type of products. It extends earlier research on common language network externalities by measuring language similarity effect on bilateral trade from the point of view of the 10 most influential global languages. In addition, we use the extended gravity model in its nonlinear (multiplicative) form to estimate the regressions. The findings provide evidence that the impact of language similarity is greater than that of language commonality, and both have a significant impact on bilateral trade. The results also show that language effect on trade varies within the 10 languages, and that this impact is product-specific: culturally sensitive products benefit from a greater language effect.

JEL classification: F10; F40

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1. Introduction

The increasing complexity of the business environment, means better and higher quality communication are needed for a company to succeed in international arena. Hence, the pivotal role language has assumed in international business (IB). For, it reduces costs and uncertainty, which, in turn, helps to promote trust among international business partners (Lazear, 1999; Melitz, 2008).

Research on the economic impact of language sharing has emphasized the network effects of language that enhance its value for users (more users who share the same language) (Grin, 1996). Languages with many users enjoy more valuable externality effects, thus, enhancing their economic and cultural role. Given their relative importance by number and wealth of speakers—as well as several other factors, such as literary production—Calvet (2001) has classified English as a "hyper-central" language and several other languages with a global reach as "super-central". However, the link between the pattern of the world's major languages and their impact on international trade has not been adequately addressed.

The "gravity" model claims that cross-country trade is positively affected by the countries' "mass"—or size—and negatively by their "distance" (Pöyhönen, 1963; Tinbergen, 1962). Theoretical and empirical developments of the gravity model incorporated a number of factors representing dimensions of cross-country mass and distance. One specific distance factor is of interest to this study: language. The other factor of interest to us is the impact of the 10 major languages on trade (aggregate and commodity export). Based on the gravity model prescriptions, we expect language similarity, as well as the impact of the 10 major languages, to have a significant positive effect on cross-country trade. We used the gravity model in its nonlinear (multiplicative) form using Poisson Pseudo Maximum Likelihood (PPML).

This paper's aim is threefold: first, to measure the influence of language on bilateral trade in a panel data analysis of 58 countries that adopt the world's 10 most spoken languages. These countries represented on average 63% of the world population and 79% of the world GDP in

2010. Second, to check for a language effect on specific commodity groups: Product code 17 (sugars and sugar confectionery); Product code 49 (printed books, newspapers, pictures, etc.); Product code 52 (cotton); Product code 68 (stone, plaster, cement, asbestos, mica, etc.); Product code 87 (vehicles other than railway, tramway); and Product code 95 (toys, games, sports requisites). Third, to rank and compare the impact of the 10 languages on the specific commodities and on international trade.

Our analysis brings three chief results. First, trade is positively related to language commonality and similarity; we find that the volume of trade between pairs of countries sharing the same language is larger than between countries with different languages. In addition, increased language similarity leads to increased bilateral trade. Second, there are products more sensitive to language effect than others. The more culturally sensitive a product, the greater the language effect. For instance, Product code 49 (printed books, newspapers, pictures etc.) has the strongest language effect of all the products tested. And third, there are languages that have a significant impact in international trade: Chinese, English, German, and Japanese. Finally, in spite of the importance of language similarity, geographic distance is still a significant determinant of trade.

The implication of these findings to international business researchers and managers is important: distance does matter (Ghemawat, 2001), but internationalization strategies must carefully consider the potential benefits of trading with countries that share a similar language.

This study is organized as follows: section 2 provides a brief literature review of the gravity model; section 3 presents the hypotheses relating to language and international trade; section 4 describes the research and data collection methods. Section 5 presents the results. The paper ends with a summary of the conclusions and implications.

2. The gravity model of international trade

The gravity model for international trade (Poyhonen, 1963; Tinbergen, 1962) states that two countries are expected to display a trade relationship proportional to their size (e.g., national income, GDP, population), and inversely to the distance between them. In other words, there is a direct relationship between a country's market share (GDP home/world GDP) and its demand/consumption of internationally traded goods. This idea is expressed by the following equation:

$$Xij = \frac{YiYj}{\sum Yj} \quad (1)$$

where X_{ij} is export/import, Y_i is the income for country i, Y_j is the income for country j, and $\sum Y_j$ is world income. The assumptions of the model are: complete specialization of production, identical consumers' preferences, and no market friction or transaction costs of any sort (distance, transport costs, informational asymmetries, institutional differences, etc.). This model can be developed to encompass transaction costs, leading to the following expression:

$$Xij = \frac{YiYj}{Tij\sum Yj} \quad (2)$$

where T_{ij} represents one plus trade costs/transaction costs. Under this model, there are the so called iceberg type costs (Anderson and van Wincoop, 2003). As a rule, geographical distance between countries has been used as a proxy for these costs.

Following the pioneer studies of Anderson (1979), the gravity model for trade has been successfully derived for different sets of trade theory (e.g., factor endowment, technological differences, monopolistic competition, increasing returns to scale, Armington demands) (e.g. Helpman and Krugman, 1985; Helpman, 1985, 1987; Bergstrand, 1985, 1989; Baier and Bergstarand, 2001; Anderson and van Wincoop, 2003; Anderson, 2011). The microfoundations of the gravity model, coupled with its relative ease of implementation (if we ignore the error terms, the above-mentioned models can be estimated via OLS through log-linearization) has led to its wide acceptance. As a result, the gravity model has been extensively and successfully

used to study trade flows between countries with consistent results (e.g. Rose, 2000; Frankel and Rose, 2002; Melitz, 2008) and other social interactions, such as migrations.

In this analysis we use an extended gravity model as proposed in Eaton and Tamura (1994), Rose (2000), Frankel and Rose (2002), and Silva and Tenreyro (2006). As previously observed, the standard specifications of the gravity model assume that distance incorporates all the costs and barriers to international trade. However, Anderson and van Wincoop (2003) showed that such specification does not account for multilateral trade resistance. This is significant because misspecification or omission of some variables in the gravity model leads to inefficient estimation and biased results (Helpman, 1985; Baldwin and Taglioni, 2007). Consequently, Anderson and van Wincoop (2003) proposed an augmented gravity model equation based on Constant Elsaticity of Substitution (CES) model:

$$Xij = \frac{YiYj}{\sum Yj}\left(\frac{Tij}{PiPj}\right)^{1-\sigma} \qquad (3)$$

where Pi and Pj represent multilateral trade resistance ($Pi\ importer, Pj\ exporter$), and σ is the elasticity of substitution coefficient between different goods and is greater than 1. The model accounts for bilateral trade frictions in the form of Tij (e.g., political borders, firm discount out of cultural and or language proximity). The augmented gravity model has proven more adequate in fully explaining trade flows (e.g., Rose and Frankel, 2002; Anderson and van Wincoop, 2003; Anderson, 2011). As a result, we incorporated additional distance dimensions that may hinder bilateral trade or enact transaction costs, while focusing on the language dimension. In doing so, we attempt to disentangle the otherwise hidden effects of these distance dimensions (a full description of our variables is in section 4 and in Table 1).

3. Hypotheses

3.1. The effect of language commonality on trade

According to Grin (1994), economists did not think of language as an important factor in resource allocation; as such, language had been largely ignored in IB literature. However, gradually, language has been gaining a pivotal role in IB literature, mainly because it is now understood that language and culture are not the same. The pioneering works by Davidson and McFetridge (1985) and Marschan-Piekkari, et al. (1999a, 1999b) have helped consolidate the importance of language in IB. In regards to language and trade, although most studies now use language as a control variable, few use it as a main variable of interest. These studies tend to treate language as a dichotomous variable, in which sharing a common language is set to one or zero. This approach ignores the possibility of two specific languages allowing for some level of mutual understanding of each other (for instance, Portuguese and Spanish). Consequently, in this research we use language similarity approach, acknowledging that language can have an impact regardless of whether it is significant outside the home country (Melitz and Toubal, 2014). This approach has been used by Selmier and Oh (2013) and Melitz and Toubal (2014).

While focusing attention on the effect of common currencies on trade, Rose (2000) and Frankel and Rose (2002) included language commonality in their extended gravity estimates and found large positive effects. Melitz (2008) studied language ties in further detail and showed that the ability to communicate directly in a common language promotes trade more effectively than when communication depends on translation. Selmier and Oh (2013) included additional measures of language similarity and found that the major trade languages had a significant impact on both international trade and foreign direct investment.

The level of trade between two countries is influenced by several barriers. Some of them are "hard" in nature, as they relate to structural features of the trading partners. The most evident of these is geographic distance, which is especially important for companies that deal with bulky products or coordinate dispersed activities. Tariffs and legal system commonality, for instance,

also affect transaction costs in a direct manner. Other trade barriers are "soft"—or informal—and may be mitigated by cultural and language proximity (Rauch and Trindade, 2002). Consider, for instance, the negotiation of complex commercial conditions or the enforcement of contract rules. In these scenarios, cultural and language ties arguably make it easier for trade partners to comprehend administrative sensitivities and avoid ambiguities (Ghemawat, 2001).

Although cultural validity is embedded in language, language and culture are not always linked. This is illustrated by the cultural dissimilarities between English-speaking countries such as India, South Africa, the UK, and the USA. While cultural underpinnings such as social norms and religion may trigger business associations by means of subtle mechanisms, the power of language is easier to grasp. Language links streamline communication by minimizing misunderstandings that may jeopardize the effectiveness of trade agreements. This is especially relevant in the context of long-term, complex business relationships, as they require more sophisticated interactions and interfirm trust (Lazear, 1999). By communicating in a language that is native to all parties involved in an international transaction, firms streamline the flow of essential information and may offset the transaction costs associated with geographic distance. This favors the 10 most influential global languages this study focuses on. Therefore, we hypothesize that:

Hypothesis 1: Language similarity is positively related to bilateral trade.

3.2. The effect of language similarity on commondities

The communication difficulties imposed by today's complex business environment elevate the importance of language in the IB arena. As noted by Dunlevy (2005), the customer needs more information (for example, product specifications, time of delivery) and assurances of the product quality, and the supplier needs some guarantees of receiving the sales price agreed upon. In other words, matching buyer and seller is made increasingly difficult by product complexity. Whereas with exchange-traded commodities the information requirement

is available and standardized and the matching of seller and buyer is made easy, for differentiated products the information requirement is greater (Rauch, 1999). This leads to increased transaction costs and contributes to the increased importance of language. However, this information requirement is not constant across product types, meaning, for instance, that consumer goods (typically highly differentiated, complex products such as vehicles and toys) should entail more requirements in terms of product information than producer goods (which are typically more standardized and homogenous, e.g., cement). As such, we would expect the language requirement to be greater as product complexity and differentiation increases. In other words, consumer products should exhibit greater language requirement than producer goods. In similar vein, we expect *culturally sensitive* commodity products—such as music and books—to have high transaction costs and to be more influenced by language. Translation is a poor substitute for words in their original languages (Melitz, 2008), for words entail some aspects of culture and taste that are difficult to express in another language. Hence, we hypothesize:

Hypothesis 2: Language influence varies in accordance with the type of commodity.

3.3. The effect of the 10 most influential global languages on trade

Although common and similar language can facilitate trade, some languages may have a stronger impact, a notion that has attracted some recent research (e.g., Selmier and Oh, 2013). If a large number of users speak a given language, it tends to gain momentum, as more people will be attracted by the economic benefits brought about by learning of that particular language. Welch, et al. (2001) observe that UK exporting firms recruit overseas agents based on their English fluency as well as their sales skills. And Choi (2002) notes that poor countries tend to learn the languages of rich countries. If that is the case, then it would be expected for the poor countries to learn the most spoken language as it would diminish their transaction costs and allow them to benefit from the externalities that follow. This would explain the current

expansion and adoption of English as a second language in many countries (Ginsburgh, et al., 2007). However, languages spoken in less developed economies are also valuable human capital assets, even for natives of rich nations. A recent study by the British Council (2013) ranks Spanish, Arabic, French, Mandarin Chinese, German, and Portuguese, among others, as the "languages for the future" that English citizens should focus on.

Melitz (2008) considers that beyond size and influence, the learning and communication facilities also play an important role on the impact of foreign trade. However, in addition to conveying certain aspects of culture, languages are also legacies of trading networks (e.g., the effect of colonial relationships) and native speaker influence (Ghemawat, 2001). In addition, the existence of large number of participants in international trade, with different languages, suggests differentiated influence of the various languages. Hence the hypothesis:

Hypothesis 3: Languages do not all have the same influence on international trade. The most spoken languages have a greater influence on trade.

4. Research method and data

Data and sources

Our dataset consists of 248,126 cross-country observations. Trade data (exports) are pooled cross-country series for the years 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, and 2010[1] were obtained from the UN Comtrade database. The data on commodities export data starts in 1990. The GDP and population data were collected from the United Nations Conference on Trade and Development (UNCTAD) database. The gravity data (e.g., geographic distance, borders, and colonization ties) were collected from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) and Andrew Rose database. The data on language similarity came from Melitz and Toubal (2014). The series on exports, commodity products, GDP, and GDP per capita were deflated with the US price deflator, using 2005 as the base year.

[1] The time periods follow Rose (2001) with the addition of more recent data.

The selection criteria for the commodities were based on wether the products is: complex, intermediate, or simple. We selected 2 products of each category. The commodity products are: Product code 17 sugars and sugar confectionery), Product code 49 (printed books, newspapers, pictures, etc.), Product code 52 (cotton), Product code 68 (stone, plaster, cement, asbestos, mica, etc.), Product code 87 (vehicles other than railway, tramway), Product code 95 (toys, games, sports requisites).

The 10 influential global languages were selected according to the following criteria: (1) to be a UN official language (Arabic, English, French, Mandarin Chinese, Russian, and Spanish); (2) to be the official language of five or more countries (all the above plus Portuguese); (3) to have witnessed large and influential diasporas (adding German, Hindi, and Japanese); and (4) to account for a significant share of international trade. Moreover, all the languages listed occupy a prominent position in the Ethnologue ranking and are classified as hyper- (English) or super-central by Calvet (2006).

The 58 countries included in our analysis (listed in Appendix A) are those whose primary language: (1) is one of the 10 selected above; and (2) is spoken by at least 50% of their population. These data were collected from the Ethnologue website. In order to simplify the calculation of the number of speakers of a certain language in a particular country, we considered the total population as speakers of the language in question once the 50% threshold is surpassed. To reduce the overestimation of the number of speakers caused by this procedure, we used the Ethnologue criteria of number of native speakers. The number of countries analyzed in each time period varied according to the availability of data.

Variables

Exports. The dependent variables are exports (i.e., aggregate exports and individual commodity groups exports) between countries i and j (X_{ijt}). It was operationalized as the deflated series of exports between each of the 58 countries sampled.

Language Commonality. Language commonality (comlang_off) is a dummy variable that assumes the value one if countries i and j have a common primary language, or zero otherwise. In order to measure the impact of the 10 most influential languages, we generate a series of 10 dummy variables for each language (***Arabic, Chinese, English, French, German, Hindi, Japanese, Portuguese, Russian, and Spanish***). For instance, Arabic language is set to one, when one of the country pair speaks Arabic, and zero otherwise. This procedure was applied to all the languages. With this set-up we expect to understand the impact of each language on trade.

Language Similarity. Language similarity (proxling2bakker2010) is a continuous index. It is based on ASJP's words similarity database, which compares pairs of words from different languages. We used the data constructed by Melitz and Toubal (2014). The paper mentioned provides further details on the construction of the variable.

Distance. Distance (Dij) is measured by the distance in kilometers between the main cities of the countries in our sample. Following Frankel and Rose (2002) and Anderson and van Wincoop (2003), the variable was computed in its natural logarithmic form. We expect this variable to negatively impact trade, reflecting the logic that as distance between a pair countries increases so diminishes the trade between them (i.e., due to transport and distribution costs).

Gross Domestic Product. Gross Domestic Product (YiYj) represents the market size of a given pair of countries. It is a proxy for the intensity of supply and demand in the gravity equation (Rose, 2000). This variable was computed as an inner product of the deflated GDP amounts of countries i and j transformed into its natural logarithmic form. The rationale is that trade responds positively to income (larger markets attract more international trade), but also to income similarity between trading partners (Helpman, 1987; Helpman and Krugman, 1987). We expect GDP to be positively related to bilateral trade.

Gross Domestic Product Per Capita. GDP per capita (YiYj/PopiPopj) is a proxy measure of the factor endowment of countries i and j, such as the availability of skilled labor. It was

computed as inner product of the deflated GDP amounts of countries i and j divided by the inner product of their populations (inner product of income per capita of the pair of countries), then converted into its natural logarithmic form (Helpman, 1987).

Contiguity. Countries that share a common border are expected to have higher levels of bilateral trade (Anderson and van Wincoop, 2003), with the possible exception of countries with border conflicts. Contiguity ($Cont_{ij}$) is a dummy variable that assumes the value one if countries i and j share a common land border, and zero otherwise.

Colonization History. Colonization history is a dummy variable that assumes the value one if country i colonized country j (or vice versa), and zero otherwise. The logic is that countries with shared colonial links are expected to trade at higher levels due to cultural proximity.

Common Colonization. Countries that share a common colonizer are expected to have more homogeneous cultural traits, which in turn may facilitate bilateral trade. Common Colonization (com_colij) was operationalized as a dummy variable that assumes the value one if countries i and j had a common colonizer since 1945, and zero otherwise.

A summary of the variables used in the study as well as their data sources is in Table 1.

Table 1: Variables (codes, description, and sources)

Variable code	Variable description	Source 1	Source 2
Cntry_LandLock	Both Countries Landlocked	CEPII database	
Col_Rel	Colonial Relationship	CIA_Factbook	CEPII database
Col_1945	Colony after 1945		
Com_Col	Common Coloniszr, dummy variable set 1 if common, 0 otherwise	CIA_Factbook	CEPII database
ComLang_Ethno	Common Language Ethnologue, dummy variable set 1 if common, 0 otherwise	Ethnologue Website	
Com_Nation	Common Nation, dummy variable set 1 if common, 0 otherwise	CIA_Factbook	CEPII database
ComLang_off	Common Official Language, dummy variable set 1 if common, 0 otherwise	CIA_Factbook	CEPII database
Contig	Contiguity, dummy variable set 1 if common, 0 otherwise	CEPII database	
CntryCd_Orig/CntryCd_Dest	Country Code		
Cntry_Ilsnd	Country is an Island	CEPII database	
LangEthn_Orig/LangEthn_Dest	Country Language According to Ethnologue L1>50%)		
Leg_Origin	Country Legal Origin	Andrei Shleifer Website	CIA_Factbook/CEPII database
CntryNm_Orig/CntryNm_Dest	Country Name		
Region_Orig/Region_Dest	Country Regional Location	UNCTAD	
currunion_Dum	Currency Union Dummy	CEPII Database	CIA_Factbook/Andrew Rose Website
LnDist	Distance	CEPII database	
ExchRt_Orig/ExchRt_Dest	Exchange Rate	Penn 7.1 Database	
Export_XY	Total Export From Country X to Y	UNComtrade	
FTA	Free_Trade_Agreement	CEPII database	Frankel and Rose (2001)/WTO
GTTWTO_Orig	GATT/WTO Member	CEPII database	WTO
GDP_Orig/GDP_Dest	Gross Domestic Product (000000US$)	UNCTAD	
GDP_Capita	Gross Domestic Product Per Capita (US$)	UNCTAD	
HDI (HDI_Orig/HDI_Dest)	Human Development Index		
Import_XY	Import From Country X to Y	UNComtrade	
Infl_Orig/Infl_Dest	Inflation, consumer prices (annual %)	The World Bank	IMF
ISO3Cd_Orig/ISO3Cd_Dest	ISO 3 Code	ISO Alpha	UN Statitics Division
ISO2Cd_Orig/ISO2Cd_Dest	ISO 2 Code		UN Statitics Division
lndlock_orig/lndlock_dest	Landlocked Country	CEPII database	Andrew Rose Website/UNCTAD
Lang (Lang_Orig/Lang_Dest)	Language	CEPII database	CIA_Factbook
LegOrig_Dumm	Legal Origin Dummy, set to 1 if common 0 otherwise		
LitRt_Orig/LitRt_Dest	Literacy Rate	UN Development Report	The World Bank Database
Isl_Nation	One Island Nation	CEPII database	
Pop (Pop_Orig/Pop_Dest)	Population (000)		
proxling2bakker2010	Language Similarity	Melitz and Toubal (2014)	CEPII
RTA	Regional Trade Agreement (RTA)	Andrew Rose Website	WTO
Rlg_Dumm	Religion Dummy Variable	Andrei Shleifer Website	CIA_Factbook
Sm_Cntry	Same Country		
Year	Year		
arabic	arabic Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
chinese	chinese Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
english	english Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
french	french Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
german	german Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
hindi	hindi Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
japanese	japanese Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
russian	russian Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
portuguese	portuguese Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		
spanish	spanish Dummy - variable set to 1, if one of country pair is arabic, and 0 otherwise		

Econometric model

The choice of the econometric model took into account the nature of data. About 69% of cross-country export records display zero value. In the literature this issue is dealt with by: (i) substituting missing values with a small numbers and calculate regression estimates with a double log OLS method; or (ii) excluding cases with missing data. However, neither of these approaches are appropriate since they cause selection bias (Helman et. al., 2008). Instead, we followed Silva and Tenreyro's (2006), estimating the gravity equation in its multiplicative form and using the PPML. In addition, these authors noted that a log-linear specification in the presence heteroskedasticity leads to inconsistent estimates (since log-linearizing the error term changes its properties) and to a violation of the OLS method assumptions. The following extended gravity model is based on Silva and Tenreyro' (2006):

$$X_{ijt} = \exp\left(\beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln\left(\frac{Y_i Y_j}{Pop_i Pop_j}\right)_t + \beta_3 \ln(D_{ij}) + \right.$$

$$\left. \beta_4 Cont_{ij} + \beta_5 proxling2bakker2010 + \beta_6 com_{col_{ij}} + \beta_7 sm_{cntry_{ij}} + \beta_n K_{ij}\right) * \varepsilon_{ijt} \qquad (4)$$

Where i and j are countries, t is time, and:

X_{ijt} is aggregate and commodity export between countries i and j. Y is Gross Domestic Product of countries i and j. Pop is population of countries i and j. D_{ij} is the distance between countries i and j. $Cont_{ij}$ is contiguity or the existence of a shared land border between countries i and j. comlang_off is language commonality between countries i and j. proxling2bakker2010 is language similarity between countries i and j. com_col_{ij} is common colonization between countries i and j. sm_cntry is colonization history, reflecting if country i colonized country j or vice versa. K represents the additional control variables, and ε_{ijt} is the error term.

5. Results and discussion

The hypotheses were tested by correlation and multivariate regression analysis. We searched for near multicollinearity between the explanatory variables by means of correlation analysis. The final correlation matrix is in Apendix B.

To test for the presence of multicollinearity we used the variance inflation factors (VIF) for each regression models. The computed values (in Appendix C) are always lower than 10, suggesting no multicollinearity problems between the explanatory variables.

Table 2 (columns 1 to 3) depicts the results of the gravity equation estimation using the PPML method. The first column shows the results of the base model. Column 2 reports regression results using common language variable, and the last column has the results of the pooled series. As robustness check and to ensure our results are not driven by model specification, we run OLS regression (Table 2, columns 4 to 6) and compared the results with the PPML estimation. The OLS model specification is the standard for the gravity model in the trade literature:

$$\ln(\alpha + Xijt) = \beta 0 + \beta 1 \ln(YiYj)t + \beta 2 \ln(YiYj/PopiPopj)t + \beta 3 \ln(Dij) + \beta 4 Contij + \beta 5 proxling2bakker2010 + \beta 6 Com\_colij + \beta 7 Colonyij + \varepsilon ijt \quad (5)$$

The variable specification are the same as the equation 4. The difference is that the log linearizing of the OLS models require α (greater than zero and less or equal to one) for the equation to work. Except for the religion dummy variables, all other variables are correctly signed. The only difference lies in their magnitude.

Table 2: PPML Estimation of Equation 4 and OLS estimation of Equation 5 for Aggregate Exports

	Poisson pseudo maximum likelihood (PPML) estimation of Equation 4 for Exports			OLS estimation of Equation 5 for Exports		
	Basic Model 1	Basic Model 2	Pooled Series	Basic Model 1	Basic Model 2	Pooled Series
Control Variables						
Contig	0.686***	0.674***	0.754***	0.381***	0.377***	0.362***
	(0.0791)	(0.0733)	(0.0650)	(0.0406)	(0.0412)	(0.0413)
com_col	0.707***	0.814***	0.769***	0.444***	0.509***	0.493***
	(0.108)	(0.105)	(0.0991)	(0.0269)	(0.0272)	(0.0276)
col_1945	0.647***	0.768***	0.727***	1.411***	1.534***	1.496***
	(0.0575)	(0.0514)	(0.0522)	(0.0410)	(0.0413)	(0.0416)
sm_cntry	0.168	0.148	0.114	0.349***	0.351***	0.327***
	(0.159)	(0.154)	(0.0987)	(0.0596)	(0.0599)	(0.0596)
legorig_dumm	0.139***	0.117**	0.332***	0.267***	0.302***	0.340***
	(0.0489)	(0.0575)	(0.0477)	(0.0139)	(0.0139)	(0.0140)
rlg_dumm	-0.0908**	-0.152***	-0.0175	0.176***	0.139***	0.150***
	(0.0353)	(0.0383)	(0.0350)	(0.0140)	(0.0151)	(0.0153)
currunion_dum	0.0848	0.159**	0.101*	0.454***	0.540***	0.505***
	(0.0648)	(0.0696)	(0.0524)	(0.0632)	(0.0685)	(0.0682)
cntry_ilsnd	0.543***	0.593***	0.457***	0.297***	0.335***	0.196***
	(0.0401)	(0.0409)	(0.0470)	(0.0169)	(0.0170)	(0.0196)
lndlock_orig	-0.345***	-0.233***	-0.292***	-0.812***	-0.768***	-0.764***
	(0.0480)	(0.0475)	(0.0462)	(0.103)	(0.103)	(0.0997)
lndlock_dest	-0.398***	-0.322***	-0.381***	-0.551***	-0.488***	-0.595***
	(0.0443)	(0.0433)	(0.0439)	(0.0174)	(0.0179)	(0.0216)
Rta	0.342***	0.365***	0.363***	0.377***	0.399***	0.405***
	(0.0664)	(0.0678)	(0.0539)	(0.0245)	(0.0251)	(0.0250)
DifHDI	-0.539**	-0.558**	-0.598**	-0.778***	-0.635***	-0.489***
	(0.270)	(0.283)	(0.271)	(0.0697)	(0.0719)	(0.0728)
DifExchrt	-0.00322	-0.00363	-0.00379	-0.0131**	-0.0153***	-0.0173***
	(0.0141)	(0.0143)	(0.0126)	(0.00534)	(0.00536)	(0.00534)
LnDefGDPOrig	0.805***	0.816***	0.779***	0.542***	0.547***	0.567***
	(0.0164)	(0.0172)	(0.0141)	(0.0174)	(0.0176)	(0.0172)
LnDefGPDCapOrig	-0.00154	-0.0271	0.0131	-0.0449**	-0.0578**	-0.0636***
	(0.0347)	(0.0368)	(0.0332)	(0.0227)	(0.0231)	(0.0226)
LnDefGDPDest	0.791***	0.799***	0.762***	0.676***	0.680***	0.654***
	(0.0138)	(0.0142)	(0.0127)	(0.00343)	(0.00352)	(0.00421)
LnDefGPDCapDest	-0.0413	-0.0650**	-0.0258	-0.0424***	-0.0409***	-0.0376***
	(0.0255)	(0.0263)	(0.0264)	(0.00776)	(0.00802)	(0.00848)
Variables of Interest						
LnDist	-0.594***	-0.581***	-0.611***	-0.940***	-0.937***	-0.950***
	(0.0309)	(0.0326)	(0.0264)	(0.00914)	(0.00939)	(0.00977)
comlang_off	0.157***			0.270***		
	(0.0436)			(0.0176)		
proxling2bakker2010		0.514***	0.377***		0.387***	0.466***
		(0.0748)	(0.0773)		(0.0286)	(0.0326)
Arabic			-0.0267			0.0419**
			(0.0551)			(0.0202)
Chinese			0.789***			0.808***
			(0.0695)			(0.0363)
English			0.356***			0.311***
			(0.0520)			(0.0222)
French			-0.297***			0.215***
			(0.0407)			(0.0445)

	Poisson pseudo maximum likelihood (PPML) estimation of Equation 4 for Exports			OLS estimation of Equation 5 for Exports		
	Basic Model 1	Basic Model 2	Pooled Series	Basic Model 1	Basic Model 2	Pooled Series
german			0.0811*			0.428***
			(0.0472)			(0.0394)
hindi			-0.538***			-0.116**
			(0.0798)			(0.0495)
japanese			0.145*			0.485***
			(0.0874)			(0.0498)
portuguese			-0.139***			-0.0727**
			(0.0412)			(0.0338)
russian			-0.0961			-0.0121
			(0.0992)			(0.0612)
spanish			0.00822			0.0670***
			(0.0491)			(0.0186)
_cons	2.189***	1.979***	2.263***	5.455***	5.378***	5.394***
	(0.310)	(0.330)	(0.274)	(0.0967)	(0.0993)	(0.101)
N	50539	48678	48678	50539	48678	48678
Bic	20479427.1	19736524.4	17369238.2	.	.	.
Aic	20479250.5	19736348.5	17368974.4	.	.	.

Standard errors in parentheses

="* p<0.10, *** p<0.05, ** p<0.01

Table 3: PPML Estimation of Equation 4 for Commodities Exports

	Product Code 17	Product Code 49	Product Code 52	Product Code 68	Product Code 87	Product Code 95
Control Variables						
Contig	1.008***	0.512***	0.515***	0.859***	1.328***	0.386**
	(0.163)	(0.0961)	(0.192)	(0.0810)	(0.127)	(0.154)
com_col	0.114	1.205***	0.155	0.273	-0.249	-0.112
	(0.283)	(0.214)	(0.177)	(0.190)	(0.245)	(0.354)
col_1945	0.955***	1.375***	0.303*	0.756***	0.420**	0.332
	(0.185)	(0.130)	(0.173)	(0.128)	(0.163)	(0.275)
sm_cntry	0.0817	0.216	-0.141	0.0712	0.484**	2.457***
	(0.276)	(0.192)	(0.287)	(0.177)	(0.239)	(0.420)
legorig_dumm	0.0223	0.333***	0.130	0.0114	0.189*	-0.354**
	(0.147)	(0.0839)	(0.109)	(0.0750)	(0.113)	(0.160)
rlg_dumm	-0.378***	0.137*	-0.162*	0.108	-0.0308	-0.275***
	(0.134)	(0.0772)	(0.0960)	(0.0694)	(0.106)	(0.106)
currunion_dum	0.641***	-0.314**	0.231	0.318***	-0.126	1.105***
	(0.164)	(0.147)	(0.165)	(0.111)	(0.158)	(0.184)
cntry_ilsnd	-0.239*	0.479***	0.220**	0.338***	1.043***	-0.0422
	(0.131)	(0.0773)	(0.103)	(0.0976)	(0.0751)	(0.189)
lndlock_orig	-0.836***	-0.284***	0.620***	0.0956	-0.594***	1.351***
	(0.132)	(0.107)	(0.124)	(0.0916)	(0.165)	(0.190)
lndlock_dest	-0.851***	-0.0180	-0.969***	-0.194*	-0.305**	-0.219
	(0.115)	(0.0913)	(0.134)	(0.103)	(0.129)	(0.148)
rta	0.643***	0.583***	0.859***	0.0483	1.149***	1.005***
	(0.112)	(0.0973)	(0.154)	(0.0906)	(0.134)	(0.174)
DifHDI	-2.858***	-0.170	0.534	0.559	-0.725	3.129*
	(0.749)	(0.620)	(0.647)	(0.709)	(0.973)	(1.682)
DifExchrt	-0.0447*	0.00789	-0.0451**	-0.0795***	-0.0474***	-0.0528**
	(0.0242)	(0.0239)	(0.0207)	(0.0145)	(0.0137)	(0.0226)
LnDefGDPOrig	0.459***	0.880***	0.964***	0.920***	0.976***	1.410***
	(0.0307)	(0.0304)	(0.0475)	(0.0229)	(0.0428)	(0.0977)
LnDefGPDCapOrig	-0.00669	0.107	-0.625***	-0.355***	0.111	-1.043***
	(0.0693)	(0.0726)	(0.0620)	(0.0787)	(0.108)	(0.165)
LnDefGDPDest	0.522***	0.705***	0.627***	0.782***	0.928***	0.991***
	(0.0322)	(0.0263)	(0.0412)	(0.0272)	(0.0502)	(0.0849)
LnDefGPDCapDest	-0.510***	0.0213	-0.398***	0.175***	-0.0783	0.574***
	(0.0864)	(0.0578)	(0.0795)	(0.0631)	(0.0873)	(0.152)
Variables of Interest						
LnDist	-0.129	-0.698***	-0.524***	-0.778***	-0.473***	-0.208***
	(0.0875)	(0.0448)	(0.0721)	(0.0448)	(0.0613)	(0.0800)
proxling2bakker2010	0.887***	1.524***	-0.178	0.327**	-0.243	1.036***
	(0.184)	(0.140)	(0.197)	(0.139)	(0.238)	(0.247)
_cons	-2.036***	-3.741***	-1.349*	-2.598***	-4.321***	-11.33***
	(0.737)	(0.493)	(0.819)	(0.418)	(0.879)	(1.679)
N	10649	16339	11174	12847	16777	13136
Bic	218604.6	108316.6	223771.5	75996.9	2071958.7	190032.3
Aic	218459.1	108162.5	223625.0	75847.7	2071804.2	189882.6

Standard errors in parentheses

="* p<0.10 ** p<0.05" *** p<0.01"

Note: Product code 17 (sugars and sugar confectionery), Product code 49 (printed books, newspapers, pictures, etc.), Product code 52 (cotton), Product code 68 (stone, plaster, cement, asbestos, mica, etc.), Product code 87 (vehicles other than railway, tramway), Product code 95 (toys, games, sports requisites).

Table 4: PPML Estimation of Equation 4 for the 10 Most Influential Global Languages

	Product Code 17	Product Code 52	Product Code 49	Product Code 68	Product Code 87	Product Code 95
Variables of Interest						
LnDist	-0.348***	-0.694***	-0.743***	-0.861***	-0.640***	-0.311***
	(0.0898)	(0.0649)	(0.0449)	(0.0380)	(0.0461)	(0.0692)
proxling2bakker2010	1.180***	-0.525**	1.513***	-0.124	0.0105	0.880***
	(0.264)	(0.221)	(0.161)	(0.191)	(0.169)	(0.245)
arabic	0.501**	0.243**	-0.447***	0.184*	0.200	-0.262*
	(0.205)	(0.123)	(0.122)	(0.0954)	(0.130)	(0.147)
chinese	-1.309***	0.0792	1.086***	0.500***	-0.627***	1.425***
	(0.208)	(0.195)	(0.127)	(0.128)	(0.155)	(0.142)
english	-0.408***	0.370***	0.638***	0.0656	0.446***	0.719***
	(0.142)	(0.128)	(0.0862)	(0.0764)	(0.141)	(0.116)
french	0.0257	-0.566***	-0.0427	-0.608***	-0.359***	-0.307***
	(0.151)	(0.139)	(0.103)	(0.102)	(0.0952)	(0.0939)
german	-0.185	0.136	0.266***	-0.259**	-0.566***	0.0147
	(0.205)	(0.189)	(0.102)	(0.115)	(0.137)	(0.161)
hindi	-1.316***	-0.918***	-0.0696	-0.451**	-1.454***	-2.666***
	(0.478)	(0.239)	(0.205)	(0.184)	(0.164)	(0.261)
japanese	-1.409***	-0.464**	-0.419**	-0.183	1.363***	0.200
	(0.276)	(0.200)	(0.179)	(0.182)	(0.250)	(0.243)
portuguese	1.723***	0.0877	-0.457***	0.329**	-0.0748	-0.869***
	(0.165)	(0.104)	(0.126)	(0.154)	(0.0980)	(0.198)
russian	0.105	-1.640***	-0.115	-0.462***	-0.442**	-0.855***
	(0.415)	(0.182)	(0.191)	(0.149)	(0.200)	(0.185)
spanish	-0.192	0.113	-0.125	-0.0307	0.300***	-0.222**
	(0.122)	(0.111)	(0.0899)	(0.0808)	(0.0797)	(0.0906)
_cons	-1.775*	-0.240	-3.590***	-2.166***	-2.620***	-8.706***
	(0.972)	(0.710)	(0.501)	(0.342)	(0.622)	(0.762)
N	10649	11174	16339	12847	16777	13136
Bic	176782.5	206990.6	96822.4	71244.9	1780262.5	132884.2
Aic	176564.3	206771.0	96591.4	71021.0	1780030.7	132659.8

Notes: Table 4 has the same control variables as Table 2, so this table only presents the reduced version; standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01. Product code 17 (sugars and sugar confectionery), Product code 49 (printed books, newspapers, pictures, etc.), Product code 52 (cotton), Product code 68 (stone, plaster, cement, asbestos, mica, etc.), Product code 87 (vehicles other than railway, tramway), Product code 95 (toys, games, sports requisites).

The results of the gravity model accords with the literature (e.g., Frankel and Rose, 2002; Melitz, 2008; Rose, 2000; Selmier and Oh, 2012). The three traditional gravity variables are within the limits of the existing estimates and all are statistically significant. The coefficients associated with the GDP are positive and statistically significant, indicating their association with trade. The

coefficient of the country of origin GDP is higher than that of the country of destination GDP, a finding that supports the "home bias" effect in trade (Rose, 2000). All variables are correctly signed.

The results of the pooled series suggest that sharing a common language increases trade by 17% (comlang_off -> (Exp(0.157)-1)), whereas language similarity increases trade by 67% (proxling2bakker2010 -> (Exp(0.514)-1)). This finding provides support for Hypothesis 1—language similarity increases trade—while also suggesting that language similarity is more important for trade than language commonality. It also reinforces the view held by some (e.g., Melitz, 2008; Melitz and Toubal, 2014) that setting up language as a dummy variable tends to underestimate language impact on trade, as it does not take into account other ways of circumventing the dummy variable concept of either equal or different language. The magnitude of the effect of language similarity, however, is lower than that reported by Rose (2000) and Frankel and Rose (2001), whose estimates suggested that sharing a common language doubled the level of trade, but falls within the margin obtained in Head and Mayer's (2013). We crosscheck this result against OLS estimation (see Table 2, columns 4-6). The results are consistent, though the magnitude of the variables are different. Language commonality increases trade by 31% (Exp(0.270) – 1) and language similarity increases trade by 47% (Exp(0.387) – 1).

Distance and trade are negatively related, in line with gravity predictions. The PPML coefficient for distance (-0.581) (Table 2, column 2) is lower than the corresponding OLS estimate (-0.937) (Table 2, column 5). This accords with the findings of Silva and Tenreyro (2006). The PPML distance coefficient suggests that an increase of one percent in the distance between a pair of countries reduces trade by 0.581 percent. Our estimate is lower than those of Rose (2000) and Frankel and Rose (2001). However, their estimates were obtained from an OLS model, which tends to inflate the coefficients compared to PPML (Silva and Tenreyro, 2006). Our estimates fall within

the margins of the gravity model (-1, 1) and within the limits suggested by Leamer and Levinsohn (1995).

The control variables have also behaved as expected. Belonging to a regional trade agreement zone and to a common currency zone are positively and significantly related to bilateral trade. The same is observed with regard to sharing a common border. The results also suggest that cultural proximity impacts the level of cross-country trade. For instance, sharing a common legal framework and colonial ties is positively and significantly related to trade.

The results of the model estimation for the six commodities are in Table 3. Of the six product groups, only two have a negative language effect (product code 52 and product code 87) but they are not statistically significant. The result for product code 17 estimation supports Hypothesis 2. Although this is not a highly differentiated product, it conforms to the idea of consumer products being sensitive to the language variable. In addition, the item "confectionary", belonging to this group of commodities, indicates that there is cultural sensitivity involved, and thus significant language influence. This result, along with that of the product code 49, supports Hypothesis 2. They show that complex and culturally sensitive product have a considerable language influence. In this case in particular, language similarity causes a very large trade increase of 359% (Exp(1.524)-1). This result is in line with Melitz and Toubal (2014). The result of the estimation for the Product code 52, an intermediate product, behaved as expected: the language coefficient is statistically insignificant, although negative. The result for the Product code 68, a seemingly simple and intermediate product (undifferentiated), suggests some language influence; language similarity increases trade by 39% (Exp(0.327)-1), higher than expected. The reason could be that some of commodity under this code as some cultural sensitive behind it (i.e., products used in architecture, construction). Because product code 68 belongs to a group of products highly sensitive to distance, the distance coefficient estimation is (-0.778) the highest of the commodities tested. Product code

87 has a negative language coefficient, although it is not statistically significant. We reason that in this category the products are fairly standardized, so the language influence should be minimal or non-existing. Product code 95 behaves as expected, that is, it is a highly sensitive cultural product, suggests language similary increases the trade of this product by 53% (Exp(0.428)-1), . This result conforms with Hypothesis 2. The general results conforms to the idea that final consumer products (highly differentiated) to be highly sensitive to the language variable (e.g., Dunlevy and Hutchinson, 1999; Rauch, 1999; Hutchinson, 2005; Melitz and Toubal, 2014).

The results for the 10 global languages include the following. The language similarity coefficient is positive and statistically significant (Table 2, column 3) even after the 10 languages were added to the base model. The languages with positive impact on trade are Chinese, English, German, and Japanese, suggesting that sharing one of these languages increases trade. These findings provide support for Hypothesis 3, as they suggest a differential effect of language in international trade—meaning that some languages suffer less transaction costs than others and, as such, promote bilateral trade more than others. Furthermore, this effect is confirmed by the commodity analysis we conducted. The overall result shows English with a significant advantage over the other languages. English has a positive coefficient for all product codes except Product code 17 (Table 4, column 1).

6. Conclusions

Earlier research based on gravity models has shown that proximity and economic size are powerful magnets for trade between two neighboring countries. However, the impact of language as a trade facilitator has not gone unnoticed. Melitz (2008) provided evidence on the importance of language facilitating international trade. This study confirmed that language is an important determinant of cross-country trade. Distance has also emerged as an even more impactful factor,

as anticipated by gravity model prescriptions. Overall, our results suggest that the combination of geographic and language proximity has a strong positive effect on the levels of cross-country trade. Furthermore, this study sheds light on the differentiated effect of language on specific commodities. Clearly, complexity means increased language requirement. After all, translation can go only so far.

As incremental contribution, this paper sheds light on the relative weight of the 10 main global languages as trade facilitators. The results point to a positive effect of languages in terms of their potential impact on bilateral trade. The managerial implications of our findings are clear: location does matter, as is often stressed by corporate strategy researchers, but cultural and language proximity have a large effect, as they are important facilitators of trade and other forms of cross-border activity. Thus, language plays a significant role in the definition of foreign market entry strategies.

As for future research, industry specificity should be investigated. Some industries may be more sensitive to language than others. For instance, cultural and creative businesses should be more language-sensitive than agriculture or mining, whose products can be more easily introduced in countries that share a common or similar language with the exporter. Another possible extension within this field of research is the impact of language similarity on foreign direct investment, as the coordination of overseas activities and the deployment of international strategies within a multinational corporation is sensitive to the quality of communication among headquarters and subsidiaries.

7. References

Anderson, J. E. 1979. A Theoretical Foundation for the Gravity Equation. ***The American Economic Review***, 69(1): 106-116.

Anderson, J. E. 2011. The Gravity Model. ***Annual Review of Economics***, 3(1): 133-160.

Anderson, J. E. and van Wincoop, E. 2003. Gravity with Gravitas: A Solution to the Border Puzzle. ***American Economic Review***, 93(1): 170-192.

Baier, S.L. and Bergstrand, J. H. (2001). The growth of world trade: tariffs, transport costs, and income similarity. ***Journal of International Economics***, 53 (1), February 2001, Pages 1-27.

Baldwin, R. and Taglioni, D. 2007. Trade Effect of the Euro: A Comparison of Estimators. ***Journal of Economic Integration*** 22 (4), 780-818.

Bergstrand, J. H. (1989). The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade. ***The Review of Economics and Statistics***, Vol. 71, No. 1 (Feb., 1989), pp. 143-153.

Bergstrand, J. H. (1985). The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. ***The Review of Economics and Statistics***, Vol. 67, No. 3 (Aug., 1985), pp. 474-481.

Bénassy-Quéré, A., Coupet, M., and Mayer, T. 2007. Institutional Determinants of Foreign Direct Investment. ***World Economy***, 30(5): 764-782.

Boisso, D., and Ferrantino, M. (1997). Economic Distance, Cultural Distance, and Openness in International Trade: Empirical Puzzles. ***Journal of Economic Integration****, 12 (4), 456-484.*

British Council 2013. Languages for the Future. (www.britishcouncil.org)

Calvet, J. 2001. ***Identidades y Plurilingüismo***. Paper presented at the I Coloquio Tres Espacios Lingüísticos ante los Desafíos de la Mundialización, Paris.

Calvet, L. J. 2006. ***Towards an ecology of world languages***. Cambridge: Polity.

Choi, E. K. 2002. Trade and the Adoption of a Universal Language, ***International***

Review of Economics and Finance, 11(3): 265–75.

Davidson, W.H. and McFetridge, D.G., 1985. Key characteristics in the choice of international technology transfer mode. ***Journal of International Business Studies***, 16(2), pp.5–21.

Dunlevy, J. A. (2005). The Influence of Corruption and Language on the Protrade Effect of Immigrants: Evidence from the American States. ***The Review of Economics and Statistics***, February 2006, 88(1): 182–186.

Dunlevy, J., and Hutchinson, W. (1999). The Impact of Immigration on American Import Trade in the Late Nineteenth and Early Twentieth Centuries. ***The Journal of Economic History***, *59*(4), 1043-1062.

Eaton, J. and Tamura, A. 1994. Bilateralism and Regionalism in Japanese and U.S. Trade and Direct Foreign Investment Patterns. ***Journal of the Japanese and International Economies***, 8(4): 478-510.

Frankel, J. and Rose, A. 2002. An Estimate of the Effect of Common Currencies on Trade and Income. ***The Quarterly Journal of Economics***, 117(2): 437-466.

Friedman, T. L. 2006. ***The world is flat: A brief history of the twenty-first century***. New York: Farrar, Straus and Giroux.

Ginsburgh, V., Ortuño-Ortín, I., and Weber, S. 2007. Learning Foreign Languages: Theoretical and Empirical Implications of the Selten and Pool Model, ***Journal of Economic Behavior and Organization***, 64(3/4): 337–47.

Grin, F. 1996. Economic approaches to language and language planning: an introduction, ***International Journal of the Sociology of Language***, 121(1)-16.

Grin, F. 1994. The economics of language: match or mismatch? ***International Political Science Review***, 15**,** 25-42.

Ghemawat, P. 2001. Distance still matters. The hard reality of global expansion. ***Harvard Business Review***, 79(8): 137.

Head, K. and Mayer, T. (2013). What separates us? Sources of resistance to globalization. ***Canadian Journal of Economics***, 46 (4).

Helpman, E. 1987. Imperfect competition and international trade: Evidence from fourteen industrial countries. ***Journal of the Japanese and International Economies***, 1(1): 62-81.

Helpman, E. (1985). Multinational Corporations and Trade Structure. ***The Review of Economic Studies***, 52 (3), 1 July 1985, Pages 443–457.

Helpman, E. and Krugman, P. 1987. ***Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy***. Cambridge: MIT Press.

Helpman, E; Melitz, M. and Rubinstein, Y. (2008). Estimating Trade Flows: Trading Partners and Trading Volumes, ***The Quarterly Journal of Economics***, 123 (2), 1 May 2008, Pages 441–487.

Hutchinson, W. K. (2005). "Linguistic Distance" as a Determinant of Bilateral Trade. ***Southern Economic Journal***, 72 (1), 1-15.

Lazear, E. P. 1999. Culture and Language. ***Journal of Political Economy***, 107(S6): 95-126.

Leamer, E. E., and Levinsohn, J. 1995. Chapter 26 International trade theory: The evidence. In M. G. Gene and R. Kenneth (Eds.), ***Handbook of International Economics***, Vol. Volume 3: 1339-1394. Amsterdam: Elsevier.

Marschan-Piekkari, R., Welch, D., and Welch, L., 1999a. Adopting a common corporate language: IHRM implications. ***The International Journal of Human Resource Management***, 10(3), pp.377–390.

Marschan-Piekkari, R., Welch, D. and Welch, L., 1999b. In the shadow: the impact of language on structure, power and communication in the multinational. ***International Business Review***, 8(4), pp.421–440.

Melitz, J. 2008. Language and foreign trade. ***European Economic Review***, 52(4): 667-699.

Melitz, J. and Toubal, F., 2014. Native Language, Spoken Language, Translation and Trade, ***Journal of International Economics***, 93(2), pp.351–363.

Pöyhönen, P. 1963. A tentative model for the volume of trade between countries. ***Weltwirtschaftliches Archiv***, 90(1): 93-100.

Rauch., J. E. (1999). Networks versus markets in international trade. ***Journal of International Economics***, 48 (1), June 1999, Pages 7-35.

Rauch, J. E. and Trindade, V. 2002. Ethnic Chinese Networks in International Trade. ***Review of Economics and Statistics***, 84(1): 116-130.

Reto, L. A. 2012. ***Potencial Económico da Língua Portuguesa***. Alfragide: Texto Editores.

Rose, A. K. 2000. One money, one market: the effect of common currencies on trade. ***Economic Policy***, 15(30): 7-46.

Selmier II, W. T. and Oh, C. H. 2013. The Power of Major Trade Languages in Trade and Foreign Direct Investment. ***Review of International Political Economy***, 20(3): 486-514.

Silva, J. M. and Tenreyro, S. 2006. The Log of Gravity, ***The Review of Economics and Statistics***, MIT Press, vol. 88(4): 641-658.

Tinbergen, J. 1962. ***Shaping the World Economy: Suggestions for an International Economic Policy***. New York: Twentieth Century Fund.

Welch, D., Lawrence S. Welch, L., and Marschan-Piekkari, R. 2001. The Persistent Impact of Language on Global Operations, Prometheus: ***Critical Studies in Innovation***, 19:3, 193-209,

8. Appendices

Appendix A: List of countries analyzed

Countries	Legal System	IDH	CPI
Arabic_(official)			
Algeria	Religious Law + Civil Law	0.70	2.90
Bahrain	Religious Law + Civil Law	0.81	4.90
Egypt	Religious Law + Civil Law	0.64	3.10
Iraq	Religious Law	0.57	1.50
Jordan	Religious Law	0.70	4.70
Kuwait	Religious Law	0.76	4.50
Lebanon	Religious Law	0.74	2.50
Libya	Religious Law	0.77	2.20
Morocco	Religious Law + Civil Law	0.58	3.40
Occupied Palestinian territory	Religious Law	0.64	
Oman	Religious Law + Civil Law	0.70	5.30
Qatar	Religious Law + Civil Law	0.82	7.70
Syrian Arab Republic	Religious Law + Civil Law	0.63	2.50
Tunisia	Religious Law	0.70	4.30
United Arab Emirates	Religious Law	0.84	6.30
Yemen	Religious Law	0.46	2.20
English_(official)			
Australia	Common Law	0.93	8.70
Bermuda	Common Law		
Canada	Common Law	0.91	8.90
Falkland Islands (Malvinas)	Common Law		
Guyana	Common Law	0.63	2.70
Ireland	Common Law	0.91	8.00
New Zealand	Common Law	0.91	9.30
Northern Mariana Islands	Common Law		
Saint Helena	Common Law		
United Kingdom	Common Law	0.86	7.60
United States	Common Law	0.91	7.10
French_(official)			
France	Civil Law	0.88	6.80
Saint Pierre and Miquelon	Civil Law		
German_(official)			
Austria	Civil Law	0.88	7.90
Germany	Civil Law	0.90	7.90
Switzerland	Civil Law	0.90	8.70
Hindi_(Official)			
India	Common Law	0.54	3.30
Japanese_(official)			
Japan	Civil Law	0.90	7.80
Mandarin_Chinese_(official)			
China	Civil Law	0.68	3.50
China, Hong Kong SAR	Common Law	0.89	8.40
China, Macao SAR	Civil Law		5.00
China, Taiwan Province of	Common Law		5.80
Singapore		0.86	9.30
Portuguese_(official)			
Brazil	Civil Law	0.71	3.70
Portugal	Civil Law	0.81	6.00
Russian_(official)			
Russian Federation	Civil Law	0.75	2.10
Spanish_(official)			
Argentina	Civil Law	0.79	2.90
Chile	Civil Law	0.80	7.20
Colombia	Civil Law	0.71	3.50
Costa Rica	Civil Law	0.74	5.30
Cuba	Civil Law	0.77	3.70
Dominican Republic	Civil Law	0.69	3.00
Ecuador	Civil Law	0.72	2.50
El Salvador	Civil Law	0.67	3.60
Honduras	Civil Law	0.62	2.40
Mexico	Civil Law	0.77	3.10
Nicaragua	Civil Law	0.59	2.50
Panama	Civil Law	0.76	3.60
Peru	Civil Law	0.72	3.50
Spain	Civil Law	0.88	6.10
Uruguay	Civil Law	0.78	6.90
Venezuela	Civil Law	0,73	2,00

Appendix B: Correlation coefficients between the explanatory variables

	Mean	S.D.	Min	Max	contig	com_col	cur_col	col_1945	sm_cntry	legorig_dumm	rlg_dumm	currunion_dum	cntry_llsnd	lndlock_orig	lndlock_dest	rta	DifExchrt	DifHDI	DifGrwthRt	DifInfl	LnDefGDPOrig	LnDefGPDCapOrig	LnDefGDPDest
Contig	0.01	0.11	0	1	1																		
com_col	0.1	0.29	0	1	0	1																	
					-0.62																		
cur_col	0	0.05	0	1	0.01	-0.02	1																
					0	0																	
col_1945	0.01	0.11	0	1	0.02	-0.03	0.43	1															
					0	0	0																
sm_cntry	0	0.07	0	1	0.24	0.04	0.04	0.01	1														
					0	0	0	0															
legorig_dumm	0.36	0.48	0	1	0.06	0.23	0.05	0.11	0.06	1													
					0	0	0	0	0														
rlg_dumm	0.25	0.43	0	1	0.1	0	0.05	0.03	0.08	0.21	1												
					0	-0.06	0	0	0	0													
currunion_dum	0.01	0.08	0	1	0.07	0.03	0.16	0.09	0	0.04	0.06	1											
					0	0	0	0	-0.11	0	0												
cntry_llsnd	0.37	0.55	0	2	-0.08	0.16	0.03	0.01	-0.04	-0.04	-0.04	0.03	1										
					0	0	0	0	0	0	0	0											
lndlock_orig	0.1	0.3	0	1	0.02	-0.04	-0.02	-0.01	0	-0.05	0	-0.01	-0.14	1									
					0	0	0	0	-0.24	0	-0.22	0	0										
lndlock_dest	0.1	0.3	0	1	0.02	-0.04	-0.02	-0.01	0	-0.05	0	-0.01	-0.14	-0.05	1								
					0	0	0	0	-0.24	0	-0.22	0	0	0									
Rta	0.02	0.15	0	1	0.16	-0.02	-0.01	0.02	0.08	0	0.05	0.12	-0.08	0.03	0.03	1							
					0	0	0	0	0	-0.11	0	0	0	0	0								
DifExchrt	0	1.42	-26.15	26.15	0	0	0	0	0	0	0	0	0	0.05	-0.05	0	1						
					-1	-1	-1	-1	-0.88	-1	-1	-1	-1	0	0	-1							
DifHDI	0	0.26	-0.8	0.8	0	0	.	0	0	0	0	0	0	-0.23	0.23	0	-0.17	1					
					-1	-1	-1	-1	-0.84	-1	-1	-1	-1	0	0	-1	0						
DifGrwthRt	0	0.08	-0.78	0.78	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.06	1				
					-1	-1	-1	-1	-0.84	-1	-1	-1	-1	-0.75	-0.75	-1	-0.59	0					
DifInfl	0	1.37	-27.84	27.84	0	0	.	0	0	0	0	0	0	0.01	-0.01	0	0	0	-0.1	1			
					-1	-1	-1	-1	-0.99	-1	-1	-1	-1	-0.07	-0.07	-1	-0.89	-0.3	0				
LnDefGDPOrig	2.94	2.54	-5.17	9.48	0.06	-0.15	0.03	0.06	0	-0.07	-0.02	0.03	-0.14	-0.11	0.1	0.12	-0.1	0.49	0.02	0.01	1		
					0	0	0	0	-0.1	0	0	0	0	0	0	0	0	0	0	0			
LnDefGPDCapOrig	1.36	1.47	-2.39	4.55	0	-0.02	0.04	0.04	-0.01	-0.05	0.03	0.06	0.18	-0.21	0.07	0.12	-0.16	0.64	-0.01	-0.03	0.45	1	
					-0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LnDefGDPDest	2.94	2.54	-5.17	9.48	0.06	-0.15	0.03	0.06	0	-0.07	-0.02	0.03	-0.14	0.1	-0.11	0.12	0.1	-0.49	-0.02	-0.01	-0.16	-0.1	
					0	0	0	0	-0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	
LnDefGPDCapDest	1.36	1.47	-2.39	4.55	0	-0.02	0.04	0.04	-0.01	-0.05	0.03	0.06	0.18	0.07	-0.21	0.12	0.16	-0.64	0.01	0.03	-0.1	-0.06	
					-0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LnDist	8.88	0.74	4.09	9.9	-0.3	-0.02	-0.01	-0.04	-0.17	-0.05	-0.22	-0.1	0.17	-0.03	-0.03	-0.3	0	0	0	0	-0.05	-0.06	
					0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	
comlang_off	0.18	0.38	0	1	0.1	0.28	0.1	0.16	0.11	0.4	0.29	0.06	0.08	-0.03	-0.03	0.02	0	0	0	0	-0.05	0.02	
					0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	
colmt2010	0.17	0.38	0	1	0.11	0.28	0.09	0.17	0.13	0.44	0.29	0.06	0.12	-0.05	-0.05	0.01	0	0	0	0	-0.05	0.03	
					0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	
proxling2bakker2010	0.15	0.24	0	1	0.18	0.05	0.1	0.05	0.12	0.25	0.42	0.07	0.04	-0.11	-0.11	0.08	0	0	0	0	0.01	0.14	
					0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-0.01	0	
proxlingmt2010	0.15	0.27	0	1	0.17	0.01	0.09	0.04	0.11	0.21	0.43	0.07	0.07	-0.1	-0.1	0.1	0	0	0	0	0.02	0.15	
					0	0	0	0	0	0	0	0	0	0	0	0	-1	-0.59	-0.84	-1	0	0	

Appendix C: Multicollinearity test results

Variable	VIF	SQRT VIF	Tolerance	R-Squared
defimport_xy	1.11	1.05	0.9006	0.0994
contig	1.32	1.15	0.7574	0.2426
com_col	1.26	1.12	0.7930	0.2070
col_1945	1.14	1.07	0.8765	0.1235
sm_cntry	1.22	1.10	0.8213	0.1787
legorig_dumm	1.47	1.21	0.6788	0.3212
rlg_dumm	1.31	1.15	0.7609	0.2391
currunion_dum	1.06	1.03	0.9425	0.0575
cntry_ilsnd	1.71	1.31	0.5841	0.4159
lndlock_orig	1.45	1.20	0.6910	0.3090
lndlock_dest	1.34	1.16	0.7480	0.2520
rta	1.34	1.16	0.7458	0.2542
DifHDI	5.96	2.44	0.1677	0.8323
DifExchrt	1.05	1.02	0.9554	0.0446
LnDefGDPOrig	2.26	1.50	0.4432	0.5568
LnDefGPDCapOrig	3.75	1.94	0.2669	0.7331
LnDefGDPDest	2.27	1.51	0.4396	0.5604
LnDefGPDCapDest	3.79	1.95	0.2640	0.7360
LnDist	1.88	1.37	0.5324	0.4676
comlang_off	1.80	1.34	0.5558	0.4442
arabic	1.75	1.32	0.5709	0.4291
chinese	1.40	1.18	0.7139	0.2861
english	1.83	1.35	0.5462	0.4538
french	1.25	1.12	0.7973	0.2027
german	1.93	1.39	0.5172	0.4828
hindi	1.37	1.17	0.7291	0.2709
japanese	1.56	1.25	0.6399	0.3601
portuguese	1.31	1.15	0.7619	0.2381
russian	1.12	1.06	0.8923	0.1077
spanish	2.10	1.45	0.4772	0.5228
Mean VIF	1.80			

	Eigenval	Cond Index
1	7.6669	1.0000
2	1.7720	2.0801
3	1.7262	2.1075
4	1.6362	2.1647
5	1.4046	2.3363
6	1.2886	2.4392
7	1.2200	2.5069
8	1.1195	2.6170
9	1.0727	2.6734
10	0.9942	2.7769
11	0.9884	2.7851
12	0.9773	2.8010
13	0.9542	2.8346
14	0.9262	2.8772
15	0.9089	2.9043
16	0.8629	2.9807
17	0.8030	3.0900
18	0.7376	3.2240
19	0.6791	3.3600
20	0.5872	3.6135
21	0.5660	3.6804
22	0.4644	4.0632
23	0.4480	4.1368
24	0.3834	4.4718
25	0.2904	5.1380
26	0.1808	6.5119
27	0.1382	7.4491
28	0.0952	8.9737
29	0.0636	10.9790
30	0.0420	13.5147
31	0.0023	58.0559
Condition Number		58.0559

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix) 0.0007

Essay 2

What drives Foreign Direct Investment (FDI): the role of language, geographical distance and technological similarity

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Abstract

This paper is a macro level study of foreign direct investment (FDI). It uses an extended gravity model, data spanning 12 years (2000–2012), to shed new light on the impact on FDI of linguistic and technological similarities between countries. The model includes technological commonality, as measured by the aggregate production of intellectual property, at the country level. An analysis of 71 309 pairs of FDI relationships showed that language is positively associated with a high level of FDI. Technological differences do impede the flow of FDI between countries, and information flow is crucial for large flows of FDI. And importantly, information flow diminishes the negative impact of distance. The results also show different attitudes toward investment among high income and low income countries' multinational corporations (MNCs) .

JEL classification: C26, D82, F21,

Keywords: Foreign direct investment; International business; Language; Distance; Technology Information Flow; Gravity model

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1. Introduction

Neoclassical theory predicts capital will flow from rich to poor countries, and this will hold true until the returns from investments are equalled (Lucas, 1990). However, most of foreign direct investments (FDI) are located in developed countries (UNCTAD, 1998), even though the highest returns are in developing countries (Pigato, 2000). The explanations offered for this phenomenon, typically, focused on host countries' formal barriers (e.g., political risk, capital restrictions, taxes, legal and regulatory regime). Although it is intuitive that these factors affect FDI, the barriers to international investments have diminished considerably over the past few decades (Ahearne, Griever, and Warnock, 2004; Huberman, 2001). The sharp decline in transaction costs associated with FDI (e.g., similar legal background) (UNCTAD, 1998), and diminished corporate tax rates (Devereux, Lockwood, and Redoano, 2008; Slemrod, 2004) has not diminished the skewed pattern of FDI toward developed countries. The possible explanations of this phenomenon is information asymmetry, because it is most acute in the international market (Doherty, 1999) and can hinder FDI. Information asymmetry can arise due to geographical distance (Coval and Moskowitz, 1999), or different legal and regulatory regime, or business practice between home and host countries (Ahearne et al., 2004). These differences are critical for FDI, because the high market entry costs are mainly costs of acquiring information regarding ways to conduct business in the host countries (Mata and Portugal, 2002). And this situation is more severe in developing and emerging countries due to limited public information availability (Kinoshita and Mody, 2001). Given that information is costly (Grossman and Stiglitz, 1980) and leads firms to equate unknown markets with high risks (Coval and Moskowitz, 1999), we expect it would skew investment preference toward countries which firms have information about. Access to information is made difficult by geographical distance between countries (Ivković and Weisbenner, 2005), which in turn leads to increased information asymmetry. Consequently, as distance increases so increases the information costs.

Therefore, we have identified factors which can impact distance and by extension minimise information asymmetry, namely, language, level of technological development[2] and information flows. Theoretically, distance can incentive (Hirsch, 1976) or disincentive (Helpman, 1984) FDI, depending on the nature and purpose of FDI. Language barriers contribute to MNCs' information asymmetry, because they affect communication processes negatively (Kang and Kim, 2010). In addition, language differences between home and host countries means increased difficulty for MNCs in identifying business opportunities and negotiating agreements (Rauch and Trindade, 2002). Technology, particularly, information and communication technology (ICT), allows firms to circumvent barriers created by distance, enabling remote access to costumers and resources (Nachum and Zaheer, 2005), and reduces the costs of communications and coordination of operations (Mosakowski and Zaheer, 1999).

This research address the impact of information asymmetry on FDI in conjunction with the factors identified above. With the exceptions of Kinoshita and Mody (2001) and Loungani, Mody, and Razin (2002), the majority of studies on information's effect on FDI are conceptual in nature (e.g., Goldstein and Razin, 2006). We sought to fill in this gap in the literature by using a dataset covering most of the world's economies and applying a different research methodology than that of previous studies. We used the Poisson Pseudo Maximum Likelihood (PPML) approach suggested by Silva and Tenreyro (2006), instead of the traditional OLS. In addition, we applied rarely used patent data as proxy for the level technological development and tourism flow as proxy for information flow.

The present research further relied on the gravity model proposed by Pöyhönen (1963) and Tinbergen (1962). We use United Nations Conference on Trade and Development (UNCTAD's)

[2] We use the term technological and economic development interchangeably.

outward bilateral FDI stock data and the Centre d' Études Prospectives et d'Informations Internationales's (CEPII) database for most of the gravity variables. We tested our hypothesis on panel data expanding 13 years (i.e. 2000 - 2012).

The results have provided strong and positive evidence for the language's effect on FDI, especially for high-income countries. As expected, the distance variable is strongly negative, for both high and low-income countries. We found technological difference has a negative effect on FDI from high-income countries and a positive effect on FDI from low-income countries. Informational flow is positively associated with the level of FDI stock, even after accounting for possible tourism flow endogeneity. This result is not sensitive to source countries' income level.

This paper is organized as follows. In section two, we review the recent developments of studies on FDI determinants and suggest the research hypotheses. In section three, we describe the data used, and present the empirical model in section four. The results and robustness analysis are presented in sections five and six, respectively. Finally, section seven provides a summary and conclusions.

2. Literature Review

The impact of information asymmetry on capital flow has received considerable attention from both academics and policy makers (e.g., Portes, Rey and Oh, 2001; Portes and Rey, 2005; Tenzer, Terjesen, and Harzing, 2017). Most studies (e.g., Horstmann and Markusen, 1987; Goldstein and Razin, 2006) are conceptual or qualitative in nature, focusing on how information asymmetry can lead to one form of capital investment or another (e.g., FDI vs. portfolio flow, and FDI vs. licensing). The empirical studies, on the other hand, have concerned with information asymmetry's impact on investors' behaviours (e.g., Coval and Moskowitz 1999; Huberman, 2001; Hejazi and

Safarian, 2005). The rare empirical FDI research are Kinoshita and Mody (2001) and Loungani et al. (2002). We present details on the conceptual nuances of FDI and information asymmetry (language, technology and distance) in International Business (IB) literature in Table 1.

Table 1: Theoretical Summary

Authors	FDI	Language	Geographical Distance	Technology	Information	Portfolio	Method
Álvarez and Marin (2013)	+			+			GMM
Barrell and Pain (1997)	+			+			OLS
Bénassy-Quéré et al. (2007)	+	+	+				OLS
Blomström and Sjöholm (1999)	+			+			OLS
Blonigen et al. (1997)	+						Negative binomial
Borensztein et al. (1998)	+			+			OLS
Davidson and Mcfetridge (1985)	+	+	+	+			Logit
Eaton and Tamura (1994)	+						Modified Tobit
Goldstein and Razin (2006)	+				+	+	Qualitative/Theoretical
Hejazi and Ma (2011)	+	+	+				OLS
Hortsmann and Markusen (1987)	+				+		Qualitative
Kinoshita and Mody (2001)	+		+		+		Multinomial logit
López-Duarte and Vidal-Suárez (2010)	+	+					Logistic regression (binomial)
Loungani et al. (2002)	+	+	+		+		Tobit
Nachum and Zaheer (2005)	+		+	+			OLS
Neeley et al. (2012)		+					Qualitative
O'Grady and Lane (1996)		+					Qualitative
Oh et al. (2011)	+	+	+				OLS
Portes and Rey (2005)		+	+	+	+	+	OLS
Portes et al. (2001)		+	+	+	+	+	OLS
Rauch and Trindade (2002)		+	+				Modified Tobit
Selmier II and Oh (2012)	+	+	+		+		OLS
Smarzynska (2002)	+			+			Probit/ multinomial logit/OLS

Note: OLS = ordinary least square; GMM = generalized method of moments

2.1. Conceptual development of recent FDI research

2.1.1. Language in IB literature

Contemporary language research in MNCs' literature has been predominantly qualitative firm-level studies (e.g., O'Grady and Lane, 1996; Neeley et al., 2012). These researchers have highlighted the strong impact of language in IB, and the distinct effects of language and culture. In this study, language means the same language type that is internationally standardized but with local differences in terms of dialect (a particular form of a language specific to a region), specific vocabulary or grammar tradition. For instance, the Portuguese language used in Timor, Portugal, Mozambique, Guinea-Bissau, Cabo Verde, Brazil, or Angola is the standard Portuguese in its essence. However, in each country the language has evolved revealing national differences in vocabulary, accent or grammar tradition due to external influences from local (native) culture and longstanding political independence from Portugal. Moreover, by language proximity we consider the language family that is a group of languages descending from a common language root. For instance, language similarities between Portuguese and Spanish, or Spanish and Italian allow a certain ease of communication between speakers without translation. In both cases, language is not the obstacle in communication or business interaction. This positioning is in line with recent research on language in IB literature by Tenzer et al. (2017) and Hejazi and Ma (2011).

The studies in IB literature have mostly focused on post-FDI impact of language. Country level studies critical to understand the impact of language on FDI have been rare in IB literature, with the exceptions of Hejazi and Ma (2011); Oh, Selmier, and Lien (2011) and Selmier and Oh (2012). Although the literature has expanded our understanding of language influence on FDI, it has not, however, addressed the mechanisms through which language exerts its influence or the source countries' income level impact on language demand.

In this paper we try to explore the effect of information on FDI, taking into account the country of origin's effect on the pattern of FDI, because MNCs' attitudes toward risk and institutional factors are specific to a country's income level (Cuervo-Cazurra, 2012). Additionally, we used a language similarity variable approach as opposed to binary variable. Recognising the fact that two countries' languages might be different (e.g., Portuguese and Spanish), they can be understood and interchangeably used by their respective population, in such a way that they may significantly minimise transaction costs of investments (Selmier and Oh, 2012; Zheng, 2014).

2.1.2 Distance in IB literature

There is an extensive literature on distance in the IB literature. Distance has long been perceived as a factor negatively affecting countries' relationship, since it is a source of friction between markets and produces greater transaction costs (Tesar and Werner, 1995). The studies on trade have confirmed these assertions (e.g., Rose, 2000; Frankel and Rose, 2002; Disdier and Head, 2008). However, IB literature (e.g., Hirsch, 1976; Horstmann and Markusen, 1987; Markusen and Venables, 1998) argue that if high export costs prevent an arm's length transaction, then setting up an operation in the form of a subsidiary could circumvent these problems. A competing view (e.g., Helpman, 1984) suggests that, if the purpose of FDI is to reduce costs and the relationship is mainly intra-firm, then the effect of distance will be to reduce FDI.

Initially, distance was used as a proxy for transport and communication costs. However, despite the continuous decline in transport and communication costs, the distance impact has not diminished. Some argue it has been rising over the years (Bénassy-Quéré, Coupet, and Mayer, 2007), causing researchers to question the overall effect of globalization. In most studies the distance estimate is strongly negative, even after controlling for factors such as colonial ties, common language, or membership in the same trading block (Ghemawat, 2001). Consequently,

the attempts to explain the distance puzzle have shifted from transport and communication costs to information frictions. For instance, according to Rauch (1999) and Rauch and Trindade (2002) increased geographical distance means a higher information acquiring and identifications costs (ex-ante), and higher information asymmetry among investors (Coval and Moskowitz, 1999). However, research on the implications for FDI has been scarce, with the exceptions of Kinoshita and Mody (2001) and Loungani et al. (2002).

2.1.3 Technology in IB literature

Technological differences between countries have long been regarded as a factor affecting FDI's flows. Because, differences in the level of development between countries limit information flows between firms and markets (Johanson and Vahlne, 1977). The interest among academics and policymakers in the link between technology and FDI is due to the belief that technology is a major driver of economic growth (e.g., Barrell and Pain, 1997; Borensztein, De Gregorio, and Lee, 1998; De Mello, 1999). However, the reluctance to abandon this traditional perspective of FDI flows from more advanced to developing economies has limited a broader analysis of contemporary FDI flows (Guillén and García-Canal, 2009). Moreover, most FDI studies have ignored cultural variables such as language and its essential role in technology transfer.

In summary, a large amount of research on FDI exists in the literature, in which geographical distance and technology are considered (see Table 1). To the best of our knowledge no research has yet studied the effects of information asymmetry, distance, language similarity, information flow and the level of technological development on FDI. We believe this is an important gap in the literature, particularly because these variables individually are acknowledged as exerting significant influence on FDI patterns.

2.2 Hypothesis development

2.2.1 Language similarity and FDI

As previously noted, most research on the impact of language in IB has been qualitative firm-level studies (e.g., Neeley, Hinds, and Cramton, 2012). While these studies have enhanced our understanding of the complex nature of language in organizations, they are ex-post analysis on the effect of language on IB. Language is most critical ex-ante, in the initial phase of country selection and entry mode and the final phase of investment implementation. This is because language differences between home and host countries increase the difficulty MNCs experience in identifying market opportunities and negotiating business agreements (Rauch and Trindade, 2002).

Given that language barriers can negatively impact the levels of communication (Kang and Kim, 2010), this suggest language is a significant factor to consider in FDI decision-making. For, the mobility of capital and interactions with diverse economic agents (e.g., public officials, suppliers and employees) require not only a close relationship and coordination, but also constant and high-quality information exchange.

A common language allows for easier communication and enhances trust (Lazear, 1999; Melitz, 2008; Rauch and Trindade, 2002) and minimizes information asymmetry between HQs and subsidiaries (Kang and Kim, 2010). In addition, language may reduce the impact of distance between countries and make distant locations attractive to potential investors (Hakanson and Ambos, 2010). Hence, the hypothesis:

H1: The higher the language similarity, the larger will be the level of FDI.

2.2.2. Geographical distance and FDI

As noted above, the impact of distance on FDI remains a puzzle. Johanson and Wiedersheim-Paul (1975) assert that geographical distance is a component of the broader psychic distance

between countries. In addition, larger distance increases the costs of monitoring, coordinating and controlling of operations (Lerner, 1995), because of extra communication and transport costs (e.g., frequent visits, airfares, hotel stays and telephone calls (Petersen and Rajan, 1994)). Moreover, the fixed costs of setting up a plant abroad may be too high, rendering exporting the most efficient entry mode (Markusen and Venables, 1998). Hence, the hypothesis:

H2a: The higher the geographical distance, the smaller will be the level of FDI.

The steady decline in transportation and communication costs led to the belief that geographical distance should matter less (Bénassy-Quéré, Coupet, and Mayer, 2007). However, the persistent large negative impact of distance has challenged these assumptions (Ghemawat, 2001) and led to a new explanation, information friction. The underlying assumption is that increased geographical distance increases the costs of information gathering (Lerner, 1995), limits information exchange and increases information asymmetry between investors (Coval and Moskowitz, 1999), thus, undermining the feasibility of FDI. Distance in this respect is synonymous with difficult or costly information, and a large distance coefficient reflects barriers to information flows. Hence, the hypothesis:

H2b: The larger the information flows, the smaller the impact of distance on FDI.

The distance impact is dependent on the specific characteristics of each pair of countries. For instance, language similarity between a pair of countries may play an important role in mitigating distance-based information asymmetry. This is because language similarity, in this particular setting, represents the quality of and access to information. It enhances the quality of information because it allows the understanding of nuances behind certain words and behaviors. Selmier and

Oh (2012) argue that due to higher exposure to communication costs, language impact is higher for FDI than trade. Hence the hypothesis:

H2c: The higher the language similarity, the smaller the impact of distance on FDI.

2.2.3. Technological similarity and FDI

As argued above, the conventional view on the impact of technology on FDI has limited the scope of research (Guillén and García-Canal, 2009). To understand the impact of technology on FDI we analyzed it in terms of firm and country level dimensions.

A MNC with very advanced ICT can gather, store and process a significant amount of information centrally and allocate this to its dispersed units around the globe (Petersen and Rajan, 1994). These authors also note that ICT also allows firms to monitor operations effectively from a distance through, for instance, profitability programs, automatic reporting systems. In addition, an advanced ICT helps reduce information costs, accelerate the speed of information exchange and knowledge transfer between HQs and subsidiaries (Welch and Welch, 2008). In summary, an advanced ICT allows firms to circumvent barriers created by distance, enabling remote access to costumers and resources (Nachum and Zaheer, 2005). Hence, the hypothesis:

H3a: The higher the technological capability, the lower the impact of distance.

We further argue that the absorptive capability (i.e., individual language competence) (Welch and Welch, 2008), the stock of human capital availability and qualification and the general level of communication infrastructure in the host country are particularly important at a country level. These country specific characteristics attract FDI and help discriminate between competing locations (Dunning, 1980). Highly qualified human capital means a country is capable of absorbing the most advanced technology available (Cohen and Levinthal, 1990), and MNCs' adjustment to

foreign technology is quick and cost effective. An efficient communication infrastructure network plays a similar role, reducing the communication costs borne by MNCs. Moreover, if home and host country enjoy similar levels of technological development, *ceteris paribus*, the adaptation costs to set up a communication infrastructure for MNCs should also be lower, because the need to adjust the home country's technology to the host's is minimal. In contrast, two very different technological levels should be detrimental to FDI. Furthermore, a similar level of economic development allows MNCs to replicate their business models and exploit competitive advantage at a relatively low marginal cost. Hence, the hypothesis:

H3b: The larger the technological similarity, the higher will be the level of FDI.

The need for increased communication coupled with language diversity intensifies existing language barriers (Harzing and Feely, 2008), leading to slower and less efficient decision-making, as well as to power-distortion phenomena in HQ and subsidiary relationships (Harzing and Pudelko, 2013). In addition, reduced language competence leads to reduced absorptive capacity for subsidiaries during knowledge transfer (Welch and Welch, 2008), compromising both the MNCs' survival in highly competitive host markets and the host countries' welfare from FDI (Glass and Saggi, 1998). Hence, we argue that, given a minimum threshold of development and human capital qualifications, MNCs will prefer to invest in countries with similar language, despite different levels of technological development. Hence, the hypothesis:

H3c: The higher the language similarity, the smaller will be the impact of technological difference.

3. Data

We use panel data covering 13 years (2000-2012) for 224 countries and/or jurisdictions. The dataset consisted of 71,309 bilateral FDI stock observations of 649,376 country pairs. We use stock instead of flows, because flows are volatile and can significantly influence the results and question the interpretations (Bénassy-Quéré et al., 2007; Júlio et al., 2013). We deflated FDI stock data using US price deflator base year 2011, to obtain the "real" stock. Approximately 89% of the observations for the dependent variable is zero. About 71% of the FDI stock observations are from high-income countries and 29% are from low-income countries. For each hypothesis and year considered, the number of countries analyzed varies according to data availability. For instance, there is a lack of information in the developing countries' statistics for some variables. We used The World Bank gross national income (GNI) per capita criteria to determine the level of income of countries. For instance, GNI per capita larger than US$12,736 means that countries were categorized as high-income countries and low-income country otherwise.

The gravity data was obtained from the CEPII's database. The language similarity variable came from Melitz and Toubal (2014), and tourism flow from the United Nations World Tourism Organization (UNWTO). Socioeconomic data (e.g., population, GDP (current US$), patent registration, level of schooling of the workforce) were taken from The World Bank World Development Indicators (WDI) (see **Appendix A** – Variables Descriptions and Sources).

4. Empirical method

4.1. Model

We use the gravity model suggested by Pöyhönen (1963) and Tinbergen (1962). The model proposes that objects (countries/economies) attract each other according to their mass/size (e.g., population, GDP), and the distance between them reduces their attraction. This approach has been successfully used to explain bilateral FDI (e.g., Bevan and Estrin, 2004; Kleinert and Toubal, 2010; Petroulas, 2007).

We followed Silva and Tenreyro's (2006) nonlinear specification of the gravity model (PPML), because it deals with the zero observations in the data and it is robust to different patterns of heteroscedasticity. The considerable number of zero observations in the FDI dataset (89%) renders the traditional ordinary least square (OLS) inadequate. The use of OLS in this specific case would lead to biased results or inconsistent estimates (Helpman et al., 2008) and would amplify the problem of outliers in OLS application. The literature (e.g., Silva and Tenreyro, 2006) shows that for data sets with such characteristic, PPML provides a better fit and more robust estimates than other methods, including Tobit. We use an extended gravity model as in Kleinert and Toubal (2010) and Loungani et al. (2002). We intentionally do not consider using fixed effect regression, because these do not allow for estimations of time invariant regressors such as geographical distance and language. We specified the following equation:

$$lnDefFDI_{ijt} = \beta_0 + \beta_1 Distancej_{ij} + \beta_2 Language_{ij} + \beta_3 Tech_{ijt} + \beta_4 Infl_{ijt} + \beta_5 Control_{ijt} + ln\varepsilon_{ij} \qquad (1)$$

Where *i* and *j* are countries, *t* is time, and FDI_{ijt} is the deflated outward bilateral FDI stock between countries *i* and *j* at time *t*. $Distance_{ij}$ corresponds to a vector of variables representing distance (i.e.,

$Dist_{ij}$ = distance between countries *i* and *j*; $Cont_{ij}$ = contiguity, a binary variable that represents neighboring countries). $Language_{ij}$ represents language similarity variable between countries *i* and *j* (*language_simasjp*). *Tech* is a vector of variables representing the level of technology of countries *i* and *j* (i.e., $SimilarPat_{ij}$). The $Infl_{ijt}$ variable represents the information flow between countries *i* and *j* in period *t* (i.e., *Std_Tourism*). Control is a vector of control variables as per the current literature on FDI determinants (e.g., GDP, GDP per Capita, GDP growth rate, inflation rate, workforce education, legal origin, religion, currency union, and exchange rate) between countries *i* and *j* in period *t*. $\mathcal{E}_{ijt}$ represents the error term.

4.2. Variables

The dependent variable is the deflated outward bilateral FDI stock between countries *i* and *j* (FDI_{ijt}).

Deflated GDP (GDP_{ijt}) between countries *i* and *j* in period *t* can be regarded as a proxy for supply and demand forces (Rose, 2000), so we expected it to be positively related to FDI.

Geographical distance between countries *i* and *j* ($Dist_{ij}$) was measured by the distance, in kilometers, between the capital cities of the countries *i* and *j*.

Language similarity ($language\_simasjp_{ij}$) between countries *i* and *j*, was formulated as a continuous index, with zero as lower bound and one as the upper bound (zero = no similarity; one = same language) (for details on this variable, see Melitz and Toubal, 2014)

Patent (*pat*) represented the number of patents applications filed by residents of a given country at the national patent office. We computed the level of technological similarity (*SimilarPat*) by adjusting Egger and Pfaffermayr's (2004) economic similarity index:

$$SimilarPat = ln\left(1 - \left(\frac{Pt_{orig}}{Pt_{orig} + Pt_{dest}}\right)^2 - \left(\frac{Pt_{dest}}{Pt_{orig} + Pt_{dest}}\right)^2\right) \qquad (2)$$

Tourism was defined as a flow measure of foreign visitors between countries *i* and *j*. This variable was normalized (*St_Tourism*) as in Portes et al. (2001), to remove the size effect:

$$ln\left(\frac{Tourism\_orig+Tourism\_dest}{\sqrt{(Defgdp_{orig}*Defgdp_{dest})}}\right) \quad (3)$$

5. Results and discussion

The estimation results, using PPML, are presented in Table 2. We also split the samples of FDI into high and low-income countries using the World Bank's GNI per capita criteria—as described in section 3 and shown in Tables 3 and 4.

Table 2: Results of PPML Regression

	Control Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Control Variables										
com_col	-0.551***	0.195	0.864***	2.218***	0.894***	0.880***	0.767***	0.859***	0.731***	0.859***
	(0.205)	(0.171)	(0.168)	(0.479)	(0.169)	(0.164)	(0.156)	(0.163)	(0.160)	(0.169)
col_1945	-0.298	-0.285**	0.235	2.505***	0.310**	0.251	0.175	0.245	0.200	0.234
	(0.184)	(0.141)	(0.153)	(0.363)	(0.158)	(0.159)	(0.180)	(0.157)	(0.153)	(0.153)
sm_cntry	0.325**	0.498***	0.564***	1.045***	0.390***	0.658***	0.596***	0.667***	0.564***	0.558***
	(0.154)	(0.133)	(0.146)	(0.229)	(0.146)	(0.148)	(0.146)	(0.151)	(0.147)	(0.147)
legorig_dumm	0.336***	0.562***	0.250***	-0.349***	0.228***	0.506***	0.282***	0.481***	0.277***	0.249***
	(0.0899)	(0.0689)	(0.0802)	(0.112)	(0.0802)	(0.0834)	(0.0791)	(0.0868)	(0.0807)	(0.0802)
rlg_dumm	0.128	0.122**	0.116*	-0.0453	0.0674	0.0621	0.111*	0.0685	0.103	0.116*
	(0.0786)	(0.0623)	(0.0622)	(0.0826)	(0.0627)	(0.0642)	(0.0640)	(0.0647)	(0.0631)	(0.0623)
currunion_dum	1.088***	0.110	0.0448	0.247**	0.0291	0.0506	0.0734	0.0497	0.0739	0.0476
	(0.0839)	(0.0741)	(0.0701)	(0.120)	(0.0683)	(0.0701)	(0.0730)	(0.0691)	(0.0744)	(0.0703)
Rta	0.0925	-0.925***	-0.491***	-0.298	-0.521***	-0.460***	-0.533***	-0.470***	-0.536***	-0.488***
	(0.118)	(0.131)	(0.137)	(0.311)	(0.138)	(0.142)	(0.144)	(0.147)	(0.143)	(0.136)
LogDifExchrt	-0.381**	-0.449	-0.396	-2.673***	-0.419*	-0.386	-0.428*	-0.491**	-0.429*	-0.391
	(0.188)	(0.295)	(0.252)	(0.548)	(0.241)	(0.238)	(0.250)	(0.234)	(0.250)	(0.250)
DifGrwthRt	3.176***	0.428	1.242	1.343	1.162	1.162	0.919	0.892	1.140	1.246
	(0.870)	(1.002)	(1.104)	(1.408)	(1.108)	(1.116)	(1.116)	(1.096)	(1.139)	(1.101)
LogDifInfl	0.0171	-0.0245	-0.00385	-0.0530	-0.00594	-0.0225	-0.0162	-0.0203	-0.0116	-0.00375
	(0.0520)	(0.0321)	(0.0332)	(0.0414)	(0.0328)	(0.0348)	(0.0349)	(0.0353)	(0.0354)	(0.0331)
DifLbFcSec	-0.192***	0.0155	-0.160***	-0.381**	-0.154***	-0.424***	-0.139**	-0.139**	-0.196***	-0.160***
	(0.0458)	(0.0634)	(0.0558)	(0.167)	(0.0563)	(0.0858)	(0.0565)	(0.0626)	(0.0591)	(0.0560)

	Control Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
DifLbFcTer	-0.0628	0.0107	0.0398	-0.186***	0.0340	-0.00140	0.0546	0.0651	0.0728	0.0389
	(0.0430)	(0.0596)	(0.0565)	(0.0712)	(0.0564)	(0.0618)	(0.0611)	(0.0612)	(0.0613)	(0.0565)
LnDefGDPOrig		0.850***	0.908***	0.875***	0.894***	0.573***	0.897***	0.848***	0.872***	0.906***
		(0.0320)	(0.0291)	(0.0721)	(0.0291)	(0.0385)	(0.0273)	(0.0282)	(0.0287)	(0.0290)
LnDefGDPCapOrig		0.00423	-0.0267	0.385*	-0.0117	0.242***	-0.0304	0.153***	-0.00242	-0.0256
		(0.0411)	(0.0436)	(0.198)	(0.0438)	(0.0528)	(0.0439)	(0.0585)	(0.0435)	(0.0436)
LnDefGDPDest		0.477***	0.587***	0.623***	0.576***	0.593***	0.591***	0.545***	0.606***	0.585***
		(0.0277)	(0.0333)	(0.0477)	(0.0337)	(0.0349)	(0.0299)	(0.0307)	(0.0356)	(0.0333)
LnDefGDPCapDest		0.499***	0.216***	-0.443***	0.224***	0.300***	0.198***	0.330***	0.178***	0.216***
		(0.0434)	(0.0474)	(0.0923)	(0.0470)	(0.0455)	(0.0496)	(0.0462)	(0.0483)	(0.0474)
Variables of Interest										
LnDist		-0.846***	-0.767***	-0.361***	-0.900***	-0.721***	-0.784***	-0.906***	-0.771***	-0.767***
		(0.0617)	(0.0648)	(0.137)	(0.0766)	(0.0675)	(0.0684)	(0.0539)	(0.0650)	(0.0647)
Contig		0.00882	-0.197**	0.573***	-0.126	-0.277***	-0.245***	-0.256***	-0.229***	-0.197**
		(0.0779)	(0.0848)	(0.0880)	(0.0812)	(0.0843)	(0.0848)	(0.0847)	(0.0864)	(0.0849)
cntry_ilsnd		0.770***	0.523***	0.291	0.477***	0.415***	0.494***	0.463***	0.504***	0.526***
		(0.0823)	(0.0863)	(0.201)	(0.0869)	(0.0832)	(0.0909)	(0.0881)	(0.0881)	(0.0865)
lndlock_orig		-0.168	-0.0698	-0.0905	-0.0626	-0.0873	-0.111	-0.125	-0.0736	-0.0720
		(0.109)	(0.122)	(0.195)	(0.121)	(0.122)	(0.121)	(0.121)	(0.123)	(0.123)
lndlock_dest		0.172*	-0.399***	-0.0418	-0.376***	-0.475***	-0.418***	-0.419***	-0.452***	-0.399***
		(0.0975)	(0.104)	(0.154)	(0.0984)	(0.110)	(0.105)	(0.106)	(0.110)	(0.104)
language_simasjp			1.288***	0.790***	-1.392**	0.853***	1.253***	0.875***	1.238***	1.289***
			(0.147)	(0.237)	(0.555)	(0.151)	(0.155)	(0.154)	(0.145)	(0.147)
Std_Tourism				0.166**						
				(0.0789)						
LnDistlanguage_simasjp					0.348***					
					(0.0715)					
LnPtOrig						0.398***				
						(0.0458)				
LnPtDest						0.00715				
						(0.0585)				
SimilarPat							-0.0267			
							(0.0337)			
LnDistMultPt								0.179***		
								(0.0339)		
LogDifPtlanguage_simasjp									0.178***	
									(0.0656)	
crisis_2008										-0.122*
										(0.0688)
_cons	8.358***	1.582**	2.610***	1.384	3.606***	0.318	3.054***	1.964**	2.999***	2.641***
	(0.106)	(0.796)	(0.820)	(1.512)	(0.894)	(1.009)	(0.819)	(0.903)	(0.828)	(0.817)
N	12618	12618	11543	1660	11543	10210	10210	10210	10210	11543
Bic	329216989.7	101543450.7	75938267.8	4972635.4	75298564.6	68785192.4	71625000.9	69774118.4	71454729.4	75870851.7
Aic	329216892.9	101543287.0	75938098.6	4972505.5	75298388.1	68785011.7	71624827.4	69773944.9	71454555.8	75870675.2

Notes: Standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

Table 3: PPML Regression for FDI from High Income Countries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
LnDist	-0.983*** (0.0710)	-0.848*** (0.0685)	-0.438*** (0.141)	-0.969*** (0.0838)	-0.866*** (0.0733)	-0.866*** (0.0687)	-0.990*** (0.0616)	-0.880*** (0.0709)	-0.848*** (0.0685)
language_simasjp		1.013*** (0.139)	0.768*** (0.252)	-1.354** (0.563)	0.566*** (0.153)	0.943*** (0.143)	0.650*** (0.159)	0.881*** (0.134)	1.011*** (0.139)
Std_Tourism			0.228*** (0.0719)						
LnDistlanguage_simasjp				0.311*** (0.0737)					
LnPtOrig					0.418*** (0.0532)				
LnPtDest					-0.0347 (0.0391)				
SimilarPat						0.00499 (0.0261)			
LnDistMultPt							0.152*** (0.0293)		
LogDifPtlanguage_simasjp								0.231*** (0.0671)	
crisis_2008									-0.118* (0.0681)
_cons	5.252*** (0.892)	5.302*** (0.890)	0.739 (1.764)	6.150*** (0.972)	3.114*** (1.145)	6.050*** (0.894)	4.554*** (1.017)	6.089*** (0.910)	5.337*** (0.887)
N	10297	9337	1495	9337	8207	8207	8207	8207	9337
Bic	83604322.8	61033406.6	4156698.2	60576900.9	55728950.0	57676985.6	56738745.9	57343979.8	60971988.8
Aic	83604163.5	61033242.3	4156570.8	60576729.5	55728774.7	57676817.3	56738577.6	57343811.4	60971817.4

Notes: Table 3 has the same control variables as Table 2, so this table only presents the reduced version; standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

Table 4: PPML Regression for FDI from Low Income Countries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Variables of Interest									
LnDist	-0.771*** (0.134)	-0.921*** (0.138)	0.465 (0.432)	-0.988*** (0.143)	-0.570*** (0.129)	-0.891*** (0.129)	-0.871*** (0.142)	-0.866*** (0.128)	-0.940*** (0.139)
language_simasjp		0.147 (0.611)	4.258** (2.029)	-3.795 (3.163)	0.356 (0.656)	-0.382 (0.666)	-0.0827 (0.677)	0.101 (0.642)	0.0717 (0.616)
Std_Tourism			0.448** (0.218)						
LnDistlanguage_simasjp				0.476 (0.407)					
LnPtOrig					0.407*** (0.110)				
LnPtDest					-0.402*** (0.0885)				
SimilarPat						-0.368*** (0.0358)			
LnDistMultPt							-0.0457 (0.0658)		
LogDifPtlanguage_simasjp								0.142 (0.356)	
crisis_2008									-0.806*** (0.257)
_cons	3.958** (1.801)	5.882*** (1.887)	-6.133 (8.786)	6.404*** (1.915)	3.416 (2.130)	4.938** (1.997)	6.004*** (2.105)	5.564*** (1.994)	6.468*** (1.894)
N	2321	2206	165	2206	2003	2003	2003	2003	2206
adj. R-sq									
Bic	7268938.8	6584019.5	143761.6	6573214.6	5944591.3	5271576.2	6326306.2	6329871.7	6532548.6
Aic	7268812.3	6583888.4	143693.3	6573077.8	5944451.2	5271441.7	6326171.8	6329737.2	6532411.8

Notes: Table 4 has the same control variables as Table 2, so this table only presents the reduced version; Standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

All the variables present the expected signs, and are economically and statistically significant. The market size variables, GDPs of both home and host countries are positive and economically significant across all samples.

As to the variables of interest, the language similarity variable (*language_simasjp*) is positive and highly significant (Model 2, Table 2), meaning that it increases the level of FDI stock 3.63 times (exp(1.288)). This result emphasizes the strong language's influence on FDI decision. This

estimate is higher than that of Loungani et al. (2002) (0.749), but lower than that of Bénassy-Quéré et al. (2007) (1.77). For the high-income sample the language variable is positive and statistically significant (Model 2, Table 3). This finding suggests that priority must be given to workforce language qualification to attract FDI from these countries. In contrast, the evidence is not as strong for low-income countries, because the result is not statistically significant (Model 2, Table 4).

The geographical variables (distance, contiguity, and landlocked) (2a) show the expected sign. The coefficient for distance (*LnDist*) is negative and highly significant (Model 1, Table 2), suggesting that a 1% increase in distance between a given pair of countries represents a reduction in FDI in the order of 0.846%. This coefficient estimate is below that of Loungani et al. (2002) (-1.199), but higher than that of Júlio et al. (2013) (-0.637) and Bénassy-Quéré et al. (2007) (-0.53). We replicated the same results for the high and low-income samples (Model 1, Tables 3 and 4). We found a lower distance coefficient for low-income countries compared to high-income countries, suggesting MNCs of the former are less sensitive to distance than those from the latter. Perhaps because of their limited market opportunities, low-income countries' MNCs go larger distances to secure business deals (Cuervo-Cazurra and Genc, 2008).

To test for the information costs underlying the distance effect, that is the effect of information on distance (2b), we use the bilateral tourism flow (*Std_Tourism*) as in Portes et al. (2001). The result is positive and statistically significant (Model 3, Table 2). In addition, we found that information flow reduces the distance coefficient to 0.361. This result is slightly higher than the theoretical upper margin suggested by Blonigen et al. (2002). We obtained similar results across the other samples (Model 3, Tables 3 and 4). These results imply that increasing information flow may help in attracting FDI. Interestingly, for low-income countries the distance becomes positive,

but not statistically significant. This finding is in line with market seeking objectives suggested by Loungani et al. (2002).

To test the effect of language on distance (2c), we added the language similarity variable to Model 1 (Table 2), and the result is a decline in the distance coefficient. The distance coefficient shifts from 0.846 (Model 1, Table 2) to 0.767 (Model 2, Table 2). This result favors the notion of information costs of distance. In addition, we cross-check the result by interacting the distance and language, under the assumption that language compensates for distance between countries (Hakanson and Ambos, 2010). We plotted the marginal effects of all the interacted variables to check the behaviors and signs. This approach is in line with Ai and Norton (2003) and Greene (2010). The interaction variable (*Distlanguage_simasjp*) is positive and statistically significant for the overall and high-income sample (Model 4, Tables 2 and 3) but not statistically significant for the low-income sample (Model 4, Table 4). These results reinforce our hypothesis that language is a significant factor that minimizes distance, particularly for high-income countries.

To test for the effect of technological level on FDI (3a), we first added the variables representing each country's level of technology. The results suggest home country level of technology is critical for FDI. In addition, these variables diminish the distance coefficient to 0.721 (Model 5, Table 2). To cross-check the results, we also tested the interaction effects of the home and host countries' technology with distance. The interaction variable (*DistMultPt*) is positive and statistically significant for the overall and high-income samples (Model 7, Tables 2 and 3), as well as negative and not statistically significant for low-income countries (Model 7, Table 4). This would suggest high-income countries' MNCs use technology to minimize the distance to host countries.

To test the effect of technological similarity on FDI (3b), we used the level of technological similarity (*SimilarPat*) expressed by Equation 2. The result is not statistically significant for the overall sample (Model 6, Table 2), not statistically significant for the high-income sample (Model

6, Table 3), and negative statistically significant for the low-income sample (Model 6, Table 4). The overall results are, therefore, inconclusive. For the low-income sample there is a clear preference for technologically dissimilar countries when investing abroad. This is in line with the prevailing logic about the behavior of the low-income countries' MNCs (Cuervo- Cazurra, 2012; Guillén and García-Canal, 2009).

Finally, to test the effect of language on technological difference (3c), we used the interaction of the language and technological difference variables. The rationale is that although technological difference hinders FDI, it should be less important in the presence of language similarities between countries. The results for the interaction variable (*LogDifPtlanguage_simasjp*) are positive and statistically significant for the overall and high-income samples (Model 8, Tables 2 and 3), and positive but not statistically significant for the low-income sample (Model 8, Table 4). These findings suggest that language can act as a bridge between countries at different stages of development, particularly for high-income countries.

6. Robustness check

We adopted other proxy measures to cross-check the results in Table 2. We used different proxy measure for information flow (i.e., existence of stock exchange, IMF loan, Multilateral Investment Guarantee Agency (MIGA)), and level of technological development (i.e., fixed broadband internet subscriber). The new estimation confirmed the results in Table 2 (results are available upon request). Additionally, we also tested for endogeneity of tourism flow (Appendix D1) by instrumenting the intensity of fixed telephone subscriber. Once we account for this, both the distance and language similarity variables become statistically insignificant, reinforcing the idea of information costs inherent in distance and language. We also tested for endogeneity of technology (Appendix D2) by instrumenting the intensity of energy consumption. Once we account for this,

both distance and language diminishes considerably and in case of FDI from low income countries the distance variable becomes insignificant. Moreover, we also tested for institutional variables (i.e., bureaucratic inefficiencies, corporate tax rate, rule of law, and control of corruption). The results showed that differences in institutional variables tend to make countries more distant and language similarities less effective. Furthermore, we carried out OLS estimation with robust standard error for all models in Table 4 (Appendix B), to confirm robustness of the results above and also to confirm they are not driven by model specification . These analyses have shown that our findings are not driven by the particular method or dependent variable. The model specification is in line with methodological standards in the literature.

$$ln(\alpha + DefFDI_{ijt}) = \beta_0 + \beta_1 Distj_{ij} + \beta_2 Lng_{ij} + \beta_3 Tech_{ij} + \beta_4 Infl_{ij} + \beta_5 Control_{ij} + \varepsilon_{ij} \quad (4)$$

The variable specification are the same as the equation 1. The difference is that the log linearizing of the OLS models require α (greater than zero and less or equal to one) for the equation to work. All variables have the same sign as PPML estimates (Appendix B – Results of the OLS regression), differences lie in the magnitude of the coefficients in which PPML estimates show better fit. The variables: the difference in exchange rate, growth rate, information flow, technological similarity present different sign from PPML estimation.

7. Discussion

7.1. Theoretical contribution

This study sheds new light on the link between information asymmetry and FDI (i) providing empirical evidence in a debate that has been mostly conceptual or qualitative in nature and (ii) applying a different methodological approach (a gravity model using PPML) that provides better and more robust estimates than classical OLS techniques. Distance is a significant obstacle to FDI, as it makes communication and interactions between countries difficult. However, we found that high-income countries' MNCs are more sensitive to distance than their low-income counterpart. Perhaps, because low-income countries' MNCs must travel longer distances to secure business deals (Cuervo- Cazurra, 2012). Interestingly, we confirmed that the distance impact can be mitigated by ICT and language similarity.

We found that information flow is a significant factor in attracting FDI, irrespective of the source countries' income level. In addition, information flows also contribute to minimize the distance between countries. More importantly, these flows appear to signal the market searching nature of FDI from low-income countries' MNCs and the quest for cost reduction for high-income countries' MNCs. This result is robust to the consideration of possible endogeneity of tourism flow. In fact, the large impact of language and distance dissipates once we take into account the possible endogeneity effect. These findings reinforce the idea of distance as a proxy for information asymmetry and that language impact is due mainly to information costs. This result is in line with Loungani et al. (2002).

We also found that language similarity is an important factor to attract FDI. However, we observed distinct patterns of behavior depending on source countries' income level. For high-income countries, language is far more significant to attract FDI then for low-income countries. These findings are significant because previous studies on the effect of language (e.g., Selmier and

Oh, 2012) have not broken down the results by income level and have assumed the impact is uniform across countries. In addition, understanding FDI dynamics is important due to the changes in international institutional setup and business environment. It is commonly accepted in IB literature that language proximity fosters trade between two nations. However, the recent developments with a country such as the UK exiting the EU shows that trade flows between political and economic blocks (such as the EU and USA, or NAFTA and EU) have different patterns[3] and suggest counter intuitive results. During the first period of the Brexit political waffle, the main argument was that the UK does not need the EU as they can trade with the USA, Canada and Australia. Unfortunately, that was an ill argument, because all current commercial arrangements that the UK has are under the umbrella of the EU treaties with other countries or trade blocks. Once the UK leaves the EU (which is expected in 2019), it must start new commercial negotiations and those outcomes will not necessarily be better for the UK than those under the EU umbrella. Ultimately, the USA decided to give priority to the EU rather than to the UK in further trade deregulation, in spite of the language proximity, high-income country performance and political closeness between the USA and UK.

We found that technological differences between countries to hinder FDI. However, these results are also specific to the source countries' income level. Low-income countries' MNCs prefer dissimilar economies for investment as suggested in the literature in search for technology and markets (Cuervo-Cazurra and Genc, 2008). Interestingly, ICT minimizes the distance between countries more clearly for high-income countries. Furthermore, language similarity minimizes the effect of the technological difference between countries.

[3] We are grateful to the Reviewer #1 for pointing out this theoretical implication.

7.2. Practical implications for managers and policy makers

The study shows a different pattern of FDI depending on the source countries' income level. We found that high-income countries' MNCs take a more conservative approach to investments than their low-income counterparts, because the former prefer a shorter distance, similar language, and the same level of technological development. Conversely, low-income countries' MNCs are less stringent on their expectations regarding the surrounding environment. This result implies that the motivations for FDI by these two types of MNCs are different as suggested by anecdotal evidence presented in studies such as Mathews (2006) or Guillen and Garcia-Canal (2009). These findings are significant for policymakers and academics interested in the geography of FDI, because they allow for a better understanding of the nature of market forces in different countries.

The results of this paper have important implications for countries seeking to attract FDI and companies searching business opportunities in foreign markets. The findings suggest that improving information and access to information by host countries' government agencies is vital to attract FDI. For instance, low-income countries could adopt international organizations' benchmarks and reporting standards (e.g., UNCTAD), making data more easily accessible to potential investors. This study's results are also encouraging for countries distant from the main financial and decision centers, as the findings point to forms of mitigating distance barriers. In addition, this research provides the grounds for customizing policy for specific kinds of FDI, for instance, improving language qualification of the workforce to attract high-income countries' FDI.

7.3. Limitations of the study and future research

This study has several limitations that should inspire further research. We have not tested the effect of a *lingua franca* (i.e., English) on the overall language similarity result. However, the results obtained are significantly robust, confirming the impact of language similarity on FDI.

The second limitation arises from the absence of firm-level data. A more subtle analysis should focus on the impact of industry and firm specific variables such as concentration, patents, size, age or governance. The different patterns of high-income countries' MNCs and the "new" MNCs from other regions suggest that different capabilities are emerging alongside, supplementary to the traditional technological, financial and managerial advantages that compensate the liability of foreignness.

Finally, the objective limitation of the study is the quality of data that is available. Notwithstanding our effort, better formatted and more detail subsectors data would have improved the current study. The increasing availability of large-scale data on FDI, advances in big data analytics and software shall likely foster future research on FDI and variables that affect the IB environment at the firm and country levels in much greater detail.

Our results show that, for FDI, distance matters, but language similarity, information flows and technological similarity have potentially moderating effects. This is particularly true for new MNCs from lower income countries. Firm based observation focusing on host country language and language capabilities, organizational structure and technological skills would enhance our knowledge of the impact of these variables for different industries and firms. This stream of research may provide a rich field for testing the current explanations and boundaries of foreign expansion by MNCs.

8. References

Ahearne, A. G., Griever, W. L., and Warnock, F. E. (2004). Information costs and home bias: an analysis of US holdings of foreign equities. *Journal of International Economics, 62*(2), 313-336.

Ai, C., and Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics letters, 80*(1), 123-129.

Aitken, B., Hanson, G. H., and Harrison, A. E. (1997). Spillovers, foreign investment, and export behavior. *Journal of International Economics, 43*(1), 103-132.

Aitken, B. J., and Harrison, A. E. (1999). Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela. *American Economic Review, 89*(3), 605-618.

Aitken, B. J., and Harrison, A. E. (2001). Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *Mexico, Central, and South America: Economics, 1*, 1.

Akerlof, G. A. (1970). The market for 'lemons': quality uncertainty and the market mechanism. *Quarterly Journal of Economics, 84*(3), 488-500.

Álvarez, I., and Marin, R. (2013). FDI and Technology as Levering Factors of Competitiveness in Developing Countries. *Journal of International Management, 19*(3), 232-246.

Arestis, P., Nissanke, M., and Stein, H. (2005). Finance and development: Institutional and policy alternatives to financial liberalization theory. *Eastern Economic Journal*, 245-263.

Arrow, K. (1962). Economic welfare and the allocation of resources for invention. in Volume: *The rate and direction of inventive activity: Economic and social factors*, Ed. Universities-NBCER, Princeton University Press, 609-626.

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different? *World Development, 30*(1), 107-119.

Barrell, R., and Pain, N. (1997). Foreign direct investment, technological change, and economic growth within Europe. *The Economic Journal, 107*(445), 1770-1786.

Bénassy-Quéré, A., Coupet, M., and Mayer, T. (2007). Institutional determinants of foreign direct investment. *The World Economy, 30*(5), 764-782.

Bevan, A. A., and Estrin, S. (2004). The determinants of foreign direct investment into European transition economies. *Journal of Comparative Economics, 32*(4), 775-787.

Blomstrom, M., and Kokko, A. (1995). Home country effects of foreign direct investment: evidence from Sweden: *National Bureau of Economic Research (NBER).*

Blomstrom, M., Lipsey, R. E., and Zejan, M. (1994). What explains the growth of developing countries? In: William J. Baumol, Richard R. Nelson and Edward N. Wolff (eds.). *Convergence of productivity: Cross-national studies and historical evidence.* New York: Oxford University Press, 243-259.

Blomström, M., and Sjöholm, F. (1999). Technology transfer and spillovers: does local participation with multinationals matter? *European Economic Review, 43*(4), 915-923.

Blonigen, B. A., Davies, R. B., and Head, K. (2002). Estimating the knowledge-capital model of the multinational enterprise: Comment: *National Bureau of Economic Research (NBER).*.

Boeh, K. K., and Beamish, P. W. (2012). Travel time and the liability of distance in foreign direct investment: Location choice and entry mode. *Journal of International Business Studies, 43*(5), 525-535.

Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance, 56*(1), 87-130.

Borensztein, E., De Gregorio, J., and Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics, 45*(1), 115-135.

Caves, R. E. (1974). Multinational firms, competition, and productivity in host-country markets. *Economica*, 176-193.

Chakrabarti, A. (2001). The determinants of foreign direct investments: Sensitivity analyses of cross-country regressions. *Kyklos, 54*(1), 89-114.

Cohen, W. M., and Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128-152.

Coval, J. D., and Moskowitz, T. J. (1999). Home bias at home: Local equity preference in domestic portfolios. *The Journal of Finance, 54*(6), 2045-2073.

Cuervo-Cazurra, A., and Genc, M. (2008). Transforming disadvantages into advantages: developing-country MNEs in the least developed countries. *Journal of International Business Studies, 39*(6), 957-979.

Cuervo-Cazurra, A. (2012). Extending theory by analyzing developing country multinational companies: Solving the Goldilocks debate. *Global Strategy Journal, 2*(3), 153-167.

Cuervo-Cazurra, A., and Genc, M. E. (2011). Obligating, pressuring, and supporting dimensions of the environment and the non-market advantages of developing-country multinational companies. *Journal of Management Studies, 48*(2), 441-455.

Dahlquist, M., and Robertsson, G. (2001). Direct foreign ownership, institutional investors, and firm characteristics. *Journal of Financial Economics, 59*(3), 413-440.

Davidson, W. H., and Mcfetridge, D. G. (1985). Key Characteristics in the Choice of International Technology-Transfer Mode. *Journal of International Business Studies, 16*(2), 5-21.

De Mello, L. R. (1999). Foreign direct investment-led growth: evidence from time series and panel data. *Oxford Economic Papers, 51*(1), 133-151.

Demirbag, M., Glaister, K. W., and Tatoglu, E. (2007). Institutional and transaction cost influences on MNEs' ownership strategies of their affiliates: Evidence from an emerging market. *Journal of World Business, 42*(4), 418-434.

Devereux, M. P., Lockwood, B., and Redoano, M. (2008). Do countries compete over corporate tax rates? *Journal of Public Economics, 92*(5), 1210-1235.

Disdier, A.-C., and Head, K. (2008). The puzzling persistence of the distance effect on bilateral trade. *The Review of Economics and Statistics, 90*(1), 37-48.

Doherty, A. M. (1999). Explaining international retailers' market entry mode strategy: internalization theory, agency theory and the importance of information asymmetry. *The International Review of Retail, Distribution and Consumer Research, 9*(4), 379-402.

Dow, D., and Karunaratna, A. (2006). Developing a multidimensional instrument to measure psychic distance stimuli. *Journal of International Business Studies, 37*(5), 578-602.

Dunning, J. (1980)- Toward an Eclectic Theory of International Production: Some Empirical Tests. Journal of International Business Studies, 11 (9).

Eapen, A. (2012). Social structure and technology spillovers from foreign to domestic firms. *Journal of International Business Studies, 43*(3), 244-263.

Eaton, J., and Tamura, A. (1994). Bilateralism and regionalism in Japanese and US trade and direct foreign investment patterns. *Journal of the Japanese and International Economies, 8*(4), 478-510.

Egger, P., and Pfaffermayr, M. (2004). The impact of bilateral investment treaties on foreign direct investment. *Journal of Comparative Economics, 32*(4), 788-804.

Frankel, J., and Rose, A. (2002). An estimate of the effect of common currencies on trade and income. *The Quarterly Journal of Economics, 117*(2), 437-466.

Ghemawat, P. (2001). Distance still matters - The hard reality of global expansion. *Harvard Business Review, 79*(8), 137-147.

Glass, A. J., and Saggi, K. (1998). International technology transfer and the technology gap. *Journal of Development Economics, 55*(2), 369-398.

Goldstein, I., and Razin, A. (2006). An information-based trade-off between foreign direct investment and foreign portfolio investment. *Journal of International Economics, 70*(1), 271-295.

Greene, W. (2010). Testing hypotheses about interaction terms in nonlinear models. *Economics Letters, 107*(2), 291-296.

Grinblatt, M., and Keloharju, M. (2001). How distance, language, and culture influence stockholdings and trades. *The Journal of Finance, 56*(3), 1053-1073.

Grossman, S. J., and Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *The American Economic Review, 70*(3), 393-408.

Guillén, M. F., and García-Canal, E. (2009). The American model of the multinational firm and the "new" multinationals from emerging economies. *The Academy of Management Perspectives, 23*(2), 23-35.

Haddad, M., and Harrison, A. (1993). Are there positive spillovers from direct foreign investment?: Evidence from panel data for Morocco. *Journal of Development Economics, 42*(1), 51-74.

Hakanson, L., and Ambos, B. (2010). The antecedents of psychic distance. *Journal of International Management, 16*(3), 195-210.

Harzing, A.-W., and Feely, A. J. (2008). The language barrier and its implications for HQ-subsidiary relationships. *Cross Cultural Management: An International Journal, 15*(1), 49-61.

Harzing, A.-W., and Pudelko, M. (2013). Language competencies, policies and practices in multinational corporations: A comprehensive review and comparison of Anglophone, Asian, Continental European and Nordic MNCs. *Journal of World Business, 48*(1), 87-97.

Hejazi, W., and Ma, J. (2011). Gravity, the English language and international business. *Multinational Business Review, 19*(2), 152-167.

Hejazi, W., and Safarian, A. E. (2005). NAFTA effects and the level of development, *Journal of Business Research, 58*(12), 1741-1749.

Helpman, E. (1984). A simple theory of international trade with multinational corporations. *The Journal of Political Economy, 92*(3), 451-471.

Helpman, E., Melitz, M., and Rubinstein, Y. (2008). Estimating trade flows: Trading partners and trading volumes. *Quarterly Journal of Economics, 123*(2), 441-487.

Hines, J. R. (2000). Tax sparing and direct investment in developing countries *International Taxation and Multinational Activity* (39-72): University of Chicago Press.

Hirsch, S. (1976). An international trade and investment theory of the firm. *Oxford Economic Papers*, 258-270.

Horstmann, I., and Markusen, J. R. (1987). Licensing Versus Direct-Investment - a Model of Internalization by the Multinational-Enterprise. *Canadian Journal of Economics-Revue Canadienne D Economique, 20*(3), 464-481.

Huberman, G. (2001). Familiarity breeds investment. *Review of Financial Studies, 14*(3), 659-680.

Ivković, Z., and Weisbenner, S. (2005). Local does as local is: Information content of the geography of individual investors' common stock investments. *The Journal of Finance, 60*(1), 267-306.

Johanson, J., and Vahlne, J.-E. (1977). The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies, 8*(1), 23-32.

Johanson, J., and Wiedersheim-Paul, F. (1975). The internationalization of the firm—four Swedish cases 1. *Journal of Management Studies, 12*(3), 305-323.

Júlio, P., Pinheiro-Alves, R., and Tavares, J. (2013). Foreign direct investment and institutional reform: evidence and an application to Portugal. *Portuguese Economic Journal, 12*(3), 215-250.

Kang, J.-K., and Kim, J.-M. (2010). Do foreign investors exhibit a corporate governance disadvantage? An information asymmetry perspective. *Journal of International Business Studies, 41*(8), 1415-1438.

Kinoshita, Y., and Mody, A. (2001). Private information for foreign investment in emerging economies. *Canadian Journal of Economics/Revue canadienne d'économique, 34*(2), 448-464.

Kleinert, J., and Toubal, F. (2010). Gravity for FDI. *Review of International Economics, 18*(1), 1-13.

Kobrin, S. J. (1979). Political Risk - Review and Reconsideration. *Journal of International Business Studies, 10*(1), 67-80.

Lall, S. (1983). Determinants of RandD in an LDC: The Indian engineering industry. *Economics Letters, 13*(4), 379-383.

Lazear, E. (1999). Language and culture. *Journal of Political Economy, 107*(6), S95-S126.

Lerner, J. (1995). Venture capitalists and the oversight of private firms. *The Journal of Finance, 50*(1), 301-318.

López-Duarte, C., and Vidal-Suárez, M. M. (2010). External uncertainty and entry mode choice: Cultural distance, political risk and language diversity. *International Business Review, 19*(6), 575-588.

Loungani, P., Mody, A., and Razin, A. (2002). The global disconnect: the role of transactional distance and scale economies in gravity equations. *Scottish Journal of Political Economy, 49*(5), 526-543.

Lucas, R. E. (1990). Why doesn't capital flow from rich to poor countries? *The American Economic Review*, 80 (2), 92-96.

Mariotti, S., and Piscitello, L. (1995). Information costs and location of FDIs within the host country: empirical evidence from Italy. *Journal of International Business Studies*, 815-841.

Markusen, J. R., and Venables, A. J. (1998). Multinational firms and the new trade theory. *Journal of International Economics, 46*(2), 183-203.

Marschan-Piekkari, R., Welch, D., and Welch, L. (1999a). Adopting a common corporate language: IHRM implications. *International Journal of Human Resource Management, 10*(3), 377-390.

Marschan-Piekkari, R., Welch, D., and Welch, L. (1999b). In the shadow: the impact of language on structure, power and communication in the multinational. *International Business Review, 8*(4), 421-440.

Mata, J., and Portugal, P. (2002). The survival of new domestic and foreign-owned firms. *Strategic Management Journal*, *23*(4), 323-343.

Mathews, J. (2006). Dragon Multinationals. *Asia Pacific Journal of Management*, *23*, 5-27.

Melitz, J. (2008). Language and foreign trade. *European Economic Review*, *52*(4), 667-699.

Melitz, J. and Toubal, F., 2014. Native Language, Spoken Language, Translation and Trade. *Journal of International Economics*, 93(2), pp.351–363.

Mosakowski, E., and Zaheer, S. (1999). The global configuration of a speculative trading operation: an empirical study of foreign exchange trading. *Organization Science*, *10*(4), 401-423.

Mundell, R. A. (1957). International trade and factor mobility. *American Economic Review, 47*(3), 321-335.

Nachum, L., and Zaheer, S. (2005). The persistence of distance? The impact of technology on MNE motivations for foreign investment. *Strategic Management Journal, 26*(8), 747-767.

Neeley, T. B., Hinds, P. J., and Cramton, C. D. (2012). The (un) hidden turmoil of language in global collaboration. *Organizational Dynamics, 41*(3), 236-244.

O'Grady, S., and Lane, W. H. (1996). The Psychic Distance Paradox, *Journal of International Business Studies, 27*(2), 309-333.

Oh, C. H., Selmier, T., and Lien, D. (2011). International trade, foreign direct investment, and transaction costs in languages. *The Journal of Socio-Economics, 40*(6), 732-735.

Petersen, M. A., and Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. *The Journal of Finance, 49*(1), 3-37.

Petroulas, P. (2007). The effect of the euro on foreign direct investment. *European Economic Review, 51*(6), 1468-1491.

Pigato, M. (2000). *Foreign direct investment in Africa: old tales and new evidence*: World Bank.

Portes, R., and Rey, H. (2005). The determinants of cross-border equity flows. *Journal of International Economics, 65*(2), 269-296.

Portes, R., Rey, H., and Oh, Y. (2001). Information and capital flows: The determinants of transactions in financial assets. *European Economic Review, 45*(4), 783-796.

Pöyhönen, P. (1963). A tentative model for the volume of trade between countries. *Weltwirtschaftliches Archiv*, 93-100.

Rauch, J. E. (1999). Networks versus markets in international trade. *Journal of International Economics, 48*(1), 7-35.

Rauch, J. E., and Trindade, V. (2002). Ethnic Chinese networks in international trade. *Review of Economics and Statistics, 84*(1), 116-130.

Rodrik, D., and Subramanian, A. (2009). Why did financial globalization disappoint? *IMF staff papers, 56*(1), 112-138.

Rose, A. K. (2000). One money, one market: the effect of common currencies on trade. *Economic Policy, 15*(30), 7-46.

Selmier, W. T., and Oh, C. H. (2012). International business complexity and the internationalization of languages. *Business Horizons, 55*(2), 189-200.

Selmier, W. T., and Oh, C. H. (2012). The Power of Major Trade Languages in Trade and Foreign Direct Investment. *Review of International Political Economy*, *20*(3), 486-514.

Silva, J. S., and Tenreyro, S. (2006). The log of gravity. *The Review of Economics and Statistics, 88*(4), 641-658.

Slemrod, J. (2004). Are corporate tax rates, or countries, converging? *Journal of Public Economics, 88*(6), 1169-1186.

Smarzynska, B. K. (2002). *The composition of foreign direct investment and protection of intellectual property rights: evidence from transition economies* (Vol. 2786): World Bank Publications.

Stiglitz, J. E. (2004). Capital-market liberalization, globalization, and the IMF. *Oxford Review of Economic Policy, 20*(1), 57-71.

Tenzer, H., Terjesen, S., and Harzing, A.-W. (2017). Language in International Business: A Review and Agenda for Future Research, *Management International Review*, *57*, 815-854.

Tesar, L. L., and Werner, I. M. (1995). Home bias and high turnover. *Journal of International Money and Finance, 14*(4), 467-492.

Tinbergen, J. (1962). An analysis of world trade flows. In *Shaping the world economy*. Tinbergen, J. (ed.). New York NY: Twentieth Century Fund

UNCTAD (1998). *World Investment Report 1998: Trends and Determinants.* United Nations Conference on Trade and Development, United Nations Publications, New York and Geneva.

UNCTAD (2006). *FDI from Developing and Transitioning Economies: Implications for development*. *World Investment Report 2006*. United Nations Conference on Trade and Development, United Nations Publications, New York and Geneve.

Welch, D. E., and Welch, L. S. (2008). The importance of language in international knowledge transfer. *Management International Review*, *48*(3), 339-360.

Zheng, P. (2014). Antecedents to international student inflows to UK higher education: A comparative analysis, *Journal of Business Research*, *67*(2), 136-143.

9. Appendices

Appendix A: Variable Descriptions and Sources

Variable Name	Variable Code	Source I	Source II	Proxy
Both Countries Landlocked	Cntry_LandLock	CEPII	Andrew Rose	Distance
Colonial Relationship	Col_Rel	CEPII		
Colony After 1945	Col_1945	CEPII		
Common Colonizer, dummy variable set to 1 if common, 0 otherwise	Com_Col	CEPII		
Common Official Language, dummy variable set to 1 if common, 0 otherwise	ComLang_off	CEPII		
Contiguity, dummy variable set to 1 if common, 0 otherwise	Contig	CEPII		Distance
Control of Corruption	CtrlCrption	Political Risk Services International Country Risk Guide (PRS)	The World Bank WDI	
Country Growth Rate	GrwthRt_Orig/GrwthRt_Dest	The World Bank WDI		Market Attractiveness
Country is an Island	Cntry_Ilsnd	Andrew Rose		Distance
Country Regional Location	Region_Orig/Region_Dest	UNCTAD		
Currency Union Dummy	CurrUnion_Dumm	Andrew Rose		Monetary stability
Distance	Dist	CEPII		
Exchange Rate	ExchRt_Orig/ExchRt_Dest	The World Bank WDI		Macroeconomic Stability
Fixed Broadband Internet Subscribers (per 100 people)	FxBrdIntnetSubsc_Orig/FxBrdIntnetSubsc_Dest	The World Bank WDI		Infrastructure
Fixed Telephone Subscribers	Fi	The World Bank WDI		Infrastructure
Gross Domestic Product (000000US$)	GDP_Orig/GDP_Dest	UNCTAD		Market Size
Gross Domestic Product per Capita (US$)	GDP_Capita	UNCTAD		Market Size
Income Group (High and Low Income Countries)	IncGroup_Orig/IncGroup_Dest	The World Bank WDI		Level of Development
IMF Loan	IMF_Loan	IMF		Information Flow
Inflation, Consumer Prices (annual %)	Infl_Orig/Infl_Dest	The World Bank WDI	IMF	Macroeconomic Stability
Labor Force with Secondary Schooling	LbFcSec_Orig/LbFcSec_Dest	The World Bank WDI		Human Capital Development
Labor Force with Tertiary Schooling	LbFcTer_Orig/LbFcTer_Dest	The World Bank WDI		Human Capital Development
Land Locked Country	Land_Locked	CEPII	Andrew Rose	
Legal Origin Dummy, set to 1 if common 0 otherwise	LegOrig_Dumm	CEPII		Rule of Law
MIGA Dummy, set to 1 if insurance common 0 otherwise	MIGA	IMF		Information flow
Number of Patent Registered by Residents	Pt_Orig/Pt_Dest	The World Bank WDI		Level of Development
One Country Landlocked		CEPII		
Outward Stock of Foreign Direct Investment from Country i to Country j (US$)	StckFDI_Outward	UNCTAD		
Population	Pop (Pop_Orig/Pop_Dest)	UNCTAD		Market Size
Regional Trade Agreement (RTA)	RTA	CEPII	Andrew Rose	
Religion Dummy Variable	Rlg_Dumm	CEPII		

Variable Name	Variable Code	Source I	Source II	Proxy
Rule of Law	PRSRlLaw_Orig/PRSRlLaw_Dest	Political Risk Services International Country Risk Guide (PRS)	The World Bank WDI	Political Stability
Same Country	Sm_Cntry	CEPII	Andrew Rose	
Stock Exchange, dummy variable set to 1 if country has stock exchange	StckExchg_orig/StckExchg_dest	Wikipedia		Financial Market Efficiency
Strength of Legal Rights Index (0 = weak to 10 = strong)	StLegRgtIndx_Orig/StLegRgtIndx_Dest	IMF		Bureaucracy
Telephone Lines (per 100 people)	Tlf_Orig/Tlf_Dest	The World Bank WDI		Level of Development
Similar Economic Size	Simi_Econ	Princeton University		Level of Development
Time to Prepare and Pay Taxes (hours)	TmPrePayTax_Orig/TmPrePayTax_Dest	The World Bank WDI		Bureaucracy, Inefficient Public Service
Total Tax Rate (% of commercial profits)	TottaxRt_Orig/TottaxRt_Dest	The World Bank WDI		Tax
Tourism flow	St_Tourism	UNWTO		Information flow
Two Island Nation	TIsl_Nat	Andrew Rose		
Year	Year			

Appendix B: Results of OLS Regression

	Control Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Control Variables										
com_col	0.455	0.948***	1.025***	2.265***	1.030***	1.048***	0.836**	1.038***	0.974***	0.896***
	(0.395)	(0.319)	(0.316)	(0.794)	(0.316)	(0.335)	(0.334)	(0.335)	(0.334)	(0.302)
col_1945	0.838***	1.190***	1.240***	3.207***	1.246***	1.362***	1.507***	1.354***	1.340***	1.333***
	(0.236)	(0.191)	(0.189)	(0.602)	(0.189)	(0.206)	(0.207)	(0.206)	(0.207)	(0.184)
sm_cntry	1.448***	0.0678	0.265	0.452	0.251	0.318*	0.224	0.325*	0.287*	0.194
	(0.176)	(0.153)	(0.169)	(0.316)	(0.170)	(0.174)	(0.174)	(0.174)	(0.174)	(0.172)
legorig_dumm	0.814***	0.715***	0.442***	0.593***	0.442***	0.564***	0.545***	0.559***	0.529***	0.430***
	(0.0634)	(0.0523)	(0.0598)	(0.150)	(0.0598)	(0.0646)	(0.0641)	(0.0645)	(0.0642)	(0.0597)
rlg_dumm	0.781***	0.499***	0.449***	0.367***	0.444***	0.433***	0.428***	0.437***	0.423***	0.425***
	(0.0553)	(0.0450)	(0.0464)	(0.123)	(0.0466)	(0.0496)	(0.0492)	(0.0495)	(0.0495)	(0.0467)
currunion_dum	1.877***	0.603***	0.557***	0.477***	0.560***	0.472***	0.463***	0.475***	0.499***	0.503***
	(0.0920)	(0.0774)	(0.0845)	(0.165)	(0.0845)	(0.0897)	(0.0894)	(0.0897)	(0.0896)	(0.0839)
rta	1.163***	-0.551***	-0.362***	0.0772	-0.363***	-0.382***	-0.441***	-0.369***	-0.385***	-0.251***
	(0.0610)	(0.0682)	(0.0695)	(0.230)	(0.0695)	(0.0751)	(0.0748)	(0.0748)	(0.0746)	(0.0704)
LogDifExchrt	-2.863***	-2.215***	-2.271***	-4.535***	-2.278***	-2.291***	-2.372***	-2.307***	-2.236***	-0.896***
	(0.198)	(0.162)	(0.163)	(0.546)	(0.163)	(0.174)	(0.173)	(0.173)	(0.172)	(0.175)
DifGrwthRt	7.260***	1.323**	1.882***	4.889***	1.868***	1.388*	1.202*	1.297*	1.281*	0.608
	(0.794)	(0.652)	(0.665)	(1.721)	(0.665)	(0.714)	(0.711)	(0.712)	(0.714)	(0.655)
LogDifInfl	0.458***	0.00325	0.0480*	-0.190***	0.0485*	0.0586**	0.0443	0.0580**	0.0560**	-0.0237
	(0.0302)	(0.0261)	(0.0264)	(0.0707)	(0.0264)	(0.0283)	(0.0283)	(0.0283)	(0.0283)	(0.0265)
DifLbFcSec	-0.908***	-0.0485	-0.128**	-0.861***	-0.129**	-0.0912	-0.100*	-0.0552	-0.0937	-0.0718
	(0.0596)	(0.0527)	(0.0540)	(0.298)	(0.0540)	(0.0618)	(0.0572)	(0.0588)	(0.0580)	(0.0537)
DifLbFcTer	-1.715***	-0.584***	-0.558***	-1.408***	-0.557***	-0.509***	-0.500***	-0.498***	-0.530***	-0.386***
	(0.0620)	(0.0583)	(0.0603)	(0.194)	(0.0603)	(0.0681)	(0.0674)	(0.0679)	(0.0671)	(0.0610)
LnDefGDPOrig		0.856***	0.888***	0.853**	0.889***	0.900***	0.986***	0.987***	0.986***	0.859***
		(0.0908)	(0.0930)	(0.408)	(0.0936)	(0.0704)	(0.0694)	(0.0633)	(0.0593)	(0.0860)
LnDefGDPCapOrig		-0.0567	0.0449	0.281	0.0452	0.185**	0.0298	0.142*	0.0684	-0.0727
		(0.102)	(0.105)	(0.451)	(0.106)	(0.0867)	(0.0836)	(0.0822)	(0.0745)	(0.1000)
LnDefGDPDest		0.698***	0.763***	0.968***	0.763***	0.769***	0.789***	0.790***	0.794***	0.808***
		(0.0143)	(0.0150)	(0.0594)	(0.0150)	(0.0215)	(0.0167)	(0.0169)	(0.0170)	(0.0155)
LnDefGDPCapDest		0.528***	0.323***	-0.176	0.322***	0.347***	0.332***	0.348***	0.329***	0.130***
		(0.0286)	(0.0305)	(0.120)	(0.0305)	(0.0327)	(0.0323)	(0.0327)	(0.0326)	(0.0348)
Variables of Interest										
LnDist		-1.049***	-0.996***	-1.032***	-1.016***	-1.019***	-1.053***	-1.083***	-1.046***	-1.101***
		(0.0353)	(0.0365)	(0.152)	(0.0404)	(0.0403)	(0.0388)	(0.0398)	(0.0391)	(0.0379)
Contig		0.643***	0.544***	0.425**	0.571***	0.443***	0.445***	0.447***	0.447***	0.412***
		(0.0938)	(0.0984)	(0.198)	(0.101)	(0.103)	(0.103)	(0.103)	(0.103)	(0.0999)
cntry_ilsnd		0.672***	0.770***	1.421***	0.767***	0.804***	0.878***	0.811***	0.826***	0.785***
		(0.0629)	(0.0642)	(0.232)	(0.0642)	(0.0688)	(0.0692)	(0.0687)	(0.0686)	(0.0636)
lndlock_orig		-0.415	-0.329	0.599	-0.322	-0.354	-0.334	-0.332	-0.339	-0.308
		(0.396)	(0.410)	(1.769)	(0.413)	(0.265)	(0.288)	(0.262)	(0.245)	(0.380)
lndlock_dest		0.397***	0.0826	-0.0310	0.0833	0.0813	0.0464	0.0903	0.0838	-0.0394
		(0.0630)	(0.0676)	(0.190)	(0.0676)	(0.0721)	(0.0718)	(0.0719)	(0.0720)	(0.0683)
lng_simasjp			1.467***	1.471***	0.677	1.476***	1.475***	1.489***	1.528***	1.402***
			(0.131)	(0.364)	(0.708)	(0.143)	(0.142)	(0.143)	(0.143)	(0.132)

	Control Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Std_Tourism				-0.148* (0.0779)						
LnDistIng_simasjp					0.0987 (0.0869)					
LnPtOrig						0.159*** (0.0519)				
LnPtDest						0.0477** (0.0224)				
SimilarPat							0.127*** (0.0168)			
LnDistMultPt								0.0707*** (0.0190)		
LogDifPtIng_simasjp									-0.0688 (0.0722)	
crisis_2008										0.0566 (0.0660)
_cons	2.295*** (0.217)	-1.042 (0.682)	-1.309* (0.700)	0.0193 (3.017)	-1.145 (0.714)	-2.872*** (0.710)	-1.108* (0.649)	-2.208*** (0.654)	-1.842*** (0.626)	2.620*** (0.695)
N adj. R-sq	12618	12618	11543	1660	11543	10210	10210	10210	10210	10616
Bic Aic	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .

Notes: Standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

Appendix C: Robustness

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Overall Sample													
Variables of Interest													
LnDist	-0.753*** (0.0631)	-0.772*** (0.0640)	-0.731*** (0.0663)	-0.757*** (0.0645)	-0.790*** (0.0693)	-0.784*** (0.0696)	-0.386** (0.155)	-0.793*** (0.0690)	-1.250*** (0.0850)	-1.156*** (0.0840)	-0.837*** (0.0609)	-1.189*** (0.0772)	-1.280*** (0.0801)
lng_simasjp	1.178*** (0.139)	1.303*** (0.147)	1.283*** (0.148)	1.298*** (0.149)	1.302*** (0.149)	1.271*** (0.151)	0.661*** (0.247)	1.295*** (0.147)	0.563*** (0.134)	0.356*** (0.137)	1.028*** (0.143)	0.257** (0.122)	0.518*** (0.128)
IMFLoan_dest_Dumm5	0.362*** (0.0592)												
miga_dest5		0.274*** (0.0982)											
StckExchg_Dumm			0.467*** (0.132)										
SimilarEcon				0.0327 (0.0385)									
LnDifFxBrdIntnetSubsc					-0.174*** (0.0424)		-0.0774 (0.0526)	-0.264*** (0.0436)					
SimilarFxBrdIntnetSubsc						0.339*** (0.0964)							
LnDifFxBrdIntnetSubsclng_simasjp								0.214*** (0.0813)					
DifTotTaxRt									0.0332 (0.0677)				
LnTotTaxRt_orig										-0.533*** (0.0972)			
LnTotTaxRt_dest										-0.569*** (0.0958)			
LnGrwthRt_orig											0.133*** (0.0311)		
LnGrwthRt_dest											0.0808*** (0.0292)		

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
LnTmPrePayTax_orig												-1.032*** (0.0678)	
LnTmPrePayTax_dest												-0.223*** (0.0733)	
DifTmPrePayTax													-0.371*** (0.0577)
_cons	2.326*** (0.826)	2.533*** (0.818)	1.826** (0.848)	2.594*** (0.819)	2.990*** (0.854)	4.121*** (0.885)	1.477 (1.620)	2.995*** (0.853)	7.865*** (0.927)	11.94*** (0.982)	0.219 (0.869)	16.41*** (0.984)	8.180*** (0.882)
N	11543	11543	11543	11543	10395	10395	1520	10395	6906	6906	11543	6906	6906
High Income Sample													
Variables of Interest													
LnDist	-0.840*** (0.0675)	-0.853*** (0.0673)	-0.823*** (0.0714)	-0.830*** (0.0669)	-0.886*** (0.0728)	-0.877*** (0.0731)	-0.489*** (0.162)	-0.891*** (0.0725)	-1.331*** (0.0859)	-1.228*** (0.0888)	-0.895*** (0.0646)	-1.250*** (0.0808)	-1.351*** (0.0806)
lng_simasjp	0.879*** (0.132)	1.024*** (0.138)	0.997*** (0.139)	1.032*** (0.141)	0.979*** (0.141)	1.018*** (0.139)	0.611** (0.258)	0.957*** (0.138)	0.423*** (0.132)	0.223 (0.136)	0.835*** (0.138)	0.176 (0.125)	0.373*** (0.127)
IMFLoan_dest_Dumm5	0.360*** (0.0588)												
miga_dest5		0.369*** (0.0989)											
StckExchg_Dumm			0.348** (0.137)										
Std_Tourism							0.258*** (0.0732)						
SimilarEcon				0.0583 (0.0391)									
LnDifFxBrdIntnetSubsc					-0.196*** (0.0450)		-0.0906* (0.0535)	-0.332*** (0.0476)					
SimilarFxBrdIntnetSubsc						0.331*** (0.100)							

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
LnDifFxBrdIntnetSubscl ng_simasjp								0.295*** (0.0788)					
DifTotTaxRt									0.0598 (0.0647)				
LnTotTaxRt_orig										-0.453*** (0.0998)			
LnTotTaxRt_dest										-0.533*** (0.0988)			
LnGrwthRt_orig											0.152*** (0.0294)		
LnGrwthRt_dest											0.0466 (0.0322)		
LnTmPrePayTax_orig												-0.977*** (0.0684)	
LnTmPrePayTax_dest												-0.171** (0.0752)	
DifTmPrePayTax													-0.350*** (0.0569)
_cons	5.130*** (0.901)	5.215*** (0.883)	4.763*** (0.918)	5.245*** (0.886)	5.938*** (0.916)	6.757*** (0.959)	1.005 (1.923)	6.024*** (0.911)	9.715*** (0.989)	13.14*** (1.008)	2.539*** (0.946)	16.82*** (0.998)	9.989*** (0.938)
N	9337	9337	9337	9337	8507	8507	1367	8507	5831	5831	9337	5831	5831

Low Income Sample

Variables of Interest													
LnDist	-0.876*** (0.130)	-0.899*** (0.135)	-0.854*** (0.135)	-0.988*** (0.136)	-1.056*** (0.163)	-1.057*** (0.165)	0.548 (0.443)	-1.073*** (0.160)	-0.0299 (0.133)	-0.117 (0.139)	-0.926*** (0.141)	-0.0751 (0.127)	-0.0106 (0.135)
lng_simasjp	0.463 (0.576)	0.190 (0.588)	0.194 (0.603)	0.250 (0.624)	0.840 (0.617)	0.881 (0.637)	4.256** (2.094)	0.282 (0.725)	0.786 (0.483)	0.904** (0.425)	0.136 (0.613)	0.964** (0.438)	0.764 (0.480)
IMFLoan_dest_Dumm5	0.553***												

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
	(0.146)												
miga_dest5		-0.649 (0.396)											
StckExchg_Dumm			1.040*** (0.270)										
Std_Tourism							0.476** (0.233)						
SimilarEcon				-0.552*** (0.0652)									
LnDifFxBrdIntnetSubsc					-0.211** (0.104)		-0.00849 (0.120)	-0.127* (0.0762)					
SimilarFxBrdIntnetSubsc						-0.173 (0.166)							
LnDifFxBrdIntnetSubscIng_simasjp								-0.626 (0.614)					
DifTotTaxRt									-0.0588 (0.170)				
LnTotTaxRt_orig										-0.493** (0.200)			
LnTotTaxRt_dest										-0.393* (0.228)			
LnGrwthRt_orig											0.0321 (0.0900)		
LnGrwthRt_dest											-0.0198 (0.0762)		
LnTmPrePayTax_orig												-0.445** (0.193)	

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
LnTmPrePayTax_dest												-0.505**	
												(0.223)	
DifTmPrePayTax													0.0295
													(0.114)
_cons	5.468***	6.174***	4.198**	4.465**	6.429***	6.567***	-6.521	6.868***	-1.368	3.966	5.838***	5.263*	-1.478
	(1.898)	(1.844)	(1.997)	(1.981)	(2.240)	(2.506)	(9.346)	(2.255)	(2.517)	(3.312)	(2.239)	(2.920)	(2.506)
N	2206	2206	2206	2206	1888	1888	153	1888	1075	1075	2206	1075	1075

Notes: Appendix C has the same control variables as Table 4, so this table only presents the reduced version; standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

Appendix D1: Tourism Flow Endogeneity Analysis

	Model 1	Model 2	Model 3
	Overall Sample	High Income Sample	Low income Sample
Std_Tourism	0.466* (0.269)	0.300* (0.176)	0.886 (1.025)
LnDist	-0.215 (0.276)	-0.232 (0.173)	0.881 (1.108)
Contig	0.547*** (0.0800)	0.571*** (0.0866)	0.310 (0.844)
cntry_ilsnd	0.0860 (0.333)	0.139 (0.252)	2.268 (1.576)
lndlock_orig	-0.336** (0.150)	-0.0691 (0.196)	1.476 (1.414)
lndlock_dest	-0.200 (0.136)	-0.0332 (0.147)	5.200*** (1.312)
lng_simasjp	0.331 (0.516)	0.533 (0.365)	4.021* (2.290)
_cons	-3.747 (5.119)	-0.990 (2.951)	-12.60 (18.56)
N	1495	1660	165
adj. R-sq			
bic aic	. .	. .	. .

Notes: This appendix has the same control variables as Table 4, so this table only presents the reduced version; standard errors in parentheses; * p<0.10; ** p<0.05; *** p<0.01

Appendix D2: Level of Technology Endogeneity Analysis

	Model 1	Model 2	Model 3
	Overall Sample	High Income Sample	Low income Sample
com_col	2.349***	2.515	6.258***
	(0.773)	(3.202)	(1.896)
col_1945	-2.290	-8.818	-4.275**
	(1.586)	(13.19)	(2.039)
sm_cntry	0.973**	2.561	2.193***
	(0.393)	(3.192)	(0.792)
legorig_dumm	0.175	0.271	0.131
	(0.113)	(0.367)	(0.286)
rlg_dumm	0.494***	-0.107	0.281
	(0.100)	(0.877)	(0.259)
currunion_dum	0.422*	1.328	-0.0932
	(0.224)	(1.736)	(0.758)
rta	0.701**	1.927	1.296***
	(0.325)	(2.482)	(0.474)
LogDifExchrt	-1.119***	-2.877	2.263*
	(0.305)	(2.987)	(1.246)
DifGrwthRt	2.987**	6.661	3.809
	(1.407)	(5.042)	(3.422)
LogDifInfl	0.0591	0.130	0.151
	(0.0488)	(0.204)	(0.106)
DifLbFcSec	-0.424**	-2.894	1.019**
	(0.186)	(3.686)	(0.486)
DifLbFcTer	0.00485	0.659	-1.662***
	(0.109)	(0.904)	(0.533)
LnDefGDPOrig	0.741***	-0.528	1.822***
	(0.158)	(2.096)	(0.290)
LnDefGDPCapOrig	0.373***	0.372	-1.329***
	(0.0819)	(0.301)	(0.371)
LnDefGDPDest	0.790***	1.462	0.0756
	(0.0511)	(0.962)	(0.224)
LnDefGDPCapDest	0.621***	0.795*	0.781***
	(0.0687)	(0.407)	(0.141)
LnDist	-0.592***	-0.0231	-0.911***
	(0.104)	(0.994)	(0.133)
contig	0.302**	0.394	-0.661
	(0.127)	(0.420)	(0.466)
cntry_ilsnd	-0.0726	-4.287	-0.715
	(0.567)	(7.087)	(0.676)
lndlock_orig	0.844***	3.087	1.401***
	(0.324)	(3.945)	(0.452)
lndlock_dest	0.173	0.334	1.733***
	(0.229)	(0.868)	(0.577)
lng_simasjp	1.174***	3.111	-0.00654
	(0.288)	(3.063)	(0.676)
SimilarPat	-1.709*	-6.779	-2.680***
	(0.888)	(9.205)	(0.983)
_cons	-11.79***	-24.60	-0.0315
	(2.903)	(21.80)	(2.473)

	Model 1	Model 2	Model 3
	Overall Sample	High Income Sample	Low income Sample
SimilarPat			
com_col	0.658*** (0.231)	0.214 (0.365)	1.942*** (0.138)
col_1945	-1.736*** (0.158)	-1.416*** (0.190)	-1.924*** (0.284)
sm_cntry	0.400*** (0.0530)	0.348*** (0.0645)	0.703*** (0.0991)
legorig_dumm	-0.0428 (0.0425)	-0.0203 (0.0482)	0.0812 (0.0864)
rlg_dumm	-0.0670** (0.0309)	-0.0907*** (0.0346)	-0.107* (0.0644)
currunion_dum	0.237*** (0.0414)	0.191*** (0.0436)	-0.353* (0.210)
rta	0.353*** (0.0452)	0.268*** (0.0530)	0.459*** (0.0871)
LogDifExchrt	-0.115 (0.105)	-0.314*** (0.119)	0.985*** (0.231)
DifGrwthRt	-0.462 (0.460)	0.343 (0.505)	-0.131 (1.111)
LogDifInfl	0.00908 (0.0169)	0.0183 (0.0195)	0.0247 (0.0296)
DifLbFcSec	-0.182*** (0.0318)	-0.400*** (0.0361)	0.449*** (0.0558)
DifLbFcTer	-0.0182 (0.0383)	0.0893* (0.0465)	-0.446*** (0.0669)
LnDefGDPOrig	-0.159*** (0.0165)	-0.224*** (0.0176)	0.261*** (0.0389)
LnDefGDPCapOrig	0.0308 (0.0265)	-0.0251 (0.0334)	-0.304*** (0.0723)
LnDefGDPDest	0.0495*** (0.0138)	0.107*** (0.0154)	-0.193*** (0.0299)
LnDefGDPCapDest	0.0107 (0.0224)	0.0311 (0.0257)	-0.0252 (0.0472)
LnDist	0.0939*** (0.0221)	0.105*** (0.0256)	0.00678 (0.0441)
contig	-0.00578 (0.0475)	0.00912 (0.0549)	-0.300*** (0.115)
cntry_ilsnd	-0.624*** (0.0452)	-0.773*** (0.0497)	-0.574*** (0.108)
Indlock_orig	0.361*** (0.0406)	0.433*** (0.0466)	0.307*** (0.0878)
Indlock_dest	0.234*** (0.0411)	0.0916** (0.0455)	0.520*** (0.0790)
lng_simasjp	0.237*** (0.0883)	0.323*** (0.106)	-0.451*** (0.170)
MultElctPwrCnsmp	5.94e-10** (2.32e-10)	1.79e-10 (2.37e-10)	4.86e-09*** (1.37e-09)
_cons	-2.780*** (0.349)	-2.243*** (0.435)	0.176 (0.786)
c_SimilarPat			

	Model 1	Model 2	Model 3
	Overall Sample	High Income Sample	Low income Sample
_cons	1.755** (0.887)	6.858 (9.204)	2.440** (0.981)
N	10000	8121	1879
adj. R-sq			
Bic Aic	. .	. .	. .

Standard errors in parentheses
="* p<0.10 ** p<0.05 *** p<0.01"

Essay 3

CEOs' impact on Foreign Direct Investment (FDI) decisions

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Abstract:

This paper address Chief Executive Officer's (CEO's) characteristics which impact greenfield investment location decisions. Using a hierarchical model, data spanning 10 years (2003–2012), the analysis of 49 138 firm-level greenfield investments shows that CEO's level of education is crucial to the decision of which country to select and the amount invested. The more educated a CEO is the more likely investment in developing countries. The results also show that CEOs from developing and emerging countries (DECs) are more risk-prone than their peers from developed countries. They also are more likely to invest in countries considered risky. In addition, the results show that CEOs' power is associated with less risky choices, that is, the more powerful a CEOs the more likely to invest in developed markets.

Keywords: CEO's demographics characteristics, Decision under uncertainty, FDI/Greenfield, hierarchical models

JEL classification: D81, F21, F23, G02

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1. Introduction

The belief that Foreign Direct Investment (FDI) is critical for technology transfer and consequently economic development (Barrel and Pain, 1997; Borenzeistein et al., 1998; De Melo, 1999) has influenced policy designs in both source and host countries. It prompted, globally, incentives to capital liberalisation and privatisations (Arestis et al., 2005; Stiglitz, 2004). This new *world order* has generated, for investing firms, considerable business opportunities (Caves, 1971; Dunning, 1998), in a highly dynamic and complex foreign environment requiring contant and innovative solutions (Roth, 1995). For, foreign operations require, additionally, knowledge of the host country's legal and regulatory regime, business practice, language and culture (Caves, 1974; Johanson and Vahlne, 1977). In addition, the large and immobile capital involved, coordination demanded, lack of and sometimes conflicting information mean higher risk and uncertain environment (Anderson and Gatignon, 1986). An environment conducive to strong CEO's influence over the firm (Hambrick and Mason, 1984; Hambrick and Finkelstein, 1987). This contrast with the prevailing neoclassical views of CEO as "…inputs into production process" (Bertrand and Schoar, 2003 , pg. 1173), and her/his actions an extension of firms' policies (Myers and Majluf, 1984). Implying, both firms' policies and performance are independent of CEO's type.

Not surprisingly, this view lead to internationalisation studies mainly focused on either firm, industry and/or countries' characteristics to explain firm's behaviour (Brouthers and Hennart, 2007), while, enquiry into CEO's impact is seldom addressed. At the same time, this neglect is puzzling for the reasons mentioned above but also because CEOs are the main decision maker (Graham et al., 2013; Rajagopalan et al., 1993; Schoemaker, 1993; Taylor, 1975), enjoy great discretionary power in choosing firms' investment projects (Morck et al., 1990; Williamson, 1963), and their characteristics influence investment decisions (Bertrand and Schoar, 2003; Malmendier and Tate, 2008; Malmendier and Tate, 2005a). In addition, CEO's FDI (greenfield,

in particular) decision affects firm and shareholders wealth (Herrmann and Datta, 2006) and CEO's future (Carter, 1971). Hence, our focus in CEOs.

Furthermore, as alluded above, greenfield decision falls within decision under uncertainty. This means (CEO's) heavy reliance in heuristics as coping mechanism (Simon, 1978; Tversky and Kahneman, 1974). Heuristics are individual specific, they control the interpretation of stimuli, shape and determine the quality of (strategic) responses (Dutton and Duncan, 1987; Kahneman and Tversky, 1979; Tversky and Kahneman, 1981; Tversky and Kahneman, 1974). Often time, these attributes more than the external stimuli determine the perception and the strategic decisions (Dearborn and Simon, 1958; Schwenk, 1984; Schwenk, 1988). It follows, the type of CEO does matter.

Consequently, we argue, engaging in greenfield requires a specific type of CEO. A type with the ability to identify and exploit market opportunities and help firm navigate unexpected challenges. This we contend translates into a CEO: a) mindful of the complex managerial environment (e.g., strength and weakness) ideal for this type of operations (e.g., Tzu, 2007; Wiersema and Bantel, 1992), so to increase the likelihood of success; b) tolerant to ambiguity and willing to take risk (Gupta and Govindarajan, 1984) - new market opportunities imply innovative practices and these are always risky and challenging for both firm and CEO (Lilienfeld-Toal and Ruenzi, 2014); c) flexible, adaptive and to always changing environment (Fredrickson and Mitchell, 1984); and finally, d) with energy (physical and mental) to tackle uncertain environment (Sexton and Bowman, 1985). These propensities are correlated with certain individual characteristics (e.g. Chaganti and Sambharya, 1987; Child, 1972; Custódio and Metzger, 2014; Rajagopalan and Datta, 1996; Sambharya, 1996; Tihanyi et al., 2000; Wiersema and Bantel, 1992). Thus, we relied on demographic characteristics to study CEO's influence in greenfield location decision process. The identified traits are: age, education, international experience, nationality, power (duality), and tenure.

With the few exceptions (e.g., Herrmann and Datta, 2002; Herrmann and Datta, 2006; Nielsen and Nielsen, 2011) managers' role on entry mode decision has been neglected in International Business (IB), despite their influence in internationalisation process (Aharoni et al., 2011). Those that studies it focus on CEOs' attributes that lead to the choice between acquisition and greenfield. To the best of our knowledge no one study has yet addressed exclusively the impact of CEO's attributes on greenfield's location decision around the globe.

For the empirical work we used hierarchical (mixed effect linear and binomial) model due to data interdependence (Bryk and Raudenbush, 1988; Raudenbush and Bryk, 2002). We also controlled for other characteristics that may be correlated with CEOs' effect, namely, firm, industry and country characteristics.

To conduct the above analysis, we used 10 years (2003 – 2012) Financial Times' data on global firm level greenfield investments. The firm and CEO data are mainly from Amadeus, Bloomberg, Boardex, Compustat and Thomson Reuters.

The results have provided strong evidence for the effect of CEO's level of education on the country selection decision and the amount invested. In other words, CEO's level of education determines the level of risk of the firm. Similarly, we found CEO's country of origin determines the likelihood of choosing developing markets (i.e. *riskier markets*). We also found that, as CEO's power increases, the selection of developing markets becomes less likely, implying CEO's power entails less risky strategy. We found, surprisingly, that longer tenured CEO's are associated with increased likelihood of investment in developing countries. This implies that they are more risk prone than their counterparts.

In addition to the above mentioned contributions, we expect our empirical findings to, first, be helpful to practitioners looking for ideal CEO traits to decide and carry out *risky* foreign endeavour (e.g., greenfield investments); second, help policy makers devise ways to address

the issue of resource allocation disparity around the globe; third, add to the existing body of literature on the role of CEOs' decision making under uncertainty; and as a by-product addresses the Lucas' (1990) paradox, of why resources are channelled to locations where they are not expected to make the highest profit.

The remainder of the paper is organised as follows: in Section II we provide a review of the theoretical literature. In section III we present a set of literature-based hypotheses . In section IV we describe the data and methodology. Section V presents and discusses the results obtained. Section VI discusses the robustness, and finally, Section VII presents the summary and conclusion.

2. Theoretical review

Market entry decision implies a specific type of commitment to: control, resource, risk and returns (Anderson and Gatignon, 1986; Harzing, 2002). In this paper we limited our interest to greenfield, a high resource and high risk investment (Aggarwal and Ramaswami, 1992), references to other entry modes are merely for contextual purposes and to emphasise differences. The choice of greenfield is contingent upon environmental (external and internal) constraints (Yiu and Makino, 2002), nature of the firm's specific assets (i.e., superior organisational ability or technical expertise) (Hennart and Park, 1993), level of know-how transfer expected from/to the parent firm (Chang and Rosenzweig 2001), and past entry mode experience (Cho and Padmanabhan, 1995).

The entry mode literature has been mainly focused on the performance between acquisition vis-a-vis greenfield (e.g., Hennart and Park, 1993; Slangen, 2011; Slangen and Hennart, 2008a; Slangen and Hennart, 2008b). We reason it is because the immobility of the large capital invested limits the strategic flexibility (Anderson and Gatignon, 1986; Hill et al., 1990) and thus

increases uncertainty and risks for firms (Aggarwal and Ramaswami, 1992). These studies have enhanced our understanding on the effect of, for instance, taxes and corruption on the choices faced by firms. And provided evidence that greenfield is the riskier form of market entry (e.g. Aggarwal and Ramaswami, 1992; Anderson and Gatignon, 1986). However, the literature have not addressed the role of individuals within organisation, and implicitly attributed entry mode decision to firms' optimizing actions (e.g., Barkema and Vermeule, 1997). The behavioural FDI studies (e.g., Larimo, 1995; Wahab, 1977; Pinheiro-Alves, 2011) sought to correct for the above shortcomings, highlighting the negotiations and self-interest involved in the investment decision process. They have also shown that investment decisions are not always value maximising for the firm or shareholders. Nonetheless, the impact of CEOs' profile on the country selection decision, namely the selection of more *distant and riskier markets* continues to be ignored (Aharoni et al., 2011). The few recent exceptions core concern has remained, the dichotomous choice of acquisition vs greenfield (e.g., Herrmann and Datta, 2002; Herrmann and Datta, 2006).

3. Hypothesis development

3.1. Why CEO focus?

The view of the firm as an optimising production function has been challenged by numerous studies which demonstrated the managers', namely the CEO, impact on firms' outcome; that CEO is the main decision maker (Graham et al., 2013; Rajagopalan et al., 1993; Schoemaker, 1993; Taylor, 1975), and they enjoy great discretionary power in choosing a firm's investment project (Morck et al., 1990; Williamson, 1963). In addition, findings show CEO's behavioural characteristics influence firms' investment decisions (Bertrand and Schoar, 2003; Malmendier and Tate, 2008; Malmendier and Tate, 2005a), and internationalisation process (Aharoni et al.,

2011; Cyert and March, 1963), thereby, resource allocation around the globe. Moreover, FDI (greenfield, in particular) decisions significantly affect value creation by the firm, shareholder's wealth (Herrmann and Datta, 2006), and CEO's future (Carter, 1971).

Several studies, in the agency theory lenses, acknowledge the existence of boundaries and limits to CEO's discretion. Hannan and Freeman (1977) and Jensen (1986) argue that environmental and firm's constraints limit CEO's influence over the firm's outcome and performance. Other views, such as the upper echelon (e.g., Child, 1975; Hambrick and Mason, 1984) and managerial discretion (e.g., Finkelstein and Hambrick, 1990; Williamson, 1963) theories argue that top executives have significant impact on firm's behaviour. Noting that environmental factors, such as high discretionary power and uncertainty, may reinforce CEO's influence over the firm (Carpenter and Fredrickson, 2001; Schwenk, 1988). This is significant for investment decision making process because under uncertainty CEO's background experience, more than stimuli determines perception and the final outcome (e.g., strategic decision) (Dearborn and Simon, 1958).

Extending these arguments to greenfield investments, we can assume that CEO's influence over location decision is also strong and CEO background experience plays a significant role in the decision process. From this, it follows that certain type of CEO should be more relevant in risky, uncertain and culturally challenging environments than other. Therefore, we identified a set of CEO's characteristics we think appropriate for decisions under those environment, namely: age, education level, international experience, nationality, power and tenure.

3.1.1. **Age**

Age changes our personal characteristics, namely, physical, information processing abilities, and risk taking behaviour (Child, 1974; Hambrick and Mason, 1984; Taylor, 1975; Agarwal, S.

et al., 2009), thereby, influencing the quality of and the way decisions are reached (Hsu et al., 2013; Taylor, 1975).

It has been argued that older CEOs, compared to their younger counterparts, possesses less physical and mental stamina (Child, 1974), are less flexible and more reluctant to embrace change (Wiersema and Bantel, 1992). In other words, they lack abilities critical in uncertain and new markets (Geletkanycz, 1997; Sexton and Bowman, 1985).

The literature also suggests young managers possess greater ability to integrate and process complex information (Hambrick and Mason, 1984), and older managers are "… far more susceptible to the dysfunctional effects of information overload" (Taylor, 1975 : 73). Implying that young managers are more likely to invest in greenfield in places lacking or with conflicting information (i.e. DECs).

In terms of risk taking, according to some (e.g., Prendergast and Stole, 1996) the need to signal superior managerial abilities, leads young CEOs to take more risks, and attempt more innovative strategies. In contrast, older CEOs are more averse to risk, less risk tolerant (Graham et al., 2013; Serfling, 2014; Yim, 2013), and less willing to invest in more distant foreign operations (Herrmann and Datta, 2006). Favouring reputation, career, financial security (Wiersema and Bantel, 1992), legacy and the status quo (Geletkanycz, 1997). This suggests they might avoid decisions involving large resources or significant investment in DECs.

Greenfield amplifies the already existing requirement in terms of high level of coordination, ability to process large amount of information and handle uncertain environment (Herrmann and Datta, 2006). In addition, the need to adjust to a new culture and environment, and the inherent risks, suggest that ventures in *new and risky markets* (e.g., DECs) are more likely to be carried out by younger CEOs than their older counterpart. As such, we hypothesise:

Hypothesis 1 a) Older CEOs favour investments in developed over developing countries.

Hypothesis 1 b) CEO age is negatively associated with high resource commitment.

Other authors (e.g., Scharfstein and Stein, 1990) contest this view, suggesting that young managers may be bounded by career concerns, and lack the reputation of more experienced managers, which may lead to a higher risk aversion. The underlying logic is that environmental pressure (e.g., higher scrutiny and rate of "termination" after poor performance (Chevalier and Ellison, 1999), and a restrict labour market for top executives (Fama, 1980)) would encourage the avoidance of "termination" risk, which "… significantly reduces future career opportunities" (Serfling, 2014 : 253). This behavioural adjustment could mean, for instance, performing as the average industry (Chevalier and Ellison, 1999), or mimicking others' behaviour (Hong et al., 2000). They noted that the penalty for failing alone is higher than failing as collective. On the other hand, the rewards for been a pioneer are not much greater that might warrant riskier attitude (Hong et al., 2000). In sum, this implies risk is associated positively with age. In light of this, if there is a prevailing future career concerns and earnings, we hypothesise:

Hypothesis 1 c) CEO age is positively associated with the choice of high risk market.

Hypothesis 1 d) CEO age is positively associated with mimicking investments behaviour.

3.1.2. Education level

A top executive's formal education is indicative of her/his personal skills, knowledge base, values and preferences (Hambrick and Mason, 1984). It shapes the problem-solving skills and the ways in which (s)he looks at, assesses and interacts with the outside world (Hitt and Tyler, 1991). High educational level also makes it easy to process large amounts of information, evaluating competing choices (Wiersema and Bantel, 1992), and absorbing new ideas (Herrmann and Datta, 2006). In addition, highly educated executives tend to be more open

minded toward other cultures (Tihanyi et al., 2000) and engaged in in-depth analysis of decision-making process (Hsu et al., 2013). These are abilities critical for firms seeking new market opportunities (Herrmann and Datta, 2005).

In terms of risk taking behaviour, CEO's overall education is associated with deviation from status quo (Datta and Rajagopalan, 1998; Rajagopalan and Datta, 1996), and more openness to strategic change (Datta and Guthrie, 1994; Wiersema and Bantel, 1992). This does not imply all highly educated CEOs present high or similar level of risk attitude. In fact, empirical evidence suggests CEOs with background in science are more risk prone than the rest (Contractor and Lorange, 2002; Custódio and Metzger, 2014; Tyler and Steensma, 1998). These results suggest that science graduate CEOs would be more likely to invest in *riskier markets* than non-science' graduate CEOs.

Considering the complexity and breadth of issues involved in greenfield investment (e.g. information and processing demanded, particularly, in DECs), we argue that highly educated CEOs may be better suited to deal with unexpected environmental changes. And thus, they would favour a perceived *riskier market* (i.e., DECs). As such, we hypothesise:

Hypothesis 2 a) Highly educated CEOs favour investment decision in DECs more than less educated CEOs.

Hypothesis 2 b) Education level is positively associated with high resource commitment.

Hypothesis 2 c) CEOs science backgrounds will favour investment in DECs more than business educated CEOs.

3.1.3. International experience

A CEO's international experience impacts positively risk and returns assessment, information processing abilities, and coordination of foreign operations (Aggarwal and Ramaswami, 1992). This is turn influences CEO's confidence and resource commitment (Erramilli, 1991), and firm's international performance (Daily et al., 2000; Newman and Nollen, 1996; Sambharya, 1996; Tihanyi et al., 2000). International experience also helps CEO deal with uncertainty and cultural tensions and identify potential international market opportunities in *turbulent markets* (Bartlett and Ghoshal, 1999; Bartlett and Goshal, 2003; Sambharya, 1996). In contrast, less internationally experienced CEOs lack confidence in their ability to manage international operations (Cavusgil and Naor, 1987), are less likely to conduct an in-depth search (of market opportunities) (Cyert and March, 1963), and to invest in external markets, overstating risks and underestimating returns of foreign operations (Herrmann and Datta, 2006). This is significant because CEO's ability to evaluate risk and returns is critical for global resources' allocation. It can lead to, for instance, preference for Joint Venture (JV) over Whole Owned (WO) (Gatignon and Anderson, 1988), or to the exclusion of some locations from investment decision-making process (Cockroft and Riddell, 1991).

Furthermore, CEO's international experience may also include a network of connections with other managers and public officials, meaning access to useful private information (El-Khatib et al., 2015). Private information helps identify business opportunities, reduce risk and uncertainty inherent in international operations (Datta and Rajagopalan, 1998; Liesch et al., 2002). In sum, a broad network helps manage international operations and improves firm's competitiveness (Daily et al., 2000).

Given that CEO experience in setting up foreign operations are crucial to navigating a new and uncertain environment, we hypothesise:

Hypothesis 3 a) More internationally experienced CEOs favour more investment in developing countries than less internationally experienced CEO.

Hypothesis 3 b) CEOs' international experience is positively associated with high resource commitment.

3.1.4. Nationality

A person's set of beliefs, values and preferences can be traced from family to country (Briscoe et al., 2014). "… [N]ationality is a shared beliefs of a set of people …" (Miller, 1988), pg. 648) that shapes (CEO's) perception of the reality, determines what is important and the way to respond to it (Finkelstein and Hambrick, 1990; Geletkanycz, 1997; Hambrick and Abrahamson, 1995). In fact, empirical research has shown the internalised views and assumptions of national culture affects an organisation's behaviour and actions (Shane, 1995). Influencing, for instance, an executive's preference for specific strategies (Nielsen and Nielsen, 2011; Schneider, 1989); evaluation of country's political risk (Kobrin, 1979); country in which to invest (Daniels and Arpan, 1972); and the form of control (Erramilli and Rao, 1993).

Consequently, we argue that, depending on the country of origin, CEOs should exhibit different risk perception and behaviour. To further support this conjecture, we note that research on CEO's risk attitude found US CEOs more risk tolerant, more optimistic, and with less loss aversion than peers from different nationalities (Graham et al., 2013).

Because DECs markets are highly *uncertain and complex*, they require CEOs with: a) greater tolerance to ambiguity and willing to take risk (Gupta and Govindarajan, 1984); and b) the

ability to communicate with different stakeholders (Heidenreich et al., 2015), to successfully operate and avoid a critical organisational contingency (Blumentritt and Nigh, 2002). Importantly, experiences in these markets help identify potential market opportunities in *uncertain* environments (Lord, 2000), and gives CEOs confidence they can navigate successfully *uncertain environment* (Cuervo-Cazurra, 2012; Cuervo-Cazurra and Genc, 2008). Hence, it follows from the above that DECs' CEOs would exhibit greater risk tolerance, less risk aversion attitude than their developed countries counterpart, and more engaging with *other* cultures and markets. As such we hypothesise:

Hypothesis 4 a) CEOs from developing countries will favour investments in riskier markets more than CEOs from developed countries.

Hypothesis 4 b) CEOs from developing and emerging countries are associated with high resource commitment.

3.1.5. CEO duality (power)

A powerful CEO is one with the discretion to influence a firm's policies and the decisions reflect her/his will (Li and Tang, 2010).

The view on CEO duality is not consensual in the literature. Some argue (e.g., Daily and Dalton, 1997) it clarifies "… decision-making and authority and sending clear signals to stakeholders" (Finkelstein and D'Aveni, 1994, pg. 1080). Others suggest it constrains a firm's action by relying solely in one person's decision (Bartlett and Ghoshal, 1999; Bartlett and Goshal, 2003), compromises the effective governance mechanism (Finkelstein and D'Aveni, 1994), and magnifies judgement error due to non-diversified opinions (Adams et al., 2005). Non-diversified opinions limit information gathering, which restricts firms' array of response in face of international challenges (Tihanyi et al., 2000). And ultimately, it can lead to low

external market opportunities identification (Finkelstein and D'Aveni, 1994), and extreme results (Adams et al., 2005).

Theoretically, powerful CEOs can use their power either to adjust firms' policies or pursue personal goals (Liu and Jiraporn, 2010). They may intensify managerial risk aversion or exhibit excessive risk taking behaviour, if doing so will increase their benefits (Serfling, 2014; Shleifer and Vishny, 1989). These behaviours can translate into risk reducing (e.g., diversification activities) (Grinstein and Hribar, 2004; Liu and Jiraporn, 2010) or, risk increasing (e.g., excessive acquisitiveness) (Malmendier and Tate, 2005b; Malmendier and Tate, 2008) projects to adjust CEO's portfolio's risk (against shareholders' interest).

Regardless, the general consensus is that powerful CEOs are a serious challenge to governance mechanisms and a source of serious agency problem. Primarily, because they control the identification and prioritisation of problems (Dutton and Duncan, 1987), flow of information (Shrivastava and Grant, 1986), and allocation of resources (Williamson, 1963).

In international operations, CEO duality means low autonomy and constant contact with the headquarter (HQ) (Anand and Delios, 1996; Roth, 1995), which increases the response time, and thus, endangering the subsidiary (Slangen and Hennart, 2008b). In addition, it also means less innovations, for concentrated power often prevents imaginative solutions (Miller and Friesen, 1982). This is particularly significant because greenfield in *complex and turbulent markets* require creative and innovative solutions (Geletkanycz, 1997).

Although theoretically there is no clear indication to powerful CEO's risk attitude, we reason that (s)he may abandon some projects if these are perceived to impact their power over the firm. Further, we argue that internationalisation would reduce CEOs' power. Consequently, they would be reluctant to engage in high resource commitment to greenfield in *unknown and/or distant markets* (e.g., DECs).

As such, we hypothesise:

Hypothesis 5 a) Powerful CEOs will favour investments in developed countries over developing.

Hypothesis 5 b) CEO's power is negatively associated with high resource commitment.

3.1.6. CEO Tenure

The literature suggests CEO tenure is negatively associated with informational diversity and attitude toward risk (Hambrick and Mason, 1984), but positively with a commitment to organisation values and status quo (Tihanyi et al., 2000), and firm's past strategies (Finkelstein and Hambrick, 1990).

The informational diversity perspective suggests information processing diminishes with tenure, because of CEO's heavy reliance on likeminded people (March and March, 1977) and past experience as CEO (Katz, 1982). Thus, becoming less open to and more adverse to external information sources (Wiersema and Bantel 1992). The lack of information diversity can lead to less information gathering and analysis (Miller, 1991), and more reluctance to challenge the status quo (Wiersema and Bantel, 1992). Factors critical in generating alternative solutions and new market opportunities (Katz, 1982).

The view on the attitude toward risk is conflicting. For instance, Wiersema and Bantel (1992) found a positive relationship between tenure and risk. In contrast, Chaganti and Sambharya (1987) and Herrmann and Datta (2006) suggest tenure is associated with less risky strategies. We, on the other hand, suggest an inverted U shape for the relationship between risk and CEO's tenure. We reason that short-tenured CEOs lack the full grasp of the job requirements (Hambrick and Fukutomi, 1991), which contribute to weaker authority and more scrutiny (Ocasio, 1994). This suggests they are not in the possession of firms' strengths and weaknesses

to engage in *risky operations*. While long-tenured CEOs are in a position in which status quo and commitment to past policies are more important (Hambrick and Mason, 1984; Tihanyi et al., 2000). In addition, long tenure is in itself a sign of success and a vindication of CEO's approach to firm's management (Miller and Friesen, 1982). Finally, average-tenured CEOs will exhibit a less risk averse attitude because they are aware of the firm's resources capabilities (Shen and Cannella, 2002), to pursue their projects.

Given the greenfield requirement in terms of information processing, complexity, coordination and resource commitment, we expect average-tenured CEOs to favour distant and *riskier markets* and more resource commitment, while shorter and longer tenure's CEOs to favour investment in more "stable" developed markets. As such, we hypothesise:

Hypothesis 6 a) Long- and short-tenured CEOs will favour investments in developed countries.

Hypothesis 6 b) There is an inverted U shape in the relationship between tenure and high resource commitment.

Hypothesis 6 c) Long- and short-tenured CEOs are associated with less resource commitment.

4. Data and methodology

4.1. Data

The greenfield data is from the Financial Times' *FDI markets*. This data has been used by UNCTAD's world investments report (e.g., Unctad, 2011). We focused only on new greenfield, our final sample consists of 49138 greenfield investments undertaken between 2003-2012, in which parent firms have no previous greenfield experience in that particular market (**Appendix A0** – Distribution of Greenfield per Year and Industry). The parent firms are based in 113 countries and target 188 host countries, with the US accounting for over 28% greenfields

source and China the main recipient (13.6%). We matched the 11343 parent firms with Amadeus, Boardex, Bloomberg, Compustat, and Datastream datasets, to obtain detailed information about these firms. The biographical information on CEOs were hand collected from the above databases, and firms' annual reports.

We used The World Bank criteria to determine a country's level of income. A developed country is one with gross national income (GNI) per capita larger than 12.736, and developing otherwise.

The data on population, GDP (current US$) were taken from The World Bank World Development Indicators (WDI) (**Appendix A1** – Variables Descriptions and Sources).

4.2. Methodolgy

To study CEO's influence in location decision process we relied on their demographic characteristics because empirical evidences suggest a predictive relationship between CEOs' demographics traits (e.g., age, education, international experience) and firm's behaviour (e.g., strategic choice, firm's performance, risk taking) (Chaganti and Sambharya, 1987; Child, 1972; Custódio and Metzger, 2014; Rajagopalan and Datta, 1996; Sambharya, 1996; Tihanyi et al., 2000; Wiersema and Bantel, 1992). The identified CEO's traits are: age, education, international experience, nationality, power (duality), and tenure.

To test the hypotheses advanced we used mixed effect models, because FDI data are non-independent. For instance, there are parent firms involved in as many as 275 FDI. This means dependency between FDI, firm's characteristics and/or global strategies (Arregle et al., 2006). Ignoring this issue may lead to inconsistent estimate (Bryk and Raudenbush, 1992).

We used mixed effect binomial models in those cases where our dependent variables has two categories (e.g., Hypothesis: 1a, 2a, and 3a). The variables referring to FDI are level 1 and

parent firms' variables are level 2. We followed Leckie's (2008) formulation of two level binomial mixed effect model, no random slope: $\beta_{1j}X_{ijt}$

$$log\left(\frac{\pi ij}{1-\pi ij}\right) = \beta 0 + \sum \beta iXijt + \mu 0j \quad (1),$$

where β_0 is common to all firms, while the random effect μ_{0j} is specific to firms. The level one variables are represented by $\sum \beta iXij$ and level 2 by $\mu 0j$.

We used the hierarchical linear model in those cases where our dependent variable is continuous (e.g. Hypothesis: 1b, 2b, and 3b), we The general two level linear hierarchical model is of the form:

$$\ln Yijt = \beta 0j + \sum \beta iXijt + \mu 0jt + \mu 1X1jt + \in ijt (2)$$

where Yijt is the value outward greenfield or the level of herding behaviour, depending on the hypotheses being tested. The level one variables are represented by $\beta 1X1ijt$, and the hierarchical structures (level one and two) by $\mu 0j \; and \; \mu 1X1jt$, respectively.

4.3. Variables

4.3.1. The dependent variables

We have three different types of dependent variables. For instance, for the hypothesis 1a) the dependent variable (*dependent*) is the response variable, market choice: developed vs. developing. For hypothesis 1b) the dependent variable is the value of the outward greenfield of firm *a* from country *i* to country *j* ($LnCapital_{aijt}$). For this variable we computed a log transformation. For hypothesis 1d) the dependent variable (*H*) was calculated adjusting Lakonishok et al.'s (1992) model of herd behaviour for the stock market. The purpose is to measure CEO's characteristics that affect country level herding. The model is as follow:

$$H(i) = |\mathrm{B(i)}/(\mathrm{B(i)} + \mathrm{S(i)}) - \mathrm{p(t)}| - \mathrm{AF(i)} \quad (3)$$

Where B(i) represents CEOs that increase FDI in country i in year t, and S(i) CEOs that increase FDI in other countries, not i in year t. p(t) is the proportion of CEOs greenfield in year t relative to number of active. AF(i) is the adjustment factor, the expected value of |B(i)/(B(i)+ S(i)) – p(t)|.

The other variables of interest, CEO's age, education, international experience, nationality, power, tenure were obtained either from Amadeus, Boardex, Bloomberg, Compustat, and Datastream database or firms' annual reports.

1) CEO's age (*Age*) was measured by counting the number of years since birth. 2) CEO's education (*cod_education*) was computed, as suggested by Finkelstein (1992) and Datta and Rajagopalan (1998), in a 7 point scale: 7 = doctorate degree, 6 = attended doctoral program, 5 = master's degree, 4 = some graduate school, 3 = undergraduate degree, 2 = some college, and 1 = high school. 3) CEO's international experience (*CEO_IntEx1*) is a dummy variable set to one if, as suggested in the literature, CEO has previous foreign market experience (i.e., study abroad, work experience, place of birth different from the current country) and zero otherwise. 4) CEO's nationality (*CEO_Nat*), is a dummy variable set to one if the country of origin of the CEO as reported from the above mentioned databases is from a developing country and zero otherwise. 5) CEO's power (*CEO_Pwr1*), following the literature (e.g., Adams et al. 2005) was computed as a dummy variable, one if CEO is also Chairperson and zero otherwise. 6) Tenure (Tenure) was measured counting the number of years since CEO's appointment. To conform with our hypotheses, we created three dummy variables (*CEO_Tent1, CEO_Tent2, and CEO_Tent3*). CEO_Tent2 is equal to one if CEO's tenure is less than or equal to 2 and zero otherwise, and CEO_Tent3 is equal to 1 if tenure is greater than or equal to 8 years and zero

otherwise. CEO_Tent1 was used as the base category. These intervals are based on the tenure versus performance literature (Ocasio, 1994; Miller, 1991).

4.3.2. The control variables

The control variables are those that according to the literature (e.g., Custódio and Metzger, 2014; Hennart and Park, 1993) may affect CEO's greenfield decision-making process (i.e., firm, industry, and country characteristics).

At firm level, we controlled for:

Firm size (*LnEmployee*) influences the structure and decision making process (e.g., Guthrie and Olian, 1991), large firms exhibiting a more institutionalised power structure. They also have better access to capital (Custódio and Metzger, 2014), which they use to acquire and process information (Hsu et al, 2013), and to expand to foreign markets (Anand and Delios, 1997). We measured firm size using number of employees in logarithm form to reduce heteroscedasticity (Guthrie and Olian, 1991). According to Aggarwal (1979) number of employees, total assets, and total sales are essentially interchangeable.

Prior firm performance (*ROA_1*) influences CEO's level of authority and firm expansion in *riskier markets*. Positive prior performance increases CEO's discretionary power in choosing firms' project and markets, while prior poor performance motivates centralisation of formal authority (Finkelstein and D'Aveni, 1994). Prior performance was measured with two variables: return on equity (*ROE_1*), and return on assets (*ROA_1*). The variables were lagged one year to match our approach and to rule out reverse causal associations (Finkelstein and D'Aveni 1994; Guthrie and Olian 1991).

Firm international experience (FrmIntExp1) increases knowledge of new markets and activities, which in turn influence the level of risk a firm is willing to take (i.e., markets to enter and resources to commit) (Aggarwal and Ramaswami, 1992; Johanson and Vahlne, 1977). It is expected that the CEOs of these firms will face different environmental pressure from those firms with little or no international experience. The firm's international experience was measured as percentage of foreign sales over total sales, lagged one year (Finkelstein and D'Aveni 1994).

Project size (*LnCapital1, LnJobsCreated*) implies firm's resource and risk commitment (Aggarwal and Ramaswami, 1992). And, in great extent determines the involvement of CEO in the project (Luo, 2001).

It is widely accepted that industry constrains and influences managements' actions (Porter, 1986) and that managerial discretion is industry specific (Rajagopalan and Datta, 1996). For instance, in highly competitive industries CEOs enjoy greater latitude and discretion power (Rajagopalan and Datta, 1996). This implies that, ultimately, market characteristics will determine type of CEO hired. Consequently, we control for industry level characteristics through industry fixed effects.

At country level we controlled for:

GDP (*lngdp*) is a proxy for supply and demand forces (Rose, 2000). This variable was computed in log form.

Geographical distance (*LnDist*) between countries *i* and *j* ($Dist_{ij}$) was measured by the distance, in kilometres, between the capital cities of countries *i* and *j*. The variable was computed in log form.

Finally, to control for heterogeneity across years, we included year fixed effects for the year of the greenfield project. This allows us to control for time-specific factors, such as price deflation.

5. Results and discussion

The descriptive statistics and the correlations are presented in Appendix D. The table shows some expected relationship, for instance, age (Age) and age squared (AgeSqr).

Additionally, we check for multicollinearity by performing the VIF test for all the models (see an example, Appendix E for the Model 6 Table 2). The value of VIF are lower than the threshold of 10, meaning no serious multicollinearity issues. The exception are variables Age and AgeSqr (values of 176.14, and 182.43, respectively). We kept those two variables in accordance with standard literature (e.g., Custódio and Metzger, 2013).

The results of mixed effect regression model analysis are presented in Table 1 (binomial), Tables 2 and 3 (linear) regressions. Model 1 Table 1 includes only the dependent variable. The model has a significant F value and a log-likelihood of -32938.4. Model 5, Table 1 includes the control and variable of interest. The model has a significant F statistics with a log-likelihood of -1192.9. A likelihood ratio test, comparing model 5 (two level hierarchical model) with the equivalent logit version (no hierarchical structure), shows that model 5 is a highly significant improvement relative to the base model (LR test of 21.42 $p>0.000$). This result is indicative of a multilevel model structure (Goldstein, 2008). This means that any research on CEO's effect on investment decision should have in consideration firm's characteristics (i.e., resource availability/constraint, size of the firm), and the industry in which the firm operates. As such the level two model is comprised of firm and industry level variables. The assumption underlying the basic logit model is that the different parent firm's characteristics has the same effect on CEO's characteristics. We, on the other hand, argue that CEO behaviour is influenced by the parent firm's specific characteristics. The way to capture this feature is to allow, for instance, for the coefficient on the varying characteristics of parent firms, size (as represented by the level of sales) and capital structure to vary among firms. To test this relation, we executed the likelihood-ratio test to confirm the random slopes. In mixed effect (hierarchical) models,

when the results pertaining to the random intercepts (and random slopes) are statistically significant, we conclude that these intercepts vary from firm to firm and industry to industry (Hamilton, 2013).

The estimation results using the mixed effect binomial are presented in Table 1, and hierarchical linear models in Table 2 and 3.

Table 1: Result of Mixed Effect Binomial Model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Variables of Interest									
Age				0.0639	-0.000240	-0.000240	0.00446	0.00446	0.00435
				(0.0435)	(0.124)	(0.124)	(0.124)	(0.124)	(0.124)
AgeSqr				-0.000478	-0.000126	-0.000126	-0.000169	-0.000169	-0.000168
				(0.000380)	(0.00110)	(0.00110)	(0.00110)	(0.00110)	(0.00110)
cod_education				0.0357***	0.0891**	0.0891**	0.0902**	0.0902**	0.0896**
				(0.0131)	(0.0363)	(0.0363)	(0.0363)	(0.0363)	(0.0421)
CEO_IntEx1				-0.0499	-0.178	-0.178	-0.177	-0.177	-0.177
				(0.0866)	(0.236)	(0.236)	(0.235)	(0.235)	(0.236)
CEO_Nat				0.254*	1.488***	1.488***	1.486***	1.486***	1.485***
				(0.141)	(0.438)	(0.438)	(0.437)	(0.437)	(0.440)
ceo_pwr1				0.0212	-0.350**	-0.350**	-0.377**	-0.377**	-0.377**
				(0.0634)	(0.160)	(0.160)	(0.159)	(0.159)	(0.159)
Tenure				-0.0215***	0.00611	0.00611			
				(0.00587)	(0.0191)	(0.0191)			
Control Variables									
roa_1					2.106**	2.106**	2.000*	2.000*	2.002*
					(1.040)	(1.040)	(1.037)	(1.037)	(1.039)
Firm_Age					-0.000588	-0.000588	-0.000678	-0.000678	-0.000685

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
					(0.00162)	(0.00162)	(0.00161)	(0.00161)	(0.00163)
FrmIntExp1					-0.00442	-0.00442	-0.00455	-0.00455	-0.00456
					(0.00309)	(0.00309)	(0.00308)	(0.00308)	(0.00310)
LnEmployee					0.534***	0.534***	0.534***	0.534***	0.534***
					(0.142)	(0.142)	(0.141)	(0.141)	(0.141)
LnRD					-0.0122	-0.0122	-0.0123	-0.0123	-0.0125
					(0.0427)	(0.0427)	(0.0426)	(0.0426)	(0.0431)
LnNetSlsRvn					-0.583***	-0.583***	-0.579***	-0.579***	-0.579***
					(0.138)	(0.138)	(0.138)	(0.138)	(0.138)
TotDbtCpt					0.232	0.232	0.214	0.214	0.213
					(0.359)	(0.359)	(0.358)	(0.358)	(0.359)
Lngdp_orig					-0.0315	-0.0315	-0.0318	-0.0318	-0.0321
					(0.0743)	(0.0743)	(0.0740)	(0.0740)	(0.0751)
Lngdp_des					-0.447***	-0.447***	-0.449***	-0.449***	-0.449***
					(0.0420)	(0.0420)	(0.0421)	(0.0421)	(0.0421)
Lndistance					0.167**	0.167**	0.174**	0.174**	0.174**
					(0.0698)	(0.0698)	(0.0700)	(0.0700)	(0.0700)
LgDum					-0.792***	-0.792***	-0.795***	-0.795***	-0.795***
					(0.171)	(0.171)	(0.170)	(0.170)	(0.171)
DifGrwth					-0.390***	-0.390***	-0.391***	-0.391***	-0.391***
					(0.0180)	(0.0180)	(0.0181)	(0.0181)	(0.0181)
lng_simasjp					-1.563***	-1.563***	-1.551***	-1.551***	-1.551***
					(0.392)	(0.392)	(0.392)	(0.392)	(0.393)
infl_dest					0.256***	0.256***	0.256***	0.256***	0.256***
					(0.0222)	(0.0222)	(0.0223)	(0.0223)	(0.0223)
lbfcsec_dest					-0.0185***	-0.0185***	-0.0185***	-0.0185***	-0.0185***
					(0.00265)	(0.00265)	(0.00265)	(0.00265)	(0.00265)
prstbpltvlc_dest					-10.14***	-10.14***	-10.13***	-10.13***	-10.13***

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
					(0.828)	(0.828)	(0.828)	(0.828)	(0.828)
CEO_Tent2							0.0755	0.0755	0.0757
							(0.137)	(0.137)	(0.137)
CEO_Tent3							0.333*	0.333*	0.333*
							(0.191)	(0.191)	(0.191)
background_science									0.00580
									(0.201)
_cons	0.565***	-0.00362	0.385***	-1.661	12.85***	12.85***	12.60***	12.60***	12.61***
	(0.0905)	(0.0204)	(0.0568)	(1.240)	(3.818)	(3.818)	(3.803)	(3.803)	(3.813)
lnsig2u									
_cons	-0.530**								
	(0.214)								
Level 2 Random Intercept									
_cons		0.333***	-0.272***	-0.539***	-0.619***	-9.196	-0.627***	-10.01	-12.47
		(0.0219)	(0.0617)	(0.106)	(0.175)	(1633.2)	(0.178)	(2994.9)	(35415.6)
Level 3 Random Intercept									
_cons			0.221***	-0.283***					
			(0.0227)	(0.0662)					
Level 2 Random Intercept and Slope									
_cons						-0.619***		-0.627***	-0.627***
						(0.175)		(0.178)	(0.178)
Industry Fixed Effect					Yes	Yes	Yes	Yes	Yes
Year Fixed Effect					Yes	Yes	Yes	Yes	Yes
N	49137	49137	49137	10983	3463	3463	3463	3463	3463
BIC	65898.4	63337.8	62063.5	14309.4	2793.3	2801.5	2798.4	2806.5	2814.7
AIC	65880.8	63320.2	62037.1	14236.4	2485.8	2487.8	2484.7	2486.7	2488.7
LL	-32938.4	-31658.1	-31015.6	-7108.2	-1192.9	-1192.9	-1191.4	-1191.4	-1191.4

Standard errors in parentheses
="* p<0.10, ** p<0.05, *** p<0.01"

Table 2: Result of Mixed Effect Linear Model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Age	0.0431	0.0431	0.0430	0.0430	0.0515	0.0515	0.0515	0.0515
	(0.0538)	(0.0538)	(0.0538)	(0.0538)	(0.0531)	(0.0531)	(0.0531)	(0.0531)
AgeSqr	-0.000295	-0.000295	-0.000297	-0.000297	-0.000370	-0.000370	-0.000370	-0.000370
	(0.000476)	(0.000476)	(0.000475)	(0.000475)	(0.000469)	(0.000469)	(0.000469)	(0.000469)
cod_education	0.0270*	0.0270*	0.0266	0.0266				
	(0.0164)	(0.0164)	(0.0164)	(0.0164)				
CEO_IntEx1	-0.133	-0.133	-0.131	-0.131	-0.122	-0.122	-0.122	-0.122
	(0.106)	(0.106)	(0.106)	(0.106)	(0.105)	(0.105)	(0.105)	(0.105)
CEO_Nat	0.261	0.261	0.263	0.263	0.235	0.235	0.235	0.235
	(0.202)	(0.202)	(0.202)	(0.202)	(0.199)	(0.199)	(0.199)	(0.199)
ceo_pwr1	-0.0159	-0.0159	-0.0157	-0.0157	-0.0180	-0.0180	-0.0180	-0.0180
	(0.0705)	(0.0705)	(0.0703)	(0.0703)	(0.0696)	(0.0696)	(0.0696)	(0.0696)
Tenure	0.000498	0.000498						
	(0.00794)	(0.00794)						
CEO_Tent2			-0.0210	-0.0210	-0.0268	-0.0268	-0.0268	-0.0268
			(0.0548)	(0.0548)	(0.0546)	(0.0546)	(0.0546)	(0.0546)
CEO_Tent3			-0.0153	-0.0153	-0.0129	-0.0129	-0.0129	-0.0129
			(0.0774)	(0.0774)	(0.0771)	(0.0771)	(0.0771)	(0.0771)
background_science					0.0305	0.0305	0.0305	0.0305
					(0.0787)	(0.0787)	(0.0787)	(0.0787)
_cons	-0.850	-0.850	-0.835	-0.835	-1.105	-1.105	-1.105	-1.105
	(1.628)	(1.628)	(1.626)	(1.626)	(1.607)	(1.607)	(1.607)	(1.607)
lnsig_e								
_cons	0.196***	0.196***	0.196***	0.196***	0.197***	0.197***	0.197***	0.197***
	(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0123)
Level 2 Random Intercept								
_cons	-1.147***	-18.06***	-1.145***	-19.13***	-13.07***	-13.07***	-13.07***	-13.07***
	(0.123)	(1.291)	(0.123)	(1.380)	(1.675)	(1.675)	(1.675)	(1.675)
Level 2 Random Intercept and Slope								
_cons		-1.147***		-1.145***	-1.179***	-1.179***	-1.179***	-1.179***
		(0.123)		(0.123)	(0.124)	(0.124)	(0.124)	(0.124)

Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3463	3463	3463	3463	3463	3463	3463	3463
BIC	11720.3	11728.5	11728.3	11736.5	11738.9	11738.9	11738.9	11738.9
AIC	11406.7	11408.7	11408.5	11410.5	11412.9	11412.9	11412.9	11412.9
LL	-5652.4	-5652.4	-5652.3	-5652.3	-5653.5	-5653.5	-5653.5	-5653.5

Notes: Table 2 has the same control variables as Table 1, so this table only presents the reduced version;
Standard errors in parentheses
="* p<0.10, ** p<0.05, *** p<0.01"

Table 3: Result of Mixed Effect Linear Model for Herding Behaviour

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	0.00188**	0.00239***		0.00224**	0.000782	0.00204***	0.00187**
	(0.000845)	(0.000769)		(0.000952)	(0.00124)	(0.000749)	(0.000847)
AgeSqr	-0.0000157**	-0.0000213***		-0.0000191**	-0.00000505	-0.0000183***	-0.0000158**
	(0.00000745)	(0.00000679)		(0.00000845)	(0.0000109)	(0.00000663)	(0.00000747)
cod_education	-0.0000755	0.0000976	-0.0000195	-0.000277	-0.000253	0.000105	-0.000117
	(0.000241)	(0.000212)	(0.000240)	(0.000287)	(0.000353)	(0.000216)	(0.000241)
CEO_IntEx1	0.0000964	-0.000105	-0.000115	-0.00190	0.00331	-0.000316	0.000294
	(0.00157)	(0.00146)	(0.00157)	(0.00175)	(0.00227)	(0.00148)	(0.00157)
CEO_Nat	-0.00267	-0.00167	-0.00217	-0.00132	-0.00292	-0.00180	-0.00242
	(0.00287)	(0.00303)	(0.00287)	(0.00306)	(0.00385)	(0.00309)	(0.00287)
ceo_pwr1	0.000542	0.00188*	0.000564	0.000571	-0.000339	0.00159	0.000756
	(0.00106)	(0.000972)	(0.00106)	(0.00118)	(0.00153)	(0.000979)	(0.00107)
CEO_Tent2	0.00298***	-0.000712	0.00285***	0.00221**	0.00420***	-0.000388	
	(0.000924)	(0.000854)	(0.000902)	(0.00106)	(0.00133)	(0.000849)	
CEO_Tent3	0.00185	0.00131	0.00186	0.00312**	0.000384	0.00121	
	(0.00127)	(0.00113)	(0.00128)	(0.00152)	(0.00188)	(0.00114)	
GdCode		-0.00491*					
		(0.00275)					
LnJobsCreated		0.000628					
		(0.000424)					

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
LnCapital		-0.00125***					
		(0.000389)					
CEO_Age53			-0.000660				
			(0.00101)				
timeonboardyrs_since				0.000241*			
				(0.000124)			
timeinorganisationyrs_since				-0.000133**			
				(0.0000610)			
Tenure							-0.000182
							(0.000125)
_cons	0.138***	0.185***	0.191***	-0.0874	0.120***	0.190***	0.140***
	(0.0254)	(0.0238)	(0.0107)	(0.209)	(0.0371)	(0.0233)	(0.0255)
Level 2 Random Intercept							
_cons	-19.40***	-8.046***	-16.75	-15.25***	-21.14***	-8.001***	-5.640***
	(1.616)	(0.169)	(320.3)	(1.922)	(1.380)	(0.162)	(0.197)
Level 2 Random Intercept and Slope							
_cons	-5.640***	-18.15***	-5.624***	-5.684***	-5.345***	-15.76	
	(0.199)	(1.587)	(0.198)	(0.263)	(0.213)	(544.5)	
lnsig_e							
_cons	-3.855***	-4.431***	-3.855***	-3.845***	-3.760***	-4.428***	-3.854***
	(0.0124)	(0.0201)	(0.0124)	(0.0134)	(0.0161)	(0.0200)	(0.0123)
Inudstry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3463	1372	3463	2949	2088	1375	3463
BIC	-16375.8	-7795.5	-16378.4	-13819.2	-9311.1	-7820.8	-16382.9
AIC	-16701.7	-8088.1	-16698.2	-14148.6	-9610.2	-8097.8	-16696.6
LL	8403.9	4100.0	8401.1	7129.3	4858.1	4101.9	8399.3

Notes: Table 3 has the same control variables as Table 1, so this table presents only the reduced version;
Standard errors in parentheses
="* p<0.10, ** p<0.05, *** p<0.01"

In general, most variables present the expected signs, and they are economically and statistically significant. Market size, as measured by host countries' GDP, is negative and statistically significant, meaning a GDP increase makes greenfield in developing countries less likely. Conversely, home countries' GDP is not statistically significant.

The geographical distance variable (*LnDist*) is positive and statistically significant (Model 1, Table 1) implying a unit increase in distance between a given pair of countries increases the likelihood of greenfield in developing countries. Clearly, this is the case where there is a predominance of horizontal FDI.

As for the variables of interest, the age variables (*Age, AgeSqr*) are not statistically significant (Models 4 to 9, Table 1). This result is inconclusive regarding the hypothesis 1a) and hypothesis 1c). To further explore the age effect we tested for the hypothesis that risk attitude diminishes considerably after the age of 53 (Agarwal et al., 2009). For this scenario, we used a dummy variable (*CEO_Age53*) set to one if CEO age is less than or equal to 53 years of age and zero otherwise. The result (Appendix B, Model 1) is positive and statistically significant. This suggests that if CEO's age is below 53 the likelihood of investment in developing markets increases by 30% (exp(0.264)-1). This result reinforces the idea that risk attitude is age sensitive.

To test for the effect of age on resource commitment (hypothesis 1b) we ran the regression in the equation 2. The result (Models 1 to 8, Table 2) is inconclusive. We crosscheck the results by testing the hypothesis of age less than 53 (*CEO_Age53*) (Appendix C, Models 1 to 8), the results remain inconclusive.

To test for the relationship between herding behaviour and age 1d), we performed the regression with the dependent variable as in equation 3. We found (Model 1, Table 3) a positive relationship between age and herding behaviour, although weak 0.18% (exp(0.0018223)-1). This result does support hypothesis 1d). The results are in the same range as those obtained by

Lakonishok et al. (1992). We crosscheck this result by testing CEO's age under 53 (*CEO_Age53*) (Model 3, Table 3), finding no evidence to support or contradict the hypothesis.

To test for the effect of education (*cod_education*) on the likelihood of choosing a riskier market (Hypothesis 2a), we found (Model 9, Table 1) that as the level of education increases so does the likelihood of greenfield in developing markets. More specifically, a unit increase in the level of education increases the likelihood of investing in developing countries by 9.4% (exp(0.0896)-1). This result supports hypothesis 2a), suggesting highly educated CEO is vital in the selection of new markets opportunities. The result also imply that risk is correlated with the level of instruction of the decision maker. This result is consistent with the findings of Contractor and Lorange (2002), Hambrick and Mason (1984) and Tihanyi et al. (2000).

As for the relationship between resource commitment and level of education (*cod_education*) (hypothesis 2b), the results support the idea that increased level of education increases the level of resources committed to greenfield investments (Models 1 and 2, Table 2). This result suggests that education increases the level of risk tolerance.

To test the hypothesis 2c), whether or not science graduate CEO (*background_science*) are more risk prone, the result (Model 9, Table 1) is inconclusive, positive but not statistically significant. Additionally, we checked for the effect CEO with a background in science with training in business related fields (*Mbamsc*) (e.g., MBAs, Executive Management Programs). The idea is to try to confirm whether CEO's additional training in business related fields curbs/intensifies their risk attitude behaviour. The result (Appendix B, Models 2 and 3) is inconclusive, positive but not statistically significant.

The result of the test of hypothesis 3a), CEO's internationally experience's (*CEO_IntExp1*) impact on the location of investment decision , is inconclusive (Models 1 to 9, Table 1), negative and not statistically significant.

As for the hypothesis 3b), the effect CEO's international experience (*CEO_IntExp1*) on resource commitment (hypothesis 3b), the result (Models 1 to 8, Table 2) is also inconclusive, negative not statistically significant. Caution should be exercised on reading these results, because of the variable is a dummy and does not take into account the intensity of CEO's international experience (e.g., numbers of markets, difference in the markets).

The result of the test of hypothesis 4a), the effect of how CEO's country of origin (*CEO_Nat*) on investment location decisions and attitude toward risk. We found (Model 9, Table 1) that developing countries' CEO are more likely to favour markets perceived riskier. Being a CEO from developing country increase the likelihood of investment in developing country by 340% (exp(1.485)-1). This support the hypothesis 4a), that developing market CEO's are ideal when considering investment in *riskier market*. For firms with the purpose of investing/diversifying to *unknown market* thought should be placed on the CEO's type. This result conforms to the general wisdom that developing countries CEOs are more accustomed to volatile markets, are less likely to be deterred by possible riskiness inherent in any market (Cuervo-Cazurra, 2012).

As for the hypothesis 4b), developing countries CEO will commit more resource to greenfield, the results (Models 1 to 8, Table 2) are inconclusive, positive not statistically significant. Hinting at a positive relationship between resource commitment and developing countries CEOs.

The result of the test of hypothesis 5a), the effect of CEO's power (*CEO_Power1*) on the choice of investment location (Model 9, Table 1) is negative and statistically. It suggests an increase in CEO's power is likely to lead to less investment in *riskier* markets. More precisely, a decrease in the order of 31.7% (1- exp(-0.377)). This result support hypothesis 5a). The result is interesting from a firm's perspective, because it suggests engaging in market diversification requires a more restrained CEO's power. We crosscheck these results by considering the effect

of time on the board and time in the organisation. We found (Appendix B, Model 4) these variables decrease the negative effect of CEO's power, especially, time on the board. They make investment in developing countries 28.5% (1-exp(-0.335)) less likely. This result suggest time in an organisation and time on board curbs lightly CEO's influence.

As for the hypothesis 5b), the impact of CEO's power (*CEO_Power1*) on the capital invested, the result (Models 1 to 8, Table 2) negative and not statistically significant result.

To test for the longevity's effect on CEO's (*tenure, CEO_Tent2, CEO_Tent3*) location decision (hypothesis 6a), that is, CEO's risk attitude, we initially, used simple tenure (time in office). The result (Model 5, Table 1) provided was inconclusive. For our hypothesis, we found longer tenure (*CEO_Tent3*) (Model 9, Table 1) means an increase of investment in developing countries by 39.5%. This suggests the better knowledge acquired during tenure allows CEO to invest in *riskier markets*. For the first years (*CEO_Tent2*) the result is inconclusive, not statistically significant. These results are contrary to our hypothesis.

As for the hypothesis 6b, the effect of tenure (*CEO_Tent2, CEO_Tent3*) in resource commitment. The result (Models 1 to 8, Table 2) is negative and not statistically significant.

6. Robustness check

We carried out robustness test to crosscheck our results (Appendix B and C). We considered the effect of capital invested on the market choice, the size of the project (i.e., jobs created in the host country).

We tested for the total capital invested, and relative capital invested (in terms, of firm's asset, sales, number of employees). We only present the result for capital relative to total asset

(*Lncapital1*), the other results are available upon request. The result (Appendix B, Model 8) in general confirms the above findings. But importantly, they showed that a unit increase in capital invested makes the choice of developing countries less likely.

We also tested for effect of project size in terms of jobs created (*LnJobsCreated*). We found (Appendix B, Model 7) that a unit increase in the number of jobs created makes it more likely the project will be in developing countries. The implication of these results is that as capital increases, less likely are investments in developing countries. In contrast as the need for labour increases the more likely the investment in developing countries.

We also tested for the effect of gender (*GdCode*) on the choice of market and resource commitment. We found no relationship between gender and market choice (Appendix B, Models 6 to 8). The result (Appendix C, Models 6 and 7) for gender and resource commitment we also found no relationship.

We also performed robustness tests regarding the CEO's characteristics and herding behaviour. We found, albeit the weak result (Model 2, Table 3) that powerful CEO (*CEO_Power1*) tend to herd in developed market. We found evidence of herding behaviour for short tenured (*CEO_Tent2*) (Models 1, 3 and 5) and long tenured CEO (*CEO_Tent3*) (Model 4, Table 3). Long tenured CEOs exhibit herding behaviour for developed markets only. This would suggest information is not the reason for their herding. Short tenured CEO (*CEO_Tent2*) exhibit herding behaviour for developing markets. This could be for informational reason, or they do not have full knowledge of knowledge of the firm capabilities (Shen and Cannella, 2002), hence they follow the crowd. These results are interesting because we hypothesise in 7b an inverted U shape for CEO's behaviour in terms of market choice and in this case there seems to be a U shape behaviour for herding of short and long tenured CEO.

7. Conclusion

Most studies on internationalisation process has been mainly focused on either firm, industry and/or countries' characteristics to explain firms' behavior. Seldom CEO's impact is addressed. The present research tries to fill in this gap in the literature by addressing CEO's demograhic characteristics effect on the greenfield decision making. We focused on CEOs because according to the literature they are the main decision makers and enjoy great discretionary power in chosing firms' projects, and consequentely determine the allocation of resource around the globe. We have identified the characteristics with the ability to influence CEO's decision, namely: age, education, international experience, nationality, power (duality), and tenure. Until very recently, most students of FDI have focused on firms, industry, and country characteristics to explain the internationalisation process. Although important to understand the pattern of international investment, the CEOs characteristics is seldom addressed. Despite the fact CEOs are main decision makers (Graham et al., 2013; Rajagopalan et al., 1993; Schoemaker, 1993; Taylor, 1975), and enjoy great discretionary power in choosing firms' investment projects (Morck et al., 1990; Williamson, 1963). CEOs also influence the internationalisation process (Aharoni et al., 2011; Cyert and March, 1963), and consequently, the resource allocation around the globe. In addition, unlike most research in IB we acknowledge the fact that most FDI are not independent from the firm's overall global strategy, hence we use hierarchical models to test for the hypotheses advanced. And, because some models the response variables are binomial we used mixed effect binomial models, those in which the dependent variables are continuous we use the mixed effect linear models. To study CEO's effect we use FT greenfield investment data.

We found CEO's age does not determine location of investment or capital invested. However, we found that risk attitude is associated with certain age group. Our results suggest that up until the age of 53, the CEO exhibits positive attitude toward new and risky markets.

We also found level of education determines CEO's risk attitude, it determines the market choices and capital invested. The results also suggest an increase in the level of CEO's education increases the likelihood of greenfield in developing countries and commitment to more resource to investment. We were not able to confirm whether the type of education is associated or not with increased/diminished risk attitude.

The result regarding CEO's international experience is inconclusive. We found no evidence to support or contradict our hypothesis. This result raises the question of variables used to measure the CEO's international experience. I better approach would be measure the intensity and market diversity experience of the CEO. It also would be helpful to have a CEO's international connection. These data would have provided a more robust findings.

We found CEO's country of origin determines the level of risk attitude s(he) is willing to take. Not surprisingly, in accordance with the literature, we found developing countries CEO's more likely to invest in *risky markets*. However, we could not determine whether or not it is also associated with increased resource commitment.

We found increased CEO's power is associated with less likelihood of investment in developing countries. The more powerful a CEO's the less likely s(he) will exhibit a high risk attitude. We could not find evidence that CEO's power is associated with less resource commitment to investment.

For the tenure hypothesis we found longer tenured CEOs, compared to average tenured, exhibit a more positive attitude toward developed countries' market. This is against our hypothesis.

The results reported here have important implications for firms considering investment in *risky markets* and for resource allocation around the world. Importantly, the findings reveal that CEO's type is important for firm behavior and outcomes. The result support young and highly educated CEO as determining factor in searching for markets considered risky. In addition it

also point to the fact that power full CEO are less likely to invest in perceived *risky markets*. This is significant for efficient resource allocation around the world, because it suggests these CEOs are less likely to invest in *risky markets*. Furthermore, the results also suggest CEO's country of origin is essential to level of risk they are willing to take.

8. References

Adams, R.B., Almeida, H. and Ferreira, D., 2005. Powerful CEOs and their Impact on Corporate Performance. ***Review of Financial Studies***, 18(4), pp.1403–1432.

Agarwal, S., Driscoll, J.C., Gabaix, X. and Laibson, D., 2009. The age of reason: Financial decisions over the life cycle and implications for regulation. ***Brookings Papers on Economic Activity***, 2009(2), pp.51-117.

Aggarwal, S. and Ramaswami, S.N., 1992. Choice of Foreign Market Entry Mode: Impact of Ownership, Location and Internationalization. ***Journal of International Business Studies***, 23, 1, pp. 1 - 27.

Aharoni, Y., Tihanyi, L. and Connelly, B.L., 2011. Managerial Decision-Making in International Business: A forty-five-year Retrospective. ***Journal of World Business***, 46(2), pp.135–142.

Albuquerque, R., 2003. The Composition of International Capital Flows: Risk Sharing Through Foreign Direct Investment, Journal of International Economics, 61, 2, pp. 353 – 383.

Anand, J. and Delios, A., 1996. How Japanese MNCs Have Matched Goals and Strategies in India and the Columbia, ***Journal of World Business***, 31(3), pp.50–62.

Anand, J. and Delios, A., 1997. Location Specificity and the Transferability of Downstream Assets to Foreign Subsidiaries. ***Journal of International Business Studies***, 28, 3, pp. 579 – 603.

Anderson, E. and Gatignon, H., 1986. Modes of Foreign Entry: A Transaction Cost Analysis and Propositions. ***Journal of International Business***, (Fall November 1985), pp.1–26.

Arregle, J., Hébert, L. and Beamish, P.W., 2006. Mode of International Entry : The Advantages of Multilevel Methods. ***MIR - Management International Review***, 46(September 2005), pp.597–618.

Asiedu, E., 2002. On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa different? ***World Development***, 30(1), pp.107–119.

Asiedu, E., 2004. Policy Reform and Foreign Direct Investment in Africa: Absolute Progress but Relative Decline. ***Development Policy Review***, 22, 1, pp. 41 – 48.

Barber, B.M. and Odean, T., 2000. Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors. ***The Journal of Finance***, 55(2), pp.773–806.

Barrell, R., and Pain, N. (1997). Foreign direct investment, technological change, and economic growth within Europe. *The Economic Journal, 107*(445), 1770-1786.

Barkema, H.G. and Vermeule, F., 1997. What Differences in the Cultural Backgrounds of Partners are Detrimental for International Joint Ventures. ***Journal of International Business Studies***, 27(January), pp.285–290.

Barkema, H.G. and Vermeulen, F., 1998. International Expansion through Start-Up or Acquisition: A learning Perspective. ***Academy of Management Journal***, 41(1), pp.7–26.

Bartlett, C. and Ghoshal, S., 1999. ***Managing across Borders: The Transnational Solution***, Harvard Business School Press.

Bartlett, C. and Goshal, S., 2003. Birkinshaw (2003) ***Transnational Management. Text, Cases, and Readings in Cross-Border Management***, Boston MA Irwin.

Bertrand, M. and Schoar, A., 2003. Managing with Style: The Effect of Managers on Firm Policies. ***The Quarterly Journal of Economics***, CXVIII (Issue 4), pp.1169–1208.

Blumentritt, T.P. and Nigh, D., 2002. The Integration of Subsidiary Political Activities in Multinational Corporations. ***Journal of International Business Studies***, 33(1), pp.57–77.

Borensztein, E., De Gregorio, J. and Lee, J.-W., 1998. How does Foreign Direct Investment Affect Economic Growth? ***Journal of International Economics***, 45(1), pp.115–135.

Briscoe, F., Chin, M.K. and Hambrick, D.C., 2014. CEO Ideology as an Element of the Corporate Opportunity Structure for Social Activists. ***Academy of Management Journal***, 57(6), pp.1786–1809.

Brouthers, K.D. and Hennart, J.-F., 2007. Boundaries of the Firm: Insights from International Entry Mode Research. ***Journal of Management***, 33(3), pp.395–425.

Bryk, A. and Raudenbush, S., 1992. ***Hierarchical Linear Models for Social and Behavioural Research: Applications and Data Analysis Methods***,

Bryk, A. and Raudenbush, S., 1988. Toward a More Appropriate Conceptualization of Research on School Effect's: A Three-Level Hierarchical Linear Model. ***American Journal of Education***, 97, 1 (Nov., 1988), pp. 65 - 108.

Carpenter, M.A. and Fredrickson, J.W., 2001. Top Management Teams, Global Strategic Posture, and the Moderating Role of Uncertainty. ***Academy of Management Journal***, 44(3), pp.533–545.

Carter, E.E., 1971. A Behavioural Theory Approach to Firm Investment and Acquisition Decisions. ***The Journal of Finance***, 26(3), p.788.

Caves, R.E., 1974. Multinational Firms, Competition, and Productivity in Host-Country Markets. ***Economica***, 41(162), pp.176–193.

Caves, R.E., 1971. The Industrial Economics of Foreign Investment. ***Economica***, 38(149), pp.1–27.

Cavusgil, S. and Naor, J., 1987. Firm and Management Characteristics as Discriminators of Export Marketing Activity. ***Journal of Business Research***, 15, 3 (June, 1987), pp. 221 – 235.

Chaganti, R. and Sambharya, R.B., 1987. Strategic Orientation and Character9istiscs of Upper Management,. Management, 8 (March 1985), pp.393–401.

Chang, S.-J. and Rosenzweig, P.M., 2001. The Choice of Entry Mode in Sequential. Strategic Management Journal, 776 (November 2000), pp.747–776.

Chevalier, J. and Ellison, G., 1999. Career Concerns of Mutual Fund Managers. The Quarterly Journal of Economics, (May), pp.389–432.

Child, J., 1974. Managerial and Organizational Factors Associated with Company Performance. ***Journal of Management Studies***, pp.175–189.

Child, J., 1975. Managerial and Organizational Factors Associated with Company Performance — Part II A Contingency Analysis. ***Journal of Management Studies***, 17(September), pp.12–27.

Child, J., 1972. Organizational Structure, Environment and Performance: The Role of Strategic Choice. ***Sociology***, 6(1), pp.1–22.

Cho, K. and Padmanabhan, P., 1995. Acquisition versus New Venture: The Choice of Foreign Establishment Mode by Japanese Firms. ***Journal of International Management***, 1(3), pp.255–285.

Cockroft, L. and Riddell, R., 1991. ***Foreign Direct Investment. African External Finance in the 1990s***, Washington, The World Bank.

Contractor, J.F. and Lorange, P., 2002. The Growth of Alliances in the Knowledge Based Economy. ***International Business Review***, 11, pp.485–502.

Cuervo-Cazurra, A., 2012. Extending Theory by Analysing Developing Country Multinational Companies: Solving the Goldilocks debate. ***Global Strategy Journal***, 2(3), pp.153–167.

Cuervo-Cazurra, A. and Genc, M., 2008. Transforming Disadvantages into advantages: Developing Country MNEs in the Least Developed Countries. ***Journal of International Business Studies***, 39(6), pp.957–979.

Custódio, C. and Metzger, D., 2014. Financial Expert CEOs : CEO s Work Experience and Firm's Financial Policies. ***Journal of Financial Economics***, 114(1), pp.125–154.

Custódio, C. and Metzger, D., 2013. How Do CEOs Matter ? The Effect of Industry Expertise on Acquisition Returns. ***The Review of Financial Studies***, 26(8), pp.2007–2047.

Cyert, R. and March, J., 1963. ***A Behavioural Theory of the Firm***. Englewood Cliffs, NJ.

Daily, C.M., Certo, S.T. and Dalton, D.A.N.R., 2000. International Experience in the Executive Suite : The Path to Prosperity ? ***Strategic Management Journal***, 523(February 1999), pp.515–523.

Daily, C.M. and Dalton, D.R., 1997. CEO and Board Chair Roles Held Jointly or Separately: Much Ado About Nothing? ***Academy of Management Perspectives***, 11(3), pp.11–20.

Daniels, J.D. and Arpan, J., 1972. Comparative Home Country Influences on Management Practices Abroad. ***Academy of Management Journal***, 15(3), pp.305–315.

Datta, D.K. and Guthrie, J.P., 1994. Executive Succession : Organizational Antecedents of

CEO Characteristics. ***Strategic Management Journal***, 15(April 1993), pp.569–577.

Datta, D.K. and Rajagopalan, N., 1998. Industry Structure and CEO Characteristics: An Empirical Study of Succession Events. ***Strategic Management Journal***, 19(June 1995), pp.833–852.

Dearborn, D. and Simon, H., 1958. Selective perception: A note on the departmental identifications of executives. ***Sociometry***, 21, 2 (June, 1958), pp. 140 – 144.

De Mello, L. R. (1999). Foreign direct investment-led growth: evidence from time series and panel data. ***Oxford Economic Papers***, *51*(1), 133-151.

Dixit, A.K., 1989. Entry and Exit Decisions under Uncertainty. ***Journal of Political Economy***, 97(3), pp.620–638.

Dunning, J.H., 1998. Location Enterprise : The Multinational Neglected. ***Journal of International Business Studies***, 40(1), pp.45–66.

Dutton, J. and Duncan, R., 1987. The Influence of the Strategic Planning Process on Strategic Change. ***Strategic Management Journal***, 8, pp.103–116.

El-Khatib, R., Fogel, K. and Jandik, T., 2015. CEO Network Centrality and Merger Performance. ***Journal of Financial Economics***, 116(2), pp.349–382.

Erramilli, M.. K., 1991. The Experience Factors in Foreign Market Entry Behaviour of Service Firms. ***Journal of International Business Studies***, pp.479–501.

Erramilli, M.K. and Rao, C.P., 1993. Service Firms' International Entry-Mode Choice: A Modified Transaction-Cost Analysis Approach. ***Journal of Marketing***, 57(3), pp.19–38.

Fama, E., 1980. Agency Problems and the Theory of the Firm. ***The Journal of Political Economy***, 88, 2, pp. 288 – 307.

Finkelstein, S., 1992. Power in Top Management Teams: Dimensions, Measurement, and Validation. ***The Academy of Management Journal,*** 35(3), pp.505–538.

Finkelstein, S. and D'Aveni, R.A.D., 1994. CEO Duality As a Double-Edged Sword : How Boards of Directors Balance Entrenchment Avoidance and Unity. ***Academy of Management Journal***, 37(5), pp.1079–1108.

Finkelstein, S. and Hambrick, D.C., 1990. Top-Management-Team Tenure and Organiza- tional Outcomes : The Moderating Rosie of Managerial Discretion. ***Administrative Science Quarterly***, 35(1987), pp.484–503.

Fredrickson, J. and Mitchell, T., 1984. Strategic Decision Processes: Comprehensiveness and Performance in an Industry with an Unstable Environment. ***Academy of Management Journal***, 27, 2 (Jun. 1984), pp. 399 – 423.

Gatignon, H. and Anderson, E., 1988. The Multinational Corporation's Degree of Control over Foreign Subsidiaries: An Empirical Test of a Transaction Cost Explanation. ***Journal of Law, Economics, and Organization***, 4, 2, pp. 305 – 336.

Geletkanycz, M. a, 1997. The Salience of "Culture's Consequences" : The Effects of Cultural Values on Top Executive Commitment to the Status Quo. ***Strategic Management Journal***, 18(September 1996), pp.615– 634.

Goldstein, H., 2008. Application 1 : The Use of Performance Indicators in Education.

Graham, J.R., Harvey, C.R. and Puri, M., 2013. Managerial Attitudes and Corporate Actions. ***Journal of Financial Economics***, 109(1), pp.103–121.

Grinstein, Y. and Hribar, P., 2004. CEO Compensation and Incentives: Evidence from MandA Bonuses. ***Journal of Financial Economics***, 73(1), pp.119–143.

Gupta, A. and Govindarajan, V., 1986. Resource Sharing among SBUs: Strategic Antecedents and Administrative Implications. ***Academy of Management Journal***, 29, 4 (Dec., 1986), pp. 695 – 714.

Gupta, A.K. and Govindarajan, V., 1984. Business Unit Strategy, Managerial Characteristics, and Business Unit Effectiveness at Strategy Implementation. ***Academy of Management Journal***, 27(1), pp.25–41.

Guthrie, J.P. and Olian, J.D., 1991. Does Context Affect Staffing Decisions ? The Case of General Managers. ***Personnel Psychology***, 44, 2 (June 1991), pp. 263 – 292.

Hambrick, D. and Abrahamson, E., 1995. Assessing Managerial discretion across industries: A multimethod approach. ***Academy of Management Journal***, 38, 5 (Oct., 1995), pp. 1427 – 1441.

Hambrick, D. and Finkelstein, S., 1987. Managerial Discretion: A Bridge between Polar Views of Organizational Outcomes. ***Research in Organizational Behaviour***, 9, 369 – 406.

Hambrick, D.C. and Fukutomi, G.D.S., 1991. The Seasons of a CEO S Tenure. ***Academy of Management Review***, 16(4), pp.719–742.

Hambrick, D.C. and Mason, P. a., 1984. Upper Echelons: The Organization as a Reflection of Its Top Managers. ***Academy of Management Review***, 9(2), pp.193–206.

Hamilton, L.C., 2012. ***Statistics with Stata: version 12***. Cengage Learning.

Hannan, M. and Freeman, J., 1977. The Population Ecology of Organizations. ***American Journal of Sociology***, 82, 5 (March 1977), pp. 929 - 964.

Harzing, A., 2002. Acquisitions versus Greenfield Investments: International Strategy and. ***Strategic Management Journal***, 227(September 2000), pp.211–227.

Hausmann, R. and Fernandez-Arias, E., 2000. Foreign Direct Investment: Good Cholesterol? (March 2000). ***IDB Working Paper nº 348***,.

Hedeker, D., 2003. A Mixed-Effects Multinomial Logistic Regression Model. ***Statistics in Medicine***, 22(9), pp.1433–1446.

Heidenreich, S., Mohr, A. and Puck, J., 2015. Political Strategies, Entrepreneurial Overconfidence and Foreign Direct Investment in Developing Countries. ***Journal of World Business***, 50, 4, pp. 793 – 803.

Heiner, R., 1983. The Origin of Predictable Behaviour. ***The American Economic Review***, 73, 4, pp. 560 – 595.

Hennart, J.-F. and Park, Y.-R., 1993. Greenfield vs. Acquisition: The Strategy of Japanese Investors in the United States. ***Management Science***, 39(9), pp.1054–1070.

Herrmann, P. and Datta, D.K., 2006. CEO Experiences : Effects on the Choice of FDI Entry Mode. ***Journal of Management***, 43:4(June), pp.757–778.

Herrmann, P. and Datta, D.K., 2002. Mode : Choice of Foreign Entry Empirical. Journal of International Business Studies, 33(3), pp.551–569.

Herrmann, P. and Datta, D.K., 2005. Relationships between Top Management Team Characteristics and International Diversification : An Empirical Investigation British, ***Journal of Management***, 16, pp.69–78.

Hill, C.W.L., Hwang, P. and Kim, W.C., 1990. An Eclectic Theory of the Choice of International Entry Mode. ***Strategic Management Journal***, 11(2), pp.117–128.

Hitt, M.A. and Tyler, B.B., 1991. Strategic Decision Models : Integrating In different Perespectives. ***Strategic Management Journal***, 12(December 1990), pp.327–351.

Hong, H., Kubik, J. and Solomon, A., 2000. Security Analysts' Career Concerns and Herding of Earnings Forecasts. ***The RAND Journal of Economics***, 31(1), p.121.

Hsu, W.T., Chen, H.L. and Cheng, C.Y., 2013. Internationalization and Firm Performance of SMEs: The Moderating Effects of CEO Attributes. ***Journal of World Business***, 48(1), pp.1–12.

Ireland, R.D. et al., 1987. Strategy Formulation Processes: Differences in Perceptions of Strength and Weaknesses Indicators and Environmental Uncertainty by Managerial Level. ***Strategic Management Journal***, 8(5), pp.469–485.

Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. ***AEA Papers and Proceedings***, Vol. 76(2), pp.323–329.

Johanson, J. and Vahlne, J.-E., 1977. Process of the Internationalization Development Firm Model of Knowledge Foreign and Increasing Market Commitments. ***Journal of International Business Studies***, 8(1), pp.23–32.

Kahneman, D. and Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. ***Econometrica***, 47(2), pp.263–292.

Katz, R., 1982. The Effects of Longevity on Project Communication and Performance. ***Administrative Science Quarterly***, 27, pp.81–108.

Kinoshita, Y. and Mody, A., 2001. Private Information for Foreign Investment in Emerging Economies. ***Canadian Journal of Economics Revue Canadienne d`Economique***, 34(2), pp.448–464.

Kobrin, S., 1979. Political Risk: A Review and Reconsideration. ***Journal of International Business Studies***, 10, pp.67–80.

Kogut, B. and Singh, H., 1988. The Effect of National Culture on the Choice of Entry Mode. ***Journal of International Business Studies***, 19(3), pp.411–432.

Lakonishok, J., Shleifer, A. and Vishny, R.W., 1992. The Impact of Institutional Trading of Stock Prices. ***Journal of Financial Economics***, 32, pp.23–43.

Larimo, J., 1995. The Foreign Direct Investment Decision Process Case Studies of Different Types of Decision Processes in Finnish Firms. ***Journal of Business Research***, 2963(94), pp.25–55.

Lawrence, B.S., 1997. Demography. Organization Science, 8(January-February), pp.1–22.

Leckie, G., 2008. Module 11 : Three-Level Multilevel Models. MLWin lesson, 11, pp.1–47.

Li, J. and Tang, Y., 2010. CEO Hubris and Firm Risk Taking in China: The Moderating Role of Managerial Discretion. ***Academy of Management Journal,*** 53 (1), 45 – 68.

Liesch, P. W.; Welch, L. S.; Welch, D.; McGaughey, S. L.; Petersen, B. and Lamb, P., 2002. Evolving Strands of Research on Firm Internationalization: An Australian-Nordic Perspective. ***International Studies of Management and Organization***, 32(1), pp.16–35.

Lilienfeld-Toal, U. Von and Ruenzi, S., 2014. CEO Ownership, Stock Market Performance, and Managerial Discretion. ***The Journal of Finance***, LXIX(3), pp.1013–1050.

Liu, Y. and Jiraporn, P., 2010. The Effect of CEO Power on Bond Ratings and Yields. ***Journal of Empirical Finance***, 17(4), pp.744–762.

Lord, M.D., 2000. Corporate political strategy and legislative decision making: The impact of corporate legislative influence activities. ***Business & Society***, 39(1), pp.76-93.

Lucas, R. Jr., Why Doesn't Capital Flow from Rich to Poor Countries? ***The American Economic Review***, 80 (2),. 92-96.

Luo, Y., 2001. Determinants of Entry in an Emerging Economy: A Multilevel Approach. ***Journal of Management Studies***, 38(3), pp.443–472.

Malmendier, U. and Tate, G., 2005a. CEO Overconfidence and Corporate Investment. ***Journal of Finance***, 60(6), pp.2661–2700.

Malmendier, U. and Tate, G., 2005b. Does Overconfidence Affect Corporate Investment? CEO Overconfidence Measures Revisited. ***European Financial Management***, 11(5), pp.649–659.

Malmendier, U. and Tate, G., 2008. Who Makes Acquisitions? CEO Overconfidence and the Market's Reaction. ***Journal of Financial Economics***, 89(1), pp.20–43.

March, J.C. and March, J.G., 1977. Almost Random Careers: The Wisconsin School Superintendence 1940-1972. ***Administrative Science Quarterly***, 22. 3 (Sept. 1977), pp. 377 – 409.

Melitz, J. and Toubal, F., 2014. Native Language, Spoken Language, Translation and Trade. ***Journal of International Economics***, 93(2), pp.351–363.

Miller, D., 1991. Stale in the Saddle: CEO Tenure and the Match Between Organization and Environment. ***Management Science***, 37(1), pp.34–52.

Miller, D., 1988. The Ethical Significance of Nationality. ***Ethics***, 98(4), pp.647–662.

Miller, D. and Friesen, P.H., 1982. Innovation in Conservative and Entrepreneurial Firms : Two Models of Strategic Momentum. ***Strategic Management Journal***, 3, pp.1–25.

Morck, R., Shleifer, V., Vishny, R. W., Shapiro, M. and Poterba, J. M., 1990. The Stock Market and Investment : Is the Market a Sideshow ? The Stock Market and Investment : Is the Market a Sideshow ? ***Brookings Papers on Economic Activity***, 1990(2), pp.157–215.

Myers, S.C. and Majluf, N.S., 1984. Corporate Financing and Investment Decisions when Firms Have Information that Investors do not Have. ***Journal of Financial Economics***, 13(2), pp.187–221.

Nachum, L. and Zaheer, S., 2005. The Persistence of Distance? The Impact of Technology on MNE Motivations for Foreign Investment. ***Strategic Management Journal***, 26(8), pp.747–767.

Newman, K.L. and Nollen, S.D., 1996. Culture and Congruence: The Fit between

Management Practices and National Culture. ***Journal of International Business Studies***, 27(4), pp.753–779.

Nielsen, B.B. and Nielsen, S., 2011. The Role of Top Management Team International Orientation in International Strategic Decision-Making: The Choice of Foreign Entry Mode. ***Journal of World Business***, 46(2), pp.185– 193.

Nielsen, S. and Nielsen, B.B., 2008. the Effects of Top Management Team and Board Nationality Diversity and Compensation Systems on Firm Performance. ***Academy of Management Annual Meeting Proceedings***, 8(1), pp.1–6.

Ocasio, W., 1994. Political Dynamics and the Circulation of Power: CEO Succession in U.S. Industrial Corporations, 1960-1990. ***Administrative Science Quarterly***, 39(2), pp.285–312.

Pennings, J.M., Barkema, H.G. and Douma, S., 1994. Organizational Learning and Diversification. ***Academy of Management Journal***, 37(3), pp.608–640.

Pfeffer, J. and Salancik, G.R., 1977. Organizational Context and the Characteristics and Tenure of Hospital Administrators. ***Academy of Management Journal***, 20(1), pp.74–88.

Pigato, M., 2000. Foreign Direct Investment in Africa: Old Tales and New Evidence Washington. ***The World Bank***.

Pinheiro-Alves, R., 2011. Behavioural Influences in Portuguese Foreign Direct Investment. ***Journal of Socio-Economics***, 40(4), pp.394–403.

Porter, M., 1986. Competitive in Global Industries: A Conceptual Framework. ***Hitotsubashi Bijinesu Rebyū [Hitotsubashi Business Review***, 35(4), p.CH1.

Prendergast, C. and Stole, L., 1996. Impetuous Youngsters and Jaded Old-Timers: Acquiring a Reputation for Learning. ***Journal of Political Economy***, 104, 6 (Dec. 1996), pp. 1105 – 1134.

Rajagopalan, N. and Datta, D., 1996. CEO Characteristics: Does Industry Matter? ***Academy of Management Journal***, 39, 1, pp. 197- 215.

Rajagopalan, N., Rasheed, A.M.A. and Datta, D.K., 1993. Strategic Decision Processes Critical Review and Future Directions. ***Journal of Management***, 19(2), pp.349–384.

Raudenbush, S. and Bryk, A., 2002. ***Hierarchical Linear Models: Applications and Data Analysis Methods***, (2nd ed.). Thousand Oaks: Sage Publications.

Reis, A.B., 2006. Welfare, Taxes and Foreign Investment. ***Journal of Economic Dynamics and Control***, 30, pp.1045–1061.

Rose, A. K. 2000. One money, one market: the effect of common currencies on trade. ***Economic Policy***, 15(30): 7-46.

Roth, K., 1995. Managing International Interdependence : CEO Characteristics in a

Resource-Based Framework. ***The Academy of Management***, 38, 1, pp. 200 – 231.

Sambharya, R.B., 1996. Foreign Experience of Top Management Teams and International Diversification Strategies of U .S. Multinational Corporations. ***Strategic Management Journal***, 17(February), pp.739–746.

Scharfstein, D. and Stein, J., 1990. Herd Behaviour and Investment. ***The American Economic Review***, 80, 3, pp. 465 – 479.

Schneider, S.C., 1989. Strategy Formulation: The Impact of National Culture. ***Organization Studies***, 10(2), pp.149–168.

Schoemaker, P.J.H., 1993. Strategic Decisions in Organizations - Rational and Behavioural Views. ***Journal of Management Studies***, 30(1), pp.107–129.

Schuman, H. and Scott, J., 1989. Generations and Collective Memories. ***American Sociological Review***, 54(3), pp.359–381.

Schwenk, C.R., 1984. Cognitive Simplification Processes in Strategic Decision-Making. ***Strategic Management Journal***, 5(2), pp.111–128.

Schwenk, C.R., 1988. The Cognitive Perspective on Strategic Decision Making. ***Journal of Management Studies***, (January), pp.41–55.

Serfling, M.A., 2014. CEO Age and the Riskiness of Corporate Policies. ***Journal of Corporate Finance***, 25, pp.251–273.

Sexton, D. and Bowman, N., 1985. The Entrepreneur: A Capable Executive and More. ***Journal of Business Venturing***, 1 , 1, pp. 129 – 140.

Shane, S., 1995. Uncertainty Avoidance and the Preference for Innovation Championing Roles. ***Journal of International Business Studies***, 26(1), pp.47–68.

Shen, W. and Cannella, A.A., 2002. Revisiting the Performance Consequences of CEO Succession: the Impacts of Successor Type, Post succession Senior Executive Turnover, and Departing CEO Tenure. ***Academy of Management Journal***, 45(4), pp.717–733.

Shleifer, A. and Vishny, R.W., 1989. Management Entrenchment. The Case of Manager-Specific Investments. ***Journal of Financial Economics***, 25(1), pp.123–139.

Shrivastava, P. and Grant, J.H., 1986. Empirically Derived Models of Strategic Decision-Making Processes. ***Strategic Management Journal***, 6(2), pp.97–113.

Simon, H.B., 1978. Rational Decision Making in Business Organizations. ***The American Economic Review***, 69(4), pp.493–5113.

Slangen, A., 2011. A Communication-Based Theory of the Choice Between Greenfield and Acquisition Entry. ***Journal of Management Studies***, 48. 8, pp. 1699 – 1726.

Slangen, A. and Hennart, J., 2008a. Do foreign Greenfields Outperform Foreign Acquisitions or Vice Versa? An Institutional Perspective. ***Journal of Management Studies***, 45(7), pp.1301–1328.

Slangen, A. and Hennart, J., 2008b. Do Multinationals Really Prefer to Enter Culturally Distant countries Through Greenfields rather than through Acquisitions? The Role of Parent experience and subsidiary autonomy. ***Journal of International Business Studies***, 39(3), pp.472–490.

Taylor, R.N., 1975. Age and Experience as Determinants of Managerial Information Processing and Decision Making Performance. ***Academy of Management Journal***, 6(4), pp.74–82.

Tihanyi, L. et al., 2000. Composition of the Top Management Team and Firm Diversification. ***Journal of Management*** , pp.1157–1177.

Tversky, A. and Kahneman, D., 1974. ***Judgment under Uncertainty: Heuristics and Biases***. Science (New York, N.Y.), 185(4157 (Sept. 27, 1974)), pp.1124–31.

Tversky, A. and Kahneman, D., 1981. The Framing of Decisions and the Psychology of Choice. Science, 211(4481), pp.453–458.

Tyler, B.B. and Steensma, H.K., 1998. The Effects of Executives' Experiences and Perceptions on Their Assessment of Potential Technological Alliances, ***Strategic Management Journal***, 965(November 1997), pp.939–965.

Tzu, S., 2007. ***The Art of War***,

UNCTAD, 2011. ***World investment report 2011: Non- Equity Modes of International Production and Development***, United Nations Conference for Trade and Development, Geneva.

Wahab, A., 1977. Foreign Investment Decisions of Western Canadian Firms. Diss. University of British Columbia.

Wiersema, M.F. and Bantel, K.A., 1992. Top Management Team Demography and Corporate Strategic Change. ***Academy of Management Journal***, 35(1), pp.91–122.

Williamson, O.E., 1963. Managerial Discretion and Business Behaviour. ***American Economic Review***, pp.1032–1057.

Yim, S., 2013. The acquisitiveness of youth : CEO age and acquisition behaviour $. ***Journal of Financial Economics***, 108(1), pp.250–273.

Yiu, D. and Makino, S., 2002. The Choice between Joint Venture and Wholly Owned Subsidiary: An Institutional Perspective. ***Organization Science***, 13(6), pp.667–683.

9. Appendices

Appendix A0 - Distribution of Greenfield per Year and Industries, 2003–2012

Panel A: Distribution by Year

	Frequency	Percent
2003	4173	8%
2004	4851	10%
2005	5099	10%
2006	4928	10%
2007	5165	11%
2008	5199	11%
2009	4943	10%
2010	4671	10%
2011	4715	10%
2012	5393	11%
Total	49137	100%

Panel B: Distribution by Industry Activity

	Frequency	Percent
Business Services	8566	17.4%
Construction	2930	6.0%
Customer Contact Centre	748	1.5%
Design, Development and Testing	2359	4.8%
Education and Training	594	1.2%
Electricity	840	1.7%
Extraction	852	1.7%
Headquarters	1942	4.0%
ICT and Internet Infrastructure	910	1.9%
Logistics, Distribution and Transportation	3046	6.2%
Maintenance and Servicing	642	1.3%
Manufacturing	11164	22.7%
Recycling	171	0.3%
Research and Development	1225	2.5%
Sales, Marketing and Support	12465	25.4%
Shared Services Centre	353	0.7%
Technical Support Centre	330	0.7%
Total	49137	100,0%

Appendix A1 – Variables Descriptions and Sources

Variables Name	Variable Code	Source I	Source II	Source III	Proxy
CEO Characteristics					
CEO Age	Age/AgeSqr/CEO_Age53	Amadeus	Thomson Reuters	Boardex	Risk Taking/Infomation Processing
CEO Education:					
CEO MBA Dummy	mbamsc	Bloomberg	Amadeus		
CEO Level of Education	cod_education	Bloomberg	Amadeus		
Econ Dummy	background_econ	Bloomberg	Amadeus		
SEM Dummy	background_science	Bloomberg	Amadeus		
CEO Gender	GdCode	Bloomberg	Thomson Reuters	Boardex	
CEO International Experience	CEO_IntEx1	Bloomberg	Thomson Reuters	Boardex	
CEO Nationality	CEO_Nat	Amadeus	Thomson Reuters	Boardex	
CEO Power - Duality (Chair Dummy)	ceo_pwr1	Bloomberg	Thomson Reuters	Boardex	
CEO Tenure	Tenure/CEO_Tent1/CEO_Tent2/CEO_Tent3	Bloomberg	Thomson Reuters	Boardex	
CEO Time in Board	timeonboardyrs_since				
CEO Time in Organisation	timeinorganisationyrs_since				
First Year as CEO Dummy	Age0	Bloomberg	Thomson Reuters	Boardex	
Firm Characteristics					
Firm Age	Firm_Age	Amadeus	Thomson Reuters	Boardex	
Firm RandD	LnRD	Amadeus	Thomson Reuters		

Variables Name	Variable Code	Source I	Source II	Source III	Proxy
Exports over Total Sales	FrmIntExp1	Amadeus	Thomson Reuters		Firm international experience
Research and Development (RandD)	LnRD	Amadeus	Thomson Reuters		
Project Characteristics					
Capital Invested	LnCapital/LnCapital1/ LnCapital2/LnCapital 3	Financial Times			
Jobs Created	LnJobsCreated	Financial Times			
Firm Performance:					
Return on Asset (ROA)	roa_1	Amadeus	Thomson Reuters	Boardex	
Return on Equity (ROE)	roe_1	Amadeus	Thomson Reuters	Boardex	
Firm Size:					
Total Sales	LnNetSlsRvn	Amadeus	Thomson Reuters		
Number of Employees	LnEmployee	Amadeus	Thomson Reuters		
Total Asset	TotaAsset	Amadeus	Thomson Reuters		
Firm's Financial Constraint:					
Debt Ratio (Debt over Capital)	TotDbtCpt	Amadeus	Thomson Reuters		Financial distress
Industry Characteristics					
Country Level Characteristics					
Country GDPs	Lngdp_orig/Lngdp_des	The World Bank			

Variables Name	Variable Code	Source I	Source II	Source III	Proxy
Distance	Lndistance	CEPII			
Language Similarity	lng_simasjp				
Gross National Income (000000US$)	GNI	The World Bank Development Indicators			Market Size
Inflation, consumer prices (annual %)	Infl_Dest	The World Bank Development Indicators	IMF		Macro Economic Stability
Country Differential Growth Rate	DifGrwth	The World Bank Development Indicators			Market Attractiveness
Country Legal Origin	LgDum	Andrei Shleifer Website	CIA Factbook	CEPII database	
Labour Force with Secondary Schooling	LbFcSec_Dest	The World Bank Development Indicators			Human Capital Development
Political Stability and Absence of Violence	PRStbPltVlc_Dest	Political Risk Services International Country Risk Guide (PRS)	The World Bank Development Indicators		Political Stability

Appendix B – Robustness Test for Mixed Effect Binomial Model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
CEO_Age53	0.264* (0.150)	0.389 (0.261)	0.261* (0.146)		0.264* (0.150)	0.389 (0.264)	0.260* (0.151)	0.394 (0.265)
cod_education	0.0925*** (0.0359)	0.341** (0.138)	0.107** (0.0466)	0.0635 (0.0408)	0.0925*** (0.0359)	0.281** (0.137)	0.0882** (0.0362)	0.285** (0.140)
CEO_IntEx1	-0.179 (0.233)	-0.0973 (0.760)	-0.201 (0.231)	-0.335 (0.250)	-0.179 (0.233)	-0.0873 (0.754)	-0.197 (0.242)	-0.100 (0.754)
CEO_Nat	1.531*** (0.432)	-1.715 (7.637)	1.500*** (0.421)	1.474*** (0.441)	1.531*** (0.432)	4.552 (9.871)	1.550*** (0.432)	1.551 (9.238)
ceo_pwr1	-0.397** (0.157)	-0.420 (0.380)	-0.458*** (0.153)	-0.333** (0.169)	-0.397** (0.157)	-0.179 (0.404)	-0.369** (0.157)	-0.187 (0.407)
CEO_Tent2	0.0900 (0.133)	0.0246 (0.182)	0.270** (0.127)	0.0131 (0.155)	0.0900 (0.133)	-0.0208 (0.185)	0.0795 (0.136)	-0.0184 (0.185)
CEO_Tent3	0.332* (0.190)	0.798*** (0.301)	0.360* (0.187)	0.575*** (0.218)	0.332* (0.190)	0.899*** (0.308)	0.312 (0.191)	0.927*** (0.309)
background_science		-0.299 (0.473)	0.000222 (0.197)					
Mbamsc			0.143 (0.217)					
Age				0.0706 (0.134)				
AgeSqr				-0.000770 (0.00119)				
timeonboardyrs_since				0.0132 (0.0175)				
timeinorganisationyrs_since				-0.00430				

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
				(0.00901)				
GdCode						-0.730	-0.259	-0.769
						(0.951)	(0.453)	(0.951)
LnJobsCreated							0.219***	
							(0.0475)	
LnCapital1								-12.44*
								(7.192)
_cons	12.19***	20.84	10.76***	-4.928	12.19***	23.00*	12.17***	23.10*
	(1.809)	(14.44)	(1.609)	(29.40)	(1.809)	(13.60)	(1.955)	(13.64)
Level 2 Random Intercept								
_cons	-8.557	1.126***	-11.62	-15.75	-8.557	1.396***	-4.098	1.415***
	(716.7)	(0.0502)	(7603.2)	(574899.0)	(716.7)	(0.0326)	(7.241)	(0.0353)
Level 2 Random Intercept and Random Slope								
_cons	-0.637***	3.060***	-0.670***	-0.808***	-0.637***	2.988***	-0.717	3.041***
	(0.178)	(0.0819)	(0.179)	(0.237)	(0.178)	(0.121)	(0.899)	(0.125)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3463	3463	3352	2949	3463	3456	3456	3456
BIC	2796.7	3741.4	2714.5	2429.5	2796.7	3777.7	2787.2	3788.5
AIC	2483.0	3421.6	2445.4	2106.1	2483.0	3458.0	2461.3	3462.6
LL	-1190.5	-1658.8	-1178.7	-999.1	-1190.5	-1677.0	-1177.7	-1678.3

Notes: Appendix B has the same control variables as Table 4, so this table only presents the reduced version;
Standard errors in parentheses
="* p<0.10, ** p<0.05, *** p<0.01"

Appendix C – Robustness Test for Mixed Effect Linear Model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
CEO_Age53	-0.0863 (0.0632)	-0.0908 (0.0628)	-0.0910 (0.0623)		-0.0863 (0.0632)	-0.0870 (0.0633)	-0.0710 (0.0475)
cod_education	0.0275* (0.0163)			0.0397** (0.0195)	0.0275* (0.0163)	0.0276* (0.0163)	0.0202 (0.0131)
CEO_IntEx1	-0.145 (0.105)	-0.135 (0.104)	-0.139 (0.104)	-0.0359 (0.120)	-0.145 (0.105)	-0.149 (0.105)	-0.169** (0.0839)
CEO_Nat	0.264 (0.202)	0.238 (0.199)	0.234 (0.200)	0.246 (0.221)	0.264 (0.202)	0.262 (0.201)	0.300* (0.168)
ceo_pwr1	-0.00217 (0.0698)	-0.00508 (0.0690)	-0.00548 (0.0688)	-0.0417 (0.0796)	-0.00217 (0.0698)	-0.0149 (0.0705)	-0.0225 (0.0555)
CEO_Tent2	-0.0373 (0.0532)	-0.0434 (0.0530)	-0.0543 (0.0544)	-0.00379 (0.0632)	-0.0373 (0.0532)	-0.0266 (0.0542)	-0.00625 (0.0389)
CEO_Tent3	-0.00936 (0.0771)	-0.00762 (0.0768)	-0.0115 (0.0768)	-0.0483 (0.0940)	-0.00936 (0.0771)	-0.0130 (0.0774)	-0.0292 (0.0567)
background_science		0.0247 (0.0786)	0.0180 (0.0786)				
mbamsc			0.0285 (0.0827)				
Age				0.0586 (0.0612)			
AgeSqr				-0.000498 (0.000544)			
timeonboardyrs_since				-0.0149* (0.00855)			
timeinorganisationyrs_since				0.00210 (0.00420)			
GdCode						0.114 (0.176)	-0.0665 (0.135)
LnJobsCreated							0.767*** (0.0131)
_cons	0.595	0.556	0.565	24.73*	0.595	0.451	-0.876

	(0.694)	(0.689)	(0.687)	(14.22)	(0.694)	(0.718)	(0.561)
Level 2 Random Intercept							
_cons	-11.06	-17.05***	-14.43***	-11.90***	-11.06	-12.20***	-16.70***
	(232.8)	(1.739)	(1.755)	(1.517)	(232.8)	(1.771)	(1.567)
Level 2 Random Intercept and Slope							
_cons	-1.140***	-1.176***	-1.170***	-1.124***	-1.140***	-1.150***	-1.206***
	(0.123)	(0.125)	(0.126)	(0.155)	(0.123)	(0.126)	(0.103)
lnsig_e							
_cons	0.196***	0.197***	0.184***	0.206***	0.196***	0.197***	-0.153***
	(0.0124)	(0.0123)	(0.0126)	(0.0134)	(0.0124)	(0.0124)	(0.0124)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3463	3463	3352	2949	3463	3456	3456
BIC	11729.9	11732.5	11294.7	10120.6	11729.9	11720.2	9362.0
AIC	11410.1	11412.7	10970.5	9791.2	11410.1	11394.4	9030.0
LL	-5653.0	-5654.4	-5432.2	-4840.6	-5653.0	-5644.2	-4461.0

Notes: Appendix C has the same control variables as Table 4, so this table only presents the reduced version;
Standard errors in parentheses
="* p<0.10, ** p<0.05, *** p<0.01"

Appendix D – Correlation matrix

	Mean	S.D.	Min	Max	Age	AgeSqr	cod_education	CEO_IntEx1	CEO_Nat	ceo_pwr1	Tenure	roa_1	Firm_Age	FrmIntExp1	LnEmployee	LnRD	LnNetSlsRvn	TotDbtCpt
Age	55.73	7.35	24	93	1													
AgeSqr	3159.9	840.85	576	8649	0.99 0.00	1												
cod_education	2.31	2.45	0	7	0.09 0.00	0.08 0.00	1											
CEO_IntEx1	0.07	0.26	0	1	-0.13 0.00	-0.14 0.00	-0.09 0.00	1										
CEO_Nat	0.07	0.26	0	1	-0.03 0.00	-0.03 0.00	0.08 0.00	0.24 0.00	1									
ceo_pwr1	0.41	0.49	0	1	0.28	0.28	0.07	-0.13	-0.1	1								

	Mean	S.D.	Min	Max	Age	AgeSqr	cod_education	CEO_IntEx1	CEO_Nat	ceo_pwr1	Tenure	roa_1	Firm_Age	FrmIntExp1	LnEmployee	LnRD	LnNetSlsRvn	TotDbtCpt
					0.00	0.00	0.00	0.00	0.00									
Tenure	5.55	5.78	-3	57	0.35 0.00	0.38 0.00	0.01 (0.09)	-0.1 0.00	-0.01 (0.52)	0.22 0.00	1							
roa_1	0.04	0.62	-75.93	2.81	-0.02 (0.03)	-0.02 (0.03)	0.03 0.00	0.01 (0.27)	0 (1.00)	0 (0.85)	0 (0.63)	1						
Firm_Age	72.22	54.61	-12	534	0.06 0.00	0.05 0.00	0.06 0.00	0.04 0.00	0.05 0.00	-0.16 0.00	-0.03 (0.01)	-0.03 0.00	1					
FrmIntExp1	48.48	33.14	-73.47	2694.41	0 (0.68)	-0.01 (0.16)	0.12 0.00	0.05 0.00	-0.12 0.00	-0.06 0.00	-0.02 (0.09)	0.08 0.00	0.06 0.00	1				
LnEmployee	9.83	2.26	0	14.6	0.19 0.00	0.18 0.00	0.51 0.00	0.02 0.00	0 (0.76)	0.14 0.00	-0.04 0.00	0.01 (0.06)	0.25 0.00	0.13 0.00	1			

	Mean	S.D.	Min	Max	Age	AgeSqr	cod_education	CEO_IntEx1	CEO_Nat	ceo_pwr1	Tenure	roa_1	Firm_Age	FrmIntExp1	LnEmployee	LnRD	LnNetSlsRvn	TotDbtCpt
LnRD	6.92	3.15	0	16.26	0.28	0.29	0.35	-0.16	0.03	0.1	-0.03	0	0.01	0.04	0.52	1		
					0.00	0.00	0.00	0.00	(0.01)	0.00	(0.03)	(0.90)	(0.58)	0.00	0.00			
LnNetSlsRvn	8.75	2.37	0	13.06	0.18	0.17	0.49	0.01	-0.06	0.08	-0.11	0	0.26	0.14	0.9	0.57	1	
					0.00	0.00	0.00	(0.03)	0.00	0.00	0.00	(0.93)	0.00	0.00	0.00	0.00		
TotDbtCpt	0.44	1.77	-16.58	186.51	0.1	0.1	0.13	0	0.05	0.02	-0.01	-0.01	0.16	-0.03	0.01	-0.01	0.06	1
					0.00	0.00	0.00	(0.69)	0.00	(0.01)	(0.36)	(0.18)	0.00	0.00	(0.03)	(0.39)	0.00	

Note: we only present correlations for some variable due to space limitations.

Appendix E – Multicollinearity Analysis (VIF)

Variable	VIF	VIF	Tolerance	R-Squared
dependent	1.78	1.33	0.5620	0.4380
Age	176.14	13.27	0.0057	0.9943
AgeSqr	182.43	13.51	0.0055	0.9945
cod_education	1.45	1.21	0.6885	0.3115
CEO_IntEx1	1.37	1.17	0.7299	0.2701
CEO_Nat	1.45	1.20	0.6891	0.3109
ceo_pwr1	1.28	1.13	0.7826	0.2174
Tenure	1.17	1.08	0.8540	0.1460
roa_1	1.30	1.14	0.7705	0.2295
Firm_Age	1.18	1.08	0.8509	0.1491
FrmIntExp1	1.23	1.11	0.8114	0.1886
LnEmployee	6.11	2.47	0.1636	0.8364
LnRD	2.26	1.50	0.4431	0.5569
LnNetSlsRvn	6.61	2.57	0.1512	0.8488
TotDbtCpt	1.40	1.19	0.7121	0.2879
Lngdp_orig	1.61	1.27	0.6218	0.3782
Lngdp_des	1.25	1.12	0.7999	0.2001
Lndistance	1.54	1.24	0.6480	0.3520
LgDum	1.45	1.21	0.6884	0.3116
DifGrwth	1.64	1.28	0.6094	0.3906
lng_simasjp	1.58	1.26	0.6340	0.3660
infl_dest	1.29	1.14	0.7753	0.2247
lbfcsec_dest	1.65	1.28	0.6059	0.3941
prstbpltvlc_dest	1.24	1.12	0.8043	0.1957
		Mean VIF	16.68	