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A Gravity Model Analysis of Effects of Regional Economic Integration on Factor Flows

Ramith Padaki[1] and Mridula Goel[2]

Recent empirical studies suggest that regional economic integration provides important stimulus not only to trade, but also to FDI and labour flows. In contrast, theory on FDI and labour flows does not provide a definitive relationship about the effects on concurrent trade and investment liberalization in the form of economic integration. This study analyses the effect of Economic Integration – in particular, the European Union and its effect on these factor flows. It attempts to identify whether being a part of the European Union aids or deters factor mobility (Labour is quantified by migration flows and capital by Foreign Direct Investment flows). Utilizing a modification to the conventional 'Gravity Equation' of Trade for FDI and migration, a comprehensive study on a Panel Dataset of 8 countries (France, Germany, Italy, United Kingdom, Japan, USA, India, China) on the period of 2001-2010 is carried out . Different variations of the underlying model reveal that being a part of the European Union, does in fact contribute to greater bilateral factor mobility.

1. Introduction

Globalization has become a key referent of contemporary political discourse and, increasingly, a lens through which policy-makers view the context in which they find themselves. (Colin Hay, Ben Rosamond, 2011). This is visible especially at the regional level, with the escalation of Regional Integration Agreements (RIAs) ranging from Free Trade Areas (FTAs) such as NAFTA and ASEAN to Customs Unions (CUs),

[1] Departments of Economics & Computer Science BITS Pilani, K.K. Birla Goa Campus, Goa, IndiaEmail: ramith.padaki@gmail.com
[2] Department of Economics BITS Pilani, K.K. Birla Goa Campus, Goa, India
Email: mridula@goa.bits-pilani.ac.in

such as Mercosur, further at the global level with the establishment of GATT and the set-up of the World Trade Organization (WTO). These changes add up, leading us to believe in the distinct possibility of a world of Economic Globalization led by increasing Economic Integration.

Economic integration is the unification of economic policies between different states through the partial or full abolition of tariff and non-tariff restrictions on trade. The European Union provides one of the most interesting laboratories to assess the impact of this sort of deep integration (Brenton, P., Di Mauro, F. & Lücke, M., 1999). In fact, many studies have been carried out to assess its economic impact after the Single Market Programme was implemented – for instance, Baldwin et al. (1995), Sapir (1996) and Brenton (1996). Amongst others, they attempted to include all aspects of potential effects: on trade, on efficiency and competition, on FDI, on income and employment and on the growth and convergence of EU Member States.

There have been many implications and changes ever since the first establishment of the Maastricht treaty and ascension into the European Union. Although economic integration is generally adopted with the intention of increasing trade, however, empirical evidence and initial modeling work suggest that regional economic integration can provide an important stimulus not only to trade, but also to factor flows within the region concerned as supported by Francesca di Mauro (2000), Massimo Motta and George Norman (1996), Paul Brenton and Francesca di Mauro (1999) and Laura Casi (2009). The contents and significance of these works in relevance to our study are highlighted in the Literature Review Section.

It is necessary to understand the nature of factor flows (by factor, we refer to the factors of production), before the impact of regional economic cooperation on their direction and volume can be studied. This leads to the need for identification of the appropriate factors and adopting suitable definitions for their measurement. Right from the conception of the production function, be it the established works of Cobb-Douglas, Harrod-Domar or Solow-Swan, capital and labour have been considered the quintessential factors of production. On analyzing a flow measure for capital, the task is straight forward, as Foreign Direct Investment (FDI) is generally recognized as one of the main channels of economic integration (Brenton, P., Di Mauro, F., & Lücke, M., 1999).

FDI is less volatile than the other financial flows and is inalienable, giving it a relatively low default premium (Rui Albuquerque, 2000). To characterize labour flows, migration flows are considered. This is in fact, akin to many other studies on labour movements such as that by Adams (Adams Jr, R. H., 2003) while studying labour exports.

The relationship between international trade and migration has been long debated, especially for its policy implications. Various studies have been conducted on European countries, including the ones of interest to us such as the UK (Ghatak et al., 2009, Girma and Yu, 2002); Germany (Bruder, 2004); France (Briant et al., 2009); Italy (Murat and Pistoresi, 2009); the EU 15 (Parsons, 2005), with nearly all suggesting that migration causes better efficiency and thereby leads to more trade.. Ever since the establishment of the Schengen area, which allows for movements among the constituent countries without passport, there has been a surge of internal migration within the EU and further, due to the common Schengen visa it attracts additional migrants from abroad. However, this is causing a sort of benefits-tourism culture. In fact UK and many other EU countries have and are attempting to stop this by increasing the criteria needed for benefits.

While considering the case for capital, it is revealed that the European Union is the world's largest investor abroad. Despite the growing importance of emerging economies as hosts to foreign-owned firms, the EU also remains the largest recipient of FDI. However, the available theory on FDI has yet to provide clear and empirically testable propositions on the effects of both trade and investment liberalization.

It is of use to acknowledge and understand the implications of economic integration on factor flows as a whole and not only on specific aspects of the economy. In this study, an attempt is made to help understand the effect of economic integration in the EU on these factor flows. Literature is biased in its understanding of the subject. While earlier literature proposes that factor flows are substitutes to trade, recent literature claims that there is a complementary relationship between the two. If there happens to be a correlation between factor flows and economic integration, there are very useful implications to policy that can help understand and deal with migration and economic expansion.
This study aims to clarify and ascertain which aspect of literature is correct; is regional economic cooperation complementary to factor flows

or is it rival to such flows The objective of our study is to test the dependence of belonging to a full-fledged economic integration (EU) and its effect on movements of labour and capital. Both, EU and non-EU countries are considered in the study to highlight the effect of the EU integration on factor flow mobility via a dummy variable approach which is discussed later. The EU members considered for this study include prominent countries that were present in the EU at the time of the Maastricht Treaty; namely France, Germany, Italy and the United Kingdom. Non-EU countries studied to distinguish between the two categories of regional grouping and others were China, Japan, India and USA.

The gravity equation has strong theoretical foundation on international trade and has been applied extensively to study trade in recent times - for instance, Kimura, F., & Lee, H. H. (2006), Ruzita Mohd Amin, Zarina Hamid & Norma MD Saad (2009), Feenstra, R. C., Markusen, J. R., & Rose, A. K. (2001). An augmented version of the Gravity Model approach is utilized to analyze these aspects over the panel dataset for the period of 2001-2010.

The paper is arranged in a lucid manner. After an exhaustive literature review and an understanding of the gravity model, the econometric model is specified and methodology used for the analysis and data sources are presented. The section on empirical analysis covers the results of the gravity model. This is followed by discussion and interpretation of results that throws light on important policy implications.

2. Literature Review

A paper titled ‘How Far Will International Economic Integration Go?’ (Dani Rodrik, 2000) initially interested us in the intricacies of Economic Integration. It is the belief of the authors that although we are far from achieving the utopian state of full economic integration that would give perfect flow and interchange of products and the factors of production, there is undeniable truth in the fact that Economic Integration grows on a global scale and that there should, on applying oneself to an intuitive thought process, be a relation with factor flows. There are many paradigms to analyze these relationships. The most suitable however, is an augmented Gravity Model.

The Gravity Model of trade predicts bilateral trade flows based on the economic sizes (often using GDP measurements) and distance between two units. The model was first used by Tinbergen in 1962. Early applications of the gravity model were viewed with skepticism. However, the work of scholars among others, Anderson (1979) and Oguledo and Macphee (1994), provided a sound theoretical foundation for a gravity model analysis of trade flows. Anderson (1979), in a theoretical paper, made the first formal attempt to derive the gravity equation from a model that assumed product differentiation. He derived a gravity equation from the properties of expenditure systems by including multiple goods, tariffs and distance in his equation and thereby provided a theoretically sound justification for the equation.

Oguledo and Macphee (1994) derived the gravity equation from a linear expenditure system in an attempt to answer criticism that the theoretical foundation of the gravity model is weak. They used the Gravity Model to estimate trade flows from 162 countries into 11 major importing countries for 1976(counting European Community as one). They concluded that factors in traditional gravity modelsm such as GDP, population and distance, are significant influences on trade flows. As a result of these works, there has been a wider acceptance and more frequent application of the gravity model to explain international trade flows among nations.

The Gravity Model has been extensively used for empirical studies in economic integration. Although predominantly used to model international trade flows, recent research has brought attention to the modeling of migration, foreign direct investment (FDI), international portfolio capital movement, WTO membership and other trade agreements, currency unions or even internet traffic and the decay of colonial linkages. The distance and border coefficient often do not capture the full effect of trade costs and so a range of other variables have been identified to extend the standard gravity model.

The standard theory of multinational corporations assumes substitutions between trade and FDI, an assumption motivated by Mundell (1957), based on the Hecksher Ohlin model (1933) as a part of Ohlins' publication Interregional and International Trade (1952). However, more recent empirical work has discovered a complementary relationship.

In one such recent work, Francesca di Mauro (2000) uses the gravity-model approach to deal with two issues related to economic integration. France, Germany, Italy, UK, Japan, South Korea, US and Canada, constitute a set of 'home countries' (i.e. investing or exporting countries). The set of 'host countries' for either exports or FDI stocks is constituted by both OECD and non-OECD members. For analysis, three gravity-type equations for exports and FDI in 1988, 1993 and 1996, under various specifications are used. The first is to analyse the impact on FDI stocks of specific variables denoting the will to integrate, and their relative impact on exports. The results show, non-tariff barriers have a negative impact on FDI. In contrast to the impact on exports, exchange rate variability does not have a negative impact on FDI, since it can partially be overcome by directly investing in the host country. The second concern deals with the debate on the complementarity versus substitutability relationship between exports and FDI. At the aggregate level, the results show that a complementary relationship holds.

A paper by Paul Brenton and Francesca di Mauro (1999) uses the method of an augmented Gravity Model and in fact inspires the model for that econometric specification. In their paper, they use a gravity model approach on a time period of the 90s to assess the impact of the deepening integration between the EU and Central and Eastern Europe (CEEC) on FDI flows. They consider some key issues such as whether FDI in the CEECs, on the one hand, and source country exports and imports, on the other hand, are complements or substitutes and whether an increase in the attractiveness of the CEECs to foreign investors has affected the magnitude of FDI going to other European countries. They found that additional integration between the EU and the CEECs, in the form of the accession of the latter, is unlikely to substantially dampen the flows of overseas investment going to other European countries.

An important result to keep in mind is that suggested by Massimo Motta and George Norman (1996). In their theoretical paper, they produced a game-theory model that analyzed the effect of economic integration on oligopolists' international trade and foreign direct investment (FDI) activities, using a three-country, three-firm model. This model that they develop is an augmentation of the standard two-country oligopoly model. They conclude that economic integration, by improving market accessibility, will induce outside firms to invest in the integrated

regional bloc. But the geographic form that the induced FDI will take is not that which we would expect by focusing purely on country size as a determinant of FDI. Increased country size is likely to lead to dispersed FDI targeted primarily at local markets. By contrast, economic integration is more likely to lead to intra-regional export platform FDI, with the investing firm supplying the majority of the countries in the regional bloc by intra-regional export.

Another study by Ruzita Mohd Amin, Zarina Hamid & Norma MD Saad (2009), aims at investigating whether intra-ASEAN trade is trade creating (higher trade with efficient members) or trade diverting (higher trade with inefficient members) for both inter-industry and intra-industry trade. The study adopts the extended gravity model at the total as well as the disaggregated level using the one-digit Standard International Trade Classification (SITC) Revision 2. The study uses data from 1989 until 2006 for the estimation while for estimations that include volatility the data spans only from 1992 to 2006. They find that trade creation is present for total exports, and 5 sectors of goods. Membership in ASEAN is found to have no effect on the rest of the product classifications, i.e., neither trade creation nor trade diversion is found to be present.

It is notable that there is a dearth of literature that analyzes both capital and labour movements in context of economic integration. This is an aspect where there is a considerable scope for this study. There is however, an overview paper by Gabriel Felbermayr, Volker Grossmann and Wilhelm Kohler (2012); herein the authors go through the various techniques and methodologies including the gravity model, adopted to analyze migration, capital formation and trade by various authors. They conclude based on these various estimations by the reviewed papers that capital and labour are in fact complementary to the effects of trade.

In the case of migration, the studies are generally more recent than those undertaken for FDI, making exploration of this aspect of the gravity model usage more relevant. There have been, however, extensive migration studies on Europe and their closely knit working labour force. Laura Casi (2009) finds that migration has a statistically significant and robust enhancing effect on European countries exports after analyzing the benefits to trade that were experienced by European countries from immigration effects. The study focuses on 17 European Union member states and 10 extra-European partners with the highest immigration

flows towards the EU-27. The study uses a reduced form gravity equation of trade and migration over the period 1997-2006 with the intention to test whether migration is able to explain part of the basic gravity specification is not able to capture. Similarly, Nadia Campaniello (2013),using a gravity model of bilateral migrations on bilateral exports from the Mediterranean Third Countries (South) to the European Union (North) over the period 1970-2000 finds that in line with most of recent literature, there is a positive correlation, i.e. a complementarity, between migration and trade.

3. Methodology and Data

Our main research question can be stated as: is regional economic cooperation (in our case, the EU) complementary to factor flows or is it rival to such flows? The following is the research methodology and data sources that are used in answering this question.

i. Data Used:

The data used in the analysis is taken from various sources. An important fact to acknowledge is the difficulty in obtaining comprehensive migration data sets. However, the World Bank offers a Global Bilateral Migration Database that provides values for 10 year periods from 1960-2000. Values for 2010 are obtained from bilateral estimates as provided by World Bank. Unavailable data has been interpolated for missing periods using all available data points. An assumption is therefore made that the variable in question is related to time. This is a justified and acceptable augmentation of the dataset. In this manner, data for the period of 2001-2010 is utilised. The data for FDI has been obtained and augmented from the UNCTAD Bilateral FDI Statistics Reports for individual countries.

The remainder gravity variables are obtained from the Centre d'Études Prospective set d'Informations Internationales (CEPII) gravity database. CEPII makes available a "square" gravity dataset for all world pairs of countries, for the period 1948 to 2006. This dataset was generated by Keith Head, Thierry Mayer and John Ries (2010). A lighter version of this dataset has been used for some of the variables in our model, like the Common Language dummy variable as well as the Distance variable.

ii. Econometric Modelling and Specification:

Multiple models are needed to effectively and thoroughly analyse the effects of economic integration on factor flows; we have however, specified two models to evaluate our hypotheses:

Model I, takes migration as the dependent variable and the gravity variables to be independent, explanatory variables in order to analyze if being a member of a strong economic integration area, like EU, increases migration into the country.

Model II, takes FDI as the dependent variable and gravity variables to be independent, explanatory variables in order to determine if being a member of a strong economic integration area, like EU, promotes FDI into the country.

For all analyses, including panel data tests and FEVD modelling, STATA 11 (Statacorp.) was used.

Model I:

The research strategy is to investigate whether economic integration leads to a significant effect on migration, and also to determine the nature of the relation. The European Countries considered for analysis belonged to the EU prior to 1991. They are: France, Germany, Italy and the United Kingdom. Further, the non- European countries that are included in our study are China, India, Japan and USA. To distinguish between the two sets of countries, a dummy variable is used. Hence, the log-linear gravity model of migrations and the empirical specification is the following:

$$\ln(1 + M_{ijt}) = \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnPOP_{it} + \beta_4 lnPOP_{jt} + \beta_5 lnD_{ijt} + \beta_6 EU + \beta_7 CommLang + \alpha_i + u_{ijt}$$

Where the subscript i and j represent, respectively, each of the 8 countries considered. This is therefore a panel data set that is up for panel data estimation. To avoid the effects of heteroskedastcity, robust standard errors are used.

Of these variables, M_{ijt} represents the migration flow from country i to country j during time period t. GDP_{it} represents the GDP (current US $) for country i during time period t, Dij is the population weighted bilateral geographic distance between countries i and j, EU is a dummy for whether the country belongs to the EU or not. Y is the year, α are country fixed effects (FEs). A weighted distance is used to overcome the effect of dropping of time invariant variables in the equation. An additional unit term is added to the log variable of migration to avoid the inconvenient effect of zero values. This is consistent with the methodology used by RuzitaMohd Amin, Zarina Hamid & Norma MD Saad (2009).

The equation is estimated using Panel data estimation across the eight countries for the ten year period. To solve the problem of heteroskedasticity due to intragroup correlations, robust standard errors at the country of destination and origin level are used in all estimates.
We are interested in the coefficient of the Dummy Variable EU. If it is statistically significant and positive, it means that migration and economic integration are complements; while if it is statistically significant and negative, it means that they are substitutes and that economic integration reduces labour migration.

Model II:

$$\ln(1 + FDI_{ijt}) = \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnPOP_{it} + \beta_4 lnPOP_{jt} + \beta_5 lnD_{ijt} + \beta_6 EU + \beta_7 CommLang + \alpha_i + u_{ijt}$$

This is the equation for analyzing the effect of belonging to the European Union on FDI flows. $FDI_{ij\,t}$ represents FDI flows from country i to country j during time period t. FDI flows and not stocks have been used to avoid the effect of aggregation of FDI stock in the bigger countries. The remaining variables have the same meaning as mentioned above in case of Model I.

To determine as to which particular method of panel data regression is appropriate, a combination of tests is used. First the Hausman test determines whether the data is best suited to fixed effects or random effects estimation. Further, to determine whether a panel or pooled estimation technique is appropriate, the F-test for the particular

technique determined by the Hausman test is utilized. Literature suggests that a gravity model of this particular kind is suitable to fixed effects panel data estimation.

In case fixed effects model is determined, then there is a new issue to be dealt with. Employing the fixed effects regression causes dropping of time invariant variables, which is detrimental to our econometric specification which includes invariant dummy variables. We need to employ additional techniques to overcome the dropping of time invariant models. There are multiple methods to overcome this particular problem of fixed effects panel data estimation. The traditional technique used is the Hausman Taylor Regression. However, we chose to employ the method of Fixed Effect Vector Regression/ Decomposition (FEVD). It is a recent technique in panel data estimation utilized by Plumper and Troeger (2007) in their analysis. It is based on the model proposed by Hsiao (2003). It has come to be popular in attempting to solve the problem of time invariant variables. Its validity has been supported by further studies such as Plümper, T., & Troeger, V. E. (2011). It has been used widely in recent years - for instance, Akhter & Daly (2009), Sova, R., Albu, L. L., Stancu, I., & Sova, A. (2009). Gatti, & Guillaud(2008) and Beckmann, R. (2007).

FEVD modeling is employed instead of the Hausman and Taylor regression method because there are two important conditions to apply the Hausman Taylor method. These conditions are:

(a) There should be strong correlation between endogenous and exogenous variables.
(b)
(c) Exogenous time variant variable should be greater than or at least equal to time invariant exogenous variable.

However, these conditions are not met in our dataset. Hence, the FEVD model is adopted instead. The FEVD technique is a three stage process as follows:

Stage 1: take dependent variable and time variant variables. Find Error component (residual) using fixed effects and therefore obtain unit effects.

Stage 2: Take error term generated in Step 1 as the independent variable and time invariant variables as the explanatory variables. Find residual using OLS.

Stage 3: Re-estimate the first stage by keeping the dependent variable as that in the original fixed effects model and dependent variables as all the variables taken originally including the error obtained from step 2. Estimate this model using pooled OLS.

These results are as useful and as significant as those produced by Hausman Taylor Regressions, and are therefore valid as per Plumper and Troeger. (2007)

Each of the variables in Models I & II are described in Table A.1 of the Appendix along with the source of the data.

4. Results & Findings

The gathered data set comprises a panel of seven variables across eight countries. To analyse the data, using the method of panel data estimation, we must first check between the suitability of fixed and random effects. The Hausman test is utilized to determine this. The Hausman test reveals the need for fixed effects regression but rejects pooled estimation for both models. However, owing to the presence of time invariant variables, the FEVD model is utilized. The final results of the last stage are presented below to study the impact of economic cooperation on migration, as Model I, and the effects on FDI are given in in Model II:

i. Study of Labour Flows (Migration):

Table 1: Model I Data Analysis Results

VARIABLES	**Log(1+Mig)**
LogGDPSource	0.129
	(0.0841)
LogGDPdest	2.100***
	(0.110)
LogPOPsource	0.333***
	(0.0522)
LOGPOPdestn	-0.332***
	(0.113)
LOGDistance	-341.8***
	(49.80)
DummyEUdestn	1.015***
	(0.125)
CommonLanguage	0.772***
	(0.0889)
Constant	1,105***
	(163.3)
Observations	560
R-squared	0.668

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model I provides a good list of factors that are an explanation of international migration. The positive coefficient of the significant dummy variable indicates that when the destination country is a part of the EU, taking on dummy value of 1, it results in larger migration flows into that country. Further, all gravity variables are also found to be significant in explaining migration flows in our model. The longer the distance between the two countries the less are the migration flows as both costs and feasibility considerations reduce migrants' preferences in such cases. Common language promotes migration as a migrant is naturally more suited to relocate to a place with which he shares a

common language for ease of communication and his higher aptitude and usefulness in such foreign opportunities.

The GDP of the destination country for migrants is significant and directly related as it presents economic opportunities for labour. The GDP of the source country appears to be the only explanatory variable that is not significantly related to migration in our analyses. This leads to the understanding that migrants are concerned with the growth prospects of the country that they are migrating to, and are in fact attracted to the better economic prosperity in the new destination.

The population variables are significant for both the source and destination country, with expected relationship. The larger the population of the source country the more the migration from there and the larger the population of the destination the less the migration into that country, as indicated by the negative sign. It appears likely that a country discourages migrants if it has an active and dominant labour force of its own, perhaps because it has fewer remaining opportunities after employing its own workforce.

There is a positive correlation between being a part of the European Union and migration flows, which suggests that regional economic integration promotes migrant flows. It is in fact consistent with modern literature that documents this kind of complementary relationship between the two. This may be more so within the European Union: after the setting up of the Schengen area if you have a visa to travel to one Schengen country, you do not need a further visa to travel to the others. If you have a valid residence permit in one Schengen country you can travel to the others without needing a visa (in effect, a residence permit from a Schengen country is the same as a Schengen visa). This can be a major reason for greater migration into our EU countries.

Governments need to appreciate such relationship outcomes, but also realize that there can be possible risks of unstable labour resources as labour migrates from one country in the Union to another, abusing the system of social benefits as a minority class (Brücker, H., Epstein, G. S., McCormick, B., Saint-Paul, G., Venturini, A., & Zimmermann, K. F., 2002). Adequate safeguard policy measures are required to ensure that migrants do not build one way exploitative relations in foreign markets.

ii. Study of Capital flows (FDI):

Once again, the Hausman test reveals the need for fixed effects regression but rejects pooled estimation. Further, due to time invariant variables, the FEVD model is utilized. The final results of the last stage reveal the following relations between FDI inflows, membership of EU and gravity variables:

Table 2: Model II Data Analysis Results

VARIABLES	Log(1+FDI)
LogGDPSource	1.997***
	(0.0617)
LogGDPdest	1.142***
	(0.0804)
LogPOPsource	-1.442***
	(0.0383)
LogPOPdestn	0.846***
	(0.0828)
LogDistance	-277.7***
	(36.52)
DummyEUdestn	1.118***
	(0.0914)
CommonLanguage	0.361***
	(0.0652)
Constant	884.8***
	(119.8)
Observations	560
R-squared	0.903

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

It is clear that belonging to the EU has a significant effect on increased FDI flows to the countries studied. The variable is significant at the 1% level. Further, since the coefficient is positive, it seems that there is a

complementary relationship between being integrated to the EU and bilateral FDI flows to/from the country.

Integrationist accords, even those limited to trade, enhance credibility of the government in a transition economy in terms of commitment to economy-opening reforms. The impact of the policy- induced integration process on foreign capital inflows is twofold. First, by reducing the risk that global investors face and improving a country's business climate, they increase the flow of direct and portfolio investment often diverting them from other regions. Second, the increased foreign participation in investment establishes a framework to faster industrial development based on availabilities of better technologies and an improvement in corporate governance.

The negative relation between FDI and population of the source country could imply that market opportunities in the source nation are good, thus market seeking FDI is limited. Additionally, it seems that presence of a common language is significant and helps explain an overlooked aspect; there is an increase in the accessibility to international markets located in countries where communication is easier. Since access to foreign markets is an important asset for global firms, the FDI inflows are expected to increase to markets which share a common language with the source nation.

GDP of the source country and GDP of the destination country appear to be significantly and directly related to the FDI flows. Countries with large GDP are able to make more FDI due to greater economic resources and they also receive more FDI as they offer stronger markets and economic opportunities.

Longer distance between nations has a large negative coefficient and acts as an important limitation to FDI. Higher costs of FDI in distant places occurs as large part of FDI flows involve both labour and machinery movement and often also, result in exports to home countries.

iii. Comparison of results from both models:

A comparative analysis of the two models looking at migration flows and FDI flows suggests that distance is a significant variable that negatively affects both FDI and migration. Cost of transportation and

inconvenience contribute to making distance an important factor in determining inter country flows. An interesting fact to additionally observe is the fact that the presence of common language seems to favourably affect both migration and FDI flows, possibly owing to the human nature of migration involving cultural transactions, and of overcoming linguistic barriers.

The difference between the two models however lies in the fact that GDP of the source country does not affect migration flows, while it does affect FDI flows. International migration more often seeks specific labour opportunities in foreign destinations and is not gained by lack of employment in the source country as the key driver. The pull of attractive jobs in foreign places is the motivator for labour migration. GDP of the source country is a means enabler for surplus invertible resources that can move out as FDI.

Another point of difference is that while the relation for migration with population of the source country is positive, it is negative for FDI. For migration, this can be explained as the need for seeking opportunities due to an increase in population in home countries and by sheer size of number. In the case of FDI, the presence of a large populations translates to large markets at home and thereby reduces the need for market seeking FDI.

Additionally, while migration is negatively related to population of the destination, implying that countries with smaller populations need more foreign workers; migrants are more inclined to travel to countries that support smaller populations and therefore, offer more opportunities and benefits. FDI is however, positively related with the population of the host country. The more the population of the destination, the bigger is the market opportunity for FDI, given that suitable income conditions being met. Such FDI can be explained by countries trying to invest in emerging countries such as India and China which are considered in the study, thereby explaining the positive relation.

5. Conclusions and Implications

There is much to inquire and understand with the knowledge of these results. There are possibilities of wide-spanning political and economic implications. It is clear that belonging to a common market such as the

European Union produces vast opportunities for business growth as well as economic growth while simultaneously increasing and improving people's perception of the gains to be exploited in such a country. The FDI flows into a country are therefore complementary to the integration of the countries Germany, France, Italy and the UK. In fact, growth of regional economic groupings suggests that countries are aware of the widespread gains that can accrue from such cooperation and integration. The governments of these countries must capitalize on this. In general, there is an increase in bilateral capital flows with economic integration.

Further, it seems as though belonging to an economic integration leads to a higher level of mingling of populations, with higher levels of migration. This, in our study, can be attributed to the aging population of Europe that is believed to be attracting vast number of migrants. It is advantageous in nature, as there is will be more diversity in the constituent populations and a more efficient labour force.

To take this study further, the models can be expanded to include countries that are members of other important economic groups. It would be interesting and useful to study if the degree of economic cooperation plays a significant role in affecting factor flows. Does the effect on FDI and/or migration alter depending on the country being a part of a Free Trade Agreement, Customs Union or an economic common market? Further, by expanding the range of study, it can be made more meaningful and representative.

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APPENDIX

Table A.1: Definition of Variables in Models I & II

Variable	Description	Source of Data
M_{ijt}	Migration flow from country i to country j during time period t (Total)	The World Bank, *Global Bilateral Migration Database*
FDI_{ijt}	FDI flows from country i to country j during time period t	UNCTAD, *UNCTAD Bilateral FDI Statistics Reports*
GDP_{it}	GDP for country i during time period t (current US $)	The World Bank, *World Development Indicators*
GDP_{jt}	GDP for country j during time period t (current US $)	
POP_{it}	Population for country i during time period t (Total)	
POP_{jt}	Population for country i during time period t (Total)	
D_{ijt}	Population weighted bilateral geographic distance between countries i and j	CEPII's GeoDist
$CommLang$	Common Official Language: 1 if the pair of countries have a Common official language and 0 otherwise	
EU	Membership in the EU: 1 if the destination country belongs to the EU and 0 otherwise.	Author generated Source: European Union Website