

Overcoming Structural Barriers: The Effect of Migrant Networks and Coordinated Financial Policies on International Investment

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Abstract

Migrant diaspora networks act as a conduit for international investment to their country of origin by lowering information asymmetries and transaction costs. I argue that these networks have a positive effect on both international portfolio investment, defined as cross-border investments both in equities and in short- and long-term bonds, and foreign direct investment and the strength of the effect is conditional upon the existence of a coordinated financial policy. In particular, I hypothesize that dual taxation treaties increase the positive effect of migrant diaspora networks on international portfolio investment but lead to little or no change in the positive effect of these networks on foreign direct investment. Using OECD and World Bank data for 2002, I find support for these hypotheses. These findings have policy implications for countries with high levels of emigration, by signing dual taxation treaties with countries containing large populations of their migrants, these countries should experience a greater inflow of international investment.

The global economic system has seen a rise in capital and commodities flows in recent years and with these increases has come an increase in cross-border migration. Leblang (2010) finds the first quantitative evidence of how migrant diaspora networks act as a conduit for both portfolio investment and foreign direct investment across pairs of countries. A diaspora network is best defined as, “a social collectivity that exists across state borders and that has succeeded over time to (i) sustain a collective national, cultural, or religious identity through a sense of internal cohesion and sustained ties with a real or imagined homeland and (ii) display an ability to address the collective interests of members of the social collectivity through a developed internal organizational framework and transnational links” (Adamson

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and Demetriou 2007, 497). Diaspora networks create a channel through which information is exchanged, creating opportunities for investment.

I propose an extension of Leblang (2010)’s argument positing that coordinated financial policies in international investment also play a role by further reducing information and transaction costs with a diaspora network that bridges two countries within a dyad. In this case, I use the term coordinated financial policies to refer to trade agreements, tax treaties, and exchange rate policies, among others. I specifically contend that the effect of the migrant network is strengthened in combination with coordinated financial policies, creating greater opportunities for international investment. My analysis uses the presence of a bilateral tax treaty, specifically a dual taxation treaty, as an indication of a coordinated financial policy.

A dual taxation treaty is a bilateral tax treaty designed to prevent multinational corporations (MNCs) or private individuals from paying taxes on income earned from economic activity in a foreign country twice. Without such a treaty, income would be taxed once in the host country of the economic activity and again where the company or individual is permanently registered or a permanent resident (Neumayer 2007). Bilateral tax treaties also serve as a means of relieving the inefficient allocation of investment across countries that can arise with international investment. Inefficient investment occurs when investment is diverted from areas where it is most useful and productive but taxed at a higher rate, to an area with a lower tax rate but fewer opportunities for growth. Governments generally use tax policies to affect the rate of return on capital, provide public goods, and capture some of the profits that would normally be repatriated to the MNC’s home country. Investors would then base their decisions on the after-tax rate of return, not the gross rate of return. These treaties adjust the tax environment for investment by specifying the rate at which investments (Blonigen and Davies 2002).

Disaggregating international investment into either international portfolio investment or foreign direct investment (FDI) allows us to more accurately differentiate how diaspora net-

works actually work to decrease information asymmetries and transaction costs. I define international portfolio investment as cross-border investments both in equities and in short- and long-term bonds. FDI refers to acquisition or creation of some element along the production supply chain by an MNC and can be either horizontal or vertical. Horizontal FDI refers to “an arrangement where a firm maintains production facilities in multiple countries, and each facility transforms raw or intermediate inputs into more finished products, often for sale in the local (domestic) market,” while vertical has “at least two stages of production and can be geographically separated to take advantage of location-specific differences in factor endowments,” (Buthe and Milner 2008, 744). The International Monetary Fund (IMF) categorizes an investment as FDI when it is large enough to give the parent firm some control over the management of the operation, specified as ownership of at least 10% of the firm (Jensen 2003).

As the associated information and transaction costs are substantially higher, Leblang (2010) hypothesizes that migrant networks are more important for FDI than international portfolio investment. He finds evidence to support this claim, but I think the strength of the effect of the diaspora network present in a country is conditioned by the presence of a dual taxation treaty and that this effect varies with regard to the type of investment. This is because of the nature of the types of investment, the type of information associated with and required for each, and the structural barriers that exist for each.

I proceed in four steps. First, I introduce how migrant networks serve as channels with which to decrease both information and transaction costs for both international portfolio investment and FDI. Second, I discuss how the strength of the effect of the migrant network depends on the existence of a coordinated financial policy. Third, I develop and empirically test two interaction models. I find migrant networks do, indeed, have a positive effect on both international portfolio investment and FDI but that dual taxation treaties increase this positive effect only on international portfolio investment. I conclude with a discussion of

these results and of the broader implications of this analysis.

Theory

Migrant Networks as Information Channels

Previous research identifies two aggregate level ways that migrant networks influence investment: through increased familiarity and through a decrease in informational asymmetries (Leblang 2010). These two channels can be used by migrant networks separately and in combination to facilitate cross-border investment. The nature of portfolio investment and FDI are inherently different, so while each might respond to increased familiarity in a similar way, they may take advantage of informational asymmetries in different ways.

This familiarity effect refers to the emergence of beliefs about the economic values of an ethnic group analogous to product branding where members of the migrant network provide signals to investors that enable them to make inferences about the productivity of the business culture (Kapur and McHale 2006). Examples of increased familiarity can be seen in both a propensity to not internationally diversify stock portfolios and a preference for home-country products (Gould 1994, Grinblatt and Kelouarju 2001). This is generally known in the literature as a “home-bias,” or a systematic preference for assets that are available in local markets as compared to those abroad (Coval and Moskowitz 1999, 2001, Lewis 1999).

Explanations for home bias rely on patterns of investor behavior. Investors may not evaluate the relative risks of different investments solely on their historical returns, due to attributing extra risk to foreign investments because they have less knowledge about these foreign markets, institutions, and firms. French and Poterba (1991) find that the gains from diversification depend on the correlation of returns across different equity markets and the fact that investors have a tendency to expect domestic returns to be systematically higher than those associated with a more diversified portfolio. Shiller and Tsutsui (1991) surveyed

American and Japanese portfolio managers and found that while the Japanese were slightly more optimistic about both markets, the Americans and Japanese were each relatively more optimistic about their own market.

We see similar outcomes in experiments investigating judgements about probability and risk-taking in non-investment settings as well. Heath and Tversky (1991) present evidence of households behaving as if unfamiliar gambles are riskier than familiar ones, even when the two options have identical probability distributions. The primary explanation for an equity home bias is that domestic equities provide a better hedge for risks and we already know that investors are more likely to hedge their bets on something that is more familiar to them (Lewis 1999). Migrant networks provide that increased familiarity for investors to make confident, informed decisions.

A decrease in information asymmetries helps investors to decrease the transaction costs associated with investment in foreign securities and the costs of doing business abroad. Transaction costs are said to hinder international diversification and bias stock portfolios toward those that are domestic or, at the very least, familiar to the investor (Tesar and Werner 1995). I use transaction costs to cover both cultural and structural barriers including language, common business practices, institutional and regulatory differences, and the cost of obtaining information about institutional and regulatory differences. Migrant networks can provide knowledge of on-the-ground conditions and opportunities that would be costly and time-consuming for investors to discover independently (Rauch 2001).

Hypothesis 1 *An increase in migrant stock leads to an increase in international portfolio investment, whether or not there is a dual taxation treaty.*

Much like portfolio investment, we would expect migrant networks to promote FDI as well. Leblang (2010) attributes this to the many different ownership stakes across a “countless number of commodity classes,” for foreign direct investors (pg. 855). Knowledge pro-

vided by migrants helps to match investors in the host country with appropriate foreign opportunities. This kind of heads-up into the market is invaluable for FDI as it is generally associated with a long-term vision and higher relocation costs than necessary for portfolio investment (Buthe and Milner 2008). Investors looking to use their capital abroad, particularly in a more concrete fashion than stocks and bonds, need a substantial amount of information prior to investing. Hence, consistent with Leblang (2010), I hypothesize that because they create increased familiarity and decrease informational asymmetries between potential markets, migrant networks are a vital asset to the decision-making process.

Hypothesis 2 *An increase in migrant stock leads to an increase in FDI, whether or not there is a dual taxation treaty.*

As MNCs are the primary source of FDI, in contrast to portfolio investment by private individuals, I expect this positive relationship between FDI and migrant networks to be weaker than that of portfolio investment. This weak relationship, relative to migrant networks and portfolio investment, is because of the differing economies of scale. Firms would already have lower transaction costs than individuals because there are more resources available to them (Jensen 2003). For example, a firm looking to expand into China would not rely on migrant networks for language help, they would be able to hire someone who is already fluent in Mandarin, whereas a private individual looking to internationally diversify their portfolio would benefit from the knowledge of a migrant network in a similar situation.

The Presence of Coordinated Financial Policies

Another potential explanation for a home-bias in both portfolio investment and FDI is that taxes tend to disfavor foreign investors (Tesar and Werner 1995). Investors can be subject to foreign withholding taxes on dividends from foreign investment, making their investment more inefficient. An efficient allocation of capital, for example, requires “that

capital be allocated between the two countries such that the rates of return are equal (or that all the capital invested in the high-return country),” (Blonigen and Davies 2002, 3). In order to make international investment more efficient, bilateral investment treaties are introduced. These treaties generally serve as a way to promise foreign investors nondiscriminatory rights and grant them specific individual rights in the country of investment (Buthe and Milner 2009). There are two reasons for narrowing the focus on bilateral investment treaties to dual taxation treaties: (1) we can examine barriers to investment on a very basic level and (2) dual taxation treaties are bilateral, rather than multilateral, which makes their conditional effect on migrant networks directly observable. I have already hypothesized that migrant networks serve as a means for increasing investment through increased familiarity and decreased information costs so it would follow that a decrease in structural barriers would heighten the influence of the migrant networks. We can think of a dual taxation treaty as a key to a door; migrant networks provide the knowledge that there is a party going on behind the door, making it attractive to want to get inside, but you can’t if the door is locked. You can join the party only when the door is unlocked, and assuming you want to be with those inside.

The main purpose of a dual taxation treaty is to create a favorable investment atmosphere by excluding the possibility that the investor will be taxed on revenue in both their home country and the country of their investment. Blonigen and Davies (2004) list four primary functions of dual taxation treaties: standardizing tax definitions of treaty partners, reducing forms of tax avoidance, preventing treaty shopping, and providing relief from double taxation and rules reducing the maximum allowable withholding taxes on remitted income. Remitted income refers to dividend payments, interest payments, and royalty payments; the first two play an obvious role in international portfolio investment. Knowing that dual taxation treaties promote investment by reducing the uncertainty about the tax environment and by lowering structural barriers. Hence, there is good reason to posit that the combination

of migrant networks and dual taxation treaties have a greater influence on international portfolio investment together than separately.

Hypothesis 3 *A dual taxation treaty increases the positive effect of migrant stock on international portfolio investment.*

Previous studies on the determinants of FDI imply that FDI and portfolio investment should not be expected to behave similarly with regard to high-level economic policies (Ahlquist 2006). Following prior understanding about international portfolio investment, we might think that a dual taxation treaty would have a positive effect on international investment of any type but previous research has demonstrated that this is not the case. Dagan (2000) argues that the promotion of investment efficiency plays a very small role in treaty formation. He points out that treaties are more likely intended to reduce administrative costs, reduce tax evasion, and to extract tax concessions from treaty partners. Radaeill (1997) falls into the tax evasion reduction camp as well, believing that treaties are not so much geared toward promoting efficient investment but maximizing investor profits.

Additionally, some of the tax benefits provided by the dual taxation treaty are irrelevant for expanding MNCs in the first place. First, MNCs would already be avoiding double taxation through contracts and other legal documents, and second, it is often much cheaper to expand an overseas venture with retained earnings than through repatriated and re-exported funds (Hartman 1985, Sinn 1993). Blonigen and Davies (2002) find some of the first empirical support that dual taxation treaties don't have much of an effect on FDI. They use OECD data spanning from 1983 to 1992 and find evidence demonstrating that dual taxation treaties have a negligible effect on FDI.

Given this previous research, I don't expect that the effect of migrant stock on FDI will vary much between countries with a dual taxation treaty and those without. I consider an increase or decrease of 0.10 of a percentage point of FDI in the presence of a dual tax treaty to

be the minimum substantively meaningful effect. To determine the minimum substantively meaningful effect, I'll use an example of a dyad that has a dual taxation treaty and contains a large amount of migrants and a large amount of FDI. According to the 2000 United States Census, there were approximately 1.3 million people in the United States identifying as Filipino and in 2002, United States FDI outflows to the Philippines were roughly 391 million dollars (ASEAN 2006). In this situation, an increase or decrease of 0.10 percentage points in FDI would be the equivalent of about \$39,168; a negligible amount of money in the global economy. Migrant networks should be important to international investment regardless of the presence of a dual taxation treaty.

Hypothesis 4 *The effect of migrant stock on FDI should be similar in countries with and without a dual taxation treaty.*

My argument takes the form of the standard international capital asset pricing model (ICAPM) which predicts that investors should hold domestic assets in their portfolio that are proportional to their country's share of global capital market capitalization in the absence of information asymmetries and transaction costs (Lane and Milesi-Ferretti 2004, Lewis 1999, Portes and Rey 2005). Gravity models of international trade hold that bilateral transactions are a positive function of the size of the two economies and a negative function of the distance between them (Lane 2005, Lane and Milesi-Ferretti 2004, Leblang 2010, Loungani and Razin 2002). Previous studies have proxied for geographical distance by the inclusion of variables such as a common language, a common border, a common colonial heritage, and bilateral telephone volume (Eichengreen and Leungaruemitchai 2006, Lane and Milesi-Ferretti 2004, Portes and Rey 2005, Rose and Spiegel 2008) which I draw on to control for distance. Leblang (2010) finds that despite controlling for distance, migrant networks do promote international investment. I take my analysis a step further by arguing that the effect of migrant networks is conditional upon the presence of a dual taxation treaty and varies with regard to the type

of investment.

Data and Measures

Using data from Leblang’s 2010 article, I estimate two interaction models, one for each category of international investment, to test my hypotheses.¹ Equation 1 estimates the modifying effect of dual taxation treaties for the first dependent variable, *IPF*. *IPF* measures international portfolio investment by the amount, in millions of US dollars, of bilateral cross-border investments in equities and short- and long-term bonds, for 56 source countries and 154 destination countries. The transactions, from data collected by the IMF, have been broken down by the country issuing the stock or bond. *Migrant Stock* measures the total number of migrants from the destination country of investment residing in the source country of investment. This measure comes from a World Bank project on South-South migration and remittances. *DTT* is a binary variable with a value of 1 indicating that a dual taxation treaty exists within the dyad and a 0 otherwise. *Migrant Stock* \times *DTT* is the interaction term allowing the effect of migrant stock to vary with the presence or absence of a dual taxation treaty. *Controls* represents the control variables and ϵ our error term.²

$$\begin{aligned}
 IPF = & \beta_{cons} + \beta_{Migrant}MigrantStock + \beta_{DTT}DTT \\
 & + \beta_{Migrant \times DTT}MigrantStock \times DTT \\
 & + \beta_{Controls}Controls + \epsilon
 \end{aligned} \tag{1}$$

¹See Appendix A for a detailed description of the data and variables.

²Control variables include: $\ln(GDP*GDP)$ measured in dollars, representing the dyad’s market size; $\ln(distance)$ measured in kilometers; *Growth Correlation* calculated as the correlation of the GDPs in the dyad on based on a five year moving average, which is then lagged five years; $\ln(Bilateral\ Telephone\ Volume)$ as a measure of the volume of telephone traffic between the two countries; and *Common Language*, *Contiguous Borders*, *Common Currency*, *Preferential Trade Agreements (PTA)*, *Common Legal Heritage*, and *Common Religion* are represented by a 1 if present and a 0 otherwise.

I use Equation 2 to estimate the modifying effect of dual taxation treaties for the second dependent variable, *FDI*. *FDI* measures bilateral FDI, in millions of US dollars, from 28 Organization for Economic Cooperation and Development (OECD) source countries and 158 (both OECD and non-OECD) destination countries. The remaining terms are the same as in Equation 1.

$$\begin{aligned}
FDI = & \beta_{cons} + \beta_{Migrant}MigrantStock + \beta_{DTT}DTT \\
& + \beta_{Migrant \times DTT}MigrantStock \times DTT \\
& + \beta_{Controls}Controls + \epsilon
\end{aligned} \tag{2}$$

The effect of migrant stock on portfolio investment is given by:

$$\frac{\partial IPF}{\partial MigrantStock} = \beta_{Migrant} + \beta_{Migrant \times DTT}DTT \tag{3}$$

where the effect is conditional on the presence of a dual taxation treaty.³ The effect of migrant stock in the absence of a dual taxation treaty is given by the coefficient for migrant stock while the sum of the coefficient for migrant stock and the product term in the presence of a dual taxation treaty determines the effect with a dual taxation treaty.

A similar equation is used to estimate the effect of migrant stock on FDI:

$$\frac{\partial FDI}{\partial MigrantStock} = \beta_{Migrant} + \beta_{Migrant \times DTT}DTT \tag{4}$$

Following Leblang (2010), I use fixed-effects ordinary least squares (OLS) and two-way clustering of standard errors, clustered on the investment source and destination country..⁴

³The equations for the standard errors of the marginal effects can be found in Appendix B.

⁴I have omitted the *Genetic Distance* variable from Leblang (2010)'s original dataset. *Genetic Distance* was developed as a measure of genetic distances between indigenous populations through differing DNA characteristics in the human population and was provided by Spoloare and Wacziarg in their 2008 paper. Leblang (2010) ran several models and listwise deleted those observations in which *Genetic Distance* was

Tables 1 and 2 provide the estimates and 90% confidence intervals for the two models.⁵

Results

Migrant Networks and Portfolio Investment

In estimating the models, I find support for all four of my hypotheses. Migrant diaspora networks promote international investment by increasing familiarity and reducing information costs. The results in Table 1 provide evidence for my first hypothesis, that an increase in migrant stock leads to an increase in international portfolio investment regardless of the existence of a dual taxation treaty. Migrant networks serve as a means for exchanging particular pieces of information that would be helpful to investors, such as common business practices and institutional and regulatory differences.

In a substantive example of this hypothesis, according to the 2000 U.S. Census, 1,369,070 immigrants living in the United States were from the Philippines, representing the fourth largest single country source of immigrants. The coefficient indicates that if the United States experienced a 1 percentage point increase in the Filipino migrant population, roughly 13,700 people, the Philippines would experience a 0.18 percent increase in international portfolio investment from investors in the United States, regardless of whether or not a dual taxation treaty between the United States and Philippines. In 2002, this would have been an increase of about \$7.5 million.

Not only does a migrant network promote international portfolio investment on its own, but the strength of its effect increases substantially in combination with a dual taxation treaty. Dual taxation treaties can lower information asymmetries in the case of international

missing. I was unable to merge their variable with the rest of Leblang (2010)'s dataset, and so proceeded without it (King et al. 2001). My estimates were similar after adding the new observations that were previously missing due to the *Genetic Distance* variable.

⁵My estimates are robust to alternative estimation techniques, see Appendix B for more information.

Table 1: Migrant Stock and International Portfolio Investment

Variable	Coef.	90% C.I.	Coef.	90% C.I.
Constant	-129.15	[-214.92, -43.38]	-116.81	[-186.3, -47.3]
Migrant Stock	0.18	[0.08, 0.29]	0.12	[0.04, 0.20]
Migrant Stock \times Dual Taxation	-	-	0.26	[0.15, 0.37]
Market Size	0.17	[0.07, 0.27]	0.16	[0.09, 0.22]
Distance	-1.16	[-1.55, -0.77]	-1.18	[-1.50, -0.85]
Contiguous Border	-0.86	[-1.59, -0.11]	-1.05	[-1.64, -0.46]
Common Language	-0.11	[-0.58, 0.36]	-0.11	[-0.49, 0.28]
Growth Correlation	0.03	[-0.26, 0.32]	0.02	[-0.22, 0.27]
Common Currency	1.15	[0.58, 1.72]	0.99	[0.55, 1.43]
Dual Taxation Treaty	1.30	[0.73, 1.87]	-0.31	[-1.13, 0.51]
PTA	0.79	[0.05, 1.53]	0.72	[0.13, 1.31]
Bilateral Telephone Volume	0.10	[0.00, 0.20]	0.09	[0.01, 0.17]
Common Legal Heritage	0.19	[-0.16, 0.54]	0.21	[-0.09, 0.51]
Common Religion	0.55	[0.08, 1.02]	0.50	[0.12, 0.88]
N	5134		5134	
R^2	0.79		0.79	
DV: log(international portfolio investment)				

portfolio investment though the harmonization of tax policies and the lowering of structural barriers through its very existence. I find empirical support that the significant, positive effect of migrant networks on international portfolio investment is even stronger in countries where a dual taxation treaty exists. In fact, the presence of a dual taxation treaty should increase the effect of migrant stock on international investment almost threefold. In the United States - Philippines example, for a one percentage point increase in the migrant population (again, about 13,700 people), we would expect to experience about 0.26 percent more investment, roughly \$11 million, through the combination of a migrant network and a dual taxation treaty than if there were no dual taxation treaty. This is illustrate in Figure 1.

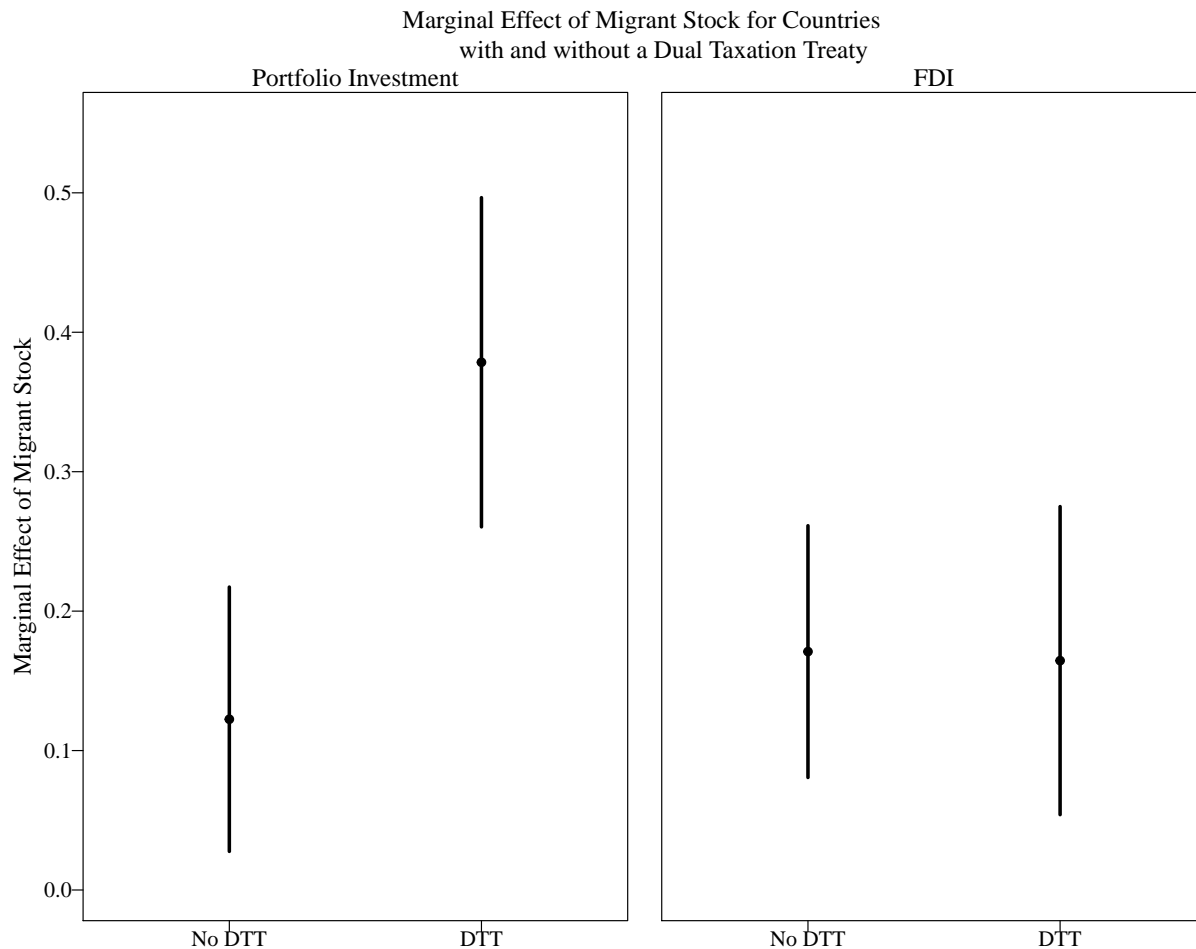


Figure 1: The marginal effect is represented by a solid dot and 90% confidence intervals by solid, vertical lines. The plot on the left demonstrates the marginal effect of migrant stock on international portfolio investment in countries with and without a dual taxation treaty. This shows that the marginal effect of migrant stock is about three times greater where a dual taxation treaty is present. The plot on the right shows that there is no meaningful difference in the marginal effect of migrant stock on FDI with or without a dual taxation treaty.

Migrant Networks and FDI

We see a similar effect on FDI outflows. I expect that migrant networks greatly increase business opportunities for investors in their new country of residence in their homeland by possessing the ability to provide important on-the-ground information. This makes it easy for

investors to acquire information and leads me to expect support for the second hypothesis: an increase in migrant stock leads to an increase in FDI, whether or not there is a dual taxation treaty. The model in Table 2 estimates indicate that migrant networks do, in fact, have a positive effect on FDI. In continuing our Philippines-United States example, a one percent increase in migrant stock would lead to a 0.16 percent increase in U.S. FDI to the Philippines, or about \$625,000, regardless of whether or not a dual taxation treaty is in place. This is, as we predicted, slightly less than the effect that migrant networks had on portfolio investment. This is most likely due to the additional resources that can be used toward information gathering that MNCs have in comparison to private individuals and their portfolio investments.

Table 2: Migrant Stock and FDI

Variable	Coef.	90% C.I.	Coef.	90% C.I.
Constant	-121.40	[-206.91, -35.89]	-121.90	[-193.6, -50.2]
Migrant Stock	0.16	[0.06, 0.29]	0.17	[0.08, 0.25]
Migrant Stock \times Dual Taxation	-	-	-0.006	[-0.07, 0.05]
Market Size	0.15	[0.05, 0.25]	0.15	[0.07, 0.23]
Distance	-1.18	[-1.62, -0.74]	-1.19	[-1.55, -0.83]
Contiguous Border	0.61	[-0.37, 1.59]	0.62	[-0.21, 1.45]
Common Language	1.70	[0.72, 2.68]	1.70	[1.45, 1.94]
Growth Correlation	0.18	[-0.09, 0.45]	0.17	[-0.63, 0.97]
Common Currency	0.72	[-0.26, 1.70]	0.72	[-0.09, 1.53]
Dual Taxation Treaty	0.60	[0.09, 0.11]	0.63	[-0.03, 1.29]
PTA	0.07	[-0.68, 0.81]	0.07	[-0.55, 0.69]
Bilateral Telephone Volume	-0.06	[-0.20, 0.08]	-0.06	[-0.18, 0.06]
Common Legal Heritage	0.21	[-0.16, 0.58]	0.21	[-0.11, 0.54]
Common Religion	0.23	[-0.20, 0.66]	0.23	[-0.13, 0.59]
N	3658		3658	
R^2	0.64		0.64	
DV: log(FDI)				

As consistent with expectations, the difference in the marginal effects of migrant stock across countries with and without a dual taxation treaty on FDI appears to be both statis-

tically insignificant and negligible, as demonstrated in the right panel of Figure 1. As FDI is more heterogeneous than international portfolio investment, it requires different types of information. Dual taxation treaties do not provide the kind of tax benefits that promote efficient FDI the same way that they do for international portfolio investment. Additionally, much of the earnings from FDI are not repatriated, but rather reinvested into the continuation of the overseas venture. I find the effect of migrant stock on FDI is substantively similar across systems with and without a dual taxation treaty. Rainey (2014) shows that using two one-sided tests against some substantively meaningful value allows researchers to make a more compelling argument of negligible effects. Following his example, I have set our minimum substantively meaningful effect to an increase or decrease of 0.10 percentage points. The 90% confidence interval of our estimate ranges from -0.07 to 0.05 percentage points, falling into the range of negligible effects and supporting my hypothesis.

Conclusion

Migrant diaspora networks play an important role in influencing international investment. These networks increase familiarity within a dyad and reduce both informational asymmetries and transaction costs. By emphasizing migrant networks, we can examine the determinants of cross-national flows of investment much more easily because of their unique cross-border position. I find that migrant networks have a positive effect on both international portfolio investment and foreign direct investment; the larger the migrant population in a particular country, the more that country will invest in the migrant's homeland.

I, then, turned to the role that coordinated financial policies play in the strength of this positive effect. Investors are typically less inclined to internationally diversify their portfolio if they are much more secure in their knowledge of domestic stocks than foreign stocks. We see migrant networks overcoming this home-bias, resulting in an increase in international

portfolio investment. Just the knowledge that a dual taxation treaty exists provides the investor with information about how their investment will be treated abroad; we can see that the marginal effect of migrant networks on international portfolio investment is the strongest when a dual taxation treaty is in place. On the other hand, the marginal effect of migrant stock on FDI in the presence of a dual taxation treaty is not the same. FDI is much more heavily reliant on the reduction of information and transaction costs which dual taxation treaties do, but not in the way that is most efficient and beneficial, for the promotion of FDI. We see that the marginal effect of migrant stock on FDI with or without dual taxation treaty is negligible, leading me to conclude that there may be other coordinated financial policies that break down structural barriers in ways that are more appropriate for the promotion of FDI.

My findings have important policy implications as well. The results lead us to believe that countries with a high population of emigrants in a particular new host country would do well when there exists a dual taxation treaty with that new country. This would increase the international portfolio investment inflows by about 0.37 percentage points, which can amount to a substantial amount of investment. Countries with largely concentrated emigrant populations are those that would benefit the most from ratifying a dual taxation treaty. My results show that countries can use migrant populations in combination with economic policy to their advantage.

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Appendix A

My first dependent variable, average of portfolio investment, is determined with data from the IMF's Coordinated Portfolio Investment Survey (CPIS) for the year 2002 and consists of 56 source countries and 154 destination countries due to CPIS reporting constraints. The second dependent variable, foreign direct investment (FDI), comes from data from the OECD's International Direct Investment for the year 2002, for 28 source countries and 158 destination countries.

Portfolio Investment Sample Countries

Origin: Argentina, Australia, Austria, Bahamas, Belgium, Bermuda, Brazil, Bulgaria, Canada, Chile, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kazakhstan, (Republic of) Korea, Luxembourg, Macao, Malaysia, Malta, Mauritius, Netherlands, Netherlands Antilles, New Zealand, Norway, Panama, Philippines, Poland, Portugal, Romania, Russian Federation, Singapore, Slovak Republic, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom, United States, Uruguay, Vanuatu, Venezuela.

Destination: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Benin, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Honduras, Hungary, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Latvia, Liberia, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mauritius, Mexico, Moldova, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovak Republic, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe.

Foreign Direct Investment Sample Countries

Origin: Australia, Austria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Nether-

lands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

Destination: Albania, Algeria, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Belgium, Benin, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Honduras, Hungary, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, (Republic of) Korea, Kuwait, Kyrgyz Republic, Lao People's Democratic Republic, Latvia, Liberia, Lithuania, Madagascar, Malawi, Mali, Mauritius, Mexico, Moldova, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovak Republic, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe.

Outcome Variables		
Variable	Coding	Source
Portfolio Investment (<i>lstocka</i>)	Log(portfolio investment from destinations of migrants to source of migrants)	International Monetary Fund's Coordinated Portfolio Investment Survey
Bilateral Foreign Direct Investment (<i>loutflowsa</i>)	Log(FDI from destination of migrants to source of migrants)	OECD's International Investment Statistics
Key Explanatory Variables		
Variable	Coding	Source
Bilateral Migrant Stock (LI)	Log(migrant stock in destination from source)	World Bank's South-South Migration and Remittances
Dual Taxation Treaties (<i>Ldtt</i>)	1 if yes, 0 otherwise	United Nations Conference on Trade and Development

Control Variables		
Variable	Coding	Source
Dyad's Market Size (Lgdpproduct2)	Log(product of dyad's GDPs)	Penn World Tables, Mark 6.1, World Bank's World Development Report
Bilateral Distance (LIdist)	Log(distance)	Center D'etudes Prospectives et D'informations Internationales (CEPII)'s Distances Database
Shared Border (Lcontig)	1 if shared, 0 otherwise	Center D'etudes Prospectives et D'informations Internationales (CEPII)'s Distances Database
Common Official Language (Lcommlang_off)	1 if common, 0 otherwise	Center D'etudes Prospectives et D'informations Internationales (CEPII)'s Distances Database
Correlation of Growth Rates (Lgrowcorr)	Lagged correlation	Correlation with GDP data based on 5-year moving average, lagged 5 years.
Common Exchange Rate Peg (Lcommoncurrency)	1 if common, 0 otherwise	Klein-Shambaugh Nature of Exchange Rate Regimes
Preferential Trade Agreements (Lpta2)	1 if yes, 0 otherwise	Goldstein, Rivers, and Tomz (2007)
Common Legal Heritage (commonlegal)	1 if common, 0 otherwise	Based on legal origin data from Rafael La Porta
Common Religion (commonreligion)	1 if common, 0 otherwise	Based on size of largest group from Rafael La Porta
Telephone Volume (LB)	Log(bilateral telephone volume)	Telegeography.com, missing data interpolated based on source and destination's GDP and population

Appendix B

The standard errors of the interaction terms are represented by the following equations:

$$\hat{\sigma}_{\frac{\partial IPF}{\partial MigrantStock}} = (var\hat{\beta}_{MigrantStock} + DualTaxation^2 var\hat{\beta}_{DualTaxation} + 2(DualTaxation)cov\hat{\beta}_{MigrantStock}\hat{\beta}_{DualTaxation})^{1/2} \quad (5)$$

$$\hat{\sigma}_{\frac{\partial FDI}{\partial MigrantStock}} = (var\hat{\beta}_{MigrantStock} + DualTaxation^2 var\hat{\beta}_{DualTaxation} + 2(DualTaxation)cov\hat{\beta}_{MigrantStock}\hat{\beta}_{DualTaxation})^{1/2} \quad (6)$$

Table 3 reports the estimates of the marginal effect of dual taxation treaties on migrant stock and the 90% confidence intervals.

In order to verify my decision to use fixed-effects OLS rather than some other estimation technique, I used a variety of methods to identify any problematic data points and then re-estimated the models using an M-S estimation technique.

The first step was to run an outliers test to determine, what, if any, outliers may exist in the data. The test returned international portfolio investment in Colombia by Colombian migrants currently living in Central African Republic in 2002. This is most likely due to Central African Republic having no population of Colombian migrants and the only shared trait is a common legal system. I, then, estimated the model again without this observation. The very similar results can be seen in Table 4 (with 90% confidence intervals given in brackets). The outliers test returned no outliers with regard to the FDI model.

I plotted the residuals versus leverage for international portfolio investment in Figure 2 and FDI in Figure 3, with the size of each point indicative of its Cooks Distance.

Finally, I re-estimated the interaction models using the `lmRob()` function in the “Robust” R package. This function uses an algorithm to compute a final robust estimation based on an initial estimate with a high breakdown point, or the proportion of incorrect observations

an estimator can handle before producing incorrect results, and high efficiency, or the it estimates the quantity of interest in the best possible manner. This final estimation is based off of an initial estimation using the alternate M-S estimate, as there are factor variables in the models. Figures 4 and 5 shows a coefficient plot of my results with no substantive changes in the variables of interest, the black lines indicating OLS regression and red indicating a robust regression.

Table 3: The Marginal Effect of Dual Taxation on Migrant Stock

	No Dual Taxation Treaty	Dual Taxation Treaty
Migrant Stock (PI)	0.12 [0.03, 0.22]	0.38 [0.26, 0.50]
Migrant Stock (FDI)	0.17 [0.08, 0.26]	0.16 [0.05, 0.28]

Table 4: OLS - With and Without an Outlier

Variable	With		Without	
	Coef.	90% C.I.	Coef.	90% C.I.
Constant	-116.81	[-186.3 , -47.3]	-116.81	[-186.3 , -47.3]
Migrant Stock	0.12	[0.04, 0.20]	0.12	[0.04, 0.20]
Migrant Stock x Dual Taxation	0.26	[0.15, 0.37]	0.26	[0.15, 0.37]
Market Size	0.16	[0.09, 0.22]	0.16	[0.09, 0.22]
Distance	-1.18	[-1.50, -0.85]	-1.18	[-1.50, -0.85]
Contiguous Border	-1.05	[-1.64, -0.46]	-1.05	[-1.64, -0.46]
Common Language	-0.11	[-0.49, 0.28]	-0.11	[-0.49, 0.28]
Growth Correlation	0.02	[-0.22, 0.27]	0.02	[-0.22, 0.27]
Common Currency	0.99	[0.55, 1.43]	0.99	[0.55, 1.43]
Dual Taxation Treaty	-0.31	[-1.13, 0.51]	-0.31	[-1.13, 0.51]
PTA	0.72	[0.13, 1.31]	0.72	[0.13, 1.31]
Bilateral Telephone Volume	0.09	[0.01, 0.17]	0.09	[0.01, 0.17]
Common Legal Heritage	0.21	[-0.09, 0.51]	0.21	[-0.09, 0.51]
Common Religion	0.50	[0.12, 0.88]	0.50	[0.12, 0.88]
N	5134		5133	
Adj. R ²	0.79		0.78	
DV: International Portfolio Investment				

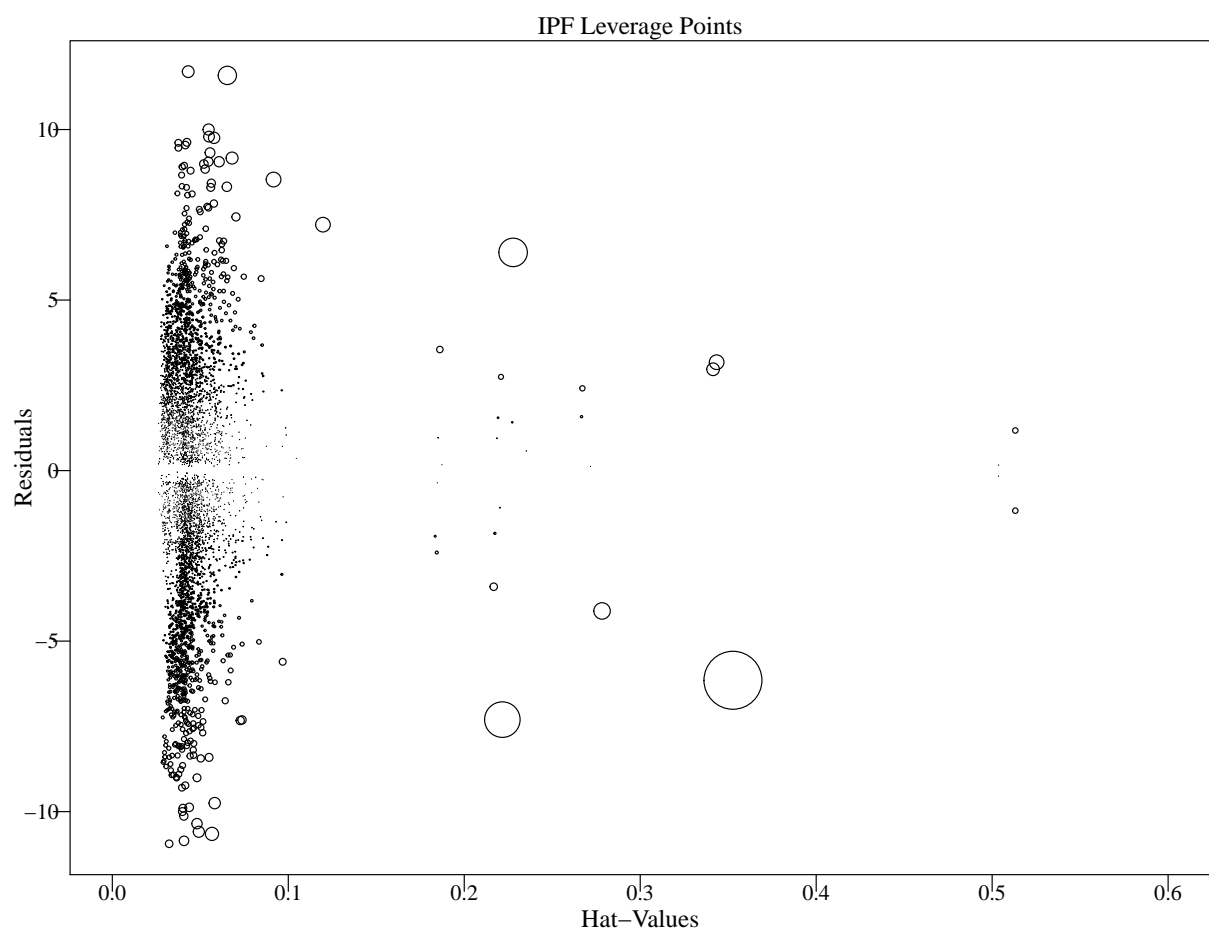


Figure 2: Residuals vs. Leverage

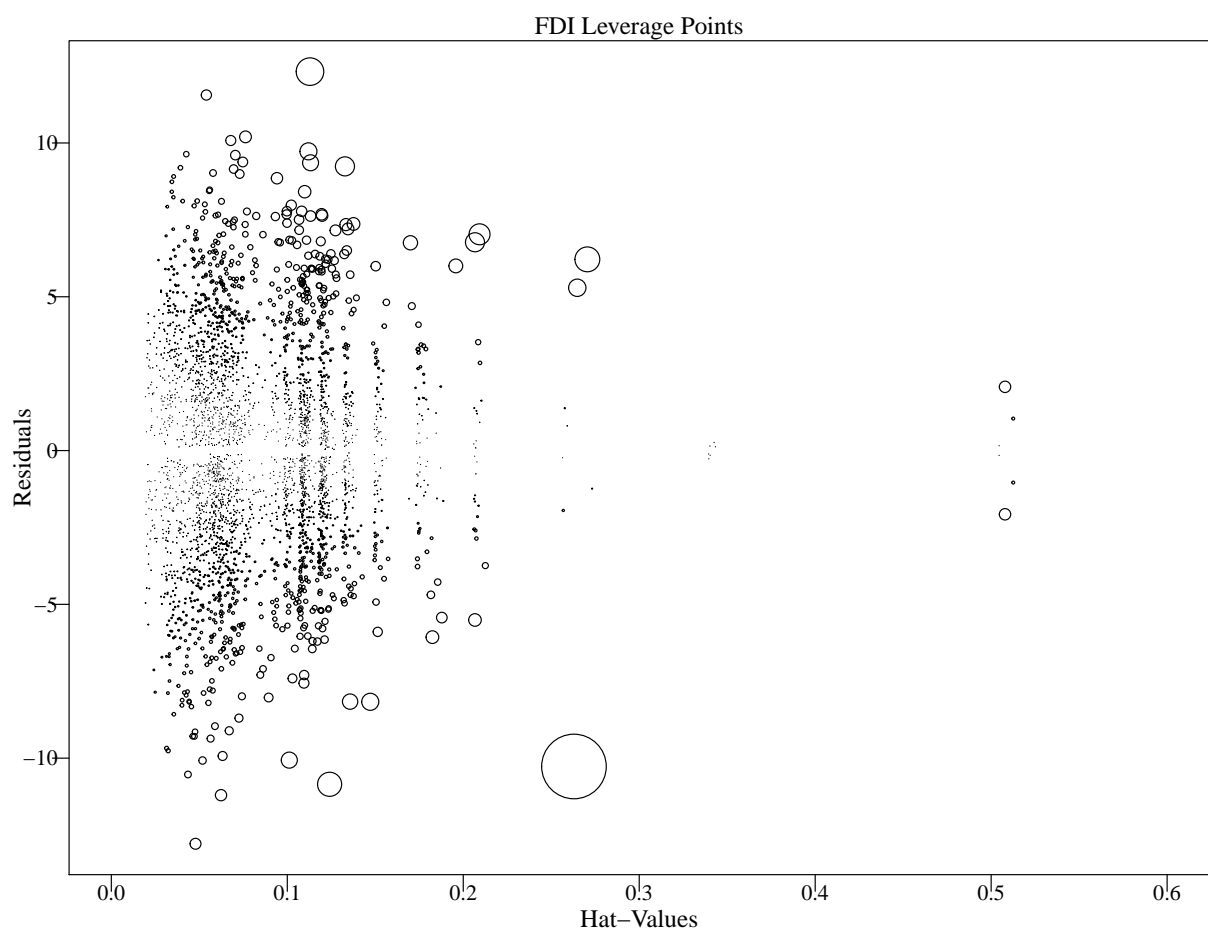


Figure 3: Residuals vs. Leverage

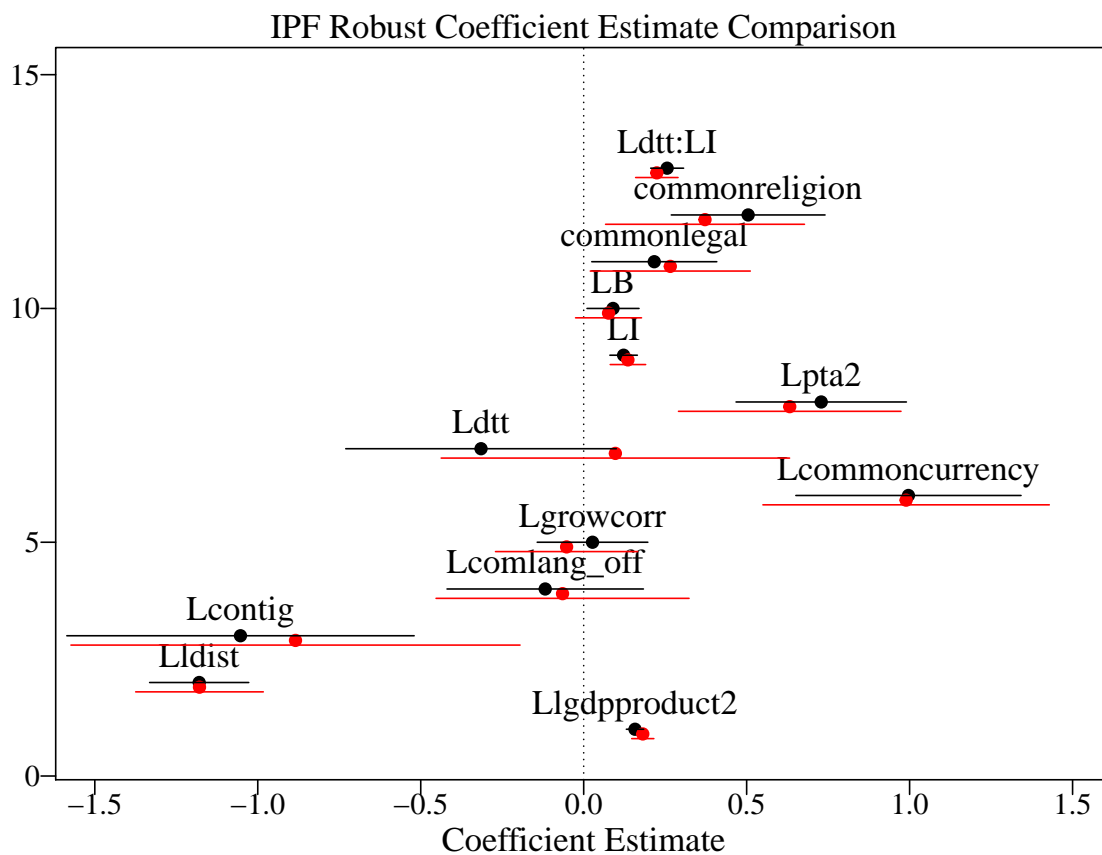


Figure 4: IPF Coefficient Estimate

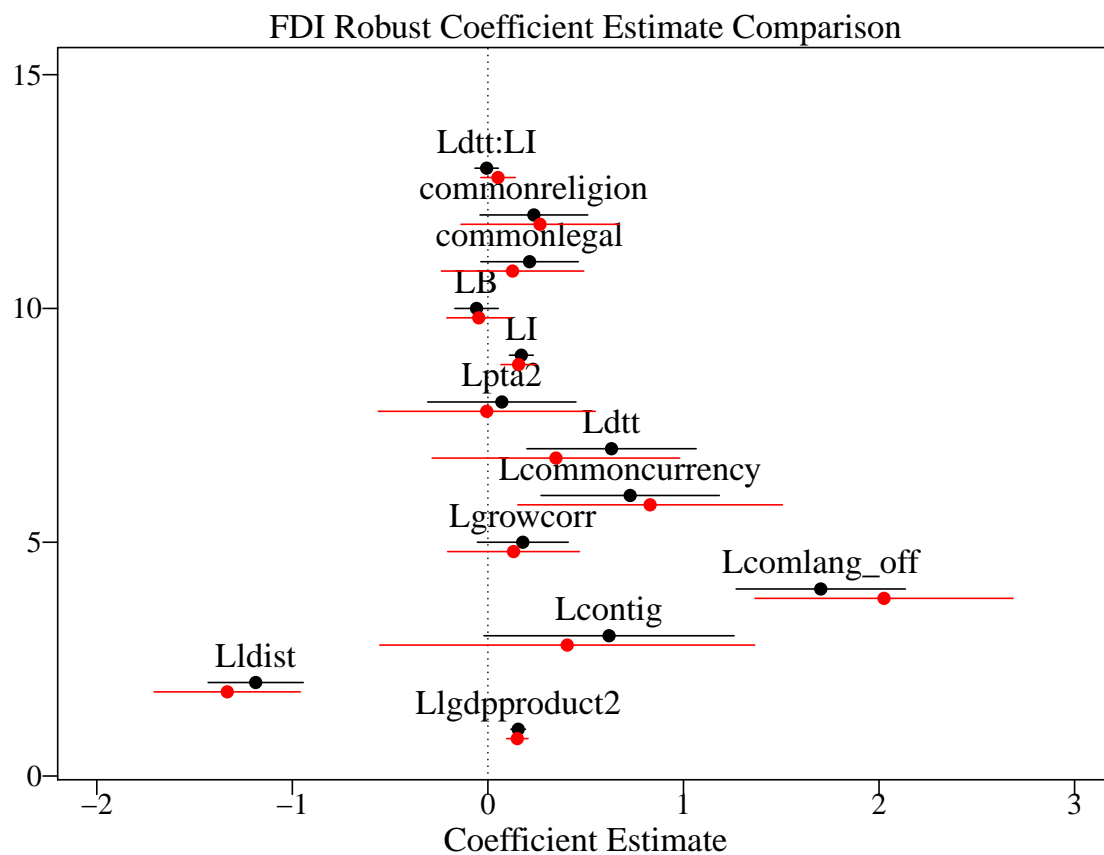


Figure 5: FDI Coefficient Estimate