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On the Detrimental Impact of Visa Restrictions on Bilateral Trade and Foreign Direct Investment

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Abstract

This article estimates the effect of visa restrictions on bilateral trade flows and foreign direct investment (FDI) stocks. By raising the costs of travel and deterring some visitors, visa restrictions hamper personal contact across borders, which is detrimental to trade and FDI. Employing a standard gravity-type model in a global dyadic country sample, I estimate that if one country unilaterally requires a visa from nationals of the other country with no reciprocal restriction in place by the partner country, this lowers bilateral trade and FDI by up to 19 and 25 per cent, respectively. If both countries require a visa from nationals of the other country, the effect on trade is larger, but less than double, at up to 25 per cent, while the effect on FDI is essentially the same as for unilateral restrictions. With such substantial negative effects, it is at least questionable whether many of the existing visa restrictions would pass a cost-benefit test.

Key words: trade, investment, visa, gravity, travel.

1. Introduction

Visa restrictions impose a great burden on affected travelers. There is the cost and hassle of applying for the visa either via post, which can take weeks or months to be processed, or in person, which implies travelling to the embassy or one of the few consulates and waiting in the queue, possibly for hours. Employing professional visa services can mitigate the non-pecuniary cost, but only at the expense of a greater financial cost.

Do visa restrictions also impose substantial costs on the country restricting access to its territory as well as on the country whose nationals face such restrictions? This article tackles this question by analyzing the effect of visa restrictions on bilateral trade and foreign direct investment (FDI). It complements an existing analysis of the effect that visa restrictions have on dyadic flows of travel (Neumayer 2010). Yet, much of this travel will consist of tourists and without further analysis it is impossible to assess the economic damage that visa restrictions inflict on affected countries beyond the tourist sector.

Bilateral trade and FDI are likely to be negatively affected by visa restrictions. Much of international trade requires personal contact with trading partners. Visa restrictions render such physical contact more difficult as they raise the burden for (potential) foreign trading partners to enter the country. The same will apply to foreign economic actors potentially investing in the country imposing the visa restriction. Almost by definition, the setting up of a direct investment abroad will not be possible without personal contact between the investment partners from the two countries.

One may of course argue that most trade and FDI will be sufficiently economically profitable to compensate potential trading and investing partners for the

costs imposed by visa restrictions. However, this presupposes that the partners have perfect information about potential gains to be made from trade and investment. Yet, such potential gains will often only be discovered after personal contact or after having visited the site of potential investment several times. Hence, visa restrictions can damage a country's trade and FDI by rendering the discovery of mutually beneficial economic opportunities more costly. Furthermore, in some, particularly poorer, countries a considerable part of international trade takes place in markets concentrated close to the international border to neighboring countries. For such trade, even small additional costs such as the ones imposed by visa restrictions can defeat the small profit margins of traders.

There are therefore good reasons to presume that visa restrictions damage bilateral trade and investment. It is perhaps surprising that no empirical analysis has hitherto tried to estimate the size of these negative effects. One reason for this is the work effort involved in inputting data on visa restrictions for a global sample of nation-states. Fortunately, this paper's analysis can build on an existing dataset of visa restrictions, which the author has assembled previously (Neumayer 2006).

This article finds that unilateral visa restrictions imposed by one country without reciprocal visa restrictions in the partner country reduce bilateral trade by up to 19 per cent, while such trade is estimated to be reduced by up to around 25 per cent if both countries have visa restrictions in place on travelers from the respective partner country. For bilateral FDI, the estimated effects are essentially the same for both unilateral and bilateral visa restrictions at up to around 25 per cent. Not surprisingly, the effects of visa restrictions on trade and investment are smaller than the estimated effect of such restrictions on travel by visitors as reported in Neumayer (2011) who finds that, depending on the exact model specification chosen, visa

restrictions reduce such travel by on average between 52 and 63 per cent. Since not all trade and FDI is dependent on travelling into the partner countries and economic actors can in part substitute travel with other forms of communication and since much of foreign travel is not business-related, one would expect the effect of visa restrictions to be smaller on trade and FDI than on foreign travel as such.

For reasons explained in the next section, in which I describe the research design in detail, the estimated effects on trade and FDI are likely to be upward biased. The reason is that the visa restrictions variable is likely to be correlated with some other factors that affect trade and FDI and which I am not able to include in the estimation model despite including a very large set of control variables. For example, visa restrictions may be in place because of bad relations between two countries or their governments, perhaps because of historical animosity or rivalry or a recent souring of relations in the wake of political developments in one or both of the two countries forming a dyad, not captured by any of the control variables. If so, the visa restrictions would be more a symptom of another causal factor – a bad bilateral relationship – hampering bilateral trade and FDI than a cause in itself. However, visa restrictions are too much prevalent (with only 17 per cent of dyads entirely free of visa restrictions) to simply represent the symptom of bad bilateral relationships. Given that visa restrictions are thus unlikely to merely be symptomatic of bad relationships and exert a significant and sizeable effect on trade and FDI even after controlling for a very wide range of factors that capture other aspects of dyadic relationships, the results tentatively suggest that policy makers need to seriously consider the economic costs visa restrictions impose on their economies.

2. Research Design

To estimate the effect of visa restrictions on bilateral trade and FDI, I employ a basic gravity-type model. The model is specified as follows:

$$\ln y_{ij} = \ln dist_{ij} + contiguity_{ij} + sameregion_{ij} + samelanguage_{ij} + coloniallink_{ij} + tradeagreement_{ij} \\ + diplomatic_representation_{ij} + \ln migrant_stock_{ij} [+ BIT / DTT_{ij}] \\ visa_unilateral_{ij} + visa_bilateral_{ij} + u_i + v_j + \varepsilon_{ij}$$

The dependent variable is the natural log of bilateral trade or bilateral FDI stocks of the two partner countries i and j . Data on trade are taken from UN (2009), while the FDI stock data have been purchased from UNCTAD (2009) and complemented with data from OECD (2009).¹ The dependent variables are average values between 2005 and 2007 (trade) or between 2005 and 2008 (FDI), while the explanatory variables all refer to values of 2004 or the closest prior year available.

As is typical for most gravity-type models (see, for example, de Groot et al. 2004; Baldwin and Taglioni 2006; Linders and de Groot 2006; Rose 2007; Kleinert and Toubal 2010; Zwinkels and Beugelsdijk 2010), I include the log of distance between the two partner countries in the estimation equation ($\ln dist_{ij}$) and dummy variables for when the two countries are contiguous or separated by sea distance of less than 150 miles ($contiguity_{ij}$), for when the two countries are located in the same region ($sameregion_{ij}$), for when the two countries speak the same language as one of their main languages ($samelanguage_{ij}$), for when they share a (former) colonial link ($coloniallink_{ij}$) and are joint members of a bilateral or regional trade agreement

¹ Where they overlap, data from the two sources are very highly correlated at $r = 0.99$ with each other.

(*tradeagreement_{ij}*). Additionally, following Rose (2007) I include a measure of diplomatic representation in the partner country, which varies from 0 to 2 (both are represented in each other's country), as well as the log of the bilateral number of permanent migrants originating from the respective foreign partner countries. All of these variables are expected to have a positive effect on trade and FDI and their inclusion is important to prevent the visa restriction variable from spuriously picking up a geographical, cultural, political or historical relationship or account for the well documented fact that migrant networks exert a significant impact on bilateral trade and FDI (Jansen and Piermartini 2009).² In other words, the purpose of these control variables is to reduce the omitted variable bias discussed in detail below. For the FDI equation only, I additionally add a dummy variable for whether the two countries have concluded either a bilateral investment treaty (BIT) or double taxation treaty (DTT) with each other (*BIT / DTT_{ij}*), which have been demonstrated previously to have a positive effect on FDI (Neumayer and Spess 2005; Neumayer 2007; Barthel, Busse and Neumayer 2010).³

Visa restrictions are measured by two dummy variables: one is set to one if one of the two countries imposes visa restrictions on the other country, but not vice versa (*visa_unilateral_{ij}*). The other dummy variable is set to one if both countries impose visa restrictions on each other (*visa_bilateral_{ij}*). The omitted reference category therefore refers to country pairs without visa restrictions on either side. This specification allows testing for the hypothesis that visa restrictions in both countries should have a more damaging effect on bilateral trade and FDI than unilateral visa restrictions, but the effect of two visa restrictions may well be less than double the

² Unfortunately, for lack of data I cannot control for temporary migration.

³ The strong correlation between BITs and DTTs mean that these cannot be estimated separately.

effect of unilateral visa restrictions, i.e. visa restrictions may have a diminishing marginal negative effect. Finally, the fixed effects for both partner countries (u_i, v_j) capture the general attractiveness of countries as trade and investment partners. They can capture, amongst others, factors like the economic size and structure of countries as well as, to some extent, trade frictions (Anderson and van Wincoop 2003).

Data on distance come from Mayer and Zignago (2006). The variable measures distance in kilometers between the principal cities of countries weighted by population size, which thus takes into account the uneven spread of population across a country. Data on contiguity are taken from Bennett and Stam (2005), while the geographical classification largely follows the World Bank's (2009) grouping of countries.⁴ The colonial ties dummy variable is taken from Perkins and Neumayer (2008). Data on language stem from CIA (2009), while information on bilateral and regional trade agreements has been sourced from the WTO (2009). Information on diplomatic representation is taken from Bayer (2006), data on migration come from Parsons et al. (2007). Data on BITs and DTTs are taken from Barthel, Busse and Neumayer (2010). Results are fully robust to including as further explanatory control variables $\ln(GDP_i \cdot GDP_j)$, i.e. the log of the product of the two country's economic size as measured by Gross Domestic Product (GDP), the absolute difference between the GDP per capita of both countries or dummy variables for combinations of political regime type in the two countries (democracy-democracy, democracy-autocracy, autocracy-autocracy).⁵ Data on GDP and GDP per capita are taken from World Bank (2009), while data on political regime type are taken from Freedom House (2009).

⁴ The major difference is that the United States and Canada do not constitute their own region, but are part of Northern and Central America, while South America forms a group of its own.

⁵ Results are available as part of the replication dataset available on <http://personal.lse.ac.uk/neumayer>.

Fully robust here means not only that the coefficients of the visa restrictions variables remain statistically significant (this is easy to achieve), but also that the substantive estimates do not change much.

Information on the main explanatory variables, bilateral visa restrictions, is taken from the November 2004 edition of the International Civil Aviation Association's Travel Information Manual (IATA 2004). Used by the vast majority of airlines and travel bureaus, this manual provides authoritative information on restrictions in place. Ideally, one would like to trace changes in restrictions over time, but with approximately 33,000 relevant country pairs (dyads) doing so would be prohibitively costly in terms of effort (it took several months to input the existing data).⁶

Visa restrictions are a fairly common phenomenon. Only about 17 per cent of country pairs are entirely free of such restrictions. In about 48 per cent of dyads, both countries impose visa restrictions on each other, whilst in about 35 per cent of dyads the restriction is unilateral. Western developed countries impose restrictions on travelers from many more developing countries than their citizens face when travelling to the developing world. The average Western citizen needs a visa for travelling to around 93 foreign countries, whereas the average developing country

⁶ There are two types of visa restrictions. One is the usual or common type that needs to be applied for before travelling. The other, less common, type of visa can be applied for upon arrival at the border. This latter type of visa typically does not represent any restriction at all since the procedure of getting it is extremely simple and does not involve any major check on the applicant. In fact, arguably its main purpose is to generate further revenue for the destination country rather than deterring foreign travellers from the countries facing such visa restrictions, even if the additional cost may of course deter some. Since visas that can be applied for at the border are very different from visas that need to be applied for in advance and *before* travelling, I will count only the latter as visa restrictions in the estimations.

citizen can enter 156 foreign countries only with a visa. Maps 1 and 2 demonstrate the geographical unevenness in the total number of visa restrictions a country imposes on foreign travellers and in the total number of restrictions its nationals face when travelling abroad. Clearly, while such aggregated information does not do justice to the complexity and variety of bilateral relationships between countries, the maps clearly demonstrate that access to foreign spaces is very unequal (Neumayer 2006).

The estimation of gravity-type models typically has to deal with two major problems: first, an identification problem due to potential omitted variable bias; second, a potential sample selection problem due to the absence of information on bilateral trade and FDI in many dyads. I discuss both problems in turn. Starting with the identification problem, if variables that both have an influence on trade and FDI and are correlated with the explanatory variables of the estimation model are omitted from the specification, then this will cause omitted variable bias (OVB). In principle the bias can go both ways, but there are good reasons to presume that OVB will bias the estimated coefficients of the variable(s) of interest upwards (Baldwin and Taglioni 2006). Bilateral trade and investment costs, for example, will impact trade and FDI, but are impossible to measure correctly. Baldwin and Taglioni (2006) therefore suggest including dyad fixed effects as well as time-varying nation fixed effects in the estimation model to deal with the identification problem. However, because the visa restrictions variable is time-invariant, dyad fixed effects cannot be included in the estimations. This would hold true even if one collected data on visa restrictions for other years, which is very time-consuming. The reason is that there will be little within-variation (variation over time) since practically all of the variation of the visa

restriction variable will be dominated by between-variation (variation across dyads).⁷ Given dyad fixed effects are impossible, I try to reduce OVB as much as possible by including nation dummies for both partner countries, which control for the general trade and FDI openness of countries, and as many dyadic explanatory variables other than visa restrictions as possible. This cannot solve the identification problem, but it reduces it as much as possible.

As concerns the problem that for some dyads in the case of bilateral trade and for many dyads in the case of bilateral FDI no data are reported (Frankel 1997), the most common practice seems to be recoding the missing values to zero or simply ignoring these observations and estimating the gravity model on dyads which report strictly positive trade or FDI values (Linders and Groot 2006). Both measures are equivalent since the log of zero is undefined. However, doing this can lead to biased coefficient estimates due to sample selection. Bias is also likely to follow from substituting missing or zero values with an arbitrarily chosen small constant so that the natural log of these observations is defined (Linders and Groot 2006).

There is no entirely satisfactory solution to this problem since the missing values could be because either trade or FDI is truly zero or because it is non-zero, but relatively small and escapes the statistical reporting or because it is non-reported for other reasons. Two major estimation models for dealing with the issue are the Tobit model (Tobin 1958) and Heckman's (1979) sample-selection model.

The Tobit model would be appropriate if desired trade or FDI between some partner countries were negative and, since this is impossible, became censored to zero. This would be a very strange assumption to make, however. The Tobit model could also be appropriate if reported trade or FDI values got rounded to zero, i.e.

⁷ Technically, dyad fixed effects could be included in this case, but with hardly any within variation in the visa restrictions variable, no valid coefficient can be estimated in such a model.

truncated if they fall beyond a small value. My sources for trade and FDI do not actually report any values of zero, but one could argue that very small values do in fact become truncated and are converted by the two data sources into missing data rather than zero values. The problem is that no one really knows whether non-reported values for dyads means very small values that became truncated or whether these values have not been reported for other reasons.

Heckman's sample-selection model works via estimating the determinants into being selected into the sample simultaneously with estimating the determinants of the levels of trade and FDI for the dyads selected into the sample. It is in principle quite a suitable model if there were a variable that has a strong effect on the likelihood of being selected, but no effect on the level stage (the so-called exclusion restriction). The problem is that it is unclear what such a variable is supposed to be. In its absence, identification of the model depends on the non-linearity of one of the estimated parameters, namely the so-called inverse mills ratio, which some regard as more problematic (Verbeek 2000; Wooldridge 2002) than others (Leung and Yu 1996). Still, compared to the Tobit alternative, the Heckman model appears to provide the superior option. The main model is therefore estimated with ordinary least squares (OLS) on dyads that report positive trade and FDI values only, whereas a further model is estimated with Heckman's sample selection model to check the robustness of the findings from the main model.

3. Results

Table 1 presents the regression results. Column 1 refers to OLS estimation for the log of bilateral trade, column 4 to the log of bilateral FDI stocks as dependent variables. I first concentrate on these estimation results, before briefly discussing the results on

the Heckman sample-selection estimations reported in columns 2-3 and 5-6, respectively.

Focusing first on the control variables, with one exception results are in line with expectations and previous findings: more distant countries have lower trade and FDI, while contiguous countries, countries that share a former colonial link, countries that speak the same language, countries with a larger number of permanent migrants from the respective partner countries and countries with good political relations (as approximated by diplomatic representation) all have more trade and FDI, as expected. Controlling for these factors, being located in the same macro-region does not exert a statistically significant effect (the exception mentioned above).⁸ Joint membership in a bilateral or regional trade agreement raises bilateral trade, but not FDI. The existence of a BIT or DTT is associated with higher FDI.

As concerns the main variables of interest, unilateral and bilateral visa restrictions lower both trade and FDI. For trade, the effect of bilateral visa restrictions is stronger than the effect of unilateral restrictions, but it is less than double the effect of unilateral visa restrictions: an F-test rejects the hypothesis that the coefficient size of *visa_bilateral_{ij}* on travel is twice that of *visa_unilateral_{ij}* at a p-level of 0.04. This suggests that visa restrictions have a diminishing marginal negative effect on trade. For FDI, the effect of unilateral and bilateral visa restrictions are essentially the same in OLS estimations. A possible explanation for this finding is that whereas bilateral trade is essentially symmetric, bilateral FDI stocks are often very asymmetric in many dyads, particularly between developed and developing countries, where almost the entire stock comes from one of the two partner countries only. Taking into

⁸ This variable is correlated with contiguity and distance and if these variables were dropped from the model, then the same region variable becomes statistically significant with a positive coefficient sign.

account the necessary correction for the interpretation of estimated dummy variable coefficients in semi-logarithmic equations (see Kennedy 1981), unilateral visa restrictions are estimated to reduce trade by about 17.5 per cent, while the effect of bilateral visa restrictions is estimated at approximately 25 per cent. For FDI, both unilateral and bilateral restrictions are estimated to reduce bilateral FDI stocks by around 32 to 35 per cent.

Columns 2 and 3 report results for trade from the Heckman maximum likelihood sample-selection model for the level and selection stages, respectively. Being located in the same macro-region, which was insignificant in the OLS regression, continues to be insignificant at the level stage, but is a marginally significant predictor of the existence of trade at the selection stage. Contiguity has an unexpected negative effect on the existence of trade in the selection equation, but the overall effect on trade is positive, as one would expect. Otherwise, results are consistent in terms of coefficient sign and statistical significance with the results from the OLS estimation. The Wald test clearly rejects the hypothesis of independent equations, which means that the Heckman model, which estimates both stages simultaneously, is preferable over a (non-reported) two-part model, in which both stages of the estimation would be estimated separately and independently. The effect of visa restrictions can no longer be easily computed from the reported coefficients of the relevant dummy variables since it is a compound of its impact on the selection and on the level equations. Applying the formula in Sigelman and Zeng (1999: 177),⁹ unilateral visa restrictions are estimated to reduce bilateral trade by 19 per cent, while the effect of bilateral visa restrictions is around 28 per cent, i.e. close to the estimated values for OLS regression.

⁹ Alternatively, one can employ the “mfx compute, pred(ycond)” command in Stata.

Columns 5 and 6 report Heckman estimation results for FDI. Conditional on the other explanatory variables, countries that are common partners in a regional trade agreement are more likely to have bilateral FDI stocks. Otherwise results are consistent with the OLS estimations. The Wald test again rejects the hypothesis of independent equations. The estimated effect is around 25 per cent for both unilateral and bilateral visa restrictions, i.e. somewhat smaller than the estimated effects for the OLS regression. Given the large share of censored observations, the lower estimated effects from the Heckman model are probably closer to the true effects. The estimated effects also corroborate the result from the OLS estimations that for the often highly asymmetric bilateral FDI stocks unilateral visa restrictions have already essentially the same negative effect as bilateral restrictions.

The essential symmetry of bilateral trade allows me to indirectly test the argument that visa restrictions have a detrimental impact on trade in part because of the additional financial burden they impose on travelers. If this argument is correct, then the effect of visa restrictions on trade in dyads in which both partner countries are from the developing world should be stronger than in dyads in which at least one country is from the developed world, whose nationals can arguably more easily shoulder the extra burden of paying for, say, a visa services company to obtain the visa on their behalf. In an extension to the model reported in column 1 of table 1, in which I estimated separate visa restriction effects for developing country dyads on the one hand and dyads in which at least one partner is a developed country on the other, I find indeed that the effects are much stronger in the former set of dyads than in the others (detailed results not reported, but included in the replication dataset). This also tentatively suggests that visa restrictions do not merely pick up an underlying effect of good bilateral relationships not captured by some of the control variables since there

is no reason why such an omitted variable effect would systematically differ between these two sets of country dyads.

4. Conclusion

This article has extended standard gravity-type models of trade and FDI (see, for example, de Groot et al. 2004; Baldwin and Taglioni 2006; Linders and de Groot 2006; Rose 2007; Jansen and Piermartini 2009; Zwinkels and Beugelsdijk 2010; Kleinert and Toubal 2010) by including a further dyadic relationship that is likely to impact bilateral trade and FDI stocks, namely visa restrictions. The estimated coefficients of the visa restrictions variables and the substantive effects following from them need to be treated with some caution due to the identification problem described in detail above. The specification of the estimation model has tried to reduce omitted variable bias as much as possible, but it cannot eliminate it. The challenge for future research is to reduce this bias even further by including other dyad-specific variables with which visa restrictions are correlated and which also might impact bilateral trade and FDI.

Tentatively accepting the estimated effects, which are substantial but not absurdly high, visa restrictions do not only appear to impose a burden on affected travelers, they also impact the economies of countries that impose the restrictions and of countries whose nationals are faced with visa restrictions. Given the negative effects of visa restrictions, the question is why do countries impose visa restrictions at all? Neumayer (2006) argues that they are meant to reduce actual or perceived security concerns by preventing *persona non grata* from entering the country. However, they are a very blunt instrument as they deter many others who would bring economic and other benefits to the country and will often not prevent the entrance of

those who are meant to be kept out. For example, the 9/11 terrorists all entered the US on valid visas. I contend that many existing visa restrictions, particularly those in countries dependent on foreign visitors, trade and foreign investment, would not pass a cost-benefit test and more research is needed on why states maintain restrictions that *prima facie* would appear not to be in their own economic interest.

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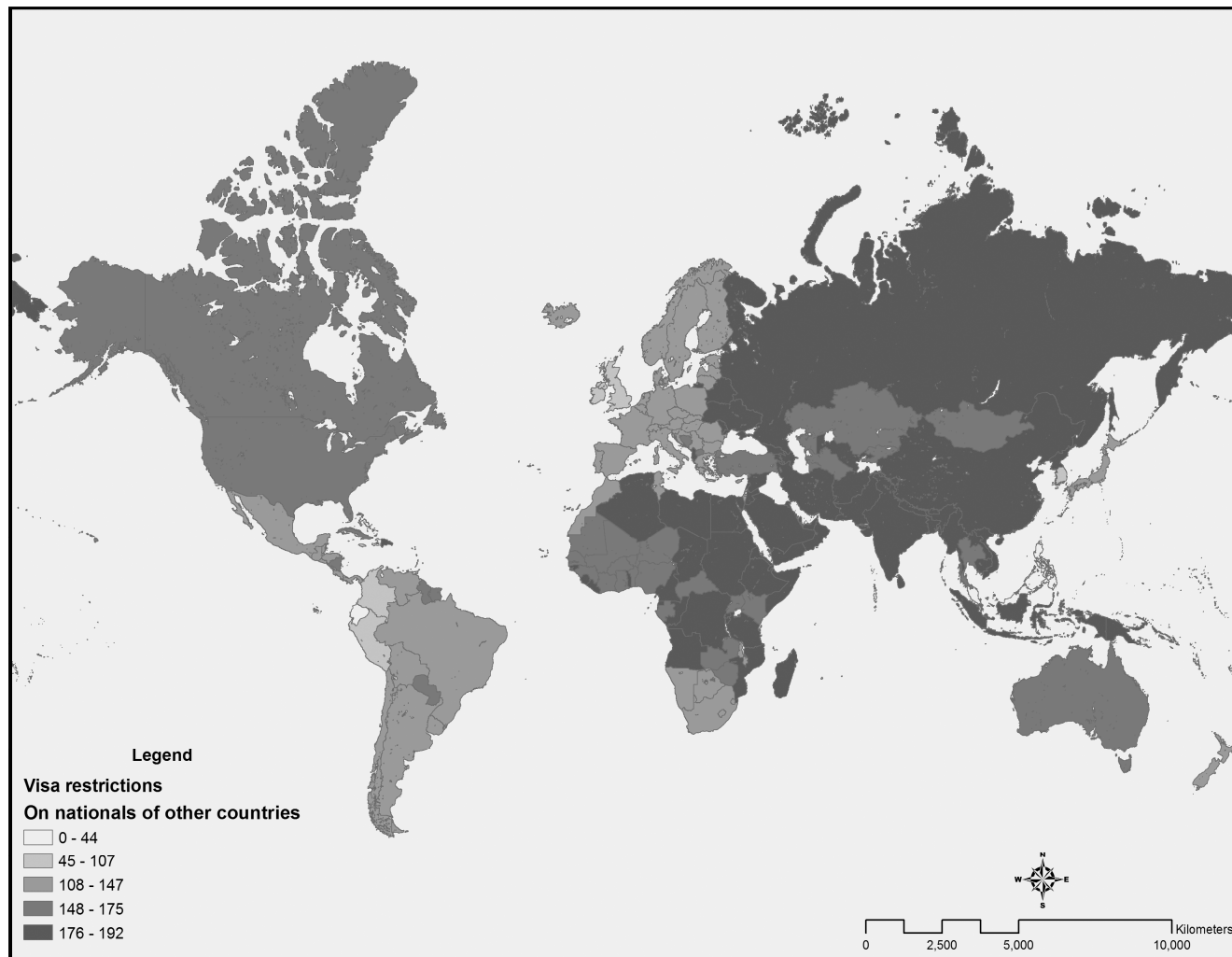
Zwinkels, R.C.J., Beugelsdijk, S. (2010). Gravity Equations: Workhorse or Trojan Horse in Explaining Trade and FDI Patterns Across Time and Space? *International Business Review*, 19, 102-115.

Table 1. Estimation results.

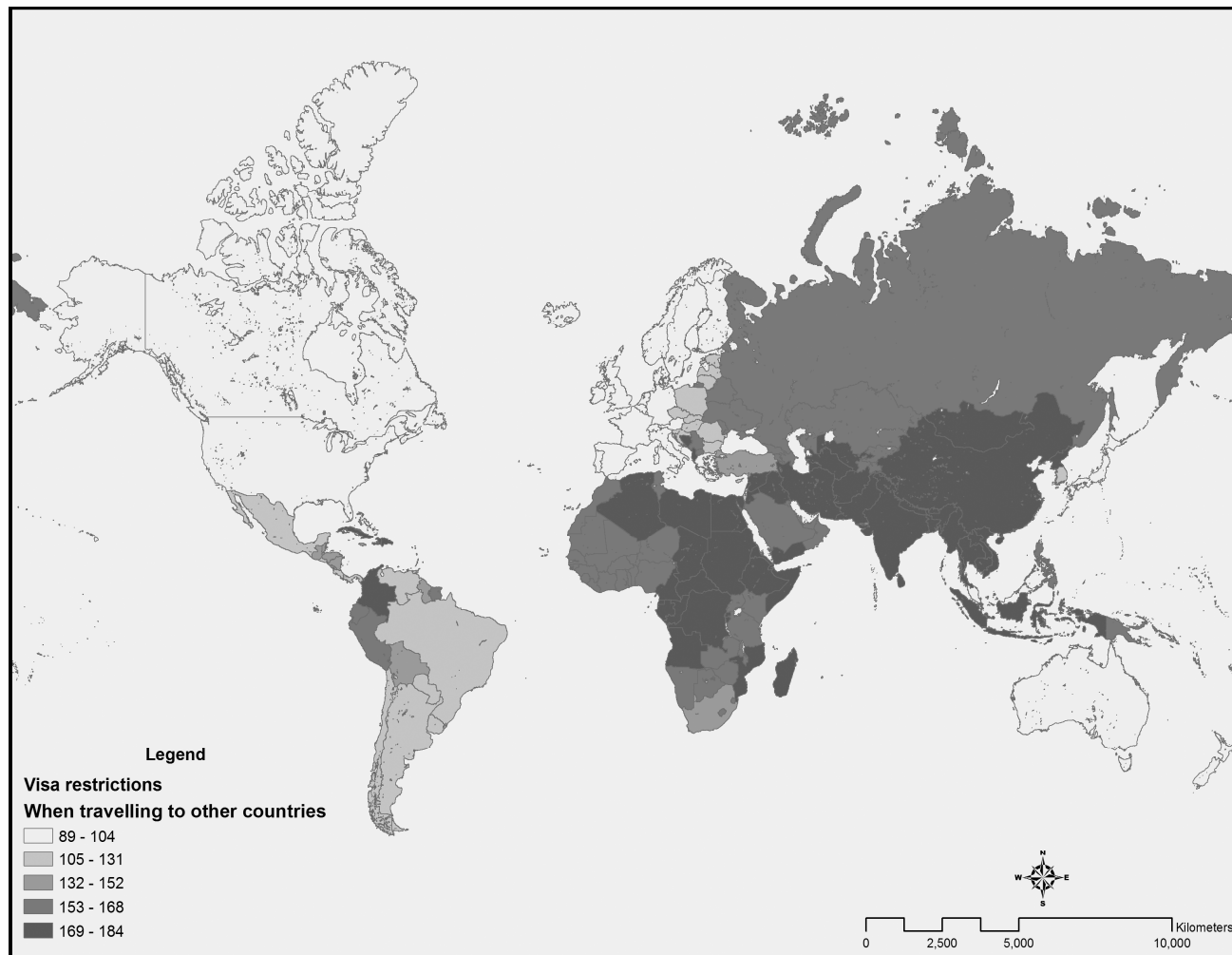
	(1) trade OLS	(2) trade Heckman level eq.	(3) trade Heckman selection eq.	(4) FDI OLS	(5) FDI Heckman level eq.	(6) FDI Heckman selection eq.
In distance	-1.051** (0.0194)	-1.058** (0.0192)	-0.775** (0.0371)	-0.800** (0.0503)	-0.888** (0.0482)	-0.510** (0.0337)
contiguity	0.243** (0.0526)	0.238** (0.0523)	-0.813** (0.266)	0.348** (0.0874)	0.285** (0.0856)	-0.00892 (0.0809)
same region	0.0375 (0.0317)	0.0410 (0.0315)	0.534** (0.0646)	-0.0118 (0.0657)	0.0111 (0.0648)	-0.0108 (0.0542)
colonial link	1.085** (0.104)	1.093** (0.104)	4.884** (0.791)	0.462* (0.220)	0.452* (0.221)	-0.0600 (0.165)
trade agreement	0.160** (0.0269)	0.158** (0.0267)	0.254** (0.0714)	-0.0529 (0.0724)	0.0507 (0.0716)	0.134** (0.0504)
same language	0.268** (0.0331)	0.275** (0.0329)	0.748** (0.0621)	0.320** (0.106)	0.297** (0.103)	-0.0810 (0.0594)
diplomatic representation	0.354** (0.0150)	0.349** (0.0149)	0.408** (0.0698)	0.106** (0.0404)	0.241** (0.0412)	0.342** (0.0275)
In bilateral migrant stock	0.109** (0.00657)	0.109** (0.00652)	0.0718** (0.0138)	0.185** (0.0166)	0.212** (0.0160)	0.124** (0.0112)
BIT or DTT				0.177** (0.0603)	0.361** (0.0605)	0.303** (0.0415)
visa_unilateral	-0.192** (0.0260)	-0.191** (0.0258)	-0.352** (0.0553)	-0.428** (0.0730)	-0.438** (0.0709)	-0.217** (0.0490)
visa_bilateral	-0.288** (0.0318)	-0.289** (0.0315)	-0.586** (0.0681)	-0.377** (0.0893)	-0.533** (0.0863)	-0.337** (0.0597)
Observations (of which censored)	24320	32938 (8618)	32938	5017	32938 (27921)	32938
Wald test ind. equ. (p-value)		16.24 (0.0001)			130.9 (0.0000)	
R-squared	0.835			0.751		

Note: Ordinary Least Squares (OLS) or Heckman maximum likelihood sample-selection estimation with fixed effects for each of the partner countries of a dyad included. Robust standard errors in parentheses.

* statistically significant at .05 level * at .01 level.



Map 1. Visa restrictions imposed by country on nationals of other countries.



Map 2. Visa restrictions faced by nationals of country travelling to other countries.