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Abstract

The vast majority of states impose visa restrictions on travellers from some foreign countries. Such restrictions are likely to deter foreign visitors from affected countries. They will therefore reduce the flow of tourists, businesspeople and other travellers and thereby damage a country's tourism industry, reduce its trade as well as its scientific, cultural and other exchange with foreign countries. This study estimates the damaging effect exerted by visa restrictions on bilateral travel in a country dyad dataset covering the period 1995 to 2005. It finds that, depending on the exact model specification chosen, visa restrictions reduce such travel by on average between 52 and 63 per cent.

Key words: *visa, visitors, travellers, trade, tourism*

Introduction

Sovereign nation-states postulate and exercise a right to control and restrict entry by foreign visitors into their domestic territory. Such controls and restrictions have "historically been viewed as inherent in the very nature of sovereignty" (Collinson 1996, 77). As Sassen (1996, 1998) remarks, there is no right to enter foreign spaces anywhere in international law. Even the non-binding Universal Declaration of Human Rights only postulates a right of exit and entry to one's own country (article 13), not a right to enter foreign spaces. Two important mechanisms by which states exert their right are border controls and visa restrictions.

Visa restrictions represent an important hurdle to and deterrent against unwelcome visitors that is binding before visitors even arrive at one's borders. First, there is the additional cost and hassle of applying for the visa before travel either via post, which can take weeks or months, via employing a professional visa service provider or in person, which implies travelling to the embassy or one of the few consulates and often queuing, possibly for hours until served. Second, the issuing consulate or embassy can of course, and sometimes does, deny the application without giving any reason. As Torpey (1998, 252) has put it: "Passport and visa controls are (…) the 'first line of defense' against the entry of undesirables."

Yet, visa restrictions are likely to deter both welcome and unwelcome travellers. They will deter foreign businessmen and businesswomen as well as foreign tourists and other travellers to the detriment of the domestic economy – see Neumayer (2010) for an analysis of the effect of visa restrictions on bilateral trade and foreign direct investment. Already the League of Nations in the inter-War period and, after World War II, the Council of Europe reminded nation-states that visa restrictions inhibit

international trade and tourism (Salter 2003). By imposing visa restrictions on foreign travellers, countries are thus, in some sense, damaging themselves.[1]

Given the potentially great economic damage that visa restrictions impose on the domestic economy, it is perhaps surprising that this is the first study to analyze the extent to which visa restrictions actually reduce the flow of travellers.[2] My findings suggest that visa restrictions on average reduce the bilateral flow of travellers by between 52 and 63 percent, depending on model specification. The effect is bigger for travel to and coming from developing countries than it is for developed country travel. There are also regional differences across the developing world. The effect of visa restrictions is thus substantially large, even if it is smaller than the effect of geographical location and former colonial links, which are themselves highly correlated with visa restrictions, however.

This article complements Neumayer (2006) where country-specific variations in visa restrictions are explained. In the current article, the effect of visa restrictions on bilateral travel is examined instead. Neumayer (2006) speculated that visa restrictions have a large detrimental effect on bilateral travel, but could not test this hypothesis. The empirical validation offered in this article adds to our understanding of the complex trade-off between providing travellers access for economic and other

[1] The detrimental economic impacts have played a high-profile political role in the United States, where after 9/11 the issuance of visas has been severely restricted. This has created much concern among business groups, research centres and universities of undue delay in granting visas and keeping out students, scientists and businessmen whose entry would be beneficial to US interests (Froelich 2004; Bhattacharjee 2004).

[2] One potential reason for this lack of existing studies is the work effort involved in inputting data on visa restrictions for a global sample of nation-states. This article's analysis can build on an earlier study of visa restrictions, for which I have coded these data already (Neumayer 2006).

benefits and denying travellers access for preventing illegal immigration and for perceived security reasons.

Research design

The estimation of the effect of visa restrictions on travel has to deal with an identification problem due to potential omitted variable bias. If variables that both have an influence on travel 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). Travel costs, for example, will impact travel, 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 my 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) and practically all of the variation of the visa restriction variable will be dominated by between-variation (variation across dyads).[3] Given dyad fixed effects are impossible, I try to reduce OVB as much as possible by including, where possible, year-specific nation dummies and dyadic explanatory variables that could be correlated with visa restrictions. This cannot solve the identification problem, but it reduces it as much as possible.

[3] 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.

In the base model, I estimate the following model of travel demand for the period 1995 to 2005, which is a log-linearized version of a gravity-type model:

$$y_{ijt} = \alpha + \beta_1 V_{ij} + \beta_2 x_{it} + \beta_3 x_{jt} + \beta_4 x_{ij} + \gamma_{t*} u_i + \gamma_{t*} v_j + \varepsilon_{ijt},.$$

The subscript *i* represents the destination country, the subscript *j* represents the foreign source country and *t* stands for time, measured in years since I have annual data. *y* is a suitable variable of travel demand. It is determined by visa restrictions between country *i* and country *j* (V_{ij}). This variable is in principle time-variant, but I have data only for one year, which is taken over for the other years (see the discussion on the measurement error this introduces below). Travel demand is further determined by x_{it}, that is by time-varying conditions in the destination country, x_{jt}, i.e. time-varying conditions in the foreign source country, as well as x_{ij}, i.e. links between the two countries, which could in principle be time-varying as well, but are constant over time in my actual research design. The year-specific destination fixed effects $\gamma_{t*} u_i$ and year-specific source country fixed effects $\gamma_{t*} v_j$ capture both any destination and source country-specific effects that do not change over time, such as the general attractiveness of a destination for tourists (weather, beaches, cultural and historical attractions etc.) and the general propensity of individuals from source countries to travel, as well as time-varying effects specific to destination or source countries, such as market attractiveness, foreign investment climate, business cycles etc.

I employ standard errors that are clustered on country dyads, i.e. observations are merely assumed to be independent across country dyads, but not necessarily within dyads. Since annual observations within the same dyads cannot be independent from each other, failure to do so would lead to a large under-estimation of standard errors.

The dependent variable

Travel demand can be measured by number of visitors or by receipts from such travel. Unfortunately, neither can capture the wider economic benefits generated to a country by incoming visitors. Receipts measure the more direct economic benefits somewhat closer than the number of visitors, but no bilateral data on receipts exist, which is why I use data on bilateral visitor numbers instead, for which data are available. Note, however, that at the aggregate national level the number of visitors and receipts are very highly correlated with each other (Neumayer 2004).

Data for visitor arrivals are taken from WTO (2007) and cover the period 1995 to 2005. For the ordinary least squares (OLS) estimations the natural log of the dependent variable is taken in order to render its distribution less skewed. This also allows an easy interpretation of estimated coefficients as elasticities. As will be explained further below, some estimations employ a Poisson count data estimator instead, for which the dependent variable is the number of travelers in levels, i.e. not logged. The sample consists of all countries for which data are available. In a robustness check, I ran the same models for a sample consisting of developing countries only. The results reported further below are similar.

The explanatory variables

Information on the main explanatory variable, 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 36,300 relevant country pairs (dyads) doing so would be prohibitively costly in terms of effort (it took several months to input the existing data).[4] Given that the panel covers the years 1995 to 2005, there is therefore some measurement error in the visa restrictions variable as a few countries will have changed some of their visa restrictions during this time period. However, this measurement error is small because the number of changes to visa restrictions is likely to be very small compared to the total number of restrictions in place. The cost of measurement error may be outweighed by the benefit of being able to use a panel dataset, which allows the inclusion of year-specific destination and source country fixed effects. However, I also report results from a cross-sectional analysis from the year 2004 only, which leads to an estimated elasticity for the visa restrictions variable that is close to the one derived from the panel model.

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, it is fair to say that 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. Egypt is a good example. Passport holders from OECD and other major tourist sending countries need a visa, but can obtain one at the border for a fee of US$15 without complication. With an estimated number of arrivals in 2006 of around 8.6 million people, this might have generated an additional revenue to the country of up to US$129 million. Since visas that can be applied for at

[4] Due to lack of data for the explanatory variables not all dyads enter the sample.

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. Similarly, countries on a so-called "visa waiver program", with which the United States exempts travellers from selected countries from the need to obtain a prior visa are deemed free of visa restrictions, even though the United States has recently introduced a kind of intermediate regime by requiring visitors from visa waiver program countries to apply for so-called Electronic Travel Authorization before the start of travel.

Visa restrictions are a fairly common phenomenon. 66 percent of country dyads impose such restrictions, but the large standard deviation of 48 percent demonstrates that there is a lot of variation in the data. There is a good deal of reciprocity: around 68 percent of country dyads either impose visa restrictions on each other or are mutually free of such restrictions. Western developed countries impose restrictions on travellers 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 citizen can enter 156 foreign countries only with a visa. In addition to economic considerations, visa restrictions are often driven by geostrategic reasons. Countries often allow visa-free travel for visitors from neighbouring countries or countries from the same region, unless they are on unfriendly terms with the foreign government. Whereas there is a roughly 69 percent chance that a dyad located in different regions has a visa restriction in place, this likelihood decreases to 49 percent if the two countries are from the same region.

In sum, the international system of visa restrictions provides highly unequal access to foreign spaces. Facilitating the mobility of some is achieved at the expense

of inhibiting and deterring mobility of others. By and large, citizens from rich and geographically or culturally close countries are far less likely to be subjected to visa restrictions than others. 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). I discuss reasons for the variation in the system of visa restrictions in more detail after the section that presents the estimation results.

< Insert maps 1 and 2 around here >

Recall from the estimating equation that in addition to the visa restriction variable, there are destination- and source-specific time-varying variables as well as time-invariant variables that measure the link between the two countries. As destination- and source-specific variables I include the natural logs of population size and per capita income as well as a measure of democracy in both countries. The idea is that larger and richer countries are more attractive destination countries and generate more travelers as source countries. Democracies tend to impose fewer, if any, restrictions on travel abroad and fewer restrictions on travellers from abroad. Data on income and population are taken from World Bank (2007), data on democracy from the Polity IV project (Marshall, Jaggers, and Gurr 2008). Political violence in destination countries is a deterrent to travelers (Neumayer 2004). I

therefore employ a variable that measures the intensity of armed conflict in a country, with data taken from Gleditsch et al. (2002).

As variables measuring links between two countries, I use the natural log of the geographical distance between the capital cities, a dummy variable for when the two countries are located in the same geographical region and, finally, a dummy variable for the existence of a former colonial link. Data on distance are taken from Bennett and Stam (2008), geographical classification largely follows the World Bank's (2007) grouping of countries.[5] The colonial ties dummy variable is taken from Neumayer (2003) and complemented to include Russia in this definition since its imposition of political and military control over ex-Soviet territories was analogous to that exercised by the classic Western and Japanese colonisers.

Regression results

Table 1 contains the estimation results. Column 1 reports the base model, which will be compared to various extensions and modifications. Addressing the control variables first, the estimated elasticities for per capita income in destination and source countries suggest that bilateral travel increases by around 11.5 and 6.4 percent for a ten percent increase in respective per capita incomes. In other words, bilateral travel is a normal good (income elasticity above zero), as one would expect. The estimated elasticity for population size in the source country suggests that a ten percent higher population size increases travel by 5.9 percent. The elasticity of population size in the destination country is somewhat smaller at 5 percent.

[5] 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.

< Insert table 1 around here >

Geographical distance deters bilateral travel: for every 10 percent increase in distance between the two countries, bilateral travel falls by 5.2 percent. Dyads in which the destination and source country belong to the same geographical region on average receive a travel flow that is 492 per cent higher than dyads in which the two countries belong to different regions.[6] Together, the distance and regional belonging variable demonstrate a very strong effect of geographical location on bilateral travel. A former colonial link between the destination- and source-country also has a strong impact on bilateral travel, increasing it on average by 505 per cent. A more democratic regime in either source or destination country or armed conflict in the destination country do not impact on bilateral travel in this model specification.

Turning now to the main variable of interest, visa restrictions, the estimated coefficient suggests that the existence of a visa requirement reduces the bilateral flow of visitors by roughly 60 per cent. While a substantively large effect, it may seem small in comparison to the geographical and colonial link variables. However, one needs to keep in mind that these variables are strongly correlated with each other. The likelihood of a visa restriction in place is much lower for geographically close dyads, dyads with countries in the same geographical region and dyads in which there is a former colonial link (Neumayer 2006).

In column 2 I estimate the model for the year 2004 only to avoid the measurement error from using the visa restrictions variable, which was derived from

[6] These and similar estimated elasticities take into account the necessary correction for the interpretation of estimated dummy variable coefficients in semilogarithmic equations (see Kennedy 1981).

data of 2004 only, for the entire time period of the panel. At 63 percent, the estimated effect of visa restrictions is almost identical to the one derived from the fixed effect panel model. In column 3, I include destination and source specific fixed effects into this model, which means that all the x_i and x_j variables are dropped from the estimation. The effect of visa restrictions is estimated at 62 percent, i.e. almost identical.

Santos Silva and Tenreyro (2006) argue that the interpretation of estimated coefficients as elasticities in OLS log-linearized models can be highly misleading in the presence of heteroskedasticity. They suggest estimating the model in levels (i.e., not log-linearized) instead and using a Poisson estimator with clustered standard errors. Results are reported in column 4 for the panel and in columns 5 and 6 for the year 2004 only, respectively. Note that the model in column 4 cannot include year-specific nation dummies as was the case in column 1, as the model failed to converge. Instead, it includes time-invariant dummy variables for destination and source countries as well as year-specific time dummies. The estimated coefficients suggest that the expected number of visitors goes down by 56.4, 52 and 59.4 percent, respectively, which represents slightly lower elasticities than in the log-linearized model.

Does the effect of visa restrictions differ across groups of countries? To test for this, I have interacted the visa restrictions variable with various dummy variables for country groups and have re-estimated model 1 (detailed results not reported, but available upon request). See table 2, which summarizes the results together with some descriptive information on actual travel flows in 2005. To start with, visa restrictions have a more damaging effect on bilateral travel to developing than to developed countries. Whereas such restrictions reduce bilateral travel by approximately 37

percent to developed countries, the effect is much stronger at 64 percent in travel to developing countries. The likely reason is that, on average, travel to developed countries is more beneficial for potential visitors than travel to developing countries such that fewer of them are deterred from travelling by the existence of visa restrictions. Among the developed countries, travel to the high-income East Asian and Pacific countries (Japan, Australia, New Zealand) is more strongly affected at minus 61 percent than travel to high-income North America (Canada and United States) at minus 31 percent, whereas travel to Western Europe is not affected in a statistically significant way. Among the developing countries, visa restrictions have the largest effect on travel to countries in Eastern Europe and Central Asia (minus 77 percent), followed by Latin America and the Caribbean (minus 68 percent), Sub-Saharan Africa (minus 63 percent), Middle East and Northern Africa (minus 51 percent) as well as low-income Eastern Asia and the Pacific (minus 25 percent). The effect on travel to South Asian countries is statistically insignificant, but there are only three countries in this region so the respective coefficient is likely to be estimated unreliably.

Testing conversely for differential effects of visa restrictions on visitors coming from certain groups of countries, I find again that such restrictions have a stronger effect on visitors from developing (minus 66 percent) than developed countries (minus 36 percent). The reason is most likely that individuals in developed countries find it easier to obtain a visa and are better able to pay for the direct and indirect costs. Among the developed countries, it is again travel from the high-income East Asian and Pacific countries which is most strongly affected (minus 58 percent), followed by travel from Western Europe (minus 26 percent), whereas travel from North America is not statistically significantly affected. Among the various regions of the developing world, visa restrictions have the strongest negative effect on travel from Latin

America and the Caribbean (minus 76 percent), followed by Sub-Saharan Africa (minus 66 percent), Northern Africa and the Middle East (minus 52 percent), Eastern Europe and Central Asia (minus 45 percent), and South Asia (minus 29 percent).

Why restrict the number of travellers via visa restrictions?

The results reported above suggest that visa restrictions have a large negative effect on the flow of travellers between two countries. Most policy makers now subscribe to the view that international trade, foreign investment, tourism, scientific, business and other contacts are desirable for mainly economic reasons. So, the question arises, why do states impose visa restrictions if these are economically damaging? The reason is that every state faces the dilemma between facilitating the cross-border flow of people for its own economic and political benefit on the one hand and monitoring, controlling and limiting that same flow for its perceived security interest as well as preventing illegal immigration on the other hand.

What differs across countries is the relative weight they put on the two aspects of the trade-off. Visa restrictions provide a crude, but powerful mechanism to manage this trade-off. They fulfil the double role of pre-selection and deterrence: Those who do not need a visa are regarded as welcome and low-risk visitors by default, those who need a visa and have been approved by the country's consulate or embassy abroad are regarded as not unwelcome and not representing a great risk upon closer inspection, whereas those who need a visa and do not have one or have been denied a visa are unwelcome. To be sure, even if no visa is needed or a visa has been attained, the final decision of whether one can enter a foreign space is made at the border itself and there is always the risk that border control will deny entry even if one is in possession of a valid visa. However, in practice this risk is rather small, which is why

the pre-selection role of the system of visa restrictions is so important.[7] Not so much passports as such, as Salter (2003, 2) seems to suggest, but the visa restrictions imposed on passport holders from certain countries are one of the most important mechanisms, with which nation states exert their prerogative to control entry into their territory.

Those countries more concerned about security will impose more restrictions. One obvious concern is that visitors might turn into immigrants by staying on (illegally) in the country instead of returning back home. Illegal entry is only one way into illegal immigration. Gaining legal access, but then overstaying the allowed period of leave is another and quite important one.[8] Western developed countries are

[7] This importance is further heightened by the fact that it might not be possible to send people whose entry is rejected back to their home country. True, in principle the passport 'provides an assurance for the State of transit or destination that the bearer can return to the State which issued the passport' (ICAO 2004, 13). In other words, in principle the passport guarantees that those denied access can be sent back to the issuing country. However, there have been many cases where individuals have destroyed their passports or countries have refused to take their nationals back. It is exactly for this reason that many countries require airlines not to let anyone enter the aircraft who is not in the possession of a valid visa (if required to do so). Otherwise the dual purpose of visa restrictions, pre-selection and deterrence, would be defeated. Increasingly, sanctions are applied to sea and ground transport companies as well (UN 2002).

[8] Just how important is difficult to say. Bigo (1998, 152) reports from discussions with French Schengen Officials and the *Central Directorate for the repression of illegal immigration and employment* that only 20% of illegal immigrants crossed the border illegally, whereas the vast majority entered the country perfectly legally, but then overstayed the allowed period of time. Andreas (1998, 607) and Koslowski (2005, 5) report a higher share of individuals crossing the border illegally for the United States (50 to 60% and 60 to 70%, respectively) despite the increasing militarisation of the U.S.-Mexican border (Nevins 2002). But even so an estimated 150,000 people each year overstay their visa with the intention of settlement.

attractive destinations for illegal immigrants who often come from poor developing countries, which explains why Western countries usually have restrictive visa policies in place with respect to travellers from developing countries. Besides immigration, another big concern to many states is the infiltration by potential terrorists, drug traffickers, political activists and other *persona non grata*. Visa restrictions represent an important mechanism to counter threats to regime stability by politically undesirable individuals and threats to national security by politically motivated violence. Autocratic regimes are suspicious that foreign influence might undermine the regime's foundations and are therefore eager to control who enters the country. The more autocratic and repressive a regime is, the more it is threatened by open borders (Anderson 2000). It is therefore not surprising that some of the most autocratic countries in the world (e.g. China, Myanmar and Northern Korea) impose visa restrictions on travellers from almost every other country in the world.

In contrast, those governments more concerned about the detrimental economic and other impacts of visa restrictions will impose fewer visa restrictions. For example, countries which are heavily dependent on trade need to provide easy access to foreign visitors in order to facilitate the international exchange of goods and services. Major tourist destinations have an incentive not to impose visa restrictions on sending countries in order to remain attractive in the increasingly competitive market for mass tourism. O'Byrne (2001) argues that the relaxation of visa requirements in many countries can be explained as a direct response to the demands by the tourism industry to whom 'freedom of travel *is* freedom to trade' (emphasis in original). Hence, it is again not surprising that some of the most tourism-dependent countries in the world (e.g., Barbados, Kenya, Maldives, Seychelles, Tanzania) as well as some of the most

trade-dependent countries and country-like entities (e.g., Hong Kong, Malaysia, Singapore) impose very few, if any, visa restrictions on travellers.

Does this mean that the estimations reported above suffer from endogeneity bias, which would follow if the explanatory variables like visa restrictions were correlated with the error term? Not necessarily. The destination and source country fixed effects included in the estimations capture, among other things, the general trade and tourism openness (dependence) of countries. They certainly reduce potential correlation of the key explanatory variable visa restrictions with the error term, even if they perhaps cannot eliminate it entirely. That explanatory variables are correlated with each other (rather than with the error term) is not a problem for the estimations, however. It simply changes the interpretation of the estimated coefficient, which then has to be seen as estimating the effect of visa restrictions conditional on the other explanatory variables, including the fixed effects, being included in the estimation model.

Conclusion

In this article, I have estimated the effect of visa restrictions on bilateral travel. The results show that bilateral travel is significantly and substantively affected by such restrictions. It is estimated to be reduced by between 52 and 63 percent on average. I have also shown that travel to and from developing countries suffers more from the imposition of visa restrictions and that there are also regional differences across the developing world. These estimated effects need to be treated with some caution due to the identification problem (potential omitted variable bias), which I tried to mitigate through careful model specification, but could not solve completely. Moreover, the data are not dis-aggregated so I cannot distinguish between different types of travel. However, while visa restrictions may not affect all types equally, they will dampen all

travel. There will be less trade, fewer tourists, less scientific, cultural and other exchange. In other words, countries imposing visa restrictions on foreign travellers pay a price for doing so.

Imposing visa restrictions need not be irrational, however. Governments will balance the economic or other benefits of allowing foreign travellers access to their country's domestic space against the security and other concerns foreign visitors generate. As pointed out above, the system of visa restrictions varies in predictable ways. More trade and tourism dependent countries impose fewer restrictions, richer countries fearful of illegal immigration and more autocratic countries impose more restrictions.

Yet, visa restrictions have a substantively large damaging effect on bilateral travel and policy makers would be well advised to consider whether the large benefits of lifting visa restrictions would outweigh any security or other concerns they may have. Visa restrictions are strangely at odds with a world that is becoming more and more inter-connected via myriad links and in which economic and other gains increasingly depend on international exchange and mobility. However, human geographers and other social scientists have long since noted how increases in "globalization" do not necessarily mean increases in the cross-border flow of human beings (Collinson 1996; Andreas and Snyder 2000; Nevins 2002; Cunningham 2004). Nation-states have proven far keener to bring down barriers to telecommunication, trade and, if less so, capital flows than they have been keen to remove barriers to the cross-border movement of people.

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Table 1. Estimation results.

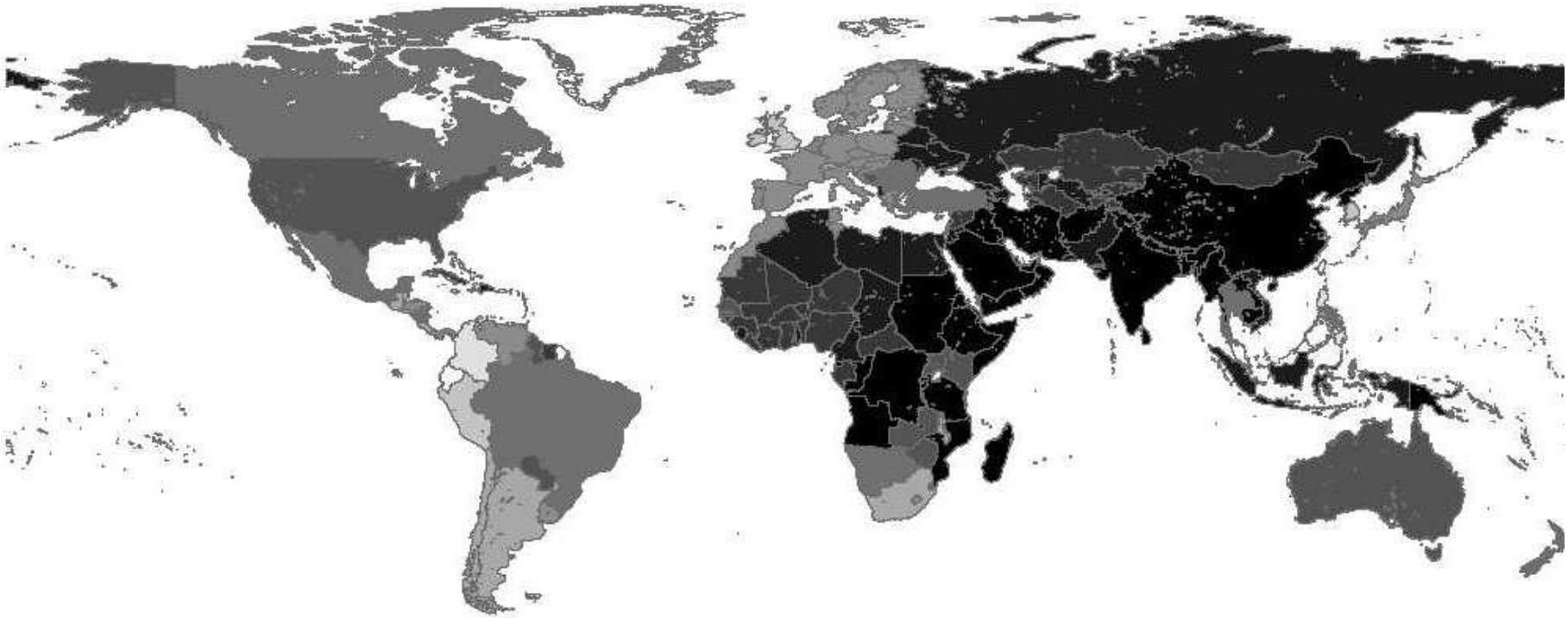
	(1)	(2)	(3)	(4)	(5)	(6)
	ln visitors	ln visitors	ln visitors	visitors	visitors	visitors
Visa restrictions	-0.923**	-0.997**	-0.968**	-0.822**	-0.723**	-0.902**
	(0.0469)	(0.0500)	(0.0447)	(0.127)	(0.160)	(0.122)
ln GDP pc (destination country)	1.151**	0.752**		0.486*	0.368**	
	(0.148)	(0.0157)		(0.207)	(0.0504)	
ln Population (destination country)	0.504**	0.788**		1.720**	0.479**	
	(0.128)	(0.0145)		(0.546)	(0.0386)	
Democracy (destination country)	0.0407	-0.00489		0.00721	0.0213	
	(0.0241)	(0.00391)		(0.00903)	(0.0154)	
Armed conflict (destination country)	0.0852	-0.0558*		-0.0364*	-0.139**	
	(0.0888)	(0.0228)		(0.0155)	(0.0522)	
ln GDP pc (foreign source country)	0.640**	0.863**		0.964**	0.480**	
	(0.0967)	(0.0157)		(0.292)	(0.0666)	
ln Population (foreign source country)	0.587**	0.778**		0.636	0.444**	
	(0.131)	(0.0134)		(0.392)	(0.0396)	
Democracy (foreign source country)	-0.0166	0.0257**		-0.00352	0.00933	
	(0.0180)	(0.00432)		(0.0108)	(0.0169)	
ln Distance	-0.515	-0.576**	-0.533**	-0.348**	-0.309**	-0.331**
	(0.0141)	(0.0152)	(0.0135)	(0.0203)	(0.0412)	(0.0187)
Colonial link	1.811**	1.834**	1.520**	0.619**	1.061**	0.637**
	(0.216)	(0.266)	(0.235)	(0.227)	(0.263)	(0.229)
Same region	1.780**	1.787**	1.737**	0.756**	0.747*	0.900**
	(0.0522)	(0.0592)	(0.0490)	(0.173)	(0.360)	(0.159)
Constant	-21.34**	-27.22**	9.617**	-35.24*	-9.767**	10.56**
	(3.672)	(0.375)	(0.279)	(12.10)	(1.265)	(0.721)
Observations	95117	8222	10870	95205	8230	10879
R-squared	0.84	0.73	0.83	0.89	0.72	0.89
Estimator	OLS	OLS	OLS	Poisson	Poisson	Poisson
Year-specific nation dummies	Yes	No	No	No	No	No
Nation dummies	No	No	Yes	Yes	No	Yes
Time dummies	No	No	No	Yes	No	No
Time period	1995-2005	2004	2004	1995-2005	2004	2004

Note: Standard errors clustered on country dyads. Standard errors in parentheses.
* statistically significant at .05 level ** at .01 level.

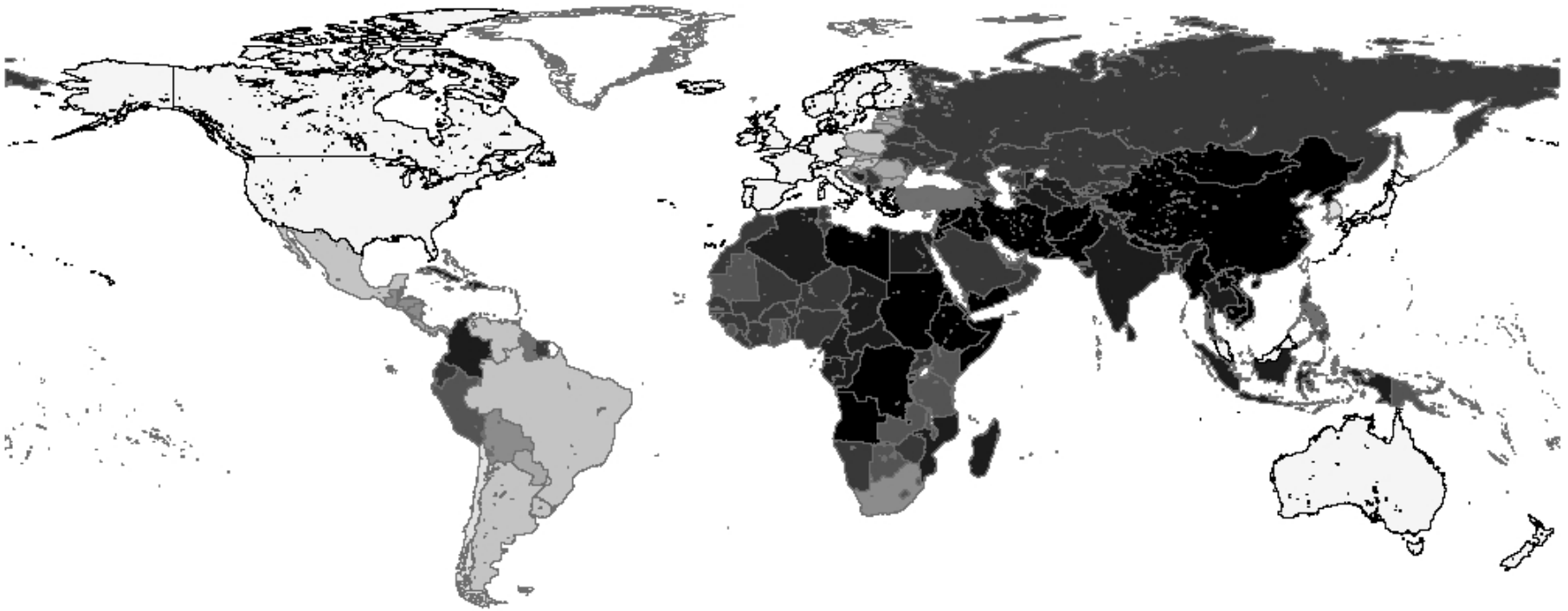
Table 2. Estimated effects of visa restrictions on travel to and from regions.

	Travel to:		Travel from:	
	Million visitors in 2005	% impact of visa restrictions	Million visitors in 2005	% impact of visa restrictions
Developed countries:	436	-37	555	-36
East Asia and Pacific (high-income)	13	-61	30	-58
North America	84	-31	107	n.s.
Western Europe	339	n.s.	418	-26
Developing countries:	523	-64	404	-66
Eastern Europe and Central Asia	219	-77	160	-45
East Asia and Pacific (low-income)	169	-25	148	-51
Latin America and the Caribbean	51	-68	34	-76
Northern Africa and Middle East	56	-51	36	-52
South Asia	6	n.s.	9	-29
Sub-Saharan Africa	22	-63	17	-66

Note: n.s.: not significant. Source: WTO (2007) and own estimations.



Map 1. Visa restrictions imposed by country on nationals of other countries (darker colours mean more restrictions).



Map 2. Visa restrictions faced by nationals of country travelling to other countries (darker colours mean more restrictions).