Policy Research Working Paper 10324

Deep Trade Agreements and International Migration

The Role of Visa Provisions

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WORLD BANK GROUP
Development Research Group &
Macroeconomics, Trade and Investment Global Practice
February 2023

Policy Research Working Paper 10324

Abstract

An increasing number of regional trade agreements contains provisions that ease access to visas among member countries, which reduces the administrative cost of crossing the border. Combining United Nations data on bilateral stocks of immigrants in the period 1990–2020 with World Bank data on the content of 279 regional trade agreements, this paper presents robust evidence of a positive effect of visa provisions in regional trade agreements on bilateral migration: the presence of visa provisions in regional trade agreements increases the bilateral stock of immigrants by 5.9 percent. This result is robust to an instrumental variable strategy addressing the endogeneity problem. The effect of the inclusion of visa provisions in regional trade agreements is particularly effective among country pairs with different income levels (such as North-South). For this type of country pairs, the presence of visa provisions in regional trade agreements increases the bilateral stock of immigrants by 13 percent. Finally, the paper shows that the effectiveness of visa provisions in regional trade agreements reduces with the anti-immigration sentiment of voters in the destination.

This paper is a product of the Development Research Group, Development Economics and the Macroeconomics, Trade and Investment Global Practice. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at anthonin.levelu@dauphine.psl.eu, amm223@georgetown.ed, and gianluca.orefice@dauphine.psl.eu.

Deep Trade Agreements and International Migration: The Role of Visa Provisions *

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Keywords: Immigration, Deep Trade Agreement, Migration Policy.
JEL-Classification: F22, F13.

*We thank participants of the 12th annual CEPII-LISER-OECD "Immigration in OECD countries" conference, "Deep Trade Agreements Conference: Effects Beyond Trade" held in June 2022 at the World Bank, and in particular our discussants Murat Kirdar and Sandra Rozo, for useful comments and suggestions. This paper has been partly supported by the Umbrella Facility for Trade trust fund (financed by the governments of the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom). The views expressed in this paper are those of the authors and do not necessarily reflect those of the institutions they belong to. The usual disclaimer applies. Declarations of interest: none.

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1 Introduction

An increasing number of regional trade agreements (RTAs) have been signed during the last decades, with many of them covering provisions going beyond purely trade-related clauses. In particular, an increasing number of RTAs contains provisions regulating and easing the bureaucratic procedures to obtain a visa, and the cross-border movement of individuals. Such a reduction in the administrative cost of moving across countries, i.e. red tape for migration, may affect the optimal migration choice for potential migrants at origin. Conditional on other *push* and *pull* factors of migration – see Hatton (2005) and Mayda (2010) – the reduction in the administrative cost to obtain a visa is expected to affect the potential migrant's choice about his/her optimal destination country, and hence may favor the settlement of migrants among an RTA's signatory countries.

This paper benefits from the recent World Bank data on the content of RTAs and studies the effect of visa-related provisions in RTAs on the bilateral settlement of migrants. Using UN data on bilateral migration stocks in the period 1990-2020, we show that including visa provisions in RTAs stimulates bilateral migration stock by 5.9%. An Instrumental Variable (IV) approach addresses the endogeneity concerns and confirms the positive effect of visa provision on bilateral migration. Interestingly, we show a strong heterogeneous effect of visa provisions. This is magnified among countries having different income levels (i.e. North-South); and dampened in destinations with a strong anti-immigration sentiment of voters (i.e. destinations having a large share of votes for the extreme right party).

Visa provisions in RTAs may target specific types of individuals and regulate a wide spectrum of migration-related frictions. For example, visa provision may apply to a restricted set of professionals (i.e. specific job profiles), or to all individuals of RTAs' member countries. Also, in some cases visa provisions grant the free mobility of individuals across signatory countries, or just simplify the administrative burden to obtain a visa or citizenship at destination (reduction in the bilateral migration cost). We benefit from the newly released World Bank database on the specific type of visa provision included in RTAs, and test the migration effect of specific types of visa provisions in RTAs.

This paper contributes to the strand of literature on the determinants of bilateral migration. Previous literature focused in particular on the role of origin- and destination-specific factors affecting bilateral migration, i.e. respectively *push* and *pull* factors. The average wage and the employment rate at destination have been shown to be key *pull* factors (Hatton, 2005; Mayda, 2010; Grogger and Hanson, 2011; Ortega and Peri, 2013). Income dispersion and poverty are the

main *push* factors highlighted in the literature (Mayda, 2010). Beyond the *push* and *pull* factors, country-pair specific characteristics may also affect bilateral migration settlement. In line with the gravity model for migration (Anderson, 2011), the geographic distance between countries has a strong negative effect on bilateral migration, while common culture traits (common language, religion, past colonial links) stimulate bilateral migration (Gross and Schmitt, 2003; Berthélemy et al., 2009). Few papers have tested the role of administrative burden at the border on bilateral migration. An exception is Bertoli and Fernández-Huertas Moraga (2015) who show that visa requirements reduce direct bilateral migration flows by between 40% and 47%. We contribute to this literature by looking at how *changes* in the administrative burden for international migration affect the international settlement of immigrants.[1] Two papers have tested explicitly the effect of RTAs and visa provision on bilateral migration. Using IMD-OECD bilateral migration flows in the period 1998-2008 for 29 OECD destinations, Orefice (2015) finds a strong positive effect of RTAs and visa provisions on bilateral migration. Figueiredo et al. (2016) add a wider set of destination countries and longer time period to Orefice (2015) and confirm the positive effect of Visa provisions on bilateral migration stocks.[2] This paper adds to Orefice (2015) and Figueiredo et al. (2016) in many ways. First, as in Figueiredo et al. (2016) we rely on bilateral migration *stocks* to cover a wider set of destination and origin countries, but base our identification on the within variation of migration stocks and signature of RTAs with visa provisions.[3] Second, we use information on the presence of visa-related provisions for a wider set of RTAs: while Orefice (2015) and Figueiredo et al. (2016) rely on a sample of 96 RTAs, the present paper benefits from recent World Bank data on the content of 279 RTAs. Third, we consider the specific type of visa provision in RTAs in affecting the bilateral settlement of immigrants (i.e. provisions directly reducing the administrative burden to get a visa, legally enforceable provision implying dispute settlement, etc.). Finally, we explicitly consider the effect of Job Posting provisions in RTAs on bilateral migration. To the best of our knowledge this is the first paper that looks at the migration effect of each specific type of visa provision. Finally, we highlight an important heterogeneity in the effect of visa-related provisions on bilateral migration stocks among countries with different income levels and attitudes towards immigration.

Our results have two relevant policy messages. First, the inclusion of visa provisions in RTAs may be used by countries as an indirect migration policy: when governments have their

[1] Bertoli and Fernández-Huertas Moraga (2015) exploit the cross-section variation in the presence of visa requirement on the bilateral stock of immigrants. With respect to Bertoli and Fernández-Huertas Moraga (2015) we also extend the sample of countries covered in the analysis. See section 2.1.

[2] To obtain data on a wider set of destinations countries, Figueiredo et al. (2016) use World Bank data on the *stock* rather than *flows* of migrants.

[3] Figueiredo et al. (2016) rely on cross-section identification (i.e. they do not control for country-pair fixed effects).

hands tied on explicit migration policy (because of electoral constraints), they can indirectly manage international migration by fine tuning *ad hoc* visa provisions in RTAs. Second, when *preferential* migration policies are prevented, governments may target origin-specific foreign labor force inflows through the inclusion of visa provisions in Regional Trade Agreements.

The remainder of the paper is organized as follows: section 2 presents the data constructed for estimations and descriptive evidence, section 3 outlines a theoretical framework underlying our econometric analysis. Section 4 presents the empirical strategy. Section 5 presents the baseline results and some heterogeneity analysis. The last section concludes.

2 Data and descriptive evidence

2.1 Data

Our analysis is based on two main data sources. First, we exploit the data made available by the World Bank Handbook of Deep Trade Agreements (Mattoo et al., 2020) – DTA database hereafter. It provides very detailed information on the content of RTAs and therefore highlights the rising role of deep trade agreements (DTAs) in the process of bilateral trade liberalization of countries. DTAs are defined as trade agreements that cover additional policy areas distinct from those directly affecting trade. For instance, DTAs may include provisions regarding international flows of investment and labor, as well as environmental or intellectual property protection provisions - see (Mattoo et al., 2020) for the list of provisions included in trade agreements. The World Bank data set on Deep Trade Agreements provides information on 18 distinct chapters, each of them authored by lead experts. We focus on Chapter 8: Visa and Asylum which assesses "*the presence, depth, and geographical distribution of visa and asylum provisions in preferential trade agreements (PTAs)*". The mapping of 'Visa' related provisions has been made on the basis of 279 RTAs included in the World Bank's database.[4] Among them, 100 RTAs include some visa-related provisions.[5] On such a sub-sample of RTAs, a set of 30 binary-choice questions (i.e. categorical variables) have been used to code the specific type of visa-prevision included.[6] The 'Visa' dummy used in our econometric analysis is therefore equal to one if a trade agreement contains at least one visa related provision, and zero otherwise. Based on the 30 binary-choice questions, we also test the effect of specific types of visa provisions (see next section).

[4]Database available at: `https://datacatalog.worldbank.org/dataset/content-deep-trade-agreements`.

[5]Among the 279 RTAs covered by the DTA database, there might be some agreements, other than the 100 DTAs identified for visa-specific mapping, that contain visa-related provisions. However *"(a) those that contained irrelevant key term hits; (b) PTAs no longer in force (such as the US-Canada PTA, superseded by NAFTA); and, to ensure consistency with other chapters of this Handbook, (c) PTAs that did not appear in the World Bank's Deep Integration database*" are not included in the list of 100 RTAs coded for visa-provisions.

[6]Additional details of the coding methodology, as well as the questionnaire are available at: `https://pubdocs.worldbank.org/en/229401607632831170/Chapter-8-Visa-and-Asylum.pdf`.

Second, we make use of the United Nations Population Division Migrant Stock data which provides information regarding the stock of international migrants by origin and destination for 232 countries between 1990 and 2020, on five-year based intervals (DESA, 2020). The main source of information collected is extracted from population censuses. When not available, the information has been retrieved through population registers and nationally representative surveys. Finally, we gather information on country-pair characteristics using the 'Gravity' CEPII database (Conte et al., 2021). From this dataset we use information on the GDP of both origin and destination countries, common religion dummy, common language dummy and a colonial linkages dummy. Information on the share of right wing (i.e. nationalist party) votes is based on the Manifesto Project Database (MPD) and the variable used in regressions built as in Moriconi et al. (2022) – see appendix section B for a detailed discussion.

Some important points for the construction of the estimation data set deserve careful explanation. First, a country-pair in a specific year may have multiple trade agreements in place. To address this issue, for a given country pair in a given year, we keep the highest value regarding the 'Visa' provisions. Second, we keep every country pair-year combination in the migrant stock database. Namely, if a given country pair-year combination does not have corresponding information in the DTA database, we assume that this specific country pair-year combination does not share a trade agreement with visa-provision (i.e. and 'visa' dummy is therefore equal to zero). Conversely, every pair-year combination in the DTA database that does not match the migrant stock data is dropped. Indeed, assuming zero-migration for these specific cells would be inaccurate. Finally, every pair-year has been merged with the 'Gravity' data. We are left with a total of 49,450 country-pair combinations observed in 7 points in time (1990, 1995, 2000, 2005, 2010, 2015 and, 2020). Table A1 presents summary statistics of selected variables in our database. Table A2, in the Appendix, presents the list of countries covered in the baseline estimation.

2.2 Descriptive

Before moving to the formal econometric analysis, this section shows some stylized facts on the number of RTAs covering visa related provisions and their qualitative correlation with the bilateral settlement of migrants. Figure 1 shows the increasing number of RTAs signed in the last 30 years and, among them, those including visa-related provisions.[7] It clearly emerges an increase in the share of newly signed RTAs including visa provisions: from around 5% in the 1990s to 20% in the post-2007 period. Such a surge in the number (and share) of RTAs that

[7]Figure 1 bases exclusively on the 279 RTAs coded by World Bank and for which we have information on their contents.

cover visa provisions corresponds to a stark increase in the bilateral migration stocks, and in particular for the North-South and South-South bilateral stocks of migrants – see Figure 2.

– Figures 1 and 2 about here –

The hypotheses of a positive correlation between the presence of visa provision in RTAs and the bilateral stock of migrants is supported qualitatively by kernel density analysis in Figure 3. In all years of our sample period, the empirical distribution of bilateral stocks of migrants among countries having visa provision in RTAs is shifted to the right with respect to that of countries without visa provisions in RTA. The difference in the kernel distribution of bilateral migration stocks between countries with and without visa provision is starker for developing destination countries – see Figure 4. We will explore such an interesting heterogeneity by type of destination in the econometric analysis reported in the next section.

– Figures 3 and 4 about here –

To shed light on the type of country-pairs that include visa-related provisions in RTAs, Table 1 shows conditional correlation between the probability of having visa-related provision and the political orientation of the pairs (i.e. sum of right wing votes share in origin and destination), difference in their income levels (i.e. difference in GDP per capita) and whether the pair shares other migration-oriented agreement (i.e. Schenghen agreement).[8] Countries with larger difference in income levels are more likely to include visa-related provisions in RTAs. Interestingly, relatively more right wing oriented countries are less likely to set visa-provision in RTAs. In countries where the nationalist parties have relatively more power, governments are less inclined to include visa provision easing the bilateral flows of immigrants. We will explore this type of heterogeneity in the econometric analysis reported in the next section.

– Table 1 about here –

3 Theoretical framework

The descriptive evidence shown in the previous section qualitatively suggests a positive correlation between the presence of a visa provision in RTAs and the bilateral stocks of migrants. This section derives a structural gravity equation for bilateral migration where visa provisions in RTAs are meant to reduce the bilateral (time-varying) administrative migration costs, i.e.

[8]The dependent variable in Table 1 is perfectly symmetric (i.e. visa dummy between destination A and origin B is the same as for destination B and origin A). So for results in Table 1 we get rid of the concept of 'origin' and 'destination', and consider a given country pair as a single symmetric cross-section identifier. For this reason in Table 1 we include only pair specific (and symmetric) covariates.

red-tape for migration. The migration choice depends on individual maximization of utility, and the potential migrant chooses the destination country that maximizes the individual's expected well-being. Beyond the push and pull factors (see Hatton 2005 and Mayda 2010),[9] the previous literature highlighted the role of migration-related policies in affecting the bilateral settlement of immigrants (Ortega and Peri, 2013; Bertoli and Fernández-Huertas Moraga, 2015). We nest the role of migration-related policies in a structural gravity model for migration that we then test in section 4.

The representative individual h, residing in country i, has to decide the optimal location j^* from a set of possible destinations $j \in J$.[10] The optimal destination j^* is obtained by maximizing: $j^* = argmax_{j \in J}\ U_{hijt}$. In line with previous papers deriving the gravity model for migration (Anderson, 2011; Bertoli and Fernández-Huertas Moraga, 2013), the utility from migrating from i to destination j, U_{hijt}, depends on the wage in destination country j (w_{jt}), and on the bilateral cost of migration from country i to country j at a given point in time t, c_{ijt}. The log-linear utility function for the potential migrants has the following form:

$$U_{hijt} = ln\left(w_{jt}\right) - ln\left(c_{ijt}\right) + ln\left(\xi_{hjit}\right). \tag{1}$$

The unobservable component of the log-linear utility $ln\left(\xi_{hjit}\right)$ captures all the individual specific unobservable factors affecting the location decision.[11] Under the assumption that the idiosyncratic component $ln\left(\xi_{hjit}\right)$ is distributed as type-1 extreme value, the probability of migration from country i to country j, p_{ijt}, follows the multinomial logit form (McFadden, 1973):

$$p_{ijt} = \frac{e^{ln(w_{jt}) - ln(c_{ijt})}}{\sum_d^J e^{ln(w_{dt}) - ln(c_{idt})}} = \frac{w_{jt}/c_{ijt}}{\sum_d^J w_{dt}/c_{idt}} \tag{2}$$

If all individuals in i extract the same utility from migrating to j (except for the random component ξ_{hjit}) the probability in equation (2) is equal to the share of individuals in i that find it optimal to migrate to j; and the predicted migration flow from i to j can be expressed

[9] Empirical studies on the determinants of migration flows (Hatton, 2005; Mayda, 2010) highlight the following economic determinants of migration: (i) income and employment rate in destination country as "pull" factors (expectations of future standards of living); (ii) income and income inequality in origin countries as "push" factors; (iii) bilateral migration costs of travel (related to geographic distance or common language); (iv) existence in destination countries of migrant networks, which reduce the information cost of migration (by easing the integration of new immigrants in the destination country).

[10] To consider the non-migration option, the set of destinations J includes also the current country of residence i.

[11] The utility function of potential migrants in i can be augmented to consider also the overall attractiveness of destination j at time t (often proxied in the literature by non-income pull factors, or magnets, such as the employment rate at destination or other amenities that the potential migrant may value at destination j). In our framework this simply corresponds to a broader interpretation of the parameter w_{jt}.

as the product between the total population in the origin country i, N_{it}, and the probability of migrating from i to j:

$$M_{ijt} = \frac{w_{jt}/c_{ijt}}{\sum_d^J w_{dt}/c_{idt}} \times N_{it} \tag{3}$$

The equilibrium wage (w_{jt}) to substitute in equation (3) can be obtained by the labor market clearance equation: the total labor supply in destination country j is $L_{jt} = \sum_i M_{ijt}$; and can be expressed as:

$$L_{jt} = \sum_i M_{ijt} = \sum_i \left(\frac{w_{jt}/c_{ijt}}{\sum_d w_{dt}/c_{idt}} \times N_{it} \right) = w_{jt} \sum_i \left(\frac{1}{c_{ijt} W_{it}} N_{it} \right) \tag{4}$$

Where $W_{it} = \sum_d w_{dt}/c_{idt}$ is the sum of net wages across all potential destinations for migrant workers in i. Since the total world labour supply is $N_t = \sum_i N_{it} = \sum_j L_{jt}$, the equilibrium wage can be written as:

$$w_{jt} = \frac{L_{jt}}{\Omega_{jt} N_t} \tag{5}$$

where $\Omega_{jt} = \sum_i \left(\frac{1}{c_{ijt} W_{it}} \right)$. By substituting the equilibrium wage in equation (3) we obtain the structural gravity equation for migration:

$$M_{ijt} = \frac{L_{jt} N_{it}}{N_t} \frac{1/c_{ijt}}{\Omega_{jt} W_{it}} \tag{6}$$

The first ratio indicates the migration pattern in a frictionless world. The parameter Ω_{jt} is the *inward migration resistance term* and can be interpreted as how costly is entering destination country j. It can be thought as a non-discriminatory restrictive immigration policy or alternatively as a term of attractiveness of the destination country (the higher the index the lower the attractiveness), or even as the general anti-immigration sentiment in destination country j. On the other hand, W_{it} is the *outward migration resistance term* and represents the cost of emigrating from country i. The country pair-time specific migration cost c_{ijt} can be decomposed into: (i) a time-invariant component (i.e. geographic distance or common culture between country i and j), and (ii) a time-variant component capturing any the bilateral migration policy that countries i and j set together to manage bilateral migration flows. Visa provisions in RTAs belong to the latter type of bilateral migration costs. By reducing the time-variant component

of the bilateral migration costs, visa provisions in RTAs are expected to stimulate the bilateral migration between countries i and j.

The extent to which a reduction in the bilateral time-varying migration costs, i.e. increase in $1/c_{ijt}$, affects the bilateral migration depends (negatively) on the inward and outward resistance terms to migration. Interestingly, the higher the anti-immigration sentiment in j (i.e. high Ω_{jt}) the less effective is the reduction in the bilateral migration costs c_{ijt} on bilateral migration M_{ijt}.[12] In our econometric analysis we test explicitly this peculiarity of the gravity model for migration by approximating the anti-immigration sentiment in destination countries using the share of votes for extreme right wing parties.

The gravity model for migration developed so far delivers predictions on the bilateral *flow* of migrants. However, because of the data constraints discussed in section 2.1, in order to cover the largest number of origins and destinations in the empirical exercise, we apply the empirical counterpart of equation (6) on bilateral *stocks* of migrants. At first glance this may appear an imperfect match between theory and empirics, but migrant stocks are the results of recursive (net) migration flows, and the structural determinants of migration flows in equation (5) apply also to stocks. Moreover, the inclusion of country-pair fixed effects (see next section) implies an identification based on *deviations* of bilateral stocks from country-pair specific average stock of immigrants; and therefore it is a coarse proxy for bilateral migration flows.[13] Finally, in section 5.5 we test the robustness of our results to the use of differences in the bilateral stock of immigrants between t and $t-1$ as a further (coarse) proxy of bilateral $flows$.

4 Empirical Strategy

To test the effect of RTA visa provision on bilateral migration stocks, we adopt a standard difference-in-difference approach comparing the bilateral stock of immigrants before and after the signature of a RTA including a visa-related provision. The empirical counterpart of equation (6) is therefore:

$$Mig_{ijt} = exp\left[\beta_1 Visa_{ijt} + \beta_2 RTA_{ijt} + \delta_{it} + \mu_{jt} + \theta_{ij} + X_{ijt}\right] \times \epsilon_{ijt} \tag{7}$$

where Mig_{ijt} is the bilateral stock of migrants from origin i residing in j at time t. The origin-time specific determinants of bilateral migration (i.e. N_{it}, W_{it} in eq. 6) are captured by origin-year fixed effects, δ_{it}. The destination-time specific factor attracting (or deterring) immigrants

[12] We implicitly assume that the inward and outward resistance terms to migration are insensitive to a change in the bilateral specific migration cost. This is plausible in our empirical framework containing a wide set of origin and destination countries.

[13] See Orefice (2015) for a test of the presence of visa provision and RTA on migration *flows*.

at destination j (i.e. N_{jt}, Ω_{jt} in eq. 6) are captured by destination-year fixed effects, μ_{jt}. The country-pair specific (time-invariant) migration costs are captured by θ_{ij} fixed effects in our baseline estimations. We therefore identify our coefficient of interest on the pure within variation in bilateral migration stocks and presence of visa provision. As a benchmark with previous literature, we also show results omitting dyadic country-pair fixed effect and explicitly controlling for gravity variables such as distance, language, colony and religion.

Two variables are meant to capture the time-varying bilateral cost of migration: (i) RTA_{ijt} is a dummy variable equal to one if the ij pair has an RTA in force at time t, and (ii) $Visa_{ijt}$ is equal to one if such an RTA includes a provision easing the procedure to obtain a visa. Controlling for the presence of an RTA (no matter the content) is important because, as shown in Orefice (2015), RTAs increase the information about migrants' potential destination country and hence affect bilateral migration flows. Finally, the set of time-varying controls, X_{ijt} includes a Schengen dummy (equal to one if the ij pair belongs to the Schengen agreement at time t) and the difference in (log) per capita GDP between i and j capturing the income difference between origin and destination at time t. In order to address the heteroskedasticity of the error term, we rely on the non-linear PPML estimator (Santos-Silva and Tenreyro, 2006).

Visa-related provisions may vary a lot across RTAs, and have an impact on different aspects of bilateral migration costs (ranging from the free movement of a specific category of workers, to the simplification of the administrative procedures needed to obtain a visa, etc). In the second part of our empirical analysis, we amend equation (7) by replacing the generic $Visa_{ijt}$ dummy by a specific type of visa-provision dummy in the RTA, $VisaType_{ijt}$

$$Mig_{ijt} = exp\left[\beta_1 VisaType_{ijt} + \beta_2 RTA_{ijt} + \delta_{it} + \mu_{jt} + \theta_{ij} + X_{ijt}\right] \times \epsilon_{ijt} \tag{8}$$

where $VisaType_{ijt}$ is a dummy equal to one if the Visa provisions concerns (in turn): (i) dispute settlement mechanism enforcing the Visa provision,[14] (ii) the freedom in movement of persons,[15] (iii) the ease of obtention of residency or nationality in either party,[16] (iv) procedures to expedite the application procedures for immigration formalities for natural persons.[17] We also test for the specific job posting related provisions in RTAs. In this case the $VisaType_{ijt}$ dummy is equal to one if the RTA includes a provisions easing the international movement of: (i) business

[14]Based on whether the agreement allows for retaliation to ensure compliance with the dispute settlement system's outcomes in migration disputes.
[15]Based on whether the agreement calls for freedom of movement of workers/people.
[16]Based on whether: (i) the agreement positively addresses or facilitates persons obtaining residency in either party, or (ii) the agreement positively addresses or facilitates persons obtaining nationality/citizenship in either party.
[17]Based on whether the agreement encourages parties to expedite the application procedures for immigration formalities for natural persons.

persons,[18] (ii) professionals,[19] or (iii) investors.[20]

5 Results

This section discusses the effect of visa provision in deep RTAs on the bilateral settlement of migrants. We start by showing the results obtained by estimating our baseline specification in eq. (7) and propose a first test for the heterogeneous effect of DTAs by origin-destination income levels – section 5.1. In section 5.2 we test the effect of specific types of visa provision as in equation (8). In sections 5.3 and 5.4 we show that visa-related provisions are particularly effective respectively for unskilled immigrant workers, but less effective for destination countries with large support for the nationalist party. A battery of robustness checks is reported in section 5.5. Finally, in section 5.6 we propose a 2SLS to address endogeneity concerns.

5.1 Baseline Results

Table 2 shows the positive effect of visa provision in RTAs on the bilateral settlement of migrants. In column (1) we omit country-pair fixed effects to explicitly obtain estimates on the gravity-type controls. In line with previous literature, the geographic distance significantly deters bilateral migration, while common cultural traits (as reflected by common language, religion, and past colonial linkages) have a positive impact on the bilateral settlement of immigrants. Importantly, the coefficient on $Visa_{ijt}$ remains positive and significant in columns (2) and (3) where we progressively introduce country-pair fixed effects and control for the Schengen dummy variable. In particular, the presence of Visa provision in RTAs increases the bilateral stock of immigrants by 5.6% to 5.9% – see columns (2) and (3).[21]

– Table 2 about here –

The presence of visa provision in RTAs may be particularly beneficial for country pairs belonging to different income groups, i.e. for country pairs where red-tape to migration is more likely to represent an actual barrier to migration. So, in Table 3 we classify origins and destinations based on their degree of development, and create a dummy equal to one if the origin i and the destination j belong to different income-level groups, (i.e. North-South dummy in table

[18] Based on whether "Are there specific provisions clarifying the scope of the presence of natural persons (e.g. Chapter/annex on temporary presence of business persons)?".

[19] Based on whether the chapter/annex on movement of natural persons covers specific categories of professionals (e.g. architects, lawyers, and accountants).

[20] Based on whether the agreement addresses the movement of investors.

[21] In moving from column (1) to (2)-(3) the number of observations reduces considerably because country-pair fixed effects perfectly predict the outcome variable of time-invariant bilateral migration stocks, and the concerned observations are dropped.

of results).[22] As expected, the presence of a visa provision boosts the bilateral settlement of immigrant among countries having different income levels. Namely, the presence of a visa provision in an RTA between Developing-Developed pairs increases bilateral migrant stocks by 13.2% – see column (3).

– Table 3 about here –

The underlying mechanism through which visa related provisions are expected to affect the bilateral settlement of migrants is the actual increase in the number of visas released among RTAs signatory countries. Easier administrative procedures to get visas will increase the number of visa requests (and granted) among member countries, and this will reflect (in the long-medium run) into larger stocks of bilateral migrants. Testing the effect of visa provisions on the number of bilateral visas for the full set of countries covered in the present study is not possible because of data constraints (i.e. lack of data on the number of bilateral visas granted among all the country-pairs considered here). However, we benefit from data on the number of visas released by the US embassies to each country of origin to test such underlying mechanism.[23] Results, reported in Table A3 support our reasoning: the presence of visa-related provision in RTAs signed by the United States increases the number of visas that US embassies grant to each specific origin.[24]

– Table A3 about here –

The positive effect of *bilateral* visa provisions on migration comes with a tiny (negligible) negative *spillover* effect for immigrants coming from third-origins. In Table 4 we show the effect of visa provision in bilateral ij RTA on the immigration stocks in country j from the Rest of the World (RoW) – excluding i-specific origin.[25] The stock of immigrants from RoW is only marginally affected by the presence of bilateral visa provision. When origin and destination ij share an RTA including visa provision, the stock of immigrants in j from the rest of the world reduces by 0.1%. The result is robust to the inclusion of the Schenghen dummy control.

– Table 4 about here –

[22] We base on the World Bank classification of country by income levels, and consider "North" as high-income countries, and "South" all remaining low and middle-income countries.

[23] Data on the number of visas granted by US embassies is from the Report of the Visa Office (`https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics.html`). We have data on the number of working-permit related visas granted yearly in the period 2000-2020.

[24] When we include origin fixed effects in estimation, the non-linear PPML estimator discards all those origins whose number of visa does not change over time. This explains the reduced number of observations in column (2) of Table A3.

[25] By excluding i-specific origin from the total stock of immigrants in j, the dependent variable used in Table 4 is indeed ij specific and the number of observations almost the same as in the baseline specification (not exactly the same because some observations are dropped by perfect collinearity with fixed effects).

5.2 Results by type of visa provisions

In Table 5 we show the effect of specific migration-related provisions in RTAs.[26] Visa provisions having legal enforceability *via* a dedicated dispute settlement mechanism (column 1), and those easing of administrative procedures for migration (column 4) are the most effective in boosting bilateral migration. In particular, the inclusion of a dispute settlement mechanism in visa provision as well as provisions aimed at reducing the administrative burden for migration increase the bilateral stock of migrants by 11.8%. Provisions *calling* for the free movement of persons have a significant effect but smaller in magnitude (i.e. 7.2%).

– Table 5 about here –

The bilateral stock of migrants may also be affected by the presence of Job Posting related provisions. Under the General Agreement on Trade in Services (GATS), posting is defined as one of the four ways to supply services across borders. Simply put, it allows workers to perform a task (i.e. service) in a foreign country establishment while staying formally employed in its firm's country of origin. In our case, Posting provisions refers to clauses in RTAs that facilitate the entry of professionals and/or investors among the member countries of an RTA. While we have a provision in our Visa-and-Asylum database that concerns the international mobility of investors, additional Job Posting related provisions may be found in other chapters of an RTA. Indeed, the database on the Investment chapter of Deep Trade Agreements contains a provision dealing with the movement of professionals within the boundary of a multi-national enterprise, which fits even better with the very definition of Job Posting.

In Table 6 we estimate the effect of job posting related provisions on bilateral migration. Namely, in columns (1) and (2) we show the effect of provisions within the Investment chapter of RTAs that aim at easing the movement of business persons (column 1) and professionals (column 2).[27] In column (3) we show the effect of Visa-and-Asylum related provisions aimed at facilitating the movement of investors among RTA member countries. All in all, job posting related provisions on natural persons and investors have a positive and significant effect on bilateral migration.

– Table 6 about here –

[26] Among all country-pairs that share an RTA at any given point in time, 45% of them include at least one Visa related provisions. More specifically, 29% legally enforce Visa-type provisions, 23.5% call for freedom of movement of persons, 16.8% encourage parties to expedite the application procedures for immigration formalities for natural persons and 14.7% positively address or facilitate persons obtaining residency.

[27] More precisely, in column (1) we show the effect of a provision that eases the temporary presence of business persons among RTA member countries. In column (2) the dummy variable of interest is equal to one if the temporary presence of business persons covers specific categories of professionals, such as architects or lawyers.

5.3 Results by worker characteristics

While the international movement of skilled and highly educated workers is subject to less binding administrative regulations (many *ad hoc* visas are currently available for highly skilled workers that want to move internationally), primary educated workers and/or those employed in unskilled-intensive occupations suffer more stringent administrative constraints to international mobility. We therefore expect that visa provisions in RTAs stimulate relatively more unskilled workers. To test such an heterogeneous effect of visa provision on migrants with different skills we use the OECD DIOC dataset,[28] and test the effect of visa provisions on skilled *vs* unskilled immigrants. Based on the occupation of workers, we consider high-skilled those immigrant workers in ISCO occupation 1 (Managers, senior officials and legislators), 2 (Professionals) and 3 (Technicians and associate professionals). Conversely, workers in other occupations are classified as low-skilled (i.e. ISCO occupations 4-9). Results are reported in Table 7. In line with the intuition, the presence of visa provision in RTAs increases the bilateral stock of low-skilled migrants by 17.9%, and the stock of unskilled immigrants by 9%.

As a robustness check of previous results we use a sector-based definition of workers' skills. Namely, we classify as primary educated migrants those employed in low-skill intensive sectors such as: (i) agricultural, fishery and related laborers (ISCO code 92), (ii) laborers in mining, construction, manufacturing and transport (ISCO code 93), and (iii) stationary-plant and related operators. Results, reported in Table 8, show that migration related provisions in RTAs favor in particular migrant workers in primary low-skill intensive sectors (see columns 1-2 in Table 8).[29]

– Table 8 about here –

All in all, the results in Tables 7 and 8 confirm the intuition that visa provisions in RTAs are beneficial for international migration subject to more binding administrative regulations (i.e. unskilled workers). To strengthen this intuition, in Table A4 we approximate the restrictiveness of administrative regulation on emigration with a dummy for the existence of exit permit requirement to emigrate from origin country i, and interact it with our visa provision dummy. In line with our reasoning, visa provision is more effective in origin countries where an exit permit is needed to emigrate. In particular, for origins that require ana exit permit to emigrate, the presence of visa provision in RTA increases bilateral migration by 22%.

[28] Available here: `https://www.oecd.org/els/mig/dioc.htm`. OECD DIOC data are available only for the period 2000-2015.

[29] It should be noted that point estimates in Tables 7 and 8 cannot be directly compared to baseline results because the OECD DIOC database covers only a sub-set of countries while our baseline regressions use a wider set of country-pairs.

5.4 The role of nationalist parties

In section 3 we have shown that the effect of a reduction in the bilateral migration costs, here approximated by the presence of visa provision in RTA, is attenuated for destinations having strong anti-immigration sentiment (i.e. high resistance term to immigration Ω_{jt}). In this section we test such a prediction of the model by approximating the anti-immigration sentiment of countries by their share of vote in favor of extreme right wing parties. Namely, in Table 9 we interact our baseline visa dummy with the share of votes for the extreme right wing nationalist party in destination j in year t.[30] In line with the prediction of a standard gravity model for migration, the positive effect of visa provisions is attenuated for destinations having a non-zero share of vote for nationalist parties (i.e. negative coefficient on the interaction between visa dummy and the share of vote for right wing parties). While for destinations with a very small (approaching to zero) share of votes for the right wing party the visa dummy boosts bilateral migration by 9.6%, for destinations having a share of right wing votes at the median of the distribution (i.e. 9%), visa provision boosts bilateral migration by 8.3%. For the country having the maximum share of votes for the right wing party (i.e. 54%), the effect of visa provision is only 1.3%.

– Table 9 about here –

5.5 Placebo and robustness checks

The presence of a specific visa related provision in RTA may be correlated with the presence of other provisions and therefore with the overall horizontal depth of RTAs. In this case, the positive effect of migration-related provision shown so far can simply be the consequence of the overall depth of RTAs on bilateral migration and not that of a reduction in bilateral migration cost. To address this concern, in columns (1) and (2) of Table 10 we control for the overall depth of the RTA (i.e. the total number of provisions covered by the RTA from World Bank Deep Trade Agreement database), and show that our variable of interest keeps its sign and magnitude even after controlling for the overall depth of the RTA. It is not the overall depth of an RTA that affects bilateral migration, but the specific inclusion of migration related provisions reducing the bilateral migration costs.

– Table 10 about here –

[30] See Appendix section B for a detailed discussion on the construction of right wing nationalist party share of votes. The share of vote for the right wing party is comprised between 0 and 1. The median share of votes for the right wing party in our sample is 9% (i.e. 0.09 in our data), and the maximum level is 54%.

Similarly, the presence of migration-related provisions can be correlated with other provisions unrelated to migration issues, and hence our results may be driven by spurious correlation. To reduce such a concern, in columns (4) to (6) of Table 10, we substitute the visa provision dummy with respectively "Movement of capital" and "Money laundering" provision dummy. The non-significant effect of such migration-unrelated provisions reassures us of the fact that the visa provision dummy captures precisely the effect of migration-related provision (placebo test).

The average positive effect of visa provision uncovered so far may hide a time-dynamic effect. Namely, visa provisions may be relatively more effective in the years just after the signature of the RTA. Also, the time-varying nature of the treatment (i.e. signature of RTA including visa provision) may produce biased OLS difference-in-difference estimations - see De Chaisemartin and d'Haultfoeuille (2020). To address such last concerns, in Table 11 we adopt the dynamic robust two-way fixed effects estimations à la De Chaisemartin and d'Haultfoeuille (2020) and show that the effect of visa provision in RTA changes over time. Visa provisions have positive effect on migration stocks at t_0 and t_1; such a positive effect vanishes in the following years. See Appendix section C for more details on the two-way fixed effects estimations à la De Chaisemartin and d'Haultfoeuille (2020).[31]

– Table 11 about here –

The European Union is a very deep trade agreement allowing for the free mobility of workers among member countries, and one may be concerned by the fact that our baseline results are driven exclusively by EU membership. In Table A5 we include a dummy variable controlling for whether the origin i and the destination country j belong to the European Union at time t, and our results hold. The structural gravity model for migration presented in section 3 delivers predictions on the bilateral $flows$ of migrants. To get closer to our model's predictions, rather than including country-pair fixed effects and using deviations of stocks from the country-pair average to identify our coefficient of interest, in Table A6 we test the effect of Visa provision on the *change* in the bilateral stock of migrants. The *change* in the bilateral stock of immigrants is a coarse but intuitive proxy for the flows of immigrants that occurred between origin i and destination j during two consecutive five-year intervals (i.e. t - $(t-1)$). Results reported in Table A6 confirm the robustness of our baseline results.

[31] Computational limitations prevented us to include country-year fixed effects in Table 11. However, in Appendix Table C1 we replicate the dynamic robust two-way fixed effects estimation including country-*period* fixed effects and our results hold. Periods are: 1990-1995; 2000-2005; 2010-2020.

5.6 Endogeneity

While the set of fixed effects included in equation 7 considerably reduces the omitted variable concern, the reverse causality problem may still bias the OLS estimations discussed above (i.e. endogeneity) if the timing of the signature of RTA with visa provision is somehow affected by bilateral migration flows between signatory countries. This is however a remote concern here. Indeed, RTAs are primarily *trade* agreements aimed at facilitating the international exchange of goods and services, and their timing is hardly influenced by migration pressure. Nevertheless, to remove any residual concern of endogeneity, we follow Orefice (2015) and instrument the $Visa_{ijt}$ dummy with the propensity that country i and j have to include visa provision in their RTAs with third-country partners:

$$Visa_{ijt}^{IV} = \left(\frac{1}{K} \sum_{k \neq j} Visa_{ikt} \times \frac{1}{K} \sum_{k \neq i} Visa_{kjt} \right) \tag{9}$$

The two terms in parentheses represent respectively the probability for country i and j to include visa provision in RTAs with third countries (leave-one-out approach). The exclusion restriction is based on the idea that: (i) countries i and j do not consider the ijt specific bilateral migration stock in deciding whether including visa-related provisions in RTAs with their respective third-country partners, and (ii) the presence of visa provision in RTAs with third countries do not directly affect the bilateral ijt specific settlement of migrants. The exclusion restriction (ii) is qualitatively supported by the negligible diversion effect of Visa provision discussed in section 5.1. Also, note that the potential average effect of visa provision in RTAs with third-countries (i.e. $\sum_{k \neq j} Visa_{ikt}$ or $\sum_{k \neq i} Visa_{kjt}$) on ijt-specific migration stock is captured by respectively it and jt fixed effects. This further supports the validity of the exclusion restriction.

Results, reported in Table 12, show the robustness of our baseline results to the instrumental variable approach. We perform a standard linear 2SLS estimation (respectively first- and second-stage regressions), with the caveat that point estimates of the second stage regression cannot directly be compared with baseline PPML (non-linear) estimations. First stage results in column (1) of Table 12 show the relevance of our IV. Second stage results in column (2) confirm the positive effect of visa-provision on the bilateral stock of immigrants. Based on linear 2SLS, the presence of visa provision in RTA boosts bilateral migration by 16%.

– Table 12 about here –

6 Conclusion

This paper sheds light on the effect of Deep Regional Trade Agreements on the bilateral stock of migrants. Visa-related provisions in DTAs, by making easier the bureaucratic procedures to obtain a visa, increase the bilateral stock of immigrants among signatory countries. In particular, the presence of a visa-related provision increases the bilateral stock of immigrants by 5.9%. The introduction of pair fixed effects implies that we account for the fact that some countries have, on average over time, stronger economic, cultural and institutional ties with each other. Importantly, controlling for the time-varying RTA dummy variable allows us to capture changes over time in the extent of these links, as captured by the signing of the regional trade agreement. We therefore identify our coefficient of interest based on the within-pair time variation in bilateral migration stocks and presence of visa provisions, after netting out the fact that the two countries signed an RTA (either at the same time or sometime before). The main threat to identification of a causal effect is the fact that the increase of bilateral migration in a five-year window triggers the signature of RTAs including visa provisions in the same period of time. This is unlikely because changes in RTAs take time for institutional reasons. Also, RTAs are primarily trade agreements signed to boost international trade (not migration), and the timing of their signature is unlikely to be affected by migration pressure. However, we still address this concern by an Instrumental Variable strategy.

The effect of visa-related provisions is larger among countries with different degrees of development (i.e. North-South pairs), and attenuated for destinations countries having strong anti-immigration sentiment. For countries having a zero share of votes for the right wing party, visa provision boosts bilateral migration by 9.6%; for destination countries having a median share of votes for the nationalist party the presence of visa-related provision increases the bilateral stock of immigrants by 8.3%. Finally, we also uncover a strong heterogeneous effect of visa-provision based on its specific content and workers' characteristics. Visa provisions have stronger positive effect for unskilled than for skilled immigrants. Also, provisions that facilitate the procedure to obtain a visa are the most effective in stimulating bilateral migration stocks. Job Posting provisions in RTAs have a strong positive effect in the bilateral settlement of immigrants.

The results obtained in the present paper are of great interest for policy makers dealing with migration policy. When direct preferential migration policy is *de jure* impossible to set, government can resort to visa-provisions in trade agreements to manage bilateral specific migration flows.

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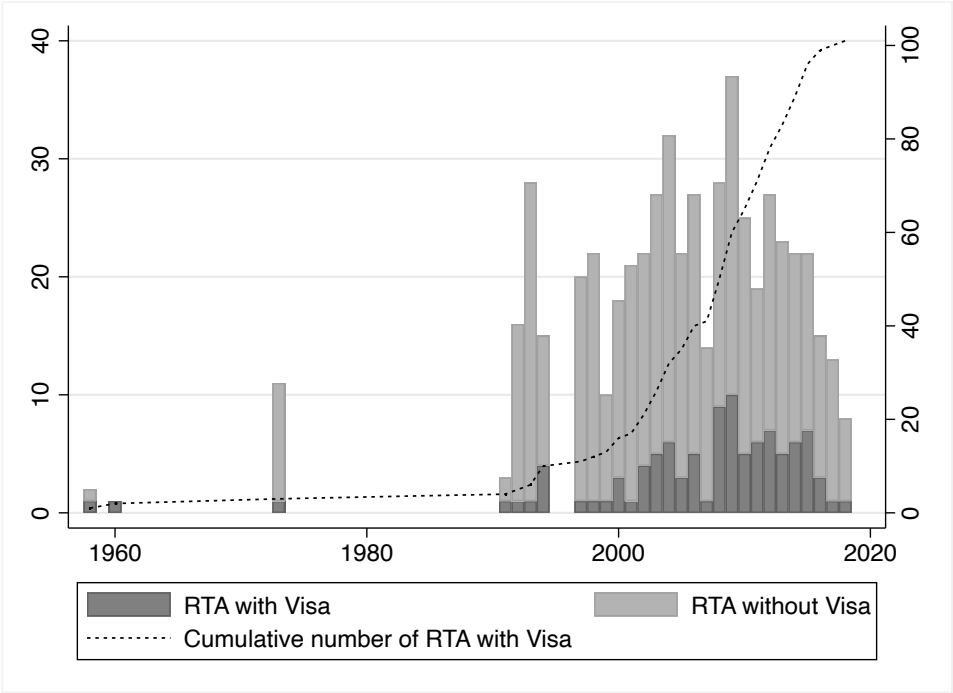
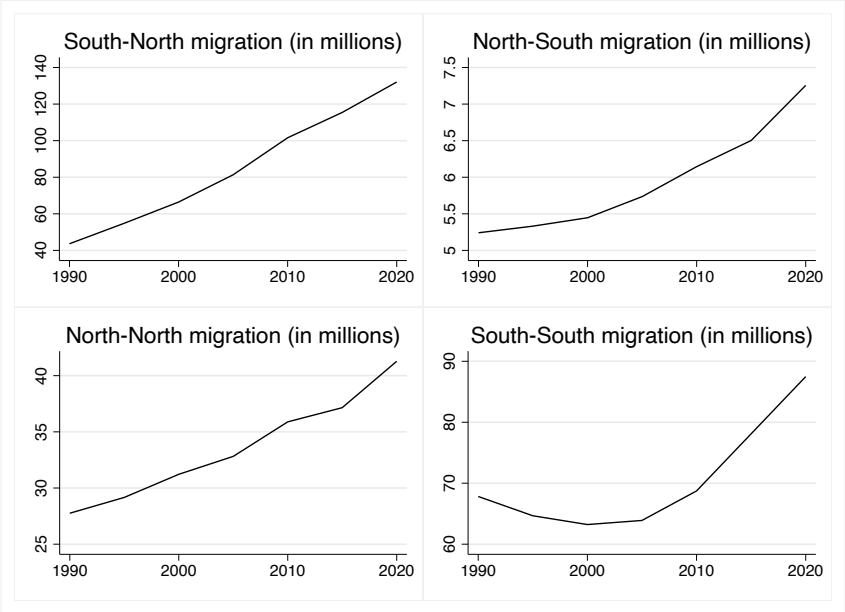
Tables and Figures

Figure 1: Number of RTAs by year, period 1958-2018.



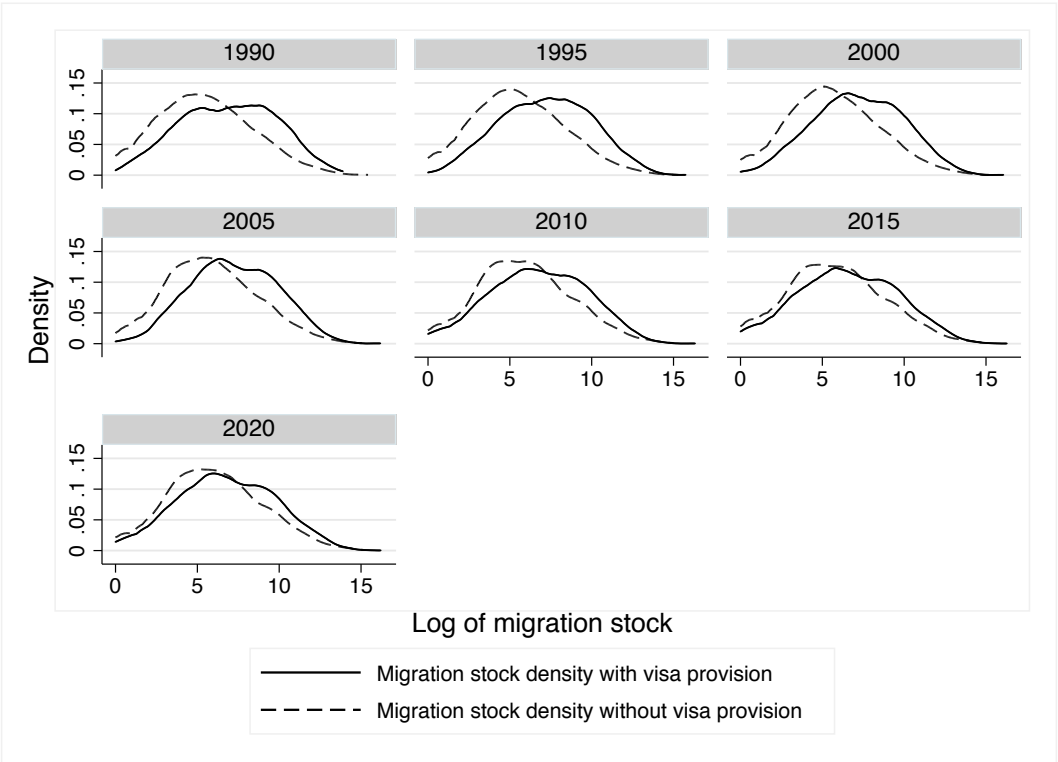
Note: cumulated number of RTA with visa provision on the right axis. Source: World Bank Deep Trade Agreement database.

Figure 2: Migration stock among country-pairs with different income levels.



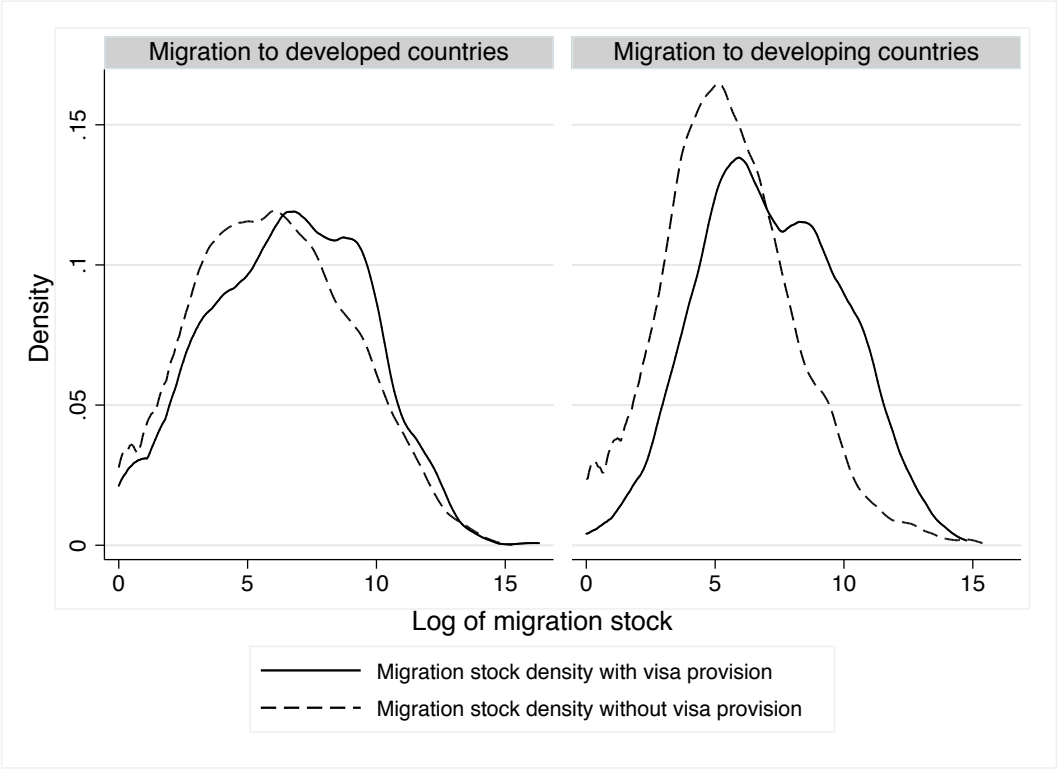
Source: United Nations Population Division.

Figure 3: Density of bilateral migration stocks among country-pairs with and without visa provisions.



Source: United Nations Population Division and World Bank Deep Trade Agreement database.

Figure 4: Density of bilateral migration stocks among country-pairs with and without visa provisions: developed *vs* developing destination countries.



Source: United Nations Population Division and World Bank Deep Trade Agreement database.

Table 1: The probability of having visa provision in DTAs.

Dep var:	Visa			
	(1)	(2)	(3)	(4)
Right wing vote (sh)[a]	-0.051***			-0.064***
	(0.004)			(0.005)
GDP difference (ln)		0.004***		0.004***
		(0.001)		(0.001)
Schenghen			0.045***	0.012**
			(0.006)	(0.006)
Estimator	OLS	OLS	OLS	OLS
Year FE	Yes	Yes	Yes	Yes
Country-pair Fixed Effects	Yes	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020	1990-2020
Observations	346,150	210,944	346,150	210,944
R-squared	0.737	0.758	0.737	0.758

Note: [a] Sum of the share of right wing votes in destination and origin country. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 2: The effect of visa provision on bilateral stocks of migrants.

Dep var:	Bilateral Stock of Migrants		
	(1)	(2)	(3)
Visa	0.190***	0.057***	0.055***
	(0.051)	(0.020)	(0.020)
RTA	0.879***	0.031	0.036*
	(0.055)	(0.021)	(0.021)
Schenghen			0.186***
			(0.039)
Distance (ln)	-1.261***		
	(0.026)		
Colony	1.915***		
	(0.067)		
Language	0.955***		
	(0.070)		
Religion	0.510***		
	(0.094)		
GDP difference (ln)	0.025	-0.000	-0.002
	(0.019)	(0.008)	(0.008)
Estimator	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes
Country-Pair Fixed Effects	No	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020
Observations	199,514	63,803	63,803
Pseudo R-squared	0.823	0.994	0.994

Note: Dependent variable is the stock of immigrants in country j originating from i. In moving from column (1) to (2) the number of observations reduces considerably because country-pair fixed effects perfectly predict the outcome variable of time-invariant bilateral migration stocks, and the concerned observations are dropped. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 3: The effect of visa provision on bilateral stocks of migrants by type of country pair.

Dep var:	Bilateral Stock of Migrants		
	(1)	(2)	(3)
Visa	0.212***	-0.008	-0.018
	(0.068)	(0.033)	(0.033)
Visa × North-South	-0.105	0.107**	0.124**
	(0.120)	(0.054)	(0.054)
RTA	0.784***	-0.039	-0.035
	(0.067)	(0.033)	(0.033)
RTA × North-South	0.269**	0.130***	0.130***
	(0.093)	(0.046)	(0.046)
Schenghen			0.197***
			(0.040)
Distance (ln)	-1.268***		
	(0.026)		
Colony	1.934***		
	(0.068)		
Language	0.943***		
	(0.069)		
Religion	0.552***		
	(0.095)		
GDP difference (ln)	0.011	0.003	0.002
	(0.019)	(0.008)	(0.008)
Estimator	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes
Country-Pair Fixed Effects	No	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020
Observations	199,514	61,613	61,613
Pseudo R-squared	0.82	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. In moving from column (1) to (2) the number of observations reduces considerably because country-pair fixed effects perfectly predict the outcome variable of time-invariant bilateral migration stocks, and the concerned observations are dropped. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 4: Bilateral visa provision and migration from the rest of the world.

Dep var:	Mig_{it}^{RoW-j}	
	(1)	(2)
Visa	-0.001**	-0.001**
	(0.000)	(0.000)
RTA	-0.000	-0.000
	(0.000)	(0.000)
Schenghen		-0.000
		(0.001)
GDP difference (ln)	0.000*	0.000*
	(0.000)	(0.000)
Estimator	PPML	PPML
Destination-Year Fixed Effects	Yes	Yes
Origin-Year Fixed Effects	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes
Sample period	1990-2020	1990-2020
Observations	198,806	198,806
Pseudo R-squared	0.99	0.99

Note: The dependent variable is the total migrant stock in country j originating from the rest of the world (RoW), except from country i. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 5: The effect specific types of visa provisions on bilateral migration stocks.

Dep var:	Bilateral Stock of Migrants			
	(1)	(2)	(3)	(4)
Dispute Settlement	0.112***			
	(0.034)			
Freedom of Movement		0.070**		
		(0.027)		
Residency or Citizenship			-0.032	
			(0.025)	
Migration formalities				0.112***
				(0.034)
GDP difference (ln)	-0.001	-0.001	-0.001	-0.002
	(0.008)	(0.008)	(0.008)	(0.008)
RTA	0.027	0.037*	0.052**	0.029
	(0.019)	(0.020)	(0.020)	(0.020)
Schenghen	0.189***	0.182***	0.188***	0.187***
	(0.039)	(0.039)	(0.039)	(0.039)
Estimator	PPML	PPML	PPML	PPML
Country-Year FE	Yes	Yes	Yes	Yes
Country-Pair FE	Yes	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020	1990-2020
Observations	63,803	63,803	63,803	63,803
Pseudo R-squared	0.99	0.99	0.99	0.99

Note: Dependent variable is the stock of immigrants in country i originating from j. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 6: The effect of 'Job Posting' related provisions on the bilateral migration stocks

Dep var:	Bilateral Stock of Migrants		
	(1)	(2)	(3)
Movement natural persons	0.077***		
	(0.027)		
Specific categories		0.092**	
		(0.045)	
Movement of investors			0.074**
			(0.030)
GDP difference (ln)	-0.002	-0.001	-0.002
	(0.008)	(0.008)	(0.008)
RTA	0.029	0.036*	0.036*
	(0.021)	(0.020)	(0.021)
Schenghen	0.185***	0.186***	0.188***
	(0.039)	(0.039)	(0.039)
Estimator	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020
Observations	63,803	63,803	63,803
Pseudo R-squared	0.99	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 7: The effect of visa provision on the bilateral migration stocks: Skilled *versus* other sector migration.

Dep var:	Unskilled		Skilled	
	(1)	(2)	(3)	(4)
Visa	0.164***	0.165***	0.086*	0.089*
	(0.058)	(0.058)	(0.048)	(0.048)
RTA	-0.092**	-0.092**	-0.014	-0.013
	(0.043)	(0.043)	(0.042)	(0.042)
Schenghen		0.052		0.097
		(0.104)		(0.086)
GDP difference (ln)	0.060**	0.061**	0.038*	0.039*
	(0.026)	(0.026)	(0.023)	(0.023)
Estimator	PPML	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes	Yes
Sample period	2000-2010	2000-2010	2000-2010	2000-2010
Observations	4,164	4,164	4,033	4,033
Pseudo R-squared	0.99	0.99	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. Data on bilateral stock of migrants by macro-occupation are from the OECD DIOC dataset `https://www.oecd.org/els/mig/dioc.htm`. Skilled immigrants are those in ISCO occupation 1, 2 and 3. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 8: The effect of visa provision on the bilateral migration stocks: Primary *versus* other sector migration.

Dep var:	Primary sec.		Other sec.	
	(1)	(2)	(3)	(4)
Visa	0.274***	0.274***	0.119***	0.120***
	(0.080)	(0.079)	(0.045)	(0.045)
RTA	-0.011	-0.013	-0.092**	-0.091**
	(0.083)	(0.082)	(0.038)	(0.038)
Schenghen		0.085		0.061
		(0.135)		(0.092)
GDP difference (ln)	0.048	0.050	0.039*	0.040*
	(0.038)	(0.039)	(0.020)	(0.020)
Estimator	PPML	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes	Yes
Sample period	2000-2010	2000-2010	2000-2010	2000-2010
Observations	2,494	2,494	4,270	4,270
Pseudo R-squared	0.99	0.99	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. Data on bilateral stock of migrants by macro-occupation are from the OECD DIOC dataset `https://www.oecd.org/els/mig/dioc.htm`. Primary educated immigrants are those in ISCO occupation 92, 93 and 81. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 9: The effect of visa provision on the bilateral migration stocks: interaction with the share of right wing vote at destination.

Dep var:	Bilateral Stock of Migrants	
	(1)	(2)
Visa	0.083***	0.092***
	(0.032)	(0.032)
Visa × Right wing vote (sh)	-0.094	-0.136*
	(0.078)	(0.079)
RTA	0.059*	0.065**
	(0.033)	(0.033)
Schenghen		0.183***
		(0.043)
GDP difference (ln)	0.008	0.004
	(0.008)	(0.008)
Estimator	PPML	PPML
Country-Year Fixed Effects	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes
Sample period	1990-2020	1990-2020
Observations	34,722	34,722
Pseudo R-squared	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. The share of vite for right wing party is comprised between 0 and 1; with median value of 0.09 (i.e. 9% of votes) and maximum value of 0.54 (i.e. 54%).Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 10: The effect of visa provision on the bilateral migration stocks: (i) controlling for the depth of PTAs, (ii) placebo test using migration unrelated provisions.

Dep var:	Bilateral Stock of Migrants					
	(1)	(2)	(3)	(4)	(5)	(6)
Visa	0.138***	0.128***				
	(0.034)	(0.034)				
Movement of capital			-0.047	-0.042		
			(0.035)	(0.034)		
Money laundering					-0.008	-0.005
					(0.044)	(0.044)
RTA Depth	0.003***	0.003***	0.005***	0.005***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Schenghen		0.134***		0.141***		0.143***
		(0.036)		(0.036)		(0.036)
GDP difference (ln)	0.001	-0.000	-0.000	-0.002	-0.001	-0.002
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Estimator	PPML	PPML	PPML	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020
Observations	63,803	63,803	63,803	63,803	63,803	63,803
Pseudo R-squared	0.99	0.99	0.99	0.99	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 11: Dynamic effects of 'Visa' provision: Dechaisemartin & D'Haultfoeuille estimator

Dep var:	Bil. Mig. stock (ln)				
Time	t_0	t_{+1}	t_{+2}	t_{+3}	t_{+4}
Visa	0.041**	0.130***	-0.022	-0.199	-0.180
	(0.024)	(0.052)	(0.100)	(0.155)	(0.126)
Controls	Yes	Yes	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020
Observations	6,846	5,295	3,784	2,348	2,232
Switchers	242	215	96	66	66

Note: Controls includes the log of GDP difference, RTA and Schenghen. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table 12: Visa provision and migration stocks: IV estimation.

Dep var:	Visa	Mig. stock (ln)
	(1)	(2)
Visa^{IV}	0.139***	
	(0.013)	
Visa		0.150*
		(0.085)
Schenghen	-0.210***	0.037
	(0.033)	(0.055)
GDP difference (ln)	0.010***	-0.032
	(0.002)	(0.006)
Estimator	First Stage 2SLS	Second Stage 2SLS
F-stat	116.496	
Country-Year Fixed Effects	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes
Sample period	1990-2020	1990-2020
Observations	59,587	59,587
Two-way clustered s.e.	Yes	Yes

Note: 2SLS procedure. Standard errors clustered at the destination-year and origin-year. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

A Appendix tables

Table A1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Migration stock (in mill.)	0.004	0.071	0	12.169	346150
Visa	0.046	0.211	0	1	346150
Distance (ln)	8.800	0.778	2.349	9.899	300594
GDP per capita diff (ln)	8.971	1.472	0	11.765	213858
Colony	0.007	0.08	0	1	300594
Religion	0.176	0.249	0	0.997	265484
Language	0.173	0.379	0	1	300594
RTA	0.107	0.309	0	1	319478
Schenghen	0.006	0.08	0	1	346150

Note: authors' calculation on datasets described in section 2.1.

Table A2: Countries used in regression

Afghanistan	Cameroon	Gambia, The	Kyrgyz Republic	Nigeria	St. Vincent and the Grenadines
Albania	Canada	Georgia	Lao PDR	North Macedonia	Sudan
Algeria	Central African Republic	Germany	Latvia	Norway	Suriname
Angola	Chad	Ghana	Lebanon	Oman	Sweden
Antigua and Barbuda	Chile	Greece	Lesotho	Pakistan	Switzerland
Argentina	China	Grenada	Liberia	Panama	São Tomé and Principe
Armenia	Colombia	Guatemala	Libya	Papua New Guinea	Tajikistan
Australia	Comoros	Guinea	Luxembourg	Paraguay	Tanzania
Austria	Congo, Dem. Rep.	Guinea-Bissau	Macao SAR, China	Peru	Thailand
Azerbaijan	Congo, Rep.	Guyana	Madagascar	Philippines	Togo
Bahamas, The	Costa Rica	Haiti	Malawi	Poland	Tonga
Bahrain	Croatia	Honduras	Malaysia	Portugal	Trinidad and Tobago
Bangladesh	Cyprus	Hong Kong SAR, China	Maldives	Puerto Rico	Tunisia
Barbados	Czech Republic	Hungary	Mali	Qatar	Türkiye
Belarus	Côte d'Ivoire	Iceland	Malta	Russian Federation	Turkmenistan
Belgium	Denmark	India	Mauritania	Rwanda	Uganda
Belize	Djibouti	Indonesia	Mauritius	Samoa	Ukraine
Benin	Dominica	Iran, Islamic Rep.	Mexico	Saudi Arabia	United Arab Emirates
Bermuda	Dominican Republic	Iraq	Micronesia, Fed. Sts.	Senegal	United Kingdom
Bhutan	Ecuador	Ireland	Moldova	Seychelles	United States
Bolivia	Egypt, Arab Rep.	Israel	Mongolia	Sierra Leone	Uruguay
Bosnia and Herzegovina	El Salvador	Italy	Morocco	Singapore	Uzbekistan
Botswana	Equatorial Guinea	Jamaica	Mozambique	Slovak Republic	Vanuatu
Brazil	Estonia	Japan	Myanmar	Slovenia	Venezuela, RB
Brunei Darussalam	Eswatini	Jordan	Namibia	Solomon Islands	Vietnam
Bulgaria	Ethiopia	Kazakhstan	Nepal	South Africa	Yemen, Rep.
Burkina Faso	Fiji	Kenya	Netherlands	Spain	Zambia
Burundi	Finland	Kiribati	New Zealand	Sri Lanka	Zimbabwe
Cabo Verde	France	Korea, Rep.	Nicaragua	St. Kitts and Nevis	
Cambodia	Gabon	Kuwait	Niger	St. Lucia	

Note: Countries used in baseline regression reported in Table 2 Column 1.

Table A3: The effect of visa provision on the number of US granted visas.

Dep var:	US Visa (Employment)		
	(1)	(2)	(3)
Visa	0.577**	-0.271	0.620***
	(0.260)	(0.173)	(0.235)
Distance (ln)	-0.337***		
	(0.0824)		
Colony	4.162***		
	(0.201)		
Language	0.354**		
	(0.162)		
Religion	-5.896***		
	(0.537)		
RTA	0.548**	0.123	-0.281
	(0.239)	(0.143)	(0.250)
GDP difference (ln)	-0.162***	-0.378***	-0.225
	(0.0459)	(0.132)	(0.283)
Estimator	PPML	PPML	PPML
Year FE	Yes	Yes	Yes
Origin Fixed Effects	No	Yes	Yes
Sample period	2000-2020	2000-2020	2000-2020
Observations	3,464	3,383	100
Subsampling	No	No	Yes
Pseudo R-squared	0.27	0.91	0.92

Note: Column 3 reports the estimation results when subsampling on origin countries that switch to sharing a 'Visa' provision with the US at any time during the sample period. Therefore, we exploit the year variation only and exclude between countries variation. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table A4: The effect of visa provision on the bilateral migration stocks: Controlling for exit permit requirement

Dep var:	Bilateral Stock of Migrants		
	(1)	(2)	(3)
Visa	0.340***	0.107*	0.107*
	(0.098)	(0.063)	(0.063)
Exit permit	0.160	-0.086	-0.086
	(0.202)	(0.067)	(0.067)
Visa × Exit permit	0.928***	0.096**	0.096**
	(0.273)	(0.040)	(0.040)
RTA	1.118***	0.028	0.028
	(0.088)	(0.031)	(0.031)
Schenghen			-0.006
			(0.039)
Distance (ln)	-1.427***		
	(0.036)		
Colony	2.018***		
	(0.101)		
Language	0.891***		
	(0.095)		
Religion	0.413***		
	(0.143)		
GDP difference (ln)	0.027	0.008	0.008
	(0.022)	(0.010)	(0.010)
Estimator	PPML	PPML	PPML
Country-Year Fixed Effects	Yes	Yes	Yes
Country-Pair Fixed Effects	No	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020
Observations	92,826	26,683	26,683
Pseudo R-squared	0.82	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. In moving from column (1) to (2) the number of observations reduces considerably because country-pair fixed effects perfectly predict the outcome variable of time-invariant bilateral migration stocks, and the concerned observations are dropped. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table A5: The effect of visa provision on bilateral stocks of migrants: Controlling for EU country-pair.

Dep var:	Bilateral Stock of Migrants	
	(1)	(2)
Visa	0.061***	0.060***
	(0.020)	(0.020)
RTA	0.026	0.028
	(0.019)	(0.019)
EU	0.730***	0.706***
	(0.056)	(0.059)
Schenghen		0.077**
		(0.036)
GDP difference (ln)	0.004	0.003
	(0.008)	(0.008)
Estimator	PPML	PPML
Country-Year Fixed Effects	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes
Sample period	1990-2020	1990-2020
Observations	63,803	63,803
Pseudo R-squared	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. EU dummy = 1 if the country-pair belong to the European Union. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

Table A6: The effect of visa provision on bilateral stock of migrants: first difference

Dep var:	Bilateral Stock of Migrants (first difference)	
	(1)	(2)
Visa	0.294***	0.264***
	(0.080)	(0.085)
RTA	0.559***	0.585***
	(0.093)	(0.096)
Distance (ln)	-1.570***	-1.578***
	(0.039)	(0.039)
Religion	0.472***	0.492***
	(0.115)	(0.116)
Colony	1.156***	1.142***
	(0.131)	(0.131)
Language	0.827***	0.820***
	(0.074)	(0.074)
GDP difference (ln)	0.181***	0.173***
	(0.031)	(0.032)
EU		-0.250
		(0.161)
Estimator	PPML	PPML
Country-Year Fixed Effects	Yes	Yes
Sample period	1990-2020	1990-2020
Observations	148,272	148,272
Pseudo R-squared	0.99	0.99

Note: Dependent variable is the stock of immigrants in country j originating from i. EU dummy = 1 if the country-pair belong to the European Union. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.

B Right vote variable construction

This section describes how we constructed our variable on the country's preferences for 'Nationalism' or right wing vote. We define 'Nationalism' as the overall sentiment of a country's population towards the national way of life as well as their openness to multiculturalism and internationalism. We follow Moriconi et al. (2022) to construct such an index based on information from the Manifesto Project Database (MPD). The MPD provides political parties' positions on a wide range of topics, based on the content of their electoral manifestos for more than 1000 political parties across 50 countries since 1945. Using text analysis, the MPD is able to track up to 56 topics of interest, such as freedom and human rights, democracy, free-market economy, or welfare state to name a few. While Moriconi et al. (2022) calculate their 'Nationalism' index based on only two topics, i.e. 'European Community/Union' and 'National way of life', we base our index on 'National way of life', 'Internationalism' and 'Multiculturalism'. Indeed, we believe that the degree of inclination to 'Internationalism', defined by the MPD as references to cooperation with specific countries, aid to developing countries or, support for the UN or other international organizations among other considerations, indicates how political parties position themselves towards third-party countries. Similarly, we include 'Multiculturalism' as it reflects the attitudes of a country towards cultural diversity or, on the contrary, the enforcement of cultural integration. The 'National way of life' provides information on the pride of citizenship, the support for established national ideas.[32] For each of these three topics, the MPD records two measures: a positive measure and a negative measure based on the mentions and overall sentiment.

In order to identify what are political parties' preferences towards these 3 topics, we compute the 'Party preference' as the difference between the positive and the negative measures. Next, we use Principal Component Analysis to combine these three topics. Table B1 reports the results of the PCA along with the eigenvectors in Table B2. The first component explains 42% of the total variance of the variables. It correlates negatively with higher values of 'National way of life' and positively with higher values of 'Internationalism' as well as 'Multiculturalism'. In other words, the lower the score for the component, which we will call 'Right wing vote', will identify parties the most to the right of the spectrum. For instance, our strategy has allowed identifying 'Le Front National' or since 2018 'Le Rassemblement National' as the party the most at the right of the political spectrum in France, for every year included in our analysis. By doing so, we identify for each country and time, the party on the extreme right of the political spectrum.

[32] We do not use the 'European Community/Union' topic because it is specific to EU countries, and we cover many more non-EU countries in our dataset.

Finally, we use the MPD data to obtain the percentage of electoral votes for each of the political parties identified above to obtain the right vote share in country j at time t. We are left with a variable that we call 'Right vote' as it broadly reflects the share of right vote in country i at time t, where right vote is defined by our three main topic of interests described above.

Table B1: Principal component analysis on party preferences

Component	Eigenvalue	Difference	Proportion	Cumulative
1st Component	1.220	0.294	0.406	0.406
2nd Component	0.925	0.070	0.308	0.715
3rd Component	0.855		0.285	1.000

Table B2: Principal components (eigenvectors)

Variable	1st Component	2nd Component	3rd Component
Internationalism	0.523	0.802	0.289
National way of life	-0.628	0.133	0.767
Multiculturalism	0.576	-0.582	0.573

C De Chaisemartin & D'Haultfeuille estimator: Controlling for heterogeneous treatment timing and dynamic effects.

In a difference-in-difference setting, the treatment may not always be implemented at the same time for every unit. The so-called staggered design leads therefore to a bad comparison problem where the classical DiD estimator will compare the outcome evolution of the groups that switch (becomes treated from t-1 to t) to groups that can be already treated. In addition and as discussed in De Chaisemartin and d'Haultfoeuille (2020), the fact that in these designs, the treatment effect might not be constant over time or that the treatment may vary in intensity leads to the negative weight problem, creating large biases in the average treatment effect.

To circumvent these potential biases, De Chaisemartin and D'Haultfoeuille (2022) propose an estimator that is robust to this heterogeneity, both in static and dynamic treatment effect (where past treatment may also affects the current outcome). The proposed procedure estimates the expected difference between treated groups' outcome at t+l (l denotes the periods after the first treatment at t), and the counterfactual outcome of the untreated group that remained untreated from period one to t+l. See De Chaisemartin and D'Haultfoeuille (2022) for a formal discussion

of such an estimator. In this paper, we are interested in the dynamic effect of the Visa provision. In other words, we compare the dynamic of the outcome between t-1 and t+1, t+2, t+3, t+n. In our empirical setting this is the effect after 5, 10, 15 and 20 years after the implementation of the 'Visa' provision in RTAs. Table 11 presents the results of the DiD estimator explained above. Because of computational limitations in Table 11 we could not include country-year fixed effects. To (partially) address this limitation, in Table C1 we create period fixed effects (periods are 1990-95; 2000-05; 2010-20) and include country-by-period fixed effects.

Table C1: Dynamic effects of 'Visa' provision: Dechaisemartin & D'Haultfoeuille estimator

Dep var:	Bil. Mig. stock (ln)				
Time	t_0	t_{+1}	t_{+2}	t_{+3}	t_{+4}
Visa	0.038*	0.092*	-0.023	-0.113	-0.082
	(0.023)	(0.057)	(0.089)	(0.093)	(0.091)
Controls	Yes	Yes	Yes	Yes	Yes
Country-Pair Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Sample period	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020
Observations	6,846	5,295	3,784	2,348	2,232
Switchers	242	215	96	66	66

Note: Controls includes the log of GDP difference, RTA and Schenghen. Robust standard errors in parentheses. ***, **, * significantly different from 0 at the 1%, 5%, and 10% levels respectively.