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Pro-trade effects of MENA immigrants in France: does governance matter?

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Abstract

This paper investigates the role of governance in explaining the effects of immigrants of ten MENA countries on fostering trade in France from 1995 to 2015. Based on a maximum likelihood Tobit and PPML estimators, our results reveal that immigration has a positive and significant effect on trade, with a higher impact for differentiated products. Therefore, trade and migration are complementary. Results also show, on the one hand, that governance strengthens the effects of immigrants on MENA exports to France, especially for reference priced and differentiated goods. On the other hand, it has no impact on MENA imports.

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1. Introduction

The rise of extreme right-wing parties in Europe over the past few years has revealed a growing anti-immigration attitude. However, these political movements seem to ignore the contribution of immigration to deeper trade integration. Several investigations prove that immigration promotes trade (Genc et al., 2012; Bratti et al., 2014; Ottaviano et al., 2018).

The dynamics of immigration in France show that three of the top five countries are located in North Africa. In 2016, over 35% of immigrants came from Algeria, Tunisia and Morocco (OECD International Migration Data). According to Peridy (2012), a one percent increase of MENA (Middle East and North Africa) immigrants in France leads to an additional trade flows for France by 0.15% for exports and 0.20% for imports. The literature points out that the enhancing effect of immigration on imports can be explained by the networks effect plus a preference for domestic products (Combes et al., 2005; Briant et al., 2014; Artal-Tur et al., 2015). Whereas, for exports, immigration pro-trade effects rely only on networks. These results highlight the relevance of opportunities to promote bilateral trade through immigrant networks. Indeed, social and business networks may contribute via information dissemination on supply and demand opportunities in source and destination markets. These networks can also be a substitution to institutional failures. Furthermore, Sgrignoli et al. (2015) identify a subset of products for which the presence of a community of migrants significantly increases trade intensity. In addition, Fagiolo & Mastrorillo (2014) compare the typological structure of worldwide networks of human migration and bilateral trade over the period 1960-2000. They find that the networks of international migration and trade are strongly correlated[1].

Theoretical literature teaches us that the issue of the trade-migration nexus is usually discussed in terms either of complementarity for some authors or substitution for others. Starting with the pioneering article of Mundell (1957), the debate on commodities and factors mobility favored a substitution relationship. Indeed, under the conditions of the Hecksher-Ohlin model, factors movement can substitute for free movement of goods. However, the seminal paper of Markusen (1983) is the first work supporting the complementarity of factors movement and commodity trade.

Beyond the overall impact of immigration on trade, the relation could be different at the disaggregated level of flows. Trade commodities are commonly grouped in two broad categories: homogeneous goods and differentiated goods. The first group concerns commodities which have reference prices whereas the second group does not. According to Rauch (1999), "homogeneous commodities can be divided into those whose reference prices are quoted on organized exchanges and those whose reference prices are quoted only in trade publications". Making connections between buyers and sellers requires centralizing information through a search process inducing fixed costs. Therefore, immigration appears to be an excellent channel to provide information that allows buyers and sellers to determine prices. From this perspective, migrants' networks are more likely to strengthen trade for differentiated products. Migrants networks can substitute for the lack of information observed in comparison with organized markets (Rauch, 2001).

Moreover, some empirical findings suggest that the quality of governance, in particular for exporting countries (Berkowitz et al., 2006) or migrants sending countries (Dunlevy, 2006), amplifies the effects of immigrants' transnational networks on trade. Similarly, Anderson & Marcouiller (2002), Berkowitz et al. (2006) find that countries with good institutions tend to export more complex products and import more simple products. Their results also suggest that the quality of institutions affect the transaction costs, and determine comparative advantage for both exporter and importer. In the French case, most of studies find that immigrants stimulate the bilateral trade flows, suggesting a complementarity relationship either considering regional and firm data (Combes et al., 2005; Briant, et al., 2014) or national data (Peridy et al., 2007). However, despite the importance of immigration from MENA countries, only few studies (Nassar & Ghoneim, 2002; Peridy, 2012; Artal-Tur et al., 2015) have focused on the pro-trade effects of MENA immigrants in France.

The present paper makes two contributions to the literature. First, it shapes immigrants pro-trade effects with regard to disaggregated trade flows into three types of products following Rauch's classification (homogenous, reference priced and differentiated). Immigration is measured by the stock of foreign born population in France from ten MENA[2] countries during 1995 to 2015. Second, it highlights the role of governance quality in explaining immigrants trade promoting effects. This paper contributes to this strand of literature by providing an updated answer to the question of the impact of MENA immigration on promoting trade with France. The results point to the fact that governance quality matters more for MENA exports than imports.

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[1] The contribution of immigrants in deepen economic integration, especially trade enhancement, is widely recognized in the empirical literature (Rapoport, 2016; Metulini et al., 2018; Parsons & Vézina, 2018).

[2] Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia and Turkey.

This article is organized in five sections. The second section provides an overview of the literature and the third is devoted to the modeling and description of data. The fourth section presents the results of estimations and findings. The last section highlights the main conclusions.

2. Related literature

The theoretical contribution of Mundell (1957) on the mobility of factors of production and trade reveals a substitution between trade in goods and factors because of differences in factor endowments. The hypothesis of complementarity was developed for the first time by Markusen (1983). According to Markusen, substitution between goods and factors is a special result generally true for the Heckscher-Ohlin basis for trade. The achievement of factor price equalization is resulting from factor mobility rather than differences in factor endowments.

In the same vein, Venables (1999) suggests that the interaction of several factors (both in models with perfect and imperfect competition) can boost factor mobility, rather than substituting them. Trade liberalization is likely to cause more immigration flows. Venables explains this relationship regarding two cases. In the first case, he considers an economy with insufficient labor (like USA) and which makes use of immigrant workers to fill certain jobs. In the second case, he takes into account the phenomenon of "brain drain" in developing countries because of the opportunities that migration brings to elites. Indeed, there is evidence that labor mobility generates gains for both sending and host countries. Several country cases, cross-country, and panel studies beginning from the 90s provide strong evidence of immigration trade promoting effects (Gould, 1994; Head & Ries, 1998; Dunlevy & Hutchinson, 1999; Girma & Yu, 2002).

In previous literature migration benefits are generally discussed under a macroeconomic spectrum with little discussion on the role of institutions. Indeed, the quality of institutions was not deeply explored in migration studies even if Rauch (2001) identifies the cross-border networks of immigrants as a substitute for weak institutions in the countries of origin. Furthermore, Dunlevy (2006) analyses the role of institutions considering the importance of corruption and official language of the country of emigration on exports of the American States (USA). His findings underline that the impact of immigration on exports is even higher when the political system is corrupted. Migrants reduce institutional weakness contributing to a better knowledge of markets and social structures of their country of origin. Moreover, the role of institutions was tested empirically by De Groot et al. (2004) and later by Levchenko (2007). Using a large cross-country sample of 100 economies, De Groot et al (2004) find that institutional quality and governance have positive and significant effects on bilateral trade. Their results also confirm that the low quality of governance increases transactions costs. In a similar trend, Levchenko (2007) analyses the U.S imports data, disaggregated following four-digit SITC (Standard International Trade Classification) codes for 389 industries. Using 1998 data for 177 countries regarding institutional differences as a source of trade, the author finds that developed countries gain most from trade when institutional differences are sources of comparative advantages.

This literature is based on the idea that institutions' weakness and inefficiency are vectors of negative externalities that affect private businesses by increasing transaction costs (Knack & Keefer, 1997; Hall & Jones, 1999; Olson, 2008). To date a large number of papers have analyzed diverse perspectives on institutions and trade relationship (Anderson & Marcouiller, 2002; Dollar & Kraay, 2003; Koukhartchouk & Maurel, 2003; De Groot et al., 2004; Berkowitz et al., 2006; Turrini & Van Ypersele, 2006).

In a more recent study, Briant et al. (2014) analyze the impact of institutions on trade creation by immigrants in French regions. They classify trade flows in simple and complex goods. They find that the quality of institutions in the countries of origin stimulates immigrants pro-trade effects for simple goods more than for complex goods, regarding exports. The higher is the quality of institutions; the lower is the contribution of immigrants. Conversely, the impact of immigrants on imports is higher and significant for complex goods but is not related to the quality of institutions.

3. Model and data

3.1 The model

3.1.1 The basic framework

This section presents in details the foundation of the gravity model adopted to predict bilateral trade between the 10 MENA countries and France. Starting with Tinbergen (1962), the gravity model is theoretically grounded by Anderson (1979), Krugman (1995), Trefler (1995), and Anderson & Van Wincoop (2003). The latter model is the most widely used by economists in international trade assessments. It has the advantage to handle relevant common limits of previous models like multilateral resistance to trade, omitted variables, and allows efficient comparative statics (resolving McCallum (1995) border puzzle).

The empirical model adopted in this paper follows the structural gravity model of Anderson & Van Wincoop (2003). The basic framework can be written as follow: $X_{ij} = \frac{Y_i Y_j}{(p^i)^\sigma \bar{y}} \left(\frac{T^{ij}}{P^j}\right)^{1-\sigma}$ *(1)*

Where X_{ij} denotes the export of goods from country i to country j, Y_i and Y_j are the respective Gross Domestic Products of i and j. $T^{ij} = c^{ij} D_{ij}^{\rho} \varepsilon_{ij}$ represents the trade costs, c^{ij} is the consumption of goods of country i in j, D_{ij}^{ρ} is the distance between i and j, and ε_{ij} is the random component. p^i and p^j are respectively the Free on Board (FOB) prices of goods produced in country i and j. The ratio of GDP of country i on goods produced is $\bar{y} = \frac{Y_i}{N_i p^i}$ (where N_i is the number of products produced in country i). The constant elasticity of substitution (CES) preferences σ is supposed to be identical for all goods.

Applying market clearing condition $p^i = \frac{1}{P^i} \left(\frac{s^i}{N^i}\right)^{\frac{1}{1-\sigma}}$ (where $s^i = Y_i / \sum_i Y_i$).

When we take into account the hypothesis of symmetric price indexes, and substituting p^i in the gravity equation, the precedent equation can be simplified as: $X_{ij} = \frac{Y_i Y_j}{Y} \left(\frac{T^{ij}}{P^i P^j}\right)^{1-\sigma}$ *(2)*

Where $Y = \sum_i Y_i$

The relation established in equation (2) means that trade flows increase with economic size ($Y_i Y_j$), measured by the product of countries i and j GDP's $\left(GDP_i * GDP_j\right)$, and decrease with trade costs (we use the geographical distance as a proxy of trade costs).

3.1.2 Empirical specification

In order to specify the empirical model, we use the logarithm function to obtain a linear form as the multiplicative form of the theoretical model cannot be estimated. The log linear expression of equation (2) is presented as:

$$log\left(\frac{X_{ij}}{Y_i Y_j} Y\right) = log\left(\left(\frac{T^{ij}}{P^i P^j}\right)^{1-\sigma}\right) \quad (3)$$

The theoretical solution is obtained using first differences of equation (3)[3]:

$$log\left(X_{ij}\right) = \alpha + log\left(Y_i Y_j\right) + (1-\sigma)\rho\, log\left(D_{ij}\right) + (1-\sigma)c_{ij} - (1-\sigma)\, log(p_i) - (1-\sigma)\, log\left(p_j\right) + (1-\sigma)\varepsilon_{ij} \quad (4)$$

Given the complexity to measure price indexes, they are assimilated into country fixed effects (FE). Conventional gravity models of trade have focused on multidimensional FE specification. In the literature, we distinguish Matyas (1997) and Cheng & Wall (2005) models. The Matyas model is a special case of the more general FE model. It imposes cross-pair restrictions on intercept: the country specific FE is assumed to be the same for all its trading partners. Cheng & Wall (2005) propose a FE augmented model with a specific country-pair effect including the effect of cross-sectionally specific omitted variables constant over time. One major difference in the last specification is that country-specific effect is unique and may be different depending on the direction of trade ($\alpha_{ij} \neq \alpha_{ji}$). However, a recent paper by Fischer & LeSage (2020) reveals that cross-sectional dependence persists after including the FE suggested by Matyas (1997) and Cheng & Wall (2005). They find that trade organization and spatial proximity are the main sources of cross-sectional dependence. We specify an augmented structural gravity model and introduce migration and other traditional variables (colonial ties and free trade agreements)[4].

The longitudinal data are consistent with the model to be estimated including both time and individual dimension. As a key to gravity model, population allows us to approximate the effects of the market size in explaining trade flows in equation (5). The model is presented below:

$$Log\left(X_{ijt}\right) = \alpha + \beta_1 \log(GDPcap_{it}) + \beta_2\, log\left(GDPcap_{jt}\right) + \gamma_1 \log(Pop_{it}) + \gamma_2 \log\left(Pop_{jt}\right) + \rho log\left(D_{ij}\right) + \delta\, log\left(Migration_{ijt}\right) + \eta_i V_{ijt} + \varepsilon_{ijt} \quad (5)$$

We note that i is the country of origin (MENA) and j is the country of destination (France).

X_{ijt} is the bilateral trade flows, $GDPcap_{it}$ and $GDPcap_{jt}$ are the Gross Domestic Products per capita of reporter (MENA) and partner (France)[5], and D_{ij} is the distance between i and j. $Migration_{ijt}$ is the stock of immigrants in country j (France) from country i (MENA) in year t. V_{ijt} is a vector of control variables. It includes two

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[3] First difference transformation eliminates the constant term (Y) in equation (3), but one usually assumes a constant component (α) in the double log equation. Moreover, the unit income elasticity of countries i and j distinguish the theoretical and empirical models (Anderson (1979), Anderson & Van Wincoop (2003)).

[4] See for instance empirical works by Kahouli & Maktouf (2015), Artal-Tur et al., (2015) focusing on Mediterranean countries.

[5] Trade is proportional to countries wealth and often approximated by GDP per capita. Rich economies are generally open and more likely to trade as assumed by Frankel & Wei (1993), Rauch (1999), and Lee (2012).

dummies: colonial ties (Colony), and free trade agreement (FTA). $V_{ijt} = \eta_1 Colony_{ij} + \eta_2 FTA_{ijt}$. $\varepsilon_{ijt} = u_{ij} + v_t + \epsilon_{ijt}$, with u_{ij} and v_t respectively the individual and time FE. ϵ_{ijt} is the error term.

We address the impact of the quality of institutions in explaining immigrants pro-trade effects for 10 MENA countries (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia and Turkey) over the period 1995-2015. This impact holds on the ability of migrants to seize business opportunities bilaterally. Considering the wealth of partners measured by GDP per capita, the model can therefore be estimated following the equation below:

$$Log\left(X_{ijt}^{k}\right) = \alpha + \beta_1 \log(GDPcap_{it}) + \beta_2\, log\left(GDPcap_{jt}\right) + \gamma_1 \log(Pop_{it}) + \gamma_2 \log\left(Pop_{jt}\right) + \rho\, log\left(D_{ij}\right) + \delta_1 log\ (Migration)_{ijt} + \delta_2 log\ (Migration)_{ijt} * rle_{it} + \eta_1 Colony_{ij} + \eta_2 FTA_{ijt} + u_{ij} + v_t + \epsilon_{ijt} \qquad (6)$$

Panel data improves estimation efficiency of the gravity model. In panels, FE can be estimated, unlike cross-section data where their estimates are collinear with country specific variables.

X_{ijt}^{k} denotes the export of commodity $k = 1,2,3$ from country i to j at time t, in thousands of US dollars. Our data are composed of three groups of trade flows commodities: homogeneous (1), reference-priced (2), and differentiated goods (3). The sub samples matching Rauch's classification of commodities are in appendix 1 with the remainder explanatory variables of the model. Our panel database allows us to estimate the effect of immigration on about 9,000 sub-products of the 4-digit SITC (Standard International Trade Classification) trade flows. The institutional quality indicator is "rule of law" (rle_{it}) from World Governance Indicators (WGI) database.

3.2 Data

Trade flows: International trade flows data are released at disaggregate level by UN COMTRADE. Trade data are exports and imports flows between the 10 MENA countries and France considering Rauch's classification. Trade flows are recorded on the basis of the 4-digit SITC level following conservative and liberal aggregations. We record 53,999 observations for MENA exports and 101,932 observations for MENA imports. This distribution indicates the high diversity of French exports in comparison with imports.

Population & Economic size: Pop_{it} and Pop_{jt} are respectively the population size of origin ($i: MENA$) and destination ($j: France$). $GDPcap_{it}$ and $GDPcap_{jt}$ are respectively the gross domestic products per capita of i and j. Population and GDP per capita (in current US dollars) are released by the CEPII (Centre d'Etudes Prospectives et d'Informations Internationales).

Immigration: $Migration_{ijt}$ is the stock of foreign born population from country i (MENA) and living in country j (France) at time t. Migration data are provided by the OECD database (OECD. Stats). It specifies the number of foreign born (stocks of immigrants) in the country of destination.

Trade costs: D_{ij} is the geodesic distance calculated using latitudes and longitudes of the most important cities in terms of population. It is a distance in kilometers weighted by the respective populations of economic centers considered between countries i and j following the great circle formula (Mayer & Zignago, 2011).

Colony: $Colony_{ij}$ is a dummy taking two values: 1 if the country has colonial links with France, and 0 otherwise.

Free trade agreement: FTA_{ijt} is a dummy taking value 1 if there is a free trade agreement between i and j, and 0 otherwise. Distance, colony, and free trade agreement come from "Geo_cepii" and "Dist_cepii" databases released by the CEPII.

Institutions: Institutional quality is measured on the basis of the performance policy governance indicator released by the World Governance Indicators (Kaufmann et al., 2010). To approximate the quality of governance, we use the rule of law (rle_{it}). It measures to what extent both the government and citizens know the law and obey it. Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. The WGI (World Governance Indicators) collects data based on survey or public reports to rate aggregate indicators on the perception of governance and institutional quality. The data covers the period from 1996 to 2017 and the indicators range from -2,5 to +2,5.

The use of the gravity model has two advantages: its deterministic nature (high level of robustness) and the stability of key variables. Therefore, we expect positive signs for GDP per capita and Migration under the assumption of a growing trade volume with the size of economies. However, the distance is the main resistance factor and should therefore negatively affect trade flows as it increases transport costs.

The traditional multilateral resistance to trade (trade remoteness) is not suitable for the present model given that we consider a unique partner (France) for all the reporters. The econometric method is detailed in the following section.

4. Estimations and results

4.1 Estimation strategy

In order to estimate the model, we have to tackle some biases that arise when using panel data. The most common of them are heteroskedasticity and endogeneity. Heteroskedasticity generates some unobserved residuals changing across the individuals (reporters). As a consequence, the hypothesis of independence between covariates, lagged residuals and current residuals are violated[6]. The tobit estimator allows an option for robust or sandwich estimator of variance. This estimator is robust to misspecifications under the assumption of independent observations.

Endogeneity is a serious concern coming from the correlation between covariates and the error component. The conditions of orthogonality impose the independence of bilateral trade policy measures with the error term[7]. Such a correlation is generally a consequence of omitted variables, measurement errors, and reverse causality or simultaneity. As a source of endogeneity, reverse causality is often suspected because immigrants have often a preference for home country's main trading partners. Several studies have addressed this source of endogeneity. Wagner et al. (2002) use country FE to control for unmeasured characteristics through a log-linear and random opportunities (maximum likelihood) estimation. In an earlier study, Altonji & Card (1991) adopt instrumental variables procedure to control for correlation between immigrant inflows and economic conditions. Briant et al., (2014) include country and department specific FE, and use instrumental variables in their regressions to tackle this problem (they use lagged variables of the stock of foreign born as instruments). Nonetheless, in our data, we will lose many observations if we consider an instrumental approach. The gravity model adopted in the present study allows, with specific FE to moderate a potential endogeneity (Arkolakis et al., 2012). In presence of time invariant variables, the FE may be overlapped. Thus, we take it into account by estimating different specifications with and without individual and time FE.

In addition, we notice that in such models, spatial autocorrelation and spatial heterogeneity are two different phenomena that can be treated using FE. In spatial modeling, countries' location has an impact on the dependent variable. Several methods have been implemented to take it into account (LeSage & Pace, 2008; Behrens et al., 2012; Metulini et al., 2018). Spatial gravity models usually require the concentrated maximum likelihood estimator to overcome the intrinsic endogeneity, applying a logarithmic transformation of the dependent and control variables (Sgrignoli et al., 2015). However, in the present paper, we do not deal with this issue because there is no neighboring[8] in our country pairs.

Using the international trade data, we face the problem of missing data and zero trade. As a first step, we try to fix the problem of zero trade, and then the selection bias, by adding a unit to the value of trade. This technique can be useful because moving to the logarithmic form makes us lose a lot of observations. This method has been widely used because of its simplicity in econometrics (Eaton & Tamura, 1994; Wagner et al., 2002; Herander & Saavedra, 2005). We estimate our empirical model using the tobit estimator. It has the advantage of using a likelihood function and admits a useful test to assess the relevance of using panels. In addition, the tobit estimator allows us to increase the number of integration points, and defines the lower and upper margins of the censoring points.

In spite of a widespread use in several empirical works, the tobit estimator lacks efficiency in overcoming correctly the zero trade and heteroskedasticity. One of the popular alternative method is the Pseudo Poisson Maximum Likelihood (PPML), proposed by Silva & Tenreyro (2006), which allows an estimation with dependent variable in level instead of log.

4.2 Results of estimations

4.2.1 The effect of immigration on exports

On the pro-trade effect of immigration, the results of estimation (Table I) indicate a positive and significant effect of immigration on exports regardless of the category of good considered. The elasticity of immigration varies from 0.130 (column 1) to 0.203 (column 6) following respectively the conservative and liberal aggregation of trade flows. An increase by 1% in the stock of immigrants rises by 0.13% (column 1) to 0.20% (column 6) the exports of MENA towards France. Moreover, the standard errors are relatively low (from 0.017 to 0.070) reinforcing the precision of estimates.

This result supports the assumption that an increase of the stock of immigrants generates an expansion of exports in direction to the host country (France). Such an effect usually goes through three channels. Firstly, the

[6] High heterogeneity between panels explains at some extend variability of the variance of the error term.

[7] Bergstrand (2013) distinguishes natural trade costs or exogenous costs (e.g distance, transportation costs) and man-made costs inherent to policy-maker decisions (domestic policies).

[8] Countries of origin do not share borders with France, as there is no neighborhood, spatial autocorrelation does not matter in this context.

informational channel: immigrants have a good knowledge of domestic and home markets. So, they contribute to fill the information gap between traders and consolidate the bilateral trade. Secondly, the networks channel: networks give an opportunity to contract enforcement, through sanctions and offset the low quality of home institutions. Thirdly, the preference channel: immigrants have a preference for home products. This preference effect increases the demand for home country goods and then amplifies the imports of the host country. Following the type of goods, the effect of immigration is higher for differentiated goods (column 6), with an elasticity of 0.203 against 0.174 (column 5) and 0.158 (column 4) respectively for reference priced, and homogeneous on the basis of liberal aggregation[9]. Differentiated products exports from MENA countries to France represent more than 60% of flows (65% using the conservative aggregation and 62% for the liberal aggregation, see Appendix 4, column 4). Thus, immigrants play a central role and provide important information, which matches buyers and sellers for this type of product.

Table I: The effect of immigration on exports

Dependent variable : Log of Export	Conservative			Liberal		
	1	2	3	4	5	6
Log(GDPcap_i)	0.894**	0.742**	1.330***	0.931**	0.639**	1.346***
	(0.417)	(0.302)	(0.164)	(0.377)	(0.296)	(0.168)
Log(GDPcap_j)	2.058*	2.330***	2.297***	2.918**	2.348*	2.114***
	(1.092)	(1.452)	(0.762)	(1.317)	(1.297)	(0.783)
Log(Pop_i)	1.496***	2.175***	1.097***	1.131***	1.401***	1.070
	(0.303)	(0.221)	(0.121)	(0.275)	(0.215)	(0.224)
Log(Pop_j)	2.455	1.585	1.810	3.687	2.471	2.081
	(2.546)	(1.838)	(1.199)	(2.312)	(1.789)	(1.284)
Log(Distance)	-1.388**	-2.333***	-0.721**	-1.214*	-2.536***	-0.660**
	(0.697)	(0.541)	(0.308)	(0.640)	(0.529)	(0.315)
FTA	-0.160	-0.478***	-0.249***	0.069	-0.266*	-0.268***
	(0.177)	(0.133)	(0.0639)	(0.157)	(0.138)	(0.0647)
Colony	-0.836	-0.971	-0.773	-1.176	-0.846	-0.694
	(0.806)	(0.604)	(0.522)	(0.734)	(0.588)	(0.630)
Log(Migration)	0.130***	0.186***	0.192***	0.158***	0.174***	0.203***
	(0.017)	(0.012)	(0.038)	(0.016)	(0.025)	(0.0705)
Log(Migration)#rle	0.072	0.048***	0.059***	0.022	0.037***	0.063***
	(0.063)	(0.014)	(0.023)	(0.057)	(0.014)	(0.024)
Constant	-54.78***	-44.12***	-35.55***	-57.51***	-49.32***	-33.24***
	(16.26)	(11.87)	(6.237)	(14.85)	(11.46)	(6.402)
Country-pair FE	No	No	No	Yes	Yes	Yes
Time FE	No	No	No	Yes	Yes	Yes
Observations	4,494	7,244	23,270	5,315	7,589	22,104
Number of id	616	986	2,477	746	1,004	2,329
chi2	237.9	288.4	1522	249.6	385.1	1394
rho	0.821	0.830	0.843	0.822	0.833	0.842
chi2	684.5	1222	3223	839.6	1244	3048
chi2-pvalue	0	0	0	0	0	0

Notes: Random tobit estimation with country-pair and time fixed effects. Estimates of columns 1, 2 and 3 are based on conservative aggregation whereas columns 4, 5 and 6 follow the liberal aggregation. The first, second and third columns are respectively homogeneous, reference-priced and differentiated goods flows for each aggregation. All the estimates include individual and time fixed effects. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Furthermore, the explanatory variables have the expected sign except for colonial links. Indeed, having a colonial link with France reduces bilateral trade in comparison with those that have not. Mass components (GDPcap and Pop) in the model fill the assumption that countries with large GDP per capita and populations are more likely to trade.

The post-estimation statistic, rho, indicates the relevance of the tobit panel estimation. The likelihood-ratio test suggests that sigma_u is significantly different from zero, and the Wald test rejects the null hypothesis that overall coefficients are equal to zero.

4.2.2 The effect of immigration nexus institutions on exports

Turning to the role of institutions measured by "Rule of Law" in the pro-trade effect, our results show that the impact of immigration nexus institutions is positive for exports (Table I). The supplementary effect of Rule of Law on immigration has increased exports by 0.048% (column 2) for reference priced goods, and 0.059% (column 3) for differentiated goods following conservative aggregation. We find similar results following the liberal aggregation. Otherwise, immigration stimulates bilateral exports from MENA countries towards France when their institutional quality is higher. The role of immigrants in trade facilitation is often based on informational inputs, which reduces transaction costs. In addition, they participate thereby to establish some confidence that can be reinforced by institutional reforms and progress in governance, including fight against corruption. Our results do not confirm those of Briant et al. (2014) who find that immigrant's impact on trade is higher when institutions of home country are weak. Despite the heterogeneity of the sample, the results are robust[10] to diverse restrictions in estimations.

[9] The distribution of export flows following the liberal aggregation does not significantly differ from the conservative.

[10] Israel and Jordan have the higher institutional records in the sample. In addition, the bilateral trade diversification is not the same with all the partners. Turkey, Israel and Tunisia have a more diversified trade products with France. The restriction of estimation on the eight other countries yields the same output that support a positive effect of institutions in immigrants trade creation effects.

4.2.3 The effect of immigration on imports

The impact of immigration on imports is presented in Table II. Results indicate that immigrants have a positive impact on imports. They stimulate trade for the three type of goods: homogeneous (0.122 in column 1), reference priced (0.185 in column 2) and differentiated (0.136 in column 3). All the elasticities are significant at 1% percent regardless of the flows considered. So, a growing size of the stock of immigrants increases MENA imports from France. As a consequence, the network effect is valid in the current estimation for import flows. In the country of destination, immigrants can detect new products matching with consumer's preferences in the home country. So, they can supply information to reduce firms' fixed trade costs in foreign markets (country of origin).

Table II: The effect of immigration on imports

Dependent variable : Log of Import	Conservative			Liberal		
	1	2	3	4	5	6
Log(GDPcap_i)	0.573***	0.979***	0.987***	0.520***	1.094***	0.969***
	(0.102)	(0.0595)	(0.0354)	(0.0923)	(0.0573)	(0.0363)
Log(GDPcap_j)	0.241*	0.685**	0.873***	0.256**	0.699***	0.768**
	(0.132)	(0.277)	(0.260)	(0.120)	(0.742)	(0.372)
Log(Pop_i)	0.584***	0.959***	0.484***	0.605***	0.964***	0.466***
	(0.146)	(0.0892)	(0.0549)	(0.133)	(0.0864)	(0.0561)
Log(Pop_j)	2.717**	1.529**	1.745***	2.286**	1.951***	1.897***
	(1.273)	(0.759)	(0.454)	(1.152)	(0.733)	(0.466)
Log(Distance)	-0.698*	-0.152	-0.898***	-0.420	-0.523**	-0.863***
	(0.366)	(0.245)	(0.155)	(0.335)	(0.240)	(0.158)
FTA	-0.165*	-0.223***	-0.230***	-0.190**	-0.236***	-0.246***
	(0.086)	(0.049)	(0.029)	(0.078)	(0.047)	(0.029)
Colony	0.288	-1.239***	-0.605***	0.343	-1.209***	-0.602***
	(0.347)	(0.212)	(0.131)	(0.318)	(0.205)	(0.134)
Log(Migration)	0.122***	0.185***	0.136***	0.146***	0,173***	0.155***
	(0.0382)	(0.0459)	(0.0521)	(0.0474)	(0.0648)	(0.0572)
Log(Migration)#rle	0.0098	0.00410	0.0014	0.0012	0.00692	0.0117
	(0.0069)	(0.0044)	(0.0024)	(0.0063)	(0.0049)	(0.0125)
Constant	7.536	18.89***	37.99***	0.976	26.77***	38.30***
	(5.011)	(3.075)	(1.879)	(4.549)	(2.984)	(1.924)
Country-pairs FE	No	No	No	Yes	Yes	Yes
Time FE	No	No	No	Yes	Yes	Yes
Observations	10,369	17,893	41,167	12,356	18,320	38,753
Number of id	1,101	1,697	3,672	1,338	1,690	3,442
rho	0.821	0.844	0.865	0.824	0.848	0.863
chi2	1568	2700	6130	1890	2727	5780
chi2-pvalue	0	0	0	0	0	0

Notes: Random tobit estimation with country-pair and time fixed effects. Estimates of columns 1, 2 and 3 are based on conservative aggregation whereas columns 4, 5 and 6 follow the liberal aggregation. The first, second and third columns are respectively homogeneous, reference-priced and differentiated goods flows for each aggregation. All the estimates include individual and time fixed effects. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The remaining variables of the model have the expected signs. Colonial ties have a negative effect on trade flows. This result implies that most of imports are destined to countries that do not share a colonial history with France. An explanation may hold in the distribution of trade flows by products as almost half of trade concerns countries that do not share colonial ties. The elasticities of GDPcap and Population at origin are still positive and significant. Distance and FTA are negative. Including dummies and specific FE allows controlling for multilateral resistance and time invariant unobserved heterogeneity within data.

Results seem valid regardless of commodity group considered and are confirmed by the post-estimation likelihood-ratio test. Furthermore, the Wald test rejects the null hypothesis that overall coefficients are equal to zero.

4.2.4 The effect of immigration nexus institutions on imports

Regarding the interacted effect of immigration on imports through institutions, results presented in Table II show that this channel is not relevant. The coefficient of the interaction term is not significantly different from zero and means that institutions do not matter in explaining immigration effects on promoting imports.

Therefore, the quality of institutions of the importing country does not matter in the pro-trade effect and there is no additional impact because the contribution of immigrants is essentially based on trade facilitation through networks.

In addition, we notice that bilateral import flows are various in comparison with exports. Indeed, MENA imports from France are more diversified. We report 779 products imported from France (MENA imports) and 757 products exported by MENA countries (MENA exports) to France. So, trade opportunities are more important for French firms according to the distribution of trade products.

4.3 Robustness checks

In this section, we run robustness estimations using the PPML. Looking at exports, as expected, the results of estimations (Table III) highlight that the effect of immigration is positive and significant for the three type of products considering conservative or liberal aggregation. The elasticity of immigration is significant at 1%

following the liberal (0.221 in column 6) and conservative (0.217 in column 3) classification. The supplementary effect of institutions on immigration is positive and significant on exports for reference priced and differentiated goods. This means that the respect of contract in the MENA countries is an important tool to increase its exports towards France through the demand of immigrants.

Table III: Effect of immigration on exports

Dependent variable : Export	Conservative			Liberal		
	1	2	3	4	5	6
Log(GDPcap_i)	1.163**	1.885**	1.622*	1.679**	1.601***	1.585*
	(0.550)	(0.807)	(0.859)	(0.612)	(0.798)	(0.856)
Log(GDPcap_j)	1.958*	2.880***	2.746***	1.778*	2.982***	2.613**
	(1.044)	(1.104)	(1.053)	(1.040)	(1.145)	(1.225)
Log(Pop_i)	2.411***	3.043***	1.549**	2.506***	2.694***	1.522**
	(0.332)	(0.755)	(0.691)	(0.456)	(0.499)	(0.688)
Log(Pop_j)	1.724	1.091	1.258	1.483	1.443	1.043
	(5.937)	(4.410)	(6.219)	(6.281)	(3.172)	(6.211)
Log(Distance)	-1.713***	-2.478**	-1.038*	-1.549***	-2.600***	-1.106*
	(0.857)	(1.238)	(0.416)	(0.772)	(0.956)	(0.615)
FTA	-1.049**	0.466	0.625	-1.660***	0.272	0.647
	(0.519)	(0.649)	(0.479)	(0.437)	(0.639)	(0.479)
Colony	0.559	0.569	-0.663	0.485	0.672	-0.599
	(1.166)	(2.018)	(1.769)	(1.230)	(1.496)	(1.761)
Log(Migration)	0.142***	0.112***	0.217***	0.120***	0.110***	0.221***
	(0.0501)	(0.0354)	(0.0197)	(0.0463)	(0.0350)	(0.0201)
Log(Migration)#rle	0.0660	0.0400***	0.0946***	0.058	0.048***	0.095***
	(0.046)	(0.015)	(0.017)	(0.044)	(0.014)	(0.019)
Constant	7.403	-63.48***	-42.03	1.662	-66.71***	-41.68
	(37.39)	(15.89)	(26.72)	(36.30)	(13.72)	(26.18)
Country-pair FE	No	No	No	Yes	Yes	Yes
Time FE	No	No	No	Yes	Yes	Yes
Observations	4,494	7,244	23,270	5,315	7,589	22,104
R-squared	0.260	0.023	0.014	0.258	0.019	0.014
Chi-2	0.80	0.45	3.10	0.88	1.50	3.47
Reset test p-value	0.371	0.50	0.078	0.348	0.22	0.0623

Notes: PPML estimation with country-pair and time fixed effects. Estimates of columns 1, 2 and 3 are based on conservative aggregation whereas columns 4, 5 and 6 follow the liberal aggregation. The first, second and third columns are respectively homogeneous, reference-priced and differentiated goods flows for each aggregation. All the estimates include individual and time fixed effects. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The GDP per capita and Population (only at origin) have a positive effect on trade as expected. Distance and FTA still have a negative effect on trade. Time and country-pair FE reinforce the precision of immigration elasticities. In addition, we perform a heteroskedasticity-robust test to check the significance of an additional regressor. The reset test corroborates that the model is correctly estimated using PPML.

Concerning the robustness checks for import flows (Table IV) it appears that immigration positively affects MENA imports.

Table IV: Effect of immigration on imports

Dependent variable : Import	Conservative			Liberal		
	1	2	3	4	5	6
Log(GDPcap_i)	0.322***	0.230***	0.491***	0.292***	0.242***	0.496***
	(0.0821)	(0.0584)	(0.0918)	(0.0648)	(0.0845)	(0.0928)
Log(GDPcap_j)	0.580*	0.740***	0.459***	0.513**	0.883***	0.437**
	(0.302)	(0.244)	(0.177)	(0.216)	(0.233)	(0.180)
Log(Pop_i)	0.599***	0.448***	0.390***	0.589***	0.457***	0.377***
	(0.0515)	(0.0435)	(0.0541)	(0.0402)	(0.0620)	(0.0537)
Log(Pop_j)	2.766	2.632**	2.769**	2.681	2.745**	2.772**
	(2.227)	(1.329)	(1.195)	(2.101)	(1.131)	(1.180)
Log(Distance)	-1.036***	-0.293	-0.668***	-0.963***	-0.332	-0.642**
	(0.197)	(0.271)	(0.252)	(0.164)	(0.366)	(0.251)
FTA	-0.321***	0.0805	-0.264***	-0.289***	0.0595	-0.283***
	(0.0981)	(0.113)	(0.0979)	(0.101)	(0.110)	(0.109)
Colony	0.281	0.439	0.533	0.300	0.333	0.567
	(0.281)	(0.347)	(0.461)	(0.291)	(0.536)	(0.472)
Log(Migration)	0.138**	0.167***	0.172***	0.132***	0.169***	0.177***
	(0.0556)	(0.0410)	(0.0596)	(0.0392)	(0.0613)	(0.0606)
Log(Migration)#rle	-0.0043	0.0091	0.0012	-0.0084	0.0165	0.0106
	(0.0059)	(0.0090)	(0.0073)	(0.0056)	(0.0124)	(0.0074)
Constant	-36.14***	-0.390	19.78***	-35.04***	2.351	19.72***
	(8.211)	(8.998)	(4.213)	(8.147)	(8.909)	(4.009)
Country-pair FE	No	No	No	Yes	Yes	Yes
Time FE	No	No	No	Yes	Yes	Yes
Observations	10,369	17,893	41,167	12,356	18,320	38,753
R-squared	0.014	0.026	0.021	0.013	0.044	0.020
Chi2	0.82	0.04	0.03	1.27	1.58	0.13
Reset test p-value	0.366	0.846	0.858	0.259	0.208	0.714

Notes: PPML estimation with country-pair and time fixed effects. Estimates of columns 1, 2 and 3 are based on conservative aggregation whereas columns 4, 5 and 6 follow the liberal aggregation. The first, second and third columns are respectively homogeneous, reference-priced and differentiated goods flows for each aggregation. All the estimates include individual and time fixed effects. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

This direct effect is significant at 1%, with higher slopes for differentiated goods (0.177 in column 6) in comparison with the two others regardless of the aggregation considered. The additional effect of institutions in the relation between immigration and imports is once again not significant.
GDP cap, Population and distance have the expected sign. FTA still has a negative effect. This result upholds the estimates obtained in the previous section; they are robust to different estimators.
From the above, it is clear that the effects of networks are positive and significant. The importance of network effects in the impact of immigration cannot be ignored, and the results of estimations seem to confirm the relation between trade and migration. In the French case, immigrants enhance the bilateral trade between France and MENA countries.
In addition, based on the results of estimations, institutions are important for MENA exports to France. However, institutions have no relevant impact for MENA imports.

5. Conclusion

This paper aims to contribute to the understanding of immigration pro-trade effects, in particular from MENA countries to France. We especially assess the effect of immigration on trade through the institutional quality.
Our findings indicate that immigration enhances trade for both MENA import and export flows. Therefore, there is a complementarity relationship between trade and immigration. This relation is valid for the three types of products. Immigrants pro-trade effects are more pronounced, particularly, for reference priced and differentiated products. This effect is greater for countries with higher quality of institutions. The indirect effects of immigration through institutions emphasize the importance of "rule of law" in the country of origin (MENA) in increasing exports. However, for MENA imports, institutional quality does not have an impact on immigration driven trade effects. Finally, our results suggest that immigration has bilateral beneficial effects on trade depending indirectly on the institutional quality. The respect of law and contract enforcement seems relevant for immigration pro trade effects on exports flows.

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Appendices

Appendix 1: Data and sources

Dependent Variables	Description	Sources	Link
Export	Exports value US dollars	UNCOMTRADE	UNCOMTRADE data
Import	Imports value US dollars		
Independent variables			
Migration	Number of foreign born	OCDE.stat	International Migration Database
GDPcap	Gross Domestic Product per capita	CEPII	Gravity data
Pop	Population		
Distance	Geodesic distance		
Colony	Colonial linkage		
FTA	Free trade agreement		
rle	Rule of law	Worldwide Governance Indicators	WGI

Appendix 2: Descriptive statistics

EXPORTS					
log(Export)	53999	4.800515	2.986305	0	15.53381
log(GDPcap_i)	52777	9.999154	142.5957	8.272626	32768
log(GDPcap_j)	53999	10.49674	2.158985	10.3391	512
log(pop_i)	51487	2.995715	1.018428	1.12905	4.516428
log(pop_j)	51487	4.146576	.0358108	4.08666	4.201828
log(Distance)	53999	7.675445	.3542211	7.117863	8.085911
Colony	53999	.547325	.4977599	0	1
FTA	53999	.8505343	.3565502	0	1
log(Migration)	25264	1.64e+30	2.61e+32	6.52e-39	4.15e+34
rle	45492	-.0354641	.5201593	-1.218195	1.278926
IMPORTS					
Variable	Obs	Mean	Std. Dev.	Min	Max
log(Import)	101932	9.95e+25	3.18e+28	.0009995	1.01e+31
log(GDPcap_i)	101113	8.327387	.8898052	1.87e-41	10.5343
log(GDPcap_j)	101933	10.40214	.2473163	1.90e-41	10.72365
log(pop_i)	101933	2.862326	3.344727	-717.5498	4.516428
log(pop_j)	101933	4.130143	3.184679	-717.5498	4.201828
log(Distance)	101932	9.49e+19	3.03e+22	7.117863	9.67e+24
Colony	101932	.5459914	.4978827	0	1
FTA	101932	.7935879	.4047317	0	1
log(Migration)	46526	11.59386	2.068053	3.87e-41	14.12918
rle	83015	-.1076504	.5459998	-1.218195	1.278926
Sources: Author's calculations					

Appendix 3: Matrix of correlation

	log(Export)	log(GDPcap_i)	log(GDPcap_j)	log(Pop_i)	log(Pop_j)	log(Distance)	FTA	Colony	log(Migration)	rle
log(Export)	1.0000									
log(GDPcap_i)	-0.0022	1.0000								
log(GDPcap_j)	-0.0020	1.0000	1.0000							
log(Pop_i)	0.1606	-0.0089	-0.0086	1.0000						
log(Pop_j)	0.0648	-0.0233	-0.0191	-0.0193	1.0000					
log(Distance)	-0.0395	0.0087	0.0078	-0.0798	0.1096	1.0000				
FTA	0.0647	-0.0480	-0.0457	0.1025	0.3471	-0.1360	1.0000			
Colony	-0.1487	-0.0089	-0.0076	-0.4330	-0.0969	-0.6816	-0.0060	1.0000		
log(Migration)	-0.0023	1.0000	1.0000	-0.0086	-0.0239	0.0074	-0.0481	-0.0073	1.0000	
rle	0.2262	0.0024	0.0014	-0.1041	0.1138	0.3230	0.0133	-0.5704	0.0012	1.0000
	log(Import)	log(GDPcap_i)	log(GDPcap_j)	log(Pop_i)	log(Pop_j)	log(Distance)	FTA	Colony	log(Migration)	rle
log(Import)	1.0000									
log(GDPcap_i)	-0.0243	1.0000								
log(GDPcap_j)	-0.1579	0.3542	1.0000							
log(Pop_i)	-0.5629	-0.0551	0.2463	1.0000						
log(Pop_j)	-0.6352	0.0543	0.2730	0.9547	1.0000					
log(Distance)	0.6353	-0.0517	-0.2676	-0.9548	-1.0000	1.0000				
FTA	0.0428	-0.0199	0.3363	0.0697	0.0243	-0.0222	1.0000			
Colony	0.0087	-0.3934	-0.0958	-0.0781	0.0047	-0.0054	0.1106	1.0000		
log(Migration)	0.1518	-0.3658	-0.0519	0.1639	0.0258	-0.0263	0.2666	0.6364	1.0000	
rle	0.0377	0.4830	0.0715	-0.0418	-0.0010	0.0016	0.1169	-0.5397	-0.3976	1.0000

Appendix 4: Distribution of trade flows

	Imports				Exports			
	Proportion	Std. Err.	[95% Conf.]		Proportion	Std. Err.	[95% Conf.]	
Conservative	1	2	3		4	5	6	
Homogeneous	.1467522	.0010835	.1446412	.1488886	.1293941	.0014441	.12659	.132251
Reference priced	.2560475	.0013364	.2534369	.2586756	.2116399	.0017575	.2082158	.215105
Differentiated	.5972003	.0015018	.5942534	.6001403	**.658966**	.0020396	.654957	.6629523
Liberal								
Homogeneous	.1746081	.0011624	.1723414	.1768982	.1541993	.0015538	.1511783	.1572694
Reference priced	.2630138	.0013481	.2603801	.2656646	.219896	.001782	.2164232	.2234086
Differentiated	.5623781	.0015191	.5593986	.5653532	**.6259047**	.0020819	.6218153	.6299763