June 2019 (Draft version; not to be quoted!)

MIGRATION, COMPARATIVE ADVANTAGES AND KNOWLEDGE DIFFUSION IN THE EU-MENA REGION.[1]

FERRAGINA Anna M., CELPE-DISES (University of Salerno), ITALY
IANDOLO Stefano, CELPE-DISES, University of Salerno, ITALY
TAYMAZ Erol, Middle East Technical University, Ankara, TURKEY

Abstract

The issues we investigate are related to how migration flows between MENA and EU contribute in shaping the comparative advantages of these partners regions and in creating a process of international diffusion of knowledge associated with the pattern of international migration between the two areas. We document industry specific productivity shifts in tradable goods as explained by the variation in the international movement of people looking at how migration figures correlate with home and destination country's extensive margin (EM) and intensive margins (IM) of trade. To look at the extensive margin, in addition to the indictor at country level by Hummels and Klenow, following Bahar et al. (2014, 2018), we use a disaggregated indicator at 4 digit SITC which measures new appearances of product in a country's export basket in order to see if migrants can explain variation in the ability of countries to export those goods. To look at the intensive margin, we use the annual growth rate of a pre-existing export product. We find different effects for immigration and emigration. Positive effects for immigrants (who possess tacit, embodied knowledge that they can transfer through direct interaction). Emigration seems not robustly significant maybe because of the "indirect nature" of knowledge transfer. Knowledge diffusion at the IM seems stronger maybe because the fixed costs associated with starting an industry have already been paid for. Knowledge diffusion at the EM seems less strong because knowledge diffusion is just a part of a more complex productivity growth process (Bahar et al., 2018; Jaeger et al. , 2010). Comparing the results for the three technology product categories, we get somewhat an idea about the extensive and intensive margin direction. Knowledge diffusion at the EM seems to be stronger in low tech products both for immigrants and emigrants. Knowledge diffusion at the IM for immigrants seems strong and balanced across various product cathegories, while for emigrants the results are less robust. All these results can be relevant for prescriptions in terms of EU and MED countries policies of migration and trade.

Keywords: Trade-migration link, panel data approach, extensive and intensive margin.

JEL classification: F14, F22, L14

[1] FEMISE 2018 Internal Competition: 4th round . F E M I S E R E S E A R C H PROGRAMME on "Support to economic research, studies and dialogue of the Euro-Mediterranean Partnership"Research No. FEM44-11- Financial contribution from FEMISE in the context of the Commission-FEMISE contract no. ENPI/2014/354-494.

Introduction

The issues we investigate are related to how migration flows between MENA and EU contribute in shaping the comparative advantages of countries and in creating a process of international diffusion of knowledge between the partners of the two regions associated with the pattern of international migration.

The novelty of the idea is that the knowledge transmissions channels rather than being explored in relation to FDI and to trade, an over investigated issue, are seen in relation to migration flows Of all international factor flows, migration is indeed the strongest knowledge diffusion driver.

We check whether migrants can explain variation in good-specific productivity, as measured by the ability of countries to export those goods, for products that are intensively exported by the migrants' home/destination countries. In particular, we investigate how an increase in the stock of immigrants (emigrants) from country exporters of a given product is, on average, associated with an increase in the likelihood that the receiving (sending) country will export that same product in the next years. Hence, our methodology exploits changes in countries' export baskets and investigate cross-country productivity spillovers leading to new exports as a proxy for knowledge diffusion. The key assumption is that, after controlling for product-specific global demand, firms in a country will be able to export a good only after they have become productive enough to compete in global markets.

In particular, we document industry specific productivity shifts in tradable goods as explained by the variation in the international movement of people looking at how migration figures correlate with home and destination country's extensive and intensive margins of trade. To look at the extensive margin, following Bahar et al. (2014, 2018) we use new appearances of product in a country's export basket in order to see if migrants can explain variation in good-specific productivity, as measured by the ability of countries to export those goods. To look at the intensive margin, we use the annual growth rate of a pre-existing export product. For this purpose we will consider different publicly available data sources that include bilateral data on migration and trade. We also consider the role of highly-skilled migrants and of their occupation to see if the marginal effect for a skilled immigrant (emigrant) is larger/smaller than for an unskilled immigrant (emigrant) and how the sector of employment matter in the transmission effect to the trade specialisation. We combine different available data sources that include bilateral data on migration and trade and adopt a gravity framework.

Our dataset is covering years from 1990-2015 (we can't extend our analysis to 2017 because the CEPII dataset is at our disposal up to 2015). The total number of bilateral observations amounts to over 7 millions of observations (28 European countries*6 periods*781 product categories*225 partners). The models are estimated for each of the five years between 1990 and 2015 for the migration and for trade between EU and all its trade and migration partners (more than 150 countries). Hence our data set covers approximately 50 per cent of the global stock of migrants: the extensive country coverage – 225 countries of origin and 28 EU destinations – attenuates the sample selection bias due to the specific choice of the countries entering the analysis and it allows to exploit differences between countries at different income levels.

We expecially focus on people´s flows within the Mediterranean (MED) region which constitute a quite relevant social and economic process, with net benefits for both the origin and destination countries. In 2015 more than 18 millions of nationals born in the southern basin of the Mediterranean were living in EU countries, this being one of the most important corridors for people´s flows in the world, which are mainly supported by the nearness of African and European continents and their dissimilar level of wealth and employment opportunities. The rapid increase in immigrant population in the EU is one of the most challenging political and sociological issues of today, being also important for its economic consequences (Farges et al., 2011).

We will discuss our findings in the light of the outcomes of previous research on closely related issues also focues on the Euro-mediterranean area. In particular the trade-migration nexus and the role of migrant networks and proximity[2], in which it is explored how migrants promote and help to deal with market heterogeneity in international markets. We will also follow the adoption of an ethnic network approach and test for interactions between the characteristics of migrants and the immigration-induced changes in product and trade patterns in the EU-Mediterranean zone.

As pointed out by these previous studies a pro-trade effect of immigrants arriving to EU from MENA countries exists. Especially Southern EU-countries (and in particular Italy, Spain, France and Portugal) have shown clear trade creation effects of people´s flows arriving to these countries. But, does this effect impact the extensive margin of trade or hinges on the intensity of exports of the basket of

[2]FEMISE program FEM34-01-CP2010: The Trade Creation Effect of Immigrants: Characterising Socioeconomic Opportunities Arising From Linkages Between People's And Goods' Flows Inside The Mena Region and FEM34-30-CP2010: Analyzing the Immigration-Induced Changes in Product Diversity and Trade Patterns: The Case of the EU-Mediterranean-Eastern Europe Zone

products already exported? How important is the degree of technology embodied in traded goods by considering low, medium and high technology classes? How does MENA behave with respect to other geographical areas with respect to this type of trade impact? How does the education and occupationalllevel spur on the effect of trade and what is the effect on sending and receiving countries? (ongoing) How does institutional and cultural variables such as cultural distance, the level of development of countries of origin, and the institutional distance are related to the level of new trade flows? (ongoing)

To preview our main results, with regard to migration, we find different effects for immigration and emigration. Positive effects for immigrants (who possess tacit, embodied knowledge that they can transfer through direct interaction). Emigration seems not robustly significant maybe because of the "indirect nature" of knowledge transfer. It is unclear whether most of the effect should take place at the EM or the IM. Knowledge diffusion at the IM seems stronger maybe because the fixed costs associated with starting an industry have already been paid for. Knowledge diffusion at the EM seems less strong because knowledge diffusion is just a part of a more complex productivity growth process (Bahar et al., 2018; Jaeger et al. , 2010). Comparing the results for the three technology product categories, we get somewhat an idea about the extensive and intensive margin direction. Knowledge diffusion at the EM seems to be stronger in low tech products both for immigrants and emigrants Knowledge diffusion at the IM for immigrants seems strong and balanced across various product cathegories for emigrants the results are less robust.

The findings of the analysis provide useful inputs for improving the policy making process in the host countries, especially in the field of migration policy, with the aim of enhancing the understanding of trade creation effects of networks of migrants. In this way integration processes between countries would be showing some positive externalities in the side of trade flows and diffusion of tacit knowledge spread between the two areas. Characteristics of emigrants should also be taken into account when defining migratory policies, mainly for the education and assimilation issues.

The remainder of the paper is as follows. In section 1 we describe the present and recent past of good´s and people´s flows for the MED countries, while in section 2 we review the main contributions of the related literature. In section 3 we descrive the data and develop the empirical model and its theoretical anchor that will inform the research. In section 4 we present the results of the two different estimation strategies: estimating the extensive and the intensive margin at country levele with a general gravity-type equation with an OLS and PPML approach, and then the adoption of an analysis of extensive and

intensive margin disaggregated at product level adopting an indicator of comparative advantage shift at produc level as measure of extensive margin and a compound growth rate of revealed comparative advantages to measure the intensive margin, and splitting up the trade vector by heterogenous groups of countries and for different technology cathegories of products controlling for the geography and economic development, and institutional distance in driving the trade-migration linkage. This section also includes the discussion of the research findings. Finally, section 5 concludes and suggests policy implications derived from our results.

1. An overview of good´s and people´s flows between MENA and the EU region vis-à-vis other geographical areas

EU plays a very prominent role representing one of the largest trading partner of countries in the MENA region. If we look at tab. 1 we see that the share of EU as destination for MENA exports, in spite of a sizeable decrease after 1995, in 2015 was still almost 22 per cent, In 2015, 30% of the total Mena imports came from Europe (tab. 2). Three of the five main export partners for MENA are in Europe (Italy, France and UK) and also two of top five countries to which Middle East & North Africa imported goods are European (Germany and Italy, before China, USA, United Arab Emirates) (according to World Bank data, 2019).

Tab. 1. Destination areas of MENA Exports[3]

Destination areas of MENA Exports	1990	1995	2000	2005	2010	2015
EU28	42.19	33.90	29.08	24.98	19.78	21.70
Developed Countries	41.51	37.44	43.15	39.39	31.46	12.82
Eastern Asian developing countries	3.16	7.39	9.50	11.23	23.61	18.78

[3] MENA: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq; Jordan, Kuwait, Yemen, United Arab Emirates, Lebanon, Libya, Morocco, Oman, Palestinian Territory, Qatar, Saudi Arabia, Sudan, Syria, Tunisia. Developed Countries: (Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg Netherlands, New Zealand, Norway, Portugal, Slovenia, South Korea, Spain, Sweden, Singapore, Switzerland, Turkey United Kingdom, USA.
Eastern Europe: Belarus, Bulgaria, Czech Republic, Hungary, Poland , Republic of Moldova, Romania, Russian Federation, Slovakia, Ukraine.
East Asian developing countries (Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India,Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka.
Africa Developing Countries Ethiopia, Rwanda, Ghana, Côte d'Ivoire, Senegal, Benin, Kenya, Uganda, and Burkina Faso.

African developing countries	0.01	0.26	0.04	0.59	0.66	0.96
Northern Africa Countries	0.57	0.87	0.78	0.84	1.13	1.48
Eastern Europe	0.00	0.00	0.07	0.15	0.21	0.37
South-Mediterranean Countries	2.64	2.41	1.93	2.09	2.03	3.01
MENA Countries	2.95	5.54	4.83	8.56	9.94	29.18
Other Countries	6.96	12.19	10.62	12.18	11.18	11.69

Source. UN COMTRADE.

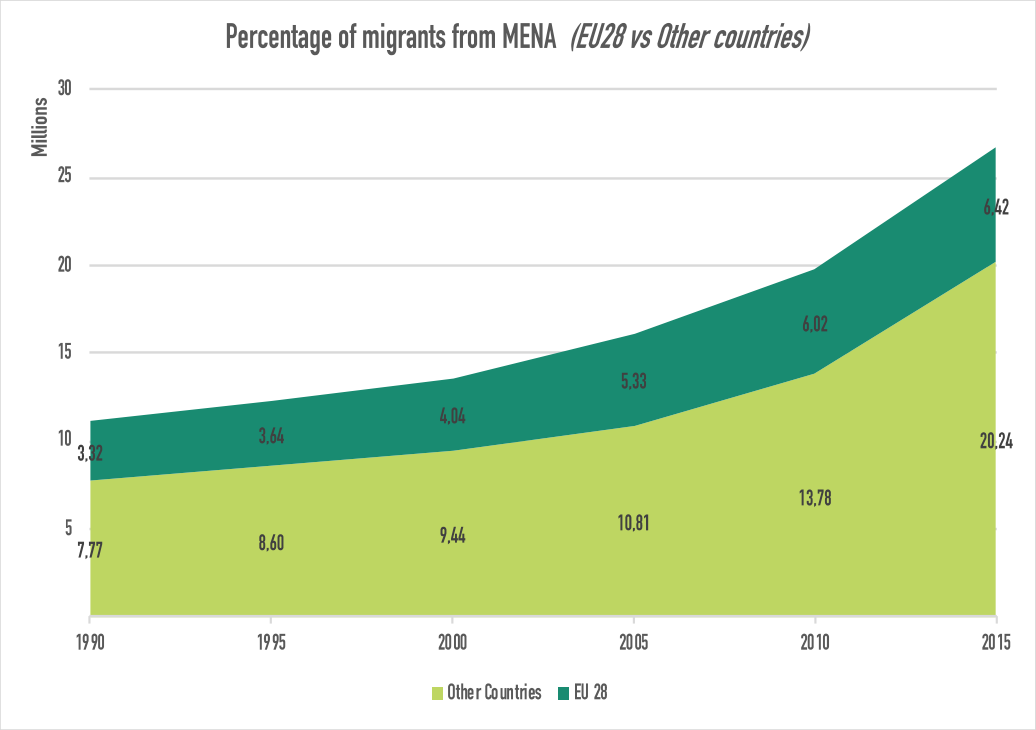
Tab. 2. Origin areas of MENA Imports

Origin areas of MENA Imports	1990	1995	2000	2005	2010	2015
EU28	52.02	46.55	43.87	37.38	30.98	28.34
Developed Countries	24.50	22.51	22.97	18.14	17.27	18.69
Eastern Asian developing countries	3.98	7.63	9.56	13.54	17.54	18.77
African developing countries	0.10	0.13	0.17	0.15	0.28	0.33
Northern Africa Countries	4.39	4.54	4.22	2.27	3.77	4.80
Eastern Europe	0.00	1.02	1.90	3.61	3.12	2.08
South-Mediterranean Countries	2.28	2.17	1.64	3.14	3.94	3.03
MENA Countries	3.61	6.01	7.49	13.02	13.73	12.51
Other Countries	9.11	9.44	8.18	8.74	9.37	11.46

Source. UN, COMTRADE.

People´s flows to EU are also very important inside the MENA region, with historical linkages between expecially Northern African (NA) and EU countries. Almost one out of four migrants from MENA comes to Europe (6,4 millions equal to 24.1% in 2015, see fig. 1) (UN, 2017).

Fig. 1 – Percentage of migrants from MENA to EU28



Source: Own Calculation on UN Data *(United Nations, Department of Economic and Social Affairs. Population Division (2017). Trends in International Migrant Stock: The 2017 revision)*

The main people´s flows arriving to the EU region were those from Turkey, Morocco, Algeria and Tunisia, with immigrants mainly establishing in Spain, France, Italy and Germany. There was in particular a remarkable growth in immigrants arriving to these three countries along 2002-2010. The period was characterised by high volumes of (in some cases government-promoted) regular entrances of immigrants, resulting in an annual increase of 23% between 2000 and 2007, and causing a structural change in the foreigners´ presence on the countries. Immigrant population grew by a factor of 2 in Portugal, of 3 in Italy and of 4 in Spain, between 2002 and 2010, recording a rate of immigrants to total national population of 4.3%, 7.0% and 12.2%, respectively at the end of the period (Artal Tur et al., 2011). Total (official and unofficial) migration flows originating in the MENA account for approximately 10-15 million people, which represents some 3%-5% of total MENA population (Eurostat, 2017).

2. Review of the literature

This study belongs to the literature on international knowledge diffusion in that it looks at the role of migrants as a major input to increases in knowledge diffusion, productivity and technology improvement via diversification and specialisation in more technology advanced goods. In particular, it

builds on Bahar et al. (2014), who suggest that the appearance of new industries in a country's export basket can be partly explained by the local character of knowledge diffusion. That is, productivity inducing knowledge follows a highly geographically localised diffusion pattern, which is attributed to its 'tacitness' (Jaffe et al., 1993; Keller, 2002, 2004; Bottazzi and Peri, 2003; Kerr, 2008). This vision has been originally suggested by Arrow (1969), who argued that the transmission of this tacit or non-codifiable knowledge relies on human minds rather than on written words. Thus, if tacit knowledge can induce sector-specific productivity shifts as measured by new exports, then migrants, who are naturally carriers of tacit knowledge, would shape the comparative advantage of their sending and/or receiving countries.

All the factors that affect human capital accumulation have notable effects on economic and political outcomes, and international migration is one of these. Starting from the consideration that people decide whether to migrate based on the costs and benefits they expect, individual migration decisions can affect those left-behind and the origin countries in different ways (Rapoport, 2018). These effects can be in some way direct and immediate (e.g., wage effects on labour markets, remittances) or can be seen as externalities that can contribute to integrate home countries into the world economy. These externalities, in their turn, can be positive or negative. Traditionally, one of the main concerns about the international migration was the so called "brain drain"; but the more recent literature has found positive spill-overs and incentive-creating effects of migration by creating business opportunities as well as by favoring the circulation and diffusion of knowledge (Miguelez, 2017). Aside from that, the effects of migration contribute in shaping the comparative advantage of origin and destination country has been introduced in the analysis. The channels through which tacit knowledge diffuse can be several, but, in most of the cases, they involve human interaction. This implies the international migration to be a good medium to facilitate the transfer of knowledge and technology. Traditionally, the most common way to measure knowledge diffusion has been to consider patent and inventor data (specifically patent citation) (Thompson and Fox-Kean, 2005; Singh and Marx, 2013). More recently, another way to track knowledge diffusion has been used: following Bahar et al. (2014) the evolution of the export basket of countries has been identified as an useful proxy to measure the knowledge diffusion.

This study also hinges on an already large strand of the literature which analyse the relationship between trade and migration, following the pioneering work of Gould (1994). Early contributions include those of Head and Ries (1998), Rauch (1999), and Rauch and Trindade (2002). All these studies concluded that, in aggregate, migration leads to a trade creation effect.

The pro-trade effect of migration flows within this literature builds on two main channels. The first channel is due to the "preference" of immigrants for some type of homeland products, foodstuff, etc.,

resulting in an increase of imports of host countries, which is also called the "transplanted home bias" effect by White (2007).

The second channel affects both import and export flows, being defined as the "network" or the "information bridge" channel (Dunlevy, 2006). In this case, networks of immigrants promote new business opportunities by reducing transaction trade costs (i.e. improving information channels, or moderating institutional failures in business relationships, like security and arbitrage issues) (Rauch, 2001; Wagner et al., 2002; Briant et al., 2014). In the "network approach", the basic idea is that information costs are a major component of the fixed costs that firms have to pay to enter a new market. In this way international networks of people would be of great help in reducing such fixed trade costs and larger stocks of immigrants in a given destination would help firms to overcome such start-up and commercialization fixed costs in foreign markets, improving both export participation and intensity of exports.

Despite the widespread extension of ICTs, information costs still play a crucial role in shaping world trade patterns. According to Rauch (2001), social and business transnational networks are likely to alleviate some information failures that are limiting trade exchanges. Cross-border networks are prone to substitute for organized markets in matching international buyers and sellers. In this respect, co-ethnic networks are of particular interest, as illustrated for instance by Casella and Rauch (2003). Immigrants' ties to their home country may promote trade for at least three reasons. First, immigrants have a good knowledge of the customs, language, laws as well as business practices in both the host and home countries. Accordingly, their presence helps bridging the information gap between sellers and buyers on both sides, hence promoting bilateral trade opportunities, and establishing lasting ties based on trust and mutually understood culture. Second, immigrant networks may provide contract enforcement through sanctions and exclusions, which substitutes for weak institutional rules and reduces trade costs. As the literature has shown, these two types of trade-enhancing effects are relevant in pushing both imports and exports flows between destination and home countries of immigrants. And third, immigrants bring their taste for homeland products, leading to the correspondent preference effect, which is more likely to promote imports from the home country towards the destination country.

Following this literature, recent empirical contributions, employing a gravity approach, demonstrate that both flows could positively covariate. Immigrants tend to form ethnic (and business) networks across borders, reducing fixed trade costs. These two channels, network and preference, provide the rationale of the immigration trade-enhancing linkage. In general, studies began focusing on the different impact of immigration in generating new exports and imports in order to disentangle the importance of preference and network effects (White, 2007; Felbermayr and Toubal, 2008).

Three main stylised facts also emerge from the literature: (i) the trade–migration link appears stronger for differentiated goods than for homogeneous commodities; (ii) the effect of immigrants on imports is typically estimated to be larger than the one on exports; and (iii) there is ample evidence of a stronger pro-trade effect for high-skilled migrants. By running a gravity model separately for each aggregated group, Rauch and Trindade (2002) estimate separate elasticities of trade with respect to immigrant stocks for differentiated goods, goods traded on organised exchanges, and goods that display some reference price. Rauch and Trindade's (2002) statistics show that the pro-trade effect of ethnic networks on differentiated products is at least 24 per cent larger in magnitude compared to the correspondent impact on goods that exhibit some reference price and 60 per cent greater with respect to goods traded on organise exchanges. The same classification and a similar methodology have been used – among others – by Felbermayr and Toubal (2012) and Ehrhart et al. (2014). As for the second stylised fact, the explanation of the gap between the immigrants elasticity of imports and exports is assumed to be the preference channel of migration. Bratti et al. (2014) summarise the results of a sample of some of the most influential contributions to the trade–migration literature and find a significant difference in magnitude. Furthermore, the meta-analysis proposed by Genc et al. (2012) – which is based on 48 studies and it contains about 300 estimates – indicates a discrepancy in the metamodal elasticity between imports and exports of approximately 0.03. Lastly, the third stylised fact indicates that the better the ability of the ethnic networks to receive and process information on trading opportunities, the higher the pro-trade effect. By focusing on a balanced panel of low-income Southern sending countries and high-income Northern receiving countries, Felbermayr and Jung (2009) find that the pro-trade elasticity of high-skilled workers is almost four times bigger than that of lowskilled workers when migration of all skill groups is accounted for. Other studies such as Herander and Saavedra (2005), Felbermayr and Toubal (2012) and Ehrhart et al. (2014) show higher pro-trade effects of high-skilled ethnic networks compared to the correspondent impact of the total stock of immigrants. Focusing on the studies concerning MENA countries for the trade-migration linkages many studies exist on North Mediterranean countries (Blanes and Martín-Montaner, 2006, for Spain, White and Tedesse, 2007 for Italy; Briant et al., 2009 for France; Blanes and Martín-Montaner, 2006 for Spain; Blanes, 2008 for Spain; Peridy, 2011 for France, FEM34-01; Andrés Artal-Tur, Silviano Esteve-Pérez, Vicente Pallardó-López, Francisco Requena-Silvente, for Italy, Spain and Portugal, 2011, FEM34-01). Blanes and Martín-Montaner (2006) analyze the salient case of Spain, with some 4.3 millions of (legal and legalized) immigrants arriving at this country along the first decade of the new century. Original contribution of the authors starts by identifying the relevant trade creation effect of immigrants for intra-industry (IIT) trade exchanges. Blanes (2008) shows again that the main mechanisms behind the link migration-trade rely on the information effect, that is, immigrant's additional information about

products and social and political institutions, together with the social or ethnic network effect, showing that immigrants with a medium level of education and those related to business activities are the ones who have a significant positive effect on bilateral trade. Another contribution is that of Murat and Pistoresi (2009), who study the relationship between emigration, immigration and trade, employing data for Italy. The sample splits for 51 foreign trading partners and time focus spans from 1990-2005. Their results suggest that networks of Italian emigrants in foreign countries clearly boost trade, but this pro-trade effect does not depend on institutional and cultural dissimilarities of the trading partners. Immigrants arriving to Italy are shown to reduce imports, finding a substitution effect of factor-and-goods´ flows.

White and Tedesse (2007) also study the Italian case for the period 1996-2001, and observe that immigrants increase trade flows by exploiting superior information regarding host country and home markets and/or by acting as conduits that bridge cultural differences between their host and home countries. Greater cultural bilateral distance is also found to positively estimulate pro-trade effects. Regarding the analysis for Portugal, Faustino and Leitão (2008) tests the relationship between immigration and Portuguese bilateral trade, considering the fifteen European partners (EU15), and using a static and dynamic panel data analysis, showing that the stock of immigrants has a positive effect on Portuguese exports, imports and bilateral intra-industry trade. Their results also show that immigration affects all types of trade positively by decreasing trade costs. Static and dynamic results do not confirm their hypothesis of a negative effect of immigration on exports. In the static model, a 10% increase in immigration induces a 6% increase in exports and a 5.5% increase in imports. The effect on the Portuguese trade balance is then positive, what can be considered a static welfare social gain, although dynamic results show a negative one in the long run. Authors´ findings also suggest that when immigrants to Portugal originate from a Latin partner country, the effects on trade are stronger than in the case of immigrants from non-Latin countries.

For the case of France, a relevant and recent contribution is due to Briant et al. (2009), who found an important trade creation effect for immigrants arriving to France; particularly, the tradeenhancing effect of immigrants is investigated along two intertwined dimensions: the degree of complexity of traded goods, and the quality of institutions in partner countries. The tradeenhancing impact of immigrants is, on average, more salient for countries with weaker institutions. However, this positive impact is especially large on the imports of simpler products, so the preference channel seems to be acting in this case. When we turn to complex goods, for which the information (fixed-costs) channel conveyed by immigrants used to be the most valuable, immigration enhances imports regardless of the quality of institutions in the partner country. For exports, immigrants substitute for weak institutions on both simpler and complex goods. The results are interesting, but again cover a very distant period, 1972-

1999. Also for France, the previous contribution of Combes et al. (2005) shows that within-country migration flows also positively affect the volume of inter-regional trade flows.

Studies focused on the MENA region versus EU are quite scant (e.g. Foad, 2010; Selim Cagatay et al., 2013, FEM34-30). Foad (2010) examines the immigration-trade linkage separately for migrants moving from the Middle East and North Africa (MENA) to both Europe and North America, in order to test how differences in income and education (by selection issues in migration) existing between these two groups affect such pro-trade effect, given that MENA migrants to North America are observed to be less numerous, but more educated. The author expects that the fact that these migrants going to North American used to show more cultural assimilation in that area should weaken both network and preference effects, then affecting the trade-enhancing effect. What he founds is that the migration-trade link is shown to be stronger for migrants in Europe, with the strongest output for imports. He also observes that the migration-trade link is stronger for differentiated goods than for homogeneous goods, especially for differentiated goods´ imports into Europe. These results suggest that while network effects matter, immigrant preferences for native country goods are the key factor driving the migration-trade link. The results in this study also provide quantitative evidence of weaker assimilation among MENA migrants to Europe with respect to North America, a widely accepted result that has had little empirical support in the existing literature.

As a whole, studies on the MED region are still scarce, based on old data that not used to cover the recent important wave of people´s flows of the new century, not applying all tools provided by the last developments of the literature, and with unclear results from a regional perspective. Moreover, most of them builds on crosssection analysis. So it seems clear that more research is needed for this important North-South corridor, in order to generate more evidence informing the EU Trade and Migration Common Policies, as well as the EU Neighbouring Policy. In such context, the present paper is directed to keep filling some of these existing gaps.

3. Data

One of the main concerns about the international migration literature has been the lack of data. So, traditionally, most of the contribution were theoretical. More recently, however, the availability of new migration data has contributed to a new body of literature. For our purpose we consider different publicly available data sources that include bilateral data on migration and trade.

For data on migration, we adopt those from the United Nations, Department of Economic and Social Affairs (United Nations, Department of Economic and Social Affairs. Population Division (2017). Trends in International Migrant Stock: The 2017 revision). UN dataset covers a long time period (since

1990), and updates until 2017 providing data on international migrant stocks by age, sex and origin for the mid-point (1 July) of each year: 1990, 1995, 2000, 2005, 2010, 2015 and 2017.

Concerning the trade, we use product data from the UN COMTRADE. Data are available from 1962 to 2017, with products classified according to the Standard Industry Trade Classification (SITC) (Rev. 2)[4] with a 4-digit level of detail.

Moreover, we use the CEPII Gravdata dataset for distance and cultural data (the dataset provides information on colony– coloniser relationship, and common language, as well as data on the same religion between pairs of countries).

After the merging procedure, we end up with a dataset covering from 1990-2015 at five years interval[5] covering more than 200 countries and more than 700 single products.[6]

4. Empirical Model

This research wants to contribute to a recent and growing body of literature that studies the diffusion of knowledge across borders as a result of international human mobility (Valette, 2017) and the subsequent shaping in the trade and in the comparative advantage of nations (Bahar et al., 2014). In analysing the impact of migration flows between MENA and Europe on trade of European countries, we implement two different methodologies that differ on the indicators we use to estimate the extensive and intensive margins and on the estimation strategies.

In the first estimation strategy, we use a set of country-level indicators to measure the margins of trade as proposed by Hummels and Klenow (2005), and we will estimate an augmented gravity model with migration and trade variables through OLS and PPML[7]

---

[4] For more historical data (1990-2000), the data are from The Center of International Data of Robert Feenstra. For more recent data (2005-2015) they are from the UN COMTRADE with corrections implemented by Hausmann et al. (2014) for the bilateral trade data.

[5] We are not able to extend our analysis as the CEPII Gravdata is at our disposal up to 2015.

6 One of the future data to be exploited are the database developed by Docquier, Lowell and Marfouk, henceforth DLM07 (2007) and the . The data are based on the Censuses of OECD countries and there is information on the migration stocks of foreign born by origin country for the years 1990 and 2000. This dataset may be useful for our purpose (as in Bahar and Rapoport, 2018) as it allows to disentangle the education and gender dimensions. It should be noticed that this dataset has been recently updated to 2010 (see Valette, 2017). To the same purpose we might also take advantage of the IAB brain-drain database (Institut für Arbeitsmarkt- und Berufsforschung) developed by Brücker, Capuano, and Marfouk (2013), which breaks down by country of origin the stocks of migrants (defined as foreign-born individuals) of 20 OECD countries.

[7] The basis of the trade modeling is mostly relying on specific forms of the gravity equation. From a theoretical point of view, this equation has been renewed by Anderson and van Wincoop (2003), who introduce the role of multilateral resistance for explaining bilateral trade. This means that bilateral trade not only depends on traditional mass variables (GDP) and bilateral trade costs (often proxied by distance), but also on multilateral trade costs and other trade barriers. The model presented below takes into account these new developments in the gravity equation.

We start by employing an OLS model with dummy variables for country, province and year effects. Dummies specification allow to partially control for omitted variables bias and fixed effects problems arising in the estimation procedure in OLS and Poisson models given the existence of possible correlations between some of the covariates and the own characteristics´ of the origin/destination country/provinces, as well as existing correlations with time effects (see Baldwin and Taglioni, 2006).

A Pseudo-Maximum Poisson Likelihood (PPML) estimation procedure is proposed, because it could improve estimations of our empirical model while dealing with excess of zeros in trade flows not accounted by OLS procedure.

In the second methodology, we use more disaggregated (product-level) as indicators of both the increase in the export of already exported products, and the change in the countries' export basket.

Another reason why we undertook this second methodology is to address endogeneity issues: we use instrumental variables coming from a gravity model to provide exogenous variation of migration.

In the next paragraphs, we will show more in details the two approaches

a. First estimation strategy

At this stage, we want to measure the knowledge diffusion linked to migration flows in the EU-MENA using country-level indicators. According to the methodology proposed by Hummels and Klenow (2005), we decompose the share of country's exports on the world exports, in extensive and intensive margins, in which the extensive margin is measured as:

$$EM = \frac{\sum_{i \in I^C} X_i^W}{\sum_{i \in I^W} X_i^W} \qquad [1]$$

And the intensive margin is given by:

$$IM = \frac{\sum_{i \in I^C} X_i^C}{\sum_{i \in I^C} X_i^W} \qquad [2]$$

In which (X_i^C) is the value of country c's exports and (X_i^W) are world's exports; I^C is the set of goods exported by country c and it is a subset of I^W (all goods exported in the world). Both indicators lie between 0 and 1.

What we we want to estimate is the following equation:

$$\begin{aligned} LHS = \alpha + \beta \ln(EMI_{ijt}) + \gamma \ln(IMM_{jit}) + \xi \ln(Previous\ export_{ijt-1}) + \rho \ln(Total\ imports_{jit}) + \\ + \xi \ln(Accumulated\ export_{ijt-1}) + \rho \ln(Total\ imports_{jit}) + z_{ijt} + \varphi_{it} + \theta_t + \delta_{ij} \end{aligned} \qquad [3]$$

Where the Left Hand Side (*LHS*) is alternatively the Extensive and Intensive margin à la Hummels and Klenow (2005); EMI_{ijt} is the total stock of emigrants (in log) from country i to j; IMM_{jit} is the total stock of immigrants (in log) from country *j* to *i*.

In our specification, we include some trade variables: the accumulated value of exports and the total value of imports. Moreover, z_{ijt} includes explanatory variables capturing bilateral ties between territories (as contiguity, colonial ties, geography, and distance); φ_{it} represents a set of importing (exporting) countries-by-time effects (to capture multilateral resistance), θ_t is a set of year dummies (i.e. a time-specific effect which captures business cycles), δ_{ij} are product-country pair dummies.

At this stage, to estimate Eq. [3], we will use OLS and PPML to control for (all) pair-specific unobserved characteristics, ruling out all possible omitted variables bias and zero trade flows accounting for unobserved heterogeneity as recommended by Baier and Bergstrand (2007) and Briant et al. (2009).

b. Second estimation strategy

In our work, as said, we implement a second estimation strategy to use different (less aggregated) indicators with respect to the ones used in the first stage (to measure the knowledge transfer also at product level) and also to address endogeneity issues.

Following the work from Frankel and Romer (1999) and from Bahar and Rapoport (2018), We will instrument migration using estimates from a gravity model and compute predicted bilateral migration stocks based on common cultural and historical characteristics of the sending and receiving countries of the migrants. Thus, at a first stage we estimate a gravity equation (through a Pseudo-Poisson Maximum Likelihood (PPML). Then, we use the instruments to provide an exogenous variation in the number of migrants, both from and to partner countries.

Further, with the predicted bilateral migration stocks, we reconstruct the aggregate migration stocks using the already mentioned weighting procedure (using RCA). For each combination of country c, product p and year t, we compute the total sum of predicted immigrants (emigrants) from (to) all other countries.

We consider the Revealed Comparative Advantage (Balassa, 1965) to construct our variable of interest for the empirical specification when the extensive margin is estimated. In particular, we construct a variable that equals *1* if country *i* achieved a *RCA* of *1* or more in product *p* at time *t* conditional on having $RCA_{i,p,t-1}$=0 in the previous period,

$$EM_{i,p,t} = 1 \; if \; RCA_{i,p,t-1} = 0 \; and \; RCA_{i,p,t} \geq 1 \quad [4]$$

When we estimate the effect of migration on intensive margin, we use the compound average growth rate (CAGR) in the export of product *p*.

$$IM_{i,p,t} = \left(\frac{exports_{i,p,T}}{exports_{i,p,t}}\right)^{1/T-t} - 1 \qquad [5]$$

As first step, we construct the instruments, following Frankel and Romer (1999), implementing a gravity model to compute predicted bilateral migration (immigrants and emigrants) stocks based on common cultural and historical characteristics of the sending and receiving countries of the migrants.

$$migrants_{i,j,t} = \alpha + \beta_1 X_{i,j} + \theta_i + \theta_j + \nu_{i,j,t} \qquad [6]$$

The gravity model in Equation [5] is based on cultural and historic bilateral variables between the sending and receiving countries of migrants (Frankel and Romer 1999; Bahar and Rapoport 2018) and we will estimate it through a PPML.

Silva and Tenreyro (2006), indeed, suggest that the application of a PPML estimator in gravity settings gives better performance, relative to linear models, in settings where many zeros are present in the dependent variable.

The variables included in the estimation are dummy variables indicating: a (former) colony–coloniser, a same coloniser, a same language relationship, and same religious beliefs.

After predicting migration stocks, we will use the predicted figures as instrument in the following IV estimation to provide an exogenous variation in the number of migrants, both from and to partner countries (Bahar and Rapoport , 2018).

By using an instrumental variable approach, we will estimate the following equation through a 2SLS

$$LHS = \alpha_{c,t} + \beta_{im} IMM_{j,i,t} + \beta_{im} EMI_{i,j,t} + \beta_{trade} trade_{i,j,t} + \varepsilon_{p,t} \qquad [7]$$

As in the previous specification, the LHS changes if the extensive or intensive margin is estimated;

The independent variables include stocks of immigrants from ($IMM_{j,i,t}$), and of emigrants to ($EMI_{i,j,t}$) other countries (areas). We include also country-by-year fixed effects to control for any country level time-variant characteristics that correlate with both national migration determinants and trade variables: the accumulated exports of product *p* in the previous period and value of imports of product *p*. Moreover, when the intensive margin is estimated, we include also the compound average growth rate (CAGR) of the export value in the previous period (in order to control for previous growth trend).

What must be emphasized is that our immigration and emigration stocks are symmetric. So, we must limit our instrumental variable estimation to one endogenous regressor only (either immigrants or emigrants). Otherwise, we may have less instruments than endogenous variables if we included both immigrants and emigrants in the same regression model.

5. Results

We run the estimation strategy 1 extensive and intenve margin of trade for MENA-EU and for other areas of origin and destinations of people flows, also disggragated by technology groups of products (tab. 3).

In general, in most of the areas considered, we observe positive and significant effects of the two variables of interest in the model (immigrants and emigrant stock). This is observed on both intensive and extensive margin of exports, for both estimation models employed in the analysis (OLS and Poisson). The coefficient values are around 2%-3%, which appears to be highly significant. However, in some areas a substitution effects between the intensive margin and people´s flows arise. This is in the overall sample and in the sample for the Norther African countries, while for Eastern European and Mena countries there is no significant coefficient on the intensive margin variable.

In terms of the size of elasticities between the two margins of trade, observed in Table 3, in general, greater trade effects seem to appear for the intensive margin of trade than for the extensive margin both for the emigrant and for immigrant. The higher elasticity of intensive margin with respect to extensive margin for emigrants and immigrant is also verified across the different origin areas with the interesting exception of Eastern Europe countries of origin.

In particular, a more intense increase in the intensive margins of manufactures following the arrival of immigrants is observed from Eastern Asian countries, conversely, we observe a lower trade effects of

migration encountered for the MENA countries, in some cases not significant. This can be explained by different possible hypotheses: i) the higher share of homogenous trade flows in the EU- MENA trade, compared to other trade exchanges of this country, and ii) the lower impact of network effects between EU and MENA compared to those arising for more distant regions, where immigrants´ networks play a greater role in reducing more drastically some existing impediments to trade (informational failures and institutional fragilities guaranteeing successful commercial treats). In this way, a higher assimilation of MENA citizens in EU, seems to be suggested, in line with results of Foad (2010).

In terms of product technology, the impact is overall associated to all the tech gropus, however a strong heterogeneity exist, with the Mena region showing a more pronounced positive influence in the extensive and intensive margin of the low tech sectors.

The rest of the variables in the model (not shown in the table) have all the expected signs while dummy variables capturing bilateral ties between territories, such as common language , show a negative and significant coefficient, what seems to be indicating that (controlling for all other factors) the higher the mutual knowledge, the lower the trade effects.

Goodness-of-fit is high for all estimations, as expected in a gravity framework.

As for the break down of our sample of immigrants by geographical blocks of origin countries, considering the trade as a whole, the results seem to prove the existence of general protrade effects arising for exports for those countries more (geographically) distants, the ones which clearly should be benefiting from informational and institutional (enforcement, commercial laws) packages transferred by migrants´networks, as the theory points out.

Tab. 3. OLS and PPLM extimates of Extensive and Intensive margin of exports (Hummels and Klenow indicators at country level)

	General				Low tech				Medium tech				High tech			
	Extensive Margin		Intensive Margin		Extensive Margin		Intensive Margin		Extensive Margin		Intensive Margin		Extensive Margin		Intensive Margin	
	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML
									All Countries							
Emigrants (ln)	0.018***	0.028***	-0.005	-0.051***	0.017***	0.025***	-0.000	-0.001	0.022***	0.032***	0.003	0.012	0.020***	0.028***	0.004	0.048***
	[0.002]	[0.004]	[0.006]	[0.014]	[0.002]	[0.004]	[0.005]	[0.029]	[0.002]	[0.004]	[0.005]	[0.020]	[0.002]	[0.004]	[0.004]	[0.017]
Immigrants (ln)	0.017***	0.027***	0.005	-0.066***	0.017***	0.025***	0.010***	0.029	0.019***	0.028***	0.010**	-0.019	0.018***	0.025***	0.013***	0.039**
	[0.002]	[0.004]	[0.004]	[0.013]	[0.002]	[0.004]	[0.003]	[0.018]	[0.002]	[0.004]	[0.004]	[0.015]	[0.002]	[0.004]	[0.004]	[0.016]
									MENA							
Emigrants (ln)	0.004	0.002	0.003	-0.028	0.015	0.024*	0.010	0.085**	0.013*	0.014	0.018*	0.069*	0.009	0.012	0.009	0.075***
	[0.008]	[0.014]	[0.010]	[0.018]	[0.009]	[0.013]	[0.012]	[0.036]	[0.008]	[0.012]	[0.010]	[0.036]	[0.008]	[0.011]	[0.009]	[0.027]
Immigrants (ln)	0.000	-0.007	0.007	-0.006	0.009*	0.012*	0.018**	0.109***	0.000	-0.005	0.010	0.052**	0.005	0.005	0.018**	0.086***
	[0.005]	[0.008]	[0.007]	[0.014]	[0.005]	[0.007]	[0.008]	[0.022]	[0.005]	[0.008]	[0.008]	[0.024]	[0.005]	[0.007]	[0.009]	[0.026]

								Northern Africa								
Emigrants (ln)	-0.003	-0.011	-0.005	-0.051*	0.013	0.015	-0.010	-0.011	-0.007	-0.012	-0.004	-0.042	-0.002	-0.005	-0.007	0.050
	[0.009]	[0.012]	[0.013]	[0.028]	[0.014]	[0.018]	[0.015]	[0.039]	[0.010]	[0.010]	[0.015]	[0.033]	[0.009]	[0.011]	[0.016]	[0.043]
Immigrants (ln)	0.005	0.004	-0.002	-0.052**	0.013*	0.017**	0.008	0.084***	0.001	-0.000	-0.000	-0.011	0.004	0.002	0.003	0.044
	[0.007]	[0.010]	[0.008]	[0.025]	[0.007]	[0.008]	[0.009]	[0.019]	[0.007]	[0.009]	[0.009]	[0.024]	[0.006]	[0.007]	[0.010]	[0.029]
								Eastern Europe								
Emigrants (ln)	-0.001	-0.003	-0.004	0.005	-0.003	-0.006	-0.004	0.035**	0.001	-0.000	-0.003	0.032**	0.002	0.001	-0.002	0.035*
	[0.004]	[0.005]	[0.003]	[0.012]	[0.004]	[0.005]	[0.003]	[0.017]	[0.004]	[0.005]	[0.003]	[0.014]	[0.004]	[0.005]	[0.003]	[0.021]
Immigrants (ln)	0.012**	0.014**	0.004	0.005	0.008*	0.008	0.007**	0.062**	0.018***	0.021***	0.007**	0.049***	0.020***	0.025***	0.010***	0.120***
	[0.005]	[0.006]	[0.003]	[0.013]	[0.005]	[0.006]	[0.003]	[0.029]	[0.004]	[0.005]	[0.003]	[0.015]	[0.004]	[0.005]	[0.003]	[0.024]
								Mediterranean								
Emigrants (ln)	0.017**	0.031***	-0.000	-0.010	0.013*	0.024**	-0.004	0.023	0.020***	0.036***	-0.002	0.037	0.014**	0.026**	-0.002	0.058**
	[0.007]	[0.011]	[0.007]	[0.016]	[0.007]	[0.010]	[0.007]	[0.040]	[0.006]	[0.011]	[0.007]	[0.034]	[0.007]	[0.010]	[0.006]	[0.028]
Immigrants (ln)	-0.009	-0.023**	0.012**	0.024*	-0.004	-0.013	0.014**	0.089***	-0.013*	-0.028***	0.012*	0.030	-0.008	-0.020**	0.016**	0.066**
	[0.007]	[0.010]	[0.006]	[0.014]	[0.007]	[0.010]	[0.006]	[0.033]	[0.007]	[0.010]	[0.007]	[0.027]	[0.006]	[0.009]	[0.006]	[0.030]
								Developed countries								
Emigrants (ln)	0.010***	0.012**	-0.009***	-0.048***	0.009***	0.011**	-0.008**	0.015	0.012***	0.015***	-0.007**	-0.011	0.013***	0.016***	-0.005	0.061***
	[0.004]	[0.005]	[0.003]	[0.009]	[0.004]	[0.005]	[0.003]	[0.019]	[0.003]	[0.005]	[0.003]	[0.021]	[0.003]	[0.005]	[0.003]	[0.020]
Immigrants (ln)	0.012***	0.015***	0.010***	0.025***	0.006*	0.008	0.009***	-0.020	0.014***	0.017***	0.012***	0.055***	0.011***	0.014***	0.014***	0.092***
	[0.004]	[0.005]	[0.004]	[0.008]	[0.003]	[0.005]	[0.003]	[0.021]	[0.003]	[0.005]	[0.004]	[0.020]	[0.003]	[0.005]	[0.004]	[0.023]
								East Asian Developing								
Emigrants (ln)	0.016	0.009	0.020	-0.028	0.020	0.022	0.051	0.128	0.012	0.020	0.026	-0.061	0.010	0.015	0.016	-0.071
	[0.012]	[0.022]	[0.041]	[0.072]	[0.013]	[0.020]	[0.040]	[0.107]	[0.013]	[0.020]	[0.032]	[0.079]	[0.011]	[0.018]	[0.028]	[0.070]
Immigrants (ln)	0.021**	0.081***	-0.028	-0.182***	0.016	0.063***	-0.031	-0.119*	0.026***	0.074***	-0.029	-0.032	0.013	0.047*	-0.055	-0.238***
	[0.008]	[0.017]	[0.031]	[0.055]	[0.010]	[0.020]	[0.026]	[0.067]	[0.009]	[0.018]	[0.025]	[0.072]	[0.014]	[0.027]	[0.033]	[0.053]
								African developing								
Emigrants (ln)	-0.095	-0.106*	0.099	-1.233**	0.106*	0.207***	0.171	0.342	0.165*	0.285***	0.595	1.518***	0.285***	0.486***	0.257*	1.272***
	[0.080]	[0.055]	[0.440]	[0.543]	[0.058]	[0.044]	[0.230]	[0.288]	[0.078]	[0.041]	[0.379]	[0.167]	[0.053]	[0.056]	[0.134]	[0.258]
Immigrants (ln)	0.042***	0.066***	0.013	0.066***	0.000	0.014	-0.074***	-0.380***	0.016	0.032**	-0.030	-0.096	0.069***	0.108***	0.048	0.289***
	[0.007]	[0.005]	[0.033]	[0.018]	[0.012]	[0.011]	[0.022]	[0.035]	[0.031]	[0.015]	[0.085]	[0.116]	[0.012]	[0.006]	[0.041]	[0.090]

In the estimation strategy two, to address endogeneity issues we instrument migration using estimates from a gravity model. We start from predicting migration stocks using estimates from a gravity model.

$$migrants_{i,j,t} = \alpha + \beta_1 X_{i,j} + \theta_i + \theta_j + \nu_{i,j,t}$$

It is based on cultural and historic bilateral variables between the sending and receiving countries of migrants (Frankel and Romer (1999) and Bahar and Rapoport (2018)).

We estimate the gravity model using a PPML[8] and we use the predicted migration stocks as instrument to provide an exogenous variation in the number of migrants, both from and to partner countries (Bahar and Rapoport , 2018).

[8] See Appendix - Table A1 for the results of gravity model run to build the instrument of the estimation with IV.

Our results in tab. 5 suggest that immigrants coming from MENA countries, may be an impactful driver of knowledge for European trade, showing a positive and significant coefficient both in the general estimation coefficients, than in all the technological cathegories, while emigrants show less strong and not robustly significant effect on margins.

Tab. 5. Effects on EU28 RCA and CAGR – (Emigrants (Immigrants) to (from) MENA) - IV

	All products				*Low-tech products*				*Med-tech products*				*High-tech products*			
	RCA		CAGR		RCA		CAGR		RCA		CAGR		RCA		CAGR	
Emigrants	0.010		0.147***		0.057*		0.063		-0.036		0.099		-0.053		-0.076	
	[0.019]		[0.056]		[0.032]		[0.094]		[0.040]		[0.080]		[0.047]		[0.073]	
Immigrants		0.068***		0.991***		0.143***		0.688***		0.130***		0.621**		0.186***		0.638***
		[0.016]		[0.212]		[0.030]		[0.411]		[0.027]		[0.260]		[0.042]		[0.359]
Accumulated exports	0.036***	0.019***	0.325***	0.469***	0.046***	0.019***	0.301***	0.459***	0.043***	0.020***	0.382***	0.462***	0.046***	0.010**	0.275***	0.375***
	[0.005]	[0.002]	[0.013]	[0.013]	[0.008]	[0.003]	[0.020]	[0.021]	[0.011]	[0.003]	[0.020]	[0.021]	[0.012]	[0.004]	[0.017]	[0.024]
Previous Growth			-0.424***	-0.508***			-0.436***	-0.513***			-0.406***	-0.471***			-0.334***	-0.407***
			[0.005]	[0.005]			[0.009]	[0.008]			[0.011]	[0.009]			[0.012]	[0.011]
Imports	0.002*	0.001	-0.003	-0.004	0.002*	0.001	-0.003	-0.004	0.002	0.000	-0.001	-0.003	0.003	0.001	-0.007*	-0.010**
	[0.001]	[0.000]	[0.003]	[0.003]	[0.001]	[0.000]	[0.003]	[0.003]	[0.002]	[0.001]	[0.005]	[0.004]	[0.003]	[0.001]	[0.004]	[0.005]
Country-year fe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product-year fe	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
N	15.893	90.056	34.150	47.474	5.729	29.887	10.738	15.302	4.058	25.361	9.747	14.192	2.662	14.636	5.355	7.993
r2	0.23	0.28	0.232	0.288	0.011	0.037	0.255	0.300	0.008	0.029	0.199	0.254	0.037	0.077	0.201	0.169

Standard errors in brackets

* p<.10, ** p<.05, *** p<.01

The other variables show expected signs since there is a considerable literature showing how trade is a driver of knowledge diffusion (Coe et al., 2009). So, we expect a positive coefficient for accumulated

exports that is a strong driver of knowledge rather than being mere shipping of goods (Frankel and Romer 1999). The less significant coefficients of imports also suggest that knowledge flows are less strong in inflows rather than in outflows of goods.

The lagged CAGR, the growth-related control we use when the intensive margin is estimated, has the expected sign correlating negatively with future growth, consistent with convergence effects.

Conclusions and Policy implications

The interdependence of trade and migration frameworks is evident in our analysis and become an important issue to be accounted for the designers of these two relevant EU policies, migration and trade. Our results, indeed, suggest that people flows from MENA can be driver of knowledge, contributing to skill diffusion and productivity growth.

In our estimations[9], we find different effects for immigration and emigration. In particular, we find a positive effect for immigrants, testifying their possess of tacit, embodied knowledge that they can transfer through direct interaction.

Emigration, instead, from our results could still be a relevant channel, but it seems not robustly significant maybe because of the "indirect nature" of knowledge transfer. The knowledge transfer across outflows of migrants is less immediate as knowledge diffusion could happen through return migration, or through links and communication between emigrants and their co-nationals back home.

If we look, instead, to the margins of trade, it is (theoretically, as well) unclear whether most of the effect should take place at the extensive or the intensive margin of trade. In our results, knowledge diffusion seems to have a stronger impact on latter, maybe becase the fixed costs associated with starting an industry have already been paid for, and firms can increase the value of already exported goods more easily. Knowledge diffusion, indeed, is just a part of a more complex productivity growth process (Bahar et al., 2018; Jaeger et al. 2010), so its effect on firms productivity and on the capability of acquiring comparative advantage, may require more time.

One major policy implication of our results is that the restriction of the number of migrants due to tighter migrations policies would shorten trade-creation effects, especially if less educated and qualified migrants arrive increasingly to the country as some authors have shown (Briant et al., 2009). This problem must be taken into account seriously when discussing future migration policies, at the EU level, given existing interdependencies between migration and trade policies pointed out by the results of our investigation.

[9] See Table A2 in Appendix for a comparison of results for MENA countries among different methodologies.

References

Arrow, K. (1962). The economic implications of learning by doing. The Review of Economics Studies, 29(3), 155–173. doi:10.2307/2295952

Aubry, A., Rapoport, H. and Reshef, A. (2017). 'Migration, FDI and the margins of trade', mimeo, Paris School of Economics.

Bahar, D., Hausmann, R. and Hidalgo, C.A. (2014). 'Neighbors and the evolution of the comparative advantage of nations: evidence of international knowledge diffusion?', Journal of International Economics, vol. 92(1), pp. 111–23.

Bahar, D., & Rapoport, H. (2018) Migration, knowledge diffusion and the comparative advantage of nations. The Economic Journal.

Bahar, D., Hausmann, R., & Hidalgo, C. (2014). Neighbors and the evolution of the comparative advantage of nations: Evidence of international knowledge diffusion? Journal of International Economics, 92(1), 111–123. doi:10.1016/j.jinteco.2013.11.001

De Silva, Sara Johansson and Carlos Silva-Jáuregui (2004), "Migration and Trade in MENA: Problems or Solutions?", Middle East and North Africa Working Paper Series No. 40, Washington D.C: World Bank.

Docquier, F. and A. Marfouk (2007), "The Brain Drain in Developing Countries", World Bank Economic Review, 21:193- 218, 2007.

Egger, Peter H., Maximilian von Ehrlich, and Douglas R. Nelson (2011), " Migration and Trade", CESIFO WORKING PAPER NO. 3467, available at http://www.cesifogroup. de/portal/pls/portal/docs/1/1200786.PDF ESCWA.

Foad, H. (2010) "Assimilation and Trade between the Middle East, Europe, and North America", Review of Middle East Economics and Finance, 6(2).

Genc, M., M. Gheasi, P. Nijkamp and J. Poot (2010) The Impact of Immigration on International Trade: A Meta-Analysis, IZA DP No. 6145, Germany.

Girma, S. and Z. Yu (2002), "The Link between Immigration and Trade: Evidence from the UK", Review of World Economics Weltwirtschaftliches Archiv, 138, 1, 115-30.

Gould, David M. (1994), "Immigrant Links to the Home Country: Empirical Implications for U.S Bilateral Trade Flows", Review of Economics and Statistics, no. 76 (2), pp. 302-316.

Hassan, Munir (1998), "Complemntarity between International Migration and Trade: A Case Study of Bangladesh", Southwestern College, Kansas, mimeo.

Head, Keith and Ries, John (1998), "Immigration and trade creation: econometric evidence from Canada", in Canadian Journal of Economics, vol. XXXI, n. 1, pp. 47-62.

Kachani, M., A. Tovias, N. Péridy and G. Palzur (2012) "Assessing the effects of EU countries' migration policies: The experience of Southern Mediterranean countries", Review of Middle-East Economics and Finance, 7(1).

Markusen, J.R. (1983) "Free Movements and Commodity Trade as Complements", Journal of International Economics, No. 14, pp. 341-356.

Murat, Marina and Barbara Pistoresi (2009), "Migrant Networks: Empirical Implications for the Italian Bilateral Trade", International Economic Journal, 23 (3), 371- 390.

Nassar, Heba and Ahmed F. Ghoneim (2003), "Trade and Migration, Are They Complements or Substitutes: A Review of Four MENA Countries", ERF Working Paper No. 0207, Cairo: Economic Research Forum.

Péridy et al. (2007) "Recent migration patterns from MENA countries to the EU: a quantitative assessment and policy implications", European Commission (FEMISE programme n. 31-01 with the Leonard Davis Institute of International Relations, The Hebrew University, University of Jerusalem, Israel (Prof. Alfred Tovias) and the University of Rabat, Morocco (Prof Mohammed Kachani).

Rauch, James E. (1999) "Networks versus Markets in International Trade," Journal of International Economics, volume 48, pp 7–35.
Rauch, James E. (1999), "Networks versus Markets in International Trade," Journal of International Economics, volume 48, pp 7–35.
Rauch, James E. (2001) "Business and Social Networks in International Trade", Journal of Economic Literature, v. XXXIX, pp. 1177-1203.
Rauch, James E. and Trindade, Vitor (2002) "Ethnic Chinese Networks in International Trade." The Review of Economics and Statistics, v. 84, pp. 116–130.

Appendix

Tab. A1. Gravity Models Results- Estimation to predict migration stocks (PPML)

Gravity Models Results- Estimation to predict migration stocks (*PPML*)

	Emigrants Stocks	Immigrants Stocks
Colony	0.195	1.188***
	[0.177]	[0.378]
Common coloniser	2.485***	1.074
	[0.183]	[0.765]
Common religion beliefs	-13.277***	-10.559***
	[2.477]	[1.787]
Common language	2.389***	1.768***
	[0.516]	[0.553]
N	34869	35687

Standard errors in brackets

* p<.10, ** p<.05, *** p<.01

Tab. A2. Effects on EU28 on EU28 trade by comparing OLS, PPML and IV ((Emigrants (Immigrants) to (from) MENA)

Extensive Margin

Immigrants								
OLS			PPML			IV		
Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech
0.009*	0.000	0.005	0.012*	-0.005	0.005	0.143***	0.130***	0.186***

Emigrants		
OLS	PPML	IV

Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech
0.015	0.013*	0.09	0.024*	0.014	0.012	0.057*	-0.36	-0.053

H&K for OLS and PPML; RCA and CAGR for IV.

Intensive Margin

Immigrants								
OLS			PPML			IV		
Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech
0.018**	0.010	0.018**	0.109***	0.052**	0.086***	0.688***	0.621***	0.638***

Emigrants								
OLS			PPML			IV		
Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech	Low-Tech	Med-Tech	High-Tech
0.010	0.018*	0.09	0.085**	0.069*	0.075***	0.063	0.099	-0.076

H&K for OLS and PPML; CAGR for IV