Immigration and the economic performance of countries

Chletsos, Michael and Roupakias, Stelios

University of Piraeus, University of Ioannina

10 July 2019

Immigration and the economic performance of countries

Chletsos Michael[*], Roupakias Stelios[†]

Abstract

Using a global dataset of over 100 developed and developing countries, we attempt to identify the nexus between immigration and the economic performance of countries, as proxied by export sophistication. To isolate causal effects, we use instruments obtained from a pseudo-gravity model of bilateral immigration in the spirit of Frankel and Rose (2002). Employing an extensive set of institutional, demographic, climate and disease controls, we find that countries with high immigrant concentrations tend to exhibit lower performance.

Keywords: Immigration, Gravity Model, Instrumental variables, Economic complexity

JEL Classification F22, F14, C26, O19

[*] University of Piraeus, Department of Economics, Greece, E-mail: mchletsos@unipi.gr
[†] University of Ioannina Department of Economics, Greece, E-mail: sroupakias@gmail.com

1. Introduction

Immigration is one of the most important and controversial phenomena currently. Almost 258 million persons worldwide reside in places different from their homeland (United Nations, 2017),[1] inducing a rightward shift in the ideology of the native-born (see, e.g., Barone et al, 2016; Halla et., 2017; Edo et al., 2019). Although there is a voluminous literature on the effects of immigration on the labour market opportunities of natives,[2] very little is known about the impact of immigration on the economic performance of the host countries in a broader sense (Borjas, 2019). Immigrants do not only contribute to the expansion of labour supply, but they also bring new skills and ideas, which could potentially foster creativity and promote economic growth.

Thus, beyond the simple partial equilibrium model of the labour market, immigration can deliver favourable effects and make natives better off by contributing to the expansion of Total Factor Productivity (TFP) (i.e., the "knowledge" or the "effectiveness of labor" term in the Solow growth framework), through its impact on innovation and entrepreneurship (Bansak et al., 2015). Productivity gains can also emerge from higher diversity among immigrants (Alesina et al., 2016). Immigrants can help development through the trade creation channel as well, increasing exports to their countries of origin (Gould, 1994; Head and Ries, 1998; Peri and Requena-Silvente, 2010). On the contrary, however, negative effects on the diffusion of "knowledge" and economic growth can emerge when the presence of migrants erodes social trust and triggers ethnic conflicts (Felbermayr et al., 2010; Ager and Brückner, 2013).[3] What is more, unskilled migration can be to the detriment of the receiving economies if it reduces machinery investments undertaken by local firms (Lewis, 2011).

The results of the few cross-country studies suggest that there is a positive association between immigration and TFP in the receiving countries (see e.g., Ortega and Peri, 2014; Aleksynska and Tritah, 2015). Likewise, Bosetti et al. (2015) reveal that high-skilled immigration has contributed to the creation of "knowledge" (proxied by patents per capita) in a panel of 20 European countries. On the other hand, studies

[1] The UN report is available at: https://www.un.org/en/development/desa/population/publications/pdf/popfacts-/PopFacts_-2017-5.pdf

[2] See, among many others, Borjas (2003); Ottaviano and Peri (2012); Manacorda et al. (2012); Biavaschi et al. (2018).

[3] There is also some evidence that immigration affects economic development through its impact on institutions and political stability (see e.g., Dimant et al., 2013; Gebremedhin and Mavisakalyan, 2013; Clark et al., 2015).

on the direct effects of immigration or ethnic diversity on economic development tend to produce mixed results (see e.g., Montalvo and Reynal-Querol, 2005; Ager and Brückner, 2013; Boubtane et al., 2013a; Boubtane et al., 2013b; Ortega and Peri, 2014; Alesina et al., 2016; Boubtane et al., 2016).[4]

This study seeks to examine the relationship between immigration and the economic performance of countries, building on a recent promising strand of the literature, which suggests that the sophistication of a country's exports is a powerful predictor for economic growth and development (see e.g., Hausmann et al., 2007; Hidalgo et al., 2007; Hidalgo and Hausmann, 2009). In particular, using data for a global sample of developed and developing countries, we estimate the relationship between the share of foreign-born individuals over total population and the Economic Complexity Index (ECI), intended to capture the knowledge intensity of an economy, as embedded in its exports. We aim to contribute to the literature which examines the potential effects of immigrants on the diffusion of "knowledge" and innovation, employing the ECI as a proxy. To the best of our knowledge, this study is the first to assess whether immigration generates spillovers on the amount of "knowledge", through its impact on export sophistication.[5]

This paper also contributes to the emerging literature which explores the potential drivers of export sophistication (see, e.g., Lapatinas and Litina, 2018; Fan et al., 2018; Kočenda and Poghosyan, 2018 Lapatinas, 2019). The study more closely related to ours is Fan et al. (2008), who examine the impact of ethnic fractionalization on ECI, based on a sample of 85 countries. Nevertheless, since these authors rely on random and fixed effects methods, their results might suffer from the potential endogenous distribution of foreigners across countries. On the contrary, our paper attempts to identify the effects of general migration, putting special care on endogeneity related issues.

Our study is also related to the literature examining the determinants of international migration by fitting a pseudo gravity model of bilateral migrations (see, e.g., Mayda, 2010; Grogger and Hanson, 2011). We pursue a similar approach to mitigate concerns to the validity of our analysis, stemming from the fact that the selection of migrants might be endogenous to the economic conditions prevailing in

[4] As for single-country analyses, see, among others, Ottaviano and Peri (2006); Peri (2012); Hunt and Gauthier-Loiselle (2012).

[5] A partial exception is Valette (2019) who examines the impact of emigrants from developing countries on the economic sophistication of their origin countries.

the receiving countries. This identification strategy has recently gained wide acceptance among researchers attempting to isolate causal effects of migration (see, e.g., Felbermayr et al., 2010; Mavisakalyan, 2011; Gebremedhin and Mavisakalyan, 2013; Ortega and Peri, 2014; Aleksynska and Tritah, 2015; Kahanec and Pytliková, 2017). Overall, our analysis produces robust evidence that immigration is negatively associated with the capacity of the countries under scrutiny to export complex products.

[Insert Figure 1 about here]

2. Data and Empirical Model

To assess the impact of immigration on export sophistication, we combine data from various sources for up to 111 countries in the year 2000. Our dependent variable is the improved version of the standard Economic Complexity Index (ECI), which reflects the diversity and the ubiquity of a country's exports (that is, the number of products exported by a country, and the number of countries exporting that product, respectively), corrected by how difficult it is to export each product (available at: https://atlas.media.mit.edu/en/).[6] As shown in Figure 1, advanced economies in Northern Europe and America tend to exhibit higher levels of economic complexity. Interestingly, as discussed in Hidalgo and Hausmann (2009), this index is a strong predictor of future economic growth. Information on our main independent variable of interest, namely immigration, is drawn from the World Development Indicators (available at: datatopics.worldbank.org/world-development-indicators/). Following previous literature, the immigration variable is defined as the ratio of the migrant stock over total population.[7]

With these definitions in mind, immigration is expected to be positively associated with the economic complexity index, insofar as migrants add to the stock of productive "knowledge" and foster innovation. Immigrants can also improve economic complexity through the trade creation channel. The alternative view is that

[6] For further details on the construction of ECI, we refer the reader to Hidalgo and Hausmann (2009); Albeaik et al. (2017).
[7] The upper part of Figure 1 depicts the allocation of migrants across countries in the year 2000, whereas the lower part shows the values of the Economic Complexity Index for that same year.

mainly unskilled migration reduces the capacity of a country to produce and export differentiated goods.

To avoid obtaining spurious results due to omitted variables bias, we also employ an extensive set of control variables, which are likely to explain cross-country differences in economic sophistication, as in Lapatinas and Litina (2018); Fan et al. (2018); Lapatinas (2019). In particular, we introduce covariates that capture the level of economic of economic development (GDP per capita), the quality of institutions (polity index), the degree of trade openness (sum of imports and exports over GDP), the stock of human capital (share of college graduates), demographics (urban share and population density) and infrastructure (access to broadband internet).[8] In a battery of sensitivity tests, we introduce further climate and disease controls and alternative measures for institutions and openness.

In line with existing literature, we estimate the following empirical model:

$$ECI_i = a + \beta_M IMM_i + \beta_C controls_i + Region/Colonial\ history\ dummies_i + u_i \qquad (1)$$

where the index *i* stands for the destination country *i*. We also introduce 4 broad *Region dummies*[9] to capture unobserved differences across regions. Following Ortega and Peri (2014), eq.(1) includes colonial history controls as well, that is, dummies for former English and French colony.

However, the OLS estimate of β_M in eq.(1) would be spurious insofar as there are unobserved determinants of sophistication and immigration, and which we cannot control for. We cannot also exclude the possibility of a feedback effect from economic complexity to immigration, that is, reverse causation. It might also be the case of noisy immigration data, mainly due to undocumented migration. As already noted above, to mitigate these endogeneity concerns, we employ gravity predictors of immigration as instruments, generated by an approach quite similar to the one introduced by Frankel and Rose (2002), and later adopted by Mavisakalyan (2011) and Gebremedhin and Mavisakalyan (2013) within the immigration context. The underlying identification assumption is that the gravity-based migrations represent the supply-driven component of immigration.

[8] See Table 1 for a detailed description of data and sources.
[9] Namely, North and South America, Asia, Europe, Oceania.

More precisely, we modify the conventional gravity model by substituting (the log of) bilateral migrant stocks for trade as the dependent variable. We introduce in the set of regressors the log of GDP per capita and population in the sending countries, the log of distance between the sending and the destination countries, the log of the product of areas of countries (as a proxy for transportation costs), and 0-1 dummy variables for common language and border. Our gravity model is estimated with OLS and Poisson pseudo-maximum likelihood methods, using data from Rose (2005), merged with the 226x226 matrix of international bilateral migrant stocks in the year 2000, from the Global Bilateral Migration Database, (available at: https://datacatalog.-worldbank.org/dataset-/global-bilateral-migration-database).[10]

Lastly, to impute the predicted stock of immigrants, we collapse the exponent of the fitted values at the destination country level. Hence, our instrument is given by:

$$Gravity\ \widehat{instrument} = (\sum_{i \neq j} \exp(\ln(Z_{ij}\,\widehat{\beta}))/(\sum_{i \neq j} \exp(\ln(Z_{ij}\,\widehat{\beta})) + Natives_i \quad (2)$$

where indices *i* and *j* designate the destination and origin country, respectively, Z_{it} is the matrix of the right-hand side variables included in the gravity model, $\hat{\beta}$ is the vector of the gravity coefficients, and $Natives_i$ is the observed stock of natives.

3. Results

In this section, we explore the effects of the immigrant share variable on the amount of productive "knowledge", as proxied by the ECI, by estimating the empirical model described in Section 2. What is more, to assess the robustness of the results, we conduct a battery of robustness checks, including (i) alternative estimation techniques, (ii) additional controls, (iii) alternative measures for the level of institutional development and openness and (iv) outliers.

However, before commenting on the impact of migration, it is important to briefly discuss the results obtained from the pseudo-gravity model, and which are used to construct our instrument. As a check of robustness, we estimate the basic model, discussed in section 2 (clustering standard errors at the country pair level), in column 1 of Table 2, and two alternative variants of it in the remaining columns. In particular, the second specification introduces host-country dummies, whereas the third column

[10] See Özden et al. (2011) for further details on the dataset.

replicates the basic model by using Poisson pseudo-maximum likelihood method instead of the OLS. Importantly, the results are quite consistent across specifications. More precisely, the origin country size, as proxied by GDP per capita and population, as well as common language and border are positively associated with the stock of migrants. On the contrary, the bilateral distance enters with a significant negative coefficient. Only the sign pattern of the coefficient on the product of land areas appears to alter in specification 2. In light of these findings, we chose to build our 2SLS strategy, relying on the results from specification 1, as in Mavisakalyan (2011) and Gebremedhin and Mavisakalyan (2013). We note, however, that the second-stage results (not reported for brevity, available upon request) using the gravity-based instruments from specifications 2 and 3 remain qualitatively similar to the ones shown below in Tables 3-6.

Table 3 offers simple OLS correlations, adding gradually furthers controls to verify that the results are immune to potential collinearity. Specification 1 controls for the level of economic development only, and migration appears to be significantly correlated with lower economic complexity. Adding trade openness in specification 2, reduces the sample size by 4 observations, but produces stronger results regarding the correlation between economic complexity and migration. The picture remains unchanged in specification 3 where we control for the level of institutional development, as proxied by the polity index. Column 4 introduces the share of population with at least a college degree. However, even after this modification, the effect of immigration still appears negative and significant. Our main estimates of interest remain similar in qualitative terms when adding demographic controls in specifications 5 and 6. Lastly, migration enters with a significant negative coefficient, even after controlling for infrastructure, as proxied by the share of individuals with access to broadband internet over total population.

[Insert Table 3 about here]

Nevertheless, as discussed in section 3, migrants tend to cluster non-randomly across countries, and thus the estimates displayed above might not be interpreted as causal. We, therefore, recur to a 2SLS identification strategy to isolate causal effects, employing the gravity based, predicted migration as an instrument. The estimates from this empirical exercise and the associated (heteroscedasticity robust) standard errors are reported in Table 4. According to the first-stage results, the gravity-based instrument appears to be strongly correlated with immigration (not shown for brevity,

available upon request), whereas the Kleibergen–Paap statistics usually lie above the rule of thumb of 10. We interpret these findings as indicative that the estimated parameters of interest are unlikely to suffer from weak identification issues. Notably, the estimated coefficients of interest are stable across specifications, and appear to be nearly three times as high as the OLS correlations, signifying the presence of endogeneity. For instance, the coefficient on immigrant share variable in the first column suggests that a one percent increase in the foreign population over total population reduces economic complexity by about 0.67 standard deviations.

[Insert Table 4 about here]

Table 5 checks the stability of our prior results to the inclusion of further controls. The first column adds a set of economic variables, namely a dummy for being a major oil exporter, government spending as a percentage of GDP, gross capital formation, inflation, the value added of agriculture relative to GDP, and the size of the shadow economy. Column 2 introduces the index of ethnic fractionalization, computed with data from the Global Bilateral Migration Database. The final specification, follows Ortega and Peri (2014), and adds region, climate and disease controls, namely, a land-locked dummy, the percentage of land in the tropics, and two indices for the incidence of malaria and yellow fever. Importantly, most of the additional controls enter with an insignificant coefficient, without affecting the sign pattern and the significance on the main independent variable of interest.

[Insert Table 5 about here]

Table 6 reports estimates from a battery of sensitivity tests, related to the use of alternative measures for the quality of institutions and openness in the destination countries, as in Lapatinas and Litina (2018). Column 2 substitutes an institutional quality index for the polity index. More precisely, we follow Ortega and Peri (2014), and compute the average between protection against expropriation risk and constraints on the executive, using data from Acemoglou et al. (2001). In columns 2 and 3 we employ the rule of law from World Bank Government Indicators and the democracy index from Cheibub et al. (2010), respectively. As can easily be verified, none of these modifications alters our main conclusion that immigration is negatively associated with export sophistication. In the remaining specifications, inspired by Dreher and Gaston (2008), we measure openness with the KOF globalization index and three globalization sub-indices, respectively. However, the coefficient of the

immigrant share remains negative and significant. Interestingly, the estimates in the last column, reveal that the positive effects of globalization operate through the social globalization channel.

[Insert Table 6 about here]

To further scrutinize the robustness of the results, we have replicated the analysis reported in Table 4, by using the economic complexity index in 2014 as the dependent variable, in order to further eliminate contemporaneous correlation between the main variables of interest. We have also explored whether the effects of migrants vary according to the host country's stage of economic and institutional development.[11] The results from these empirical exercises (not reported for brevity, available upon request), indicate that immigration continues to exhibit a strong negative association with export sophistication, whereas the effects do not systematically differ between developed and developing countries. Lastly, we run an experiment à la Coates et al. (2010), to assess the sensitivity of our results to individual outliers. More precisely, we sequentially estimate our basic IV model 1000 times, by randomly eliminating 10 percent of observations at a time from the sample. The resulting estimated coefficients on immigration and the associated t-statistics are reported in Figure 2. As we observe, immigration always enter with a negative coefficient. More importantly, we can reject the null hypothesis that immigration exhibits an insignificant effect in all instances, at the 10 percent level. We therefore can safely exclude the possibility of positive effects of immigration.

[Insert Figure 2 about here]

4. Conclusions

The main goal of the current study was to determine the impact of migrants on the economic performance of countries, as proxied by sophistication embedded in their exports. Using a cross sectional design, and pseudo-gravity estimates of bilateral migrations to address potential endogeneity and mitigate the usual measurement error concerns, we have shown that higher immigration is strongly correlated with lower levels of export sophistication. Hence, this study has been unable to demonstrate that

[11] In line with literature, specification 4 employs the interaction of immigration with a high- and low- development dummy variables, where high (low) signifies countries with GDP per capita and Polity indices above (below) the median in the sample. Likewise, interactions are also applied for the gravity generated instruments.

migrants contribute positively to the amount of productive “knowledge” in the receiving countries. In light of the results from earlier studies on the determinants of growth, our findings also imply that immigration exerts a negative influence on economic development through the export sophistication channel.

The current findings add to a growing body of literature on the nexus among immigration, innovation and development. Notwithstanding, this is the first study focusing on this particular dimension of innovation. Further research needs to examine more closely the links between immigration and economic complexity. Country-specific evidence might also enhance our understanding, since some countries tend to attract mostly skilled migrants, while the opposite is true for others.

References

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. American economic review, 91(5), 1369-1401.

Ager, P., & Brückner, M. (2013). Cultural diversity and economic growth: Evidence from the US during the age of mass migration. European Economic Review, 64, 76-97.

Albeaik, S., Kaltenberg, M., Alsaleh, M., & Hidalgo, C. A. (2017). Measuring the knowledge intensity of economies with an improved measure of economic complexity. arXiv preprint arXiv:1707.05826.

Aleksynska, M., & Tritah, A. (2015). THE HETEROGENEITY OF IMMIGRANTS, HOST COUNTRIES' INCOME AND PRODUCTIVITY: A CHANNEL ACCOUNTING APPROACH. Economic Inquiry, 53(1), 150-172.

Alesina, A., Harnoss, J., & Rapoport, H. (2016). Birthplace diversity and economic prosperity. Journal of Economic Growth, 21(2), 101-138.

Bansak, C., Simpson, N. B., & Zavodny, M. (2015). The economics of immigration. Routledge.

Barone, G., D'Ignazio, A., de Blasio, G., & Naticchioni, P. (2016). Mr. Rossi, Mr. Hu and politics. The role of immigration in shaping natives' voting behavior. Journal of Public Economics, 136, 1-13.

Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. Journal of development economics, 104, 184-198.

Biavaschi, C., Facchini, G., Mayda, A. M., & Mendola, M. (2018). South–South migration and the labor market: evidence from South Africa. Journal of Economic Geography, 18(4), 823-853.

Borjas, G. J. (2003). The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. The quarterly journal of economics, 118(4), 1335-1374.

Borjas, G. J. (2019). Immigration and Economic Growth (No. w25836). National Bureau of Economic Research.

Bosetti, V., Cattaneo, C., & Verdolini, E. (2015). Migration of skilled workers and innovation: A European perspective. Journal of International Economics, 96(2), 311-322.

Boubtane, E., Coulibaly, D., & Rault, C. (2013a). Immigration, growth, and unemployment: Panel VAR evidence from OECD countries. Labour, 27(4), 399-420.

Boubtane, E., Coulibaly, D., & Rault, C. (2013b). Immigration, unemployment and GDP in the host country: Bootstrap panel Granger causality analysis on OECD countries. Economic Modelling, 33, 261-269.

Boubtane, E., Dumont, J. C., & Rault, C. (2016). Immigration and economic growth in the OECD countries 1986–2006. Oxford Economic Papers, 68(2), 340-360.

Cheibub, J. A., Gandhi, J., & Vreeland, J. R. (2010). Democracy and dictatorship revisited. Public choice, 143(1-2), 67-101.

Clark, J. R., Lawson, R., Nowrasteh, A., Powell, B., & Murphy, R. (2015). Does immigration impact institutions?. Public Choice, 163(3-4), 321-335.

Coates, D., Heckelman, J. C., & Wilson, B. (2010). The political economy of investment: Sclerotic effects from interest groups. European Journal of Political Economy, 26(2), 208-221.

Dimant, E., Krieger, T., & Redlin, M. (2015). A crook is a crook… but is he still a crook abroad? On the effect of immigration on destination-country corruption. German Economic Review, 16(4), 464-489.

Edo, A., Giesing, Y., Öztunc, J., & Poutvaara, P. (2019). Immigration and electoral support for the far-left and the far-right. European Economic Review, 115, 99-143.

Fan, Z., Anwar, S., & Huang, S. (2018). Cultural diversity and export sophistication. International Review of Economics & Finance, 58, 508-522.

Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. American political science review, 97(1), 75-90.

Felbermayr, G. J., Hiller, S., & Sala, D. (2010). Does immigration boost per capita income?. Economics Letters, 107(2), 177-179.

Frankel, J., & Rose, A. (2002). An estimate of the effect of common currencies on trade and income. The Quarterly Journal of Economics, 117(2), 437-466.

Gebremedhin, T. A., & Mavisakalyan, A. (2013). Immigration and political instability. Kyklos, 66(3), 317-341.

Gould, D. M. (1994). Immigrant links to the home country: empirical implications for US bilateral trade flows. The Review of Economics and Statistics, 302-316.

Grogger, J., & Hanson, G. H. (2011). Income maximization and the selection and sorting of international migrants. Journal of Development Economics, 95(1), 42-57.

Halla, M., Wagner, A. F., & Zweimüller, J. (2017). Immigration and voting for the far right. Journal of the European Economic Association, 15(6), 1341-1385.

Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. Journal of economic growth, 12(1), 1-25.

Head, K., & Ries, J. (1998). Immigration and trade creation: econometric evidence from Canada. Canadian journal of economics, 47-62.

Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. Proceedings of the national academy of sciences, 106(26), 10570-10575.

Hidalgo, C. A., Klinger, B., Barabási, A. L., & Hausmann, R. (2007). The product space conditions the development of nations. Science, 317(5837), 482-487.

Hunt, J., & Gauthier-Loiselle, M. (2010). How much does immigration boost innovation?. American Economic Journal: Macroeconomics, 2(2), 31-56.

Kahanec, M., & Pytliková, M. (2017). The economic impact of east–west migration on the European Union. Empirica, 44(3), 407-434.

Kočenda, E., & Poghosyan, K. (2018). Export sophistication: A dynamic panel data approach. Emerging Markets Finance and Trade, 54(12), 2799-2814.

Lapatinas, A., & Litina, A. (2018). Intelligence and economic sophistication. Empirical Economics, 1-20.

Lapatinas, A. (2019). The effect of the Internet on economic sophistication: An empirical analysis. Economics Letters, 174, 35-38.

Lewis, E. (2011). Immigration, skill mix, and capital skill complementarity. The Quarterly Journal of Economics, 126(2), 1029-1069.

Manacorda, M., Manning, A., & Wadsworth, J. (2012). The impact of immigration on the structure of wages: theory and evidence from Britain. Journal of the European economic association, 10(1), 120-151.

Mavisakalyan, A. (2011). Immigration, public education spending, and private schooling. Southern Economic Journal, 78(2), 397-423.

Mayda, A. M. (2010). International migration: A panel data analysis of the determinants of bilateral flows. Journal of Population Economics, 23(4), 1249-1274.

Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic diversity and economic development. Journal of Development economics, 76(2), 293-323.

Ortega, F., & Peri, G. (2014). Openness and income: The roles of trade and migration. Journal of international Economics, 92(2), 231-251.

Ottaviano, G. I., & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. Journal of Economic geography, 6(1), 9-44.

Ottaviano, G. I., & Peri, G. (2012). Rethinking the effect of immigration on wages. Journal of the European economic association, 10(1), 152-197.

Özden, Ç., Parsons, C. R., Schiff, M., & Walmsley, T. L. (2011). Where on earth is everybody? The evolution of global bilateral migration 1960–2000. The World Bank Economic Review, 25(1), 12-56.

Peri, G. (2012). The effect of immigration on productivity: Evidence from US states. Review of Economics and Statistics, 94(1), 348-358.

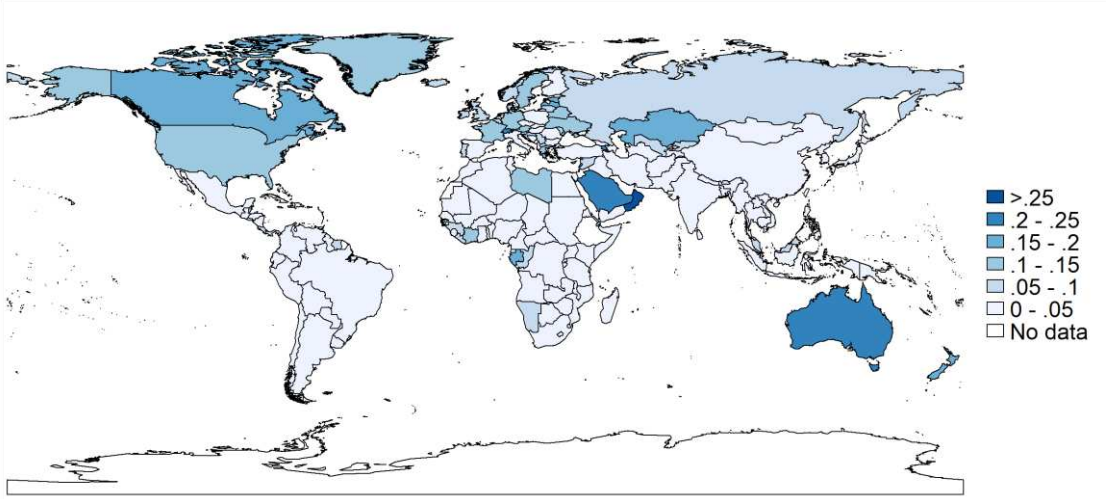
Peri, G., & Requena-Silvente, F. (2010). The trade creation effect of immigrants: evidence from the remarkable case of Spain. Canadian Journal of Economics/Revue canadienne d'économique, 43(4), 1433-1459.

Rose, A. K. (2005). Does the WTO make trade more stable?. Open economies review, 16(1), 7-22.

Schneider, F., Buehn, A., & Montenegro, C. E. (2010). New estimates for the shadow economies all over the world. International Economic Journal, 24(4), 443-461.

Valette, J. (2018). Do migrants transfer productive knowledge back to their origin countries?. The Journal of Development Studies, 54(9), 1637-1656.

Panel A. Immigration



Panel B. Economic Complexity Index

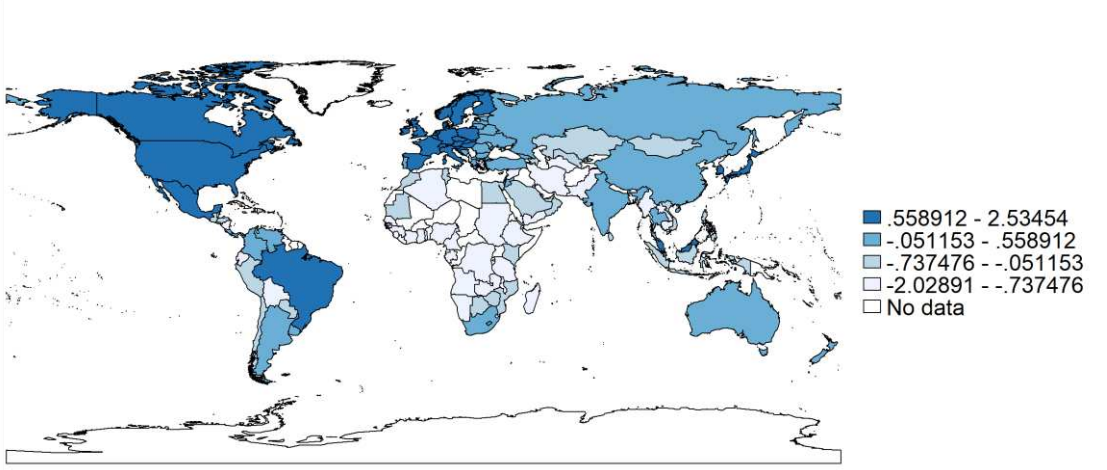


Figure 1. Immigration as a percentage of a country's population and Economic Complexity Index.

Table 1 Data and Sources

	mean	sd	min	max	Source
ECI+	0.00	1.00	-2.51	1.65	Observatory of Economic Complexity
Immigrant share	10.78	15.53	0.04	80.22	World Bank Development Indicators
Ethnic Fractionalization	0.75	0.19	0.05	0.97	Own Calculations
GDPpc	8.36	1.56	5.28	11.84	World Bank Development Indicators
Density	385.79	1907.33	0.14	21398.95	World Bank Development Indicators
Openness	84.29	49.17	1.17	366.07	World Bank Development Indicators
Urban	55.49	24.61	8.25	100.00	Development Indicators
Polity	2.91	6.57	-10.00	10.00	Polity2 index. PolityIV
Rule of law	-0.02	1.00	-2.28	1.98	World Bank Government Indicators
Economic globalization	56.38	19.36	19.43	98.23	KOF Index of Globalization
Social globalization	46.89	21.94	5.17	92.48	KOF Index of Globalization
Political globalization	51.84	25.86	1.00	97.02	KOF Index of Globalization
Overall globalization	50.74	18.24	20.75	91.91	KOF Index of Globalization
Internet	8.76	13.31	0.00	52.00	World Bank Development Indicators
Education (HC)	6.11	5.22	0.06	22.97	Barro and Lee (2013)
Shadow	33.80	13.07	8.60	67.30	Schneider et al. (2010)
Oil	0.32	0.00	1.00	0.32	Fearon and Laitin (2003)
Government spending	5.06	4.97	25.86	5.06	World Bank Development Indicators
Agriculture	8.80	0.09	35.27	8.80	World Bank Development Indicators
Investment	5.25	10.67	36.49	5.25	World Bank Development Indicators
Iinflation (GDP deflator)	10.50	-7.71	49.34	10.50	World Bank Development Indicators
Institutional quality index	2.09	3.00	10.00	2.09	Acemoglu et al. (2001)
Pct. of tropic land	0.46	0.00	1.00	0.46	BACI dataset
Democracy	0.47	0.00	1.00	0.47	Cheibub et al. (2010),

Table 2 Gravity Estimates of the Determinants of Bilateral Migration

Dependent variable: Log of Bilateral migrant stock	(1) OLS	(2) FE	(3) Poisson
Log gdppc at origin	0.331***	0.442***	0.194***
	(0.021)	(0.016)	(0.056)
Log distance	-1.244***	-1.526***	-0.879***
	(0.030)	(0.027)	(0.167)
Log population at origin	0.247***	0.663***	0.267***
	(0.014)	(0.016)	(0.070)
Common language	1.069***	1.213***	0.396*
	(0.063)	(0.052)	(0.239)
Common border	2.229***	1.927***	1.471***
	(0.157)	(0.167)	(0.428)
Log product of land areas	0.242***	-0.001	0.396***
	(0.008)	(0.012)	(0.057)
Observations	13,914	13,914	20,608
R-squared	0.285	0.616	0.616
Destination Dummies	No	Yes	No

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3 The impact of immigration on economic complexity, OLS correlations

VARIABLES	(1) eciplus	(2) eciplus	(3) eciplus	(4) eciplus	(5) eciplus	(6) eciplus	(7) eciplus
Immigrant share	-0.020***	-0.027***	-0.026***	-0.030***	-0.031***	-0.029***	-0.029***
	(0.006)	(0.006)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)
GDPpc	0.371***	0.376***	0.365***	0.376***	0.368***	0.368***	0.278***
	(0.054)	(0.055)	(0.059)	(0.061)	(0.078)	(0.079)	(0.096)
Openness		0.002	0.001	0.001	0.001	-0.000	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Polity index			0.007	-0.006	-0.006	-0.005	-0.010
			(0.015)	(0.020)	(0.020)	(0.020)	(0.022)
HC				0.013	0.012	0.012	0.005
				(0.011)	(0.011)	(0.012)	(0.012)
Urban share					0.001	-0.000	0.002
					(0.005)	(0.005)	(0.005)
Density						0.000	0.000
						(0.000)	(0.000)
Internet							0.010
							(0.007)
Observations	111	107	106	95	95	95	94
R-squared	0.750	0.756	0.760	0.745	0.745	0.750	0.757
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colonial history controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 The impact of immigration on economic complexity, 2SLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Immigrant share	-0.067**	-0.077**	-0.075**	-0.074***	-0.080***	-0.076**	-0.075***
	(0.026)	(0.032)	(0.030)	(0.028)	(0.030)	(0.030)	(0.029)
GDPpc	0.606***	0.581***	0.573***	0.563***	0.426***	0.423***	0.352***
	(0.140)	(0.134)	(0.131)	(0.127)	(0.112)	(0.110)	(0.128)
Openness		0.004*	0.002	0.003*	0.002*	0.002	0.001
		(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Polity index			-0.030	-0.051	-0.049	-0.046	-0.051
			(0.027)	(0.034)	(0.034)	(0.034)	(0.034)
HC				0.014	0.004	0.004	0.001
				(0.014)	(0.015)	(0.015)	(0.016)
Urban share					0.014	0.013	0.014
					(0.009)	(0.009)	(0.009)
Density						0.000	0.000
						(0.000)	(0.000)
Internet							0.007
							(0.008)
Observations	111	107	106	95	95	95	94
R-squared	0.559	0.598	0.641	0.647	0.672	0.691	0.696
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colonial history controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-Test	10.34	7.602	10.28	13.70	15.94	13.20	13.35

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 The impact of immigration on economic complexity, Further controls

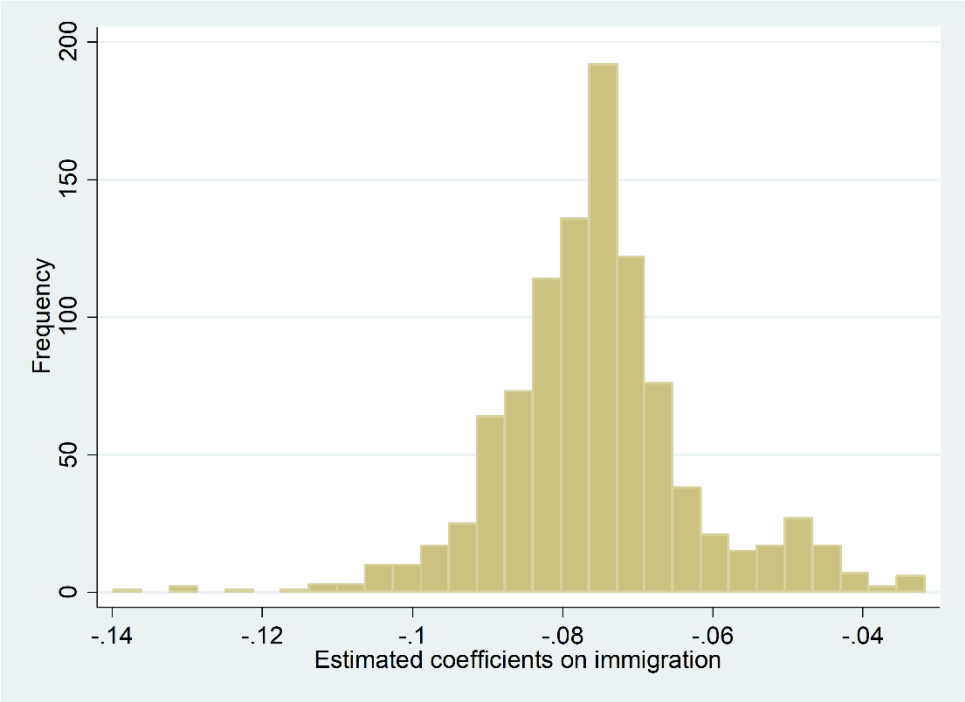
	(1)	(2)	(3)
Immigrant share	-0.076***	-0.074***	-0.075***
	(0.024)	(0.023)	(0.023)
GDPpc	0.101	0.123	0.111
	(0.132)	(0.126)	(0.121)
Openness	0.002	0.003	0.003
	(0.002)	(0.002)	(0.002)
Polity index	-0.068***	-0.066***	-0.061**
	(0.023)	(0.025)	(0.024)
HC	0.011	0.016	0.006
	(0.015)	(0.016)	(0.014)
Urban share	0.006	0.003	-0.000
	(0.006)	(0.006)	(0.006)
Density	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.001)
Internet	0.009	0.008	0.010
	(0.007)	(0.007)	(0.008)
Oil	-0.469*	-0.497*	-0.410
	(0.271)	(0.270)	(0.288)
Investment	-0.031*	-0.036**	-0.035**
	(0.016)	(0.018)	(0.015)
Government	0.017	0.020	0.014
	(0.021)	(0.022)	(0.020)
Agriculture	-0.049***	-0.050***	-0.047***
	(0.015)	(0.016)	(0.016)
Inflation	-0.003	-0.003	-0.004
	(0.006)	(0.006)	(0.006)
Shadow	-0.006	-0.008	-0.002
	(0.007)	(0.007)	(0.006)
Ethnic Fractionalization		0.014	0.171
		(0.326)	(0.356)
Observations	89	89	88
R-squared	0.741	0.739	0.758
Region Dummies	Yes	Yes	Yes
Colonial history controls	Yes	Yes	Yes
Climate/disease controls	No	No	Yes
Kleibergen-Paap F-Test	16.10	14.84	11.33

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 The impact of immigration on economic complexity, Alternative measures of institutions and openness

	(1)	(2)	(3)	(4)	(5)
Immigrant share	-0.082**	-0.072**	-0.073**	-0.052**	-0.064*
	(0.035)	(0.028)	(0.029)	(0.023)	(0.038)
Institutional quality	0.089				
	(0.103)				
Rule of law		-0.018			
		(0.158)			
Democracy			-0.287		
			(0.294)		
KOF globalization				0.038***	
				(0.009)	
KOF economic globalization					0.002
					(0.006)
KOF social globalization					0.046**
					(0.022)
KOF political globalization					-0.003
					(0.013)
Observations	85	95	94	97	96
R-squared	0.629	0.647	0.647	0.715	0.701
Region Dummies	Yes	Yes	Yes	Yes	Yes
Colonial history controls	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-Test	7.945	10.62	10.42	12.79	7.214

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1



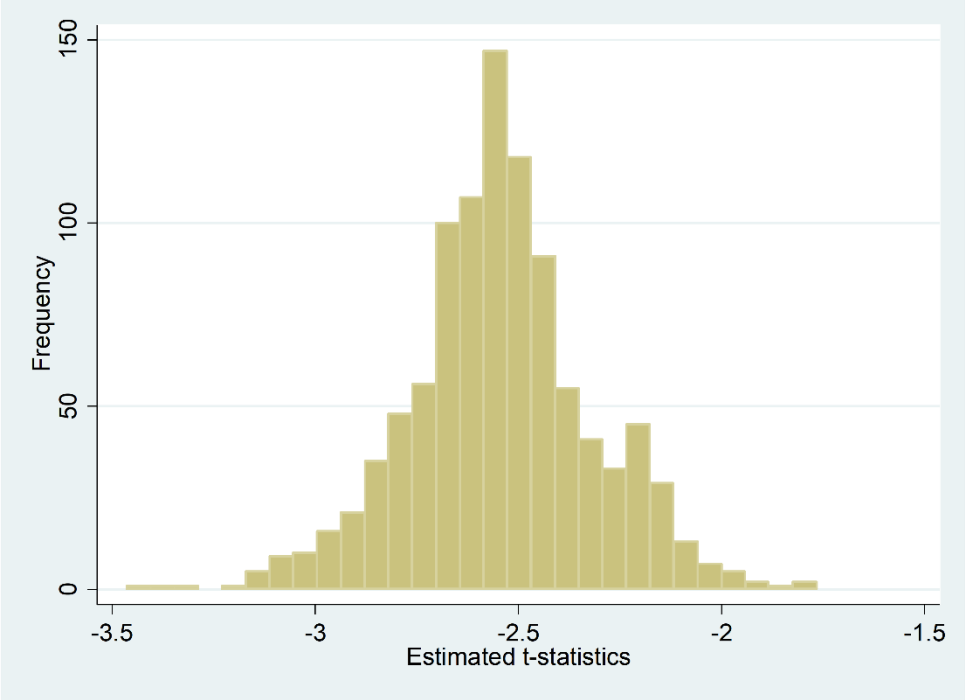


Figure 2 The figure plots the frequencies of the estimated coefficients on the immigrant share variable, and the t-statistics, resulting from a sequential procedure of 1000 regressions, by randomly eliminating 10 percent of observations at a time from the sample.