



# Long-term relatedness between countries and international migrant selection<sup>☆</sup>

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## ABSTRACT

This paper studies the effect of the long-term relatedness between countries, measured by their genetic distance, on educational migrant selection. Analyzing bilateral migrant stocks of the 15 main destination countries and 85 sending countries for the year 2000, we find that migrant selection and genetic distance follow a nonlinear *J*-shaped pattern: at low levels of genetic distance, increases in genetic distance reduce the positive selection of migration. However, at higher levels of genetic distance, this pattern is reversed and migration becomes more positively selected. We complement this finding by showing that the net benefits of genetic distance are strongly decreasing for low-skilled migrants with increasing genetic distance, while high-skilled migrants are less responsive to genetic distance in general. Results are robust to conditioning on bilateral control variables, including various destination- and sending-country-specific fixed effects and applying an instrumental-variables approach that exploits exogenous variation in genetic distances in the year 1500.

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## 1. Introduction

In 2014, about 4.3 million people migrated permanently to OECD countries, which has increased the stock of the total foreign-born population in those countries to 120 million (OECD, 2016). International migration to these countries is dominated by migrants with

higher skill levels as they are more likely to migrate than migrants with lower skills (Grogger and Hanson, 2011). High-skilled migrants are essential for economic development in destination countries that rely on innovation-driven economic growth (Coe and Helpman, 1995; Nelson and Phelps, 1966), while a disproportionate loss of high-skilled migrants could have detrimental development effects in the sending countries (Bhagwati and Hamada, 1974; Wilson, 2008).<sup>1</sup> Therefore, it is important to study and understand the determinants of international migrant selection.

Since Borjas (1987), a large literature has evolved that attempts to explain migrant selection by returns-to-skills differences between destination and sending countries.<sup>2</sup> However, the focus on differences in earning opportunities and a standard set of migration costs (e.g., geographical distance, existence of relatives abroad, household

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<sup>1</sup> However, recent research on ‘beneficial brain drain’ questions that this type of migration is necessarily harmful to the sending countries, see, e.g., Beine et al. (2008).

<sup>2</sup> For recent examples, see, e.g.: Belot and Hatton (2012), Chiquiar and Hanson (2005), Fernández-Huertas Moraga (2011), Grogger and Hanson (2011), Kaestner and Malamud (2014), Pary et al. (2017) and Patt et al. (2017).

assets, and credit availability; cf. Kaestner and Malamud (2014); Patt et al. (2017)) as the main determinants of migration decisions and the resulting pattern of migrant selection appears too narrow.<sup>3</sup> It ignores that the costs and benefits of migration may also be affected by non-economic factors, such as cultural barriers to migration (Bauernschuster et al., 2014; Falck et al., 2012, 2017) or the benefits of living in a culturally different environment (Benson and O'Reilly, 2009a,b). Because policy makers are virtually unable to change these cultural factors, knowing to what extent and how they influence migrant selection is important for the design of labor-market and migration policies.

In this paper, we study how the *long-term relatedness* between countries, that is, their cultural distance or proximity, affects the selection of migrants. We measure migrant selection by using education-specific migrant stocks for the 15 main destination countries and 85 sending countries for the year 2000 (Docquier et al., 2007; Grogger and Hanson, 2011). The migrant skill mix that a destination country receives is positively (negatively) selected when the migrant stock is relatively more (less) skilled than the population in the sending country. To measure long-term relatedness, we use the genetic distance between two countries (Spolaore and Wacziarg, 2009, 2016b), which is based on the matrix of bilateral genetic distances between populations calculated by Cavalli-Sforza et al. (1994). Genetic distance measures how different the distribution of genes is between two populations. The calculation of genetic distance is only based on 'neutral' genes, which are considered as being 'neutral' because they change randomly. Those random changes in the distribution of genes take place regularly over time, which allows the interpretation of genetic distance as a molecular clock that measures the time span since two populations shared a common ancestor (Kimura, 1968). Studying the divergence in neutral genes between populations yields therefore a measure of the general relatedness of countries. Because cultural traits and habits are similarly transmitted across generations, genetic distance represents a summary statistic for a wide array of cultural traits transmitted intergenerationally (Spolaore and Wacziarg, 2009, 2016b). The view that genes and culture develop together over time is also present in the *dual inheritance theory* in social anthropology (Boyd and Richerson, 1985; Henrich and McElreath, 2003). In empirical work, several recent studies make use of genetic distance as a proxy for long-term relatedness or cultural distance between countries (see, e.g., Adserà and Pytliková, 2015; Desmet et al., 2011; Spolaore and Wacziarg, 2009, 2013, 2016b,c).

We contribute to the literature on the economic effects of long-term relatedness by documenting that the selection of migrants is related to genetic distance. In fact, our study documents a nonlinear *J-shaped* pattern between the bilateral migrant skill mix in the destination country and genetic distance: at low levels of genetic distance, increases in genetic distance slightly reduce the positive selection of migrants. At higher levels of genetic distance, however, this relationship is reversed and the migrant skill mix becomes much more positively selected when genetic distance increases. We complement this analysis by exploring the migration propensities for high- and low-skilled migrants separately. There we find that high-skilled migrants are generally less responsive to genetic distance than low-skilled migrants. At low levels of genetic distance, the results indicate that genetic distance attracts low-skilled migrants slightly more than high-skilled migrants. At high levels of genetic

distance, the migration propensity is particularly low for low-skilled migrants. Thus, the findings suggest that the *J-shaped* pattern is mainly driven by strongly decreasing net benefits from cultural distance for low-skilled migrants (see Section 2 for a discussion of the benefits and costs of cultural distance).

While we find a strong nonlinearity regardless of the set of control variables, the *J-shaped* pattern between migrant selection and genetic distance appears only after the inclusion of measures for geographical distances and differences in aggregate income and returns to skills between the destination and the sending country. Because these covariates represent major alternative explanations for the pattern of migrant selection, this finding suggests that genetic distance is not an important determinant of the *aggregate* selection pattern when genetic distance is relatively low. However, the *J-shaped* pattern is robust to the inclusion of a large set of further covariates and an instrumental variables approach, which uses exogenous variation in genetic distance in the year 1500 to correct for a potential endogeneity bias that is induced by past migration waves and other omitted variables (Spolaore and Wacziarg, 2009). Because genetic distance remains a significant predictor of migrant selection throughout, we conclude that normally unobserved cultural traits, habits, and norms systematically affect migrant selection.

Importantly, even after controlling for a number of variables typically used to measure cultural differences (e.g., linguistic distance, common language, religion, and colonial history), we still find an independent and significant effect of genetic distance on migrant selection. We also verify whether the effect is mediated through skill-selective migration policies. For example, destination countries may welcome culturally distant populations only if they are sufficiently skilled. Controlling for standard and self-compiled measures of bilateral migration policies, we do not find that genetic distance is mediated through this channel. This does not rule out that the selection pattern is partly driven by informal and unobservable policies and local behavior against migrants from culturally distant populations. However, as long as these demand-side factors are the result of cultural distance, we still identify a total effect of genetic distance on migrant selection.

Contributing to the growing literature on the economic consequences of cultural traits and habits,<sup>4</sup> we provide the first study that links the literature on the determinants of migrant selection to the literature that examines the social and economic effects of the long-term relatedness between countries. While previous studies have found that differences in cultural traits are especially successful in explaining the size and the direction of economic exchange,<sup>5</sup> this study complements the literature by showing that long-term relatedness is a decisive factor for explaining migrant selection.

The remainder of the paper is organized as follows. Section 2 lays out our theoretical considerations. Section 3 introduces the data, discusses genetic distance as a measure for the long-term relatedness between countries, and provides first descriptive evidence on the relationship between genetic distance and migrant selection. Section 4 explains the econometric setup and the identification strategy. In Section 5, we provide the results of our analysis. Section 6 conducts several extensions and robustness checks. Section 7 concludes.

<sup>4</sup> See, e.g., Ashraf and Galor (2013), Burchardi and Hassan (2013), Guiso et al. (2006), Ottaviano and Peri (2005), Spolaore and Wacziarg (2013) and Tabellini (2010).

<sup>5</sup> For example, the literature contains studies that use long-term relatedness to explain income differences between countries (Spolaore and Wacziarg, 2009), migration flows (Belot and Ederveen, 2011; Dahl and Sorenson, 2010; Falck et al., 2012; Falck et al., 2017; Mayda, 2009), the diffusion of technology (Comin et al., 2012; Spolaore and Wacziarg, 2012), trade patterns (Guiso et al., 2009; Felbermayr and Toubal, 2010), and investment behavior (Guiso et al., 2009).

<sup>3</sup> For the year 2014, the OECD (2016) reports that only 14% of all migrants can be seen as labor migrants who are assumed to migrate for purely economic reasons. Most other migration happens for, e.g., family reasons, humanitarian reasons, and by accompanying families of workers.

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