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International migration and income inequality

Nicola Daniele Coniglio,[1] Vitorocco Peragine,[2] and Davide Vurchio[3]

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Abstract: In this paper we explore the links between international migration and income inequality. After presenting a simple model which considers the role of income distribution in individual decisions to migrate, we estimate a set of models on the determinants of yearly bilateral migration from a very large pool of countries in the period 1960–2019. The empirical results confirm that inequality—in both origin and destination countries—significantly shapes individual choices about where, and whether, to migrate. We find that the effect of inequality at both ends of migration corridors is heterogeneous across countries at different levels of development, most likely due to differences in migration barriers and in the patterns of migrants' self-selection. In the second part of the study, we explore the direct effect of international migration on global inequality, by assessing how the current level of migration in the world has likely affected income inequality between and within nations. By adopting a counterfactual methodology, we find that migration flows lead to lower between-country inequality and higher within-country inequality, compared with a scenario with no migration. The overall impact is a negligible reduction in global inequality. The impact of migration on inequality, although small, tends to increase over time.

Key words: international migration, inequality, income distribution

JEL classification: F22, I3, D63

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* University of Bari Aldo Moro, Bari, Italy; corresponding author: nicoladaniele.coniglio@uniba.it.

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Information and requests: publications@wider.unu.edu

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1 Introduction

International migration is deeply shaped by income inequality, but most studies on the determinants of international migration flows have focused on one specific dimension: between-country income inequality (generally proxied by wages or per capita GDP differences). Although cross-country differences in per capita GDP capture part of the potential gains associated with international migration (for instance, those related to better in-kind public services and institutions, as emphasized by Ravaillon 2019), individual benefits accruing to immigrants depend also on which part of the income distribution immigrants expect to 'land' in, as well as on the shape of such distribution. As Milanovic (2011, 2015) puts it, by choosing one country, 'a person receives at least two "public" goods—average income of the country and inequality of income distribution'. It might be reasonable to assume that, *ceteris paribus*, a potential migrant would prefer a more equal distribution (corresponding often to a more inclusive society in terms of public services) to a more unequal one. Moreover, recent studies (e.g., Clemens and Mendola 2020) confirm that the propensity to migrate is higher for relatively rich individuals, suggesting that the distribution of income in the source country matters in shaping overall out-migration flows. Hence, inequality at both ends of the migration process is likely to affect cross-border mobility.

The link between international migration and inequality runs also in the opposite direction. International migration affects income inequality in two main dimensions. On one side, as cross-border migration flows are sensitive to income differentials, the movement of people from poor to rich countries has a strong potential to reduce inequality between countries (defined as inequality between national per capita income[1]) through a direct reallocation of people across countries with different income levels and through remittance flows (Milanovic 2011, 2015). The between-country inequality-reducing effect of migration is likely to be larger than other explicit cross-country redistributive systems (e.g., foreign aid). On the other side, international migration might translate into an increase in within-country inequality. This is particularly true if immigrants enlarge the tails of the income distribution in both sending and receiving countries. The net effect of the between and within changes on global inequality—defined as inequality in the world population[2]—is unclear, leading to what Weyl (2018) defines as a 'philosophically disturbing trade-off between the global and the internal inequality-reducing effect of migration'.

Despite the relevance of the relationship between inequality in the income distribution and international migration having been emphasized in several recent contributions, a systematic investigation of this topic is still lacking in the literature.

In this paper we try to fill this gap by exploring both sides of the nexus between these relevant phenomena. We first study the effect on international migration flows of inequality in income distribution of both origin and destination countries. After presenting a simple model of migration decisions which explicitly considers the role of inequality, we bring the main theoretical hypothesis to the test of data. We employ a recently released database on yearly bilateral migration flows between a very large pool of origin-destination countries in the period 1960–2019 (Standaert and Rayp 2022). We estimate a set of models on the determinants of international migration, employing alternative specifications which allow us to identify, through within-country and within-origin-destination pair variations, the role of inequality at both ends of migration corridors (Beine et al.

[1] Corresponding to Milanovic's Concept 1 (unweighted) and/or Concept 2 (weighted) of global inequality; see Milanovic (2013).

[2] Corresponding to Milanovic's Concept 3 of global inequality; see Milanovic (2013).

2016; Bohme et al. 2020). Our theoretical expectations are confirmed by the empirical results, which in fact show a significant role played by the degree of inequality in the income distribution in explaining international migration flows. We find, in line with the relative deprivation hypothesis, that income inequality at origin acts as a push factor for out-migration flows. Interestingly, when we restrict our analysis to outflows from the poorest countries (the low-income group according to the World Bank definition), an increase in inequality reduces the magnitude of emigration. This latter finding might be due to the fact that higher inequality in poor countries improves the position in the income ladder of those individuals who have the resource to migrate, i.e., the most affluent ones (Clemens and Mendola 2020). In fact, an increase in the share of national income held by the bottom 40 per cent is associated with a reduction in bilateral migration flows for all origin countries except the poorest, where the cost of international migration is prohibitive for the large majority of the population. Our results show that inequality at destination strongly matters in migration decision; growing inequality in receiving countries reduces immigration inflows. Besides these direct effects at both ends of a migration corridor, we also find that a change in the origin–destination inequality gap—what we label 'inequality dissimilarity'—affects migration flows. A growth in relative inequality is associated, *ceteris paribus*, with an increase in bilateral flows. Taken together, the evidence of the role played by both origin-country and destination-country inequality suggests that migrants care about their expected position in a *new* income ladder which combines reference groups in both countries.

In the second part of the study, we explore the direct effect[3] of international migration on global inequality (between and within countries). The purpose of this is to assess how the current level of migration in the world has likely affected income inequality between and within nations. In order to compute measures of inequality with or without international migration, we consider countries as composed of individuals who were born there, wherever they currently reside. In other words, we consider diasporas as part of the origin country (in line with the idea of relative deprivation posed by the new economics of labour migration; Stark 1993).[4] Rather than assigning to diasporas the average income of the destination country (as in other studies), we explicitly consider the likely distribution of diasporas in the income deciles of destination countries and associate them with the respective income decile levels as measured in the World International Inequality Database (WIID).[5] This procedure allows us to compute inequality measures both within and between countries for a '*world with migration*'—that is, one with the current level of international migration as measured by the UN database on bilateral migration stocks (UNDESA 2022). We compare these measures with hypothetical distributions of income representing a '*world without migration*', where members of diasporas 'return' to their origin countries in the decile of the

[3] The direct effect considers only the change in income accruing to those who move and thus does not consider the indirect effects accruing to individuals who leave home and those in destination countries. Although the indirect effects might be important, these are likely to have a second-order impact on global inequality, at least in the short run, based on a large bulk of existing evidence; see Kapur and McHale (2009) for a comprehensive discussion.

[4] We also report alternative analysis where diasporas are considered part of the destination-country income distribution.

[5] To compute the distribution of migrants in destination-country income deciles, we base our analysis on two main datasets: the EU Statistics on Income and Living Conditions (EU-SILC) dataset 2011 and the Database on Immigrants in OECD Countries (DIOC) 2010/2011. The latter includes data on demographic and labour market characteristics of the population (both native and foreign-born) of 33 OECD countries and offers reliable and comparable information on migrants by country of origin (see Arslan et al. 2014). The DIOC 2010/2011 has information for more than 200 countries of origin on migrants' age, nationality, duration of stay in destination country, labour force status, and occupation. We employ Mincer equations to estimate wages by country of origin and estimate employment probability differentials between immigrants and 'natives'. This methodological approach allows us to have a plausible benchmark for assessing where migrants are placed in the income distribution of the country of destination (see details in Section 3).

distribution which they have likely moved from. The empirical analysis serves the goal of providing plausible ranges of the impacts of current levels of international migration on global inequality.[6]

We find that, on average, migration flows have led to an increase in within-country inequality (measured by Theil entropy measure). On the other hand, international migration has led to a decrease in between-country inequality. The net effect of within and between inequality dynamics shows that migration has generated a feeble—although statistically significant—reduction in world inequality.

Other papers have looked at the nexus between inequality and migration. The work by Liebig and Souza-Poza (2004) was among the first empirical papers showing that, controlling for average income, the Gini coefficient of origin countries is positively and significantly related to the intention to migrate abroad. This study suggested that a key role in shaping migration behaviours is played by how income is distributed, in addition to its average level. The authors also find that the selectivity of migration flows is attenuated when origin countries have higher inequality. This evidence inspired the work of Stark (2006), which established a behavioural explanation for the positive effects of the Gini index based on the idea of (total) relative deprivation[7] as a push factor of international migration flows (Stark and Taylor 1991; Stark and Wang 2000, 2005).[8] The key argument of the relative deprivation hypothesis is that individuals care not only about their material conditions but also about their relative position with respect to their reference group. A growing concentration of income in the top part of the distribution would push more individuals—mainly those in the lowest part of the distribution—to emigrate. This hypothesis has two main limits. First, it ignores that growing inequality for individuals who are credit constrained might, at the same time, increase the willingness to migrate and reduce the resources that are necessary to migrate across borders. This secondary effect is likely to be particularly important for poor countries and for South–North migration flows, for which international migration is particularly costly. The second limit of the relative deprivation hypothesis is rooted in the fact that the reference group to which individuals relate themselves might change with international migration, as reference group substitution might occur (Czaika and de Haas 2012). If migrants value their relative position not only with respect to those left behind but also with respect to those living in the current destination, then inequality in the destination country will also play a role.

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[6] As a *world without migration* counterfactual is by definition not observed and not observable, there is no unique or preferred way to define it. In this study, we assume that in the absence of migration, members of diasporas 'return' to their origin countries in the decile of the distribution which they have likely moved from. To identify deciles of origin, we exploit the recent insights offered by the work of Clemens and Mendola (2020) on different propensity to migrate by income decile of the origin countries. One important limit of our approach is that it ignores the indirect effects of migration, in particular on economic growth (would growth and the income of those not directly involved in migration be higher, lower, or similar in a world without migration?). This simplistic assumption, although problematic for some specific countries where migration is a transformative phenomenon, is unlikely to substantially bias our exercise, as several studies show that migration has quantitatively limited effects on income and wages in origin and destination countries (Blau and Khan 2015; Longhi et al. 2005).

[7] Stark (2006) shows that a growing level of relative deprivation in a society is unambiguously reflected in a growing level of inequality as measured by the Gini coefficient. The prediction of the paper is that inequality will always boost migration from the lower tail of the income distribution (negative self-selection). This prediction contrasts with that of the seminal paper of Borjas (1987), which posits that the selectivity of migrants depends on the differences in inequality between origin and destination countries; when the destination country has a more unequal income distribution migration is positively self-selected.

[8] See also Stark et al. (2020), which revisits the link between the Gini coefficient and total relative deprivation, suggesting that these measures might change in asymmetric ways when income grows.

We argue in this paper that besides the role played by the relative deprivation at home, inequality in destination countries also matters, as it shapes the expected position of migrants in the income distribution of their new society. As international migration is an individual choice taken under a veil of ignorance about the position where the migrant will land in the destination country, a lower level of inequality will represent, *ceteris paribus*, a powerful pull factor for migrants. This uncertainty is highly relevant for unskilled migrants or skilled migrants from poor countries facing an imperfect transferability of skills and human capital in destination countries. Inequality in destination countries might differently affect the location choices of skilled and unskilled migrants from origin countries where outflows are less constrained by lack of resources (high-income countries) as the former might have different expectations in terms of their position in the income distribution.[9]

Few studies have jointly investigated the role of inequality at both ends of the migration corridors. The work by Brücker and Defoort (2009) tested the importance of origin and destination Gini coefficient in shaping the skill composition of migration flows (self-selection) from 145 developing countries towards six OECD countries in the period 1975–2000, but the paper does not address the effect of inequality on the size of flows.[10]

From a theoretical perspective, the dissimilarity of inequality between origin and destination countries—after controlling for their respective levels—might also affect the preferences of prospective migrants. Inequality reflects socioeconomic and cultural features of a society—such as the taste for redistribution and the overall delivery of public goods and services—and hence inequality distances or gaps might play a role that is akin to that of cultural distance in shaping migration flows (Lanati and Venturini 2021). As migrants live across origin and destination societies, the relative inequality also matters. We explicitly consider this hypothesis that has not, to our knowledge, been addressed in previous studies.

Analyses of the impact of international migration on inequality have generally focused on specific sending or receiving countries (see Blau and Kahn, 2015, for a survey). To our knowledge the only attempt to estimate the *direct*[11] effect of international migration on measures of between-country inequality is the study by Kapur and McHale (2009). This study finds that bilateral international migration, measured using stocks in the year 2000, decreases the between-country component of world inequality (as measured by the between-country Theil coefficient) by about 2 per cent. One

[9] The available data do not allow for a separate analysis for migrants with different levels of skills. We discuss the potential role of skills in the concluding remarks.

[10] Partial exceptions also include the paper by Czaika and de Haas (2012) and the recent work by Plotnikova and Ulceluse (2020). Czaika and de Haas (2012) investigate the role of relative deprivation within and between countries in total and bilateral migration. Our analysis differs from that of this paper in several directions. We employ what we believe is a better empirical strategy for identifying the role of inequality using a complex set of theoretically derived fixed-effects models that account for multilateral resistance to migration (Beine et al. 2016). Our analysis is based on yearly flows of total and bilateral migrants rather than migration stocks for a single year (2000). In fact, stocks include migrants who have moved in different periods, making it difficult to measure the covariates, including those related to inequality, that have shaped actual migration moves. Plotnikova and Ulceluse (2022) employ social network analysis in order to investigate if migration flows are shaped by the (dis)similarity of measures of inequality. Their analysis is based on bilateral migration data for 2005–2010 for 41 European countries and finds that migration is predominant between countries with more similar levels of inequality. Our study complements their approach by looking at dynamic relationships between these two variables using panel fixed-effects models for a larger set of countries.

[11] The direct effect considers only the change in income accruing to those who move and thus does not consider the indirect effects of individuals left at home (with the exception of remittances, which are accounted for in the study) and those in destination countries. Although the direct effects might be important, as argued by the authors, these are likely to have a second order impact on global inequality, at least in the short term, based on a large bulk of existing evidence.

important limit of this study—that our analysis attempts to overcome—is the inability to consider how migration affects within-country inequality, as its estimates are based on average per capita income rather than the position of migrants in the income distribution in source and destination countries.

The paper is organized as follows. In Section 2 we present a simple theoretical framework where the migration decision is taken in a 'Rawlsian' framework through the device of the veil of ignorance, where position in the income distribution of the destination country is uncertain. In Section 3 we empirically analyse the role of inequality in origin and destination countries as a determinant of international migration flows. Section 4 addresses the other side of the coin—that is, the long-term impact of migration on global (within and between) inequality. Some final remarks are reported in Section 5.

2 A simple model of inequality and migration: choosing under a 'veil of ignorance'

In this section we provide a simple conceptual and theoretical framework to discuss the role that inequality (in both origin and destination countries) plays in shaping the migration choices of rational individuals facing the problem of where, and whether, to migrate.

We consider the problem of an individual migrant who has to choose where to migrate, given a set of potential countries. We abstract here from the costs of migration (or, alternatively, we assume these costs are equal for the different countries) and focus on the criterion of choice followed by the potential migrant. We think that the choice to migrate, from the point of view of the migrant, is a risky one: the migrant in general does not know the position they will occupy in the distribution of the destination country; on the other hand, it is reasonable to assume that they do have some fundamental knowledge of the different countries of destination, such as their average standard of living and their degree of inclusiveness or polarization.

It could be evocative in this context to use the conceptual device of the 'original position' proposed by Rawls (1971) and Harsanyi (1953): that is, the idea of an individual choosing from among a set of distributions, under a veil of ignorance about the position they will occupy in the different distributions. As is well known, in the Rawlsian tradition, the problem of the collective choice of the 'just' distribution, through the device of the veil of ignorance, under which each component of the society has to express their preference, is 'reduced' to a problem of individual choice under uncertainty. We think that this conceptual device[12] is well suited to treating the problem at hand, as migrants' decisions about where to migrate can be thought of as a choice among a set of potential destination countries, each characterized by an income distribution, without *a priori* knowing the position that the migrant will occupy in the distribution of the country of destination.

Following Rawls, we assume that the migrant knows, in addition to the distribution of the country of origin, the distributions of the potential country of destination, but she does not know in what position she will end up sitting in that distribution. Hence, we assume that the migrant will use the information on the distribution of destinations in a rational fashion, in order to maximize their utility: they will compare the distributions of different countries of destination in terms of risk and

[12] We refer to the Rawlsian conceptual the of the veil of ignorance, but we do not endorse his specific assumption on the individual attitudes towards risk, leading him to the derivation of the maximin rule.

expected income and they will compare the distribution of destination with the distribution of origin.

In this framework there is a clear exploitation of the isomorphism between the analysis of risk and the analysis of inequality: an income distribution can in fact be modelled as a random variable, and the two main moments of the distribution (mean and variance) can be interpreted respectively as the expected value and (a measure of) the risk associated with the lottery implied by the underlying random variable or, alternatively, as the average income and the inequality of an income distribution. Analogously, if we model the individual preferences over alternative distributions by a von Neumann-Morgenstern (VNM) utility function, the concavity (resp. linearity) of the individual utility function can expresses risk aversion (resp. neutrality) in the context of risk analysis or, alternatively, inequality aversion (neutrality) in the context of inequality and welfare.

Therefore, under alternative hypotheses on individual attitudes towards risk, we can predict the migrants' choices among different potential countries of destination.

We formulate the following problem: consider an individual i living in a country O (origin), with income distribution $FO(x)$, who has to choose whether and where to migrate among a set of n possible destination countries $(D1, D2, \dots, Dn)$ with corresponding income distributions $FD1(x), FD2(x), \dots, FDn(x)$ and corresponding average incomes $mD1, mD2, \dots, mDn$.

The usual assumption in the literature on the determinants of migration is that the individual will compare the mean income of the country of origin with the mean income of the country of destination and will choose the country with maximal mean income, provided that the mean income is greater than the mean income of the country of origin. That is to say, each individual i living in country O will choose to migrate to country Dj if:

$$mDj > mFO \qquad \text{(i)}$$

$$mDj = max\,(mD1, mD2, \dots, mDn) \qquad \text{(ii)}$$

Condition (i) states that the country of destination has higher average income than the country of origin; condition (ii) states that the migrant will choose the country with the highest average income among the countries of destination.

This choice is consistent with a risk-neutral individual i endowed with VNM utility functions $Ui(x)$ that are increasing and linear in income.

This is the implicit assumption of most of the empirical literature on migration: the idea that the mean income of the destination country, used as proxy of the average standard of living, is the criterion which drives migration choices.

We depart from this model, as we think that a more robust assumption is that of individuals who are risk averse and are therefore endowed with VNM utility functions $Ui(x)$ that are increasing and concave. In such a case, well-known results in the literature show that the individuals will choose among the possible distributions by looking at both the mean income and the inequality in the distribution.

More precisely, an individual i endowed with VNM utility functions $Ui(x)$ which are increasing and strictly concave in income will choose according to the criterion of second-order stochastic

dominance, corresponding, in turn, to the criterion of generalized Lorenz dominance[13] (see Lambert 1993). Formally, defining by $> GL$ the generalized Lorenz dominance, each individual i living in country O will choose to migrate to country Dj if:

$$FDj(x) > GL\, FO(x) \quad \text{(iii)}$$

$$FDj(x) > GL\, FDk(x)\ for\ all\ k = 1, \dots, n, with\ k\ different\ from\ j \quad \text{(iv)}$$

Condition (iii) states that the migrant will choose to migrate provided that the distribution in the destination country GL dominates the distribution in the country of origin; condition (iv) states that, *ceteris paribus*, among the different potential countries of destination, the migrant will choose the country that dominates all the others in pair-wise comparisons.

As is well known, the generalized Lorenz curve is obtained as the product of the mean income and the Lorenz curve, capturing the inequality of a distribution: hence, in the criterion above, the driving forces of a choice among distributions are both the average income and the inequality in the distribution.

This condition captures the intuition that a migrant choosing among a set of countries of destination which differ in terms of both average income and inequality will use both criteria: which one will prevail—that is to say, which is the optimal trade-off between expected income and inequality—will depend on the specific utility functions of the individuals and can be investigated on an empirical basis.

In the case of a comparison of countries with equal mean income, the results above read as follows. Defining by $> L$ the Lorenz dominance (see Lambert, 1993), each individual i living in country O will choose to migrate to country Dj if:

$$FDj(x) > L\, FO(x) \quad \text{(v)}$$

$$FDj(x) > L\, FDk(x)\ for\ all\ k = 1, \dots, n, with\ k\ different\ from\ j \quad \text{(vi)}$$

Condition (v) states that the migrant will choose to migrate provided that the destination county has less inequality than the country of origin; condition (vi) states that, *ceteris paribus*, among the different potential countries of destination, the migrant will choose the country characterized by the minimal level of inequality.

This condition captures the intuition that a migrant choosing among a set of countries of destination which have equal mean incomes will prefer a more equal distribution—as it is less risky than a more unequal one.

[13] The Lorenz curve is a graphical representation of an income distribution and shows the cumulative share of income from different sections of the population. The generalized Lorenz curve is obtained by multiplying the Lorenz curve by the average income. One distribution X 'dominates' distribution Y according to (generalized) Lorenz dominance if the (generalized) Lorenz curve of X lies always above the (generalized) Lorenz curve of Y; see Lambert (1993).

Lorenz and generalized Lorenz dominance generate partial orderings of income distributions—that is to say, the comparison according to the Lorenz and generalized Lorenz dominance can be inconclusive: this is the main reason why, in most empirical analysis, instead of testing for dominance, synthetic indexes are used. Consistently, in our empirical analysis we will focus on two main characteristics[14] of a country Dj: the mean income mDj and an inequality index IDj. Alternative metrics for measuring inequality at both ends of migration corridors will be employed as discussed below.

3 Inequality in origin and destination countries and international migration

3.1 Data and empirical strategy

In order to test the role of inequality as a determinant of international migration—starting from a random utility model (RUM) of the individual migration decision as in Beine et al. (2016)—we estimate, using a gravity-like specification, a set of models where the dependent variable is net yearly migration flows between 209 countries (Standaert and Rayp 2022) in the period 1960–2019.[15]

Borrowing from recent literature in international trade, we estimate alternative models with a rich structure of fixed effects, which allows us to identify more precisely—exploiting within-country and dyadic variations—the effect of inequality in both origin and destination countries on bilateral migration flows.[16] The following alternative empirical specifications employed are:

$$Y_{ij,t+1} = \beta_1 Inequality_{i,t} + \beta_2 Inequality_{j,t} + \beta_3 X_{i,t} + \beta_4 X_{j,t} + \delta_i + \delta_j + \gamma_t + \epsilon_{ijt} \quad (1)$$

$$Y_{ij,t+1} = \beta_1 Inequality_{j,t} + \beta_4 X_{j,t} + \delta_i * \gamma_t + \delta_j + \epsilon_{ijt} \quad (2)$$

$$Y_{ij,t+1} = \beta_1 Inequality\_dissimilarity_{ij,t} + \delta_i * \gamma_t + \delta_j * \gamma_t + \epsilon_{ijt} \quad (3)$$

where our dependent variable, $Y_{ij,t+1}$, is bilateral net migration flow from origin country i to destination country j in the following year (at time $t+1$; all covariates are measured at time t). In Equation 1 we test for our hypothesis by including Gini indexes in country i and j as measures of

[14] Following the same line of argument, one could endorse Rawls's (1971) specific assumptions on individual attitudes towards risk, hence modelling individuals' preferences as extremely risk adverse, thereby obtaining the famous maximin criterion: the choice among different distributions would be based on the comparison (and the maximization) of the minimum values of each distribution. Empirically, this approach would imply a focus on the average income of the lowest quintile of the distribution, rather than on the average income and the inequality in the distribution. This specification is not pursued in the present paper but it could be the object of future extensions.

[15] The database recently computed by Standaert and Rayp (2022) contains close to 2.9 million observations on over 56,000 country pairs (migration corridors) from 1960 to 2020. This is by far the most comprehensive database on bilateral migration produced to date. The authors employ a Bayesian state-space model that combines the information from multiple datasets on both stocks and flows into a single estimate. In the tradition of demographic accounting methodologies, the state-space model uses the relationship between migrant stocks, migrants flows, births, and deaths. One fundamental advantage of this new database is its ability to include information on South–South migration flows.

[16] Although we do not explicitly account for potential reverse causality, i.e. the effect of migration on inequality, it is reasonable in our opinion to assume—in the light of the results of Section 4—that international migration has a minor role in changes in income distribution. Furthermore, it is rather evident that changes in income distribution due to migration are likely to be negligible in the short run.

inequality respectively in origin and destination countries. As an alternative, we employ the share of national income obtained by the poorest (bottom) 40 per cent of population in origin and destination countries.[17] These specifications include origin, destination, and time fixed effects which absorb country-specific time-invariant determinants of migration as well as common time-variant shocks, as in earlier influential studies of bilateral migration such as Mayda (2010) and Pedersen et al. (2008).

In order to account for multilateral resistance to migration[18] as in Beine et al. (2016), we adopt in Equation 2 a more complex set of fixed effects which allows us to focus on inequality at destination (or origin) while accounting for all time-variant push (pull) factors in origin (destination) countries.

Finally, we test the hypothesis that relative inequality, or inequality dissimilarity, between origin and destination countries affects bilateral flows by employing Equation 3. This specification includes both origin and country by time fixed effects which absorb time-variant push and pull factors, and hence the variation (and the estimated effect, β_1) is based on within variation of inequality dissimilarity in a specific migration corridor.

In order to control for other push and pull factors, we include a standard set of determinants of international migration flows employed in gravity models such as population, GDP per capita, number of violent episodes, dependency ratio, bilateral distance, common language, common border, and shared language. Table 1 reports a detailed description and summary statistics for all variables employed in the empirical analysis. The models are estimated with a Poisson pseudo-maximum likelihood (PPML) (Santos Silva and Tenreyro 2011).[19]

[17] We also employ alternative metrics of inequality (Atkinson index, Theil index) and obtain similar results, which are available upon request from the authors.

[18] The concept of multilateral resistance—which first emerged in trade studies—is based on the fact that the rate of migration between two countries does not depend exclusively on bilateral factors which identify their relative attractiveness, but also on what happens in alternative destinations (i.e. on how attractiveness changes vis-à-vis other countries). Bertoli and Fernández-Huertas Moraga (2013) and Beine et al. (2016) propose estimation techniques for dealing with multilateral resistance in estimates of bilateral migration.

[19] We use on average more than 1.3 million observations in our analysis, which includes a high number of zeros (more than 72 per cent). Santos Silva and Tenreyro (2011) have shown that a high number of zero flows and heteroscedasticity of error terms might produce biased estimates of the parameters of interest when using a log-log panel specification and suggest the use of PPML.

Table 1: Descriptive statistics for the variables used for the parametric estimations

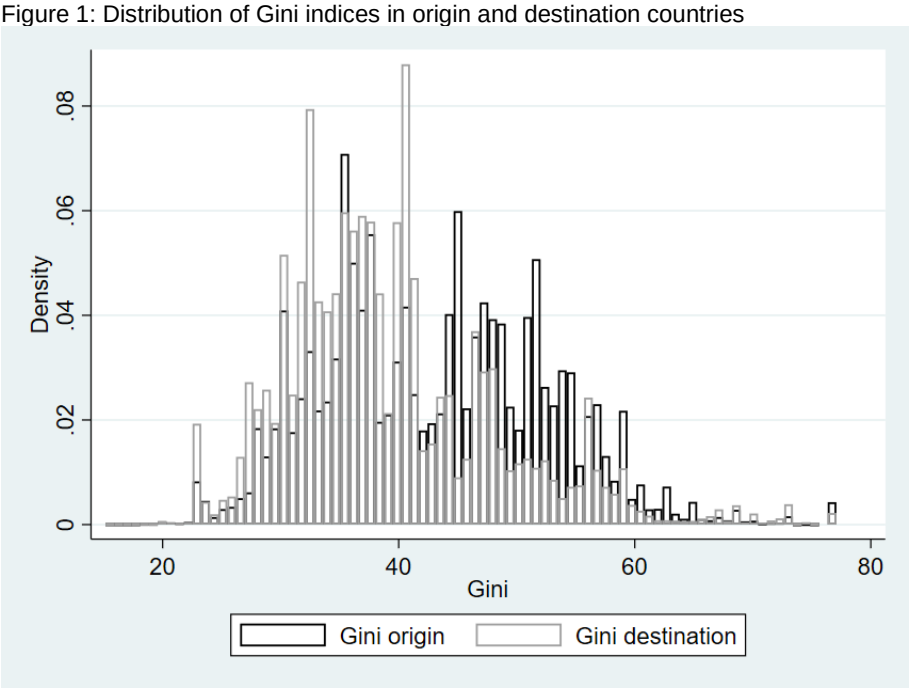
Variable name	Description	Mean	Std dev.	Min.	Max.	Source
(Dependent variable in Tables 2 and 3) Bilateral migration ouflows ij (total; log; $t+1$)	Total annual outflows of migrants from country of origin i to country of destination j (all OECD destinations; log; $t+1$)	162.58	3,285.24	0	610,257	Standaert S. and G. Rayp (2022); UNU-CRIS (2022)
Gini index at origin (log)	Gini index in the origin country	45.10	11.49	15.16	77.08	WIID (UNU-WIDER 2021)
Gini index at% destination (log)	Gini index in the destination country	44.99	11.16	-	-	WIID (UNU-WIDER 2021)
Bottom 40% income share at origin (%)	Share of income generated by bottom 40% of origin-country population (%)	14.48	5.18	1.95	30.55	-
Bottom 40% income share at origin (%)	Share of income generated by bottom 40% of destination-country population (%)	14.49	5.02	-	-	-
GDP per capita at origin (in log)	GDP per capita in the origin country (ln)	8.88	1.21	5.96	12.31	-
GDP per capita at destination (in log)	GDP per capita in the destination country (ln)	8.94	1.23	5.96	12.33	-
Population at origin (in log)	Population of the origin country (ln)	16.04	1.54	12.32	21.07	World Bank (2022)
Population at destination (in log)	Population of the destination country (ln)	15.08	2.34	12.32	21.07	Conte et al. (2022)
Bilateral distance ij in km (log)	Geodesic bilateral distancebetween origin and destination (in log)	8.76	0.75	4.28	9.89	Conte et al. (2022)
Migration network ij (log)	Bilateral migrant stock between origin and destination (ij) in the beginning year to which a flow corresponds (in log)	2.51	3.6	0	16.32	Özden et al. (2011)
Common language ij	Dummy that takes the value 1 if at least 9% of both populations in a country pair speak the same language	0.147	0.353	0	1	Conte et al. (2022)
Contiguity *ij*	Dummy that takes the value 1 if a country pair shares a common border	0.02	0.134	0	1	Conte et al. (2022)
Dependency ratio i (ln)	Measured as the ratio between individuals with age below or equal to 14 and those over 64 over the workforce (in log)	−0.38	0.31	−1.82	0.21	UNDESA (2022)
Violence i (ln)	Sum of the number of episodes of political violence at origin; as in Beine and Parsons (2015) this variable is calculated as the sum of the number of episodes of political violence at origin over previous ten-year period before migration flow is observed (in log)	0.92	1.41	0	4.91	Center for Systemic Peace (2022)

Source: authors' construction based on stated sources.

3.2 Estimation results

Does inequality in origin and destination countries shapes international migration? Comparing the distribution of Gini coefficients of origin and destination countries, there is evidence of a difference in the inequality characteristics of the dyads of the migration corridor. Considering the pairs of countries for which there is non-missing migration flow, Figure 1 shows that origin countries have a Gini index distribution that is right-shifted compared with that of destination countries. This is also confirmed by comparing the average Gini index for the two groups of countries: the average for origin countries is 43.08 while the average for destination countries is 41.35. The difference between these values is statistically significant at 1 per cent, according to a two-sided Student's t-test.

Figure 1: Distribution of Gini indices in origin and destination countries



Note: density is weighted on migration flows.

Source: authors' own illustration based on data from Standaert and Rayp (2022).

Our results, based on the full sample of countries and reported in Table 2, suggest that the answer to the question of whether inequality in origin and destination countries shapes international migration is affirmative. In Column 1, we include the Gini index for both origin and destination countries. The estimated coefficient for inequality at origin is positive and statistically significant, suggesting that an increase in the Gini index in the origin country is associated with an increase in bilateral outflows. In order to give a clear interpretation of the coefficients, let us assume an origin country experiencing a reduction in its Gini index, passing from 45.104 (the average value, reported in Table 1) to 45.088 (−0.016 is the average yearly difference in within-country inequality in the period under scrutiny). Such a reduction in inequality is associated with an increase of 2.162 in out-migration flows. Other measures of inequality produce qualitatively similar results. Higher inequality in the destination country has a strong and negative effect on bilateral migration flows.

More unequal societies, *ceteris paribus*, increase out-migration flows as people vote with their feet, but inequality also discourages migration inflow.

In Columns 2 to 7 we estimate models that include a rich set of fixed effects which deal with the issue of multilateral resistance to migration and allow us to control for other time-variant

confounding push and pull factors. More precisely Columns 2 and 3 include destination-by-year fixed effects which absorb time-variant pull factors and, as the main covariate, respectively, the (log of) Gini coefficient and the share of income of the bottom 40 per cent. The results confirm the higher propensity to migrate from unequal countries. An increase in the share of total income obtained by the bottom part of the income distribution is associated with a decline in out-migration (Column 3). This result is in line with theories of relative deprivation (Stark 2006; Stark and Taylor 1991).

When focusing on destination countries—i.e., including origin-by-year dummies as well as destination dummies—the estimated coefficient on the effect of inequality in the destination country is negative (Column 4) while a growing income share obtained by the bottom 40 per cent is positively associated with inflows (Column 5). The latter result is consistent with the fact that most immigrants end up in the lower tail of the income distribution in destination countries.

The estimates of Column 6 suggest that inequality dissimilarity—measured by the absolute value of differences in the Gini coefficients at origin and destination—is associated with an increase in bilateral migration. This latter finding reflects the role played by the change in relative inequality between the origin and destination; given the generally higher level of inequality at origin, a positive change in this covariate implies that the origin country became relatively more unequal than the destination country. This relative inequality effect adds to the direct effect of changes in the distribution in origins and destinations and suggests that immigrants live in a new space where their relative deprivation is assessed across borders. In other words, it is highly likely that migration shifts the 'reference points' of migrants, generating a new income ladder that includes people in both the country they left and the new one. The same results are confirmed when using an alternative measure of inequality dissimilarity which uses the share of income of the poorest 40 per cent of the population (Column 7).

Table 2: Inequality at origin and destination and bilateral migration flows: a gravity model (full sample; 1960–2019)

Dependent variable: bilateral migration flow (subsequent year, $t+1$)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gini index at origin (ln)	1.063***	1.071***					
	(0.148)	(0.118)					
Income share of bottom 40% at origin (ln)			−0.701***				
			(0.0852)				
Gini index at destination (ln)	−0.502***			−0.674***			
	(0.189)			(0.152)			
Income share of bottom 40% at destination (ln)					0.574***		
					(0.117)		
Inequality dissimilarity (abs|Gini_origin—Gini_dest|)						0.374***	
						(0.0618)	
Inequality dissimilarity (abs|Bottom40% income_origin—Bottom40% income_dest|)							0.270***
							(0.0443)
GDP per capita at origin (ln)	−0.225***	−0.215***	−0.187***				
	(0.0453)	(0.0393)	(0.0386)				
GDP per capita at destination (ln)	0.475***			0.424***	0.423***		
	(0.0590)			(0.0458)	(0.0456)		
Population at origin (ln)	−0.0305	0.0308	−0.00717				
	(0.112)	(0.114)	(0.112)				
Population at destination (ln)	0.152***			0.110**	0.115***		
	(0.0548)			(0.0432)	(0.0428)		
Bilateral distance (ln)	−0.439***	−0.433***	−0.429***	−0.419***	−0.418***		
	(0.0297)	(0.0290)	(0.0289)	(0.0298)	(0.0297)		
Migration network (ln)	0.625***	0.632***	0.633***	0.635***	0.635***	0.160***	0.164***
	(0.0223)	(0.0227)	(0.0226)	(0.0225)	(0.0225)	(0.00525)	(0.00531)
Commmon language	0.0758**	0.0642**	0.0603*	0.0466	0.0465		
	(0.0352)	(0.0316)	(0.0315)	(0.0312)	(0.0311)		
Contiguity	0.292***	0.287***	0.282***	0.322***	0.321***		
	(0.0511)	(0.0576)	(0.0576)	(0.0523)	(0.0522)		
Dependency ratio (ln)	−0.209	0.158	0.215**				
	(0.157)	(0.108)	(0.107)				
Violence (ln, no. of episodes)	−0.0283*	0.00653	0.00487				

	(0.0161)	(0.0126)	(0.0126)				
Constant	−2.381	2.229	8.511***	0.981	−3.172***	7.354***	7.306***
	(2.615)	(1.844)	(1.692)	(1.250)	(1.033)	(0.0630)	(0.0637)
Observations	1,352,750	1,338,620	1,348,813	1,363,119	1,370,511	1,399,051	1,412,538
Pseudo R2	0.797	0.862	0.861	0.846	0.846	0.945	0.944
Year FEs	Yes						
Origin-country FEs	Yes	Yes	Yes				
Origin-by-year FEs				Yes	Yes	Yes	Yes
Destination-country FEs	Yes			Yes	Yes		
Destination-by-year FEs		Yes	Yes			Yes	Yes
Dyadic FEs						Yes	Yes

Note: all models are estimated with PPML; standard errors clustered at dyadic level in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on data described in summary statistics.

It should be noted that Columns 6 and 7 include origin and destination by year fixed effects as well as pair fixed effects and hence the estimated coefficients capture variation of relative inequality within migration corridors.

The findings presented above are confirmed when looking at different inequality metrics—such as the Atkinson or the Theil indexes—and when using alternative estimators or specifying the dependent variable as migration rates.[20]

The general results highlighted above might mask some relevant heterogeneity across origin countries at different levels of development. In Table 3 we present estimates where we distinguish origin countries according to their income group, based on the standard World Bank classification (see Appendix B for the list of countries included in each group). The analysis of heterogeneous effects is relevant: greater migration pressure due to growing inequality at home might not necessarily translate into an increase in actual flows as the cost of international migration might be prohibitively high. In fact, individuals—in particular those living in poor countries—face liquidity and credit constraints that substantially reduce their geographical mobility. Growing inequality in origin countries where large shares of population have limited resources to emigrate usually works as push factor to migration. However, it might be the result of a further reduction in the resources of poorer people and paradoxically be negatively correlated with outward migration. Inequality at destination might produce heterogeneous effects too. The degree of selectivity of migration flows in terms of skills and human capital is highly heterogeneous across origin countries. Prospective migrants who expect to land in the bottom part of the income distribution—for instance due to low starting levels of human capital or a large waste of its transferability across borders—would prefer under a veil of ignorance a more equal society; this is more likely to be the case in migration flows originating from the South (i.e., low-income countries). On the other hand, emigration from richer countries is often highly selective towards the most talented individuals who, on the contrary, are more likely to end up in the higher part of the income distribution in destination countries. For skilled individuals, higher inequality might be associated with a relative improvement of their position in the income distribution with respect to their peers (or reference group) at origin and destination.

The results reported in Table 3 seem to corroborate the heterogeneous effects of inequality on international migration based on origin countries level of development.

In Columns 1 to 4 we test the effect of income inequality at the origin country for the different groups of countries, employing a model that includes origin-country dummies—to capture time-invariant features of the sending areas—and destination-by-year dummies—to capture the changes in the attractiveness of destination areas. Interestingly, the estimated coefficient of the Gini index is increasing in the income level of origin countries. For low- and lower-middle-income countries (respectively Columns 1 and 2), increasing inequality is associated with a negative and highly significant effect on out-migration. This result is likely to be the combined effect of two mechanisms. On one side is a 'better' positioning on the income ladder at home of those with the highest propensity to migrate, i.e., relatively rich individuals in poor countries (Clemens and Mendola 2020). This effect is in line with the relative deprivation hypothesis discussed in previous sections. On the other side, those individuals who 'fall back' on the income ladder have—due to the polarization of income—even fewer resources to undertake costly international mobility. The

[20] For the sake of brevity these estimates are not included in the main paper, but they are available from the authors' upon request.

negative effect is more pronounced for the poorest countries in the world, for which out-migration largely coincides with refugees' outflows in neighbouring areas (e.g., Syria, Afghanistan, Uganda, Sudan, Somalia, Eritrea). The 'inequality push' comes back in countries at a higher level of development—upper-middle-income (30 per cent of total migration flows in the considered period) and high-income countries (19.5 per cent of total flows). These groups include countries with large migration networks and/or geographically close to richer destination countries for which out-migration is relatively less costly (e.g., Albania, Mexico, China, Lebanon).

Inequality at destination also matters in a highly different way across origin countries at different levels of development (Columns 5 to 8). The estimated coefficient on the (log of) Gini index at destination countries is not statistically significant when we restrict the analysis to outflows from low-income and lower-middle-income countries. But the coefficient turns negative and statistically significant for countries belonging to the upper-middle-income group that are less affected by severe and widespread barriers to out-migration and whose migrants are more likely (compared with those from richer origins) to land in the bottom part of the income distribution. Inequality at destination is positively associated with out-migration from rich countries. As discussed above, this is likely to be driven by the positive self-selection associated with North–North migration flows; migrants from rich countries experience a reduced 'brain waste' due to the cross-border transferability of skills.

Table 3: Inequality and migration: the role of income level in origin countries (1960–2019)

	Inequality in origin country				Inequality in destination country			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income group of origin country	Low income	Lower-middle income	Upper-middle income	High income	Low income	Lower-middle income	Upper-middle income	High income
Gini index at origin (ln)	−2.512***	−1.476***	1.189***	1.698***				
	(0.529)	(0.172)	(0.175)	(0.170)				
Gini index at destination (ln)					0.0240	−0.166	−1.433***	0.751***
					(0.332)	(0.255)	(0.223)	(0.181)
GDP per capita, origin (ln)	−0.430***	0.233***	−0.0741	−1.110***				
	(0.0817)	(0.0469)	(0.0633)	(0.0801)				
Population, origin (ln)	2.059***	0.600***	0.568***	−1.226***				
	(0.523)	(0.135)	(0.149)	(0.122)				
GDP per capita, destination (ln)					0.149	0.0975*	0.593***	0.719***
					(0.109)	(0.0556)	(0.0699)	(0.0627)
Population, destination (ln)					−0.848***	0.0441	0.140**	0.0734
					(0.114)	(0.0538)	(0.0652)	(0.0730)
Bilateral distance (ln)	−0.980***	−0.398***	−0.311***	−0.409***	−0.951***	−0.477***	−0.351***	−0.368***
	(0.110)	(0.0467)	(0.0489)	(0.0276)	(0.162)	(0.0403)	(0.0445)	(0.0246)
Migration network (ln)	0.353***	0.727***	0.657***	0.531***	0.322***	0.701***	0.643***	0.540***
	(0.0545)	(0.0234)	(0.0392)	(0.0206)	(0.0735)	(0.0169)	(0.0338)	(0.0164)
Commmon language	0.478***	0.238***	0.263***	0.501***	0.509***	0.311***	0.335***	0.538***
	(0.0909)	(0.0292)	(0.0751)	(0.0372)	(0.0848)	(0.0334)	(0.0719)	(0.0374)
Contiguity	1.588***	0.177***	0.371***	−0.0351	1.511***	0.164***	0.260***	−0.0723
	(0.180)	(0.0620)	(0.0901)	(0.0548)	(0.223)	(0.0584)	(0.0666)	(0.0504)
Dependency ratio (ln)	−0.572	0.472***	0.446***	−1.377***				
	(0.395)	(0.151)	(0.155)	(0.168)				
Violence (ln, no. of episodes)	0.093***	0.080***	−0.084***	0.008				
	(0.0308)	(0.00924)	(0.0220)	(0.0164)				
Constant	−9.682	−3.441	−9.879***	30.26***	24.37***	3.165*	0.734	−6.584***
	(6.459)	(2.647)	(2.921)	(2.509)	(3.268)	(1.917)	(1.783)	(1.712)

Observations	169,958	317,458	303,539	401,605	262,943	482,855	493,593	663,581
Pseudo R2	0.913	0.937	0.911	0.811	0.871	0.896	0.893	0.790
Origin-country dummies	Yes	Yes	Yes	Yes				
Destination-by-year dummies	Yes	Yes	Yes	Yes				
Origin-by-year dummies					Yes	Yes	Yes	Yes
Destination-country dummies					Yes	Yes	Yes	Yes

Notes: dependent variable is bilateral migration flow (subsequent year, t+1); the list of countries in each group is reported in Appendix B; all models are estimated with PPML; standard errors clustered at dyadic level in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' construction based on data described in summary statistics.

The models reported in Table 3 include the same covariates employed for the full sample above. We find that growth of GDP per capita at origin reduces migration outflows for both low-income and high-income countries but the effect is the opposite for lower-middle-income countries—most likely due to a reduction in financial constraints in countries with a relatively lower migration cost. For upper-middle-income countries, the sign of the coefficient is negative but not statistically significant. An increase in population in the origin country is associated with larger bilateral flows for countries at lower levels of development; the effect decreases with increases in level of income and turns negative for rich countries. Economic growth at destination is, as expected, positively associated with migration inflows; our results suggest that migrants from rich countries—which are less constrained by migration barriers—are more sensitive to pull factors such as income differentials. Population growth in low-income destinations is negatively associated with inflows.

Bilateral distance discourages flows, with a significantly stronger effect for migrants from low-income countries: additional evidence of the very high migration barriers faced by individuals in poor countries. All other bilateral covariates—migration networks, common languages, and border contiguity—have the expected signs. Demographic push factors are also captured by the dependency ratio—measured as the sum of individuals below the age of 15 and those aged over 64 years over the working-age population—which is positively related to out-migration only for countries with intermediate levels of development. Finally, the number of violent episodes in origin countries increases outflows for countries in the low- and lower-middle-income groups while the effect is, surprisingly, negative for upper-middle-income countries and not statistically significant for the richest ones.

4 Migration and inequality between and within countries: a simple accounting exercise

The movement of people across borders has both direct and indirect effects on the income distribution of both origin and sending countries. Direct effects, those we investigate in this section, relate to the change in income of the migrants themselves and strictly depend on the positions in the income distribution that they depart from (in the origin country) and arrive in (in the destination country). Here we abstract from indirect effects—that is, the change in average income generated by migration due, for instance, to productivity changes or remittances—which are likely to be highly heterogeneous across countries and relatively small due to the limited size of international migration flows.[21]

In what follows, we briefly describe our methodological approach and then present the empirical results.

4.1 Methodology and data

Our goal is to compare global inequality in a *world with migration* with the inequality computed in a hypothetical income distribution of a *world without migration*. As international migration affects income distribution between and within countries, we measure inequality with the Theil index, which belongs to the family of generalized entropy (GE) inequality indexes. All members of the

[21] Clearly, the indirect effects might be relevant for some specific countries, in particular for small countries with large diasporas. Given the global nature of our analysis and the converging findings of the migration literature on the small effects of migration on involved economies (for instance on wages of 'natives' and those left behind), we believe that the indirect effects (as argued by Kapur and McHale 2009) are likely to be contained.

GE family are perfectly decomposable in within and between elements and this is the reason why the Theil index has been the most used measure of inequality.

In our baseline specification, the definition of country is based on birth rather than residence. Hence, we consider the diaspora as part of the income distribution of origin countries and not as part of that of destination countries.[22]

By relying on income data by decile, we identify the income distribution of a country i at time t (D_{it}) in the (observed) *world with migration* as follows:

$$D_{it} = \underbrace{\bigcup_{h=1}^{10} n_{it,h} Y_{it,h}}_{income\ distribution\ of\ natives} , \underbrace{\bigcup_{d=1}^{10} \bigcup_{j=1}^{J} em_{ijt,d} Y_{jt,d}}_{income\ distribution\ of\ diaspora} \quad (5)$$

where the distribution of income is given by a weighted distribution of incomes of 'natives' and emigrated population (or diasporas). The first part of Equation 5 represents the income of a country's 'native' population that resides at home while the second part represents the income generated by the global diaspora. $Y_{it,h}$ is the average income of the h^{th} decile of country i's distribution at time t, with $n_{it,h}$ being its weight, corresponding to the number of 'natives' (decile's population minus the stock of immigrants in the income distribution's decile). $Y_{jt,d}$ is the average income of the d^{th} decile of country j's distribution at time t ($j \neq i$), with $em_{ijt,d}$ being its weight, corresponding to the country i's diaspora in decile d in country j.

We use the WIID database (UNU-WIDER 2021), which contains information on the average income by decile for 209 countries between 1950 and 2019 to compute $Y_{it,h}$ and $Y_{jt,d}$. Information on the size of diasporas between 1990 and 2019 is taken from UNDESA (2022).

A crucial element for computing Equation 5 is the definition of the income associated with individuals belonging to diasporas. While Kapur and McHale (2009) employ Clemens and Pritchett's (2008) estimates of 'income per natural', which reflect the average performance of migrants in the US economy,[23] we adopt a different approach to allocate diasporas to different deciles of the destination-country income distribution.

We use the approach of Binetti and Coniglio (2019), which combines micro-level data from the following two sources to estimate where migrants from different origin countries are placed in the income distribution of OECD destination countries: (1) Database on Immigrants in OECD Countries (DIOC) 2010/2011; (ii) EU Statistics on Income and Living Conditions (EU-SILC) 2011.

The DIOC includes data on selected demographic and labour market characteristics of the population (both 'native' and foreign-born) of 33 OECD countries in order to offer reliable

[22] This choice has the computational advantage of keeping the size of countries in the two scenarios identical. The theoretical argument behind this choice rests on the underlying assumption of the relative deprivation hypothesis (which posits that migration is a strategy for climbing the ladders of the home-country income distribution) but also on the evidence that the majority of migrants return to their origin countries. Alternative estimates based on different definitions of countries, where all or some of the migrants belong to the income distribution of the destination countries, are also reported.

[23] Income per natural is computed using a model for estimating the average income in the US for migrants from each sending country. The estimate, based on origin-country characteristics and distance from the US, is then adjusted on the basis of the ratio between each receiving country's GDP per capita and that of the US. See Kapur and McHale (2009) for details on the use of these estimates in their analysis.

information on migrants (taking into account the country of origin) and make them comparable between countries (see Arslan et al. 2014). The DIOC 2010/2011 has information on immigrants from more than 200 countries of origin and is composed of four separate files, dealing with different topics: age and nationality, duration of stay, labour force status, and occupation. As income by country of origin is not recorded in the DIOC, we estimate the income of employees and the probability of employment using EU-SILC data (Coniglio and Binetti 2019).[24] The last step of this procedure is to compute the distribution of 'natives' and immigrants across the income deciles of all OECD destination countries. The resulting distributions are then used to associate the respective income level in Equation 5 to each bilateral diaspora.[25]

In our counterfactual *world without migration*, our hypothesis is that diasporas would 'return' to the origin country and earn an income which is equal to that of the average decile which they have likely departed from. Such a counterfactual income distribution is specified as follows:

$$\widetilde{D}_{it} = \underbrace{\bigcup_{h=1}^{10} n_{it,h} Y_{it,h}}_{income\ distribution\ of\ natives} , \underbrace{\bigcup_{h=1}^{10} \bigcup_{j=1}^{J} \boldsymbol{em_{ijt,h} Y_{it,h}}}_{income\ distribution\ of\ diaspora} \quad (6)$$

The difference between Equation 5 and Equation 6 is given by the second part of these equations, as we assume in the exercise presented below that the average income by deciles ($Y_{it,h}$) is not altered by migration and that the weights for the diaspora's income distribution ($\boldsymbol{em_{ijt,h}}$) are estimated according to the propensity to emigrate.

We use information on the propensity to migrate by income decile as measured by Clemens and Mendola (2020) using Gallup data on migration intentions. This approach provides a realistic and plausible allocation within the origin-country income distribution which mimics the self-selection of out-migration flows as proxied by migration intentions.

Finally, we measure and compare the Theil indexes of the two global income distributions, $F(D_{it})$ and $F(\widetilde{D}_{it})$, in the period 1990–2019 in order to measure the within and between effects on global inequality of current international migration flows. Apart from the main scenarios introduced—*world with migration* (actual migration, for which diaspora incomes are used to compute source countries' inequality, A1) and *world without migration* (counterfactual, C1)—we extend our analysis to further scenarios for both actual migration (considering diasporas in the income distribution of destination countries, A2) and counterfactual. For the latter, we compute inequality by adopting naïve alternative scenarios. These are (1) a scenario in which the diaspora is entirely allocated to the destination country's 1st income decile (*migration towards bottom decile*, C2); (2) a scenario in which diaspora figures are doubled by preserving the same inter-decile distribution (*doubled migration*, C3);

[24] The EU-SILC database contains comparable cross-sectional microdata on structural indicators of social cohesion, such as income, poverty, social inclusion, living conditions, labour, education, and health in both monetary and non-monetary terms for households and individuals (Eurostat data, obtained privately) living in 29 countries (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom).

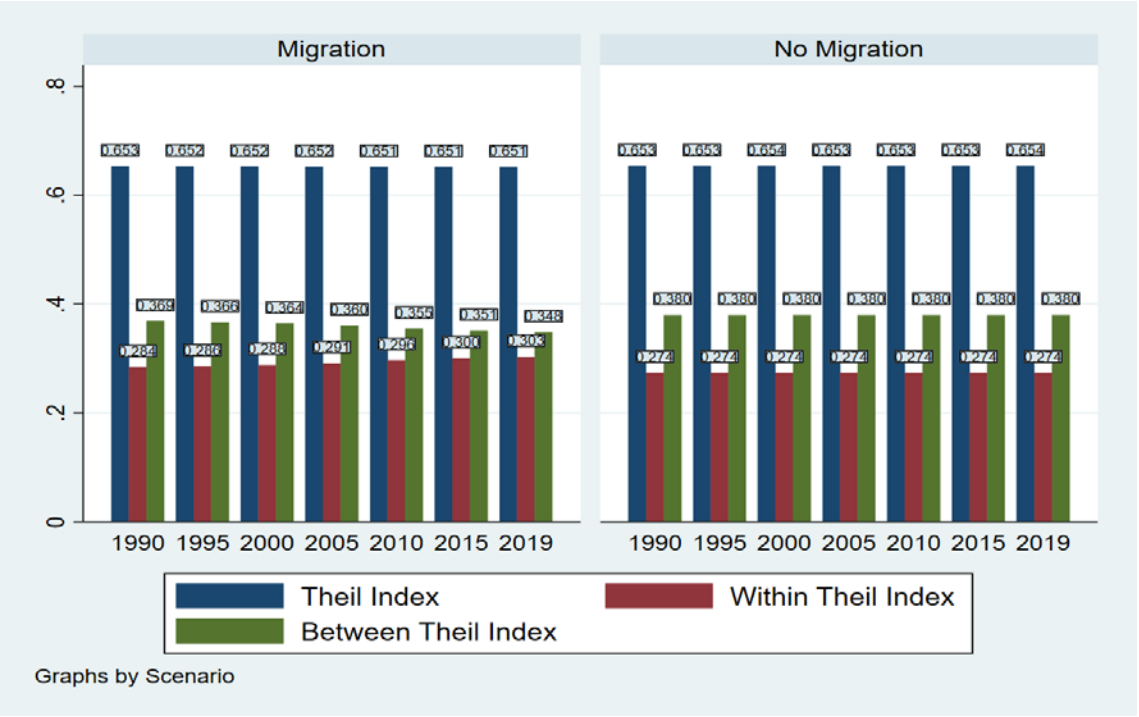
[25] Using EU-SILC data, we specify and estimate country-of-destination-specific Mincer equations where we control for education, occupation, gender, and region of origin. The estimated parameters are subsequently used to compute a predicted labour income for migrants in all OECD countries. Finally, correcting the estimates by the probability of employment (using country-of-destination-specific probit models), we analyse the distribution by decile of 'natives' and migrants from eight macro areas (Central and Latin America, Asia, Europe, Middle East and North Africa, North America, Oceania, Other European countries, Sub-Saharan Africa). Methodological details are reported in Binetti and Coniglio (2019).

and (3) a scenario in which the diaspora is entirely allocated to the destination country's 10th income decile (*migration towards top decile*, C4).[26]

4.2 Empirical results

Figure 2 shows the over-time evolution of Theil indexes of inequality for the two main scenarios depicted in the previous paragraph: a world without migration as opposed to a world with the observed level of migration. The overall measure computed on the global income distribution shows that the level of inequality in 1990 was similar in both the actual (migration, A1) and the counterfactual (no migration, C1) cases. In the period under scrutiny, even though slightly, the Theil index in the migration scenario decreased while the inequality measure in the counterfactual situation slightly increased. These dynamics are the result of two diverging phenomena that took place in the last 30 years. Although not clear from Figure 2, in the world without migration inequality has remained rather stable (from 0.65342 in 1990 to 0.65350 in 2019). In the world with migration, represented in the left panel of Figure 2, global inequality has decreased thanks to a reduction in the income differences between countries. In fact, the overall Theil index has decreased to 0.65093 as a result of the monotonic decrease of the between-country index (from 0.36852 in 1990 to 0.34781 in 2019), partially compensated for by the monotonic increase in the within-countries measure (from 0.28416 in 1990 to 0.30301 in 2019).

Figure 2: Theil index of inequality: over-time evolution of overall, between, and within measures



Source: authors' illustration based on data sources described in Section 4.1.

Figure 3 provides a comparison between alternative scenarios for 2019, the last year available for the analysis. The only scenario showing a significant impact in both the overall and the within Theil indexes is the fictitious one in which we adopt the hypothesis that diasporas are in the top decile of destination countries' income distributions (C4). Although this scenario is highly

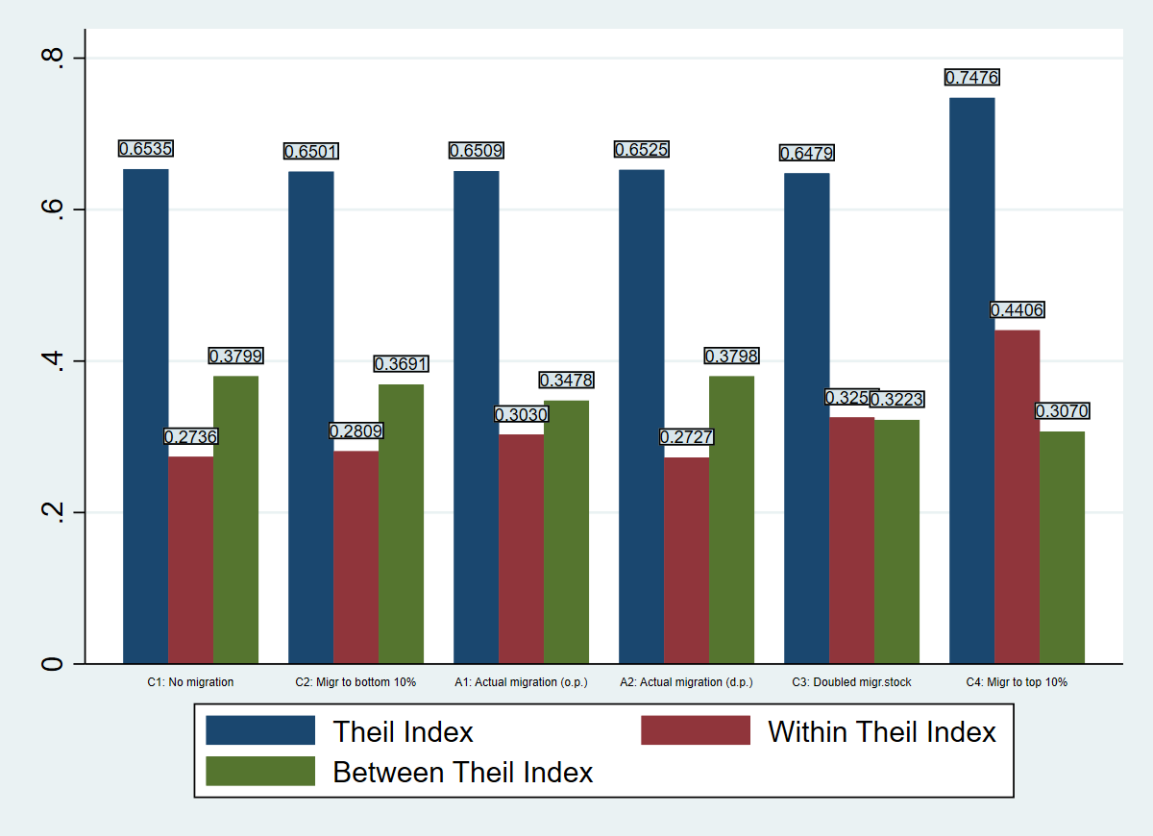
[26] The impact of counterfactual scenarios C2, C3, and C4 is estimated by assuming the origin-country perspective, i.e., including fictious diaspora in origin countries' income distribution.

unrealistic, it serves to provide an upper-bound potential effect of the current level of international migration on global inequality. This scenario is associated with the largest increase in within country inequality, as individuals would significantly increase their relative position in the origin-country income distribution via migration. On the other hand, international migration would have a potentially strong effect on the reduction of between-country inequality. The simulation suggests that the first effect prevails. The scenario with the highest level of between-country inequality is the *no migration* scenario (C1). Figure 3 shows that by introducing migration and assuming that diasporas will locate themselves in the bottom decile in destination (C2), countries would reduce between-country inequality and slightly increase within-country inequality.

Moving to the scenario that respects the actual distribution of diasporas (A1), we find a further decrease in between-country inequality and increase in within-country inequality. On the other hand, in the case of the adoption of the destination-country perspective, i.e., including emigrated people in the destination country's income distribution (A2), the values for the three measures of inequality are very close to those of the counterfactual *world without migration* (C1).

Interestingly, doubling the stock of migrants observed in the world in 2019 would have a limited impact on global inequality—the Theil index moves from 0.6509 to 0.6479—as the further reduction in between-country inequality would be largely neutralized by an increase in the within-country component. Kapur and McHale (2009), looking exclusively at the between component of global inequality, argue that the modest inequality-reducing effect of migration is due to its modest absolute size. Our analysis shows that even a large increase in total migration will not significantly alter global inequality due to the asymmetric effects of international migration on the between and within component of inequality, in particular when adopting a destination-country perspective.

Figure 3: Theil index of inequality: overall, between, and within measures in 2019 by alternative scenarios



Source: authors' illustration based on data sources described in Section 4.1.

Table 4: Countries with decreasing inequality (period 1990–2019)

Country	Gini index: current migration	Gini Index: no migration	% change in Gini index due to migration
Most-affected countries			
Syria	0.61	0.35	75.44
Micronesia	0.69	0.39	74.49
Marshall Island	0.68	0.42	62.49
Tuvalu	0.64	0.39	61.52
Tonga	0.61	0.39	59.04
Yemen	0.58	0.39	50.96
Samoa	0.59	0.39	50.02
Eritrea	0.75	0.53	41.80
Afghanistan	0.63	0.45	40.78
Kiribati	0.52	0.37	39.58
Liberia	0.69	0.50	38.89
Nauru	0.47	0.34	38.11
El Salvador	0.55	0.40	38.04
Cambodia	0.45	0.33	36.09
Kyrgyzstan	0.42	0.31	35.83
Gambia (the)	0.67	0.50	34.82
Nepal	0.62	0.46	33.94
Somalia	0.69	0.53	29.90
Tajikistan	0.46	0.36	28.91
Fiji	0.50	0.40	24.57
Laos	0.45	0.37	23.77
Haiti	0.72	0.59	23.05
Least-affected countries			
Turkey	0.421	0.420	−0.38
South Africa	0.647	0.648	0.08
USA	0.404	0.405	0.17
Chile	0.468	0.469	0.20
Paraguay	0.470	0.471	0.23
Oman	0.401	0.402	0.24
Brazil	0.499	0.500	0.26
Japan	0.321	0.322	0.31

Source: authors' construction based on data sources described in Section 4.1.

Table 4 reports the Gini indexes[27] for a sample of countries computed under the alternative scenario, without migration (counterfactual C1), and with the current level of migration as measured in 2019 (A1). For some countries with a large diaspora in countries with substantially higher average income, international migration greatly affects within-country inequality (measured on the basis of country of birth and not country of residence, i.e., excluding immigrants and including emigrants). Clearly the increase in inequality is the other side of the coin of a very large increase in income associated with migration. This is the case for countries with extremely high migration pressures due to conflicts (Syria, Eritrea, Somalia) but also micro-states with large diasporas (e.g., Micronesia, Tuvalu, Tonga, and Samoa).

The bottom of the table shows countries for which in- and out-migration have a very small or even negative effect on within country inequality (e.g., Turkey, South Africa, USA). In these countries the direct effect of migration do not alter significantly the position of the population in the income ladder.

5 Concluding remarks

In this paper we have explored the links between international migration and income inequality. First, we proposed a conceptual framework to model migrant choices about where, and whether, to migrate, where inequality in both the origin and the destination countries does play a role. By employing the 'original position' device introduced by Rawls (1971), we explored the isomorphism between the analysis of risk and the analysis of inequality and we showed how rational individuals endowed with standard utility function might prefer, *ceteris paribus*, countries characterized by less inequality over more unequal countries. This theoretical conjecture is confirmed by our empirical results. We estimate a set of models on the determinants of bilateral out-migration from a large pool of origin and destination countries for the period 1960–2019. In particular, we employ specifications which include a rich set of fixed effects that allow us to identify, through within-country variation, the role of inequality at both ends of migration corridors (see Bohme et al. 2020; Beine et al. 2016). The results show a significant role played by inequality in explaining the international migration flows. When considering low-income countries, we find that an increase in inequality reduces the magnitude of emigration, probably because a higher level of inequality in poor countries improves the position on the income ladder of those individuals who have the resource to migrate. In fact, the share of national income held by the poorest 40 per cent of the population is negatively associated with bilateral migration flows for all origin countries except low-income ones, where the cost of international migration is prohibitive for the large majority of the population.

In the second part of this study, we explored the direct effect of international migration on global inequality (between and within countries): how the current level of migration in the world has affected income inequality between and within nations. In order to compute measures of inequality with or without international migration, we considered countries as composed of individuals who were born there, wherever they reside. In other words, we considered diasporas as part of the origin country (in line with the idea of relative deprivation posed by the new economics of labour migration; Stark 1993). Hence, we explicitly considered the likely distribution of diasporas in the income deciles of destination countries and, associated with them, the respective income decile levels as measured in the WIID. This procedure allowed us to compute inequality measures—both

[27] The Gini indexes reported in Table 4 underestimate the actual level of inequalities, as they are computed on the basis of average income for each decile (i.e. the inter-decile differences in income are not considered).

within and between countries—for the world we observe—that is, with the current level of international migration as measured by the UN database on bilateral migration stocks (UNDESA 2022). We compared these measures with hypothetical distributions of income representing a 'world without migration' where members of diasporas 'return' to their origin countries in the decile of the distributions from which they have likely moved. These admittedly rather restrictive assumptions serve the goal of providing plausible ranges of the impacts of current levels of international migration on global inequality.

The results show that international migration has led to a marginal reduction in global inequality. As migration stocks were quantitatively limited in 1990, the initial effects were negligible. Growing migration flows increased the magnitude of the inequality-reduction effects of migration but the size of these effects is still rather small. On the contrary, international migration has had a more substantial impact on the composition of inequality: the reduction in between-country income differences has been almost completely neutralized by an increase in the within-country component. The growth of internal inequality is driven by what naturally happens with international migration between poor and rich countries, as migrants (and their families) tend to earn considerably more than non-migrants. This increase in inequality is often highly visible in areas of poor countries where international migration is a pervasive phenomenon.

While this paper provides interesting and new insights on the relationship between inequality and migration, it also opens new potential routes of investigation.

On the first direction of the nexus, i.e., the effect of inequality on migration choices, while it is reasonable to assume that the migrant, under a veil of ignorance about where they will sit in the distribution of the destination country, will prefer a more equal distribution—as it is less risky than a more unequal one—it could also be the case that they evaluate the future perspective of their position in the distribution. That is to say, in addition to the current shape of the distribution, the potential migrant could consider how easy or hard is to move along the distribution over time, and hence the dynamics of the income distribution which characterize the countries of destination. More precisely, countries providing more-equal opportunities, and hence positive perspectives of upward mobility, could be more attractive to the potential migrant (there is abundant anecdotal evidence in this respect, with respect to past waves of international migration). It could be interesting to test this conjecture empirically.

Another avenue for further research would be that of considering the potential heterogeneous effects of inequality for skilled and unskilled migrants. In fact, the theoretical mechanisms highlighted in this paper might have a stronger effect on the mobility of unskilled workers, or skilled workers for whom the transfer of human capital is more costly—who are more likely to end up in the lower part of the income distribution in destination countries.

Our empirical exercise, aimed at assessing the impact of international migration on global inequality, provides plausible quantification of the direct effects. Given the quantitatively rather limited size of global migration flows, we believe that our results provide a useful benchmark but, admittedly, our approach might provide biased results for specific countries.[28] We acknowledge that the approach employed in the paper can be further enriched with more-complex assumptions on the indirect effects of migration (e.g., changes in average growth at different deciles in the

[28] This is the main reason why we abstain from presenting results of changes in our computed measures of inequality for single countries. As the direction of the bias depends on the relative effects of migration on income (and its distribution) in both origin and destination countries, based on what we know from the migration literature, it is likely that the overall bias in our estimates which comprise all countries in the world is rather limited.

absence of migration, the role of remittances). We leave these interesting avenues for enriching the analysis to future research.

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Appendix A: Data sources of variables adopted

Variable	Description	Source
Bilateral migration flows	Total annual outflows of migrants	Standaert and Rayp (2022)
Gini index at origin	Gini index for origin country	UNU-WIDER (2021)
Gini index at destination	Gini index for destination country	UNU-WIDER (2021)
Income share of bottom 40% at origin	Share of income generated by bottom 40% of origin-country population (%)	UNU-WIDER (2021)
Income share of bottom 40% at destination	Share of income generated by bottom 40% of destination-country population (%)	UNU-WIDER (2021)
GDP per capita at origin	Per capita gross domestic product of origin country	World Bank (2022)
GDP per capita at destination	Per capita gross domestic product of destination country	World Bank (2022)
Population at origin	Population of origin country	World Bank (2022)
Population at destination	Population at destination country	World Bank (2022)
Bilateral distance	Population weighted bilateral distance between origin and destination country	Standaert and Rayp (2022)
Migration network		Standaert and Rayp (2022)
Common language	Dummy variable equal to 1 if origin and destination country speak the same language	Standaert and Rayp (2022)
Contiguity	Dummy variable equal to 1 if origin and destination country share a border	Standaert and Rayp (2022)
Dependency ratio	Sum of individuals below the age of 15 and those over 64 years old over working-age population in origin country	Standaert and Rayp (2022)
Violence	Number of violent episodes in origin country	Standaert and Rayp (2022)
Atkinson index, destination	Atkinson index of destination country	UNU-WIDER (2021)
Theil index, destination	Theil index of destination country	UNU-WIDER (2021)
Atkinson index, origin	Atkinson index of origin	UNU-WIDER (2021)
Theil index, origin	Theil index of origin	UNU-WIDER (2021)

Data sources for counterfactual exercise:

Data on 'intention to migrate' by income deciles based on Gallup World Poll database (obtained privately).

OECD (2022). 'Database on Immigrants in OECD and non-OECD Countries: DIOC'. Available at:: www.oecd.org/els/mig/dioc.htm (accessed October 2022).

Global Bilateral Migration Database: Özden et al. (2011).

WIID: UNU-WIDER (2021).

Appendix B: Countries included in the analysis on the determinants of bilateral migration (total 161)

Low income	Lower-middle income	Upper-middle income	High income
Afghanistan	Algeria	Albania	Australia
Burkina Faso	Angola	Argentina	Austria
Burundi	Bangladesh	Armenia	Bahrain
Central African Rep.	Benin	Azerbaijan	Belgium
Chad	Bhutan	Belarus	Canada
Congo; Dem. Rep.	Bolivia	Bosnia and Herzegovina	Chile
Eritrea	Cabo Verde	Botswana	Croatia
Ethiopia	Cambodia	Brazil	Cyprus
Gambia; The	Cameroon	Bulgaria	Czech Rep.
Guinea	Comoros	China	Denmark
Guinea-Bissau	Congo; Rep.	Colombia	Estonia
Haiti	Côte d'Ivoire	Costa Rica	Finland
Liberia	Djibouti	Cuba	France
Madagascar	Egypt; Arab Rep.	Dominican Rep.	Germany
Malawi	El Salvador	Ecuador	Greece
Mali	Ghana	Equatorial Guinea	Hungary
Mozambique	Honduras	Fiji	Ireland
Niger	India	Gabon	Israel
Rwanda	Kenya	Georgia	Italy
Sierra Leone	Kyrgyz Rep.	Guatemala	Japan
Somalia	Lao People's Dem. Rep.	Guyana	Korea; Rep.
Sudan	Lesotho	Indonesia	Kuwait
Syrian Arab Rep.	Mauritania	Iran; Islamic Rep.	Latvia
Tajikistan	Moldova	Iraq	Lithuania
Togo	Mongolia	Jamaica	Luxembourg
Uganda	Morocco	Jordan	Mauritius
Yemen; Rep.	Myanmar	Kazakhstan	Netherlands; The
	Nepal	Lebanon	New Zealand
	Nicaragua	Libya	Norway
	Nigeria	Malaysia	Oman
	Pakistan	Mexico	Panama
	Papua New Guinea	Namibia	Poland
	Philippines	Paraguay	Portugal
	Senegal	Peru	Qatar
	Solomon Islands	Russian Federation	Romania
	Sri Lanka	South Africa	Saudi Arabia
	Swaziland	Suriname	Singapore
	Tanzania	Thailand	Slovak Rep.
	Timor-Leste	Turkey	Slovenia
	Tunisia	Turkmenistan	Spain
	Ukraine	Venezuela	Sweden
	Uzbekistan		Switzerland
	Vietnam		Taiwan
	Zambia		Trinidad and Tobago
	Zimbabwe		United Arab Emirates
			United Kingdom
			United States of America
			Uruguay

Total: 27	Total: 45	Total: 41	Total: 48

Source: authors' construction based on own empirical analysis.