Gender Inequality and Emigration: Push factor or Selection process?

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Abstract

Our objective in this research is to provide empirical evidence relating to the linkages between gender equality and international emigration. Two theoretical hypotheses can be made for the purpose of analyzing such linkages. The first is that gender inequality in origin countries could be a push factor for women. The second one is that gender inequality may create a "gender bias" in the selection of migrants within a household or a community. An improvement of gender equality would then increase female migration. We build several original indices of gender equality using principal component analysis. Our empirical results show that the push factor hypothesis is clearly rejected. All else held constant, improving gender equality in the workplace is positively correlated with the migration of women, especially of the high-skilled. We observe the opposite effect for low-skilled men. This result is robust to several specifications and to various measurements of gender equality.

Keywords:
Migration, Gender Inequality, core labor standards
JEL code:
F22, J61, J71

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1. INTRODUCTION

Gender inequality is a worldwide phenomenon and one of the most persistent forms of inequality. Achieving gender equality and women's empowerment is a key aspect of development. It is one of the Millennium Development Goals adopted in 2000 by the United Nations. While the influence of gender inequality in education or at the workplace on economic growth has been widely studied,[2] it remains to consider carefully how it may also affect other individual or collective behavior. One specific aspect is a possible impact on migration behavior.

When considering non-wage motivations for migration, little attention has been given to working conditions (in a broad sense, including social security, unemployment insurance...), and when it has, the interest has been focused on the working conditions in destination countries, considered as pull factors. Nevertheless, poor working conditions in source countries could also be considered as push factors. In this article, we propose to address the issue of the linkages between gender equality and emigration.

More precisely, we focus on gender inequality *in the work place*, which is only one part of the entire phenomenon. As it is stated in the last ILO Report devoted to this issue (ILO, 2007, p.1), "*like any other social institutions, the labour market and its institutions are both a cause of and a solution to discrimination. In the workplace, however, discrimination can be tackled more readily and effectively*". Since labor market characteristics have a central role in the migration decision process, our primarily focus of interest is on this specific aspect of gender inequality.

Literature on migration has focused on several gender-related issues. Ravenstein (1885, 1889) edicted seven "laws of migration". The fifth law, as enumerated by Lee (1966), states that "*females appear to predominate among short journey migrants*" (Ravenstein, 1889, p.288 and Lee, 1966, p.48). However, in this last paper (p.51), Lee describes female migrants as mostly dependent movers: "*not all persons who migrate reach that decision themselves. Children are carried along by their parents, willy-nilly, and wives accompany their husbands though it tears them away from environments they love*". As Lauby and Stark (1988) noted, this presumption may explain why migration studies have "*focused on the movement of men, on the assumption either that men are the decision makers in the migration process and women are tied movers, or, if women migrate alone, that they follow the same routes, are motivated by the same considerations and experience the same consequences as do male migrants*". The scope of investigation broadened in the 80s due to the "feminization of international labor migration"[3] observed during the period, and a

[2] See for instance Behrman, Foster, Rosenzweig, and Vashishtha (1999) or Klasen (2002) on discrimination in education and Forsythe, Korzeniewicz, and Durrant (2000), Seguino (2000), Lagerlof (2003) or Klasen and Lamanna (2009) on the influence of gender equality at work.

[3] The term "feminization" is however contentious, as noted by Jolly and Reeves (2005),

new interest for this issue emerged. Women migrants were not viewed as "tied movers" anymore, and the literature considered the dynamics of collective behavior within the household or the community. One such example is the article by Lauby and Stark (1988) on the rural-urban migration of young women in the Philippines (see also Pedraza, 1991, for a survey of the literature on international migration of women). More recently, the World Bank published a book on the international migration of women (Morrison, Schiff, and Sjöblom, 2007) that addresses the issues of gendered determinants of migrations, the impacts of remittances on sending countries and the labor market participation of female migrants in the United States. The idea - first expressed by Ravenstein (1885) - that women were more migratory than men, at least over short distances, has recently known a renewal of interest. (Dumont, Martin, and Spielvogel, 2007) and (Docquier, Lowell, and Marfouk, 2009) have shown that skilled women exhibit higher emigration rates than skilled men. Dumont et al. (2007) also consider the gender dimension of the brain drain. Docquier et al. (2010) uses a more sophisticated model with interdependencies between decisions made by males and females. They show that if the pairing between men and women is an assortative, matching process (i.e. men with a high school education match with women having the same educational level), and if we take into account that under family reunion programs women tend to follow men more intensively than the other way round, then the hypothesis that skilled women are more migratory than skilled men must be rejected on the basis of existing data. However, very few studies focus on the linkages between gender *inequality* and migration.[4] This research is an attempt to fill this gap.

In his study of migration from Mexico, Kanaiaupuni (2000, p.1337) states that "*educated women experience great gender discrimination and few occupational rewards in Mexico and, therefore, may be more likely to migrate across the*

because women already made up nearly half of the migrants several decades ago. For example, in 1960, female migrants accounted for 47% of the total, as compared to 49% in 2000. However, the feminization also consists in a qualitative change in female migration patterns, including both "*young single women and female family breadwinners, who move both independently and under the authority of older relatives*" (Sorensen, 2005). The so-called feminization should therefore be understood as an increase in individual migrations decided alone - for example to look for a job - rather than as accompanying male family members (Jolly and Reeves, 2005). In addition, globalization and development of information and communication technologies (ICTs) in the 90s and 2000s should have accelerated this qualitative feminization: *"Growth in export and ICT-enabled sectors, together with a decline in the importance of physical strength and a rise in the importance of cognitive skills, has increased the demand for female labor"* (World Bank, 2012).

[4] As a matter of fact, Docquier et al. (2010) consider the linkage between gender discrimination and migration, but they approach the subject from the opposite direction: i.e., they study the consequences of migration on gender discrimination, while we consider here the consequences of changes in discrimination on the migratory movements. The argument made by Docquier et al. is that when high-skilled men move abroad, they bring their high-skilled spouses with them. Thus, international migration is a factor worsening female human capital shortage, which is a consequence of existing discrimination in education in developing countries, and consequently exacerbating existing gender inequalities.

border where they will earn greater wages than they would otherwise". Pedraza (1991, p.309) mentions in addition that "*the act of emigrating also becomes a way of escaping total dependence on their husbands"* for women in the Dominican Republic. The underlying idea of both papers is that gender discrimination may act as a *push factor*. If migration is seen as a collective decision, gender discrimination may also affect female migration. As emphasized by Lauby and Stark (1988, p.485), *"in many cultures, the family is a specially strong unit that exerts influence over a daughter or a son even after they have become adults"*. As a consequence, female migration could be preferred to male migration if (i) women are sending back more remittances than men, if (ii) female migrants earn steadier income than men, or if (iii) the opportunity cost is lower for women due to poor labor perspectives in source countries. Therefore, on one hand, if there is more discrimination against women in the labor market of their country of origin, it may be preferable for the household to send them abroad. On the other hand however, cultural norms can play a role that impedes female migration. As Jolly and Reeves (2005) state, "*it may be less acceptable for women to move about and travel on their own, so women can find it more difficult to migrate, or migrate on shorter distances than men".* Kanaiaupuni (2000, p.1315) notes similarly that "*in many societies, women's lesser status holds direct consequences for their migration for reasons apart from the household division of labor"* (p.1315). Due to reasons of tradition, gender inequality may create a bias in the selection process within the household and reduce female migration. It is what we will call the *selection process hypothesis*. The theoretical linkages are therefore numerous, and our empirical analysis aims at clarifying such linkages.

Our research contributes to the existing literature on several levels. First, we build several original indices measuring the level of gender equality in the work place. These indices aggregate different dimensions such as the income differential, the level of women's participation in the labor market, or the differences in unemployment rates. We also include variables related to the differences in education so as to take into account the cumulative effect of gender inequality in education on inequality in employment. Secondly, we provide an empirical analysis of the linkages between gender equality in the work place in source countries and the level of emigration. Using a Heckman two-step estimator, we are able to test empirically whether the *push factor* or the *selection process* analysis is validated by the data. We found that gender equality is positively correlated with female migration, especially for the high-skilled. It has an adverse effect on the migration of men, especially for the low-skilled. Improving gender equality thus increases the average skills of migrants. These results are robust to several specifications and to the use of alternative indexes of gender equality.

Our article is structured as follows: In the second section, we will elaborate on the theoretical background of this work, and analyze the two theoretical hypotheses that can be used to explain the linkages between gender equality and emigration. The third section will be devoted to the measurement of gender

equality. In the fourth section, we will present the empirical strategy and the results. In the last, we conclude.

2. MIGRATION AND GENDER: THEORETICAL HYPOTHESES

In order to identify how gender inequality in source countries might influence labor migration, we will consider two hypotheses.

- **Hypothesis 1 (push factor hypothesis)**: gender inequality is a push factor in an individualistic behavioral context where men and women decide to migrate depending on the prevalent working conditions in their country of origin. In a collective behavioral context, gender inequality may also be a push factor due to lower opportunity cost for women.
- **Hypothesis 2 (selection process hypothesis)**: gender inequality creates a gender bias in a collective selection process of migrants. Within a given community (the household or the village), a collective decision is made in order to decide who is going to leave and who is going to stay. This type of bias occurs when preference is given to the male population rather than to the female population, even though such a choice does not appear as rational on the basis of the expected outcome abroad, the opportunity cost and the level of remittances that could be returned. Social norms concerning job-related issues may affect the migratory behavior.

Our assumption is that if hypothesis 1 is verified, then an improvement of gender equality would result in a decrease of female migration, while male migration would be unchanged. If hypothesis 2 is verified, female migration would increase, while male migration may decrease. In the selection process, high-skilled women would be preferred over low-skilled men. Therefore, we may expect that low-skilled masculine migration would decrease, while high-skilled female migration would increase. Table B.1 summarizes expected effects on migration.

Insert figure 1 here

Understanding how an improvement of gender equality may decrease female migration is fairly simple when using a "push factor" model. If working conditions become better for women in their home country, their incentives to migrate decrease.

The "selection process" hypothesis is slightly more complicated. If we are to follow the "New Economics of Migration" (Stark and Levhari, 1982; Lucas and Stark, 1985), we have to assume that the migration decision is a collective choice. The individual is not making the decision alone, but together with his

household, family, village, or community. This group wants to minimize risk by diversifying its source of income. Therefore, they collectively decide to send some members of the group abroad. Let us suppose that the decisional group is selecting migrants by a scoring process. This scoring process depends both on the group's vision on who will get the highest payoff when migrating and on social norms related to job issues.

Let us also suppose that they attribute to each individual i a score that is a function of two characteristics: gender and skill level. If x is the gender, with $x = 0$ for women and $x = 1$ for men, and y is the skill level with $y \in [0, 1]$ (0 for people with a level of no qualification and 1 for people with the highest skill level), then i's score would be:

$$z = ax + (1 - a)y \tag{1}$$

with $0 \leq a \leq 1$.

The group would select the individuals with the highest scores for migration. The score for a women with a skill level y_w would therefore be:

$$z_w = (1 - a)y_w \tag{2}$$

and for a man, with skill level y_m

$$z_m = a + (1 - a)y_m \tag{3}$$

The group will then choose a women for migration if $z_w > z_m$, which implies that:

$$(y_w - y_m) > a/(1 - a) = ES_{min} \tag{4}$$

ES_{min} is the minimum "educational surplus" needed by a women in order to be chosen by the group for migration (i.e. the minimum number of supplementary years of education). In this oversimplified model, a is a characteristic of the economy revealing a level of gender inequality. An improvement in gender equality will be modeled through a decrease in a. Of course, $dES_{min}/da > 0$.

When gender equality increases, the minimum "educational surplus needed" decreases, and therefore more women (with relatively high skills) would be selected for migration. Less men would be selected, especially the ones with a relative lower skill level. If hypothesis 2 is verified, an improvement of gender equality will be associated with an increase in the proportion of skilled women among migrants and a decrease in the proportion of low-skilled men.

3. MEASUREMENT OF GENDER EQUALITY

We focus on gender equality in the workplace. This choice does not mean that we do not recognize the multi-dimensional aspect of gender equality and the importance of factors such as family code, physical integrity, personal preference, civil liberty or ownership rights, which are the dimensions studied for instance in the OECD SIGI, Social Institutions and Gender Index, (OECD 2010). However, as labor market characteristics are predominant in explaining migration choice, we consider it is more important to focus primarily on those aspects. Nevertheless, social norms may have indirect effects on the labor market and thus indirectly on migration. In particular, they may influence the *selection process* of migration (see hypothesis 2).

We also focus on gender equality rather than on non-discrimination. The ILO's Discrimination (Employment and Occupation) Convention, 1958 (No. 111), defines a discrimination as such: *"Any distinction, exclusion or preference made on the basis of race, colour, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation"*. Any discrimination thus leads to more inequality at work. However, all inequalities cannot be explained by a discrimination. Individual characteristics of preferences can explain such inequalities and it is very difficult to distinguish the two effects. In particular, Busse and Spielmann (2005) argue that labor market participation rate "*does not necessarily involve gender discrimination, as females may choose not to work or to work fewer hours if they take care of children or other family members"*. We can discuss whether this type of behavior is the result of an indirect discrimination or not. The *result* is however similar. It creates more gender inequality due a lower access to the labour market for women. It is this inequality that may affect the migration behavior, whatever is the cause of such inequality (discriminatory or not).

The position generally taken by economists to measure discrimination is to isolate the *discrimination gap*, defined as the average group differences in treatment, from the *human capital gap*, the average group differences in productivity linked characteristics (see Darity and Mason (1998) for a general presentation of different methodologies). However, this approach cannot take into account the general limitation explained just above for other dimensions of gender equality such as the equal access to the labour market. As individual choices cannot be fully observed, we cannot state that a low women's rate participation is fully explained by direct discrimination. At the aggregate level, such individual characteristics cannot be taken into account. That's why macroeconomic studies generally focus on gender equality rather than on non-discrimination.

An additional limitation of such statistical definition of discrimination is that it relies on the number of control variables that you decide to use. The more variables controlling for various individual characteristics you have, the lower

will be the "unexplained component of the wage decomposition", defined as "discrimination in employment". But discrimination can also affect individual characteristics. If you control for the occupation considering that the wage is linked to the productivity in a certain job, you neglect a possible gender discrimination characterized by a concentration of women in certain jobs and occupations, which are relatively low-paid (the occupational discrimination).

There is also a cumulative effect of discrimination in education that you neglect if you control for the general skill level of workers. Discrimination in education can be seen as an *ex-ante* discrimination. Durlauf (1996), Benabou (1996) or Lundberg and Startz (1998) show that these *ex-ante* discrimination may have negative effects on human capital of succeeding generations and thus lead to persistent differences between those who are discriminated against and those who are not. Current discrimination in the labor market may also affect the *ex-ante* discrimination (Altonji and Blank, 1999). If women believe they will have lesser opportunities of being hired for certain jobs, they will have less incentive to invest in education (Coate and Loury, 1993). Because of all these linkages between the two kinds of discrimination, Jolliffe and Campos (2003) among others, observe a strong correlation between the unexplained component of the Oaxaca (1973) decomposition (measuring discrimination in employment) and discrimination in education. That is another justification of our approach focusing on the general level of gender equality at work rather than a narrower definition of discrimination in the labour market.

We then choose to aggregate different measures taking into account these two aspects. Education variables are: (1) the primary education ratio, (2) the secondary education ratio, and (3) the tertiary education ratio. Labor market variables are: (1) the differences in unemployment rates, (2) the income ratio, and (3) the employment rate for women.

The choice of these variables is based on the literature about the measurement of "decent work". Ghai (2003) proposes to use four indices: the labor force participation for women, the differences in income, the unemployment rate and the distribution of skilled jobs. We follow this proposal, except for the last variable because of the difficulty of obtaining consistent estimates for a large number of countries. Moreover, international comparisons are very difficult to make because of heterogeneous job definitions.[5] Education variables are similar to the Millennium Development Goals indicators[6] except for the literacy rate, which is not included here. Numerous data by gender are also available, but in a too few countries. All data is drawn from the *World Development Indicators,* except for the income ratio, which was taken from the UNDP. We use data for 1991 and 2001.

[5]This point is acknowledged by Ghai (2003) in his paper.
[6]See: http://unstats.un.org/unsd/mdg/Home.aspx

We use principal component analysis (PCA) on all these variables. The goal of PCA is to isolate common factors between different variables by reducing total information in order to obtain a more tractable economic description of the variables. Here, the goal is to find a common factor that can be used as a proxy for the general level of gender equality in the workplace. Graphically, we can represent the n countries in a p-dimensional space (the p different initial condition variables, here our 7 variables of gender equality). The distances[7] between the n row points in the p-dimensional space are a perfect representation of similarities between the rows in matrix X (the matrix with the countries in n rows, and the variables in p columns). The PCA makes it possible to find a lower dimensional space in which we project the row points and which retains the highest level of distances between rows. The best space, the one that maximizes the dispersion of the projected row points, is: $\max_H \sum_i \sum_{i'} d_H^2(i,i')$, which is equivalent to maximizing $\sum_i d_H^2(i,G)$, with H being the space of projection and G the centroid. The mass is p_i (with $\sum p_i = 1$), and we maximize $\sum_i p_i d_H^2(i,G)$, which is the projected inertia (variance). The lower dimensional space is a one-dimensional graph. If we define it by a vector u, the projection of a row point on the direction defined by u is: $\psi_i = \sum_{j=1}^{p} x_{i,j} u_j$. The inertia of each point projected on u is $\sum_{i=1}^{n} p_i (\sum_{j=1}^{p} x_{i,j} u_j)^2 = \lambda$. We then need to find the vector u (the eigenvector) that maximizes λ (the eigenvalue). The first vector leaves unexplained a certain portion of the variability. Therefore, a second factor can be built that maximizes another eigenvalue. The process continues until we are able to explain all variability with a given number of vectors. Each vector is orthogonal to the previous one, and the remaining variability decreases with the number of vectors.

To choose the optimal number of vectors (or factors) required to obtain a satisfying description of the phenomena, it is possible to use the criterion proposed by Kaiser. Since the sum of eigenvalues is equal to the number of variables, unless a factor extracts at least as much as the equivalent of one original variable, we eliminate it. Table B.2 presents the PCA results for our gender equality variables. According to the Kaiser criterion, we are only able to retain the first two factors, which are the only ones with an eigenvalue superior to 1. Table B.3 presents the main coordinates of different variables on the different factors. The first factor conveys a global overview of the level of gender equality (all variables have a positive coordinate on this axis), while the second axis provides information on the type of gender inequality. A positive coordinate on the second axis will indicate relatively higher inequality in the labor market, and a negative coordinate will characterize a higher level of inequality in education. These two factors explain 66% of all information contained in our data. We will use the coordinates on the first factor as a proxy for the global level of gender equality at work. The index is then transformed in order to lie in the interval

[7] We use the Euclidian distance. Between countries i and i', it may be defined as follows: $d^2(i, i'^p_{j=1}(x_{i,j} - x_{i',j})^2$

between 0 (low level of gender equality) and 100 (high level of gender equality). This factor explains 41% of all information contained in the data, which means that the different variables convey much other information. We focus here on the information common to all variables.

Insert table B.2 here

Insert table B.3 here

The main limit of this index is the small number of countries included in the sample due to data availability (102 observations for 51 countries, see the country sample in annex Appendix B). We thus propose three alternative indices, both to increase the geographical coverage of our study and to test the robustness of our results (see Table B.4). The second index includes all variables except the ratio of male to female unemployment and the ratio of female to male tertiary enrollment. The third index only includes labor market variables. We also propose a set of indices that includes the average value of each variable in order to increase the coverage.[8] When the first factor yields information on the type of gender inequality (inequality in employment versus inequality in education), we use the coordinates on the second factor. However, the eigenvalue of the factor retained is always greater than 1 and explains at least 30% of the information. In the remainder of this article, when we do not mention which index we are using, by assumption it is the first one: ($index\_genderequality1$).

Insert table B.4 here

4. EMPIRICAL ANALYSIS

4.1. Empirical specification

In order to test empirically whether linkages between migration and gender equality can be explained either by the *push factor* or by the *selection process* hypothesis, we propose a migration gravity specification (see for instance Borjas, 1991, or Clark et al., 2007, for the theoretical foundations of such specifications). Migration is driven by the maximization of utility, taking into account costs of migration. Each migrant chooses to migrate where the payoff is the highest,

[8] Each variable is the average value between 1981 and 1991, and between 1992 and 2001, respectively. While the evolution of these variables during 10 years may have been important, we assume that the *gender ratio* remained relatively stable.

considering also the payoff in his country of origin. Migration thus depends on *push* and *pull* factors. Here, we focus on push factors since we only study the influence of gender equality in origin countries.

The general bilateral migration equation is the following:

$$Migration_{i,j} = a_0 X_i^{\alpha_1} X_j^{\alpha_2} / C_{i,j}^{\alpha_3} \tag{5}$$

where $Migration_{i,j}$ is the total migration stock[9] between two countries. X_i is a matrix of variables affecting push factors. The level of gender equality is one of these factors. X_j is a matrix of control variables affecting pull factors. $C_{i,j}$ is a matrix of bilateral variables controlling for the cost of migration. Taking the log of both sides, we obtain the following estimable equation:

$$m_{i,j} = \alpha_0 + \alpha_1 \ln X_i + \alpha_2 \ln X_j + \alpha_3 \ln C_{i,j} + \epsilon_{i,j} \tag{6}$$

where $m_{i,j}$ is the log of total migration stocks. However, since we are interested by the influence of gender equality in origin countries, we propose to control for pull factors using fixed effects in destination countries instead of the matrix X_j. This choice is made to minimize possible omitted variable bias and unobservable heterogeneity. The estimated equation becomes:

$$m_{i,j} = \alpha_0 + \alpha_1 \ln X_i + A_j + \alpha_3 \ln C_{i,j} + \epsilon_{i,j} \tag{7}$$

where A_j contains destination countries' fixed effects. Unfortunately, we cannot include either origin countries' fixed effects or origin-destination countries' fixed effects since our database does not have sufficient temporal dimension. In order to minimize possible bias, we will use in the matrix X_i and $C_{i,j}$ all the variables generally exploited in empirical studies on the determinants of migration (Hatton and Williamson, 2002). To verify robustness, we transform the database into one that is multilateral (limiting the data to *emigration* rates towards all other countries). The number of observations is very limited in these estimations. The *signs* of our estimates are mostly similar, but the levels of *significance* are much lower due to a smaller number of observations. Also, results are much less stable when using alternative indices. For all forgoing reasons, we chose to retain the bilateral database that enables us to run much more stable estimates.

We also want to test the influence of gender equality on migration by *gender* and *skill level*. We thus estimate six additional equations (primary, secondary, tertiary-educated migrants for each gender):

[9] We estimate determinants of migrants' stocks rather than flows. As shown by Brücker and Schröder (2006), empirical migration models estimating net migration flows may be misspecified. At the equilibrium, a positive relation exists between the stock of migrants, while net migration flows becomes nil, which is consistent with stylized facts showing that net migration rates tend to vanish over time.

$$m_{i,j}^{g,s} = \alpha_0^{g,s} + \alpha_1^{g,s} \ln X_i + A_j + \alpha_3^{g,s} \ln C_{i,j} + \epsilon_{i,j}^{g,s} \tag{8}$$

where g is the gender and s the skill level (primary, secondary, tertiary), and where $m_{i,j}^{g,s}$ is thus the log of migration between country i and country j for gender g and skill level s. We then estimate the determinants of the migration skill ratio.

$$m_{i,j}^{g,t} - m_{i,j}^{g,p} = \alpha_0^{g,s} + \alpha_1^{g,s} \ln X_i + A_j + \alpha_3^{g,s} \ln C_{i,j} + \epsilon_{i,j}^{g,s} \tag{9}$$

in which $m_{i,j}^{g,t}$ is the log of migration between country i and country j for gender g with a tertiary level of education, and $m_{i,j}^{g,p}$ is the log of migration between country i and country j for gender g with a primary level of education.

We use the Heckman (1979) two-step method in order to obtain consistent estimates. One feature of our dependent variable is the high occurrence of zero, corresponding to nil bilateral migration between two given countries (approximately 29.5% in our study). In such cases, OLS standard estimates may be biased, and the two-step procedure is one way to solve the problem. We propose to use the existence of diplomatic representation as a selection variable. Here, this variable should explain the probability of having a non-nil migration value, without explaining the scale of migration. As Beine et al. (2011, p.35) noted, *"Diplomatic representation might affect the probability of initial migration setting some kind of threshold on the initial migration and visa costs faced by potential migrants."* In absence of diplomatic representation, the migration costs may be too high, which can explain a nil migration. However, the existence of a diplomatic representation as such cannot explain the *scale* of migration.

4.2. DATA

The matrix X_i in previous equations includes the level of gender equality, the GDP per capita, the level of population, the average level of education, the share of young people in the population and the level of democracy for country i. The level of gender equality is measured by our index constructed by PCA. The GDP per capita (in PPP) is a proxy for income, which is assumed to affect migration negatively. However, it may also be seen as a proxy of migration costs: if income is too low, workers cannot afford the cost and do not have the capacity to migrate. Population is included to take into account the size of the country, which will increase the "supply" of migrants. For these variables, data are drawn from the *World Development Indicators*. We also include the share of young people (15-34 years old), who face lower migration costs and who thus have a higher propensity to migrate. Data are from the *World Population Prospect: The 2008 Revision*. We take into account the level of democracy, measured by a combined polity score (Polity IV) proposed by Gleditsch (2003). This factor may affect migration costs. Autocratic regimes

tend to cause sluggish freedom of movement and increased migration costs. Lastly, in order to minimize unobserved heterogeneity between countries, we also add regional dummy variables.

We add bilateral variables such as the existence of common frontiers, the distance between countries, the existence of a common language and a colonial past. All these variables are correlated with the existence of migrant networks, which can then influence migratory costs. These variables are from CEPII distance database.[10]

Concerning data on migration, we use the database provided by Docquier, Lowell, and Marfouk (2009) available for 1991 and 2001. We add a dummy variable for 1991 in order to take into account a possible evolution over the decade.

Table B.13 in annex Appendix A presents descriptive statistics for all variables used in our estimations. The average number of migrants between two countries is included between 15157 and 22614, depending on the country sample. Around half of migrants are low-skilled. Number of female migrants is slightly higher than the number of male migrants (12246 against 11835 in average for the first sample).

4.3. RESULTS

We first estimate the determinants of global migration stocks, both for men and women (see Table B.5). We do not find any significant impact of the level of gender equality on global migration.[11] However, there is a positive and significant impact of gender equality on the skill ratio, i.e. the ratio of tertiary-educated over primary-educated migrants.

Insert table B.5 here

Other control variables take on the expected sign. However, for the level of income in origin countries, we find a positive correlation with the level of migration. This finding may be explained by the higher level of migration cost for too low levels of income. An increase in per capita GDP may be seen as a reduction in migration costs, associated with a higher level of migration. Bilateral variables are not significant, but this phenomenon may be explained by the inclusion of regional dummies for fixed effects in origin and destination

[10] http://www.cepii.fr/anglaisgraph/bdd/distances.htm

[11] We only find a positive impact on migration of secondary-skilled workers, but the effect is only significant at the 10% level.

countries.[12] It should also be noted that our selection variable (the diplomatic representation) assumes the expected positive sign. The Mills ratio is significant, justifying the use of Heckman two-step procedure instead of OLS estimates.

We then propose to test the influence of gender equality on migration by gender. Results are given in Table B.6.[13] All else held constant, a higher level of gender equality is correlated with a higher level of female migration and a lower level of male migration. This result suggests a substitution effect between women and men within a given number of migrants.

Insert table B.6 here

This first set of estimates tends to validate the *selection process hypothesis* rather than the *push factor* hypothesis. If gender inequality explains a gender bias in the selection process, it is also possible that the increase in migrants' selectivity observed in Table B.5 is explained by a higher level of migration for skilled women when gender equality is higher. In order to test this idea, we propose to estimate determinants of migration by gender and skill level. Results are given in Table B.7. We show that high level of gender equality is associated with a lower level of migration for low-skilled men and a higher level of migration for skilled women. The substitution effect shown in Table B.6 is associated with an increase in the general skill level of migrants.

Insert table B.7 here

We must however distinguish the selection process effect from what we will call hereafter the *female education enhancement effect*. When gender equality increases, the access of women to higher education also increases. With a higher gender equality, we will therefore have more skilled women. We propose to measure this effect through the inclusion of the ratio of skilled women to skilled men. If a selection effect does in fact exist, the estimated coefficient for the gender equality index should remain significant, even when introduced conjointly with the ratio of skilled women to skilled men.

Insert table B.8 here

[12] We estimate the model without regional dummies. In these estimates, bilateral variables have the expected sign, while the results for the other variables do not change.

[13] We present only results for our variable of interest: gender equality. The significance level and sign of the other estimated coefficients do not change from the previous specification.

Our main result is confirmed by this new set of estimates. A higher level of gender equality is associated with a higher level of migration for high-skilled women and with a lower level of masculine migration. One should note, however, that this negative effect is significant for all men's skill levels, contrary to previous estimates in which the effect was only significant for low-skilled men. In contrast, the effect for secondary-educated women is no longer significant.

Results concerning the gender-skill ratio are ambiguous. On the one hand, the effect is positive for secondary-educated men and (at a 10% level of significance) for secondary-educated women. On the other, the effect is negative for high-skilled women. An increase in the educational possibilities for women may increase their opportunities in their own country, which may explain this negative effect on migration, but it may also be seen as a proxy for the modernization of a society, associated with a higher level of mobility due to lower cultural costs of migration. However, such analysis lies beyond the scope of this paper and should be confirmed by a more detailed study of this specific aspect.

4.4. TESTING FOR ROBUSTNESS

We propose to use alternative indices to verify whether these results remain valid when a broader set of countries or specific variables are taken into account. Index *lngendereq*2 includes more countries, and *lngendereq*3 is constructed using only labor market variables. We also propose to use these indices, built using the average value of each component, in order to increase the coverage of our study as well (see Section 3 for more detail). Having a look to the descriptive statistics of main variables (see table B.13 in annex Appendix A), we clearly see that there are changes in the average level of migration, GDP or population when using different indexes of gender equality.[14] This can be explained by a possible selection bias in the first set of estimates, explained by problems of data availability. As we already mentioned, we could only build the first index for 51 countries. The sample of bilateral variables is therefore limited to 1934 observations, against 4063 with the second index and 3090 with the third index. The objective of this section is to check that this possible selection bias does not alter the statistical relations we identified in the previous section. We show that this bias has very little impact on our results.

Table B.9 presents the results for the impact of gender equality on total migration. (These are the same estimations as in Table B.5, but using alternative indices). The only robust finding is the result we obtained in the previous set of estimates. Gender equality tends to be positively correlated with the *selectivity* of migrants. In some cases, we find a negative correlation with the level of total

[14]There is a lower proportion of low income countries in the first sample, due to lack of data for the ratio of female to male tertiary enrollment and the ratio of male to female unemployment for such countries. It increases the average level of GDP when using the first index of gender equality.

migration and with the level of migration of low-skilled workers (with 3 of the 6 indices), which may be explained by a greater effect of gender equality on male migration than on female migration. However, this result is not robust to the use of different indices and should therefore be interpreted with caution. Results concerning secondary-educated migrants are ambiguous. While we find a negative impact when using $lngendereq1_{av}$, the effect is not significant for two other indices, and the effect is positive for $lngendereq2$. For tertiary-educated migrants, there is a slightly positive correlation; but, once again, this result is not robust. If we find a positive and significant coefficient when using two indices, the coefficient is not significant for other two indices, and even negative in one case. The only robust result is therefore the increase in migrants' selectivity (effect on the skill-ratio), where the coefficient is positive and significant, regardless of the index selected.

Insert table B.9 here

We then propose to estimate the determinants of migration by gender (equivalent to Table B.6). Results are given in Table B.10. The negative correlation observed with male migration and the positive correlation with female migration are robust to the use of alternative indices. However, the average level of significance is stronger in the case of male migration. Concerning female migration, the estimated coefficient is not significant in two cases, which may explain why we observe a negative impact of gender equality on migration in some estimations (Table B.9).

Insert table B.10 here

In Table B.11, we present results by gender and skill level. The most robust finding is that gender equality is negatively correlated with low-skilled male migration and positively correlated with high-skilled female migration, all else remaining equal. Coefficients for primary and secondary-educated masculine workers are significant for all indices. For high-skilled men, results are more ambiguous (negative for three indices and non-significant for two others). For women, the coefficient is nearly always significant, and positive for tertiary and secondary-educated women (except in one case). Results are ambiguous for low-skilled women. The idea of a substitution effect between low-skilled men and high-skilled women is validated by these estimates. Our main finding is robust to the use of alternative indices.

Insert table B.11 here

The last set of estimates (see Table B.12) includes the gender-skill ratio as an additional control variable. (This is the same specification used to obtain the results described in Table B.8). Our main findings remain valid. The inclusion of this variable to control for the *female enhancement effect* does not change the sign or the magnitude of coefficients associated with gender equality. In most estimates, we also find a positive correlation between the gender-skill ratio and the emigration rates for low-skilled men and low-skilled women. Results are more ambiguous for other skill levels. This phenomenon, observed for both genders, is intriguing, but its interpretation would take us beyond the scope of this research. It would be interesting to study in more depth the effect of modernization of the society on the mobility by gender and skill level; here, the only purpose of including this variable is to minimize a possible omitted variable bias in the estimation of the coefficient of our variable of interest. We clearly demonstrate that our finding is robust, and it also opens new perspectives for future research.

Insert table B.12 here

Lastly, we want to check that our results are not driven by bilateral migration flows between OECD countries. As data availability problems are less severe for these countries, their weight increases in the sample when the number of countries is lower. We thus propose to run the same estimations for our six indexes without all OECD countries as origin countries. Results are not reproduced but are available upon request. They show that our results remain valid even when considering only migration flows from non-OECD to OECD countries. When using the first index, the sign of coefficients remain globally similar but level of significance is much lower due to a drastic decrease in the number of observations (715 against 1934). The negative relation between male migration and gender equality remains however significant (and negative). When using the index $gendereq2$, results remain very similar when controlling for the gender enhancement effect. Here also, the lower number of observations may explain a lack of significance for certain variables. But once again, the sign of the estimated coefficients are remarkably identical. For the index $gendereq_3$, results (both in terms of sign and magnitude for the estimated coefficients) are globally similar. Interestingly, we obtain comparable results for all estimations using the last three indexes. As we used average values to build these indexes, we were able to include a longer list of developing countries. Excluding OECD countries is thus less problematic as the number of non-OECD countries remains high. Here, all estimated coefficients remain significant. Signs and magnitudes of coefficients are very similar. It tends to show that our results are robust to the exclusion of OECD countries.

5. CONCLUSION

In this contribution, we test empirically two possible theoretical explanations for the linkage between gender equality and migration. The first one is the

hypothesis of a push factor, with a negative correlation between gender equality and migration of women. The second is the selection process hypothesis in which an improvement of gender equality will reduce the bias in the selection process. More skilled women would then be selected to migrate and less low-skilled men. Our estimates clearly support this latter hypothesis.

We build several indices based on principal component analysis to measure the effective level of gender equality. By using different indices, we are able to identify robust relationships between our variables of interest. In the aggregate, we find that the general skill level of migrants is positively correlated with gender equality. We also show that, everything else remaining equal, an improvement of gender equality is correlated with a fall of migration for men and an increase for women. More specifically, whatever index is chosen, we find a negative correlation between low-skilled male migration (primary and secondary-educated) and gender equality. In contrast, the correlation is highly positive with the migration of high-skilled women.

We also control that this effect is not driven by a broader effect of *gender enhancement*. We include the gender ratio of skilled workers as an additional control variable, and its introduction does not affect our results concerning the effect of gender equality. One intriguing finding, which we set aside for future research, is that this gender enhancement effect seems to be positively correlated with the migration of low-skilled workers, *whatever their gender*. An underlying effect may be the impact of the modernization of a society on the mobility of workers. This hypothesis needs to be confirmed by further investigation.

One important conclusion of our study is that a reduction in gender bias increases the general skill level of migrants. One may fear an increase in brain drain. However, an improvement of gender equality also creates greater incentives for women to invest more in human capital. Further research should also be devoted to this possible ambiguity as well.

Lastly, one cannot exclude that both effects play a role and that our results indicates that the selection process effect is stronger that the push factor *in average*. But countries in our different samples are very heterogeneous and it is possible that *in some countries*, the push factor is higher. This is of course a limitation of empirical studies based on macroeconomic data. Here, we show that our evidences are statistically robust to different samples of origin countries. But it would be interesting to further investigate the relation between gender equality and migration by having a closer look to microeconomic data. This opens new perspectives for research.

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Annex

Appendix A. Summary statistics (for different samples)

Insert table B.13 here

Appendix B. Country sample (Origin countries)

- **Index *lngendereq1*:** Albania, Argentina, Armenia, Australia, Austria, Belgium, Botswana, Brazil, Bulgaria, Cambodia, Colombia, Croatia, Cuba, Cyprus, Czech Republic, Denmark, El Salvador, Estonia, Finland, France, Georgia, Greece, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, , Jamaica, Japan, Kazakhstan, Korea, Rep., Latvia, Lithuania, Luxembourg, Macedonia, FYR, Malaysia, Malta, Mauritius, Mexico, Moldova, Morocco, Namibia, Nepal, Netherlands, Nicaragua, Norway, Panama, Paraguay, Peru, Poland, Portugal, Qatar, Romania, Samoa, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Kingdom, United States, Vietnam
- **Index *lngendereq2*:** Afghanistan, Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, The, Bahrain, Belarus, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Cambodia, Cameroon, Cape Verde, Chad, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gambia, The, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guyana, Hong Kong, China, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep., Iraq, Ireland, Israel, Jamaica, Japan, Kazakhstan, Korea, Rep., Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lesotho, Lithuania, Luxembourg, Macedonia, FYR, Malawi, Malaysia, Maldives, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, Nicaragua, Niger, Nigeria, Norway, Oman, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Rwanda, Samoa, Senegal, Sierra Leone, Slovak Republic, Slovenia, Solomon Islands, South Africa, Spain, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Vanuatu, Venezuela, RB, Vietnam, Yemen, Rep., Zambia, Zimbabwe

- **Index *lngendereq3*:** Albania, Argentina, Armenia, Australia, Austria, Bahamas, The, Bahrain, Barbados, Belgium, Belize, Bolivia, Botswana, Brazil, Bulgaria, Cambodia, Cameroon, Canada, Chile, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Guatemala, Guyana, Hong Kong, China, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Korea, Rep., Latvia, Lithuania, Luxembourg, Macedonia, FYR, Madagascar, Malaysia, Malta, Mauritius, Mexico, Moldova, Morocco, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Norway, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Samoa, Saudi Arabia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine United Kingdom, United States, Uruguay, Venezuela, RB, Vietnam
- **Index *lngendereq1av*:** Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, The, Bahrain, Belgium, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada, Chad, Chile, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, El Salvador, Estonia, Ethiopia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guyana, Hong Kong, China, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep., Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Korea, Rep., Lao PDR, Latvia, Lesotho, Lithuania, Luxembourg, Macedonia, FYR, Madagascar, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Norway, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Samoa, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Spain, St. Lucia, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, , United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, RB, Vietnam, Rep., Zambia, Zimbabwe
- **Index *lngendereq2av*:** Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, The, Bahrain, Belarus, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Dem. Rep., Congo, Rep., Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, The, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Hong Kong, China, Hungary, Iceland, India, Indonesia,

Iran, Islamic Rep., Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Rep., Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Lithuania, Luxembourg, Macedonia, FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Samoa, Saudi Arabia, Senegal, Sierra Leone, Slovak Republic, Slovenia, Solomon Islands, Africa, Spain, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Vanuatu, Venezuela, RB, Vietnam, Yemen, Rep., Zambia, Zimbabwe

- **Index *lngendereq3av*:** Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, The, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Canada, Chad, Chile, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, Hong Kong, China, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep., Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Korea, Rep., Lao PDR, Latvia, Lesotho, Lithuania, Luxembourg, Macedonia, FYR, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Samoa, Sao Tome and Principe, Saudi Arabia, Singapore, Slovak Republic, Slovenia, Solomon Islands, South Africa, Spain, Sri Lanka, St. Lucia, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, RB, Vietnam, Yemen, Rep., Zambia, Zimbabwe

Table B.1: Effects of improved gender equality on migration

Variables	High-skilled	Low-skilled	Total Migration
Hypothesis 1: Push factor			
Female	-	-	-
Male	0	0	0
Total	-	-	-
Hypothesis 2: Selection process			
Female	+	+/0	+
Male	0/-	-	-
Total	-	+	?

Table B.2: PCA results for *index_genderequality*1

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
Factor 1	2.48895	0.98798	0.4148	0.4148
Factor 2	1.50097	0.69055	0.2502	0.6650
Factor 3	0.81042	0.12657	0.1351	0.8001
Factor 4	0.68385	0.39550	0.1140	0.9140
Factor 5	0.28835	0.06088	0.0481	0.9621
Factor 6	0.22747		0.0379	1

Table B.3: Variable coordinates on main factors

Variable	**Factor 1**	**Factor 2**	**Factor 3**
Female Labor force participation	0.4545	0.4478	-0.2848
Ratio of female to male primary enrollment	0.4813	-0.2802	0.0897
Ratio of female to male secondary enrollment (%)	0.4187	-0.4986	0.1288
Ratio of female to male tertiary enrollment (%)	0.3288	-0.4163	-0.0557
Ratio of male to female unemployment (%)	0.2407	0.3754	0.8795
Income ratio	0.4694	0.3977	-0.3431

Table B.4: Alternative indices of gender equality

Index *gender_equality*	**1**	**2**	**3**	**1 (av.)**	**2 (av.)**	**3 (av.)**
Number of observations	102	243	166	176	302	224
Factor	1	1	1	2	1	1
Proportion explained by the factor	0.4148	0.4638	0.6555	0.3155	0.4685	0.6581
Variables						
Female labor force participation	0.4545	0.1776	0.6539	0.6214	0.1389	0.6504
Ratio of female to male primary enrollment	0.4813	0.6927	NA	0.2931	0.6930	NA
Ratio of female to male secondary enrollment (%)	0.4187	0.6647	NA	0.2445	0.6739	NA
Ratio of female to male tertiary enrollment (%)	0.3288	NA	NA	0.1547	NA	NA
Ratio of male to female unemployment (%)	0.2407	NA	0.3903	0.2210	NA	0.4209
Income ratio	0.4694	0.2165	0.6481	0.6288	0.2151	0.6323

Table B.5: Determinants of total migration (Heckman two-step estimates)

Dep. Var.	**lnmig**	**select**	**lnmig_prim**	**select**	**lnmig_sec**	**select**	**lnmig_ter**	**select**
ln(Gender Eq.)	0.06	-0.3	-0.04	-0.43	0.353*	-0.16	0.24	0.03
	(-0.31)	(0.92)	(0.19)	(1.41)	(-1.67)	(0.55)	(-1.32)	(-0.1)
ln(gdp_o)	0.269**	0.368**	0.19	0.339**	0.253**	0.240*	0.350***	0.317**
	(-2.51)	(-2.36)	(-1.49)	(-2.33)	(-2.28)	(-1.77)	(-3.67)	(-2.14)
ln(pop_o)	0.755***	0.303***	0.777***	0.325***	0.717***	0.293***	0.724***	0.294***
	(-21.42)	(-4.94)	(-19.01)	(-5.69)	(-19.17)	(-5.52)	(-23.14)	(-5.09)
ln(youth)	-0.869***	-1.344***	-0.739**	-1.150**	-0.827**	-1.020**	-0.971***	-1.339***
	(2.78)	(2.71)	(2.06)	(2.51)	(2.56)	(2.35)	(3.53)	(2.84)
ln(edu)	0.317**	-0.16	-0.09	-0.04	0.293*	0.07	0.629***	-0.06
	(-2.17)	(0.73)	(0.51)	(0.21)	(-1.94)	(-0.38)	(-4.89)	(0.27)
polity	0.02	-0.01	0.0419**	0	0	0	-0.01	-0.02
	(-1.15)	(0.47)	(-1.98)	(-0.18)	(0.25)	(0.17)	(0.33)	(0.7)
colony	0.04	-0.06	0	0.09	0.07	0.01	0.13	-0.02
	(-0.28)	(0.23)	(0.02)	(-0.37)	(-0.47)	(-0.05)	(-0.97)	(0.08)
contig	-0.22	0.18	-0.31	0.16	-0.22	0.31	-0.17	0.2
	(0.82)	(-0.43)	(1.02)	(-0.39)	(0.8)	(-0.78)	(0.74)	(-0.48)
comlang_off	0.15	0.16	0.23	0.28	0.21	0.18	-0.05	0.16
	-0.85	-0.63	-1.15	-1.15	-1.17	-0.8	0.33	-0.65
dist	2.62E-006	1.11E-005	3.09E-006	1.10E-005	-1.77E-006	1.43E-005	5.35E-008	1.53E-005
	(-0.25)	(-0.68)	(-0.26)	(-0.72)	(0.17)	(-0.98)	(-0.01)	(-0.98)
asia	-1.604***	-0.28	-1.881***	-0.37	-1.715***	-0.403*	-1.285***	-0.27
	(11.04)	(1.1)	(11.38)	(1.6)	(11.42)	(1.83)	(10.1)	(1.11)
america	-1.300***	-0.2	-1.646***	-0.24	-1.404***	-0.31	-0.787***	-0.22
	(9.59)	(0.9)	(10.62)	(1.13)	(10.02)	(1.55)	(6.59)	(1.04)
africa	-1.109***	-1.132***	-1.215***	-0.936***	-1.078***	-0.859***	-0.851***	-0.793**
	(4.61)	(3.37)	(4.38)	(3)	(4.29)	(3.01)	(4)	(2.55)
pacific	-1.189***	0.69	-1.516***	0.03	-1.089***	-0.09	-0.835***	0.23
	(4.97)	(-1.6)	(5.53)	(-0.1)	(4.41)	(0.28)	(3.99)	(-0.6)
Year 1991	-3.935***	-5.093**	-2.827*	-4.467**	-3.736***	-4.166**	-4.784***	-5.187***
	(3.08)	(2.48)	(1.93)	(2.34)	(2.83)	(2.3)	(4.25)	(2.65)
Constant	-2.13	4.461*	-1.88	3.793*	-3.838**	3.29	-4.518***	2.9
	(1.39)	(-1.82)	(1.07)	(-1.65)	(2.4)	()	(3.33)	(-1.25)
Dip. Repres.		0.863***		0.865***		0.678***		0.992***
		(-4.24)		(-4.69)		(-3.9)		(-5.07)
Mills	0.756***		0.957***		0.602**		0.453**	
	(-3.23)		(-3.92)		(-2.32)		(-2.26)	
Observations	1934	1934	1934	1934	1934	1934	1934	1934

Z-statistics in parentheses

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

Table B.6: Effects of gender equality by gender (Heckman two-step estimates)

Dep. Var.	**lnmig-m**	**select**	**Lnmig-f**	**select**
ln(Gender Equality)	-0.455**	-0.28	0.595***	-0.24
	(2.18)	(0.88)	(-2.84)	(0.79)
Mills ratio	0.728***		0.638***	
	(-3.13)		(-2.77)	
Observations	1934	1934	1934	1934

Z-statistics in parentheses

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

Table B.7: Effects of gender equality by gender and skill-level (Heckman two-step estimates)

Dep. Var.	**ln_m_mig_prim**	**select**	**ln_m_mig_sec**	**select**	**ln_m_mig_ter**	**select**
ln(Gender Equality)	-0.502**	-0.460	-0.322	0.0820	-0.139	-0.0893
	(-2.058)	(-1.566)	(-1.456)	(0.302)	(-0.750)	(-0.300)
Mills	1.167***		0.498**		0.662***	
	(5.000)		(2.023)		(3.432)	
Observations	1934	1934	1934	1934	1934	1934
Dep. Var.	**ln_f_mig_prim**	**select**	**ln_f_mig_sec**	**select**	**ln_f_mig_ter**	**select**
ln(Gender Equality)	0.377	-0.281	0.908***	0.103	0.857***	0.0228
	(1.584)	(-0.966)	(4.285)	(0.380)	(4.706)	(0.0781)
Mills	1.056***		0.679***		0.589***	
	(4.364)		(2.805)		(3.017)	
Observations	1934	1934	1934	1934	1934	1934

Z-statistics in parentheses

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

Table B.8: Influence of gender equality by gender and by skill level - with gender skill ratio

Dep. Var.	**ln_m_mig_prim**	**select**	**ln_m_mig_sec**	**select**	**ln_m_mig_ter**	**select**
ln(Gender Eq.)	-0.672**	-0.713**	-0.861***	-0.293	-0.407*	-0.360
	(-2.291)	(-2.109)	(-3.336)	(-0.926)	(-1.844)	(-1.045)
ln(genderskill)	0.284	0.527*	0.623***	0.694***	0.214	0.533*
	(1.217)	(1.901)	(3.003)	(2.667)	(1.202)	(1.862)
Mills	1.265***		0.579**		0.671***	
	(5.342)		(2.390)		(3.441)	
Observations	1934	1934	1934	1934	1934	1934
Dep. Var.	**ln_f_mig_prim**	**select**	**ln_f_mig_sec**	**select**	**ln_f_mig_ter**	**select**
ln(Gender Eq.)	0.522*	-0.431	0.0627	-0.0900	0.668***	-0.172
	(1.824)	(-1.291)	(0.252)	(-0.286)	(3.098)	(-0.506)
ln(genderskill)	0.118	0.332	0.364*	0.374	-0.932***	0.400
	(0.513)	(1.209)	(1.816)	(1.448)	(-5.370)	(1.439)
Mills	1.166***		0.723***		0.560***	
	(4.758)		(3.009)		(2.830)	
Observations	1934	1934	1934	1934	1934	1934

Z-statistics in parentheses

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

Table B.9: Impact of gender equality on total migration (alternative indices)

Dep. Var.	**lnmig**	**select**	**lnmig_prim**	**select**	**lnmig_sec**	**select**
lngendereq2	0.347	-0.157	0.117	-0.540**	0.543*	-0.0157
	(1.296)	(-0.574)	(0.376)	(-2.097)	(1.930)	(-0.0657)
lngendereq3	-0.155**	-0.0263	-0.254***	-0.111	-0.0894	-0.0607
	(-2.207)	(-0.249)	(-3.180)	(-1.157)	(-1.246)	(-0.648)
lngendereq1av	-0.0868***	-0.0328	-0.109***	-0.0253	-0.0784***	-0.0333
	(-4.148)	(-1.026)	(-4.558)	(-0.892)	(-3.647)	(-1.195)
lngendereq2av	0.140	-0.127	-0.0269	-0.209*	0.153	0.0166
	(1.111)	(-0.933)	(-0.186)	(-1.650)	(1.168)	(0.139)
lngendereq3av	-0.220***	-0.0710	-0.378***	-0.0856	-0.125*	-0.134*
	(-3.431)	(-0.823)	(-5.205)	(-1.080)	(-1.903)	(-1.713)

Dep. Var.	**lnmig_ter**	**select**	**lnskillratio**	**select**	**Observations**
lngendereq2	0.491**	0.0883	0.497***	-0.293	4063
	(1.980)	(0.341)	(2.861)	(-1.164)	
lngendereq3	-0.000524	-0.0768	0.289***	-0.120	3090
	(-0.00828)	(-0.759)	(6.398)	(-1.280)	
lngendereq1av	-0.0503***	-0.0395	0.0585***	-0.0273	3214
	(-2.673)	(-1.260)	(4.389)	(-0.976)	
lngendereq2av	0.239**	-0.0155	0.310***	-0.0818	4844
	(2.068)	(-0.120)	(3.830)	(-0.661)	
lngendereq3av	-0.0527	-0.131	0.340***	-0.118	3991
	(-0.905)	(-1.574)	(8.439)	(-1.509)	

Z-statistics in parentheses

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

Table B.10: Impact of gender equality on migration by gender (alternative indices)

Dep. Var.	**lnmig-m**	**select**	**Lnmig-f**	**select**	**Observations**
lngendereq2	-0.543*	-0.360	1.171***	0.158	4063
	(-1.940)	(-1.369)	(4.196)	(0.622)	
lngendereq3	-0.375***	-0.0316	0.132*	-0.0908	3090
	(-5.193)	(-0.310)	(1.856)	(-0.897)	
lngendereq1av	-0.127***	-0.0358	-0.0219	-0.0374	3214
	(-5.933)	(-1.132)	(-1.039)	(-1.207)	
lngendereq2av	-0.368***	-0.226*	0.671***	0.0955	4844
	(-2.837)	(-1.714)	(5.146)	(0.754)	
lngendereq3av	-0.443***	-0.00840	0.0714	-0.0756	3391
	(-6.756)	(-0.101)	(1.096)	(-0.930)	

Z-statistics in parentheses

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

Table B.11: Impact of gender equality on migration by gender and skill level (alternative indices)

Dep. Var.	**ln_m_mig_prim**	**select**	**ln_m_mig_sec**	**select**	**ln_m_mig_ter**	**select**
lngendereq2	-0.711**	-0.902***	-0.634**	0.107	-0.139	-0.370
	(-2.117)	(-3.639)	(-2.149)	(0.460)	(-0.537)	(-1.480)
lngendereq3	-0.500***	-0.104	-0.362***	0.00152	-0.199***	-0.0701
	(-6.053)	(-1.140)	(-4.879)	(0.0172)	(-3.078)	(-0.724)
lngendereq1av	-0.152***	-0.0300	-0.126***	-0.0325	-0.0812***	-0.0431
	(-6.222)	(-1.079)	(-5.763)	(-1.194)	(-4.248)	(-1.391)
lngendereq2av	-0.582***	-0.378***	-0.550***	0.123	-0.162	-0.206*
	(-3.816)	(-3.083)	(-4.021)	(1.066)	(-1.358)	(-1.653)
lngendereq3av	-0.607***	-0.0617	-0.431***	-0.0183	-0.248***	-0.0960
	(-8.073)	(-0.820)	(-6.405)	(-0.251)	(-4.170)	(-1.209)

Dep. Var.	**ln_f_mig_prim**	**select**	**ln_f_mig_sec**	**select**	**ln_f_mig_ter**	**select**
lngendereq2	0.812**	-0.0272	1.274***	0.0709	1.405***	0.487**
	(2.562)	(-0.110)	(4.441)	(0.304)	(5.453)	(1.984)
lngendereq3	-0.00437	-0.0907	0.203***	-0.0704	0.302***	-0.102
	(-0.0546)	(-0.984)	(2.838)	(-0.790)	(4.778)	(-1.074)
lngendereq1av	-0.0453*	-0.0318	-0.0114	-0.0310	0.0157	-0.0478
	(-1.904)	(-1.149)	(-0.534)	(-1.153)	(0.846)	(-1.593)
lngendereq2av	0.437***	0.0564	0.645***	0.0812	0.831***	0.204*
	(2.966)	(0.461)	(4.876)	(0.697)	(6.991)	(1.669)
lngendereq3av	-0.135*	-0.0694	0.164**	-0.0705	0.247***	-0.0506
	(-1.852)	(-0.912)	(2.499)	(-0.954)	(4.235)	(-0.660)

Z-statistics in parentheses

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

Table B.12: Impact of gender equality on migration by gender and skill level (alternative indices)

Dep. Var.	**ln_m_mig_prim**	**select**	**ln_m_mig_sec**	**select**	**ln_m_mig_ter**	**select**
lngendereq2	-1.133***	-0.930***	-0.905***	-0.0618	-0.173	-0.448*
	(-3.160)	(-3.466)	(-2.835)	(-0.244)	(-0.619)	(-1.649)
ln_f_educ_ratio	0.363***	0.0220	0.211**	0.130*	0.0247	0.0593
	(3.311)	(0.275)	(2.165)	(1.720)	(0.291)	(0.734)
lngendereq3	-0.555***	-0.107	-0.389***	-0.0267	-0.199***	-0.0811
	(-6.594)	(-1.158)	(-5.123)	(-0.303)	(-3.004)	(-0.833)
ln_f_educ_ratio	0.412***	0.0281	0.200*	0.320**	-0.00195	0.129
	(3.182)	(0.204)	(1.681)	(2.465)	(-0.0191)	(0.916)
lngendereq1av	-0.165***	-0.0140	-0.133***	-0.0330	-0.0801***	-0.0371
	(-6.519)	(-0.493)	(-5.847)	(-1.183)	(-4.030)	(-1.171)
ln_f_educ_ratio	0.248*	-0.250**	0.125	0.00810	-0.0173	-0.0914
	(1.958)	(-2.410)	(1.129)	(0.0846)	(-0.181)	(-0.873)
lngendereq2av	-0.813***	-0.369***	-0.713***	0.0339	-0.192	-0.255*
	(-4.813)	(-2.746)	(-4.644)	(0.268)	(-1.441)	(-1.870)
ln_f_educ_ratio	0.318***	-0.0117	0.208**	0.120*	0.0382	0.0665
	(3.162)	(-0.157)	(2.312)	(1.709)	(0.486)	(0.882)
lngendereq3av	-0.623***	-0.0464	-0.435***	-0.0214	-0.238***	-0.0912
	(-8.193)	(-0.611)	(-6.376)	(-0.293)	(-3.957)	(-1.145)
ln_f_educ_ratio	0.140	-0.209**	0.0341	0.0462	-0.0902	-0.0801
	(1.321)	(-2.352)	(0.363)	(0.557)	(-1.105)	(-0.887)

Dep. Var.	**ln_f_mig_prim**	**select**	**ln_f_mig_sec**	**select**	**ln_f_mig_ter**	**select**
lngendereq2	0.425	-0.142	1.150***	-0.130	1.332***	0.328
	(1.245)	(-0.532)	(3.691)	(-0.510)	(4.756)	(1.230)
ln_f_educ_ratio	0.311***	0.0903	0.0943	0.151**	0.0546	0.120
	(2.955)	(1.131)	(0.988)	(1.988)	(0.656)	(1.523)
lngendereq3	-0.0806	-0.108	0.156**	-0.0926	0.264***	-0.117
	(-0.989)	(-1.163)	(2.130)	(-1.032)	(4.093)	(-1.217)
ln_f_educ_ratio	0.570***	0.169	0.342***	0.240*	0.272***	0.157
	(4.543)	(1.207)	(3.020)	(1.824)	(2.752)	(1.121)
lngendereq1av	-0.0667***	-0.0319	-0.0260	-0.0300	0.00488	-0.0638**
	(-2.696)	(-1.119)	(-1.170)	(-1.087)	(0.250)	(-2.065)
ln_f_educ_ratio	0.376***	0.000913	0.253**	-0.0154	0.177*	0.244**
	(3.145)	(0.00872)	(2.369)	(-0.157)	(1.884)	(2.389)
lngendereq2av	0.205	1.15e-05	0.543***	-0.0257	0.733***	0.115
	(1.246)	(8.60e-05)	(3.644)	(-0.201)	(5.487)	(0.855)
ln_f_educ_ratio	0.305***	0.0763	0.131	0.142**	0.123	0.118
	(3.155)	(1.025)	(1.492)	(1.988)	(1.601)	(1.593)
lngendereq3av	-0.176**	-0.0692	0.138**	-0.0703	0.224***	-0.0595
	(-2.387)	(-0.905)	(2.082)	(-0.948)	(3.790)	(-0.775)
ln_f_educ_ratio	0.358***	-0.00305	0.213**	-0.00256	0.186**	0.133
	(3.561)	(-0.0339)	(2.353)	(-0.0301)	(2.344)	(1.509)

Z-statistics in parentheses

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

Table B.13: Summary statistics

Sample	ln *gendereq*1			ln *gendereq*2			ln *gendereq*3		
Variable	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**
Total Migration	22612.859	164889.32	1934	15157.4	126180.064	4063	18240.095	143058.883	3090
mig_prim	11051.352	111361.936	1934	7192.561	84058.336	4063	8603.864	95841.548	3090
mig_sec	4920.477	30728.188	1934	3169.663	22656.073	4063	3887.085	25810.144	3090
mig_ter	6641.04	35237.519	1934	4795.177	31934.19	4063	5749.147	35028.736	3090
mig_m	11835.989	91100.312	1817	8227.849	70439.868	3699	9592.929	79022.611	2868
mig_f	12246.425	79386.467	1815	8453.096	62242.443	3685	10073.091	69923.036	2864
m_mig_prim	5827.938	62675.875	1817	3920.896	47979.953	3699	4592.265	54238.286	2869
m_mig_sec	2416.002	16156.993	1817	1617.775	12054.69	3700	1919.619	13580.93	2868
m_mig_ter	3592.05	18609.671	1817	2688.014	16946.495	3700	3078.375	17761.74	2869
f_mig_prim	5941.565	52364.128	1815	3993.482	40298.611	3686	4682.513	45377.089	2864
f_mig_sec	2824.409	15805.691	1815	1869.927	11888.738	3686	2270.716	13427.96	2865
f_mig_ter	3478.535	17842.797	1816	2586.699	16737.321	3687	3116.895	18783.085	2866
gendereq1	66.873	13.682	1934	66.873	13.682	1934	66.873	13.682	1934
gendereq2	77.95	5.316	1934	73.148	10.65	4063	76.965	6.136	2604
gendereq3	45.578	14.505	1934	43.987	15.312	2604	43.279	15.473	3090
gendereq1av	65.972	15.452	1934	63.828	17.29	2894	63.662	17.037	254
gendereq2av	71.896	7.291	1934	65.351	14.171	4063	70.195	9.509	2892
gendereq3av	47.266	14.696	1934	46.768	18.557	3184	44.666	15.222	3090
gdp_o	18911.129	11203.589	1934	11343.666	11526.39	4063	14749.174	11512.271	3090
pop_o	37497436.769	57292116.126	1934	51131296.431	170431955.436	4063	30995289.57	48498415.454	3090
Youth	9.717	8.278	1934	8.688	9.08	4063	9.550	8.717	3090
Education	55.327	31.472	1934	43.729	30.303	406	49.005	29.538	3090
Polity	8.301	3.268	1934	4.091	6.829	4063	7.036	4.692	3090
Colony	0.062	0.241	1934	0.047	0.212	4063	0.064	0.246	3090
Contig	0.02	0.141	1934	0.012	0.109	4063	0.013	0.113	3090
Comlang_off	0.066	0.249	1934	0.096	0.294	4063	0.083	0.276	3090
Dist	6104.926	4680.169	1934	6894.196	4315.106	4063	7283.451	4541.264	3090
Dip. rep.	0.797	0.402	1934	0.642	0.479	4063	0.738	0.44	3090