LUND UNIVERSITY
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Master in Economic Development and Growth

Female Brain-Drain or Female Empowerment?
A panel data analysis of brain-drain rates to OECD countries from 1980 to 2010

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Abstract: Women make up most of the high-skilled workers in OECD countries, a trend that has been on the rise since the 80's. The main hypothesis of this paper is that women migrate more than men due to the cultural impositions of gender roles on their freedom. This paper benefits from using the most comprehensive dataset on brain-drain available, that contains data for 193 countries throughout 30 years, and so far not quoted for any gendered migration studies. Through, a fixed effects panel estimation, this dissertation found that indeed freedom rights are the most important determinant, rebuking the hypothesis of previous studies that attributed brain-drain to women's rights violations. In addition, this dissertation found that there tends to exist a linear relationship between the importance of freedom rights' violation and the level of education of women, and an inverse one for women's rights, that are most important for low-skilled women. Ultimately, it is argued that fleeing human rights violations' is empowering those who would be powerless at home, women.

Key words: education; empowerment, female brain drain; freedom rights; human rights; migration; panel data, women's rights; gender roles

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1.Introduction

"Gender as a social construction that organizes relations between males and females can greatly differentiate the causes, processes and impacts of migration between the two sexes. Knowing how these differences play out at the interface of migration and poverty can be important for achieving the third Millenium Development Goal – to promote gender equality and empower women (…)" (World Bank, 2005, p.1).

Migration is a phenomenon probably as old as mankind. History has portrayed several types of migration throughout, and although different, they all shared the same motivation: the quest for better living conditions. Despite not being a new phenomenon, the fact that more women, and in particular, high-skilled women migrate OECD countries, might be surprising to many (UN, 2017). Wives, mothers or sisters are the terms the literature traditionally uses to address migrant women (IOM, 2005a). Indeed, gendered migration is almost an invisible aspect to the literature, largely due to the lack of comprehensive international data, throughout time.

In this manner, very little research has been done on cross-national patterns of gendered migration. In order to explain the observed disparity in migration from women to men, the literature has sought gendered discrimination factors to explain it. While most studies focused on socio-economic variables, the most recent ones have turned their interest to human rights' violations, namely women's rights violations (Nejad, 2013 and Nejad & Young, 2014). In both studies, women's rights violations were found to be highly significant for female-brain drain. Both studies are based in a single year observation, and the authors just assume the apparent intuitive idea behind women's rights violations and women's brain-drain to justify their analysis. Nevertheless, by not having delved deeper into different socialisation process of men and women, the authors may have overlooked important an important aspect that has been pointed out in studies of gendered migration: gendered self-selection on migration. This concept entails that given the fragile position of women in most societies concerning their freedom, only more liberal households allow women to migrate. In this manner, theoretically, women's rights, which are strongly linked to discrimination within the household, should not be so significant.

On the contrary, precisely given women's more fragile position in the society, it makes sense that women will be more affected by general freedom's restrictions in their origin country than men. Freedom rights, a concept that would *apriori* be considered genderless, is far from

it. The explanatory channel found for such reasoning, was precisely the fact that the education that high-skilled women possess bestow them with a higher perception of their freedom right's violations, particularly in comparison to low-skilled women who may take it "the way it has always been" and may not acknowledge freedom restrictions. At the same time, education grants women with more bargaining power and less discrimination within the household, aspects that are more controlled in the women's rights index, meaning they would tend to be insignificant, at least to high-skilled women.

For the present analysis, this paper is using two datasets, one concerning migration, and the other human rights' violations. The dataset concerning migration is a new dataset retrieved from the Institute for Employment Research (IAB) and it contains migration stocks data sorted by skill level (low, medium and high) from 193 countries to 20 OECD countries from 1980 to 2010, with observations every five years. As for the human rights' violation indicators, the data was retrieved from CIRI, which has indicators available yearly in the same period. Both datasets are the most comprehensive existing on both gendered-skilled migration and human rights' violations, respectively. As at the time of writing no author has quoted the migration dataset for gendered studies, this paper will make a twofold contribution to the literature: firstly, it will provide the most complete picture of the evolution of female brain-drain rates existing so far, and secondly, it will be the first macro-study on human rights violations as determinants of migration, particularly in the context of the observed high-skilled female brain-drain. To justify the argumentation this paper has built for its hypothesis, this paper will compare both freedom rights' violations and women rights' violations across skill-levels, in the attempt of establishing a relationship between these concepts.

To test such relationships, this paper performed a fixed effects estimation panel and found that there tends to be a linear relationship of the importance of freedom rights as a possible determinant for migration, and the education level of the woman, while freedom rights' violations were barely significant for men. In addition, an inverse relationship was found for women's rights, that showed that this indicator tended to be the most important for low-skilled women, but not so much either. Several robustness checks have supported the evidence of this double-intuition between the importance of general freedom rights across gender and education levels, and women's rights and educational levels. In this manner, this paper seems to have found grounds to substantiate its double-hypothesis: 1) high-skilled women are more affected than men by violations on freedom rights due to gender roles; 2)

freedom rights rather than women's rights are more likely to contribute more to high-skilled female migration.

In order to provide a better understanding on how these relationships might take place, the second part of this paper will present a theoretical discussion and literature review, the third part of the analysis will elaborate on the data and the descriptive statistics, while the fourth part of the paper contains the empirical analysis and the fifth its discussion, being part six the conclusion. On the whole, this paper seems to find evidence that migration for women can be more than the quest of better living conditions, it can be the quest to make full use of their social identity as individuals, not based on their gender.

2. Literature review

Migration is a rather complex phenomenon that touches virtually all aspects of the spectrum of human life. Taking this into account, for the literature review part, this paper will try to encompass three dimensions: at the macro-level it will study on the potentially harmful impacts of the gendered brain-drain in the origin-country, and at the same time it will analyse the theory on the determinants of brain-drain. Then, at the meso-level, it will focus on explanations for the phenomenon of gendered brain-drain, specifically on how the society shapes gender roles and the individuals' perception of freedom. Finally, at the micro-level, it will advance some case studies that analyse individual experiences that portray female migration as an empowering experience, that justify the gendered determinants appointed in the section before. In the last part of the literature review all the elements that were exposed throughout to justify its hypothesis and analysis will be presented.

2.1. A macro overview of brain-drain

2.1.1. The invisible gender-biased migration and brain-drain

The first authors to draw attention not only for gendered differences in migration, but also for brain-drain, were Dumont, Martin and Spielvogel in 2007. Up until then, it was by and large assumed and acknowledged that women migrated less, as there appeared to be a general agreement that women have more attachment to the family, domestic life and need for protection, making them less prone to migrate (Docquier, Marfouk, Salomone, and Sekkat, 2012).

There are some reasons why the dimension of the gendered brain-drain might have gone unnoticed. A very prominent one could be because migrant women are reported to have a

higher-occupation mismatch (Kofman, 2014). Overall, evidence tends to imply that immigrant women bring higher skills with them than the traditional stereotype acknowledges. For instance, there are many immigrant women that migrate through family visas, and therefore end-up in stereotypical low-skilled occupations (Cerrutti and Massey, 2001).

Moreover, the fact that women are not usually seen as capable as men in general, might even be more pronounced for migrant women. For instance, Chiswick and Miller (1999) found that foreign-born women that do not speak the language of the host-country suffer from a higher penalty in terms of earnings when compared to foreign-born men in the same position. At the same time, marked gender roles in the origin country might also lead to higher under-occupation for women. Antecol (2002), for instance, attributed a lower participation rate of immigrant women in the US labour market due to the cultural differences.

2.1.2. The negative effect of female brain-drain in sending countries

However, regardless of the position these women end-up occupying at the destination country, the fact that developing countries have such high percentages of migration of skilled-people has concerned researchers throughout, who generally attribute negative outcomes for the country or origin, in a phenomenon commonly known as brain-drain. For instance, Beine, Docquier and Rapoport (2008) studied the impact of skilled migration on human capital formation in developing countries and concluded that as long emigration rates did not exceed a threshold of 20%, it could be beneficial for the sending country, mainly through the return channel. However, above this threshold, the impacts were considered to be exponentially harmful.

What is more, women's brain-drain has been considered by a number of authors as particularly harmful for developing countries, mostly due to women's role in the household. In general, studies show that women's education is positively associated with investing in their children's education, and therefore it has deep effects in education of future generations (World Bank, 2007). Berhrman et al., (2009) showed that educated mothers are better teachers at home, for the case of India. Another possible explanation is that higher-educated mothers are also contributing with more income to the household, which lead to a greater investment in children's schooling, as well as lower fertility rates (Basu, 2002). Moreover, Quisumbing (2003) also argues that higher-educated mothers tend to have higher bargaining power within the household, and thus women can allocate more resources towards the

education of their children. At the aggregate level, education is linked to higher productivity, which alone implies that the existence of a schooling gap is an impediment for development (Knowles et al., 2012; Coulombe and Tremblay, 2006).

The only study that endeavoured to test if female high-skilled migration had an impact on origin countries was the one of Dumont, Martin and Spielvogel in 2007. The authors regressed three basic indicators on education and health, these being under-5 mortality, infant mortality, and secondary enrolment by gender, and controlled for the difference in migration of women and men per skill level. In all the regressions the authors were able to find a negative and significant impact on the differentiated of highly-skilled female migration compared to the men's, which converges with the aforementioned literature and depicts women as having a specific role in children's upbringing.

2.1.3. Determinants of migration according to theory

In general terms, one can argue that, the decision of migrating is quite costly, both in monetary and in psychological terms. These costs can be split in three major parts: the costs of displacement (transportation, visas and living arrangements); the (in)security of finding an occupation in the destination at the time of arrival that would provide a new source of income as soon as possible; and the cost of having to leave one's whole life (personal relationships and culture) behind.

This paper was able to find only one study that attempted to build a model that could explain brain-drain (Portes, 1978). Therefore, it will use this this model as a backbone of the theoretical structuration of the present analysis and frame it as a reaction and complement to general migration theory. Nevertheless, migration theory has yet to elaborate a consistent model on what might be causing differentiated gender determinants (Oishi, 2002). In this way, this paper will try to fill this void by elaborating on gender roles and the restrictions on choice of each gender in the following section (2.2).

2.1.3.1. Neoclassical theory of migration– a monetary based approach

The first theory to propose the evaluation of migration as a cost analysis was the neoclassical one. More precisely, the theory focuses on the benefits of comparative returns to human-capital, labour demand and supply in both origin and receiving countries (in comparison) and relationship of cost-benefit of migration. However, this theory is addressing the migrant only as an individual, and only considers monetary incentives (Lewis, 1954; Sjaastad, 1962). Undoubtedly, a higher remuneration is an important pull factor, but it is neither a sufficient

but nor a necessary condition to make such a complex decision as migration, and therefore this view has to be complemented with other elements on the migration literature, and most importantly, linked to special migratory case of brain-drain.

2.1.3.2. A three-dimensional analysis of brain-drain's determinants

Portes (1978) builds an explanatory model that focuses on brain-drain rates and argues that brain-drain takes place as the result of political and economic imbalances in the world's systems. As primary determinants the author partly supports his argument in the neoclassical theory, stating that people feel attracted to migrate where they can have higher returns for their labour. Nevertheless, the author demarks it from the neoclassical migration theory by introducing the concept of general well-being conditions that go beyond monetary terms and can be broadly categorised as "quality of life".

However, the author is aware that this condition would be insufficient to explain all brain-drain movements, as not all movements observed are South-North. North-North movements still comprise a significant share, despite the lower wage-differentials between these countries and similar "quality of life". The author then attributes the occupational-mismatch between the skills of these migrants and their origin country-labour market, rather than unemployment per se, as a secondary determinant of brain-drain. This can happen when a country produces a number of graduates in a certain profession in a higher number than the system has the capacity to absorb.

As for the tertiary determinants, Portes (1978) conducted some interviews on students that were undertaking a physician specialisation in a university in the US, both native and foreign students, coming to three important conclusions: foreign students had higher professional achievements than the natives; were most likely to be single and without children; and reported that one of the reasons of being there (abroad) was because they knew other physician in the country already. Indeed, foreign students reported to know more fellow physicians than the native ones prior to their arrival.

In this manner, the author's conclusions converge with the findings of more recent literature on migration such as the ones of self-selection and the importance of networks, which this paper will elaborate on in the sections below.

2.1.3.3. Self-selection and network theory

There is a general idea that those who migrate are poor. However, this view could not be far from the truth, as there are a great deal of costs and opportunities involved (World Bank,

2005). Indeed, the first migrants are usually the one that are slightly better-off and more educated in the society. “Migration is a selective process that tends, initially at least, to draw relatively well-educated, skilled, productive, and highly motivated people away from sending communities” (Massey, Arango, Hugo, Kouaouci, Pellegrino & Taylor, 1993, p.24). This goes to show that there is a great deal of self-selection when it comes to who migrates. This is even more accentuated taking into account that this study is referring to people migrating to OECD countries, which have many explicit skill-selective policies as requisite of entry and other selective policies (Kofman, 2014).

In general, by being educated and from a better-off background, these migrants have not only an informational advantage of being aware of the benefits of migration but also (most likely) an occupation when they arrive at the destination countries. These two factors together make that these skilled-people have relatively lower costs than those from a poorer background as Massey et al., (1993) commented. Not least important, these migrant’s education and background might dote them with important connections in the country where they intend to migrate. Indeed, networks are an important channel that facilitate migration, exacerbating or even perpetuating some movements, as they lower the costs of migration, by having someone to orient them and guide them at arrival or even where to stay while increasing migration’s potential returns, by for example, having a secured job. This idea is conceived within a branch of the literature that focuses on the perpetuation of international movement, namely the network theory.

Supporters of the theory argue that once the number of network connections reaches a threshold, migration becomes self-perpetuating, as it each new migrant increases the already existing network. In this manner, networks may have a self-sustained growth that can be theoretically explained by both progressive reduction of risks and costs (Massey, Arango, Hugo, Kouaouci, Pellegrino & Taylor, 1993).

Solomone (2013) compared both gender and educational level and reached the conclusion that migration networks are more important for the lower-skilled,but have the same importance for men and women. Moreover, the author concluded that distance tended to affect more men’s migration choices but not women’s. This seems to be corroborated in the case studies analysed in the sections below.

2.1.3.4. New economics of migration

Another important step forward from the neoclassical theory was that not all migrants decide to migrate alone. On the contrary, many decide to do so with their household, and aim at the general well-being of the household (Stark and Bloom, 1985).

Other important advances in theory of migration, within the "new economics of migration", challenge the neoclassical idea of migration and fit the purposes of the present analysis. One was, for instance, the recognition that migrants are not only individuals, instead, being many part of a household and taking the decision to migrate that would better suit the household (Stark and Bloom, 1985). In this manner, the studies within this branch imply that international movement will not automatically stop once wage differentials have been eliminated. "Other markets in sending countries will also provide incentives for migration, as long as they are imperfect, in disequilibria or even absent" (Massey, Arango, Hugo, Kouaouci, Pellegrino & Taylor, 1993, p.24). This last statement goes in line to what Portes (1978) had defined as disequilibrium in world systems and paves the way for this paper to test respect for human rights, as a proxy for the individual's perceived quality of life, or more specifically, women's.

2.2. A meso overview of brain-drain: a gendered analysis

2.2.1. Gendered determinants of migration

This paper has tried to highlight the most important migration determinants that can be used to explain brain-drain in general. Nevertheless, to truly understand the gendered determinants, one has to go deeper into the gender issues, which entail understanding the processes of socialisation of men and women. As the World Bank (2005) paper neatly puts it: "A gender analysis of migration looks beyond simple differences in migration behaviour between men and women – such as the likelihood and type of migration – and examines the inequalities underlying those differences. It looks at how these are shaped by the social and cultural contexts of the individual, and the influence that membership of social groups and economic and political conditions can have on decisions about migration" (p.1). For this reason, the following section will endeavour to connect the concepts of gender roles, restrictions of freedom perceptions for women and men, and also how education might affect such perceptions. Moreover, it will introduce the concept of migration, particularly of the highly educated women to OECD countries, as an empowerment choice, that among other things, escapes human rights' violations at home.

2.2.2. Gender Roles and perceived freedom

"Many of the most significant sex differences occur on achievement-related behaviours that involve an element of choice, even if the outcome of that choice is heavily influenced by socialization pressures, gender-role beliefs, and cultural norms." Eccles (1987 p. 141). To the extent that a complex choice such as migration can be influenced by perceptions of the restrictions on one's freedom based on their gender is a gap that is yet to be explored, particularly because this link of the process of socialization, gender roles, culture, and education has not been made. The literature has explored the link of discrimination through socioeconomic variables of access or outcome or considered women's rights violations. Nevertheless, by doing so, they might fail to see the bigger problem: general freedom rights, which are unarguably distinct for men and women

In broad terms, gender roles consist of values instilled to individuals through the process of socialisation that attribute gender-specific behaviours, of what is correct and expected from them. Eccles (1987) argues that gender roles are likely to also influence both educational and occupational choices, as they even shape the range of what an individual considers as their range of options available, the expectations the individual has over certain outcomes and their subjective value. In this manner, the very definition of success is central to the identity of the individual through its gender role, therefore activities that are highly-valued according to each role will be pursued in place of others. What would make women "successful" from the gender role perspective is known to be the role of caretaker within the household. Among other things, this makes that educating girls and women in traditional societies something not valued. On the opposite end, men are expected to be the breadwinner, therefore they learn how to value career or other goal-oriented activities at the same level as families, as they tended to believe that they could only play their role to the family if they were able to have a successful career.

Gender roles are by and large still fomented by "culture". "Culture is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the 'meaning' of other people's behaviour" (Spencer-Oatey 2008: 3). In this sense, gender roles will have a strong impact on the individual's freedom, to the extent he/she might not even perceive he/she is being influenced by its social and gender roles. This makes that a concept that would *apriori* be

"free", choice, in reality not free at all. To the extent that gender roles and their restriction are ingrained within the culture, many people might fail to acknowledge its "non-existence". Bourdieu (1977) defined this lack of unawareness of social freedom as "doxa", which can be summarised as when culture and tradition are taken-for-granted that become natural to the individual. These are often justified to the individual *as the way it always has been* (Ozorak, 1996). In this manner, the act of at least imagining a different possibility takes place when there is critical consciousness, "from a position of unquestioning of social order to a critical perspective on it" (Kabeer, 1999, p. 441).

One tool that would unarguably contribute to such critical questioning of social order would be education. Indeed, education provides more than a well-remunerated occupation and status in the society, it broadens one's horizons by providing the individual with information and contact with other informed people (Aslam, 2013). Nevertheless, high-education attainment is, by and large, not exempt from a self-selection process in itself, as it is strongly linked to the individual's social class. Both from a sociologic and economic point of view, numerous studies have shown that one tends to fall in the same class as their parents later in life, which means that those who are already better-off within the society tend to continue their privileged position, whereas the poor and uneducated will most likely to perpetuate this situation throughout generations.

From a sociologic point of view, studies show that the lack of social mobility education seems to provide is because individuals, particularly from a lower background, are not able to objectively study all their options available when making their decision, some not even being aware of its existence. Lack of information regarding either the outcome or option itself may discard some important options to the individual, while others are immediately discarded because they do not fit the individual gender's role (Stevens, 1986). On the other hand, from an economic point of view, this is argued due to the fact that a higher economic status can also "buy" a better education, by providing all the means and support (e.g. language teaching, private tutors, better university education…) (Schmidt, Burroughs, Zoido, & Houang, 2015).

All in all, this remits us to the fact that the high-skilled women this paper is analysing, are likely to also benefit from the fact that they come from a rather privileged background within their own society, fact also highlighted by Docquier, Lowell and Marfouk (2009). In a nutshell, the skilled- women in this analysis are 1) more educated and therefore more informed on their choices and constraints and 2) from more a privileged background, that

would grant them more physical and social means within their societies. These are important acknowledgements, as in comparison to women that are not educated and/or come from the lower classes of the society, these women will most likely face less discriminatory behaviour within their household and be more aware of the discrimination they face as a woman in society.

2.2.3. Gender roles and women's power within the household

While the previous section has endeavoured to understand the relationship between perceptions of freedom through gender and education, this section will endeavour to conceptualise a woman's freedom within her household in the same manner. Indeed, probably a woman's biggest restriction to migrate in the first place might be her household. Roles within the household are most likely to mimic those that society imposes, but in a customised manner. In other words, the freedom each household allocates to women is likely to be representative to the one of their culture, but their degree is varied. Oishi (2002) argues that to migrate, women need *social legitimacy*, which comes from their employment status, which would grant women some financial independence; their own country's integration in the global economy, which would proxy for more open-mindness; women's rural-urban mobility, the extent these women are allowed to migrate within their own country; and last but not least, their education, which as section 2.2. showed, might dote these women with higher bargaining power. Moreover, the mere fact that these women have a higher education, is already a reflection of a less restrictive household. Nevertheless, it is also important to acknowledge that to migrate, all women have to come from less restrictive households, as in very restrictive ones, women do not migrate. In this way, not only one can say that there is a self-selection of migrants through education, but also through gender.

There are some studies, which through empirical case-studies provide evidence for this hypothesis and state that the observed selectivity in female migration is strongly linked to their role in origin countries, which tends to be more restrictive than men's (Zachariah et al, 2001). Therefore, the more restrictive the woman's gender role, the less women migrate, and following Oishi (2002)'s *social legitimacy* concept, one can easily argue the woman's gender role will be more restrictive the lower her educational attainment. The World Bank neatly summarises these arguments: **"a**s gender attributes are usually assigned by cultures, the migration choices and constraints for females can vary vastly depending on their socio-cultural origins" (p.5).

Other case studies seem to corroborate this hypothesis. Oishi (2002) studied the relationship between gender roles and migration in Asian countries, and concluded that women from the Philippines, Thailand and Sri Lanka migrated the most because their gender role allowed them for greater flexibility within their own society, whereas the opposite happened in Bangladesh. The author also provided a very key insight, being the only to do so, to the extent this paper's knowledge, that most of these women were the ones making their decision to migrate, being more autonomous than what the traditional literature acknowledges. The author attributes the independence in the choice of migrating to the higher freedom women were able to enjoy within their household.

Overall, sections 2.4.1 and 2.4.2 remit us to a crucial point in the analysis: gender roles within the household and gender roles within society. Although similar, they are not the same. A woman might be participating equally in the decision-making process within the household, but then might have her freedom reduced as soon as she steps outside of the household, as society imposes her to. In this manner, educational attainment may help women to break-free from gender roles within the household, but it does not free women from their woman status within their society.

2.3. A micro-level analysis of brain-drain: the power of choice for the individuals

2.3.1. Migration as Empowerment

Kabeer (1999) defined women's empowerment as the ability to exercise choice, encompassing three inter-connected concepts: *resources*, that focus on material, human and social resources; *agency*, that incorporated the process of decision-making; and *achievement*, generally described as well-being outcomes. The application of such definition to high-skilled female migration is inevitable: these women have *resources* (education, money, maybe even connections with people already living in OECD countries), education is their *agency* in providing them with information and a physical outcome when migrating (an occupation) and their *achievement* will be the higher perceived well-being. In other words, education is allowing women, who are at a more vulnerable position within their society, to migrate to a place where their rights will be more respected.

Sen (1985b) used the term *capabilities* to refer to joint form of *resources* and *agency*, which all high-skilled women possess by definition (through their high-education attainment). The author describes *capabilities* as the potential that the individual has of living the life he/she wants, in the perceived manner of "being and doing". Combining both authors'

argumentation, to achieve the empowerment component, these women have to have *achievement*, that is, a higher perceived well-being out of their choice. In the context that migration can be associated with escaping freedom rights' violations, it can be argued to be an empowering choice.

Conversely, when a woman migrates merely to fulfil her gender role, one can hardly categorise this experience as empowering, if it does not provide the woman with any autonomy in the decision-making. Nevertheless, when women migrate to escape their gender roles, or through their migratory experience are able to break-free from them, then migration can be said to have been an empowering experience.

2.3.2. Previous gendered migrations as an empowering experience for women

The fact that migration can be an empowering experience for women has already been empirically studied in the literature. One does not often make the immediate connection between migration and empowerment, as migration is a concept that traditionally has negative stereotypes associated to it. Nevertheless, for many women it can be a very empowering experience, in comparison to what would have been their lives had they stayed at home, particularly concerning their freedom. In this regard, several authors seem to agree that the experience of migration has different benefits for women (Kats 1982).

Unfortunately, most migration case studies seem to be connected to the low-skilled, for which a straightforward connection between migration, education and autonomy cannot be drawn, which would be essential to provide insights for this paper's hypothesis. Needless to say, low-skilled women might also be empowered by migration, but in a different manner than high-skilled women. The conceptual considerations this paper has been elaborating provide substantial grounds for the hypothesis that low-skilled women will be more affected by their relationship within the household by having more restrained gender-roles, whereas high-skilled women would be more sensitive to general freedom restrictions, as imposed by their woman status within the society. The historically documented migration processes presented below seem to corroborate this argument, at least as far as for low-skilled women are concerned.

Indeed, the aspect of women migrating to flee their restrictions and lack of prospects at home is older than what history normally acknowledges, starting as early as modern migration surged in the mid-19th century, exemplified by the Irish mass migration. Indeed, this is one of the most famous migratory movements in history, but one of its important aspects is not

so often mentioned: migrants were predominantly women, young and single. As the century progressed such migration could be classified as a "female mass movement" (Diner 1983:4). Adding to Ireland's situation at the time: poverty, landlessness, which eventually culminated in the great famine, the system of single inheritance and single dowry, paved the way for the country "to become the home of the unmarried and the late-married" (Diner 1983:4).

These social and economic imbalances made Ireland a country that "held out fewer and fewer attractions to women" (Diner 1983:4). Women were faced with a situation where they had little marriage options or employment and therefore had to stay in the countryside with their families. In order to escape from their families or spinsterhood, their options were either joining a religious order or emigration. This brought about a kin chain migration, where women brought their sisters, mothers, nieces, aunts and friends. Overall, the author described Irish female migration more beneficial in comparison to the option of staying home, converging to the findings of Kats (1982).

Other more recent studies portray a similar reality, where migration seemed to provide women with higher benefits than men. Pedrazza (1991) reports the immigration of Jamaican women in London and described that as difficult as had been these women's migration experience, that it had been far more positive than for men: "as it allowed women to break with traditional roles and patterns of dependence and assert a new-found (if meager) freedom" Pedrazza (1991, p. 19). Pessar (1984) documents labour-migrant women from Dominican Republic to the US and reports that important effects in the women's livelihoods Overall migration helped women to reverse patriarchal roles, to heighten women's self-esteem, and their new income gave these women the ability to participate in the household decision-making, securing and actualizing their roles. Overall, provided that women join the workforce, an option that might have been unavailable for many in their origin-country, and by being exposed with different gender norms abroad, women migrants are often able to change their gender roles within their households, and even stand up for themselves on issues such as domestic violence (Ramirez, Domingues & Morais, 2005).

2.4. Theoretical Approach

2.4.1. Previous studies on high-skilled female migration

The literature that addresses the gendered determinants of brain-drain remains a largely unexplored branch in the literature, mostly due to the lack of detailed and comprehensive data. Until the compilation of the data the present paper uses, the best detailed dataset had

been compiled by Docquier and Marfouk (2006) (henceforth DM06) and it consisted of two stocks of migrations for OECD countries, one for 174 countries in 1990 and the other for 193 for 2000. All the studies mentioned below are based on both or merely in one of these observation periods, for which the author's chosen methodology has always been cross-sections.

Most of the papers that study female brain-drain have sought in the literature discriminatory patterns to explain such behaviour, given the intuitive association between gender and gender discrimination. For instance, Bang and Mitra (2011) did two pooled cross-sections, for the years 1990 and 2000, and added to the standard socio-economic indicators variables related with political stability and concluded that these did not appear significant. However, an indicator the authors had created, "access", that comprised the gendered difference in access to economic opportunities, captured by differences in schooling and fertility rates, came significant, meaning that women might be more sensitive to discriminatory factors.

Other authors have embarked on assessing the impact of female brain-drain in reaction to discriminatory behaviours. For instance, Baudassé and Baziller (2011) have used a principal component analysis for 51 countries and aggregated several variables into indices of gender inequality and conclude that higher gender inequality is associated with both higher female migration and, in particular, with high-skilled female migration. However, the authors based their analysis on socio-economic indicators, such as female primary education or female employment rate which, like in Bang and Mitra (2011), can be interpreted as outcomes and not as institutional opportunities (Nejad & Young 2014).

Nejad (2013) builds a model in which she introduces an index comprised by the sum of all women's rights from the CIRI database and tests the propensity of female high-skilled migration relative to that men's, using migration stocks for the years 1990 and 2000. The author concludes that at low levels of women's rights, an increase on the index leads to increases the female brain-drain ratio. The author explains such findings, arguing that when women's rights are very low, the costs to migrate are prohibitive. However, an increase in the women's rights grants women some protection, and in a point where women's rights are high enough, the incentives to migrate decrease, and the female brain-drain turns negative. In a similar vein, Nejad and Young (2014) compute a gravity model based on a bilateral migration stocks for 1990 and 2000, with both OECD and non-OECD countries as receiving countries, and estimate the impact of the same women's rights index, and come to similar conclusions.

Lastly, Docquier, Marfouk, Salomone, and Sekkat, 2012, based on a cross-section for the data of 2000, found that women do not have more predisposition than men to migrate, instead, women are more prone to "follow" men through an interdependencies model.

2.4.2. The "woman status" in the society – Hypothesis

In a comment to the last study mentioned, it is important to acknowledge that at the time (year 2000) the number of high-skilled women migrating to OECD countries was only higher than men's in relative terms, this argument could have been plausible. However, the absolute number of high-skilled women migrating surpassed men's in 2005, and evidence shows it has systematically grown since the 80's, meaning that not all women migrate to follow men. The growing number of high-skilled women migrating to OECD countries call for a more in-depth analysis, as there are not enough men women can follow.

Although the theories of migration that came up after the neoclassical one are able to capture factors that go beyond monetary analysis and depict pull and push factors that portray "worlds of first and second class", as hinted by Portes (1978) in the brain-drain literature and by Stark and Bloom (1985) in the new economics of migration, no author has ever considered whether human rights violations in general were an incentive enough for people to migrate. Indeed, human rights are intangible goods and have no possible monetary value that could be attributed to them: they essentially measure freedom of expression, and freedom of expression could hardly be argued to have monetary price attributed to it.

The only authors, to the extent of this paper's knowledge, that have tested human rights as potential determinants are Nejad (2013), Nejad and Young (2014) who have tested women's rights. Although intuitive, the authors did not conceptualise gender roles and their connection to education, and as such, might have failed to analyse another more important factor: the perception of freedom. Indeed, the evidence that this paper has gathered throughout on the links of gender roles, freedom and education call, therefore, for a greater scrutiny on the need of incorporations of freedom rights as determinants of migration. The main hypothesis of this paper is that women migrate more than men due to cultural impositions of gender roles on their freedom, which can be measured through an index of human rights violations that assesses freedom of expression under several perspectives, the empowerment index from the CIRI dataset. This index encompasses freedom of movement within and out of the country, freedom of speech, freedom of religion, freedom of association and political participation and respect for worker's rights (see appendix A for more details on what each of these rights stands for).

In short, this paper argues that women are more discriminated than men in almost all aspects of the society, nevertheless only high-skilled women might be aware of such discrimination, due to the power of critical thinking associated with higher education. In this way, high-skilled women are expected to be more sensitive to freedom rights' restrictions than men, (who are not so restricted) and than low-skilled women (who are not so aware).

As for the importance of women's rights, this paper argued for the existence of a gendered self-selection, that states that only relatively liberal households let women migrate, which is indicative that women's rights are, most likely, not so important regardless of the skill level of the women to migration. Nevertheless, to the extent women's rights are more correlated with discrimination within the household than general freedom rights, they might affect more low-skilled women. Indeed, many of the components used to evaluate women's rights are probably not even representative of the problems of high-skilled women. For instance, women's economic rights include right to work in occupations classified as dangerous or the right to work in the military (see appendix A for the short description of each human right variable directly or indirectly used in this paper). Many of the high-skilled women are neither likely to work in dangerous occupations nor to go to the military, given that they have an education that allows them a better occupation. The same happens with women's social rights, that include, among others, the right to have an education, freedom to choose a residence, freedom from forced genital mutilation, which, again, might not be representative of the problems of these high-skilled women. Moreover, women's social rights also include general freedoms controlled by the empowerment index, such as the right to travel abroad. The same could be argued for women's political rights, that includes rights such as the right to vote, the right to join political parties, the right to petition for a party, which are controlled for in the empowerment index.

All in all, this paper argues that freedom rights will influence migration of high-skilled women, in contrast to other subgroups, or to women's rights, being its main hypothesis. In this manner, it will test the following reasonings in the empirical section: 1) high-skilled women are more affected than high-skilled men by violations on freedom rights, due to the restrictions imposed by gender roles; 2) high-skilled women are more likely than low-skilled women to feel constrained by freedom rights violations 3) freedom rights rather than women's rights are more likely to contribute more to high-skilled female migration; 4) given the gendered self-selection this paper argues to exist, it is expected that this indicator will

not be overall so significant; 5) if significant, women's rights should be more important for women at lower levels of education.

All in all, this paper is attempting to connect the concept of female brain-drain to the concept of female empowerment, by showing that these women, through their education and background, were able to decide for themselves and escape a place that inhibits their freedom of expression, by migrating to OECD countries, in comparison to men.

3. Data and descriptive Statistics

3.1. Brain-Drain Data

This paper uses detailed data that encompasses emigration rates per skill level and gender to 20 OECD countries, which was collected by investigators from the Institute for Employment Research (IAB) and published in 2013. It comprises information on brain-drain stocks of 195 origin-countries for every five years, starting in 1980 until 2010, being the most complete dataset that includes educational level (Tani, 2017). Like in previous papers regarding brain-drain, this paper will address these proportions as rates (see Docquier, Marfouk, Salomone, and Sekkat, 2012, for instance). The present study dropped the observations of the Vatican City and Palestine, due to the lack of data in other indicators for these two states, for which the total sample in this analysis consists of 193 countries. According the World Bank Classification of 2016, 72% of these countries are developing economies. It is also important to mention that the 20 OECD countries where these migration rates were registered and accounted are: Australia, Austria, Canada, Switzerland, Chile, Germany, Denmark, Sweden, Norway, Finland, France, Luxembourg, the Netherlands, Spain, Portugal, Greece, Ireland, United Kingdom, the United States and New Zealand.

Regarding the data compilation, whenever data was not available for a given year, the authors estimated the number of migrants based on the same methodology as Defoort (2008). In order to define a migrant, the authors used the concept of being foreign-born individuals without citizenship. In the dataset only individuals who are 25 years-old and over are accounted for, so as to be comparable to other international migration datasets. At the same, this restriction in age is less likely to capture international students, giving a more accurate picture of actual labour or family migrants. The dataset is comprised in three skill levels, low, medium and high. The category low-skill considers migrants who have no schooling, primary and lower secondary, the category medium encompasses those who have a high

school certificate or equivalent, and the category high considers those who have more than a high school certificate or equivalent, namely tertiary education.

The present paper focuses merely on brain-drain rates, and in the same vein as previous studies, brain-drain rates are computed taking into account the share of population of origin of the same gender and education level existing in the same year, so that a more precise idea on how severe is the exodus of skilled people in their country of origin can be portrayed (see Carrington and Detragiache, 1998; Adams, 2003; Docquier and Marfouk, 2006; Dumont and Lemaître, 2005; Dumont, Martin and Spielvogel, 2007; Docquier, Lowell and Marfouk (2009) and Docquier, Marfouk, Salomone, and Sekkat, 2012, for instance). In this manner, absolute rates would put into perspective the number of migrants taking the total entering OECD countries, nevertheless, this paper is using data in relative terms, taking into account that these rates are calculated bearing in mind origin countries. The formula used for its calculation is present below.

$$m^{i}{}_{t,g,s} = \frac{M^{i}{}_{t,g,s}}{N^{i}{}_{t,g,s} + M^{i}{}_{t,g,s}}$$

In the equation, $m^{i}{}_{t,g,s}$ stands for the gendered (g) relative measure, per skill level (s), in a given year (t), from a particular source country *i*, and it is the brain-drain rate used throughout the paper. $M^{i}{}_{t,g,s}$ is the total stock of migrants going from the source country i, per gender, skill in a certain observation year, and $N^{i}{}_{t,g,s}$ is the total stock of native population that remains in the country with the same characteristics. The dataset the authors used to calculate the relative terms of education and in the native population $N^{i}{}_{t,g,s}$ was retrieved from Barro and Lee (2013). Barro and Lee's (2013) dataset comprises estimates on the shares of population by education level for 150 countries from 1950 to 2010. This means that for 43 countries there was no data regarding education levels of the population, for which the authors used data of neighbouring countries or countries with the same geopolitical characteristics as proxies. In contrast, the average emigration rates, not skill-specific, presented in this paper are merely presented by the following formula:

$$m^{i}{}_{t,g} = \frac{M^{i}{}_{t,g}}{N^{i}{}_{t,g} + M^{i}{}_{t,g}}$$

These correspond to the total stock of migrants that came to OECD countries in a given year, taking into account merely gender and year.

Having clarified the two definitions of migration rates this paper is using, table 1 presents summary statistics of both for the periods of observation of the dataset.

Table 1: Percentages of migrant women in OECD countries in absolute and relative terms

	1980	1985	1990	1995	2000	2005	2010
Absolute terms:							
Women migration as a total of migrants	53,1	52,4	50,2	50,7	50,0	50,5	50,5
Highly-skilled women as total of highly-skilled	44,7	46,0	46,1	48,1	48,4	50,1	51,4
Relative terms:							
Average female brain-drain	21,8	22,9	22,1	22,2	21,6	23,2	23,4
Average male brain-drain	17,0	18,7	18,8	18,1	18,3	19,9	20,8
Brain-drain gap	21,9	18,6	15,2	18,3	15,2	14,2	11,3

Source: Own calculation based on Brücker H., Capuano, S. and Marfouk, A. (2013).

Another important methodological note is that, like in previous brain-drain studies, this paper uses the approach of (one-country-one-vote), meaning that these averages are computed bearing in mind the number of countries in the analysis, and not population weights.

In terms of migration for OECD countries, in absolute terms, the total number of women migrating has always been higher than men's, as the first row of the table depicts. The number has slightly declined over the years, but not significantly. On the other hand, it can be seen that the absolute number of highly-skilled women migration has surpassed men's for the first time in 2005, having been on a constant increase since the 80's. As for the (relative) brain-drain rates show that women's brain-drain rates have always been higher than men's, despite the absolute number of migrant high-skilled men in OECD countries being higher until the year 2005. In this manner, one could conclude that female brain-drain is both now higher in relative and absolute terms. Nevertheless, such statement masks another important trend: the brain-drain gap has halved from 1980 to 2010. The brain-drain gap is computed by putting men's brain-drain in relation to women's. One of the most likely reasons for this difference is that women tend to have lower tertiary educational attainment, and thus, even if their absolute number is lower, it is higher in comparison to the population existing within their own country.

Indeed, the dataset compiled by Barro and Lee (2013) indicates an impressive catch-up of female tertiary educational attainment, being almost in parity with men in 2010, while in 1980 only half of women had tertiary education completed in comparison to men. It is

important to reinforce the fact that this dataset excludes 43 countries of that this paper is analysing, however, it can be argued that overall there is a trend for a catch-up on women's access to tertiary education worldwide.

Table 2: Tertiary Completed Education Average country-shares

	1980	1985	1990	1995	2000	2005	2010
Women	2,4	3,3	4,3	5,2	6,4	7,6	9,0
Men	4,9	5,7	6,5	7,2	8,1	8,8	9,8

Source: Own calculations: Barro and Lee (2013).

Table 3 puts into perspective the emigration stocks in 1980 and 2010, by both brain-drain rates (on the left) and total emigration rates, irrespective of skill level (on the right) for both genders.

Table 3: Comparison of emigration stocks in 1980 and 2010 (in %)

	Brain-drain rates				Average emigration rates			
	Women		Men		Women		Men	
	1980	2010	1980	2010	1980	1980	1980	2010
Groups of interest								
OECD (20)	14,5	9,8	12,5	9,7	6,5	6,1	6,1	6,8
EU15	20,5	13,5	14,7	10,8	11,2	7,3	6,5	8,0
EU28	18,4	14,7	17,5	15,7	8,9	7,9	8,5	7,9
Small Island developing States	47,5	53,0	38,0	46,9	9,4	20,9	18,5	9,5
Islamic Countries	14,6	15,2	13,1	13,4	1,2	2,6	3,2	1,6
Selected Regions								
Sub-Saharan Africa	24,2	27,4	16,4	20,0	1,2	3,2	3,1	1,5
Middle East and North Africa	18,1	11,0	13,3	10,3	1,9	2,8	3,2	2,8
Caribbean	76,8	68,8	58,2	69,5	16,6	27,8	24,7	15,5
Central America	25,3	34,1	18,3	26,2	1,2	5,1	5,2	1,4
South America	5,1	10,6	4,5	11,6	0,9	3,6	3,0	1,3
East Asia	24,5	16,2	14,1	13,1	1,5	3,5	3,0	1,3
Central Asia	0,8	5,2	0,6	2,1	0,2	0,8	2,1	0,2
South Asia	12,1	7,4	8,3	6,3	0,4	1,1	1,2	0,5
Eastern Europe	9,8	15,6	11,9	16,8	3,3	6,7	6,9	3,9

Source: Own calculation based on Brücker H., Capuano, S. and Marfouk, A. (2013)

In order to group countries in the above-specified categories, the United Nations classification guide (2014) was used. The exception was Islamic countries, where the criterion was having a Muslim population share higher than 50% as stated in the World Atlas fact book, in the same vein as Docquier, Marfouk, Salomone, and Sekkat (2012).

The fact that immediately stands out is that brain-rates increased from 1980 to 2010, irrespective of gender. The exception were Asian countries, and even more strikingly, EU15 countries, given that this later group of countries enjoys free-circulation of people, goods, and capital since 1992. In this group of countries, the women's brain-drain rate was almost halved from 1980 to 2010. Within OECD countries there was also a substantial decrease, again more pronounced for women. Here, even the share of absolute migration has diminished for women. One could gather that given the already relatively high standard of living within these countries and its improvement throughout the decades provides people less incentives to migrate, providing more grounds to the argument of Portes (1978). If brain-

drain rates seem to have diminished among developed countries, they have substantially increased among all developing nations. The highlight goes to Caribbean countries that have a brain-drain rate of almost 70% of both men and women in 2010, and the highest overall migration rate, of almost 30% for women and 15% for men. Small Island developing States present the second highest brain-drain rates overall, and overall emigration rates. More than half of highly-skilled women left their countries in 2010, adding up to the 20% of the total female population migrating, in contrast to the 10% of the male population. For the remaining groups of countries, Central American countries and Sub-Saharan countries present high brain-drain rates, of about 30% each for women and 20% for men, but rather low overall emigration rates, implying that migration is particularly prevalent among the high-skilled group, which indicates self-selection.

In order to conclude the descriptive statistics on who migrates to OECD countries, the following four tables represent the 30 countries with the highest brain-drain rates in both 1980 and 2010 for each gender.

Tables 4 and 5- Brain-Drain Rates (Stocks) in 1980, by gender

Men in 1980	
Jamaica	82,6%
Guyana	78,8%
Barbados	72,4%
Cape Verde	71,7%
Samoa	70,2%
Tonga	70,0%
Belize	64,2%
Trinidad and Tobago	63,8%
Malta	62,4%
Haiti	60,1%
Seychelles	58,7%
Grenada	58,4%
Cyprus	55,7%
Sao Tome and Principe	53,5%
Saint Vincent and the Grenadines	51,4%
Mauritius	51,0%
Antigua and Barbuda	50,9%
Lebanon	50,2%
Ireland	50,0%
Mozambique	49,0%
South Africa	48,5%
Saint Kitts and Nevis	47,9%
Fiji	41,0%
Bahamas, The	40,6%
Austria	40,4%
Uganda	39,6%
Suriname	38,1%
Cuba	36,9%
Nauru	36,8%
Yemen	36,5%

Women in 1980	
Lesotho	100,0%
Papua New Guinea	100,0%
Sao Tome and Principe	94,6%
Guyana	90,7%
Barbados	86,8%
Jamaica	86,5%
Cape Verde	83,2%
Belize	81,7%
Mozambique	77,3%
Trinidad and Tobago	76,8%
Tonga	75,7%
Samoa	74,3%
Haiti	73,8%
Yemen	70,7%
Antigua and Barbuda	69,0%
Grenada	64,7%
Ireland	61,9%
Sierra Leone	61,6%
Mauritius	59,6%
Liechtenstein	58,9%
Uganda	58,4%
Bahamas, The	57,8%
Saint Vincent and the Grenadines	54,4%
Malta	52,3%
Cyprus	51,8%
Lebanon	51,6%
Austria	49,7%
Maldives	49,7%
Saint Kitts and Nevis	47,7%
Angola	45,3%

Source: Own calculation based on Brücker H., Capuano, S. and Marfouk, A. (2013).

Tables 6 and 7- Brain-Drain Rates (Stocks) in 2010, by gender.

Men in 2010	
Guyana	99,5%
Barbados	94,6%
Haiti	89,1%
Antigua and Barbuda	87,5%
Trinidad and Tobago	81,3%
Grenada	79,8%
Saint Kitts and Nevis	77,9%
Dominica	77,7%
Bahamas, The	72,8%
Saint Vincent and the Grenadines	71,6%
Tonga	67,0%
Jamaica	64,1%
Sao Tome and Principe	63,0%
Mauritius	59,9%
Belize	58,4%
Cape Verde	58,2%
Suriname	54,8%
Saint Lucia	52,9%
Samoa	52,9%
Cambodia	48,8%
Seychelles	48,8%
Fiji	48,8%
Malta	47,7%
Zimbabwe	46,5%
Gambia, The	44,2%
Lebanon	43,6%
Sierra Leone	43,0%
Bosnia and Herzegovina	42,6%
Croatia	42,0%
Somalia	41,9%

Women in 2010	
Guyana	99,6%
Barbados	89,9%
Antigua and Barbuda	89,7%
Trinidad and Tobago	85,0%
Grenada	83,8%
Sao Tome and Principe	82,8%
Dominica	82,5%
Haiti	81,4%
Cape Verde	81,1%
Saint Kitts and Nevis	78,7%
Saint Vincent and the Grenadines	78,5%
Seychelles	74,3%
Tonga	72,4%
Sierra Leone	70,9%
Bahamas, The	69,8%
Belize	67,5%
Zimbabwe	67,4%
Samoa	67,4%
Mauritius	66,8%
Jamaica	65,2%
Saint Lucia	61,7%
Mozambique	60,7%
Equatorial Guinea	60,2%
Cambodia	59,3%
Suriname	58,9%
Fiji	57,4%
Palau	51,9%
Malta	51,1%
Nauru	50,1%
Somalia	49,5%

Source: Own calculation based on Brücker H., Capuano, S. and Marfouk, A. (2013).

Analysing these tables one of the first outstanding statistics is that brain-drain rates have always been higher for women than for men, although in 2010 the numbers approximated. Thiscould be explained, up to a certain extent, by the diminishing of the schooling gap between men and women worldwide throughout time, as seen previously. Moreover, when comparing the ranking of countries in the same year but according to gender, in 1980 it can be seen that the order in which these countries appear is much more distinct than in 2010. Up to a certain extent, one can argue that there is a harmonisation of "brain-drained countries" gender-wise. This can be, interpreted in line with Docquier, Marfouk, Salomone, and Sekkat (2012) that at least there is a tendency for migrants to migrate in couples or together.

Another striking fact is that the staggering majority sending countries are from developing countries, from very small countries and among some of the poorest in the world. Essentially, the appearance of these countries changes in the ranking positions from 1980 to 2010, but the countries appearing in these tables remain virtually the same. The consistent presence of Small Island developing States in the top of these rankings is described by Crossley, Bray and Packer (2009) as the lack of suitable employment for highly-skilled people in these islands, which goes in line with what Portes (1978) had reported.

3.2. Human Rights' Data

CIRI is a dataset that compiles information regarding government respect for a 15 human rights for the years of 1981 to 2011 for 195 countries, being one of the most complete datasets of the world on human rights' violations. CIRI has its name after its authors Cingranelli and Richards, that started the project in 1994. The authors' dataset is projected to represent international laws on human rights, and not to compare one country with the other. The author's objective is that each indicator is representative of what international law would "expect" and how the government actually behaves.

To collect data for every year for all the countries requires standardised qualitative information. This information on the indicators this paper is using is primarily collected from the US State Department Country Reports on Human Rights Practices (Country Reports). The authors then use this qualitative research and transform it into ordinal indicators. Given the qualitative nature of the primary source, the authors reckon that this information is "more or less" the reality it tries to transmit. In order to achieve the maximum harmonisation

possible throughout countries and throughout time, the researchers have built comprehensive and restrictive coding parameters with key words.

Regarding their dataset, this paper is interested in two indicators: one called the empowerment index, that is an indicator built by the researchers that comprises the government's respect for seven rights: Freedom of Speech, Freedom of Foreign Movement, Freedom of Domestic Movement, Freedom of Assembly & Association, Electoral Self-Determination, Freedom of Religion and respect for Workers' Rights. The names of the indices are quite self-explanatory, however, a description of each indicator is included in Table A1 in the appendix A. In this indicator, the seven rights have an equal weight. Given the comprehensive nature of these seven rights, this paper will use the general term of freedom rights when referring to this index.

Another indicator this paper is interested in analysing is women's rights. The CIRI dataset includes three types of women's rights, again explained in more detail in Table A1 in the appendix A. The dataset includes women's economical, political and social rights. Although this paper is interested in studying the impact of gender roles and education on freedom perceptions, it will test the impact of women rights so as to test assert that freedom rights, and not women rights, are more important determinants for migration, contesting previous studies on it (Nejad, 2013 and Nejad & Young 2014). In the same vein as these authors, the women's rights index consists of the sum of the three specified women's variables. Some important methodological notes important for this analysis, the variable of women's social rights was discontinued in 2005, and therefore this paper used the values reported in the year of 2004 as a proxy. Despite losing one year of observation in the analysis, this paper considered it would be important to include it in the indicator of women's rights, as women's social rights are more likely more representative of gendered discrimination taking place in the household, encompassing concepts such as genital mutilation, equality in the marriage as with the man, or right to employment without the husband's consent.

In order to have an idea of the evolution of human rights, and particularly, of the human rights that are part of the of the two indexes this paper is analysing, table 1 provides the mean of the 193 countries of each indicator throughout the observation years of this analysis.

Table 8- Human rights' averages for the periods of analysis

	1980	1985	1990	1995	2000	2005	2010
Empowerment	5,54	5,50	5,79	6,14	6,14	6,07	5,81
Freedom of Association	4,22	4,35	5,00	6,50	5,87	6,20	5,95
Freedom of Foreign Mov.	6,55	6,70	7,20	7,40	7,40	7,45	7,65
Freedom Domestic Mov.	8,00	7,55	7,95	7,70	7,10	7,65	7,40
Freedom of Speech	4,88	4,65	4,50	5,20	5,40	4,80	4,39
Elections Self-Determin.	4,70	4,60	5,00	5,70	5,90	6,55	5,75
Religious Freedom	7,40	5,90	7,05	7,15	6,65	5,60	6,30
Worker's Rights	3,90	5,30	4,55	4,65	6,10	4,00	3,25
Women's Economic Rts.	3,90	4,63	4,10	4,37	4,43	4,70	5,17
Women's Political Rts.	4,77	5,27	5,37	5,60	6,17	6,50	6,70
Women's Social Rts.	3,87	4,07	3,93	4,33	4,20	4,33	N/A
Women's Rights (Avg.)	4,18	4,66	4,47	4,77	4,93	5,18	N/A

Source: Own calculations based on CIRI.

Although the CIRI dataset only starts its observations in the year of 1981, this paper used them as a proxy for the year 1980. In this table, the scale of each right goes from 0 to 10. This is not the original scale of each variable, nevertheless the creation of a common scale for all indicators allows for an easier reading and assessment of the evolution of each variable.

Overall, one can see that worldwide, human rights respect is still rather low, and for some variables it has even been decreasing since the 80's, namely the freedom of movement within the same country, freedom of speech, religious freedom and worker's rights. If we consider a scale similar to that used in many teaching systems and consider 5, a passing scale, worker's rights and freedom of speech would "fail" in 2010, and both the empowerment index and women's rights, together with freedom of association, electoral self-determination and women's economic rights would be barely a pass. Both variables of freedom of movement were the best classified in 2010. All in all, this table paints a gloomier picture on human rights' respect than one would expect, and a slower improvement than one would like to see.

As a note of curiosity, Alexander & Welzel (2011) found that there tends to be a proportional relationship between the government type and the general respect for human rights. If we imagine human rights from a scale from 0 to 10, from 0 to 2,5 would fall countries that are complete autocracies, from 2,5 to 5 countries that are incomplete autocracies, from 5 to 7.5 countries that are incomplete democracies and from 7,5 to 10 countries that are complete democracies, like OECD countries. This means that, the average country in the sample

would rank between an incomplete democracy and an incomplete autocracy. Moreover, although intuitive, it is worth to mention that OECD countries ranked the highest in the mean of human rights, being many the maximum or close to the maximum. This evidences the contrast existing at the world level on the tolerance of human rights and OECD countries, portraying what Portes (1978) and the new economics of migration argued previously an imbalance of world systems, where there are countries of first class and countries of second class.

4. Methodology

4.1. Model Specification

In order to test the drivers of brain-rates this paper will use the migration rate of each skill level in the case of women, and the migration rates of high-skilled men, as dependent variables, in the same vein as Dumont, Martin and Spielvogel (2007). In this way, the effect of the different variables of interest estimated for high-skilled women will be directly contrasted to that of a high-skilled men, and will also be contrasted to that of low-skilled women. Although this paper is interested particularly in the determinants of female high-skilled migration, the usage of different dependent variables allows one to see if there are some gender-specific and educational differences on the magnitudes and significance of the variables of interest that would go into accordance to what the literature had argued. The idea behind using each gender and skill level alone, instead of, for instance, ratios, is reinforced by Jong (2000) who claim that using ratios or other specification that would mix gender as a main dependent variable, does not allow one to see from which gender comes the significance of the variable, or which gender influences the sign of the variable.

As an estimation method, this paper will perform a panel analysis under fixed effects for all the periods of observation. Fixed effects is the preferred method for the analysis, as it allows to control for possible autocorrelation throughout time. To confirm this, this paper has performed the Hausman test. The null hypothesis of the Hausman test states that a random effects estimation should be used (H0: RE vs FE), however, when rejected, means that the key assumption supporting the usage of random effects is false, and thus fixed effects estimates are used. In all the regressions of the analysis, the Hausman test rejected H0, for which the analysis will proceed using fixed effects.

Moreover, regarding standard errors, to make sure that the assumption of independent and

identically distributed residuals is not violated, this paper has used clustered Hubert-White robust standard errors. This prevents heteroscedastic standard errors and serial correlation throughout time. This is an important treatment of the data, as by definition, a panel dataset is made up multiple of observations per unit *i* which may include a feature that is consistent in the analysis of each *i* throughout time, meaning the error term is likely to capture some serial correlation throughout time. In this manner, clusters at the country level allow for the error term to be correlated within the clusters, but not between clusters. This paper is quite confident that it the in the validity of the estimations obtained, as it got an average of 180 clusters per regression, well above the 30 required, meaning that there is no risk of over-rejecting a null hypothesis (Adkins & Hill, 2011).

In addition, for all the estimations, the F-statistic also defined the model as globally highly significant. One last important detail is that, the fact that both the variables of interest are human rights violations, it is normal that they are correlated to some extent. The matrix of correlations in the appendix B shows that the correlation between these two variables is about 60%, which is not critical, but not a negligible number either. To avoid multicollinearity problems, this paper will proceed with a separated estimation, which will also cater for a more precise magnitude of each human rights' variable. Following the parsimonious principle of econometrics, these variables will be estimated together as a robustness check (appendix G).

To test its main hypothesis, this paper will perform the following specification model:

$$\log\left(\frac{m^{i}_{t,g,s}}{1-m^{i}_{t,g,s}}\right)_{it} = \beta_0 + \beta_1\, GDPpc_{it} + \beta_2 \log(popuplation)_{it} + \beta_3\, Empowerment_{it} + \delta_t + \alpha_i + \epsilon_{i,t,g,s}$$

To counter-argue the present hypothesis to previous findings in the literature, this paper will additionally perform the following estimation model:

$$\log\left(\frac{m^{i}_{t,g,s}}{1-m^{i}_{t,g,s}}\right)_{it} = \beta_0 + \beta_1\, GDPpc_{it} + \beta_2 \log(popuplation)_{it} + \beta_3\, Women'sRights_{it} + \beta_3\, (Women'sRights_{it})^2 + \delta_t + \alpha_i + \epsilon_{i,t,g,s}$$

Where *i* corresponds to the source country, *i* = 1,2,…193, *t* corresponds to the observation year, *t*=1,2,…7, g stands for the gendered relative measure, and *s* for skill level. δ_t corresponds to the time dummies, and α_i is the time-invariant specific effect. As mentioned

in the beginning of this section, E ($\epsilon_{i,t,}$) = 0 and Var ($\epsilon_{i,t,}$) = σ^2. All explanatory variables are considered strictly exogenous.

The dependent variable of the regression will be the logistic transformation of the brain rate. In the same vein as previous studies, the dependent variable is the logarithmic transformation of each category of migration, which allows it to expand from an interval of (0,1) to (-∞, +∞) (see for instance Dumont, Martin and Spielvogel, 2007 and Docquier, Marfouk, Salomone, and Sekkat, 2012). The formula inside the brackets is commonly known in the literature as the odds ratio or favourable probability. In this sense, the results obtained can be interpreted as semi-elasticities, or even elasticities when one of the regressors is a logarithm as well. As for the independent variables, there are two sets of controls, those for basic socio-economic indicators, and other variables of interest, the indicators on human rights.

4.2. Socio-economic variables

To begin with, the literature, usually uses GDP per capita as proxy for the level of development of the country in US Dollars. This variable was retrieved from the World Bank Development Indicators Dataset. The more developed a country is, the better living conditions it boasts, and the least likely would people migrate. In this sense, the expected sign of this variable would be negative and it will be represented by GDPpc. Another socioeconomic normally used is the logarithm of total population. The idea behind this indicator is due to the fact that there is the idea that smaller countries migrate more. According to this thinking, the expected sign would be negative and this variable will be represented by Log(Population). This variable was also retrieved from the World Bank Development Indicators Dataset. To check papers that use these two socioeconomic variables, see Dumont, Martin and Spielvogel (2007), for instance. In addition to these variables, migration papers usually control for other dummies that this paper cannot due to the fact that the regression is a fixed effects estimations, however, it will account for this problem and introduce such dummies in a random effects estimation as a robustness check (see appendix C).

4.3. Human rights variables

4.3.1. Empowerment index

The main hypothesis of this paper is that women migrate more than men due to cultural impositions of gender roles on their freedom. To test this, this paper will use an

empowerment index, retrieved directly from the CIRI dataset. As stated in the previous section, that is an indicator built by the researchers that comprises the government's respect for seven rights: Freedom of Speech, Freedom of Foreign Movement, Freedom of Domestic Movement, Freedom of Assembly & Association, Electoral Self-Determination, Freedom of Religion and respect for Workers' Rights. It ranges from 0 to 14, where 0 means no government respect for the rights these indexes represent in total, whereas the maximum score means that government fully respects all rights. Throughout specifications, this variable keeps its original name, Empowerment.

Classifying the expected sign of this variable can be quite tricky. As the empowerment index represents overall freedom rights, one can agree that at low levels of freedom, one might be more restricted to migrate, and as this level increases the more people will migrate. What happens at high levels of freedom is the question. Do people stop migrating because they are free, or because they are free, they migrate? It is more likely that there is a linear relationship between freedom rights and the propensity of migration, therefore a positive sign on the index is expected. The papers this study came across that used the empowerment index always assumed a linear relationship of the index (see for instance: Halkia, Ferri, Joubert , Saporiti & Kauffmann, 2017). Nevertheless, a squared term will be introduced to see if the relationship between migration propensity and this variable is an inverse U-shape, that diminishes at high levels. The results will be presented in Table C1 in the appendix C.

4.3.2. Women's rights

Moreover, this paper will reinforce its hypothesis by contrasting it to the one currently proposed in the literature, by testing women's rights as well. In the literature review part, this paper has highlighted the aspect of gendered self-selection, which alone indicates that regardless of the educational level, women who migrate already have a certain freedom within their household, and many of the components of the women's rights indicators control for the degree of freedom within the household specifically. Moreover, many of the rights included in the women's rights might not correspond to the reality of high-skilled, as this paper as argued in section 2.8. and more importantly, are representative of many rights that the empowerment index controls for.

In the same vein as previous studies in the literature, and as mentioned in the previous section, to test women's rights this paper has constructed an indicator based on the three specific women's rights in the dataset: women's economic rights, women's political rights

and women's social rights, as stated in the previous section. This indicator ranges from 0 to 9. In the same spirit as previous studies, (Nejad, 2013 and Nejad & Young, 2014), the squared term is introduced to test the same inverse U-shape, which was what the literature had argued as well, in section 2.4.2. The authors argue that at high levels of women's rights respect, women might not want to migrate anymore. Nevertheless, the linear form will be tested nonetheless and reported in the appendix C. The name of this variable in the results table is Women's Rights.

5. Results

The results obtained from the analysis are presented in the table below.

Table 9: Outputs of the different specifications of interest

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill	Male High-skill	Fem High-skill	Fem Med-skill	Fem Low-skill
GDPpc	-1.53e-05***	-8.25e-06*	-2.44e-05***	-1.09e-05***	-1.29e-05***	-7.47e-06*	-2.05e-05***
	(4.77e-06)	(4.55e-06)	(4.61e-06)	(3.91e-06)	(4.54e-06)	(4.27e-06)	(4.16e-06)
Log(Population)	-0.0788	-0.0694	-0.0258	-0.151**	-0.0867	-0.0817	-0.0404
	(0.0760)	(0.101)	(0.0592)	(0.0742)	(0.0785)	(0.105)	(0.0537)
1985.year	0.0324	0.0711	0.323***	0.0504	-0.0650	-0.0147	0.252***
	(0.0737)	(0.0645)	(0.0722)	(0.0510)	(0.0613)	(0.0652)	(0.0726)
1990.year	-0.0314	-0.0223	0.479***	0.0577	-0.119	-0.0931	0.413***
	(0.106)	(0.0965)	(0.0945)	(0.0743)	(0.0974)	(0.0978)	(0.0951)
1995.year	-0.0499	-0.0881	0.677***	-0.0224	-0.111	-0.128	0.618***
	(0.116)	(0.102)	(0.102)	(0.0829)	(0.109)	(0.109)	(0.104)
2000.year	0.0354	-0.0146	0.838***	0.103	-0.00384	-0.0576	0.783***
	(0.131)	(0.113)	(0.108)	(0.0939)	(0.128)	(0.122)	(0.112)
2005.year	0.340**	0.170	1.139***	0.381***	0.255*	0.0894	1.059***
	(0.140)	(0.123)	(0.112)	(0.110)	(0.144)	(0.131)	(0.119)
2010.year	0.434***	0.217	1.278***	0.499***	0.339**	0.123	1.196***
	(0.151)	(0.135)	(0.115)	(0.122)	(0.157)	(0.145)	(0.123)
Empowerment	0.0499**	0.0454**	0.0221	0.0339*			
	(0.0209)	(0.0181)	(0.0148)	(0.0173)			
Women's rights					0.0691	0.0732	0.158*
					(0.0663)	(0.0923)	(0.0957)
(Women's rights)2					-0.0105	-0.00737	-0.0185**
					(0.00681)	(0.00884)	(0.00916)
Constant	-1.129	-3.137**	-4.774***	-0.178	-0.582	-2.656	-4.586***
	(1.152)	(1.577)	(0.913)	(1.145)	(1.234)	(1.681)	(0.961)
Observations	1,009	1,011	1,011	1,010	997	999	999
Number of country	184	184	184	183	183	183	183
R-squared	0.103	0.059	0.340	0.128	0.085	0.035	0.332

Robust standard errors in parentheses

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

5.1. Results Discussion

Table 9 presents the results of the regression for the various specifications. The different specifications of the human rights variables are presented in Table C1 in the appendix C. Overall, the shape of each variable proved to be in line with the theoretically expected, and are the only ones presented here.

Overall, analysing the general socio-economic variables, it can be seen that GDP tends to enter highly significant across specifications, with the expected sign. This means that the

poorer the country, the higher the migration, although at a negligible rate. Population also had the expected sign, implying that smaller countries have a higher number of migrants, however, the variable was never significant.

Our variable of interest, the empowerment index, is significant at the 5% level for high-skilled women, and it has the highest magnitude of coefficient, in comparison to the other specifications. In contrast, for low-skilled women, it can be seen that it is not significant, while for medium-skilled women, it was also significant at the 5% level. Interestingly enough, for medium-skilled women, when the squared term was added, the term was significant at the 10% level. This suggests that these women are somewhat sensitive to freedom rights, but not so much, so that after a certain point they might migrate less. For high-skilled men, the empowerment index is significant at the 10% level, meaning that high-skilled men are also compelled to migrate due to freedom restrictions, not as much as high-skilled women, but more than low-skilled women.

On the other hand, women's rights, only enter significant when their squared term is introduced. This means, that as theory had predicted, women's rights have an inverted-U shape, denotating that at low levels of women's rights respect, women tend to migrate, but then, when women's rights respect are high enough, women tend to stay in the country. However, this variable is not significant for high-skilled women. This allows us to conclude that, in comparison to the empowerment index, which was significant at 5% this paper confirms its hypothesis: freedom rights tend to be important determinants for high-skilled women's migration, more than women's rights, which the literature had appointed as important. Indeed, women's rights are only significant for low-skilled at the 10% level, and with a coefficient higher than high-skilled women, whereas for medium-skilled women, women's rights did not enter significant. Nevertheless, women's rights always had the expected sign across specifications.

On the whole, the present analysis leaves room for some interesting conclusions: it seems that the higher the education level, the more likely are women to migrate due to general restrictions on freedom, which goes in what the literature had argued. This can be seen through the increasing significance of the variables across education levels, which is accompanied by an increase in the coefficient, which are the highest in high-skilled women and the lowest in low-skilled women. In short, by having more education, women might be more aware of their freedom rights' violations than low-skilled women, who take it as the

"way it always has been". This paper justified this perception due to gender roles, that overall impose more restrictions on women's freedom on women than, but to the extent they are ingrained in the culture, only a critical assessment might enable the individual to be aware of them. This argument was corroborated by the empowerment index coming significant at 10% for high-skilled men, who would be able to critically assess their freedom restrictions as well. The fact that this variable was more significant for high-skilled women than for high-skilled men, suggests that indeed, women are more restricted than men.

As far as women's rights are concerned, a somewhat inverse relationship could be drawn between the educational level the significance of women's rights: the higher the education level, the less important are women's rights as possible determinants of migration. Like in the empowerment index, this relationship can be drawn because both the significance of the variable and magnitude of the coefficient that are higher the lower the educational level. This supports the hypothesis of this paper, that had argued that low-skilled, rather than skilled women are likely to suffer more with women's rights violations. This goes in accordance to the idea that less educated women might be more restrained within their household than high-skilled women, which indicates that these women have less bargaining power, particularly in comparison to high-skilled women, concept denominated by Oishi as (2002) as *social legitimacy*. Moreover, another important comment would be remitting to the lack of overall significance of the variable also goes in accordance to the gendered self-selection hypothesis this paper had projected. In short, this concept states that women who migrate already enjoy a certain freedom within their household, and a substantial part of women's rights is connected to discriminatory behaviours within the household.

In this manner, the results presented in table 9 seem to corroborate the double-hypothesis of this paper: women are 1) high-skilled women are more affected than men by violations on freedom rights; 2) freedom rights rather than women's rights are more likely to contribute more to high-skilled female migration

5.2. Robustness checks

Unfortunately, in the migration literature, no IV has been found that could be used to assess causality (Tani, 2017). In this manner, the results presented in the previous section can only be interpreted as mere correlations. Moreover, this paper is also aware of the fact that the model presented previously can also suffer for some misspecification in the equation (Docquier, Marfouk, Salomone, and Sekkat, 2012). In the absence of a robust IV used in the

literature, there are some robustness checks that could be run by changing the specifications of the analysis. It is important to refer that for all specifications the F-statistic defined the model as globally highly significant and that, likewise the main model, clustered robust standard errors were used to estimate the equations.

In sum, this paper is taking five types of robustness checks: the first will be doing a random effects estimation, which allows to include dummy variables in the original specification of the model, so that more controls are added; the second will be restricting the original observations to specific countries that might be biasing the results somehow; the third will be to use another specification for the women's rights; the fourth will be testing the variables of empowerment and women's rights together; and the last will be to test an additional alternative variable in the model. All of the output tables for each estimation are presented in their respective appendix.

Firstly, although the Hausman test clearly indicated that fixed effects should be used, this paper will do some robustness checks using the same model as previously presented, only using random effects, together with the introductions of three dummy variables typically used in the literature as additional controls: colony, landlocked, if the country's official language is English and a small island dummy, in the same spirit as in Docquier, Marfouk, Salomone, and Sekkat's (2012). The dummy colony is introduced as a proxy for some similarities that the origin country might have with any OECD country, that might foment emigratory relations (e.g. common language, common schooling system). Like in Docquier, Marfouk, Salomone, and Sekkat's (2012), the world Atlas fact book was used as a reference. The expected sign would therefore be positive. The dummy landlocked that signals countries that are landlocked, and that is expected to have a negative coefficient due to higher transportation costs these countries might have. Moreover, this paper also introduced the dummy of when a country has its official language English (*de jure*), in the same vein as Docquier, Marfouk, Salomone, and Sekkat's (2012), and like the authors, the information was retrieved from Clair, Gaullier, Mayer, and Zignago. (2004). The variable small island contains the 46 countries the UN 2014 classification list considered to be a Small Island Developing State.

The results are shown in Table D1 in the appendix D. All the dummies introduced had the expected sign. The dummy English was never significant, the dummies colony and landlocked had their significance depending on the specification, whereas the dummy small

island came significant at 1% level in all specifications, which goes in accordance to the descriptive statistics seen in the previous section, that showed that the majority of brain-drain countries came from these small states. As for our variables of interest, it can be seen that with this estimation method, the empowerment index is significant at the 1% level for all women regardless of the education level. Nevertheless, the coefficient tends to follow a linear relationship with the education level, being the highest in high-skilled women. For men, this variable was again significant at the 10% level. As for women's rights, they are again significant at the 10% level only for low-skilled women, and the magnitude of the coefficient tends to follow a linear relationship with the education level, being the highest in low-skilled women. Overall, these results go in accordance to the ones obtained in the Fixed effects estimation, however, given that the Hausman test had rejected Random Effects, should be analysed with caution.

For the second part of robustness checks, this paper will redo the main model, but excluding Small Island Developing States. As it was seen in section 4, these countries were among the ones with the highest brain-drain rates, therefore one could easily argue that they are driving the results of the whole sample (although they are 46 out of 193 countries of the whole analysis). The results are presented in Table E1 in the appendix E. It can be seen that the significance empowerment index is still significant, although at the 10% level this time, for both the high-skilled and low-skilled. It is important to acknowledge that the change in the results could be due to the loss of a significant amount of observations. For both low-skilled women and high-skilled men the variable loses significance. In this manner, it can be said that the intuition associated with the empowerment index across gender and education specifications holds. The same could be argued for women's rights, given that the variable was only significant in low-skilled women (at the 10% level), with the magnitude of the coefficient increasing from high-skilled to low-skilled women, like it was found in the main model.

In the same manner, one could argue that including brain-drain rates of OECD countries in the analysis might bias the results, because these countries have the highest human rights indexes in the sample. Therefore, this paper has also excluded OECD countries from the sample. The results are presented in the Table E2 in the appendix E. The empowerment index is significant at the 5% level for both high-skilled and medium-skilled women, not significant for low-skilled women and significant at the 10% level to high-skilled men, which is consistent to the findings of the first empirical model. As for women's rights, in

any of the specification does this variable come significant, although the coefficient is again, the largest in low-skilled women. Again, the lack of significance could be due to the loss of the number of observations. Nevertheless, the intuition holds taking into account the variation of the magnitude of the variable across specifications.

Thirdly, bearing in mind the problem of the lower amount of observations, an additional robustness check was using women's rights variables merely by adding women's economic to the political, given that women's social rights had one less observation year. The results are presented in Table F1 in the appendix F. Women's rights are again only significant in low-skilled women, with the highest magnitude of the coefficient in this specification, except that the index is significant at the 10% level and not at the 5% level as in the main model. As this paper had argued in the literature review, women's social rights are more likely to associated with the reality of low-skilled women than women's economical rights or political rights, which makes this difference in significance expected.

An additional robustness check is to regress both human rights' variables together, to see if the results hold. Although there is a risk of multicollinearity, by doing it could be seen if the variable empowerment still shows significant, in opposition to women's rights. The results are presented in Table G1 in the appendix G. Again, the empowerment variable is still significant for high-skilled women and medium-skilled, while women's rights are not. For low-skilled women nothing is significant, except the square of women's rights, which still highlights the importance for this variable is this sub-specification in comparison to the others.

Lastly, typical robustness checks include changing the specification of the model, by introducing or replacing new variables. Nevertheless, as this paper highlighted in the previous section, by doing a fixed effects estimation, it cannot control for the typical dummies associated in the literature, which are the majority of all control variables inserted in the migration literature. The first robustness check was precisely aiming at circumventing this aspect, and still keep an analysis throughout time. Moreover, as this paper only has data referring to origin countries, it can only control for push factors, but not pull factors, as there are 20 receiving countries in the sample. In addition, since there are so many receiving countries in the sample, it cannot also insert the control for distance, traditionally used in the literature as a proxy for travel costs.

This leaves this paper very little possible new specifications, except for the variable unemployment. This paper purposely excluded the variable unemployment from the main specification, for a number of reasons: first and foremost, there are reasons to believe it is a variable that is theoretically irrelevant for the case study of brain-drain. As Portes (1978) had argued, one of the potential determinants of high-skilled migration is not unemployment per se, rather the lack of available employment for the skill-set of these people in their countries. Docquier, Marfouk, Salomone, and Sekkat, (2012) also argued this when, in their pooled-regression, the variable employment-to-population variable appeared with the wrong sign. Adding to this, the variable unemployment, has data only available from the year of 1990 onwards, meaning that per country, there are, at maximum, 5 observations years, diminishing drastically the total number of observations, which alone might bias the results. Moreover, with a fixed effects estimation, if there is no great variation in the variable, it will most likely not come significant, and the data shows that there is not much variation in this variable throughout the different years. Perhaps for these reasons, the original study first documenting female brain-drain, Dumont, Martin and Spielvogel (2007) also did not use unemployment, nor any variable related to employment in their model.

Nevertheless, given that according to the neoclassical theory of migration, that argues that people migrate due country's differentials in the labour market's, this paper will introduce the variable unemployment as a last robustness check. The results are shown in Table H1 in the appendix H.

With the introduction of this variable, neither the empowerment variable nor the women's rights variable come significant. Nevertheless, the trend of the magnitude of the coefficients across specifications holds as in the main model. Perhaps the most interesting of the insertion of this variable, is that it is always significant at the 10% level for low-skilled women, providing evidence for the theory of Portes (1978). Indeed, unemployment might be more significant for the low-skilled, than the high-skilled, where the lack of suitable employment might be a more likely reality and a reason to leave. In a last comment, as expected, the number of observations is very low in comparison to all the previous estimations, which may also explain the lack of significance of the variables of interest.

6. Conclusion

This paper has endeavoured to portray a detailed evolution of one aspect that the literature does not focus so much on: female brain-drain. By using the most complete dataset existing at the moment on brain drain-rates, and so far not quoted for gendered studies, this paper depicted a comprehensive evolution of female migration, both in absolute and relative terms. Nevertheless, in comparison to men, female brain-drain has been diminishing since the 80's in relative terms, fact that could be explained by the fast increase in female tertiary education attainment. This rapid increase in female tertiary attainment could also be used to explain the large increase of high-skilled women in OECD countries, that surpassed men for the first time in 2005, in absolute numbers. In this manner, understanding what is driving such a rapid increase in high-skilled women's migration, is of paramount importance, given that it may have many negative effects for the source country.

The brain-drain literature, as elaborated by Portes (1978), assumes the existence of imbalances in the world systems, idea reinforced in the new migration economics that highlighted the importance of market failures, other than the labour market. This leaves room for argumentation that, in terms of gendered discrimination, there are "worlds of first" and "second class", being OECD countries the countries belonging to the "world of first class" where women are the most respected as individuals than in any other place on the planet, as evidenced by the CIRI dataset, which could propel women, more than men, to migrate to these countries. In order to conceptualise a model on why this higher female migration could take place, on the grounds of the world imbalances in gender rights, this paper has elaborated on the processes of socialization of men and women, a component recommended by the World Bank (2005), and by and large, missing in the (scarce) economic literature on gendered migration. The previous literature that attempted to study human right's violations had done so through women's rights.

Nevertheless, the model this paper conceptualised, connecting concepts such as gender roles, social roles, social class, culture, education, perceptions of freedom and choice, led this paper to believe that freedom rights were more important determinants of migration of high-skilled women than women's rights. The idea behind was because women are more discriminated than men virtually in all societies due to their gender roles, and to the extent gender roles are ingrained in the culture, only some might see through them: the educated. At the same time, women's rights, that are generally more connected to discrimination within

the household than any other human right indicator, do not fit the phenomenon of gendered self-selection, that states that due to the more restrictive role of women in the society, only households that are more liberal, "let" women migrate. Adding to this, Oishi (2002) introduced a concept of *social legitimacy,* on which education was one of the components. Given that more high-skilled women than low-skilled women have *social legitimacy*, that is, bargaining power within the household, women's rights were even hypothesised to be more likely to affect low-skilled women, rather than high-skilled women, as previous studies had predicted.

To test this argumentation, this paper ran a fixed effects panel using each human rights indicator and found that there tends to be a linear relationship of the importance of freedom rights as a possible determinant for migration, represented by the empowerment index retrieved from the CIRI dataset, and the education level of the woman. Moreover, as expected, for high-skilled men, this variable hardly came significant. This provides evidence of the different treatment between men and women, given that both are highly-skilled and could have the same critical outlook on their freedom restrictions. In addition, an inverse relationship was found for women's rights, that showed that this indicator tended to be the most important for low-skilled women. However, it overall lacked significance, as the gendered self-selection theory predicted. Several robustness checks have supported the evidence of this double-intuition between the importance of general freedom rights across gender and education levels, and women's rights and educational levels, and the overall lack of significance of women's rights.

Nevertheless, this paper acknowledges important limitations of its analysis. Given that it merely has unilateral data, the estimation method of the analysis does not allow to add more control variables, of push and pull factors. Also, given that the estimation method was fixed effects, this paper was not able to add more control variables, which in the migration literature are often dummies. Moreover, the main analysis' estimation has a rather modest number of observations (around 1000). All of these factors can lead to some misspecification in the model, which could potentially bias the results. In addition, given the lack of a suitable IV for the migration literature (Tani, 2017), this paper can never assume causality, for which the presents results should be interpreted as mere correlations.

However, throughout the different robustness checks, this paper seems to have found grounds for evidence of a linear relationship between the educational level and the individuals perceptions of freedom violations, and an inverse one for women's educational

level and women's rights, debunking Nejad and Nejad and Young (2014) findings. In this regard, this paper has an advantage over the authors' studies, as it is able to control for effects that stand throughout time, by using a fixed effects panel estimation with six observation years, whereas Nejad and Young (2014) had merely two cross-sections for the years 1990, and 2000. Nevertheless, the fact that the authors had bilateral data allowed them to control for push and pull factors, as well as having more control variables, resulting in more observations (3000). In a similar manner, it would be interesting to extend the present study through the construction of bilateral data, for both women's rights and freedom rights, to both confront the author's findings, and to see if the linear relationship between freedom rights and women's rights and educational level this paper found would hold.

On the whole, assuming the results of the present study, one could argue that high-skilled women tend to migrate to a place where they are more empowered, where they are seen as individuals and not judged by their gender identity, where they have more freedom. Nevertheless, low-skilled women might also be empowered through migration, but in a different manner than high-skilled women do: to low-skill women it may help them to break them gender roles within their household, as the literature section provided several examples. Notwithstanding, even if future studies find that the tendency of a linear relationship between two different human rights' variables, gender and education, given that these variables often came significant, this study believes to have made a not least valid conclusion: migration is part of a quest of a more dignified living for women, who wish to have their rights (or the way they perceive them) more respected.

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APPENDIX A – Human's rights description

Table A1: CIRI's Variables Short Description

Empowerment Index	This is an additive index constructed from the Foreign Movement, Domestic Movement, Freedom of Speech, Freedom of Assembly & Association, Workers' Rights, Electoral Self-Determination, and Freedom of Religion indicators. It ranges from 0 (no government respect for these seven rights) to 14 (full government respect for these seven rights).
Freedom of Assembly and Associatio	It is an internationally recognized right of citizens to assemble freely and to associate with other persons in political parties, trade unions, cultural organizations, or other special-interest groups. This variable indicates the extent to which the freedoms of assembly and association are subject to actual governmental limitations or restrictions (as opposed to strictly legal protections). A score of 0 indicates that citizens' rights to freedom of assembly or association were severely restricted or denied completely to all citizens; a score of 1 indicates that these rights were limited for all citizens or severely restricted or denied for select groups; and a score of 2 indicates that these rights were virtually unrestricted and freely enjoyed by practically all citizens in a given year.
Freedom of Foreign Movement	This variable indicates citizens' freedom to leave and return to their country. A score of 0 indicates that this freedom was severely restricted, a score of 1 indicates the freedom was somewhat restricted, and a score of 2 indicates unrestricted freedom of foreign movement
Freedom of Domestic Movement	This variable indicates citizens' freedom to travel within their own country. A score of 0 indicates that this freedom was severely restricted, a score of 1 indicates the freedom was somewhat restricted, and a score of 2 indicates unrestricted freedom of domestic movement.
Freedom of Speech	This variable indicates the extent to which freedoms of speech and press are affected by government censorship, including ownership of media outlets. Censorship is any form of restriction that is placed on freedom of the press, speech or expression. Expression may be in the form of art or music. A score of 0 indicates that government censorship of the media was complete; a score of 1 indicates that there was some government censorship of the media; and a score of 2 indicates that there was no government censorship of the media in a given year.
Electoral Self-Determina-tion	This variable indicates to what extent citizens enjoy freedom of political choice and the legal right and ability in practice to change the laws and officials that govern them through free and fair elections. This right is sometimes known as the right to self-determination. A score of 0 indicates that the right to self-determination through free and fair elections did not exist in law or practice during the year in question. A score of 1 indicates that while citizens had the legal right to self-determination, there were some limitations to the fulfillment of this right in practice. Therefore, in states receiving a 1, political participation was only moderately free and open. A score of 2 indicates that political participation was very free and open during the year in question and citizens had the right to self-determination through free and fair elections in both law and practice.

Freedom of Religion	This variable indicates the extent to which the freedom of citizens to exercise and practice their religious beliefs is subject to actual government restrictions. Citizens should be able to freely practice their religion and proselytize (attempt to convert) other citizens to their religion as long as such attempts are done in a non-coercive, peaceful manner. A score of 0 indicates that government restrictions on religious practices are severe and widespread. A score of 1 indicates such practices are moderate, and a 0 indicates such practices are practically absent.
Worker's Rights	Workers should have freedom of association at their workplaces and the right to bargain collectively with their employers. This variable indicates the extent to which workers enjoy these and other internationally recognized rights at work, including a prohibition on the use of any form of forced or compulsory labor; a minimum age for the employment of children; and acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health. A score of 0 indicates that workers' rights were severely restricted; a score of 1 indicates that workers' rights were somewhat restricted; and a score of 2 indicates that workers' rights were fully protected during the year in question.
Women's Economic Rights	Women's economic rights include a number of internationally recognized rights. These rights include: Equal pay for equal work; Free choice of profession or employment without the need to obtain a husband or male relative's consent; The right to gainful employment without the need to obtain a husband or male relative's consent; Equality in hiring and promotion practices; Job security (maternity leave, unemployment benefits, no arbitrary firing or layoffs, etc...); Non-discrimination by employers; The right to be free from sexual harassment in the workplace; The right to work at night; The right to work in occupations classified as dangerous; The right to work in the military and the police force. A score of 0 indicates that there were no economic rights for women in law and that systematic discrimination based on sex may have been built into law. A score of 1 indicates that women had some economic rights under law, but these rights were not effectively enforced. A score of 2 indicates that women had some economic rights under law, and the government effectively enforced these rights in practice while still allowing a low level of discrimination against women in economic matters. Finally, a score of 3 indicates that all or nearly all of women's economic rights were guaranteed by law and the government fully and vigorously enforces these laws in practice.

Women's Political Rights	Women's political rights include a number of internationally recognized rights. These rights include: The right to vote; The right to run for political office; The right to hold elected and appointed government positions; The right to join political parties; The right to petition government officials. A score of 0 indicates that women's political rights were not guaranteed by law during a given year. A score of 1 indicates that women's political rights were guaranteed in law, but severely prohibited in practice. A score of 2 indicates that women's political rights were guaranteed in law, but were still moderately prohibited in practice. Finally, a score of 3 indicates that women's political rights were guaranteed in both law and practice.
Women's Social Rights	Women's social rights include a number of internationally recognized rights. These rights include: The right to equal inheritance; The right to enter into marriage on a basis of equality with men; The right to travel abroad; The right to obtain a passport; The right to confer citizenship to children or a husband; The right to initiate a divorce; The right to own, acquire, manage, and retain property brought into marriage; The right to participate in social, cultural, and community activities; The right to an education; The freedom to choose a residence/domicile; Freedom from female genital mutilation of children and of adults without their consent; Freedom from forced sterilization A score of 0 indicates that there were no social rights for women in law and that systematic discrimination based on sex may have been built into law. A score of 1 indicates that women had some social rights under law, but these rights were not effectively enforced. A score of 2 indicates that women had some social rights under law, and the government effectively enforced these rights in practice while still allowing a low level of discrimination against women in social matters. Finally, a score of 3 indicates that all or nearly all of women's social rights were guaranteed by law and the government fully and vigorously enforced these laws in practice. [This variable was retired as of 2005.]

Source: Adapted from: CIRI – Variables Short Description Guide.

APPENDIX B – General statistics of the model

Table B1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Female High-Skilled	1325.00	-1.79	1.75	-9.87	6.02
Female Med-Skilled	1325.00	-3.75	1.71	-10.32	0.07
Female Low-Skilled	1328.00	-4.28	2.07	-11.26	1.49
Male High-Skilled	1327	-2.04	1.62	-7.38	5.30
GPPpc	1201	7907	14749	65	144246
Empowerment	1044.00	8.27	4.20	0.00	14.00
Women's Rights	1029.00	4.88	1.69	0.00	9.00
Women's Rights2	1029.00	3.10	1.13	0.00	6.00

Table B2: Correlations Matrix

	GPPpc	Pop	Emp.	W. Rights
GPPpc	1			
Pop	-0,01	1,00		
Emp.	0,34	-0,14	1,00	
W. Rts1	0,42	0,01	0,61	1,00

APPENDIX C – Other specifications of the human rights variables

Table C1: All the shapes of human rights variables across specifications

Fem Med-skill	Fem Low-skill	Fem Low-skill	Fem Med-skill	Fem Med-skill	Men High-skill
GDPpc	-2.33e-05***	-2.29e-05***	-3.05e-06	-3.33e-06	-5.81e-06*
	(4.56e-06)	(4.60e-06)	(4.19e-06)	(4.11e-06)	(3.21e-06)
Log(Population)	0.0249	0.0234	-0.0574	-0.0497	-0.138**
	(0.0624)	(0.0619)	(0.0919)	(0.0922)	(0.0619)
1985.year	0.294***	0.224***	-0.0191	0.0692	0.121**
	(0.0691)	(0.0710)	(0.0614)	(0.0595)	(0.0498)
1990.year	0.455***	0.391***	-0.131	-0.0709	0.126**
	(0.0925)	(0.0931)	(0.0932)	(0.0923)	(0.0602)
1995.year	0.664***	0.604***	-0.198*	-0.154	0.0789
	(0.101)	(0.101)	(0.103)	(0.0975)	(0.0665)
2000.year	0.759***	0.694***	-0.123	-0.0717	0.202***
	(0.108)	(0.110)	(0.113)	(0.105)	(0.0726)
2005.year	0.994***	0.911***	-0.0482	0.0286	0.385***
	(0.112)	(0.113)	(0.120)	(0.115)	(0.0916)
2010.year	1.095***	1.003***	-0.0193	0.0730	0.476***
	(0.116)	(0.121)	(0.132)	(0.125)	(0.104)
Empowerment	0.00580			0.0833**	0.0412
	(0.0307)			(0.0373)	(0.0284)
(Empowerment)2	0.000589			-0.00325*	-0.00120
	(0.00164)			(0.00192)	(0.00156)
Women's rights		0.0163	0.0132		
		(0.0265)	(0.0246)		
(Women's rights)2					
Constant	-5.742***	-5.625***	-3.359**	-3.883***	-1.099
	(0.957)	(1.008)	(1.457)	(1.427)	(0.975)
Observations	1,011	999	999	1,011	1,010
Number of country	184	183	183	184	183
R-squared	0.460	0.451	0.201	0.216	0.378

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

APPENDIX D: Robustness Check 1

Table D1: High-skilled female migration with a random effects estimation model

Variables	Fem High-skill	Fem Med-skill	Fem Low-skill	Male High-skill	Fem High-skill	Fem Med-skill	Fem Low-skill
1985.year	0.0344	0.0769	0.343***	0.0513	-0.0769	-0.0233	0.249***
	(0.0743)	(0.0650)	(0.0742)	(0.0513)	(0.0615)	(0.0650)	(0.0739)
1990.year	-0.0326	-0.0188	0.490***	0.0575	-0.133	-0.100	0.411***
	(0.107)	(0.0962)	(0.0958)	(0.0746)	(0.0967)	(0.0962)	(0.0960)
1995.year	-0.0546	-0.0892	0.685***	-0.0260	-0.131	-0.137	0.618***
	(0.115)	(0.0994)	(0.103)	(0.0830)	(0.106)	(0.105)	(0.105)
2000.year	0.0310	-0.0129	0.854***	0.0988	-0.0304	-0.0711	0.781***
	(0.128)	(0.108)	(0.109)	(0.0926)	(0.122)	(0.115)	(0.111)
2005.year	0.331**	0.176	1.160***	0.374***	0.219	0.0684	1.042***
	(0.135)	(0.118)	(0.112)	(0.106)	(0.135)	(0.121)	(0.117)
2010.year	0.421***	0.221*	1.294***	0.491***	0.294**	0.0941	1.165***
	(0.143)	(0.128)	(0.115)	(0.115)	(0.145)	(0.133)	(0.121)
GDPpc	-1.34e-05***	-6.05e-06	-1.81e-05***	-1.03e-05***	-1.07e-05***	-5.01e-06	-1.44e-05***
	(4.00e-06)	(3.94e-06)	(4.10e-06)	(3.42e-06)	(3.82e-06)	(3.73e-06)	(3.75e-06)
Log(Population)	-0.0877*	-0.112*	-0.153**	-0.147***	-0.103**	-0.133**	-0.170***
	(0.0481)	(0.0632)	(0.0627)	(0.0459)	(0.0493)	(0.0662)	(0.0639)
Colony	0.457**	0.0342	-1.396***	0.276	0.424**	0.00188	-1.410***
	(0.214)	(0.249)	(0.295)	(0.198)	(0.215)	(0.257)	(0.304)
English	0.316	-0.233	-0.0200	0.285	0.352	-0.197	-0.0150
	(0.264)	(0.272)	(0.344)	(0.242)	(0.263)	(0.277)	(0.350)
Landlocked	-0.410*	-0.892***	-1.072***	-0.622***	-0.475**	-0.963***	-1.129***
	(0.223)	(0.276)	(0.333)	(0.214)	(0.230)	(0.280)	(0.336)
Smallisland	1.473***	1.220***	1.741***	1.129***	1.624***	1.349***	1.878***
	(0.347)	(0.397)	(0.434)	(0.345)	(0.348)	(0.412)	(0.442)
Empowerment	0.0511***	0.0501***	0.0404***	0.0361**			
	(0.0186)	(0.0165)	(0.0135)	(0.0159)			
Women's rights					0.0995	0.101	0.214**
					(0.0662)	(0.0922)	(0.0960)
(Women's rights)2					-0.0119	-0.00843	-0.0219**
					(0.00677)	(0.00886)	(0.00915)
Constant	-1.443*	-2.456**	-2.076*	-0.500	-0.863	-1.855	-1.871*
	(0.807)	(1.072)	(1.065)	(0.767)	(0.823)	(1.144)	(1.134)
Observations	1,009	1,011	1,011	1,010	997	999	999
Number of country	184	184	184	183	183	183	183

Robust standard errors in parentheses

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

APPENDIX E- Robustness Checks 2

Table E1: Fixed Effects Estimation excluding Small Island Developing States

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill	Male High-skill	Fem High-skill	Fem Med-skill	Fem Low-skill
GDPpc	-1.52e-05***	-7.23e-06	-2.49e-05***	-1.06e-05***	-1.35e-05***	-6.70e-06	-2.12e-05***
	(4.79e-06)	(4.51e-06)	(4.69e-06)	(3.94e-06)	(4.65e-06)	(4.31e-06)	(4.35e-06)
Log(Population)	-0.0861	-0.0226	-0.0541	-0.180*	-0.0844	-0.0331	-0.0619
	(0.0947)	(0.113)	(0.0873)	(0.108)	(0.0955)	(0.117)	(0.0837)
1985.year	-0.0341	0.0500	0.304***	0.0206	-0.0848	-0.0221	0.250***
	(0.0610)	(0.0688)	(0.0755)	(0.0540)	(0.0663)	(0.0729)	(0.0782)
1990.year	-0.113	-0.0683	0.456***	0.0145	-0.157	-0.123	0.405***
	(0.104)	(0.103)	(0.100)	(0.0784)	(0.106)	(0.109)	(0.104)
1995.year	-0.116	-0.133	0.651***	-0.0626	-0.139	-0.157	0.608***
	(0.116)	(0.109)	(0.108)	(0.0878)	(0.118)	(0.124)	(0.116)
2000.year	-0.0323	-0.0666	0.820***	0.0641	-0.0322	-0.0968	0.779***
	(0.130)	(0.121)	(0.115)	(0.0981)	(0.132)	(0.140)	(0.126)
2005.year	0.263*	0.115	1.138***	0.335***	0.227	0.0470	1.072***
	(0.138)	(0.130)	(0.119)	(0.115)	(0.148)	(0.149)	(0.135)
2010.year	0.380**	0.171	1.295***	0.459***	0.339**	0.0900	1.227***
	(0.149)	(0.141)	(0.122)	(0.128)	(0.163)	(0.162)	(0.140)
Empowerment	0.0405*	0.0408*	0.0225	0.0249			
	(0.0209)	(0.0195)	(0.0150)	(0.0172)			
Women's rights					0.0624	0.0850	0.173*
					(0.0709)	(0.0997)	(0.103)
(Women's rights)2					-0.00963	-0.00805	-0.0198**
					(0.00728)	(0.00946)	(0.00986)
Constant	-1.135	-4.063**	-4.527***	0.189	-0.863	-3.668*	-4.505***
	(1.478)	(1.788)	(1.375)	(1.712)	(1.534)	(1.931)	(1.464)
Observations	883	884	884	885	874	875	875
Number of country	149	149	149	149	149	149	149
R-squared	0.111	0.058	0.336	0.123	0.096	0.034	0.329

Robust standard errors in parenthess

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

Table E2: Fixed Effects Estimation excluding Advanced Economies

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill	Male High-skill	Fem High-skill	Fem Med-skill	Fem Low-skill
GDPpc	-6.62e-06	-3.01e-06	-7.56e-06	-1.05e-05	-4.18e-06	-2.36e-06	-6.69e-06
	(1.21e-05)	(1.11e-05)	(9.12e-06)	(1.19e-05)	(1.12e-05)	(1.09e-05)	(8.99e-06)
Log(Population)	-0.103	-0.0983	-0.0717	-0.165**	-0.107	-0.108	-0.0789
	(0.0839)	(0.111)	(0.0625)	(0.0814)	(0.0855)	(0.114)	(0.0607)
1985.year	0.0808	0.0892	0.455***	0.0876	-0.0387	-0.0128	0.362***
	(0.0946)	(0.0815)	(0.0877)	(0.0643)	(0.0786)	(0.0824)	(0.0879)
1990.year	0.0123	0.00956	0.637***	0.0821	-0.0903	-0.0681	0.560***
	(0.130)	(0.113)	(0.107)	(0.0916)	(0.118)	(0.113)	(0.107)
1995.year	0.00160	-0.0435	0.836***	-0.0122	-0.0687	-0.0857	0.765***
	(0.139)	(0.119)	(0.113)	(0.0999)	(0.128)	(0.125)	(0.116)
2000.year	0.114	0.0478	1.047***	0.133	0.0658	-0.00161	0.974***
	(0.156)	(0.130)	(0.117)	(0.111)	(0.150)	(0.141)	(0.123)
2005.year	0.416**	0.228*	1.282***	0.435***	0.322**	0.141	1.189***
	(0.160)	(0.138)	(0.121)	(0.122)	(0.161)	(0.145)	(0.129)
2010.year	0.473***	0.264*	1.376***	0.540***	0.363**	0.160	1.280***
	(0.171)	(0.153)	(0.125)	(0.135)	(0.174)	(0.161)	(0.133)
Empowerment	0.0485**	0.0421**	0.0188	0.0338*			
	(0.0217)	(0.0186)	(0.0151)	(0.0179)			
Women's rights					0.0411	0.0343	0.105
					(0.0749)	(0.101)	(0.106)
(Women's rights)2					-0.00751	-0.00236	-0.0118
					(0.00802)	(0.00990)	(0.0105)
Constant	-0.748	-2.812	-4.603***	0.0708	-0.256	-2.371	-4.466***
	(1.273)	(1.726)	(0.972)	(1.250)	(1.328)	(1.807)	(1.060)
Observations	841	843	843	842	830	832	832
Number of country	106	160	160	159	159	159	159
R-squared	0.106	0.060	0.407	0.141	0.082	0.033	0.390

Robust standard errors in parentheses

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

APPENDIX F: Robustness Check 3

Table F1: Fixed Effects Estimations under a new Women's Rights Indicator

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill
GDPpc	-1.28e-05***	-7.28e-06*	-2.02e-05***
	(4.67e-06)	(4.25e-06)	(4.22e-06)
Log(Population)	-0.0853	-0.0798	-0.0367
	(0.0788)	(0.105)	(0.0553)
1985.year	-0.0668	-0.0145	0.249***
	(0.0616)	(0.0648)	(0.0727)
1990.year	-0.124	-0.0945	0.406***
	(0.0978)	(0.0978)	(0.0956)
1995.year	-0.115	-0.127	0.614***
	(0.108)	(0.108)	(0.103)
2000.year	-0.0116	-0.0574	0.774***
	(0.126)	(0.121)	(0.111)
2005.year	0.244*	0.0904	1.048***
	(0.141)	(0.128)	(0.116)
2010.year	0.331**	0.128	1.192***
	(0.153)	(0.141)	(0.118)
Women's rights2	0.0877	0.110	0.234*
	(0.0991)	(0.137)	(0.139)
(Women's rights2)2	-0.0205	-0.0175	-0.0413**
	(0.0155)	(0.0199)	(0.0203)
Constant	-0.590	-2.680	-4.643***
	(1.233)	(1.682)	(0.986)
Observations	997	999	999
Number of country	183	183	183
R-squared	0.084	0.035	0.331

Robust standard errors in parentheses

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

APPENDIX G: Robustness Check 4

Table G1: Fixed effects estimations with all the variables of human rights in the same equation

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill
GDPpc	-1.25e-05***	-7.04e-06*	-2.05e-05***
	(4.48e-06)	(4.15e-06)	(4.07e-06)
Log(Population)	-0.0799	-0.0771	-0.0389
	(0.0738)	(0.102)	(0.0525)
1985.year	-0.0250	0.0175	0.281***
	(0.0592)	(0.0669)	(0.0729)
1990.year	-0.101	-0.0834	0.426***
	(0.0958)	(0.0982)	(0.0944)
1995.year	-0.113	-0.132	0.630***
	(0.108)	(0.108)	(0.105)
2000.year	-0.00547	-0.0620	0.795***
	(0.126)	(0.121)	(0.112)
2005.year	0.289**	0.113	1.083***
	(0.139)	(0.130)	(0.118)
2010.year	0.389**	0.159	1.226***
	(0.150)	(0.145)	(0.122)
Empowerment	0.0471**	0.0374**	0.0166
	(0.0207)	(0.0183)	(0.0151)
Women's rights	0.0397	0.0526	0.149
	(0.0676)	(0.0930)	(0.0977)
(Women's rights)2	-0.00823	-0.00581	-0.0179*
	(0.00678)	(0.00879)	(0.00930)
Constant	-1.030	-3.003*	-4.744***
	(1.128)	(1.641)	(0.918)
Observations	993	995	995
Number of country	183	183	183
R-squared	0.113	0.055	0.341

Robust standard errors in parentheses

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

APPENDIX H: Robustness Check 5

Table H1: Fixed effects estimation, adding unemployment to the main specification

VARIABLES	Fem High-skill	Fem Med-skill	Fem Low-skill	Male High-skill	Fem High-skill	Fem Med-skill	Fem Low-skill
1995.year	-1.11e-05***	-6.17e-06*	-9.27e-06***	-1.01e-05***	-1.01e-05***	-7.20e-06**	-8.71e-06***
	(3.57e-06)	(3.31e-06)	(2.93e-06)	(3.63e-06)	(3.51e-06)	(3.49e-06)	(3.21e-06)
2000.year	-0.0639	-0.0464	-0.0643	-0.0954**	-0.0663	-0.0370	-0.0668
	(0.0467)	(0.0762)	(0.0460)	(0.0403)	(0.0453)	(0.0685)	(0.0443)
2005.year	-0.0124	-0.0653	0.188***	-0.0741*	-0.0123	-0.0465	0.182***
	(0.0497)	(0.0437)	(0.0453)	(0.0422)	(0.0552)	(0.0510)	(0.0478)
2010.year	0.0729	0.00843	0.353***	0.0496	0.0829	0.0267	0.347***
	(0.0681)	(0.0597)	(0.0546)	(0.0585)	(0.0737)	(0.0706)	(0.0605)
GDPpc	0.346***	0.167**	0.594***	0.314***	0.330***	0.179**	0.584***
	(0.0867)	(0.0794)	(0.0687)	(0.0774)	(0.0942)	(0.0817)	(0.0738)
Log(Population)	0.430***	0.208**	0.696***	0.431***	0.408***	0.213**	0.688***
	(0.102)	(0.0990)	(0.0737)	(0.0901)	(0.109)	(0.0993)	(0.0778)
unemp	-0.00804	-0.00780	-0.0111*	-0.00859	-0.00864	-0.00869	-0.0116*
	(0.00667)	(0.00866)	(0.00614)	(0.00700)	(0.00671)	(0.00871)	(0.00605)
Empowerment	0.0214	0.0145	-0.000385	0.0167			
	(0.0204)	(0.0187)	(0.0135)	(0.0168)			
Women's rights					0.0608	-0.0761	0.0470
					(0.0665)	(0.0798)	(0.0729)
(Women's rights)2					-0.00625	0.00802	-0.00431
					(0.00635)	(0.00690)	(0.00668)
Constant	-0.831	-2.936**	-3.080***	-0.481	-0.730	-2.770**	-3.137***
	(0.788)	(1.270)	(0.800)	(0.675)	(0.825)	(1.240)	(0.829)
Observations	755	755	755	754	748	748	748
Number of country	172	172	172	171	171	171	171
R-squared	0.145	0.062	0.285	0.190	0.141	0.063	0.285

Robust standard errors in parentheses

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

APPENDIX I: General Statistics of the new variables included in the Robustness Checks

Table I1: Summary statistics with all the variables used throughout specifications

Variable	Obs	Mean	Std. Dev.	Min	Max
Female High-Skilled	1325,00	-1,79	1,75	-9,87	6,02
Female Med-Skilled	1325,00	-3,75	1,71	-10,32	0,07
Female Low-Skilled	1328,00	-4,28	2,07	-11,26	1,49
Male High-Skilled	1327	-2,04	1,62	-7,38	5,30
GPPpc	1201	7907	14749	65	144246
Population	994	9717	34726	16	431337
Colony	1330,00	0,60	0,49	0,00	1,00
English	1330,00	0,28	0,45	0,00	1,00
Landlock.	1330,00	0,22	0,41	0,00	1,00
Smallisland	1330,00	0,19	0,39	0,00	1,00
Empowerment	1044,00	8,27	4,20	0,00	14,00
Women's Rights2	1029,00	4,88	1,69	0,00	9,00
Women's Rights2	1029,00	3,10	1,13	0,00	6,00
Unemployment	872,00	45,06	16,42	4,52	89,31

Table I2: Correlations Matrix of all the variables used across specifications

	GPPpc	Pop	Colony	English	Llock.	S.island	Emp.	W. Rts1	W. Rts1	Unemp
GPPpc	1									
Pop	-0,01	1,00								
Colony	-0,41	-0,07	1,00							
English	-0,15	0,03	0,47	1,00						
Landlock.	-0,08	-0,12	-0,04	0,07	1,00					
Smallisland	-0,11	-0,09	0,28	0,29	-0,17	1,00				
Emp.	0,34	-0,14	-0,08	0,07	-0,05	0,11	1,00			
W. Rts1	0,42	0,01	-0,18	-0,05	-0,05	-0,05	0,61	1,00		
W. Rts2	0,49	-0,01	-0,23	-0,08	-0,06	-0,03	0,63	0,97	1,00	
Unemp.	0,07	0,05	0,09	0,15	0,27	-0,05	0,15	0,22	0,19	1