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Working Paper

Moving Up the Social Ladder? Wages of First- and Second-Generation Immigrants from Developing Countries

GLO Discussion Paper, No. 1204

Provided in Cooperation with:
Global Labor Organization (GLO)

Suggested Citation: Pineda-Hernández, Kevin; Rycx, François; Volral, Mélanie (2022) : Moving Up the Social Ladder? Wages of First- and Second-Generation Immigrants from Developing Countries, GLO Discussion Paper, No. 1204, Global Labor Organization (GLO), Essen

This Version is available at:
http://hdl.handle.net/10419/266474

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Moving Up the Social Ladder? Wages of First- and Second-Generation Immigrants from Developing Countries

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Abstract

As immigrants born in developing countries and their descendants represent a growing share of the working-age population in the developed world, their labour market integration constitutes a key factor for fostering economic development and social cohesion. Using a granular, matched employer-employee database of 1.3 million observations between 1999 and 2016, our weighted multilevel log-linear regressions first indicate that in Belgium, the overall wage gap between workers born in developed countries and workers originating from developing countries remains substantial: it reaches 15.7% and 13.5% for first- and second-generation immigrants, respectively. However, controlling for a wide range of observables (e.g. age, tenure, education, type of contract, occupation, firm-level collective agreement, firm fixed effects), we find that, whereas first-generation immigrants born in developing countries still experience a sizeable adjusted wage gap (2.7%), there is no evidence of an adjusted wage gap for their second-generation peers. Moreover, our reweighted, recentered influence function Oaxaca-Blinder decompositions agree with these findings. Indeed, while the overall wage gap for first-generation immigrants born in developing countries is driven by unfavourable human capital, low-paying occupational/sectoral characteristics, and a wage structure effect (e.g. wage discrimination), the wage gap for their second-generation peers is essentially explained by the fact that they are younger and have less tenure than workers born in developed countries. Furthermore, our results emphasize the significant moderating role of geographical origin, gender, and position in the wage distribution.

KEYWORDS: Immigrants, intergenerational studies, labour market integration, wage decompositions, unconditional quantile regressions, employer-employee data.
JEL classification: J15, J16, J21, J24, J31, J61.

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Acknowledgments: The authors are most grateful to Statistics Belgium for giving them access to the data. This research was supported by the FRESH program (Human Sciences Research Fund) of the Fonds de la Recherche Scientifique (F.R.S – FNRS). Kevin Pineda-Hernández is a 2020 FRESH grantee of the F.R.S – FNRS. Financial support from the Belgian Federal Science Office (BELSPO) is also kindly acknowledged.

1. Introduction

One of the mainstays of poverty and inequality disparities is the intergenerational transmission of socioeconomic status from parents to children, which is particularly strong among high-educated natives and low-educated immigrants (Bloome et al., 2018; Ryabov, 2020; Sharkey, 2008).[1] Focusing on the immigrant population, Card (2005) further points out that, since the descendants of immigrants are born, educated and socialized in the host country, their relative success or failure is often considered the ultimate benchmark for integration. In this respect, Duncan and Trejo (2015) state that the ultimate indicator of labour market integration for immigrants and their children may be wages, as they reflect the market's final valuation of a worker, which encompasses, *inter alia*, abilities, age, gender, family background, and human and social capital. Therefore, in light of these premises, Belgium offers an interesting case study to investigate the legacy of immigration in the labour market through the lens of wages, as people of foreign origin represented 31.1% of the total population aged 18-64 in 2016, of which 14.2% are first-generation (F-G) immigrants and 16.9% are second-generation (S-G) immigrants (FPS Employment and Unia, 2019).[2]

In the developed world, the empirical literature on the intergenerational evolution of immigrants' wages has considerably broadened in recent decades (e.g. Aydemir et al., 2009; Borjas, 1994; Card, 2005; Flake, 2013; Melzer et al., 2018; van Ours and Veenman, 2004). Nonetheless, several studies consider F-G and S-G immigrants as a homogenous group of origin, which may mask specific features related to their countries of birth or those of their parents (e.g. economic conditions, quality of the education system, or reasons for migration), which in turn may influence their labour market outcomes (Fleischmann and Dronkers, 2010). In a similar vein, the labour market integration of immigrants across generations is likely to be influenced by source-country characteristics such as patronymic, physical appearance, religion

[1] Unless mentioned otherwise, this paper henceforth uses the words i) 'first-generation immigrants' and 'foreign-born people' for people born abroad; ii) 'second-generation immigrants', 'children of immigrants' and 'descendants of immigrants' for people born in the host country with at least one foreign-born parent; and iii) 'natives' for people born in the host country with both parents born in the host country.

[2] FPS Employment and Unia (2019) define people of foreign origin as follows: people having a nationality other than Belgian, people born with a nationality other than Belgian nationality, and Belgian-born people with at least one foreign-born parent or parent having a foreign nationality. The 31.1% of the population of foreign origin aged 18-64 in Belgium can be broken down as follows: 13.2% from EU-14, 3.0% from EU-13, 2.3% from EU candidates, 1.5% from other European countries, 5.0% from the Maghreb, 2.4% from other African countries, 0.8% from the Near and Middle East, 1.7% from Asian countries and Oceania, 0.2% from North America, 0.6% from Central and South America, and 0.3% of unknown origin. FPS Employment and Unia (2019) further define the second generation as people who hold with Belgian nationality, Belgian-born or born in Belgium with a foreign nationality, having at least one parent with a foreign nationality.

or cultural customs (Levels and Dronkers, 2008). In accordance with these statements, a limited yet growing number of studies classifying immigrants by origin shows that in Europe and the United States, although S-G immigrants from Western European countries receive similar wages to those of natives, there is still evidence of a significant wage gap between natives and S-G immigrants from transition and developing countries, i.e. Africa, Eastern Europe, the Maghreb, the Near and Middle East, and Latin America (e.g. Abramitzky et al., 2021; Athari et al., 2019; Dustmann et al., 2011). However, it should be noted that most of the existing literature must be interpreted with caution because of important methodological and/or data limitations, such as: i) small samples or short time spans studied; ii) a restricted number of control variables (i.e. scarce or no information on the characteristics of workers' jobs and workplaces); iii) incomplete framework (i.e. no F-G immigrants in the sample); and iv) standard OLS regressions, computed at the mean, which are likely to be very sensitive to outliers and vary significantly along the wage distribution.

Moreover, there are solid grounds for considering the role of gender a relevant moderating factor in the intergenerational relationship between origin and wages. Indeed, the labour market aspirations of female immigrants are likely to be strongly shaped by the traditional values, gender stereotypes and cultural habits that exist in their country of birth or those of their parents (Blau et al., 2013; Kulu et al., 2015). Similarly, OECD (2020a) highlights the role of work-life balance (i.e. working while being involved in childcare and household tasks) in explaining different integration paths between female and male immigrants. A series of studies also suggests that immigrant-native wage gaps across generations differ significantly by gender (e.g. Algan et al., 2010; Duncan and Tejo, 2018; Sakamoto et al., 2010). However, it is worth noting that all those existing studies estimate regressions separately for female and male workers (i.e. no interaction between origin and gender), which prevents them from providing clear evidence on the separate contribution of gender and immigration background to potential double immigrant-native wage penalties.

Regarding the wages of immigrants across generations, it is also important to take into account workers' position in the wage distribution. Indeed, although the common approach is to estimate exclusively immigrant-native wage gaps at the mean, these can only be taken as a representative picture of the group of interest if the underlying data-generating process is homoscedastic (i.e. estimates are not reversed or do not diverge substantially along the wage distribution). Moreover, previous studies also encourage the estimation of quantile regressions

in intergenerational studies because they show that F-G immigrant-native wage gaps expand along the wage distribution and identify a heterogeneous contribution of observables to these gaps (e.g. Hofer et al., 2017; Lehmer and Ludsteck, 2011). However, as far as we know, only one study to date has applied a similar empirical strategy to the wages of immigrants across generations (Athari et al., 2019 for France). Using Di Nardo et al. (1996)'s semiparametric approach, the authors show that the wage gaps for S-G immigrants from the Maghreb and Turkey (Asia and Eastern Europe) increase (remain somewhat constant) along the wage distribution. However, they do not provide a comprehensive discussion of the role played by observables in these gaps. Last but not least, since the mid-twentieth century, migration flows to Western Europe have been mainly characterized by the arrival of low-skilled and/or low-educated immigrants (Schoonvaere, 2013). Therefore, if S-G immigrants succeed in earning more than their F-G peers and, potentially, in closing the gap with natives, it is of particular interest to investigate whether or not this occurs all along the wage distribution.

Before delving into the details of our work, we describe other features of the country under study that also motivate this research. First, Belgium is one of the worst OECD economies in terms of access to the labour market for F-G immigrants (Pina et al. 2015; OECD, 2020a).[3] Nonetheless, employment outcomes differ considerably according to geographical origin in Belgium. For instance, only 46% of the working age population born in non-EU (European Union) countries had a job in 2017, while the employment rate of EU-born citizens (68.3%) was much closer to that of natives (73.7%) (OECD/EU, 2018). This issue also extends to the descendants of non-EU immigrants, whose employment rate in 2017 amounted to 53.4% (Eurostat, 2020). A robust body of empirical literature further accords with these figures, stating that the employment outcomes of S-G immigrants from transition and developing countries (i.e. non-EU origin) are hardly any better than those of their F-G counterparts, i.e. that they are far worse than those for Belgian natives (e.g. Corluy et al., 2015; De Cuyper et al., 2018; Heath and Cheung, 2007; Piton and Rycx, 2021). Nevertheless, to the best of our knowledge, once employment in Belgium is secured for people originating from developing countries, the intergenerational evolution of their wages has never been empirically investigated.[4] Furthermore, any analyses of S-G immigrants from transition and developing countries in Belgium require careful attention, because previous studies reveal the existence of poor

[3] Only Greece, Mexico and Turkey show lower employment rates for F-G immigrants in the OECD area.
[4] Only some descriptive statistics show that the incidence of low pay among immigrant workers of non-EU origin increases across two generations (Corluy et al., 2015).

earnings outcomes, a higher wage penalty associated to overeducation and wage discrimination for F-G immigrants born in transition and developing countries (e.g. Fays et al., 2020; Jacobs et al., 2021; Kampelmann and Rycx, 2016, Grinza et al., 2020; Vertommen and Martens, 2006).

We attempt to shed new light on the intergenerational interplay between origin and wages, placing our main emphasis on workers originating from developing countries,[5] using a rich, matched employer-employee database of 1.3 million observations for the Belgian private labour market. The richness of our database is that it provides cross-sectional information on a nationally representative sample of workers for the period between 1999 and 2016. It further contains information on workers' country of birth and those of their parents, alongside a wide range of covariates (e.g. age, tenure, education, type of household, type of contract, occupation, part-time, firm size, firm-level collective agreement, firm fixed effects), which makes it well suited for providing reliable empirical findings. That having been said, we implemented our empirical strategy as follows. First, using weighted multilevel log-linear regressions, we estimate the overall and adjusted wage gaps between workers born in developed countries, including Belgian natives[6], and workers originating from developing countries across two generations.[7] Second, using a more fine-grained classification of workers' country of birth and those of their parents, we explore the role of geographical origin (e.g. the Maghreb, Sub-Saharan Africa, and the Near and Middle East) in overall and adjusted wage gaps across two generations.[8] Third, we scrutinize the role of gender in overall and adjusted wage gaps across two generations by expanding our econometric analysis to include the interaction between origin and gender simultaneously. Fourth, we use a robust econometric technique, the so-called reweighted, recentered influence function Oaxaca-Blinder (RIF-OB) decompositions (Firpo et al., 2018; Rios-Avila, 2020), in order to investigate three axes: i) how the position in the wage

[5] By 'developing countries', we mean either transition and developing countries listed in the United Nations' (2019) classification and/or emerging market and developing economies listed in the IMF's (2019) classification (see Appendix 1).

[6] In our empirical strategy, we merge Belgian natives (i.e. workers born in Belgium with both parents born in Belgium) with F-G and S-G immigrants from developed countries because using our database, we find no statistical evidence of a wage gap between Belgian natives and workers originating from developed countries across two generations. Those estimates can be obtained from the authors upon request. In addition, previous studies show that the employment outcomes of F-G and S-G immigrants from developed countries are comparable to those of Belgian natives (e.g. Corluy et al., 2015*;* Piton and Rycx, 2021).

[7] It is worth noting that our full benchmark specification includes firm fixed effects, which allows us to estimate adjusted wage gaps between workers born in developed countries and workers originating from developing countries employed in the same firm, while controlling for productivity differentials among firms.

[8] For the sake of accuracy in correctly classifying immigrants by geographical origin and economic development level, we constructed our own geographical classification of countries based on both the United Nations' (2019) classification and the IMF's (2019) classification (see Appendix 2).

distribution shapes overall wage gaps across two generations, ii) how worker, employment and firm characteristics contribute to these gaps across two generations, and iii) to provide a more fine-grained assessment of the role of gender along the wage distribution.

The body of our paper is organized as follows. In the next section, we discuss the intergenerational relationship between origin and labour market integration and document previous intergenerational studies on the wages of F-G and S-G immigrants from developing countries. We present our methodology in Section 3, while Section 4 describes the structure of our database. In Section 5, we discuss the findings of our weighted multilevel log-linear regressions and reweighted RIF-OB decompositions. Finally, Section 6 concludes.

2. Labour market integration of immigrants across generations

Classic assimilation theory states that, since S-G immigrants are born, educated and socialized in the host country, their socioeconomic outcomes should be better than those of their F-G peers and eventually comparable to those of natives (Alba et al., 2011; Greenman and Xie, 2008; Park and Myers, 2010). Nevertheless, another strand of literature views this assumption as optimistic and instead supports the segmented assimilation theory (Heath et al., 2008; Portes and Rumbaut, 2001; Rumbaut, 2005). The latter argues that the descendants of immigrants may still encounter low levels of social mobility (e.g. difficulties in entering the labour market or overconcentration in the less favourable segments of the labour market) and persistent integration problems (i.e. discrimination and marginalization). One reason behind this pessimistic view is the parental transmission of cultural capital, social norms and physical characteristics, which can vary according to immigrants' geographical origin (Blau et al .2013; Blau, 2015; Phalet and Heath, 2010). However, it should be noted that, although the segmented and classic assimilation theories diverge in terms of insights, both have overlapping explanations for assessing the integration of immigrants across generations. Indeed, both theories highlight the influence of immigrant parents' background and preferences in shaping the level of failure or success of their descendants.

In this context, among F-G immigrants, education, experience and training acquired in their home countries are often associated with poor labour market outcomes due to the imperfect international transferability of foreign human capital (i.e. a low valuation of pre-migration skills in the host country) (Basilio et al., 2017; Chiswick and Miller, 2009). However, this issue

should in principle disappear for S-G immigrants, given that they possess human capital linked to the host country's labour market. In addition, several studies show that in EU countries, S-G immigrants exhibit, on average, higher levels of education than their F-G peers (e.g. Algan et al., 2010; Ekberg et al., 2010; Eurostat, 2020; OECD, 2016). Therefore, since education in the host country is one of the drivers for boosting the likelihood of people of foreign origin both accessing the labour market and getting well-paid jobs, this can be interpreted as a sign of upward mobility, in line with the classical assimilation theory.

Nevertheless, it appears that S-G immigrants' educational outcomes depend on their origin. Indeed, in 2014 at the EU level, the share of tertiary graduates of non-EU origin was more than two percentage points lower than that of their counterparts of EU-origin (Eurostat, 2020). This achievement gap may be the result of additional barriers that S-G immigrants from developing countries face in order to accumulate host country education, as previously highlighted by the segmented assimilation theory. More precisely, F-G immigrants born in developing countries tend to be less educated, less proficient in the host country's language and less informed about how the school system works, which reduces the degree of support in their children's learning (FPS Employment and Unia, 2017; OECD, 2020d). In the same line, immigrant parents' attitudes in the home environment can slow or hinder their children's academic success. For instance, in 2018, on average across OECD countries, 62% of F-G immigrant students and 41% of S-G immigrant students did not speak the host country's language at home (OECD, 2020c). The COVID-19 crisis has also shown how fragile the education of children of immigrants can be. For instance, as a result of studying remotely, at home only, OECD (2020d) documents that children in immigrant households experienced a decline in their fluency in the host country's language.

Moreover, the labour market performance of immigrants across generations also seems to be influenced by pre-existing immigrant communities in the host country. In principle, immigrants can benefit from immigrant networks to foster their socioeconomic and residential mobility (i.e. the classical assimilation theory) (Lin et Zhou, 2005). Nonetheless, this positive role may be reversed over time and across generations in certain immigrant communities. In fact, previous research shows that immigrant networks from developing countries tend to furnish limited, lower-paid opportunities (Kalter and Logan, 2014; Kazemipur, 2006), thus delaying familiarity with the functioning of the primary labour market and strengthening earnings status-quo across generations (i.e. the segmented assimilation theory) (OECD, 2014). In a similar vein, immigrant

networks tend to trigger a pattern of strong concentration of immigrants in lower-graded or run-down neighbourhoods, which reinforces the overrepresentation of their children in disadvantaged schools and the parental transmission of poor labour market and socioeconomic outcomes (Pina et al., 2015; Ryabov, 2020; Zhou 1997). In this regard, OECD (2021) further documents that in Western European countries, S-G immigrants exhibit a strong stability for continuing to live in immigrant-dense neighbourhoods from childhood to adulthood.

Turning now to the interacting role of origin and gender, the segmented assimilation theory states that the parental transmission of the home country's cultural norms (i.e. fertility, gender norms and partnership choices) is likely to affect the labour market expectations of female immigrants from developing countries across generations (Blau et al. 2013; Kulu et al., 2015). More specifically, several studies find that S-G female immigrants who marry partners with similar ethnic characteristics present lower socioeconomic status and labour market outcomes than people who enter into interethnic marriages (e.g. Flake, 2013; Meng and Gregory, 2005; Wiik and Bergsvik, 2022). In this regard, it is worth mentioning that ethnic marriages seem to be persistent in immigrant communities with non-white ethnicity (Dupont et al. 2017; Furtado and Theodoropoulos, 2011). Moreover, earlier motherhood in the mother's home country is strongly correlated with earlier motherhood among S-G female immigrants, which has a negative, long-lasting effect on their wages and working hours in the host country (Noghanibehambari et al., 2022). Similarly, OECD (2020b) shows that female immigrants with non-EU background in certain specific households (e.g. couples with children at home and single parents) face a strong employment penalty because they are more involved in housework and motherhood than native mothers. A series of empirical studies goes in the same direction, stating that even after controlling for observables, F-G and S-G female immigrants from developing countries still face a double employment penalty based on their gender and migration background (e.g. Athari et al., 2019; OECD, 2020a; Piton and Rycx, 2021).

Finally, ethnic discrimination (i.e. the segmented-assimilation theory) can be an ultimate barrier to the labour market integration of immigrants across generations, and occur through two main channels: i) employers make employment or wage-setting decisions based on ethnic preferences (i.e. taste-based discrimination); and ii) employers discriminate based on ethnic stereotypes due to incomplete information on immigrants' productivity and human capital (i.e. statistical discrimination) (Becker, 1957; Zschirnt and Ruedin, 2016).

Although there are solid grounds for establishing an intergenerational relationship between origin and labour market integration, especially for immigrants from developing countries, other external factors should also be considered in this relationship. Indeed, host country institutions, workplaces' environment, integration policies and social stratification can mitigate or exacerbate immigrant-native labour market inequalities across generations (Crul et al., 2012). For example, in countries with high levels of inequality, there are few opportunities for upward mobility for both F-G immigrants and their children situated at the bottom of the income distribution (Zhou, 1997). In workplaces with high wage inequalities, F-G immigrants and their descendants also experience larger immigrant-native wage gaps (Melzer et al., 2018). By contrast, anti-discrimination policies and wage subsidies are linked to a better labour market integration of immigrants (Butschek and Walter, 2014; Platt et al., 2022). Active labour market policies also lead to a reduction in the share of immigrants in low-skilled jobs and with temporary contracts (Guzi et al., 2021). Similarly, firm-level and industry-wide collective wage agreements seem to attenuate immigrant-native wage gaps (Kampelmann and Rycx, 2016; Melzer et al., 2018).[9] Last but not least, educational systems with high levels of equity in terms of origin can gradually erode the parental transmission of socioeconomic disadvantages among immigrant families (e.g. school policies that assign effective teachers to work in schools with a high proportion of immigrant children or ensure ethnic diversity in classrooms) (OECD, 2016).

[Table 1]

Turning to the labour market integration of F-G and S-G immigrants from developing countries, empirical literature has mainly focused on their access to the labour market (e.g. Belzil and Poinas, 2010; Midtbøen, 2016; OECD, 2020a; Piton and Rycx, 2021). However, securing a job is only the first step to success in the labour market. Indeed, improvements in employment outcomes may mask persistent wage inequality once F-G immigrants and their descendants have entered the labour market. In this connection, to the best of our knowledge, the intergenerational relationship between wages and origin focusing on workers originating from developing countries has only been investigated in six developed countries (France, Germany,

[9] Melzer et al. (2018) find that comparing to German natives, the wages of F-G immigrants benefit from industry-wide wage agreements, while there is no relationship between industry-wide wage agreements and S-G immigrants' wages. It should, however, be noted that in Melzer et al. (2018)'s benchmark specification, S-G immigrants already perform at par with German natives in terms of wages.

the Netherlands, Sweden, the United Kingdom and the United States) so far.[10] Table 1 presents a comprehensive list of previous studies, their data, methodology and main findings.

Algan et al. (2010), Hammarstedt (2009) and Rooth and Ekberg (2003) find that in Germany and Sweden, there is no wage improvement across generations for immigrants from developing countries.[11] By contrast, Belfi et al. (2021) show that in the Netherlands, among recent graduates, there is wage parity between Dutch natives and immigrants from developing countries across two generations. More nuanced findings have emerged for France, the United Kingdom and the United States, where although S-G immigrants from developing countries receive higher wages than their F-G peers, the former still experience immigrant-native wage gaps (e.g. Abramitzky et al., 2021; Athari et al., 2019; Duncan et Trejo, 2018).

Moreover, focusing on the second generation, existing evidence also varies according to geographical origin and gender. For instance, in France and the United Kingdom, some studies show that, while S-G immigrants from Africa, the Maghreb and the Near and Middle East earn less than natives, there is no evidence of immigrant-native wage gap for S-G immigrants from Asia and Eastern Europe (e.g. Aeberhardt et al., 2010; Langevin et al., 2013; Dustmann et al., 2011). In the United States, Duncan and Trejo (2018) and Sakamoto et al. (2010) find that, while S-G female immigrants from developing countries out-earn or receive similar wages to those of female natives, their S-G male counterparts still face an immigrant-native wage penalty.

Finally, it is worth noting that most studies on the wages of immigrants from developing countries across generations present econometric and/or data limitations, such as: i) some studies focus exclusively on the wage gaps between natives and S-G immigrants, which does not enable us to build up a comprehensive picture of the evolution of immigrants' wages across generations; ii) some studies cover small samples or short time spans, which considerably reduces the external validity of their results; and iii) some studies only conduct standard OLS

[10] In Switzerland, Maskileyson et al. (2021) conduct an intergenerational study on immigrants' income. However, strictly speaking, we cannot consider that to be a study on the wages of F-G and S-G immigrants because its main variable of interest is 'personal net monthly income', which includes more than wages (i.e. pay leave, interest, dividends) and represents workers' disposable income (i.e. the income after deduction of compulsory social insurance contributions and pension fund contributions, plus or minus any alimony (maintenance) payments).

[11] In documenting the results of previous studies, we always refer to the adjusted immigrant-native wage gap (i.e. the wage gap while controlling for covariates). In this respect, it should be noted that the number of covariates considerably differs according to study (see Table 1 for a list of covariates included in each study).

regressions and/or control exclusively for worker characteristics (e.g. age, gender and education) in their regressions, leading to potential estimation issues such as omitted variable bias and heterogeneity along the wage distribution (i.e. immigrant-native wage gaps at the mean are likely to differ from those at the upper and lower parts of the wage distribution). Therefore, against this background, more research is needed using granular data and more advanced econometric methods.

3. Methodology

Our paper aims to investigate the wage inequality between workers born in developed countries and workers originating from developing countries across two generations. To achieve this goal, we first implement weighted multilevel log-linear regressions. Our full benchmark specification is written as follows:

$$\log(w_{ijst}) = \beta_0 + \beta_1 region\ of\ birth_{ijst} + \beta_2 Z_{ijst} + \beta_3 E_{ijst} + \beta_4 F_{ijst} + \psi_s + \delta_t + \varepsilon_{ijst} \quad (1)$$

where the dependent variable is the logarithmic real gross hourly wage of a worker *i* in occupation *j*, in firm *s*, at time *t*.[12] The main explanatory variable is the worker's region of birth[13], which is categorized in the following manner: workers born in developed countries, including Belgian natives[14] (i.e. the reference group), workers born in developing countries (i.e. F-G immigrants born in developing countries), workers born in Belgium with at least one foreign parent born in a developing country (i.e. S-G immigrants from developing countries) and workers born in developing countries with both parents born in Belgium (i.e. others).[15] To do so, we used the classifications of the IMF (2019) and the United Nations (2019), which have

[12] Gross hourly wages are deflated to 2013 prices. They include base pay, overtime compensation, performance-related pay and commissions, and annual and irregular bonuses.

[13] To avoid ethnic attrition, we use workers' country of birth or those of their parents to identify groups of origin instead of racial identification or ethnic nationality. The latter method tends to produce significant measurement bias on the assessment of intergenerational interplays (Duncan and Trejo, 2018; Vertommen and Martens, 2006).

[14] See Footnote 6.

[15] The category 'others' was created because in our database, workers born abroad with both parents born in Belgium earn more than any other group of origin. Two plausible non-exclusive explanations can be behind this finding. First, after the decolonization in Africa and Asia, Belgian expatriates and their children, characterized by having high levels of educational and socioeconomic outcomes, came back to Belgium. Second, the children of Belgian expatriates were born abroad due to their parents' professional occupations (mostly employed in high-skilled and well-paid jobs). Therefore, based on these premises, classifying workers born in developing countries with two parents born in Belgium as F-G immigrants born in developing countries could lead to underestimating wage gaps.

been developed according to the geographic location of countries and their basic economic conditions (e.g. gross national income per capita, export diversification, degree of integration into the global financial system, etc.). Appendix 1 presents a chart of developed and developing countries.

It should be noted that there are often classification issues when S-G immigrants' parents have different countries of birth. In principle, those cases would imply identifying workers of mixed origin. However, this procedure turns out to be statistically inappropriate because origin combinations may result in myriad workers' groups with a very small number of observations and challenging coefficient interpretations (see Heath and Cheung (2007) for further discussion). Hence, we do not attempt to identify mixed groups but to define particular groups of origin. More precisely, the second generation in our empirical strategy has been firstly determined by the father's country of birth, except if the father was born in a developed country and the mother in a developing country. In that case, the mother's country of birth has been used. This is a common approach in recent intergenerational studies (e.g. Corluy et al., 2015; Piton and Rycx, 2021).

Moreover, as wages are not only based on workers' origin, we also introduce a large range of covariates and fixed effects in our empirical analysis. They are described as follows: Z_{ijst} is a vector of worker characteristics (i.e. age, squared age, gender, educational attainment, tenure, squared tenure and type of household); E_{ijst} is a vector of employment characteristics (i.e. type of contract, dummies for part-time and overtime, and occupation dummies at two-digit ISCO level; F_{ijst} is a vector that contains information on the firm where the worker is employed (i.e. size of firm, region where firm is located, and dummies for the existence of firm-level collective agreement and type of economic and financial control); ψ_s denotes firm fixed effects;[16] δ_t represents year fixed effects; and ε_{ijst} is the error term, which is clustered at the firm level.[17] ε_{ijst} further follows the distribution $\varepsilon_{ijst} \backsim N(0, \frac{\hat{\sigma}^2}{\omega_{is}})$, where ω_{is} contains worker and firm weights and $\hat{\sigma}^2$ is the error variance that is estimated in regressions.[18]

[16] We also use sector fixed effects at two-digit NACE level instead of firm fixed effects in one of our benchmark specifications in Table 3.
[17] The clustering procedure is at the firm level because the sampling design of our database is based on workers randomly selected within each firm. The clustering procedure is further at the firm level rather than at the firm-year level to take into account serial correlation across years within a firm.
[18] The stratification of our database implies the use of weights. For details, see Footnote 22.

Moreover, we extend our analysis to the role of three moderating variables. First, in order to take into account more fine-grained characteristics linked to workers' country of birth or those of their parents (e.g. degree of human capital transferability, quality of the education system, socioeconomic background, labour market outcomes, patronymic, physical appearance and religion), F-G and S-G generation immigrants from developing countries are also classified by geographical origin, as follows: i) the Maghreb countries, ii) Sub-Saharan African countries, iii) the Near and Middle East countries, iv) non-EU Eastern European countries, v) emerging and developing Asian countries and vi) Latin American and Caribbean countries (see Appendix 2 for a list of countries by geographical region). Second, in order to fully assess the extent to which being a woman shapes overall and adjusted wage gaps, we re-estimate equation (1) with interactions between gender and origin as follows:

$$\log(w_{ijst}) = \beta_0 + \beta_1(region\ of\ birth_{ijst} * gender_{ijst}) + \beta_2 Z_{ijst} + \beta_3 E_{ijst} + \beta_4 F_{ijst} + \psi_s + \delta_t + \varepsilon_{ijst} \quad (2)$$

where $gender_{ijst}$ is a dummy variable that is set equal to 1 (0) if the worker *i* is female (male) and the reference group of $(region\ of\ birth_{ijst} * gender_{ijst})$ is male workers born in developed countries.

Third, in order to explore how the position in the wage distribution shapes overall wage gaps and identify the contribution of observables to these gaps, we use a multistep econometric technique, the so-called reweighted RIF-OB decompositions. In addition, we further investigate the role of gender along the wage distribution by conducting reweighted RIF-OB decompositions for female and male workers, separately.

Before delving into the details of our reweighted RIF-OB decompositions, it is worth mentioning that they have several advantages compared to standard econometric models (e.g. OB decompositions and OLS regressions) such as: i) using parametric or semiparametric strategies (e.g. logit regressions) to calculate reweighting factors based on the observed data for the identification of the counterfactual distributions, ii) providing a linear approximation of highly non-linear functions (e.g. the quantiles in a wage structure), iii) pinpointing the relative contribution that observations make to the estimation of distributional statistics, iv) allowing the OB decomposition for distributional statistics beyond the mean, v) estimating partial effects

of large changes in the distribution of regressors (i.e. changes in categorical or dummy variables) on the unconditional distribution of the dependent variable, while controlling for differences in the distribution of characteristics between groups,[19] and vi) facilitating interpretations of RIF estimates by recovering the underlying distributional statistics using simple averages (Firpo et al., 2018; Rios-Avila, 2020).

Reweighted RIF-OB decompositions between male (female) workers born in developed countries and male (female) workers originating from developing countries can be defined as follows:[20]

$$\hat{\Delta}^{q}_{\substack{reweighted \\ RIF-OB}} = \underbrace{(\bar{X}_0^C - \bar{X}_0)'\hat{\beta}_0^q}_{\hat{\Delta}^{q}_{X,p}} + \underbrace{\left(\hat{\beta}_C^q - \hat{\beta}_0^q\right)\bar{X}_0^{C\prime}}_{\hat{\Delta}^{q}_{X,e}} + \underbrace{\left(\hat{\beta}_1^q - \hat{\beta}_C^q\right)\bar{X}_1{}'}_{\hat{\Delta}^{q}_{S,p}} + \underbrace{(\bar{X}_1 - \bar{X}_0^C)'\hat{\beta}_C^q}_{\hat{\Delta}^{q}_{S,e}} \qquad (3)$$

where $\bar{X}$ corresponds to the vector of all observables mentioned in equation (1), $\bar{X}_0$ being that for male (female) workers born in developed countries, $\bar{X}_1$ that for male (female) workers originating from developing countries, and $\bar{X}_0^C$ that for counterfactual male (female) workers born in developed countries but with the distribution of observed and unobserved characteristics of male (female) workers originating from developing countries; $\hat{\beta}_0^q$ represents the RIF-regression coefficients of male (female) workers born in developed countries; $\hat{\beta}_1^q$ represents the RIF-regression coefficients of male (female) workers originating from developing countries; and $\hat{\beta}_C^q$ represents the reweighting RIF-regression coefficients when the data of male (female) workers born in developed countries are reweighted using logit regressions in order to have the same distribution of characteristics as the data of male (female) workers originating from developing countries.

Furthermore, the aggregate four terms on the right-hand side of equation (3) can be read as follows: the sum of $\hat{\Delta}^{q}_{X,p}$ and $\hat{\Delta}^{q}_{X,e}$ represents the total composition effect (i.e. the explained wage gap for the counterfactual group) where $\hat{\Delta}^{q}_{X,p}$ is the pure composition effect delivered by

[19] In standard RIF regressions, one cannot interpret the estimates of categorical variables as changes from 0 to 1. Reweighted RIF regressions solve this issue using logit or probit estimations to obtain inverse probability weights (i.e. counterfactual distributions). Changes in categorical variables are therefore identified as treatment effects (e.g. wage discrimination in a decomposition of wages) in reweighted RIF regressions (Firpo et al., 2018).

[20] By 'workers originating from developing countries' in reweighted RIF-OB decompositions, we actually mean F-G immigrants born in developing countries and S-G immigrants from developing countries, separately.

covariates and $\hat{\Delta}_{X,e}^{q}$ is the specification error that assesses the quality of the regression model (i.e. RIF approximation); and the sum of $\hat{\Delta}_{S,p}^{q}$ and $\hat{\Delta}_{S,e}^{q}$ indicates the total wage structure effect (i.e. the adjusted wage gap for the counterfactual group) where $\hat{\Delta}_{S,p}^{q}$ is the pure wage structure and $\hat{\Delta}_{S,e}^{q}$ is the reweighting error that assesses the quality of the reweighting procedure. Finally, it should be noted that bootstrap standard errors must be estimated in reweighted RIF-OB decompositions because the latter are based on a multi-stage procedure (i.e. RIF regressions and predicted inverse probability weights) (Firpo et al., 2018; Rios-Avila, 2020).

4. Data

4.1 Structure of the matched employer-employee database

Our empirical investigation relies on a matched employer-employee database provided by Statistics Belgium (STATBEL), which is obtained by merging two datasets covering the period 1999-2016. The first dataset is the Structure of Earnings Survey (SES), which covers all firms operating in Belgium, that employ more than 10 workers, and whose economic activities fall within sections B to S (excluding O) of the NACE Rev. 2 nomenclature.[21] The SES contains a wealth of information, provided by the management of firms, both on the characteristics of the latter (e.g. sector of activity, number of employees, type of collective agreement, region where the firm is located, type of economic and financial control) and their workers (e.g. age, gender, educational attainment, tenure, occupation, type of contract).[22] The second dataset stems from

[21] The NACE-BEL 2008 Rev. 2 is the statistical classification of economic activities in the EU (Belgian Version).
[22] The SES is conducted on the basis of a two-stage random sampling approach of enterprises or local units (first stage) and employees (second stage). The establishments, randomly chosen from the population, report data on a random sample of their workers. The SES is thus a stratified sample. The stratification criteria refer sequentially to the region (NUTS-groups), the principal economic activity (NACE-groups) and the size of the firm. The sample size in each stratum depends on the size of the firm. Sampling percentages of firms are equal to 10, 50 and 100 percent, respectively, when the number of workers is lower than 50, between 50 and 99, and above 100, respectively. Within a firm, sampling percentages of employees also depend on size. Sampling percentages of employees reach 100, 50, 25, 14.3 and 10 percent, respectively, when the number of workers is lower than 20, between 20 and 50, between 50 and 99, between 100 and 199, and between 200 and 299, respectively. Firms employing 300 or more workers must report information for an absolute number of employees. This number ranges between 30 (for firms with between 300 and 349 workers) and 200 (for firms with 12,000 workers or more). To guarantee that firms report information on a representative sample of their workers, they are asked to follow a specific procedure. First, they have to rank their employees in alphabetical order. Next, Statistics Belgium gives them a random letter (e.g. the letter O) from which they have to start when reporting information on their employees (following the alphabetical order of workers' names in their list). If they reach the letter Z and still have a number of employees on which they need to provide information, they have to continue from the letter A on their list. Moreover, firms that employ different categories of workers, namely managers, blue- and/or white-collar workers, have to set up a separate alphabetical list for each of these categories and to report information on a number of workers in these different groups that is proportional to their share of the firm's total number of employees. For example, a firm with 500 employees (e.g. 80 managers, 100 white-collar workers and 320 blue-

the Belgian National Register (BNR) and contains information on workers' country of birth and those of their parents, as well as the type of household where workers live (e.g. single person, single parent or couple with children). The linkage between the SES and the BNR datasets was carried out by STATBEL using firms' social security numbers, resulting in a cross-sectional sample of 1,609,543 observations.

Four filters were applied to the original database. First, we dropped firms with less than 10 observations to ensure sufficient variation in the estimation of wage gaps at the firm level (58,252 observations deleted). Second, in order to focus exclusively on the working-age population employed in the Belgian private sector, we kept only data for workers aged between 15 and 64 and firms operating in sectors B to N of the NACE-BEL 2008 Rev. 2 nomenclature (47,240 observations deleted).[23] Third, zero earnings observations were excluded to avoid statistical bias in the estimation of wage gaps (3,813 observations deleted). Fourth, in order to avoid misclassification by origin and generation, we filtered out workers with missing information on their country of birth (27,131 observations deleted) or at least one of their parents' country of birth (162,343 observations deleted). After applying the four filters, our final sample consists of 1,310,764 observations across 18,057 firms over the period 1999-2016.

4.2 Descriptive statistics

The population breakdown by origin and generation is given at the top of Table 2. We first observe that workers born in developed countries constitute about 89% of our final sample. Of these, Belgian natives and workers born in EU-14 countries are the largest groups. Turning to our groups of interest, F-G immigrants born in developing countries represent 7.1% of our final sample, whereas their S-G counterparts make up 3.4%. Most of them originate from the Maghreb, Sub-Saharan Africa and the Near and Middle East, regardless of their generation. It is worth noting that as expected, the distribution of workers by geographical origin in our

collar workers) will have to report information on 50 workers (e.g. 8 managers, 10 white-collar workers and 32 blue-collar workers).

[23] More precisely, our final sample covers the following sectors: (B) mining and quarrying, (C) manufacturing, (D) electricity, gas, steam and air conditioning supply, (E) water supply, sewerage, waste management and remediation, (F) construction, (G) wholesale and retail trade, repair of motor vehicles and motorcycles, (H) transportation and storage, (I) accommodation and food service activities, (J) information and communication, (K) financial and insurance activities, (L) real estate activities, (M) professional, scientific and technical activities and (N) administrative and support service activities.

sample mirrors that of the working-age population in Belgium (FPS Employment and Unia, 2019).[24]

[see Table 2]

Table 2 also displays descriptive statistics for all variables included in our empirical strategy. Regarding our main variable of interest, we observe that workers born in developed countries earn, on average, 20.3 euros per hour, while F-G immigrants born in developing countries only earn 16.8 euros. Turning to S-G immigrants from developing countries, they earn 17.4 euros per hour. In terms of worker characteristics, around 1 in 3 workers in our final sample is a woman, regardless of their origin and generation. The average age is similar between workers born in developed countries and F-G immigrants born in developing countries. By contrast, S-G immigrants from developing countries are 8-years younger than the other groups, which further explains their low level of job tenure. In terms of tertiary education, S-G immigrants from developing countries perform much better than their F-G peers (25.5% vs. 13.7%), although they still lag somewhat behind workers born in developed countries (28.9%).

Regarding job characteristics, the shares of workers originating from developing countries in part-time jobs are almost twice those of workers born in developed countries, regardless of their generation. In terms of job stability, workers originating from developing countries are also more likely to have fixed-term contracts than workers born in developed countries, regardless of their generation. Focusing on occupational status, the share of F-G immigrants born in developing countries and employed in an elementary occupation (e.g. cleaner, agricultural worker or labourer in construction) is more than three times higher than that of workers born in developed countries (33.9% vs. 10.1%). However, this share considerably decreases for their S-G counterparts (15.1%). Within the cohort of workers originating from developing countries, we also observe that the proportion of workers who are managers, professionals and technicians grows across two generations. Finally, F-G immigrants born in developing countries are considerably overrepresented in sector I (accommodation and food service activities) and sector N (administrative and support service activities) relative to workers born in developed countries. However, this overrepresentation decreases somewhat across two generations. Indeed, S-G immigrants from developing countries are more clustered in sector G (wholesale

[24] See Footnote 2.

and retail trade, repair of motor vehicles and motorcycles), sector J (information and communication) and sector M (professional, scientific and technical activities) than their F-G counterparts.

5. Results

5.1. Benchmark specification

Table 3 presents our benchmark estimates regarding the real gross hourly wage gaps between workers born in developed countries and workers originating from developing countries across two generations.[25] In column (1), when only controlling for year fixed effects, our findings first show that the overall wage gap for F-G immigrants born in developing countries stands at 15.7%, while that for their S-G peers is 13.5%.[26] Put another way, the wages of S-G immigrants from developing countries are not, on average, markedly better than those of their F-G counterparts.[27]

[Table 3]

However, although our estimates in column (1) show a clear picture of the level of overall wage inequality by origin and generation in Belgium, it is very unlikely that workers' country of birth or those of their parents entirely explain their wages. Thus, covariates are progressively included in Table 3. In column (2), we find that after taking into account worker characteristics (i.e. gender, age, squared age, education, tenure, squared tenure and type of household), the adjusted wage gap for F-G immigrants born in developing countries stands at 6.0%. By contrast, there is no evidence of a statistically significant adjusted wage gap for their S-G counterparts. The inclusion of employment characteristics (i.e. type of contract, part-time, overtime and occupation at ISCO2 level) in column (3) reduces by almost half the adjusted wage gap for F-

[25] The term "wage gap" as used in the discussion of our findings refers to the real gross hourly wage gap.

[26] In a log-linear econometric model, to obtain the % change in the dependent variable following a unit change in a dummy variable, the following formula must be applied: $100 * [\exp(\beta) - 1]$. For instance, in column (1), the regression coefficient (β) associated with the dummy 'F-G immigrants born in developing countries' is equal to -0.171. Given that our wage regression is log-linear, this coefficient suggests that F-G immigrants born in developing countries earn 15.7% less than workers born in developed countries (i.e. 100 * [exp(-0.171) – 1] = -15.7%)].

[27] We also find that workers born in developing countries with both parents born in Belgium, called 'others' in this paper, earn 13.7% more than workers born in developed countries, therefore performing far better than F-G and S-G immigrants from developing countries. As our empirical analysis focuses on the labour market performance of F-G and S-G workers from developing countries, results for the category 'others' are no longer explicitly shown in Table 4 and onwards. However, they are available on request.

G immigrants born in developing countries observed in column (2), now 3.2%. The inclusion of firm characteristics (i.e. size of the firm, firm-level collective agreement, type of economic and financial control, and region where the firm is located) and sector fixed effects at the NACE two-digit level in column (4) does not significantly affect the adjusted wage gap for F-G immigrants born in developing countries. Moreover, we observe that in columns (3) and (4), there is also no evidence of an adjusted wage gap for S-G immigrants from developing countries.

We now place particular emphasis on the results of column (5) as they represent the estimation of our full benchmark specification (i.e. controlling for worker, employment and firm characteristics, alongside firm and year fixed effects).[28] Our estimates suggest that F-G immigrants born in developing countries experience an adjusted wage gap of 2.7%. Although one might not entirely exclude the role of unobservable characteristics (e.g. motivation) in explaining the adjusted wage gap for F-G immigrants born in developing countries, given the large number of covariates we control for, there are solid grounds for assuming that this adjusted wage gap is at least in part associated with wage discrimination. Finally, we find that S-G immigrants from developing countries experience no adjusted wage gap. To put it another way, all else being equal, S-G immigrants from developing countries perform better in terms of wages than their F-G peers and equivalent to workers born in developed countries.

5.2. Geographical origins

The overall and adjusted wage gaps for F-G and S-G immigrants from developing countries may vary depending on their geographical origin. Hence, Table 4 presents the intergenerational relationship between origin and wages using a more fine-grained geographical classification. In column (1), where no covariate is included, except for year fixed effects, our estimates suggest that the overall wage gaps for F-G immigrants born in non-EU Eastern Europe (17.8%), the Maghreb (16.3%), and the Near and Middle East (16.2%) are relatively more important than those for F-G workers born in Sub-Saharan Africa (14.7%), emerging and developing Asia (14.0%), and Latin America and the Caribbean (12.7%).

[28] Most covariates are associated with significant coefficients and expected signs. More precisely, wages are found to grow with age and tenure, although only to a certain point, because their relationship is quadratic. Wages are higher for workers with high levels of education and for workers involved in specific households (i.e. couples with or without children at home). Wages tend to increase with the size of the firm. By contrast, wages are lower in temporary and part-time jobs. Wages are negatively associated with being a single parent and being employed in firms located in the southern part of Belgium (i.e. Wallonia).

There is also heterogeneity in the magnitude of the overall wage gaps for S-G immigrants from developing countries, which therefore indicates two intergenerational earnings patterns that depend on workers' geographical origin. On the one hand, the overall wage gaps for S-G immigrants from Sub-Saharan Africa (4.1%), non-EU Eastern European countries (4.4%), and emerging and developing Asia (9.9%) are significantly lower than those for their F-G peers, suggesting that there are intergenerational earnings improvements among workers originating from those regions. On the other hand, though, the overall wage gaps for S-G immigrants from the Maghreb (16.8%), the Near and Middle East (18.6%), and Latin America and the Caribbean (13.2%) are somewhat higher than those for their F-G peers, indicating downward earnings mobility or earnings status-quo across two generations for these three groups of workers.

[Table 4]

Controlling for our full set of covariates – including firm fixed effects – in column (2), the adjusted wage gaps for F-G immigrants born in developing countries also vary according to geographical origin, being 1.5% for those born in Latin America and the Caribbean, 1.8% for those born in the Near and Middle East, 2.3% for those born in emerging and developing Asia, 2.4% for those born in non-EU Eastern Europe, 2.9% for those born in Sub-Saharan Africa, and 3.6% for those born in the Maghreb. These estimates go in the same direction as those of Fays et al. (2021) and Kampelmann et Rycx (2016) for Belgium, which show that even after controlling for a large number of covariates, F-G immigrants born in developing countries, especially those originating from the Maghreb and Sub-Saharan Africa, still experience sizeable wage disadvantages (i.e. poor earnings outcomes and wage discrimination).

Turning to the adjusted wage gaps for S-G immigrants from developing countries, we find three patterns that are dependent on geographical origin. First, the adjusted wage gaps for S-G immigrants from the Maghreb, Sub-Saharan Africa and non-EU Eastern Europe are not statistically significant or stand at around zero (i.e. *ceteris paribus*, these S-G immigrants attain wage parity with workers born in developed countries). Second, S-G immigrants from the Near and Middle East experience a positive adjusted wage gap of 1.4%, suggesting that all else being equal, they perform better than workers born in developed countries and their F-G counterparts. Third, the adjusted wage gaps for S-G immigrants from emerging and developing Asia, Latin America and the Caribbean are between 3.6% and 3.8%, and are therefore worse than those for their F-G peers.

5.3. Gender and origin

As our findings in column (5) of Table 3 show that *ceteris paribus*, female workers earn 7.5% less per hour than male workers[29], the role of gender in shaping the wages of workers from developing countries across two generations deserves to be investigated in detail. Columns (1) and (2) of Table 5 first show that the overall and adjusted wage gaps for F-G and S-G male immigrants from developing countries are comparable to those in the benchmark scenario of Table 3. In other words, while the overall wage gaps for male workers originating from developing countries remain substantial across two generations (between 14.7% and 16.9%), the adjusted wage gap decreases from 3.7% to nil.

By contrast, important differences can be pinpointed between male workers born in developed countries and female workers, regardless of their origin and generation. More precisely, our gender-interacted estimates in column (1) show that the overall wage gaps are as follows: 13.8% for female workers born in developed countries, 26.1% for F-G female immigrants born in developing countries, and 22.7% for S-G female immigrants from developing countries. These findings, therefore, highlight the existence of a significant double overall wage gap for F-G and S-G female immigrants from developing countries (see the test for equality of coefficients at the bottom of column (1)).

[Table 5]

However, the striking overall wage penalties experienced by female workers, regardless of their origin and generation, may be in part explained by some disadvantages in the statistical profiles of female workers (see Appendix 3 for descriptive statistics by origin, generation and gender). Indeed, for example, female workers are severely over-represented in part-time jobs relative to male workers, regardless of their origin and generation. Similarly, female workers are more clustered in clerical support, service and sales, and elementary occupations (i.e. occupations characterized by a high proportion of low-wage jobs) than male workers, regardless of their origin and generation.

[29] The regression coefficient (β) associated with the dummy for 'women' is equal to -0.078. Given that our wage regression is log-linear, this coefficient suggests that female workers earn 7.5% less than their male counterparts (i.e. 100 * [exp(-0.078) – 1] = -7.5%)]. See Footnote 25 for details.

Based on these facts, we include all our covariates, including firm fixed effects. As expected (see column (2) of Table 5), our gender-interacted estimates now indicate that the adjusted wage gaps are as follows: 7.8% for female workers born in developed countries, 8.2% for F-G female immigrants born in developing countries, and 7.3% for S-G female immigrants from developing countries. Furthermore, focusing on the tests for equality of coefficients at the bottom of column (2), we also point out the following facts: i) S-G female immigrants from developing countries perform better than their F-G same-sex peers; ii) F-G female immigrants born in developing countries experience a double adjusted wage gap, albeit a relatively small one (i.e. compared to the adjusted gender wage gap for female workers born in developed countries, a difference of 0.5 percentage points can be pinpointed); and iii) no evidence of double adjusted wage gap for S-G female immigrants from developing countries.

Finally, it is worth mentioning that to date, empirical studies taking an intergenerational perspective in Belgium have exclusively considered the interacting role of origin and gender in the access to the labour market (e.g. Colruy et al., 2015; Piton and Rycx, 2021). They find that F-G female immigrants of non-EU origin (especially those originating from developing countries) and their descendants experience double employment penalties. Therefore, our empirical analysis permits us to complete the picture of the labour market integration of F-G and S-G female immigrants from developing countries in Belgium once they overcome initial difficulties in finding a job.

5.4. Wage distribution

In order to estimate overall wage gaps beyond the mean, identify the contribution of observables to these gaps and provide a more robust econometric analysis of gender roles, we conduct reweighted RIF-OB decompositions for male and female workers, separately.[30] It is therefore essential to highlight that in this sub-section, reweighted RIF-OB decompositions represent same-sex wage gaps between workers born in developed countries and counterfactual workers originating from developing countries across two generations. Tables 6 and 7 show the unconditional quartile coefficients of reweighted RIF-OB decompositions at the lower, median

[30] The limits of STATA, i.e. the econometric software used for our estimations, do not allow us to include thousands of firm dummies in our reweighted RIF-OB decompositions. Therefore, we were constrained to work with sector fixed effects (i.e. 65 sector dummies) in this part of our empirical analysis. However, it is worth noting that the estimates of our benchmark specification using sector fixed effects are relatively similar to those using firm fixed effects (see columns (4) and (5) of Table 2).

and upper quartiles for male and female workers, respectively.[31] In addition, complete quantile functions are reported as graphs in Figures 1 and 2.[32]

[Tables 6 and 7]

Our unconditional quantile coefficients in column (1) of Tables 6 and 7 first show that the overall wage gaps between male (female) workers born in developed countries and F-G male (female) immigrants born in developing countries increase substantially along the wage distribution. A similar pattern is identified for the evolution of the overall wage gaps for S-G male immigrants from developing countries along the wage distribution. By contrast, the overall wage gaps for S-G female immigrants from developing countries appears to be almost constant along the wage distribution. Moreover, important differences can be highlighted when comparing overall wage gaps across two generations. More precisely, at the lower quartile, the overall wage gaps for S-G female and male immigrants from developing countries remain quite similar to those for their F-G same-sex peers (i.e. earnings status-quo). By contrast, at the median and upper quartiles, the overall wage gaps for S-G female and male immigrants from developing countries are less pronounced than those for their F-G same-sex peers (i.e. upward earnings mobility).

What about the decomposition of the overall wage gaps for workers originating from developing countries across two generations? Our reweighted RIF-OB decompositions in column (2) of Tables 6 and 7 show that the overall wage gaps for S-G male, F-G female and S-G female immigrants from developing countries are fully explained by composition effects (i.e. worker, employment and firm characteristics) along the wage distribution. Regarding the overall wage gaps for F-G male immigrants born in developing countries, although they are mostly driven by composition effects, a negative wage structure effect (i.e. the adjusted wage gap for the counterfactual group) is also observed (see column (9) of Table 6). The latter further increases along the wage distribution (see Figure 1). In this regard, it should be noted that, although we cannot ultimately assert whether wage structure effects are caused by wage

[31] Reweighted RIF-OB decompositions produce two errors to inform about the quality of the estimates along the wage distribution. The reweighting errors provide information on the quality of the counterfactual distributions' identification (see columns (8) of Tables 6 and 7). The specification errors provide information on the quality of the RIF regressions (see columns (10) of Tables 6 and 7).

[32] Insofar as can be ascertained, insignificant or small wage structure effects at the quantiles 10 and 20 can be taken as evidence of sticky floors (i.e. minimum wages).

discrimination or potential remaining unobservable characteristics (e.g. motivation), the large number of covariates included in our decompositions enable us to feel confident to at least partially attribute wage structure effects to wage discrimination.

Given that composition effects drive all (or most) of the abovementioned gaps, the research question*: how do worker, employment and firm characteristics shape the overall wage gaps for workers originating from developing countries across two generations?* also requires careful consideration. Regarding worker characteristics, our reweighted RIF-OB decompositions in columns (3)-(6) of Table 6 and 7 show that along the wage distribution, the overall wage gaps for F-G female immigrants and F-G male immigrants born in developing countries are slightly explained by their age. By contrast, their low levels of education and tenure play an important, positive role in their overall wage gaps, to an increasing extent along the wage distribution. In this connection, one cannot exclude the fact that the non-recognition of foreign credentials might in part explain these low levels of education and tenure. For example, we observe that among workers at the upper part of the wage distribution (i.e. workers with high-skilled jobs), the wages of F-G female immigrants and F-G male immigrants born in developing countries are particularly affected due to their education. Focusing on employment and firm characteristics, called 'employment and workplace' in column (7) of Tables 6 and 7, they also drive a substantial part of the overall wage gaps for F-G female immigrants and F-G male immigrants born in developing countries. Indeed, columns (6)-(7) of Appendixes 4.1 and 4.2 suggest that along the wage distribution, the concentration in low-wage occupations and sectors accounts for an important part of the overall wage gaps for F-G female immigrants and F-G male immigrants born in developing countries.

[Figures 1 and 2]

Turning to the overall wage gaps for S-G female immigrants and S-G male immigrants from developing countries, their low levels of age and tenure almost entirely explain these gaps along the wage distribution (see columns (3)-(6) in Tables 6 and 7). By contrast, education appears to play a very marginal role in explaining these gaps, suggesting that S-G male (female) immigrants from developing countries present similar levels of education to those of male (female) workers born in developed countries and benefit from accumulating host country education. In addition, our reweighted RIF-OB decompositions in columns (6)-(7) of Appendixes 3.1 and 3.2 show that along the wage distribution, employment and firm

characteristics marginally explain the overall wage gaps for S-G female immigrants and S-G male immigrants from developing countries. To put it another way, compared to their same-sex F-G peers, S-G female immigrants and S-G male immigrants from developing countries have better employment characteristics and are less concentrated in sectors with high rates of low pay.

Needless to say, our reweighted RIF-OB decompositions accord with the estimates of our weighted multilevel log-linear regressions, which also find that worker characteristics account for most of the overall wage gaps for F-G immigrants born in developing countries and essentially explain those for S-G immigrants from developing countries (see column (2) of Table 3).

6. Conclusion

In a developed world marked by demographic ageing, the labour market integration of immigrants born in developing countries and their descendants plays a key role in ensuring the sustainability of social security systems (e.g. healthcare, pensions, and unemployment benefits). Indeed, good labour market outcomes for the immigrant population accords with a positive net contribution to economic growth and tax base (Christl et al., 2021; OECD 2021). In this regard, although the employment rates of F-G and S-G immigrants from developing countries have been well-documented at the international level (e.g. Belzil and Poinas, 2010; Midtbøen, 2016; OECD, 2020a; Piton and Rycx, 2021), the evolution of their wages across generations has received less attention due to, *inter alia*, data availability.[33] More precisely, as far as we know, the wages of workers originating from developing countries have only been investigated from an intergenerational viewpoint in six developed countries (i.e. France, Germany, the Netherlands, Sweden, the United Kingdom and the United States). It should, however, be noted that most existing evidence on immigrant-native wage gaps across generations is characterized by sampling and econometric limitations, such as: small samples, short time spans, limited number of control variables and/or standard OLS regressions (mainly computed at the mean). Therefore, using a granular, matched employer-employee database of 1.3 million observations

[33] In many developed countries, until recently, it was quite challenging to identify F-G and S-G immigrants on a large scale or obtain granular information on both wages and origin. The latest data available for international comparison were produced in 2014 with the ad hoc module of the Labour Force Survey that followed the first ad hoc module on the labour market situation of immigrants, conducted in 2008. See Table 1 for the existing empirical literature on the wages of F-G and S-G immigrants from developing countries.

over the period 1999-2016 for the Belgian private labour market and robust econometric techniques (i.e. weighted multilevel log-linear regressions and reweighted RIF-OB decompositions), we contribute to the existing literature by providing a comprehensive assessment of the wages of F-G and S-G immigrants from developing countries, and examining the moderating role of geographical origin, gender, and position in the wage distribution.

Our estimates first suggest that, although the wages of S-G immigrants from developing countries are somewhat higher than those of their F-G peers, the overall wage gaps between workers born in developed countries, including Belgian natives, and workers originating from developing countries remain quite similar across two generations (15.7% for F-G immigrants; 13.5% for S-G immigrants). Nevertheless, controlling for a wide range of observables (e.g. age, tenure, education, household, type of contract, occupation, part-time, overtime, size of firm, firm-level collective agreement, firm fixed effects), we find that, while the adjusted wage gap for F-G immigrants born in developing countries is 2.7%, there is no evidence of a significant adjusted wage gap for their S-G peers.

Regarding the moderating role of fine-grained geographical origin, our results show that S-G immigrants from the Maghreb, the Near and Middle East, Latin America and the Caribbean earn lower wages than their F-G peers, who already experience a sizeable overall wage gap with respect to workers born in developed countries. By contrast, the overall wage gap for S-G immigrants from Sub-Saharan Africa and non-EU Eastern Europe is remarkably lower than that for their F-G peers. The wages of these S-G immigrants thus converge (significantly but not completely) towards those of workers born in developed countries. Controlling for observables, different intergenerational earnings patterns by geographical origin can be observed. Whereas S-G immigrants from the Maghreb, Sub-Saharan Africa, the Near and Middle East and non-EU Eastern Europe perform better than their F-G peers and similarly to workers born in developed countries (i.e. we find no significant adjusted wage gap for these S-G immigrants), S-G immigrants from emerging and developing Asia, Latin America and the Caribbean perform worse than their F-G peers, who already experience a significant adjusted wage penalty.

As regards the moderating role of gender, our estimates suggest that F-G and S-G female immigrants from developing countries receive considerably lower wages than female workers born in developed countries, even though the latter experience a significant overall gender wage gap (i.e. evidence of a double overall wage gap for F-G and S-G female immigrants from

developing countries). By contrast, controlling for observables, the adjusted wage gaps for F-G and S-G female immigrants from developing countries are largely comparable to those for female workers born in developed countries. Thus, while there is no significant evidence of a double adjusted wage penalty for F-G and S-G female immigrants from developing countries, our results suggest that these immigrant women experience the same wage penalty (of around 8%) as that estimated for female immigrants born in developed countries (in comparison to their male counterparts). Similar results are found in Sweden and the United States (e.g. Duncan et Trejo, 2018; Ekberg et al., 2010).

Regarding the moderating role of the position in the wage distribution, our unconditional quantile coefficients suggest that when comparing within each gender group, the overall wage gaps for F-G female and male immigrants born in developing countries increase substantially along the wage distribution. A similar but less accentuated pattern can be observed for S-G male immigrants from developing countries. By contrast, the overall wage gap for S-G female immigrants from developing countries remains relatively constant along the wage distribution. Moreover, our reweighted RIF-OB decompositions show that along the wage distribution, the overall wage gaps for F-G female and male immigrants born in developing countries are mainly driven by human capital characteristics and occupational/sectoral segregation. However, F-G male workers born in developing countries also face a significant wage structure effect (i.e. wage discrimination), which increases along the wage distribution. Turning to their descendants, we observed that, by contrast, along the wage distribution, the overall wage gaps for S-G female and male immigrants from developing countries are essentially explained by their low levels of age and tenure. To put it another way, the wages of S-G immigrants from developing countries are lower than those of workers born in developed countries, due mainly to demographic characteristics of immigrant populations (i.e. S-G immigrants from developing countries are younger and with less job tenure than workers born in developed countries).

Overall, our paper sheds light on the importance of the legacy of immigration in explaining persistent overall wage gaps for workers originating from developing countries across two generations. However, it also indicates that unlike their F-G peers, S-G immigrants from developing countries no longer experience an adjusted wage gap. Last but not least, although our estimates suggest that the wages of S-G immigrants from developing countries are likely to converge over time towards those of workers born in developed countries (as the adjusted wage gap is largely explained by their younger age and tenure), caution must be exercised because

wage and employment dynamics by origin might evolve differently over the entire career of workers.

Data availability statement

The data used in this paper are available from Statistics Belgium. However, restrictions may apply to the availability of these data, as confidentiality agreements and license must be signed with Statistics Belgium. The STATA do-files that support the findings of this paper are available on request.

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Table 1: Previous intergenerational studies on the wages of immigrants from developing countries

Authors	Country	Data (1) / Time span (2) / Methodology (3)	Covariates	Main findings
First-generation immigrants vs. Second-generation immigrants vs. Natives				
Abramitzky et al. (2021)	United States	(1) Cross-sectional sample and father-child linkage: * (2) 1880, 1910, 1940, 1994-2000, 2006-2015 (3) OLS regressions	Parent's age, gender and son's age.	The earnings gaps for S-G immigrants are substantially smaller than those for their F-G peers, except for immigrants from Latin America and the Caribbean.
Algan et al. (2010)	France, Germany and United Kingdom	(1) FR: Labour force survey: 93,002 observations DE: Microcensus: 685,994 observations UK: Labour force survey: 1,327,893 observations (2) FR: 2005-2007, DE: 2005-2006, UK: 1993-2007 (3) FR-DE-UK: OLS regressions	Age, education, gender, potential experience and region of residence.	FR: Immigrant-native wage gaps are persistent across generations for immigrants from Africa and Turkey. F-G and S-G immigrants from Asia out-earn or receive similar wages to those of natives. DE: There is no evidence of wage improvement across generations for immigrants from non-EU Central and Eastern Europe and Turkey. UK: S-G immigrants from Asia, Africa and the Caribbean receive higher wages than their F-G peers but still lag behind natives.
Athari et al. (2019)**	France	(1) Labour force survey: 233,000 observations (2) 2013-2018 (3) Unconditional quantile regressions	Education, gender, region of residence, experience, tenure, part-time and sectors.	S-G immigrants perform better than their F-G peers, irrespective of their geographical origin. S-G immigrants from the Maghreb, Sub-Saharan Africa and Turkey still experience immigrant-native wage gaps.
Belfi et al. (2021)	Netherlands	(1) Individual survey: 5,984 observations (2) 2008-2012, 2015 (3) OLS regressions	Age, gender, educational outcomes, experience, study province and living abroad at time of survey.	Among recent university graduates, there is evidence of wage parity between Dutch natives and immigrants from non-Western countries across two generations.
Borjas (1993)	United States	(1) Decennial census: 783,020 observations (2) 1940, 1950, 1960, 1970 (3) OLS regressions	Age, education, marital status and metropolitan residence.	S-G immigrants from Cuba, Mexico and the Philippines perform better than their F-G peers but worse than natives. S-G immigrants from China reverse the negative immigrant-native wage gap faced by their F-G peers.
Card et al. (2000)	United States	(1) Population surveys: 920,993 observations (2) 1940, 1970, 1994-1996 (3) OLS regressions	Age, region and origin composition.	The wages of S-G female and male immigrants from Latin America are higher than those of their F-G same-sex peers, but remain behind those of natives. F-G and S-G female and male immigrants from Asia and the Caribbean out-earn or perform similar to same-sex natives.
Duncan and Trejo (2018)	United States	(1) Population survey: around 60,000 observations (2) 2003-2016 (3) Weighted OLS regressions	Age, education, gender and region of residence.	S-G male immigrants from Latin America, Africa and Asia face immigrant-native wage gaps, although to a much lesser extent than those experienced by their F-G same-sex peers. S-G female immigrants from Asia out-earn female natives, while their S-G same-sex peers from Latin America attain wage parity with female natives.

Table 1 (Continued)

Table 1. Continued

Authors	Country	Data (1) / Time span (2) / Methodology (3)	Covariates	Main findings
Ekberg et al. (2010)	Sweden	(1) Grandparent-parent-child linkage: 25,118 pairs (2) 1960, 1980, 2003 (3) OLS regressions and SUR models	Age, education, gender, marital status and region of residence	F-G male immigrants from non-Western European countries experience an immigrant-native wage advantage, which disappears for their sons. There is no evidence of immigrant-native wage gap among female workers across generations.
Hammarstedt (2009)	Sweden	(1) Grandparent-parent-child linkage: 9,560 pairs (2) 1968, 1970, 1980, 1985, 1999, 2001, 2003 (3) OLS regressions	Age, education, marital status and region of residence	There is downward intergenerational earnings mobility among immigrants from non-Western European countries.
Hammarstedt and Palme (2012)	Sweden	(1) Parent-child linkage: * (2) 1975, 1980, 1997-1999 (3) OLS regressions	Age, gender, region of residence and occupations.	Immigrant-native wage gaps for immigrants from Africa, Turkey and the Middle East expand across generations. S-G immigrants from Eastern Europe, Latin America and Asia reverse the immigrant-native wage gap faced by their parents.
Second-generation immigrants vs. Natives				
Aeberhardt et al. (2010)	France	(1) Household survey: 40,000 observations (2) 2003 (3) Weighted OLS, MLE and two-step Heckman regressions, and Oaxaca-Blinder decompositions	Education, gender, region of residence, experience, tenure and part-time.	S-G immigrants from Africa experience a sizeable overall wage gap. However, between two and three quarters of this gap is explained by covariates.
Dustmann et al. (2011)	United Kingdom	(1) Labour force survey: * (2) 1998-2009 (3) OLS regressions	Age, gender, education and region of residence.	S-G immigrants with non-white ethnicity earn substantially less than white British natives. There is wage parity between British natives and S-G immigrants from Bangladesh and China.
Gueye and Ceci-Renaud (2022)	France	(1) Administrative wage data: 394,446 observations (2) 2002-2014 (3) Random effects regressions	Age, birth cohort, education, experience, gender, geographical location, parents' profession, part-time, occupations and firm size.	S-G immigrants from the Maghreb and Sub-Saharan Africa experience a significant immigrant-native wage gap, while there is no evidence of a wage gap between French natives and S-G immigrants from Turkey.
Langevin et al. (2013)	France	(1) Individual survey: 6,778 observations (2) 2008-2009 (3) Weighted OLS and two-step Heckman regressions, Oaxaca-Blinder decompositions	Age, experience, gender, tenure, education, city size, occupations and sectors.	S-G immigrants from Africa and Turkey receive lower wages than French natives, while their S-G peers from Asia and Eastern Europe attain wage parity with French natives.
Rooth and Ekberg (2003)	Sweden	(1) Cross-sectional sample: 192,443 observations (2) 1998 (3) Oaxaca-Blinder decompositions	Age, education, gender, marital status and region of residence	The earnings outcomes of S-G immigrants with non-European background are worse than those of Swedish natives.
Sakamoto et al. (2010)	United States	(1) Population survey: 4,011,429 observations (2) 1994-2006 (3) OLS regressions	Age, education, gender, region of residence and people with disability	S-G male immigrants with an African background earn substantially less than white male natives. The wages of S-G female immigrants with an African background are comparable to those of white female natives.

Notes: * The number of observations is not specified. ** Using French labour force survey between 2013-2016, Boutchenik and Le (2017) find similar results for S-G immigrants from the Maghreb.

Table 2. Descriptive statistics by origin – means and percentages, 1999-2016

	Sample of workers born in or from		
	Developed countries	**Developing countries[a]**	
		First generation	**Second generation[b]**
Share of the sample by origin (%)[c]	88.7	7.1	3.4
Region of birth (%)[d]			
Developed countries			
Belgium (n = 969,398)	83.5		
EU-14 countries (n = 179,765)	14.6		
Other EU countries (n = 17,018)	1.5		
Other developed countries (n = 4,621)	0.4		
Developing countries			
Maghreb countries (n = 50,175)		36.7	43.3
Sub-Saharan African countries (n = 27,253)		18.9	23.3
Near and Middle East countries (n = 25,444)		19.4	22.6
Non-EU Eastern European countries (n = 12,419)		10.9	6.7
Emerging and developing Asian countries (n = 8,979)		8.5	3.2
Latin American and Caribbean countries (n = 5,777)		5.6	1.7
Worker characteristics			
Real gross hourly wage (in EUR)[e]	20.3	16.8	17.4
Age	38.2	38.2	30.2
Women (%)	31.6	28.7	34.1
Tenure	9.1	5.1	4.0
Education (%):			
At most lower secondary	28.9	50.9	29.4
Upper secondary	42.2	35.3	45.1
Tertiary	28.9	13.7	25.5
Household (%):			
Single person	12.0	14.3	12.0
Couple without children living at home	18.1	11.8	12.3
Couple with children living at home	59.5	61.5	62.0
Single parent	7.8	6.5	10.6
Other households	2.6	6.0	3.1
Employment characteristics			
Part-time (%)	9.7	18.9	16.3
Overtime (%)	4.5	4.8	4.6
Type of contract (%):			
Permanent	92.5	86.0	82.4
Fixed-term	6.1	12.7	15.4
Apprenticeship	0.2	0.1	0.6
Internship	1.2	1.2	1.5
Occupational categories - ISCO1 (%):			
Managers	4.3	1.5	2.4
Professionals	12.6	5.8	11.2
Technicians and associate professionals	9.9	4.4	9.3
Clerical support	19.5	10.9	17.6
Service and sales workers	9.9	9.8	15.1
Craft and related trades workers	17.6	18.3	12.9
Plant and machine operators and assemblers	16.1	15.2	16.4
Elementary Occupations	10.1	33.9	15.1

Table 2. (Continued)

Table 2. Continued

	Sample of workers born in or from		
	Developed countries	**Developing countries[a]**	
		First generation	**Second generation[b]**
Firm characteristics			
Sector of activity - NACE1 (%):			
B - Mining and Quarrying	0.2	0.1	0.1
C - Manufacturing	35.6	24.6	25.0
D - Electricity, gas, steam and air conditioning supply	1.3	0.2	1.0
E - Water supply, sewerage, waste management and remediation activities	0.9	0.8	0.6
F - Construction	8.1	8.3	5.6
G - Wholesale and retail trade, repair of motor vehicles and motorcycles	19.7	12.4	17.1
H - Transportation and storage	9.6	9.1	11.8
I - Accommodation and food service activities	2.4	8.8	5.4
J - Information and communication	5.0	2.8	6.1
K - Financial and insurance activities	1.2	0.9	1.6
L - Real Estate activities	0.3	0.3	0.3
M - Professional, scientific and technical activities	5.3	3.1	5.1
N - Administrative and support service activities	10.4	28.9	20.2
Size of the firm (FTE number of employees)	513.3	460.8	554.1
Firm-level collective agreement (Yes) (%)	27.4	21.6	28.4
More than 50% privately owned (Yes) (%)	93.9	96.8	94.2
Region where the firm is located (%):			
Brussels	12.9	26.6	28.9
Flanders	65.3	56.8	50.1
Wallonia	21.9	16.5	21.0

Notes: Sample covers workers aged 15-64. Worker and firm weights are used. [a] By 'developing countries', we actually mean either transition and developing countries listed in the United Nations' (2020) classification and/or emerging market and developing economies listed in the IMF's (2020) classification (See Appendix 1 for a chart of developed and developing countries). [b] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. [c] The category 'others' is also considered in the sample. Therefore, the sum of shares does not add up to 100%. [d] Appendix 2 shows the list of countries by region of birth. [e] At 2013 constant prices. It includes base pay, overtime compensation, performance-related pay and commissions, and annual and irregular bonuses. Source: STATBEL, 1999-2016.

Table 3. Baseline: weighted multilevel log-linear regressions

	Log (Real gross hourly wage)				
Workers born in or from:	(1)	(2)	(3)	(4)	(5)
Developed countries (n = 1,170,802)	Reference	Reference	Reference	Reference	Reference
Developing countries					
First generation (n = 87,693)	-0.171***	-0.062***	-0.033***	-0.034***	-0.029***
	(0.007)	(0.004)	(0.004)	(0.003)	(0.002)
Second generation[a] (n = 42,354)	-0.144***	0.005	0.010*	-0.001	-0.002
	(0.007)	(0.005)	(0.006)	(0.004)	(0.002)
Others[b] (n = 9,915)	0.128***	0.042***	0.027***	0.027***	0.022***
	(0.009)	(0.006)	(0.004)	(0.004)	(0.003)
Control variables					
Women		-0.131***	-0.092***	-0.088***	-0.078***
		(0.004)	(0.005)	(0.003)	(0.003)
Age		0.030***	0.023***	0.023***	0.021***
		(0.001)	(0.001)	(0.001)	(0.001)
Squared age		-0.000***	-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)	(0.000)
Tenure		0.013***	0.011***	0.010***	0.009***
		(0.001)	(0.001)	(0.000)	(0.000)
Squared tenure		-0.000***	-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)	(0.000)
Education (ref. at most lower secondary)					
Upper secondary		0.109***	0.066***	0.051***	0.050***
		(0.004)	(0.006)	(0.003)	(0.003)
Tertiary		0.493***	0.209***	0.171***	0.147***
		(0.007)	(0.012)	(0.005)	(0.007)
Type of household (ref. single person)					
Couple without children living at home		0.010***	0.004***	0.004***	0.005***
		(0.002)	(0.001)	(0.001)	(0.001)
Couple with children living at home		0.016***	0.012***	0.012***	0.014***
		(0.002)	(0.001)	(0.001)	(0.001)
Single parent		-0.016***	-0.009***	-0.006***	-0.003**
		(0.002)	(0.002)	(0.001)	(0.001)
Other households		0.007**	0.002	0.004*	0.002
		(0.003)	(0.003)	(0.002)	(0.002)
Type of contract (ref. permanent)					
Fixed term			-0.031***	-0.038***	-0.037***
			(0.006)	(0.010)	(0.008)
Apprenticeship			-0.225***	-0.223***	-0.227***
			(0.022)	(0.022)	(0.021)
Internship			-0.002	-0.003	-0.028**
			(0.037)	(0.027)	(0.014)
Part-Time			-0.045***	-0.029***	-0.025***
			(0.006)	(0.005)	(0.003)
Overtime			0.016*	0.017***	0.004
			(0.009)	(0.004)	(0.003)

Table 3. (Continued)

Table 3. Continued

	Log (Real gross hourly wage)				
	(1)	(2)	(3)	(4)	(5)
Size of the firm (FTE number of employees in log)				0.025***	0.006***
				(0.002)	(0.002)
Firm-level collective agreement (Yes)				0.024***	0.002
				(0.004)	(0.003)
More than 50% privately owned (Yes)				0.008	0.025
				(0.014)	(0.029)
Region (ref. Brussels)					
Flanders				-0.007	-0.008
				(0.005)	(0.005)
Wallonia				-0.035***	-0.027***
				(0.007)	(0.010)
Year fixed effects[c]	Yes	Yes	Yes	Yes	Yes
Occupations (ISCO2)[d]	No	Yes	Yes	Yes	Yes
Sector fixed effects (NACE2)[e]	No	No	No	Yes	No
Firm fixed effects[f]	No	No	No	No	Yes
Observations	1,310,764	1,305,599	1,304,303	1,303,510	1,303,510
Adjusted R-squared	0.04	0.49	0.60	0.64	0.70

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses, which are clustered at the firm level. Worker and firm weights are used in all our regressions. Sample covers workers aged 15-64. [a] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. [b] The category 'others' refers to workers born in developing countries with both parents born in Belgium (see Section 3 for more details). [c] 17 year dummies. [d] 35 occupation dummies. [e] 65 sector dummies. [f] 17,899 firm dummies. Source: STATBEL, 1999-2016.

Table 4: Geographical origin: weighted multilevel log-linear regressions

Workers born in or from:		Log (Real gross hourly wage) (1)	(2)
Developed countries (n = 1,170,802)		Reference	Reference
Developing countries			
Maghreb countries	First generation (n = 32,365)	-0.178***	-0.037***
		(0.011)	(0.003)
	Second generation[a] (n = 17,810)	-0.184***	-0.003
		(0.011)	(0.004)
Sub-Saharan African countries	First generation (n = 16,472)	-0.159***	-0.029***
		(0.008)	(0.003)
	Second generation[a] (n = 10,781)	-0.042***	-0.009***
		(0.008)	(0.003)
Near and Middle East countries	First generation (n = 16,644)	-0.177***	-0.018***
		(0.010)	(0.003)
	Second generation[a] (n = 8,800)	-0.206***	0.014***
		(0.009)	(0.003)
Non-EU Eastern European countries	First generation (n = 9,589)	-0.196***	-0.024***
		(0.008)	(0.003)
	Second generation[a] (n = 2,830)	-0.045***	-0.004
		(0.012)	(0.006)
Emerging and developing Asian countries	First generation (n = 7,609)	-0.151***	-0.026***
		(0.011)	(0.004)
	Second generation[a] (n = 1,370)	-0.104***	-0.037***
		(0.018)	(0.009)
Latin America and Caribbean countries	First generation (n = 5,014)	-0.136***	-0.016***
		(0.016)	(0.005)
	Second generation[a] (n = 763)	-0.141***	-0.039***
		(0.019)	(0.009)
Control variables			
Year fixed effects[b]		Yes	Yes
Worker characteristics[c]		No	Yes
Employment characteristics[d] + Occupations (ISCO2)[e]		No	Yes
Firm characteristics[f] + Firm fixed effects[g]		No	Yes
Observations		1,310,764	1,303,510
Adjusted R-squared		0.04	0.70

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses, which are clustered at the firm level. Worker and firm weights are used in all our regressions. Sample covers workers aged 15-64. [a] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. [b] 17 year dummies. [c] age, squared age, gender, educational attainment, tenure, squared tenure, and type of household. [d] type of contract, dummy for part-time, and dummy for overtime. [e] 35 occupation dummies. [f] Size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement and region where the firm is located (Brussels, Flanders or Wallonia). [g] 17,899 firm dummies. The category 'others' is also included in the regressions, but its estimates are not portrayed in this table (available on request). Source: STATBEL, 1999-2016.

Table 5: Gender and Origin: weighted multilevel log-linear regressions

Workers born in or from:		Log (Real gross hourly wage) (1)	(2)
Developed countries			
Men (n = 800,464)		Reference	Reference
Women (n= 370,338) [1]		-0.149***	-0.081***
		(0.006)	(0.004)
Developing countries			
Men	First generation (n = 64,439)	-0.186***	-0.038***
		(0.008)	(0.002)
	Second generation[a] (n = 27,922)	-0.159***	-0.006**
		(0.008)	(0.003)
Women	First generation (n = 23,254) [2]	-0.302***	-0.086***
		(0.009)	(0.004)
	Second generation[a] (n = 14,432) [3]	-0.257***	-0.076***
		(0.011)	(0.005)
Control variables			
Year fixed effects[b]		Yes	Yes
Worker characteristics[c]		No	Yes
Employment characteristics[d] + Occupations (ISCO2)[e]		No	Yes
Firm characteristics[f] + Firm fixed effects[g]		No	Yes
Test for equality of coefficients (p-value)[h]			
[1] = [2]		0.00	0.06
[1] = [3]		0.00	0.18
[2] = [3]		0.00	0.00
Observations		1,310,764	1,303,510
Adjusted R-squared		0.07	0.70

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses, which are clustered at the firm level. Worker and firm weights are used in all our regressions. Sample covers workers aged 15-64. [a] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. [b] 17 year dummies. [c] age, squared age, educational attainment, tenure, squared tenure, and type of household. [d] type of contract, dummy for part-time, and dummy for overtime. [e] 35 occupation dummies. [f] Size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement and region where the firm is located (Brussels, Flanders or Wallonia). [g] 17,899 firm dummies. [h] The null hypothesis of the test specifies that the estimates are not statistically different from each other. The categories 'other men' and 'other women' are also included in the regressions, but their estimates are not portrayed in this table (available on request). Source: STATBEL, 1999-2016.

Table 6: Reweighted RIF-OB decompositions for MALE workers - unconditional quartile coefficients

Reference group: male workers born in developed countries		Overall wage gap	Total composition effect[a]							Total wage structure effect[c]	
			Total = (I) + (II)	Pure composition effect (I)					Specification error (II)	Pure wage structure effect	Reweighting error
				Age	Tenure	Education	Household	Employment and workplace[b]			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Counterfactual group: male workers born in or from developing countries											
25% Quartile	First generation	-0.119***	-0.089***	0.007***	-0.020***	-0.017***	-0.001***	-0.059***	0.002	-0.031***	0.001
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)
	Second generation[d]	-0.116***	-0.124***	-0.071***	-0.027***	-0.003***	-0.002***	-0.023***	0.002	0.008***	0.001
		(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)
50% Quartile	First generation	-0.156***	-0.110***	0.004***	-0.024***	-0.027***	-0.001***	-0.073***	0.010***	-0.046***	0.001
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)
	Second generation[d]	-0.118***	-0.127***	-0.072***	-0.031***	-0.005***	-0.001***	-0.017***	-0.001	0.008***	0.000
		(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)
75% Quartile	First generation	-0.245***	-0.188***	-0.000	-0.022***	-0.047***	0.001*	-0.117***	-0.002	-0.058***	0.000
		(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)
	Second generation[d]	-0.178***	-0.178***	-0.101***	-0.028***	-0.010***	0.001***	-0.040***	0.000	0.001***	-0.001
		(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)

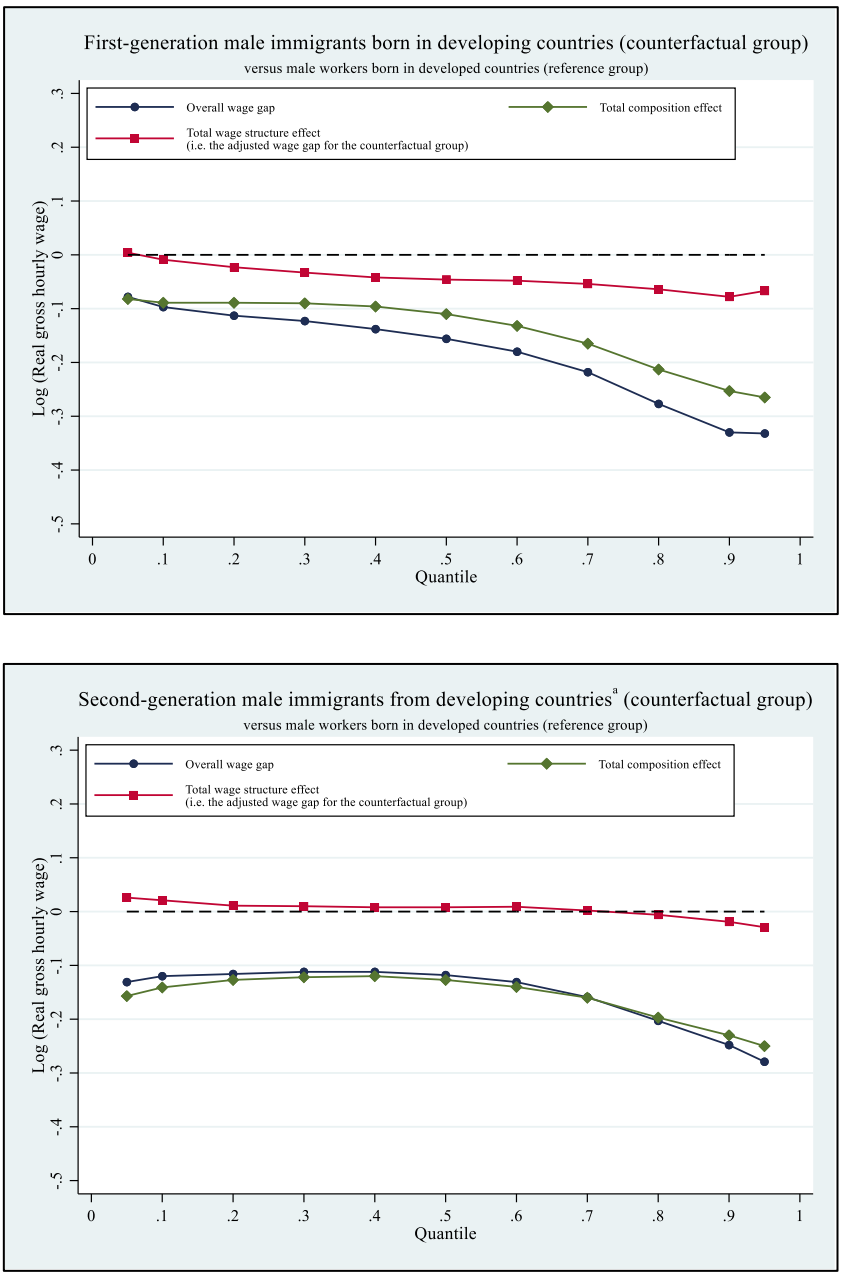
Notes: *** p<0.01, ** p<0.05, * p<0.1. Bootstrap standard errors are in parentheses, which are estimated using 100 repetitions. Sample covers workers aged 15-64. [a] Total composition effect is the sum of a pure composition effect and a specification error. The pure composition effect reflects the part of the overall wage gap attributed to differences in observables characteristics, which are grouping as follows: Age: age and squared age; Tenure: tenure and squared tenure; Education: at most lower secondary, upper secondary and tertiary; Household: single person, couple without children living at home, couple with children living; single parent and other households; and Employment and workplace: type of contract (permanent, fixed term, apprenticeship and internship), dummy for part-time, dummy for overtime, 36 occupation dummies, size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement, region where the firm is located (Brussels, Flanders or Wallonia), 66 sector dummies and 18 year dummies. For categorical and dummy variables, the detailed reweighted RIF-OB decomposition results are influenced by the choice of the omitted category. To deal with this issue, we compute the decompositions based on the normalized effects of categorical variables or set of dummies (i.e. effects that are expressed as deviation contrasts from the grand mean). [b] The detailed pure composition effect of variables included in ' Employment and workplace' can be found in Appendix 4.1. [c] Total wage structure effect is the sum of a pure wage structure effect and a specification error. The pure wage structure effect refers to wage differentials between the reference group and the counterfactual group (e.g. wage discrimination). [d] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. Source: STATBEL, 1999-2016.

Table 7: Reweighted RIF-OB decompositions for FEMALE workers - unconditional quartile coefficients

Reference group: female workers born in developed countries		Overall wage gap	Total composition effect[a]							Total wage structure effect[c]	
			Total = (I) + (II)	Pure composition effect (I)					Specification error (II)	Pure wage structure effect	Reweighting error
				Age	Tenure	Education	Household	Employment and workplace[b]			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Counterfactual group: female workers born in or from developing countries											
25% Quartile	First generation	-0.088***	-0.089***	0.006***	-0.023***	-0.022***	-0.001*	-0.101***	0.052***	0.002	-0.001
		(0.002)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.013)	(0.001)
	Second generation[d]	-0.087***	-0.092***	-0.057***	-0.024***	0.000*	-0.002***	-0.019***	0.009***	0.005***	0.000
		(0.003)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)
50% Quartile	First generation	-0.162***	-0.156***	0.006***	-0.031***	-0.027***	0.000	-0.108***	0.005***	-0.006	-0.001
		(0.002)	(0.002)	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)	(0.002)	(0.015)	(0.002)
	Second generation[d]	-0.110***	-0.112***	-0.064***	-0.033***	0.000	-0.001***	-0.006***	-0.008***	0.001	0.000
		(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)
75% Quartile	First generation	-0.225***	-0.200***	0.005***	-0.030***	-0.046***	0.002***	-0.099***	-0.032***	-0.024	-0.000
		(0.004)	(0.002)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.020)	(0.003)
	Second generation[d]	-0.116***	-0.117***	-0.079***	-0.031***	0.000	0.001***	0.007***	-0.015***	-0.001	-0.000**
		(0.005)	(0.003)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.004)	(0.000)

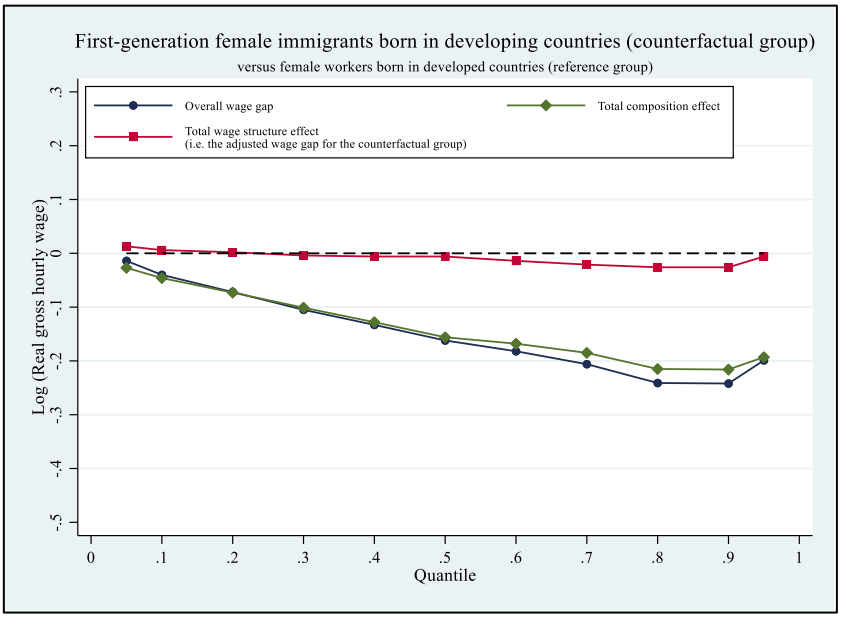
Notes: *** p<0.01, ** p<0.05, * p<0.1. Bootstrap standard errors are in parentheses, which are estimated using 100 repetitions. Sample covers workers aged 15-64. [a] Total composition effect is the sum of a pure composition effect and a specification error. The pure composition effect reflects the part of the overall wage gap attributed to differences in observables characteristics, which are grouping as follows: Age: age and squared age; Tenure: tenure and squared tenure; Education: at most lower secondary, upper secondary and tertiary; Household: single person, couple without children living at home, couple with children living; single parent and other households; and Employment and workplace: type of contract (permanent, fixed term, apprenticeship and internship), dummy for part-time, dummy for overtime, 36 occupation dummies, size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement, region where the firm is located (Brussels, Flanders or Wallonia), 66 sector dummies and 18 year dummies. For categorical and dummy variables, the detailed reweighted RIF-OB decomposition results are influenced by the choice of the omitted category. To deal with this issue, we compute the decompositions based on the normalized effects of categorical variables or set of dummies (i.e. effects that are expressed as deviation contrasts from the grand mean). [b] The detailed pure composition effect of variables included in ' Employment and workplace' can be found in Appendix 4.2. [c] Total wage structure effect is the sum of a pure wage structure effect and a specification error. The pure wage structure effect refers to wage differentials between the reference group and the counterfactual group (e.g. wage discrimination). [d] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. Source: STATBEL, 1999-2016.

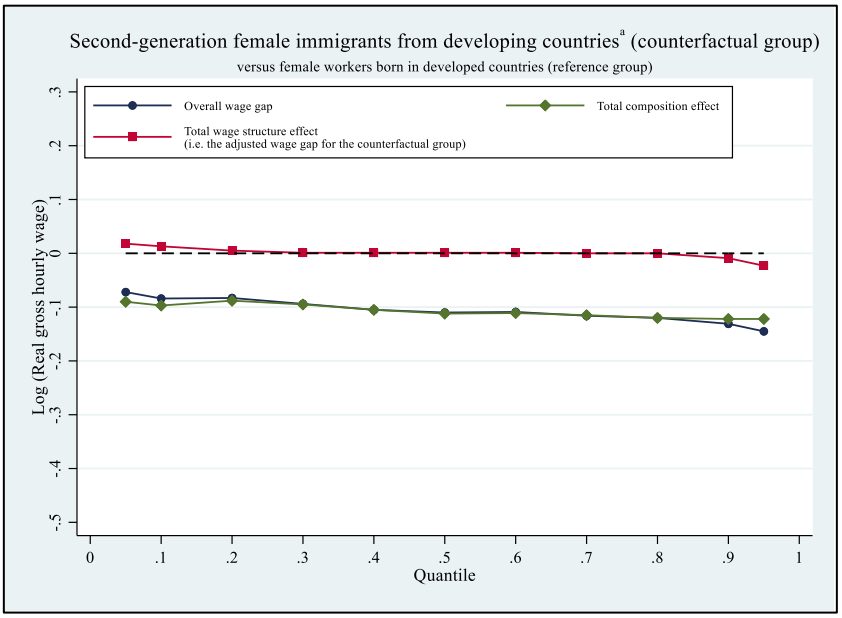
Figure 1: Reweighted RIF-OB decompositions: complete unconditional quantile coefficients for male workers



Notes: Sample covers workers aged 15-64. [a] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. All the unconditional quantile coefficients associated with overall wage gaps and total composition effects for F-G and S-G male immigrants from developing countries are statistically significant at the 1% level. For F-G male immigrants born in developing countries, while all the unconditional quantile coefficients associated to total wage structure effects between quantiles 10 and 20 are not statistically significant at 1%, 5% and 10% levels, those between quantiles 30 and 90 are statistically significant at the 1% level. For S-G male immigrants from developing countries, all the unconditional quantile coefficients associated with total wage structure effects are not statistically significant at 1%, 5% and 10% levels. Source: STATBEL, 1999-2016.

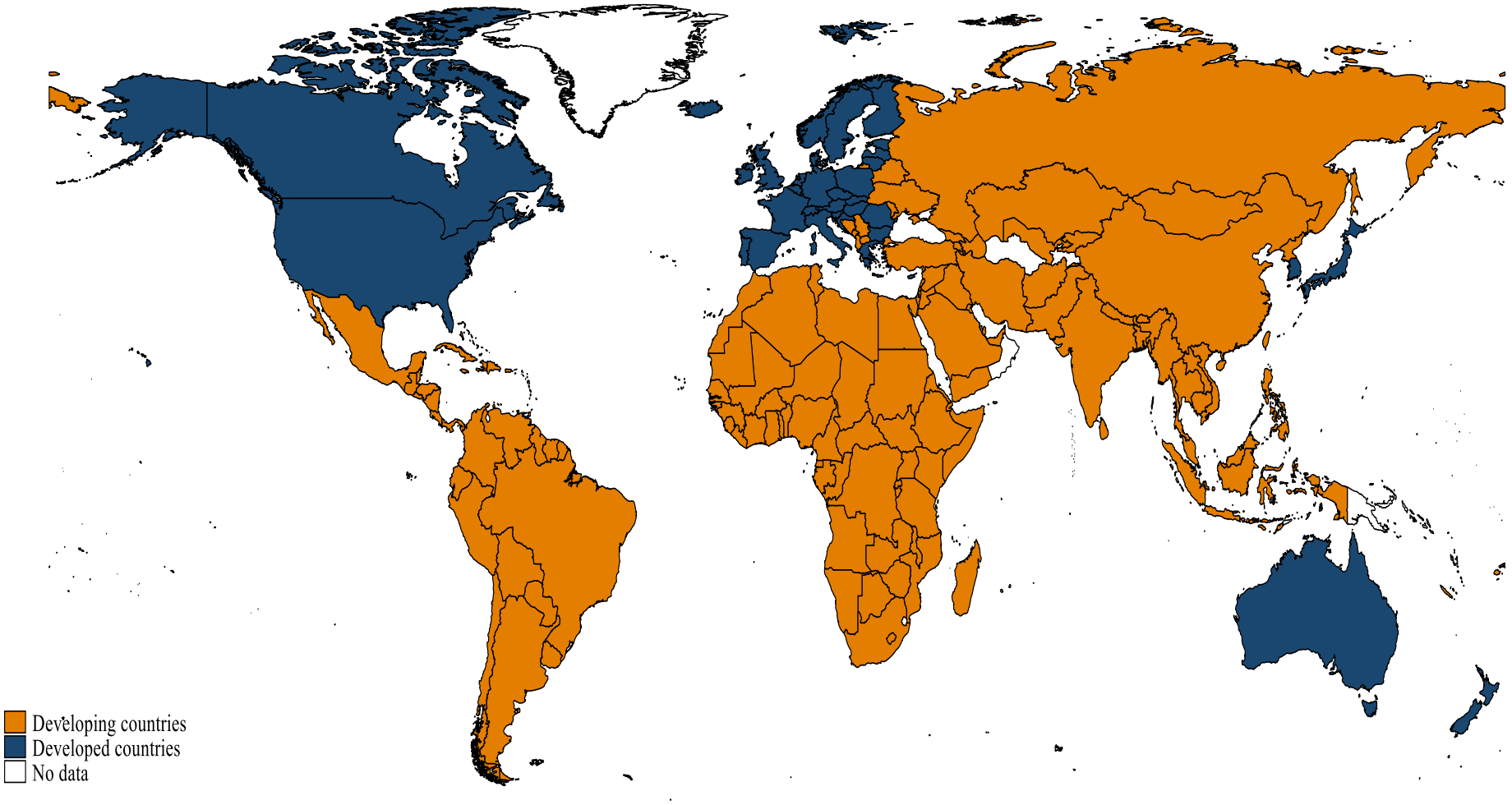
Figure 2: Reweighted RIF-OB decompositions: complete unconditional quantile coefficients for female workers





Notes: Sample covers workers aged 15-64. [a] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. All the unconditional quantile coefficients associated with the overall wage gaps and total composition effects for F-G and S-G female immigrants from developing countries are statistically significant at the 1% level. All the unconditional quantile coefficients associated with the total wage structure effects for F-G and S-G female immigrants from developing countries are not statistically significant at 1%, 5% and 10% levels. Source: STATBEL, 1999-2016.

Appendix 1: Chart of countries (IMF, 2019; United Nations, 2019)



Notes: For the sake of accuracy in correctly classifying immigrants by geographical origin and economic development level, we constructed our own geographical classification of countries based on both the United Nations' (2019) classification and the IMF's (2019) classification (see Appendix 2). Overseas territories are classified depending on their neighbouring countries. No data stipulates that no observation for workers born in or from these countries (Greenland (Denmark), Oman, Papua New Guinea, Tajikistan and Turkmenistan) is found in our database.

Appendix 2: List of countries by geographical region in our database (IMF, 2019; United Nations, 2019)

Developed countries

Belgium

EU-14 countries[a]: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

Other EU countries: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic and Slovenia.

Other developed countries: Andorra, Australia, Canada, Iceland, Japan, Liechtenstein, Monaco, New Zealand, Norway, Saint-Marin, Singapore, South Korea, Switzerland, Taiwan and United States.

Developing countries

The Maghreb countries: Algeria, Libya, Mauritania, Morocco and Tunisia.

Sub-Saharan African countries: Angola, Benin, Botswana. Burkina Faso, Burundi, Cabo Verde, Cameroon, Central Africa Republic, Chad, Comoros, Congo, Congo DRC, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion (French Department), Rwanda, Sao Tome and Principe, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

The Near and Middle East countries: Afghanistan, Bahrein, Egypt, United Arab Emirates, Iran, Iraq, Israel, Jordan, Kuwait, Pakistan, Palestine, Qatar, Saudi Arabia, Syria, Turkey and Yemen.

Non-EU Eastern European countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kosovo, North Macedonia, Moldova, Montenegro, Russia, Serbia and Ukraine.

Emerging and Developing Asian countries: Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, French Polynesia (French Department), India, Indonesia, Kazakhstan, Kyrgyz Republic, Laos, Malaysia, Mongolia, Myanmar, Nauru, Nepal, North Korea, Nauru, New Caledonia, Philippines, Sri Lanka, Thailand, Uzbekistan, Vanuatu, Vietnam, and Wallis and Futana (French Department).

Latin American and Caribbean countries: Argentina, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Dutch Antilles, Ecuador, Grenada, Guadeloupe (French Department), Guatemala, Guyana, French Guyana (French Department), Haiti, Honduras, Jamaica, Martinique (French Department), Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

[a] EU countries are defined as during the time span of the database (1999-2016). Therefore, the United Kingdom is still considered as an EU country.

Appendix 3. Descriptive statistics by origin and gender – means and percentages, 1999-2016

	Sample of workers born in or from					
	Developed countries		**Developing countries[a]**			
			First generation		**Second generation[b]**	
	Men	Women	Men	Women	Men	Women
Share of the sample by origin and gender (%)[c]	60.7	28.0	5.1	2.0	2.3	1.1
Region of birth (%)[d]						
Developed countries						
Belgium (n = 969,398)	83.8	82.7				
EU-14 countries (n = 179,765)	14.8	14.3				
Other EU countries (n = 17,018)	1.1	2.5				
Other developed countries (n = 4,621)	0.3	0.5				
Developing countries						
Maghreb countries (n = 50,175)			41.8	23.8	43.9	42.1
Sub-Saharan African countries (n = 27,253)			18.4	20.2	22.2	25.5
Near and Middle East countries (n = 25,444)			21.0	15.4	23.8	20.2
Non-EU Eastern European countries (n = 12,419)			9.4	14.8	6.1	5.8
Emerging and developing Asian countries (n = 8,979)			5.7	15.7	2.5	4.4
Latin American and Caribbean countries (n = 5,777)			3.7	10.1	1.5	2.0
Worker characteristics						
Real gross hourly wage (in EUR)[e]	21.3	18.2	17.4	15.4	17.9	16.3
Age	38.7	37.2	38.4	37.5	30.5	29.7
Tenure	9.6	7.8	5.6	3.8	4.2	3.5
Education (%):						
At most lower secondary	29.9	26.7	50.5	51.9	31.1	25.9
Upper secondary	42.3	41.9	36.5	32.5	46.0	43.2
Tertiary	27.8	31.4	13.0	15.5	22.9	30.9
Household (%):						
Single person	12.5	10.8	15.3	11.7	12.7	10.5
Couple without children living at home	17.3	20.0	10.7	14.6	11.5	13.9
Couple with children living at home	61.3	55.5	64.1	55.2	63.7	58.4
Single parent	6.1	11.4	3.5	13.9	8.6	14.8
Other households	2.8	2.3	6.5	4.6	3.5	2.5
Employment characteristics						
Part-time (%)	3.5	23.2	10.1	40.8	10.3	28.5
Overtime (%)	5.8	1.8	6.1	1.6	6.1	1.5
Type of contract (%):						
Permanent	93.5	90.3	87.1	83.4	84.0	79.1
Fixed-term	5.0	8.5	11.7	15.1	14.1	18.2
Apprenticeship	0.2	0.3	0.1	0.1	0.5	0.9
Internship	1.3	1.0	1.1	1.3	1.4	1.8

Appendix 3. (Continued)

Appendix 3. Continued

	Sample of workers born in or from					
	Developed countries		**Developing countries[a]**			
			First generation		**Second generation[b]**	
	Men	Women	Men	Women	Men	Women
Occupational categories - ISCO1 (%):						
Managers	5.0	2.9	1.6	1.4	2.3	2.7
Professionals	13.1	11.5	5.6	6.3	11.2	11.2
Technicians and associate professionals	10.3	8.9	4.6	4.1	9.0	10.0
Clerical support	13.4	32.7	9.8	13.9	11.8	29.3
Service and sales workers	6.5	17.1	8.2	13.8	11.2	23.1
Craft and related trades workers	23.3	5.4	24.0	4.2	17.8	3.1
Plant and machine operators and assemblers	20.2	7.3	19.9	3.7	22.6	3.7
Elementary Occupations	8.1	14.2	26.3	52.7	14.2	17.1
Firm characteristics						
Sector of activity - NACE1 (%):						
B - Mining and Quarrying	0.3	0.1	0.1	0.0	0.2	0.0
C - Manufacturing	40.6	24.8	30.2	15.1	30.9	13.0
D - Electricity, gas, steam and air conditioning supply	1.5	1.0	0.2	0.3	0.9	1.3
E - Water supply, sewerage, waste management and remediation activities	1.0	0.6	1.0	0.4	0.7	0.3
F - Construction	10.9	2.0	11.4	0.8	7.8	1.3
G - Wholesale and retail trade, repair of motor vehicles and motorcycles	16.3	27.1	12.0	15.0	13.6	24.3
H - Transportation and storage	10.5	7.5	11.7	3.2	14.2	6.7
I - Accommodation and food service activities	1.7	4.1	7.5	11.6	4.7	7.0
J - Information and communication	5.1	4.9	2.7	3.1	5.8	6.6
K - Financial and insurance activities	0.9	1.8	0.7	2.2	1.2	2.5
L - Real Estate activities	0.2	0.4	0.2	0.5	0.2	0.5
M - Professional, scientific and technical activities	4.5	7.1	2.6	5.5	4.1	7.2
N - Administrative and support service activities	6.6	18.6	19.8	42.1	15.8	29.2
Size of the firm (FTE number of employees)	583.2	361.9	485.6	399.1	624.9	409.8
Firm-level collective agreement (%)	28.9	24.2	23.8	15.9	31.2	22.9
More than 50% privately owned (%)	93.7	94.4	96.6	97.2	93.4	95.9
Region where the firm is located (%):						
Brussels	11.7	15.4	24.4	32.2	26.5	33.9
Flanders	65.6	64.6	57.9	54.2	51.5	47.4
Wallonia	22.7	20.0	17.7	13.6	22.1	18.7

Notes: Sample covers workers aged 15-64. Worker and firm weights are used. [a] By 'developing countries', we actually mean either transition and developing countries listed in the United Nations' (2020) classification and/or emerging market and developing economies listed in the IMF's (2020) classification (See Appendix 1 for a chart of developed and developing countries). [b] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. [c] The category 'Others' is also considered in the sample. Therefore, the sum of shares does not add up to 100%. [d] Appendix 2 shows the list of countries by region of birth. [e] At 2013 constant prices. It includes base pay, overtime compensation, performance-related pay and commissions, and annual and irregular bonuses. Source: STATBEL, 1999-2016.

Appendix 4.1: Reweighted RIF-OB decompositions for MALE workers - Detailed composition effects

Reference group: male workers born in developed countries		Total composition effect[a]									
			Pure composition effect[b] (I)								
		Total = (I) + (II)	Worker characteristics	Type of contract	Part-time	Overtime	ISCO2	Firm characteristics	NACE2	Year fixed effects	Specification error (II)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Counterfactual group: male workers born in or from developing countries											
25% Quartile	First generation	-0.089***	-0.032***	-0.005***	-0.004***	0.000***	-0.037***	-0.002***	-0.015***	0.003***	0.002
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)
	Second generation[c]	-0.124***	-0.103***	-0.006***	-0.004***	0.000***	-0.012***	0.005***	-0.009***	0.004***	0.002
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
50% Quartile	First generation	-0.110***	-0.048***	-0.004***	-0.001*	0.000***	-0.056***	-0.002***	-0.013***	0.003***	0.010***
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
	Second generation[c]	-0.127***	-0.109***	-0.004***	-0.001*	0.000***	-0.016***	0.007***	-0.005***	0.003***	-0.001
		(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
75% Quartile	First generation	-0.188***	-0.068***	-0.002***	0.003***	-0.000*	-0.093***	-0.001	-0.019***	-0.005***	-0.002
		(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)	(0.001)	(0.002)	(0.000)	(0.002)
	Second generation[c]	-0.178***	-0.138***	-0.001*	0.003***	-0.000	-0.033***	0.007***	-0.010***	-0.005***	0.000
		(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)

Notes: *** p<0.01, ** p<0.05, * p<0.1. Bootstrap standard errors are in parentheses, which are estimated using 100 repetitions. Sample covers workers aged 15-64. Weights for firms and workers are used. [a] Total composition effect is the sum of a pure composition effect and a specification error. [b] The pure composition effect reflects the part of the overall wage gap attributed to differences in observables characteristics, which are grouping as follows: Worker characteristics: age, squared age, tenure, squared tenure, education, household; Type of contract: permanent, fixed term, apprenticeship and internship; part-time; overtime; ISCO2: 36 occupation dummies; Firm characteristics: size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement and region where the firm is located (Brussels, Flanders or Wallonia); NACE2: 66 sector dummies; Year fixed effects: 18 year dummies. For categorical and dummy variables, the detailed reweighted RIF-OB decomposition results are influenced by the choice of the omitted category. To deal with this issue, we compute the decomposition based on the normalized effects of categorical variables or set of dummies (i.e. effects that are expressed as deviation contrasts from the grand mean). [c] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. Source: STATBEL, 1999-2016

Appendix 4.2: Reweighted RIF-OB decompositions for FEMALE workers - Detailed composition effects

Reference group: female workers born in developed countries		Total composition effect[a]									
			Pure composition effect[b] (I)								
		Total = (I) + (II)	Worker characteristics	Type of contract	Part-time	Overtime	ISCO2	Firm characteristics	NACE2	Year fixed effects	Specification error (II)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Counterfactual group: female workers born in or from developing countries											
25% Quartile	First generation	-0.089***	-0.039***	-0.006***	-0.007***	-0.000**	-0.083***	0.003***	-0.022***	0.013***	0.052***
		(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)
	Second generation[c]	-0.092***	-0.083***	-0.010***	-0.002***	-0.000***	-0.008***	0.003***	-0.007***	0.006***	0.009***
		(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)
50% Quartile	First generation	-0.156***	-0.053***	-0.002***	-0.003***	-0.000**	-0.093***	0.007***	-0.025***	0.008***	0.005***
		(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)
	Second generation[c]	-0.112***	-0.098***	-0.002***	-0.001***	-0.000**	-0.004***	0.006***	-0.008***	0.003***	-0.008***
		(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)
75% Quartile	First generation	-0.200***	-0.070***	0.002***	-0.003***	0.000	-0.080***	0.013***	-0.031***	-0.000	-0.032***
		(0.002)	(0.002)	(0.000)	(0.001)	(0.000)	(0.003)	(0.001)	(0.003)	(0.001)	(0.002)
	Second generation[c]	-0.117***	-0.109***	0.005***	-0.001***	0.000	-0.001	0.012***	-0.008***	-0.000	-0.015***
		(0.002)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)

Notes: *** p<0.01, ** p<0.05, * p<0.1. Bootstrap standard errors are in parentheses, which are estimated using 100 repetitions. Sample covers workers aged 15-64. Weights for firms and workers are used. [a] Total composition effect is the sum of a pure composition effect and a specification error. [b] The pure composition effect reflects the part of the overall wage gap attributed to differences in observables characteristics, which are grouping as follows: Worker characteristics: age, squared age, tenure, squared tenure, education, household; Type of contract: permanent, fixed term, apprenticeship and internship; part-time; overtime; ISCO2: 36 occupation dummies; Firm characteristics: size of the firm (FTE number of workers in log), dummy for more than 50% privately owned, dummy for firm-level collective agreement and region where the firm is located (Brussels, Flanders or Wallonia); NACE2: 66 sector dummies; Year fixed effects: 18 year dummies. For categorical and dummy variables, the detailed reweighted RIF-OB decomposition results are influenced by the choice of the omitted category. To deal with this issue, we compute the decomposition based on the normalized effects of categorical variables or set of dummies (i.e. effects that are expressed as deviation contrasts from the grand mean). [c] S-G immigrants' origin is defined based on the father's country of birth. However, if the father was born in a developed country and the mother was born in a developing country, the mother's country of birth is retained. Source: STATBEL, 1999-2016

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