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The gender aspect of migrants' assimilation in Europe[☆]

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ABSTRACT

The labor market performance of migrants relative to natives has been widely studied but its gender dimension has been relatively neglected. Our paper aims at revisiting labor market convergence between migrants and natives and examining this dimension in a comprehensive study of the EU-15 countries and Switzerland over the period 1999-2018. We measure convergence of labor market outcomes, such as employment probability, for male and female migrants to similar natives before and after the Great Recession and across countries of destination. Our results show that in most countries female migrants start with a larger employment gap but converge more rapidly than male migrants do. We also provide an overview of the correlation between potential factors such as economic conditions, labor market structures, institutions and attitudes towards migrants and women and employment convergence of male and female migrants. While we do not identify very significant correlations at the national level, we find a strong correlation between attitudes towards migrants and their employment convergence across sub-national regions.

1. Introduction

Since 1950 the countries of Western Europe have gone from being origin of, to being destination for world migrants. In the last two decades, Western Europe has been one of the most important international destinations of migrants. Ferrie and Hatton (2015) documented that the share of new migrants from Europe in the United States dropped from 56.2 percent in the 1950s to just 13.1 percent in the 2000s and in the same years, United Kingdom and Scandinavian countries first, followed later by Ireland, Italy and Spain, experienced a transition from net emigration to net immigration.

Fig. 1 (a) using the European Union Labor Force Survey (hereinafter, *EU-LFS*) documents this phenomenon and shows that the average share of migrants in the total population almost doubled (on average from 10% to 20%) between 1999 and 2018 in 16 European countries. No single country experienced a decrease of that share. Some countries such as Italy, Spain and France received a very large inflow of migrants over the past two decades and the population share of migrants in these countries more than quadrupled.

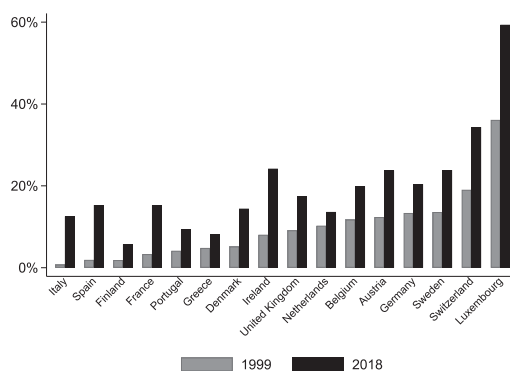
There have been important economic and political consequences of international migration in Western European countries. A large body of research shows their positive contributions to European economic growth (e.g., Docquier et al. (2014); Cattaneo et al. (2015)). Nevertheless, the relatively sudden arrivals of large numbers of migrants contributed to anti-immigration sentiment and political backlash (Mayda et al., 2018). A very important aspect, in determining natives' view of migrants, in Europe, is their ability to assimilate into the labor market by finding a job as this is seen as a fundamental step for them to contribute economically.

While economists have analyzed economic assimilation of migrants in individual European countries, relating it to local factors and possibly some policies, multi-country analyses are rare. Moreover the gender dimension of assimilation has been relatively neglected even though it is important for several reasons. First, female immigration to Europe increased significantly in the considered period. Second, participation of women in labor markets has also significantly increased. Third, while women have made significant progress in many economic indicators, awareness of the remaining gender gaps has become more acute.

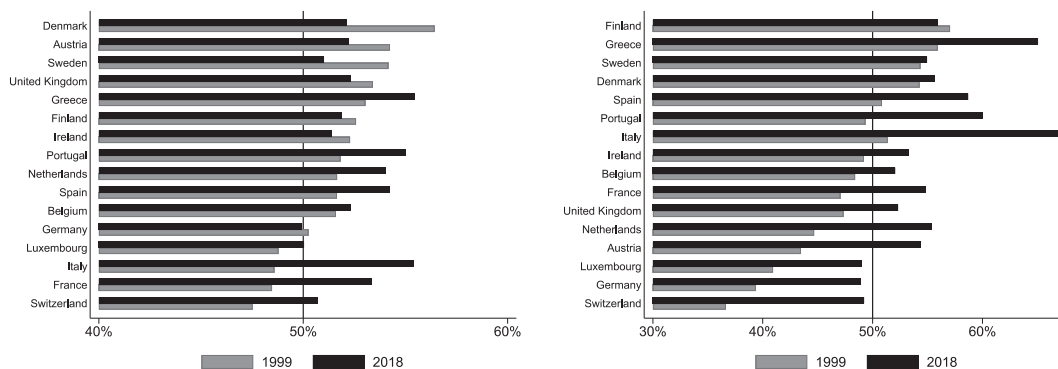
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(a) Share of Migrants



(b).1 Share of Female among Migrants

(b).2 Share of Female among Skilled Migrants

Fig. 1. Migration Statistics.

Fig. 1 (b).1 shows the so called ‘feminization of migration’ in Western Europe, i.e. the relative increase in women immigrants. Female migrants have come to outnumber male migrants in many EU countries in 2018, although female immigration was much lower in the early 2000s. If we look at high-skilled migrants with education above high school level, their sex ratio is even more favourable to women (Fig. 1 (b).2). Switzerland had the lowest share of women migrants in 1999 but that share climbed to parity in the most recent survey. Considering the occupation- and sector- distribution of migrants’ employment by gender (using *EULFS* data), migrants are more likely to be employed in elementary occupations - a group that employs less than 10% of native workers and over 20% of migrants. Female migrants are even more likely (over 30%) to be employed in elementary occupations than male migrants (slightly below 20%), suggesting a double disadvantage that female migrants face (Fig. A1). The sector-distribution also shows an employment gap that varies by gender. Female migrants are more likely to be employed in house keeping and personal services sector in both periods, whereas male migrants are more likely to be employed in the construction sector (in Period 1) and in the hotel and restaurant sector (in Period 2) (Fig. A2).

This paper contributes in three ways to the existing literature. First, we provide a comparative and consistent analysis of labor market outcomes of migrants, and of their convergence to natives by gender, for the 16 Western European countries over two decades (1999-2018). The performance of migrants relative to natives in the labor market has been widely studied but most of the research is confined to case studies of individual countries - mainly the English-speaking developed countries (i.e., the U.S., Canada, and Australia).¹ Comparative analysis on eco-

nomic assimilation of international migrants is very limited. We offer here a comprehensive picture for European countries and we provide an overview of the factors associated with economic assimilation. Second, we provide descriptive statistics capturing immigrant gap at arrival and after a decade, and how these vary across countries and over time. The focus of this study therefore is on comparing labor market convergence of male migrants, and female migrants, and examine the variation in initial conditions and subsequent convergence in the period 1999-2018 (i.e., pre- and post-Great Recession). Third, we analyze host country specific factors that may be related to differences in patterns of assimilation by gender in Western European countries. In this context, we provide a rich description by documenting the variation in assimilation pattern across countries and by exploring correlates of such variation. We examine the role of macroeconomic conditions, institutional settings, indicators of gender bias and measures of individual attitudes. While this analysis does not aim at identifying the causal determinants of the patterns observed it may suggest which factors are more strongly associated with immigrants’ assimilation, and specifically of female immigrants’ assimilation. Distinguishing between economic, institutional and attitude-sentiment factors we can provide evidence of which one of these framework is more likely to affect female immigrant assimilation.²

² There are a few caveats to keep in mind. Our sample covers documented migrants only. Any form of undocumented migration is not included in our analysis. Also, while cultural integration of migrants is also important to understand their assimilation pattern, we only consider assimilation in the labor market. Still, given the broad country coverage and the extensive analysis of potential correlates, this study provides a comprehensive comparative analysis of assimilation of migrants.

¹ Lalonde and Topel (1992) for the U.S.; Baker and Benjamin (1994) and Aydemir and Skuterud (2005) for Canada; Antecol et al. (2006) for Australia.

The paper is structured as follows: the next section reviews existing studies on labor market effects of migration, migrants' economic assimilation and the feminization of migration. Section III estimates the size of the initial employment gap and employment convergence for male migrants and female migrants, across countries and in the decade before and after the 2009 economic downturn. Section IV examines the role of the macroeconomic conditions, structure of labor markets, institutional settings, gender indicators and attitudes as potentially associated with measures of employment convergence of migrants. Section V provides concluding remarks.

2. Literature review

2.1. Feminization of migration and economic assimilation of female migrants

Existing studies have emphasized that economic, cultural and institutional push factors affect women and men in different ways. Moreover recent studies have recognized that female migration has been sizeable and growing especially among highly educated.³ The economic assimilation of female migrant, however, has received less attention.

The literature on economic assimilation of migrants, following the seminal work of Chiswick (1978), focuses mainly on male migrants' labor market integration. Due to their more continuous working histories, and higher labor market attachment men have been very often the only focus of attention in these studies. The early approach to measuring economic integration using a simple regression specification was pioneered by Chiswick (1978). The study compared the current earnings of recently arrived migrants with the current earnings of migrants who migrated previously, finding an immediate disadvantage of migrant men in terms of the earnings but also a very high rate of migrant assimilation in the U.S. In a sequence of influential papers Borjas (1985, 1995, 2015) argued that a picture of convergence obtained only from a cross sectional analysis could be largely affected by the changing skill composition and different assimilation rates of the subsequent arrival cohorts in the U.S. The studies by Borjas pointed out the existence of a secular worsening of the wage gap at arrival for immigrants. These 'cohort effects' - driven by skill differentials among immigrant cohorts, should be separated from assimilation, but in a cross-sectional analysis they would be confused with it, yielding an incorrect picture of the assimilation process. Borjas therefore proposes to follow individual cohorts over time and compare them with similar natives and this has become the standard approach in even more recent studies who can follow a genuine panel of individuals (e.g. Abramitzky et al. (2014)).

Some studies focused on women exist, but are rare. Chiswick (1978)'s study was followed by a study of white migrant women in the United States by Long (1980) and Schoeni (1998) to test the robustness of the findings for women. And Adsera and Chiswick (2007) presents, for the first time, an analysis of migrant earnings that is particularly interested in analyzing whether there is any variation in the labor market performance of migrants between the genders. However, what is missing is a more systematic application of the cohort framework to study assimilation of women and men immigrants, comparing them across countries and over time to see how assimilation patterns differ by gender. This paper fills such a gap.

2.2. Assimilation theory and European evidence on migrants' assimilation

According to the classic assimilation model, migrants have an initial disadvantage in the labor market of the host country as they have limited knowledge of its language and culture, their professional skills are not

³ Dumont et al. (2007), Bang and Mitra (2011), Docquier et al. (2012), Baudassé and Bazillier (2014), Naghsh Nejad (2013), Naghsh Nejad and Young (2014), Ruysen and Salomone (2018).

easily transferable, they may lack host-country educational credentials, and labor market experience and they have limited access to information and social networks. Moreover, acquiring human capital in the post migration period may require schooling or training and imply foregone earnings, so that these initial human capital investments further depress entry wages for migrants. However, after learning the local language and adapting their skills and knowledge, many migrants converge with comparable native-born counterparts and in several countries they even experience faster wage growth than natives do.

All studies of the economic progress of migrants use this human capital model as a point of departure (Borjas, 2000; 2014) and predict that a negative initial employment and wage gap will be followed by fast subsequent wage growth and at least partial convergence with natives' labor market outcomes. However, initial wage gap and subsequent dynamics could vary significantly across migrants, both in relation to their pre-existing abilities and skills and their countries of origin. Migrants with easily transferable skills and coming from countries of origin culturally and economically similar to the destination may earn more at the time of entry and have slower wage growth. To the contrary migrants with less transferable skills and coming from very different countries of origin migrants may earn less at the time of entry and have faster wage growth.

The heterogeneity among migrants imply that the classic assimilation model should be adjusted allowing for what has been called segmented assimilation. According to the segmented assimilation model, there exist differential patterns of assimilation among migrants of different origins in a host country (Alba and Nee, 1997). The theory attributes this phenomenon to different degree of opportunities or disadvantages by migrants' origin. It does not consider migrants in a host country as homogeneous, but rather focuses on the differences by country of origin, and hence, on differences by race and ethnicity and socio-economic status. However, even models allowing for heterogeneity, do not explicitly consider gender as one dimension and they overlook the gender-specific evidence on assimilation.

One aspect of immigrants' economic assimilation analyzed in several studies is how fast and how "complete" it is, as time since arrival passes (Okoampah (2016) for Germany; Clark and Lindley (2009) for the UK; Amuedo-Dorantes and de la Rica (2007) for Spain; Venturini and Villosio (2008) for Italy; Zorlu and Hartog (2012) for the Netherlands; Bratsberg et al. (2017) for Norway). While the findings show a large range of variation across countries,⁴ the existing research has not carefully and systematically examined these differences nor tried to connect them to country-specific economic, institutional, cultural or political conditions. A series of OECD working papers (Causa and Jean, 2007; Jean et al., 2010) looked at the role of migration policies on immigrant assimilation, but a broader analysis is missing and other country specific factors have not been carefully studied.

In view of this literature, our paper contributes in three ways. First, it provides measures of the labor market assimilation of migrants from arrival to one decade after it, by gender, for a large set of countries, covering most of Europe. Second, we analyze and compare initial gaps and assimilation rates between genders, for the decade before and after the great recession (2009) identifying some magnitudes and regularities. Third, we examine which country- and region-specific factors are related to the variation in assimilation pattern of men and women (separately) across countries. Such a cross-country analysis only identifies correlations and is not causal. Our results show the complexity of the assimilation phenomenon and how country-level factors may affect assimilation of men and women, but it is not easy to clearly identify which factors are strongly associated with better assimilation. We also perform a cross-regional analysis in Europe, finding that local attitudes towards migration are significantly correlated with the speed of employment convergence of migrants, suggesting that variation within a country can be important.

⁴ See the survey in Borjas (2014).

3. Estimation of convergence

3.1. Data and sample

Our main data are from the European Union Labor Force Survey, *EU-LFS*, the largest quarterly (and yearly) household survey of people aged 15 and over in Europe. The population covered includes employed, unemployed ('labor force') and economically inactive (the population 'outside the labor force' such as, students, pensioners, and people working at home). It covers all Member States, as well as Iceland, Norway, Switzerland and the United Kingdom. Each national statistical institute conducts individual Labor Force Surveys based on a nationally representative sample and common classifications and methods (e.g., NACE, ISCO, ISCED, NUTS) and these data are then harmonized and made available by Eurostat. The large coverage of the dataset, the comparability of variables, methods and classification make this study the first, to our knowledge, documenting assimilation of immigrants, in a large set of countries with a high degree of comparability.

In 2018, the survey covered 1.5 million of individuals and it contained information about demographics characteristics and socio-economic and labor market status. With low non-response rates and large sample sizes, the analysis of small subgroups is also viable. For migrants – defined as foreign-born, we know their country of birth (aggregated to about 15 country groups) and the years since arrival in the host country

We focus our analysis on 16 Western European countries: 15 that were members of the European Union in 1995, and Switzerland.⁵ These countries have relatively homogeneous institutions and levels of economics development.⁶

Based on information on the country of birth and on the length of stay in the host country, we define the main variables in our analysis as follows:

$$\text{migration status} = \begin{cases} 1, & \text{if years since migration} \neq 0 \\ 0, & \text{if years since migration} = 0 \end{cases}$$

$$\text{arrival cohort} = \begin{cases} \text{year} - \text{years since migration}, & \text{if one is migrant} \\ 0, & \text{if one is native} \end{cases}$$

We include individuals who are between 25 and 75 years of age to avoid the initial transition dynamics into labor market. Migrants in our sample are those who resided in the host country for less than 11 years (as the years since migration variable is top-coded and we are interested in assimilation within 10-year time span) and who entered into the host country at the age of 18 or older to isolate the effect of host country education in assimilation. In addition, each sample of Period 1 and Period 2 only includes the migrants from 1999 to 2008 and from 2009 to 2018, respectively. This is particularly important in terms of our sample construction because it allows to make the two samples perfectly comparable. Tables A1 and A2 report the sizes of individual cohorts and the native counterparts in Period 1 and Period 2. Our final sample includes 20,311,421 individuals living in 16 countries in 152 regions (as defined by the NUTS2 statistical classification).

The dataset has two limitations. First, as most population surveys, it is not an individual longitudinal panel but rather a repeated cross sections. Based on migrants' year of arrival and country of origin, however, we construct "arrival cohorts" of migrants over time to analyze their labor market integration. Second, information on workers' wages and income is available only in a very limited way and we cannot use it,⁷ we focus on employment probability, as is common in the existing

⁵ EU-15 area countries are: (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom) and Switzerland.

⁶ We do not include the new East European accession countries, as they are a more heterogeneous group and their experience as immigrant-receiving countries is very recent. Most of them are still net emigration countries with a small immigrant population (Dustmann and Frattini, 2013).

literature using labor force survey data. The employment probability is a crucial outcome especially in Europe where the employment rates of migrants have been lagging relative to natives, and generous unemployment benefits (Kerr and Kerr, 2011) produce a significant fiscal cost of unemployment.

We pool data from the past 20 survey waves over 1999-2018 and divide them into two periods, one pre-Great Recession (1999-2008) and one including Great Recession and recovery (2009-2018).⁸ As the Great Recession generated very significant and lasting disruption of the labor markets it will be interesting to see whether this resulted in different patterns of assimilation between the two periods. Specifically, it has been documented that the Great Recession affected employment outcomes of migrants more than those of natives (Orrenius and Zavodny (2010) for Mexican migrants in the US; Dustmann et al. (2010) for non-OECD immigrants in both Germany and the UK) and that migrants' earnings are lower among those who arrived in a period of high unemployment (Bratsberg et al., 2006; Chiswick and Miller, 2015; Gill and Shaeye, 2021). The splitting of the sample allows us to observe economic convergence of migrants before and during-after the great recession.

Table 1 reports summary statistics of the variables used in our regression analysis for each of the two periods, by gender and migration status weighted by yearly weighting factor provided in *EU-LFS*. The average share of migrants in the total population and in the female population increases slightly from 2.0% (Period 1) to 2.3-2.4% (Period 2) while the share for the male migrants decreases slightly. The great recession significantly reduced inflow of immigrants and their number only recovered after that, so the average share of foreign-born is not very different in the two periods. Average length of years since migration is about 4.0 years; as our sample only includes migrants who lived in the host country less than 11 years and arrived older than 17 years old, the average share represented here is necessarily lower than that of Fig. 1 (a).

3.2. Methodology

We first estimate a linear model of the probability of being employed,⁹ on several covariates, arrival cohort fixed effects and a polynomial in years since migration, separately by gender group, period and for each country as follows:

$$y = \beta_0 + \beta_1 \text{cohort} + \beta_2 \text{ysm} + \beta_3 \text{ysm}^2 + \beta_4 \text{ysm}^3 + \beta_E \text{edu} + \beta_X X + \varepsilon \quad (1)$$

Alternatively we estimate a similar model, but capturing a common 'intercept' for all migrants (rather than a set of cohort of arrival effects)

$$y = \beta_0 + \beta_1 \text{mig} + \beta_2 \text{ysm} + \beta_3 \text{ysm}^2 + \beta_4 \text{ysm}^3 + \beta_E \text{edu} + \beta_X X + \varepsilon \quad (2)$$

In both cases, y is a binary variable for one's employment status as defined below.

$$\text{employment status} = \begin{cases} 1, & \text{if employed} \\ 0, & \text{if unemployed or inactive} \end{cases}$$

The difference between the two models is that *cohort* is a set of dummy variables one for each year-of-arrival cohort (the reference group is the native) capturing the cohort-specific initial gap. The variable *mig* is a binary variable for one's migrant status and it captures the average initial gap of all immigrants. *ysm* is the number of years since migration, equal to zero for natives by construction. The squared and cubic terms are included to account for non-linear effects of the time since migration. *edu* is a set of dummies for Low, Medium or High education, X is a vector of control variables including individual characteristics (age, age-squared, and marital status) as well as a full set of fixed effects (year · age · education and region). The fixed effects for each combination of survey

⁷ The survey only includes income deciles of an individual and there are many missing observations.

⁸ 2001-2008 and 2009-2018 for Switzerland.

⁹ Due to data limitations and imprecision of results occupational specialization is not a variable used in the analysis.

Table 1
Descriptive statistics for the variables used in the analysis.

	All, Period 1	Male, Period 1	Female, Period 1	All, Period 2	Male, Period 2	Female, Period 2
Total Population						
Foreign-born (%)	2.09	2.35	2.04	2.31	2.14	2.40
Natives						
Employed (%)	61.32	70.33	52.55	63.69	69.2	58.26
High-skilled job (%)	41.74	41.62	41.9	47.02	46.66	47.43
Highly-educated (%)	21.71	23.43	20.02	29.63	30.1	29.17
Age	47.55	47.14	47.95	48.84	48.51	49.17
	[13.75]	[13.62]	[13.86]	[13.65]	[13.60]	[13.69]
Married (%)	65.03	65.39	64.67	58.48	58.31	58.65
Migrants						
Employed (%)	63.54	76.24	51.77	62.91	75.69	50.85
High-skilled job (%)	28.52	29.02	27.85	39.82	40.17	39.33
Highly-educated (%)	29.06	29.29	28.85	44.42	43.24	45.53
Age	36.37	36.37	36.37	36.56	36.74	36.38
	[9.92]	[9.75]	[10.08]	[9.83]	[9.76]	[9.89]
Married (%)	63.21	65.39	64.67	58.48	58.31	58.65
Years since migration	3.99	3.96	4.01	3.85	3.79	3.91
	[2.23]	[2.23]	[2.22]	[2.12]	[2.10]	[2.15]

Note: Standard deviations are in brackets.

year, education and age captures most of the employment variation in the corresponding groups of natives. Their inclusion allow us to identify the convergence of migrants' outcomes to the group of natives with the same education and age. The region-fixed effects capture unobserved characteristics of the region at the sub-national level (NUTS2) where the individual resides. Errors are clustered at the sub-national regional level.

The "number of years since migration" is expected to have a positive coefficient on employment probability capturing the speed of economic assimilation. The "migration status" or the "cohort of arrival dummies" should instead have a negative coefficient capturing the initial gap between migrants and similar natives. As discussed in the previous section, when migrants first arrive in the host country, they have relative disadvantages due to the lack of country-specific skills and reduced information and local knowledge. As they remain in the host country, they start to accumulate those skills, build up a network, and catching up the native's labor market outcome. The next section presents the estimates from the two regressions, summarizing the features of initial gaps and convergence speed across countries.

3.3. Initial gaps and speed of convergence in employment rates

To illustrate our basic estimates of convergence, we first show, in Table 2 the regression estimates from Eq. (1) and (2) in the specific case of Switzerland.¹⁰

In Table 2, Panel A we see that the initial employment probability gap between migrants and natives (the coefficient in the first row on migration status) are all negative and significant in each period and for each group. Two noteworthy features are that the gap was much larger for women than for men, and that for men it decreased significantly in the second decade. In the more recent decade 2009-2018 we see that while migrant men started at a 4 percent point (log points) of disadvantage in employment probability relative to natives, migrant women had forty log points (about 34 percentage points) disadvantage. Interestingly, and anticipating a common feature of our estimates, the speed of convergence in employment probability, was significantly larger for women than for men in the same decade (2009-2018).

Using the estimated coefficients on years since migration and its square and cube we can calculate the value of the convergence after 10 years ($ysm = 10$) as follows: $10 \cdot \beta_2 + 100 \cdot \beta_3 + 1000 \cdot \beta_4$. This value provides a compact indicator of the convergence between migrants and

natives employment probability during the first ten years. For example, using estimates for males in period 1 (1999-2008) from Table 2, Panel A, the convergence after 10 years in Switzerland for this group was equal to 0.885, i.e., 88.5% log point increase. The initial gap estimate (coefficient on *mig* in the second regression) is the average estimate of initial gap; for the same group, from Table 2 Panel A, it is -0.272, i.e. -27.2% point. Combining these two estimates, we obtain a 10-year gap estimate between the natives and migrants equal to $-0.272 + 0.885 = 0.614$. In other words, male migrants' probability of being employed while starting with a gap relative to natives equal to 27.2%, it was 61.4% point higher than that of the male natives after 10 years of stay. This reflects a very strong employment performance of migrants once in the Swiss labor market, not uncommon to many countries, where immigrants start at a disadvantage and overcome natives in their employment probability.

In Panel B of Table 2, additional information is provided. Dummy variables for each arrival cohort show the initial gap with natives in the probability of being employed for each arrival cohort. The estimates of the more recent period (Period 2) show smaller initial gaps for recent cohorts which suggests improvements in the initial performance of migrants. This may be due to the increase in the high skilled/professional migrants during this period in Switzerland as documented in the existing literature (e.g., Grossmann and Stadelmann (2011), OECD (2015), OECD (2019)).

3.3.1. Changes in the gaps over time

By estimating Eq. (1) and (2) for each country we obtain initial gap, speed of convergence coefficients and calculate the convergence of immigrants to native employment rates, after 10 years in the country. In Table 3 we show the mean and median of the three estimates - initial gap, linear convergence coefficient and the 10-year gap, for each gender and period. Those coefficients are obtained from specifications similar to Table 2 Panel A. Each estimate is in log (percentage) points and captures the difference between immigrant and natives of same gender and similar education and age.

Mean and median values of each estimate suggest that on average migrants faced a significant initial disadvantage in the labor market. However, there is a significant catching-up process by migrants, reducing on average the 10-year gap to a smaller value or even to a positive value. It is worth noting that these estimates vary significantly by gender and period. On average, female migrants faced greater initial disadvantage in the probability of being employed than male migrants both before and after the Great Recession. At the same time, however, female migrants experience on average experienced faster convergence in employment probability than male migrant did. As a consequence both

¹⁰ Country-specific results related to the other 15 countries are available from the Authors upon request.

Table 2
Regression results.

Panel A: Estimated Average Initial Gap by Gender and Period in Switzerland				
	Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
Migration status	-0.272*** (0.061)	-0.436*** (0.072)	-0.042* (0.021)	-0.403*** (0.044)
Year since migration	0.176** (0.051)	0.141* (0.064)	-0.005 (0.011)	0.135** (0.043)
Year since migration squared	-0.041** (0.013)	-0.020 (0.018)	0.003 (0.003)	-0.022* (0.011)
Year since migration cubed	0.003** (0.001)	0.001 (0.002)	-0.000 (0.000)	0.001 (0.001)
Observations	77,623	91,868	164,615	187,134
R-squared	0.439	0.330	0.389	0.348
Year Edu Age fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Panel B: Estimates of Additional Year Since Migration by Gender and Period in Switzerland				
	Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
Year since migration	0.206*** (0.048)	0.167** (0.055)	0.002 (0.017)	0.147*** (0.036)
Year since migration squared	-0.049*** (0.012)	-0.028 (0.015)	0.001 (0.004)	-0.026** (0.010)
Year since migration cubed	0.004*** (0.001)	0.002 (0.001)	-0.000 (0.000)	0.002* (0.001)
Year of arrival				
2001	-0.312*** (0.056)	-0.482*** (0.078)		
2002	-0.272*** (0.065)	-0.456*** (0.079)		
2003	-0.312*** (0.060)	-0.464*** (0.080)		
2004	-0.303*** (0.058)	-0.459*** (0.067)		
2005	-0.302*** (0.065)	-0.467*** (0.070)		
2006	-0.309*** (0.061)	-0.470*** (0.051)		
2007	-0.271*** (0.058)	-0.423*** (0.074)		
2009			-0.056 (0.029)	-0.415*** (0.031)
2010			-0.047* (0.019)	-0.413*** (0.039)
2011			-0.045* (0.021)	-0.394*** (0.039)
2012			-0.022 (0.025)	-0.405*** (0.038)
2013			-0.048 (0.030)	-0.411*** (0.033)
2014			-0.053 (0.041)	-0.425*** (0.058)
2015			-0.080 (0.045)	-0.435*** (0.051)
2016			-0.046 (0.036)	-0.425*** (0.065)
2017			-0.020 (0.022)	-0.372*** (0.100)
Observations	77,623	91,868	164,615	187,134
R-squared	0.439	0.330	0.389	0.348
Year Edu Age fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes

Note: Robust standard errors clustered by the sub-national regional level are in parentheses. Estimation is by OLS with sample survey weights. Dependent variable is employment status, which is defined as a binary variable equal to 1 if employed, and 0 otherwise. Marginal effects presented at the means of continuous variables. For binary independent variables, marginal effects reflect predicted probabilities when the variable increases from 0 to 1. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

groups exhibit a small 10-year gap whose average across countries is around 0 but with large variation across them (large standard errors). The large variation in the estimates of initial gap and convergence is visible in Fig. 2 that shows the smoothed distribution of the initial gaps, convergence coefficients and 10-year gap, showing large dispersion of those.

Table A3 in the Appendix reports these estimates in full for 16 individual countries. We notice that in Period 1, initial gap for male and female migrants is larger in traditional destination countries: the Netherlands, France, Austria and Switzerland. Especially it is largest in the Netherlands (-0.515 for male and -0.751 for female) while Luxembourg (-0.019) and Greece (-0.129) mark the smallest initial gap for

Table 3
Estimates of probability of being employed.

Country	Estimates	Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
Mean	Initial Gap	-0.219 [0.132]	-0.412 [0.155]	-0.233 [0.158]	-0.398 [0.260]
	Convergence Coefficient	0.263 [0.259]	0.359 [0.226]	0.318 [0.216]	0.351 [0.255]
	10-year Gap	0.034 [0.241]	-0.020 [0.191]	0.091 [0.144]	-0.040 [0.134]
	Median	Initial Gap	-0.222 [0.243]	-0.395 [0.351]	-0.220 [0.304]
	Convergence Coefficient	0.176 [0.179]	0.398 [0.430]	0.288 [0.204]	0.412 [0.440]
	10-year Gap	0.042 [0.109]	-0.001 [0.109]	0.084 [0.107]	-0.031 [0.069]

Note: Mean, standard deviation, median and median absolute deviation are calculated from the entire sample which includes the 16 Western European countries. Standard deviations (below means) and median absolute deviations (below medians) are in brackets.

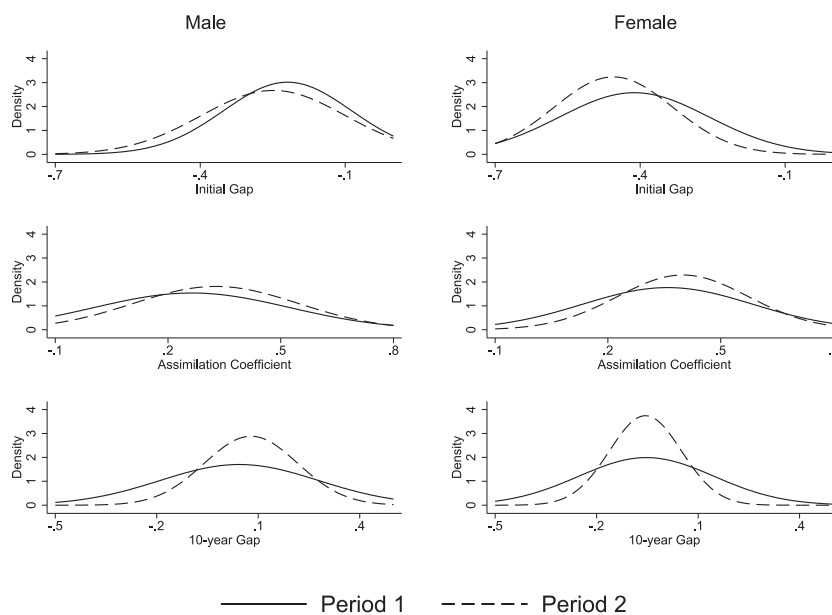


Fig. 2. Distribution of the Estimates (Country-level).

male and female migrants, respectively. The convergence coefficient is again higher in traditional destination countries. For male migrants, it is highest in Switzerland (0.885) and for female migrants it is highest in the Netherlands (0.672). In Denmark, coefficient for both the sub-populations is lowest (-0.177 and -0.098).

By looking at 10-year gap estimate for Period 1, we notice, remarkably, that in many countries, male migrants not only caught up with but overcome similar natives in employment probability after 10 years. The 10 year employment gap is often positive. However, for female migrants, full convergence or more than full convergence in 10 years is less common. Still several countries show positive 10-year gaps for female immigrants too.

In Period 2 of the analysis, during and after the Great Recession, migrants in new destination countries such as Italy, Spain, Portugal and Greece, experience a larger initial gap while initial gap in traditional destination countries is not as large as in the previous period. For example, Italy (-0.554) and Sweden (-0.629) show the largest initial employment gap for the male and female migrants, respectively.¹¹ The initial gap for male migrants is smallest in Switzerland (-0.042) and for

female migrants, it is smallest in Denmark (-0.258). The convergence coefficient is also higher in new destination countries in Period 2. For male migrants is highest in France (0.795) and the one for female migrants was highest in Portugal (0.695). Convergence coefficient for the male and female migrants is lowest in Germany (0.035) and the Netherlands (0.063), respectively. 10-year gap estimates in Period 2 also reveal slower assimilation for female migrants.

To sum up, we can identify a few regularities, within significant cross-country variations. First, the initial employment gap between immigrants and natives did not vary significantly between period 1 (before great recession) and Period 2 (during-post) on average. Some countries (including traditional immigrant destination, such as France, the Netherlands) with large initial gaps did not worsen such a gap during the recession, but improved it somewhat while countries of new immigration (such as Italy and Greece) experienced larger initial gaps during the recession. A clear emerging pattern seems to be that female migrants have a larger initial gap in employment relative to similar natives, but they also show a larger convergence coefficient than male migrants. Still in most cases the employment probability of female migrants does not

¹¹ Finland is excluded in this period of analysis. It shows very large imprecision in the estimates and appears to be an outlier. The country had a very small share

of migrants (less than 1%), and due to such a small number of observations the estimates are subject to very significant error.

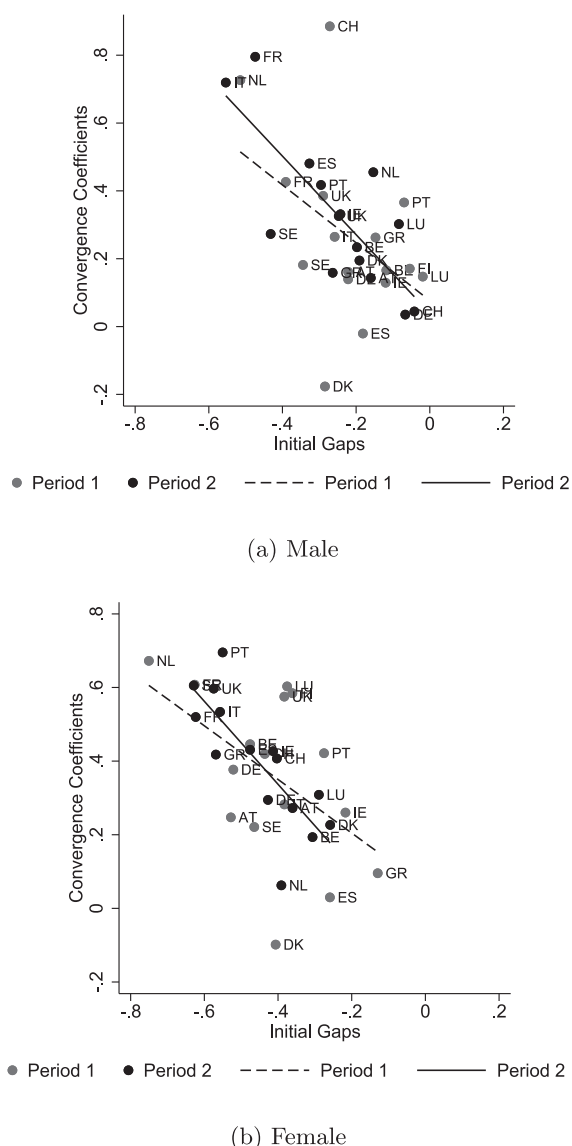


Fig. 3. Correlation between Assimilation Coefficients and Initial Gaps.

converge fully in ten years to that of their native counterparts. Finally, while the average of the 10-year gap is small, this variable has very large dispersion across countries as shown in Fig. 2 so that in some countries immigrants do better than native in employment probability while in others they still lag significantly after 10 years in the country.

3.3.2. Assimilation patterns and initial gaps

Fig. 3 plots the estimated initial gap (horizontal axis) and convergence coefficient (vertical axis) across countries, for male (upper panel) and female (lower panel) immigrants. One very apparent feature is that there is a very strong negative correlation between initial gap and convergence (assimilation) coefficient.¹² This tendency is common to both men and women and also to both Period 1 and Period 2 of our analysis. This implies, interestingly, that the 10-year gap between migrants and natives are more homogeneous across countries than the initial gaps or the convergence coefficients. One potential reason for this strong correlation is that human capital specificity –linked to language, local norms and conversion of educational titles and degrees–varies across countries, but it takes the same amount of time for immigrants to adjust to

it. Countries with more specific rules/requirements/languages are also faster in allowing immigrants to overcome these. Another possible explanation is that in countries with larger initial gaps there is stronger and more selective return, so that the remaining immigrants appear to experience faster convergence.

3.3.3. Correlation of gaps between men and women

One emerging feature of the tendencies summarized above is a large variation in the assimilation pattern across countries. The variety of estimates in the convergence coefficients and 10-year gaps is vast. While explaining in a causal way those differences goes beyond the aim of this paper, we think it is very informative to identify possible correlates with those outcomes across countries. This is a first step to understand whether we observe some regularities, at least in terms of association.

Before examining such factors, let us establish the correlation of migrant-native employment gaps between men and women across countries. Are initial disadvantage and convergence speed of men and women immigrants strongly correlated across countries? Using the estimated values for initial gap, convergence coefficient and 10-year gap, Table 4 shows the partial correlation between men and women estimates across countries. The table reports the coefficients from regressions of initial gap, assimilation coefficient and 10-year gap for female on those for male with and without period-fixed effects, across countries respectively, predicting the variation in the estimates for female migrants using those for male migrants.¹³ The estimates indicate strong correlation across initial gaps and convergence coefficients as well as, but less strong, among 10-year gaps.¹⁴ (Fig. A5).

The estimated equation is:

$$y^f = \beta_0 + \beta_1 x^m + \varepsilon \tag{3}$$

where y^f and x^m are coefficient (initial gap, convergence coefficient, and 10-year gap) for female and male, respectively. We pool the two periods and we use population as weights and errors are clustered at country level.

The table shows large correlation between the initial gap estimate for male migrants and the one for female migrants, 0.555 (without period-fixed effect) and 0.538 (with period effect) which are statistically significant. As the initial gap estimates for male migrants and female migrants are all negative values between -1 and 0, the estimated constant coefficient confirms that there is a greater initial average gap for female migrants (as noted above) and that an initial gap decrease in male migrants is associated with a smaller initial gap decrease in female migrants. Assimilation coefficient estimates for male are also statistically significantly associated with the estimate for female: 0.423 (without period-fixed effect) and 0.428 (with period-fixed effect), where the absolute value of both estimates is below 1. The table shows positive association also for 10-year gaps but the coefficients are less significant (without period-fixed effect) or not statistically significant (with period-fixed effect) and their magnitude (0.292 and 0.345, with and without period-fixed effect) as well as R-square are much lower than for the two previous coefficients. The 10-year gap for male migrants is only weakly associated with that for female migrants, suggesting that different factors may be affecting country-level variation in overall assimilation of male migrants and female migrants.

The large variation across countries and the significant correlation of men-women initial gap and convergence coefficients, suggest that assimilation may depend on some country-specific factors and affect both genders. However, the fact that country-specific 10-year gaps of men and women immigrants are not very correlated across countries, and

¹³ Appendix Fig. A4 show that there is a strong positive correlation between the initial gap for men and women across countries and for the assimilation coefficient. The correlation appears stronger in Period 1.

¹⁴ Appendix Table A4 shows the result with full sample. Excluding an outlier from the regression analysis does not lead to a change in the estimated coefficients.

¹² Appendix Fig. A3 shows the correlation with outlier (Finland, Period 2).

Table 4
Estimates from regressions of coefficients for female on coefficients for male.

	Initial Gap (Female)		Convergence Coeff. (Female)		10-year gap (Female)	
	(1)	(2)	(1)	(2)	(1)	(2)
Initial Gap (Male)	0.555** (0.157)	0.538*** (0.158)				
Convergence Coeff. (Male)			0.424*** (0.087)	0.428*** (0.080)		
10-year gap (Male)					0.293 (0.178)	0.346* (0.179)
Constant	-0.325*** (0.053)	-0.330*** (0.048)	0.272*** (0.053)	0.271*** (0.052)	-0.082** (0.029)	-0.085*** (0.027)
Observations	31	31	31	31	31	31
R-squared	0.417	0.447	0.363	0.364	0.136	0.168
Period-fixed effects		Yes		Yes		Yes

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

large residual variability for each of these coefficient across countries, suggest that idiosyncratic factors, specific to gender and period may play an important role. In the rest of the paper we try to identify some country-characteristics and their correlation to the coefficients capturing immigrants' employment assimilation.

4. Country-level correlates

The large variation in convergence coefficients across countries, their correlation between men and women and the evolution from before to after the Great Recession, suggest that some country-level factors could be important to understand differences in economic assimilation, and especially assimilation of women immigrants, the focus of this analysis.

In this section we use country-level data from various sources to see whether macroeconomic, institutional and cultural characteristics are correlated with economic assimilation of migrants across countries, especially female immigrants. We examine factors that are general in nature and could affect assimilation of both male and female migrant. Then we focus on gender-specific factors that may be more specific to the assimilation of migrant women. While the analysis is descriptive and does not aim at identifying causal effects, identifying important correlates is a first step in formulating hypotheses on what factors may affect assimilation.

We fully acknowledge that possible omitted variables and reverse causality may affect our estimates, however, in a descriptive way, this is a new analysis of how different variables associate to immigrant assimilation across countries. We consider our analysis as exploratory but informative.

4.1. Macroeconomic factors, networks, and institutions

The first set of factors that we examine are the general, non-gender specific factors. Within this category, we examine first macroeconomic variables. Introducing macro level variables gives us the opportunity to capture the general economic context in which migrants assimilate. It is well documented in the literature that migrants and migrant communities are disproportionately affected by the business cycle (Orrenius and Zavodny (2010, 2021); Sala-Rios et al. (2018)). Furthermore, empirical evidence shows that migrants suffer a more adverse impact in the labor market during economic crises (e.g., Dustmann et al. (2010) for Germany and UK; Prean and Mayr (2016) for Austria; Barth et al. (2004) for Norway; Barrett and Kelly (2012) for Ireland; Paggiaro (2013) for Italy and Motellón and López-Bazo (2015) for Spain). Compared to their native counterparts, migrants tend to be more concentrated in sectors of the economy with high levels of temporary, informal or unprotected employment, which are highly susceptible to economic fluctuations.

Hence, we include the core variables that have been studied in the literature as potential correlates of the employment convergence speed. We include as correlates country-level Gross Domestic Product (GDP) per capita growth, national unemployment rates (e.g., Clark and Lindley (2009) for the UK, Chiswick et al. (1997) and Chiswick and Miller (2002) for the US, and Åslund and Rooth (2007) for Sweden) as well as output gap, defined as the difference between actual and potential GDP and the number of recessions, defined as two consecutive quarters of negative GDP growth during the period examined. Each variable is averaged separately over each period examined (i.e., 1999-2008 and 2009-2018) for each country. These variables, capturing the strength of the host country economy, have been shown in country-specific studies, to affect the relative performance of natives and immigrants. Dustmann et al. (2010) find that significantly larger unemployment responses to economic shocks for migrants relative to natives within the same skill group in Germany and UK (similar results can be found for Austria (Prean and Mayr, 2016); for the United States (Orrenius and Zavodny, 2010); for Norway (Barth et al., 2004); for Ireland (Barrett and Kelly, 2012); for Italy (Paggiaro, 2013) and for Spain (Motellón and López-Bazo, 2015). Moreover Fromentin (2016) finds differences in the cyclical employment patterns of migrants and natives in the construction sector between 2008 and 2011 in European countries.

The presence of a network of migrants, measured as the stock of the migrant population, may also be positively correlated with assimilation as it may provide support to migrants in terms of resources, social support or a safety net (Chiswick and Miller, 2015; Fromentin, 2014), or negatively if competition over economic opportunities and resources negatively affects assimilation (Beaman, 2012).

Additionally, we consider institutional variables. Greater rigidities in the labor market may generate barriers to entry into the labor force, disproportionately affecting migrant workers (Angrist and Kugler, 2003; Kugler and Pica, 2006). Forms of protection of insiders relative to outsiders could lead to reduced opportunities for migrants' integration. Using the OECD Employment protection indicators, Causa and Jean (2007) examine how employment protection affects the employment gap between migrants and natives. According to the authors, stronger Employment Protection Legislation (EPL) dualism, (i.e., the relative level of EPL for permanent vs. temporary contracts) is expected to decrease the bargaining power of migrant workers relative to natives slowing their integration. In addition to this, given the role played by firm creation in labor market adjustments, it is possible that anti-competitive regulations, which can be measured by the OECD product market regulation indicator, could slow down the migrants' participation in the labor market (Jean et al., 2010; Jean and Jiménez, 2011). Following the existing literature, institutional settings are measured by the OECD employment protection indicators and product market regulation indicators. Specifically, we include eight OECD indicators in our anal-

ysis. Four are from the OECD employment protection indicators which evaluate the regulations on the dismissal of workers on regular contracts and the hiring of workers on temporary contracts – protection of permanent workers against individual dismissal/collective dismissal, specific requirements for collective dismissal, and regulation of temporary forms of employment. Four are from the OECD product market regulation indicators which measures the degree to which policies promote or inhibit competition in areas of the product market (i.e., barriers to entrepreneurship, barriers to trade and investment, product market regulation, and state control).

4.2. Women-specific indicators

The second set of country-level variables that we consider include indicators of women's empowerment and their economic and political rights, as well as attitudes towards the role of women in society. We examine both objective measures of gender equality in the host country as well as the perception in nationally representative samples of the host country's population on the role of women in society. While in principle those indicators may help measure an environment which is more conducive to women's labor market success, existing studies have documented the existence of a 'double penalty' in the labor market for 'women' as well as 'migrants' (e.g., Hayfron (2002) for Norway; Nicodemo and Ramos (2012) and Sánchez-Domínguez and Azenza (2021) for Spain; Piazzalunga (2015) for Italy). In this context, factors that lead to an improvement in women's labor market outcomes may only have a limited impact in improving migrant women's labor market outcomes, especially relative to native women.

As gender equality indicators we include in our analysis the proportion of seats held by women in national parliaments, female to male tertiary enrollment ratio, female to male employment ratio and indicators related to women's rights in the following areas: women's political rights (e.g., the right to vote), women's economic rights (e.g., the right to work without a husband's consent) and women's social rights (e.g., the right to initiate a divorce) as measured by Cingranelli et al. (2014)'s the CIRI Human Rights Dataset. As done for the macroeconomic indicators, we calculate the average value of each variable for two periods using available yearly data. These indicators are expected to have a positive association with the convergence coefficient of migrant women.

In addition to this, we also examine the role of the prevailing attitudes towards women in society. Existing research has shown that attitudes and social norms may affect women's educational attainment, labor force participation and labor market outcomes (Fernández and Fogli, 2009; Ganguli et al., 2020; Nollenberger et al., 2016). Following studies like Ganguli et al. (2020), we use two questions from the European Values Study (EVS) and one question from the European Social Survey (ESS). These questions ask respondents to rate their agreement with the following statements either on a binary scale ('1' is Agree, '2' is Disagree) or on a 1-4 scale ('1' is Agree Strongly and '4' is Strongly Disagree) regarding job opportunities ('When jobs are scarce, men have more right to a job than women' from the EVS) and housewives ('Being a housewife is just as fulfilling as working for pay' from the EVS and 'Women should cut down on paid work for sake of family' from the ESS). The responses are reverse-coded so that higher values on these questions represent more traditional roles of women in society. If more conservative attitudes towards women negatively affect the economic convergence of female migrants then these indicators should be negatively associated with the convergence coefficients estimated.

4.3. Regression results

To analyze whether those factors are associated with economic convergence of male migrants or female migrants we run the following regression: control for their initial gap, we run the following panel regression using country-level variables for each of the two periods:

$$y_{i,t}^m = \beta_0 + \beta_1 inigap_{i,t}^m + \beta_m X_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$y_{i,t}^f = \beta_0 + \beta_1 inigap_{i,t}^f + \beta_f X_{i,t} + \varepsilon_{i,t} \quad (5)$$

The dependent variables $y_{i,t}^m$ and $y_{i,t}^f$ are either the convergence coefficient for male migrants or female migrants, respectively in country i and period t . As we saw that initial gap is correlated with convergence we control for $inigap_{i,t}^m$, $inigap_{i,t}^f$, the corresponding initial gaps for male migrants and female migrants. The coefficients β_m and β_f capture the partial correlation of the male-migrants' convergence coefficients or the female-migrants convergence coefficients with specific macroeconomics, network institutional variables that we include, in turn, as explanatory variable $X_{i,t}$.

We also estimate an augmented specification that focuses on the "difference" in convergence of female migrants relative to convergence of male migrants, as follows:

$$y_{i,t}^f = \beta_0 + \beta_1 inigap_{i,t}^f + \beta_2 assim_{i,t}^m + \beta_3 X_{i,t}^f + \varepsilon_{i,t} \quad (6)$$

The variable $assim_{i,t}^m$ is the estimate of the convergence coefficient for male in the same country and period. While the term $X_{i,t}$ in Eq. (4) and (5) includes macroeconomic and institutional variables, $X_{i,t}^f$ in Eq. (6) instead focuses on gender indicators. Population at the beginning of the year of the period (i.e., 1999 and 2009) for each country is used as weights and errors are clustered at country level to capture correlation within country.

Table 5 reports the estimated coefficients β_m , for male migrants' convergence and β_f for female migrants' convergence from the regressions above (results with country-fixed effects are available in Appendix Table A5). Given the small number of observations in each regression we include one factor at a time in estimating its partial correlation. The macroeconomic variables capturing the country-level conditions, reported in Panel A of the Table, have very small coefficients that are never significant. Across countries, over the considered periods we do not observe a systematic association between growth, or labor market tightness and relative assimilation of immigrants. Similarly for the network size variable we do not see a significant coefficient. This holds both for men and women.

Panel B, shows that institutional variables, all measured so as to increase with stronger entry barriers and regulation, either on the labor or on the product market, have overwhelmingly negative correlation (sometimes significant) with male and female employment convergence. While it may be risky to interpret individual coefficients we see that two labor market variables, capturing the degree of protection from dismissal have a negative correlation with both men and women convergence coefficients. This may be the sign that labor market protections may act as barrier to entry for immigrants and especially women, sometimes working in more marginal and less protected occupations. In panel C and D of Table 5 the convergence coefficients are those estimated from specification (6) and therefore capturing the differential convergence of women, once we accounted for the convergence of men in a country. The association of those estimates with measures of institutional features or attitudes, that capture higher women's empowerment or equality are never significant and positive. In some instances they are significant and negative and in most cases insignificant. This is puzzling and pushes us to wonder whether better integration of women in a country, does not extend to immigrant women. Additionally, the indicators showing negative association are relative to political integration of women, which may be a dimension not very relevant for the economic integration of immigrant women. To inquire more carefully on the relation between attitudes and integration, we now turn to more local data, capturing regional indicators, rather than national ones and we include indicators of attitudes towards immigrants.

4.4. Regional-level analysis

Because of the small number of observations – only 32 in most regressions–, the cross-country correlation are noisy and usually sta-

Table 5
Country-level macroeconomic, institutional, and cultural explanatory factors.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
A: Macroeconomic Factors				
Average GDP growth	(+)	31	-0.711 (2.313)	-1.305 (1.642)
Migration Stock (Log)	(+)	31	0.004 (0.029)	-0.001 (0.035)
Recession	(-)	31	-0.004 (0.018)	0.013 (0.017)
Output gap	(-)	31	-0.010 (0.009)	-0.001 (0.007)
Unemployment rate	(-)	31	-0.001 (0.006)	-0.001 (0.005)
B: Institutional Factors				
Protection of permanent workers against individual and collective dismissal	(-)	31	-0.009 (0.042)	-0.102* (0.055)
Protection of permanent workers against individual dismissal	(-)	31	0.007 (0.045)	-0.064 (0.062)
Specific requirements for collective dismissal	(-)	31	-0.042** (0.020)	-0.104** (0.044)
Regulation on temporary forms of employment	(-)	31	-0.005 (0.023)	-0.035 (0.034)
Barriers to entrepreneurship	(-)	31	-0.109** (0.042)	-0.051 (0.050)
Barriers to trade and investment	(-)	31	-0.129 (0.103)	-0.094 (0.104)
Product market regulation	(-)	31	-0.107 (0.063)	-0.075 (0.091)
State control	(-)	31	-0.038 (0.036)	-0.038 (0.061)
C: Institutional factors - women specific				
Proportion of seats held by women in national parliaments	(+)	31		-0.005* (0.003)
Female to male tertiary enrollment ratio	(+)	29		0.151 (0.166)
Female to male employment ratio	(+)	31		1.505 (1.197)
Women's political rights	(+)	31		-0.138* (0.070)
Women's economic rights	(+)	31		-0.041 (0.053)
Women's social rights	(+)	16		0.143 (0.113)
D: Attitudes towards women				
Men should not have more right to a job than women	(+)	30		-0.224 (0.262)
Being a housewife not just as fulfilling	(+)	28		-0.763* (0.393)
Women should not be prepared to cut down on paid work	(+)	27		-0.262 (0.383)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

tistically insignificant. In this section we conduct a similar analysis at the regional level. We first consider sub-national regions in European countries as the places of destination for migrants. We then estimate the “initial gap,” the “convergence coefficient” and the “10-year gap” specific to migrants in each of these local areas. As units we use the Nomenclature of Territorial Units for Statistics or NUTS, a geocode standard used for referencing the subdivisions of countries in Europe. The standard, adopted in 2003, is developed and regulated by the European Union. The more aggregate NUTS1 level, refers to broad areas while the NUTS2 level includes administrative units usually called “regions” in most countries. We consider these two levels, depending on the national availability, to analyze the association between economic conditions, attitudes and the employment convergence of immigrants. The number of

regions in our sample for the NUTS1 and NUTS2 levels are shown in [Table A6](#).

The main analysis presented uses NUTS1 level areas as it includes a larger sample of countries.¹⁵ When considering regional factors we include, the same macro-variables included at the national level. Additionally we include variables capturing local attitudes towards migrants and towards women obtained from the European Social Survey.¹⁶ There is significant regional variation within countries in attitudes and insti-

¹⁵ Results from the analysis at NUTS2 level are available from the authors upon request.

¹⁶ The description of the datasets and variables used in the analysis is available in the [Appendix](#).

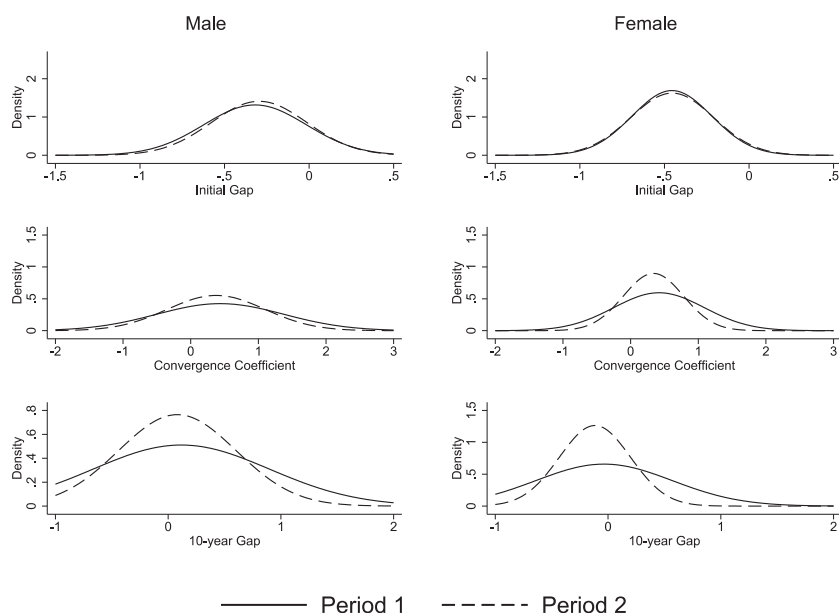


Fig. 4. Distribution of the Estimates (Region-level).

tutional settings and hence this analysis can add significant variation and estimate partial correlations more precisely. Table A7 in the Appendix shows that, for the selected variables in Period 1, within country variation across regions is 50% or more of the cross-country (between) variation.

We estimate “convergence coefficient” and “initial gap” in 75 regions for 2 periods using regional regressions mirroring those in (4) and (5). The estimates for some regions are very noisy as the total number of migrants is extremely small. We drop the five smallest regions, whose coefficients are very imprecisely estimated, to avoid excessive volatility.¹⁷ Our final sample includes 70 regions in 15 countries over Period 1 and Period 2.

Fig. 4 above shows the distribution of the three estimated coefficients, initial gap, assimilation coefficient and 10-year gap in the regional sample.¹⁸ Average values for initial gap (-0.456 for female and -0.319 for male in Period 1; -0.454 for female and -0.295 for male in Period 2) are similar to those obtained for the country regressions; the initial average probability of being employed for female migrants is more than 10% points lower than that for male migrants. The average value of assimilation coefficients at regional level for male migrants (0.439 in Period 1; 0.377 in Period 2) is slightly higher than the female counterparts (0.423 in Period 1; 0.340 in Period 2) for both periods. However, the estimates for male migrants present greater variation in both periods. Finally, we can see that while male migrants in many regions managed to catch up with their native counterparts after 10 years (0.119 in Period 1 and 0.082 in Period 2), female migrants have not overcome the initial disadvantage after, and this happens in both periods (-0.033 in Period 1 and -0.113 in Period 2). Those results are all broadly consistent with the country-level estimates.

4.4.1. Macro variables and attitudes

The macroeconomic variables in the regional analysis are constructed using data from Eurostat. They include average GDP growth rate, average unemployment rates for all population, average youth unemployment rate (youth unemployment defined by one aged between 15 and 24), average long-term unemployment rate, average unemployment rate for high-skilled population (whose educational attainment is

tertiary or above), number of recessions (defined by consecutive negative growth of the growth rate), and number of recessions by period (defined by the negative growth lower than 3.4%), for our regression analysis. These macroeconomic variables are averaged over each period (Period 1 for 1999-2008; Period 2 for 2009-2018) for each region.

The attitude variables are obtained, instead, from the European Social Survey (ESS). Variables on sentiments towards migrants and women are based on the questionnaires on social attitudes towards migrants, attitudes towards cultural values, attitudes towards labor-market and economy, attitudes towards crime, attitude of government towards refugees and attitude towards women’s empowerment.¹⁹

These variables which are ordinal with a four or five-point scale with values or with 0-10 scale are all re-scaled to 0-1 scale and averaged at NUTS1 level using survey weights for each of the two periods.²⁰

In Table 6 we show the correlation of several variables capturing the positive attitude of people towards migrants. As those are highly correlated, in Appendix Table A9 we show the result of regressions using 4 principal components from 23 variables capturing pro-immigration attitudes. The results are consistent with those shown in Table 6. The population at the beginning of the relevant period (i.e., in 1999 and 2009) for each region is used as weight and errors are clustered at the country level to allow for spatial correlation.

Table 6 reports results from the regressions including country fixed effects. We show the coefficient estimates for male migrants and female migrants separately.

In Panel A we see that most macroeconomic variables at the regional level have the expected correlation with immigrants’ assimilation. The number of recession and the unemployment rate have a negative correlation, statistically significant, for male immigrant convergence. Female immigrant convergence is less correlated to those variables. Weak economic conditions and slow labor markets are associated with slower convergence of immigrants, especially male.

In Panel B we see how local attitudes are associated to the assimilation of migrants. A few recent papers show that when refugees are dispersed in a country (e.g., Edin et al. (2003) for Sweden; Aksoy et al. (2020) for Germany) local attitudes have a significant impact on refugees’ integration outcomes, with negative attitudes hurting

¹⁷ Specifically, these regions are Åland from Finland, Corse and overseas departments and regions of France, and Azores and Madeira from Portugal.

¹⁸ Region-specific results are available from the authors upon request.

¹⁹ More detailed information is available in the Appendix.

²⁰ Alternatively we code the attitudes variables in binary response. Appendix Table A8 shows that sign and magnitude do not change significantly when the dependent variable is binary.

Table 6
Regional-level macroeconomic, institutional, and cultural explanatory factors.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
A: Macroeconomic factors				
Average GDP growth	(+)	128	0.804 (1.237)	-0.933 (2.303)
Number of recessions, Consecutive negative growth	(-)	128	-0.061*** (0.016)	-0.032 (0.032)
Number of recessions, GDP growth lower than -3.4 percent	(-)	128	-0.035 (0.037)	-0.025 (0.065)
Unemployment rate, All	(-)	140	-0.015 (0.013)	-0.006 (0.006)
Unemployment rate, Youth	(-)	140	-0.007 (0.004)	-0.003 (0.004)
Unemployment rate, Long-term	(-)	140	-2.947** (1.257)	-1.083 (0.882)
Unemployment rate, High-skilled	(-)	140	-1.757 (1.917)	-0.775 (1.232)
B: Attitude variables				
B.1 Attitude towards migrants				
Do not mind if close relative married to migrant	(+)	111	1.087** (0.470)	-0.010 (0.525)
Do not mind if your boss is migrant	(+)	111	1.774** (0.754)	0.829 (0.923)
Law against ethnic discrimination in workplace good	(+)	117	1.464*** (0.483)	-1.106 (0.644)
Not better for a country if everyone shares customs	(+)	117	0.965** (0.427)	0.772 (0.458)
Migrants create new jobs	(+)	117	1.314*** (0.396)	0.414 (0.582)
Migrants make country's crime problems better	(+)	117	1.142 (1.009)	-0.392 (1.653)
Government more generous for refugee applications	(+)	122	0.454 (0.496)	0.103 (0.533)
Not important to speak country's official language	(+)	117	1.383*** (0.387)	1.692*** (0.562)
B.2 Attitude towards women				
Women should not be prepared to cut down on paid work	(+)	113		0.366 (0.677)
Men should not have more right to a job than women	(+)	121		0.026 (0.552)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

integration. The correlations shown in Panel B of Table 6 are consistent with this association and those findings. The fact that these local attitudes seem highly correlated with integration outcomes, more than national institutions and economic factors were, suggests that the local environment can be very important for immigrant economic integration, even more than national institutions or aggregate economic conditions. Looking specifically at some of these variables we see that in regions where people are more open to work with a migrant boss, or have a migrant relative and where they approve of law against ethnic discrimination on the workplace, on average, migrants' labor-market assimilation is faster. For instance, a 0.1 higher value—in a 0-1 scaled variable—of the index of openness to relative's marriage to migrant, or having a migrant boss, or supporting anti-discrimination law, is associated with 0.109, 0.177 and 0.146, respectively, percentage point higher convergence coefficient of all migrants.

While many attitude variables have statistically significant coefficients on the employment convergence of male migrants, we do not find significant coefficients on employment convergence of female migrants. Several of them have a negative sign and only one is positive and significant. Similarly in Panel B.2 indicators capturing attitudes towards women in the region do not appear to be significantly correlated

with the assimilation of women immigrants. These results suggest two considerations. First, local attitudes are correlated to the assimilation of migrants more than national economic and institutional variables. This suggests that the regional dimension and individual attitudes may be more relevant to assimilation than aggregate factors. Second, factors that affect the male migrants and possibly also help native women are not correlated with our measures of employment assimilation of immigrant women. This may be due to the more complex combination of cultural and economic conditions affecting the labor market integration of this group.

4.5. Assimilation and characteristics of migrants

While the previous sections looked at how local and national factors are correlated with the assimilation of immigrants, in this section we consider whether the characteristics of immigrants themselves are associated to different speed of employment convergence. We first consider the country-level analysis and analyze whether some immigrant characteristics affect employment assimilation. Then we analyze whether controlling better for immigrants' origin affect the potential role of destination country factors.

Table 7
Country-level macroeconomic, institutional, and cultural explanatory factors.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
A: Macroeconomic factors				
Average GDP growth	(+)	30	-5.943 (3.503)	-4.785** (1.653)
Migration stock (Log)	(+)	30	0.077 (0.044)	0.093** (0.036)
Recession	(-)	30	-0.019 (0.018)	0.016 (0.019)
Output gap	(-)	30	-0.016 (0.015)	-0.013 (0.010)
Unemployment rate	(-)	30	-0.003 (0.008)	0.002 (0.006)
B: Institutional factors				
Protection of permanent workers against individual and collective dismissal	(-)	30	-0.026 (0.055)	-0.183*** (0.049)
Protection of permanent workers against individual dismissal	(-)	30	0.002 (0.050)	-0.124** (0.053)
Specific requirements for collective dismissal	(-)	30	-0.072* (0.039)	-0.124** (0.038)
Regulation on temporary forms of employment	(-)	30	-0.077 (0.055)	-0.062 (0.062)
Barriers to entrepreneurship	(-)	30	-0.208* (0.104)	-0.127 (0.108)
Barriers to trade and investment	(-)	30	-0.282 (0.235)	-0.674*** (0.197)
Product market regulation	(-)	30	-0.280** (0.110)	-0.294** (0.112)
State control	(-)	30	-0.165*** (0.053)	-0.193*** (0.063)
C: Institutional factors - women specific				
Proportion of seats held by women in national parliaments	(+)	30		-0.002 (0.004)
Female to male tertiary enrollment ratio	(+)	29		-0.052 (0.250)
Female to male employment ratio	(+)	30		3.274*** (0.862)
Women's political rights	(+)	30		-0.030 (0.097)
Women's economic rights	(+)	30		0.038 (0.075)
Women's social rights	(+)	15		0.066 (0.222)
D: Attitudes towards women				
Men should not have more right to a job than women	(+)	29		0.417 (0.445)
Being a housewife not just as fulfilling	(+)	27		-0.869 (0.681)
Women should not be prepared to cut down on paid work	(+)	26		0.335 (0.389)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient obtained from core regressions which include the country of origin fixed effects. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Using the country of birth variable available from the *EU-LFS*, we constructed a binary variable to determine whether an immigrant is from a developing country or not.²¹ Previous studies focusing on European countries show that migrants from developing countries experience larger initial employment disadvantage and in some cases slower assimilation as well. An explanatory factor documented in the exist-

ing literature is differential reward for human capital (schooling and experience) accumulated in different countries of origin due to differential schooling quality or specificity of on-the-job learning (Amuedo-Dorantes and de la Rica, 2007; Basilio et al., 2017; Zorlu and Hartog, 2012).

Hence we first examine whether the share of migrants from developing countries is associated with the assimilation coefficient across receiving countries. Additionally, we employ the *EU-LFS* ad-hoc modules (2008 and 2014) on “labor market situation of migrants and their immediate descendants” to examine the role of additional characteristics of migrants, such as reason for migration, host country language proficiency and pre-migration labor market situations of migrants. Previous studies have shown that humanitarian migrants have different employment outcomes than economic migrants (Brell et al., 2020) and that

²¹ We follow the standard IMF classification to define the ‘developing country’ status. Consequently, the ‘developing countries’ category includes the following countries: 3 new EU member states (Bulgaria, Croatia and Romania), Non-EU/EFTA countries in Europe, Countries in North Africa, Other African countries, Near Middle Eastern countries, East Asian countries, South and Southeast Asian countries and Latin American countries.

proficiency in the host country language play an important role in migrant's labor market assimilation (Aleksynska and Algan, 2010).

These selected explanatory variables are re-coded as binary variables, and then averaged by country and period.²² We expect an increase in the share of economic migrants, professionally qualified migrants and migrants who are fluent in host country language in one country to be associated with a faster assimilation. Table A10 presents the country-level regression results from the same specification described in Eqs. (4) and (5) where the dependent variable is- in separate specifications- the assimilation coefficient for male migrants and female migrants.

While the correlations are not very strong we find a significant positive correlation with the immigrants' proficiency in the host country language and a weakly significant negative effect of the share of humanitarian immigrants. A 0.1 (in 0-1 scale) percentage point increase in the share of migrants migrating for humanitarian reason is associated with a 0.111 percentage point decrease in the convergence coefficient for male migrants and a 0.1 percentage point increase in the share of migrants proficient in the host country language is associated with a 0.048 percentage point increase in the convergence coefficient for female migrants.

4.6. Controlling for country of origin

We then analyze whether explicitly controlling for immigrants' country of origin, affects the initial gaps and patterns of assimilation. To capture more fully for immigrants' characteristics in the main specification of the individual-level regressions in Eqs. (1) and (2), we include the country of origin fixed effects.^{23,24} Table A11 summarizes mean and median values of each estimates. These estimates are not too different from those shown in in Table 3 when not including country of origin fixed effects. Females have a larger initial gap, but converge faster, however at 10 year the gap is still smaller for males. While controlling more accurately for origins, reduces the heterogeneity of immigrants, and should control for potential effects of changing origins,²⁵ the estimated gap and convergence measures are not affected much.

Additionally we reproduce the estimates of Table 5 using the assimilation coefficients obtained including country of origin fixed effects. The results are shown in Table 7. When country of origin are controlled for we now find that some country level factors are significantly associated with employment convergence of female migrants. In particular the stock of existing migrants has a positive impact on assimilation of female migrants. Measures of rigidity of labor market and of regulations have now a negative and significant coefficient on female immigrants assimilation. Among the women specific factors, the female to

²² Some variables are only available for a single period. Please refer to the Appendix for the detailed information.

²³ This variable includes the following categories: Native of own, EU15, NMS 13, Outside EU 28, Other Africa, MENA, Asia, Latin America, and North America and Oceania.

²⁴ Germany (Period 1) is not included in our analysis as the country of origin variable is not available for this period.

²⁵ Peri and Rutledge (2020) argue that combining all migrants in one group and studying their average progress towards economic assimilation to natives would overlook the role of a composition effect in explaining the changing gap and wage assimilation of migrants relative to natives.

male employment ratio is statistically significant and with the expected sign. Overall these results suggest that controlling for country of origin characteristics may be important to uncover stronger association between institutional factors and immigrant assimilation. This reveals that some countries may attract female immigrants from more disadvantaged countries, but after we account for this, more flexible institutions and larger networks do help their assimilation.

5. Conclusion

This study provides new comprehensive estimates of employment assimilation of migrants in the labor market of the host country for Western European countries, and separately for male and female. By relying on a rich dataset covering 16 European countries over two decades, 1999-2018, before and after the Great Recession, we estimate the speed of convergence of migrants' labor market outcomes to similar natives.

We find several interesting features of immigrants' employment convergence. First, on average and in most of the countries examined, we find that female migrants start with a larger initial employment gap but subsequently converge more rapidly than male migrants to employment outcomes of similar natives. nevertheless, on average, female migrants do not converge completely after 10 years, whereas male migrants are more likely to have employment probability equal to or larger than similar natives after 10 years.

Second, we discover significant heterogeneity in the assimilation patterns by gender and across countries and also some differences between the two time periods considered. Still we find a strong correlation both in the initial employment gap and in the convergence speed between male and female immigrants across countries. namely, countries where male immigrants have lower initial gap and converge faster to native employment probability are also those where female immigrants do.

Driven by this indication that country-specific factors may be important in explaining difference in convergence we analyze how macroeconomic, institutional and cultural factors are associated to male and female immigrant assimilation. We carry out this analysis for the male and female migrants specifically. While results are noisy we find that macroeconomic conditions, especially recessions and unemployment, affect employment assimilation mainly of male immigrants. Measures of labor market rigidity slow assimilation of male and female immigrants too (especially after controlling for country of origin effect). We do not find strong association of national-level attitudes and measures of women integration on the employment assimilation of immigrant women. To dig deeper, we consider sub-national regions and measures of attitudes towards immigrants at the regional level and we find a significant association of those with employment assimilation, especially of male immigrants. Finally we analyze the composition of migrants and how this is related to the patterns of assimilation observed. We find that immigrants with better initial knowledge of host country language are associated with faster assimilation. Overall female immigrant assimilation can be affected by attitudes in their culture of origin, as well as by attitudes towards immigrants and towards women in the country, or even more in the region, of residence. These elements may combine in a complex way so that no individual factor is the only factor determining assimilation. Still local attitudes and labor market institutions seem potential candidates to explain some of female employment assimilation.

Appendix. Notes on the dataset

In this section we provide the description of the variables, and their underlying sources, which are used as explanatory variables in the cross-country analysis in Section 4.3, NUTS1 level analysis in Section 4.4 and the additional analysis in Section 4.5.

Country-level variables

The country-level analysis includes macroeconomic indicators, labor market institutions and survey-based measures of attitudes towards women. Macroeconomic variables are from various sources and include growth of average GDP per capita, total number of migrants, the number of recessions, output gap and unemployment rate. The variables related to the institutional settings include OECD employment protection indicators which measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts, and OECD product market regulation statistics which measure the extent to which policy settings promote or inhibit competition in areas of product market where competition is viable. Women-specific variables are retrieved from numerous sources including the CIRI dataset which rates the level of government respect for a variety of internationally recognized human rights, and the European Values Study (EVS) which is a large-scale, cross-national, and longitudinal survey research program on attitudes, values and preferences of citizens in European countries. The table below summarizes the core information related to the data used in the analysis.

Variable name	Classification	Period	Country	Construction	Source
Average GDP growth	Macroeconomic	1: 1999-2008* 2: 2009-2018	All	Average of annual growth rate over 10 years**	Eurostat
Total number of migrants	Demographic	1: 2000 2: 2010	All	Migrant stock in the first year of each period	UNDP
Number of recessions (defined by consecutive negative growth)	Macroeconomic	1: 1999-2008* 2: 2009-2018	All	Average of the number of recessions over 10 years**	Eurostat
Output gap	Macroeconomic	1: 1999-2008* 2: 2009-2018	All	Average of the output gap over 10 years**	OECD
Unemployment rate	Macroeconomic	1: 1999-2008* 2: 2009-2018	All	Average of annual unemployment rate over 10 years**	ILO
Protection of permanent workers against (individual) dismissal Specific requirements for collective dismissal Regulation on temporary forms of employment	Institutional	1: 1999-2008 2: 2009-2018	All	Average of annual values over 10 years	OECD Employment Protection Indicators
Product market regulation Barriers to trade and investment Barriers to entrepreneurship State control	Institutional	1: 1998, 2003 2: 2008, 2013	All	Average of two time points for each period	OECD Product Market Regulation Statistics
Proportion of seats held by women in national parliaments	Institutional	1: 1999-2008* 2: 2009-2018	All	Average proportion over 10 years**	IPU
Female to male tertiary enrollment ratio	Women-specific	1: 1999-2008* 2: 2009-2018	All	Ratio of average male and female tertiary educated rates over 10 years**	UNESCO
Female to male employment ratio	Women-specific	1: 1999-2008* 2: 2009-2018	All	Ratio of average male and female employment rates over 10 years**	ILO
Women's political rights	Women-specific	1: 1999-2008 2: 2009-2011	All	Average value over 10 years	CIRI Human Rights Indicator
Women's economic rights		1: 1999-2008 2: 2009-2011			
Women's social rights		1: 1999-2008 2: NA			
Attitude against job priority to men over women	Women-specific	1: 1999-2001 (wave 3) 2: 2008-2010 (wave 4)	All except Switzerland (P1)	Binary response to the statement, "Men should have more right to a job than women," is inverted and averaged by country	European Value Study (EVS)
Attitude against fulfillment just as a housewife			All except Austria, Switzerland, Ireland (P1)	Categorical response to the statement, "Being a housewife just as fulfilling," is inversely recoded to 0-1 scale numeric variable (Strongly Agree = 1, Agree = 0.66, Disagree = 0.33, Strongly Disagree = 0) and averaged by country	

Variable name	Classification	Period	Country	Construction	Source
Attitude against women's cut down on paid work	Women-specific	1: 2004 (wave 2) 2008 (wave 4) 2: 2010 (wave 5)	All except France (P1), Luxembourg, Austria, Italy (P2)	Categorical response to the statement, "Women should cut down on paid work for sake of family," is inversely recoded to 0-1 scale numeric variable (Strongly Agree = 1, Agree = 0.66, Disagree = 0.33, Strongly Disagree = 0) and averaged by country	European Social Survey (ESS)

Note: *Switzerland 2001-2008, **Switzerland for 8 years.

Region-level variables

This part of the analysis relies on within country information, aggregated at the regional level. One of the advantages is that it increases the comparability, makes the analysis more refined and also highlights the disparities and/or similarities within European countries themselves. Macroeconomic indicators in European countries at NUTS1 level are derived from Eurostat. Population data is also retrieved to be used as weight throughout the analysis. Concerning the attitude variables, the European Social Survey (ESS), which is a cross-national survey that has been conducted across Europe since 2001 (Total 8 rounds are available), is used. Every two years, face-to-face interviews are conducted with newly selected, cross-sectional samples. The survey measures the attitudes, beliefs and social preferences of diverse populations in more than thirty European countries. Among the extensive set of questionnaires, we examined the questionnaires related to sentiments towards migrants and attitudes towards women, specifically focusing on the perceived role of women in society. Each questionnaire is available at least once in each period examined (i.e., 1999-2008 and 2009-2018). The table below summarizes the core information related to the data used in the analysis.

Variable name	Classification	Period	Regions	Construction	Source
Average GDP growth					
Number of recessions (Consecutive negative growth)	Macroeconomic	1: 2000-2008	All regions except for regions from CH, FR (P1), LU (P2)	Annual values are averaged over each period	Eurostat
Number of recessions (GDP growth lower than -3.4 percent)		2: 2009-2017			
Unemployment rate (All/Youth/Long-term/High-skilled)					
Different race/ethnicity of relatives partner	Social attitudes towards migrants		All regions except for regions from AT (All), FR (P1), GR, LU, IT (P2)	0-10 scale response to the questions, How much would you mind if people from another country who are of a different race married to a close relative or yours/is your boss, is inversely rescaled to 0-1 scale and averaged	
Different race/ethnicity of boss					
Law against ethnic discrimination in workplace		1: 2002 (wave 1) 2: 2014 (wave 7)		0-10 scale response to the questions, How good is it for a country to have a law against racial or ethnic discrimination in the workplace, How much would you agree that It is better for a country if almost everyone shares the same customs and traditions, Would you say that people who come to live here generally help to create new jobs, Are host countries crime problems made better by people coming to live here from other countries? is inversely rescaled to 0-1 and averaged by country	European Social Survey (ESS)
Shared customs and traditions	Attitudes towards cultural values		All regions except for regions from FR (P1), GR, LU, IT (P2)		
Job creation by migrants	Attitudes towards job/economy				
Crime problems by migrants	Attitudes towards crime				
Generosity on judging applications for refugee status	Attitudes of government towards refugee	1: 2002 (wave 1) 2: 2014 (wave 7), 2016 (wave 8)	All regions except for regions from FR (P1), LU, GR (P2)	Categorical response to the statement, Governments should be generous when judging applications for refugee status, is inversely recoded to 0-1 scale numeric variable (Strongly Agree = 1, Agree = 0.66, Disagree = 0.33, Strongly Disagree = 0) and then averaged by country	
Non-necessity to speak countries official language	Qualification for immigration	1: 2002 (wave 1) 2: 2014 (wave 7)	All regions except for regions from FR (P1), GR, LU, IT (P2)	0-10 scale response to the question, how important should it be for migrants to be able to speak host countries official language, is inversely rescaled to 0-1 by dividing the value by 10 and then averaged by country.	
Womens cut down on paid work for sake of family	Women-specific factors	1: 2004 (wave 2), 2008 (wave 4) 2: 2010 (wave 5)	All regions except for regions from FR (P1), AT, LU, IT (P2)	Categorical response to the statement, Being a housewife just as fulfilling, is inversely recoded to 0-1 scale numeric variable (Strongly Agree = 1, Agree = 0.66, Disagree = 0.33, Strongly Disagree = 0) and then averaged by country	
Job priority to men over women		1: 2004 (wave 2), 2008 (wave 4) 2: 2010 (wave 5), 2016 (wave 8)	All regions except for regions from FR, IT (P1), LU (P2)		

Country- and region-level variables

The aim of the ad-hoc modules of the European Union Labor Force Survey is to provide information on specific topics concerning the labor market to supplement the core *EU-LFS* survey. In 2008 and 2014, the ad-hoc module focuses on the labor market situation of migrants. In Section 4.5 we examine the role of changes in the composition of migrants in affecting their economic assimilation by using these two additional ad-hoc module datasets. We can identify individuals' country of origin by using the *countryb* variable available in *EU-LFS*. This variable is provided in up to 15 country groups for reference years from 2004 onward (i.e., National, EU15, NMS10 (10 new member states of 2004), NMS3 (3 new member states of 2007 and 2013), EFTA, Other Europe, North America, Australia Oceania, North Africa, Near Middle East, East Asia, South East Asia, Central America, South America). Before 2004, this variable is provided in only 3 categories (i.e., Native, EU15, Non 15). In addition to this variable, we extract variables on characteristics of migrants, labor market policy regarding migrants and intermediate outcomes after migration are used in the analysis. They are aggregated (averaged) at national and regional levels for the analysis. The regional-level analysis is based on the countries for which the regional (NUTS1) variable, which is necessary for aggregation, is available (i.e., Austria, Belgium, Switzerland, Germany (Period 2), France, Greece, Spain, Portugal, Sweden, Luxembourg and Ireland). The table below summarizes the core information related to the data used in the analysis.

Variable name	Classification	Period	Country	Construction	Source
Origin from developing country		1: 2004-2008 2: 2009-2018	All except DE (P1)		
Economic migration	Characteristics of migrants	1: 2008 2: 2014	All except DK, FI (P1), DE, IE, NL (P2)	Categorical variable is recoded as binary variable and is then averaged by country (or region)	
Humanitarian migration					
Participation in host country language course					
Proficiency in host country language		1: NA 2: 2014	All except DK, DE, IE, NL	Binary variable is averaged by country	<i>EU-LFS</i> Ad hoc module 2008, 2014
Over-qualification for the current job					
Limitation of duration of current residence	Characteristics of labor market situation of migrants	1: 2008 2: NA	All except CH, DK, FI	Categorical variable is recoded as binary variable and is then averaged by country (or region)	
Restriction of legal access to labor market					
Need to improve host country language					
		1: 2008 2: NA	All except FI, DK		

Tables and Figures

Table A1

Sizes of Individual Cohorts in Period 1 (1999-2008).

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Natives											
	874,250	869,956	906,080	894,518	875,798	850,176	1,294,387	895,307	949,654	945,714	9,355,840
Migrants (by arrival cohorts)											
1999	0	1,982	2,196	2,379	2,494	2,718	4,499	2,922	3,170	3,668	26,028
2000	0	0	2,084	2,417	2,846	3,019	4,916	3,526	4,191	4,429	27,428
2001	0	0	0	2,527	3,267	3,628	5,520	4,176	5,066	5,274	29,458
2002	0	0	0	0	2,611	3,203	5,166	3,964	5,294	4,985	25,223
2003	0	0	0	0	0	2,330	4,532	3,619	4,401	4,684	19,566
2004	0	0	0	0	0	0	3,964	3,503	4,818	4,728	17,013
2005	0	0	0	0	0	0	0	2,696	4,947	5,051	12,694
2006	0	0	0	0	0	0	0	0	4,766	5,185	9,951
2007	0	0	0	0	0	0	0	0	0	3,923	3,923
Total	874,250	871,938	910,360	901,841	887,016	865,074	1,322,984	919,713	986,307	987,641	9,527,124

Table A2

Sizes of Individual Cohorts in Period 2 (2009-2018).

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Natives											
	901,513	944,243	932,619	1,144,147	1,124,725	1,115,937	1,097,398	1,102,477	1,114,216	1,088,810	10,566,085
Migrants (by arrival cohorts)											
2009	0	2,279	3,549	4,808	4,872	4,868	4,967	5,079	5,311	4,861	40,594
2010	0	0	2,565	4,573	4,907	5,089	5,064	5,379	5,401	5,217	38,195
2011	0	0	0	3,053	4,100	4,667	5,081	5,398	5,365	5,252	32,916
2012	0	0	0	0	2,835	4,359	5,040	5,440	5,555	5,480	28,709
2013	0	0	0	0	0	3,263	4,845	5,772	6,156	6,025	26,061
2014	0	0	0	0	0	0	3,406	6,058	7,098	7,457	24,019
2015	0	0	0	0	0	0	0	3,722	5,688	6,238	15,648
2016	0	0	0	0	0	0	0	0	3,468	5,258	8,726
2017	0	0	0	0	0	0	0	0	0	3,344	3,344
Total	901,513	946,522	938,733	1,156,581	1,141,439	1,138,183	1,125,801	1,139,325	1,158,258	1,137,942	10,784,297

Table A3

Estimates of Probability of Being Employed.

Country	Estimates	Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
Austria	Initial Gap	-0.222* (0.054)	-0.528*** (0.031)	-0.160 (0.065)	-0.361*** (0.021)
	Convergence Coefficient	0.161 (0.085)	0.247** (0.018)	0.143 (0.154)	0.272** (0.046)
	10-year Gap	-0.09 (0.128)	-0.212*** (0.046)	-0.037 (0.108)	-0.113* (0.058)
Belgium	Initial Gap	-0.118 (0.080)	-0.476*** (0.080)	-0.198*** (0.039)	-0.306*** (0.049)
	Convergence Coefficient	0.166 (0.172)	0.446*** (0.131)	0.234* (0.107)	0.194* (0.101)
	10-year Gap	0.048 (0.116)	0.030 (0.103)	0.036 (0.094)	-0.097 (0.064)
Denmark	Initial Gap	-0.285*** (0.033)	-0.406*** (0.059)	-0.191* (0.072)	-0.258** (0.060)
	Convergence Coefficient	-0.177 (0.126)	-0.098 (0.198)	0.195* (0.085)	0.227** (0.057)
	10-year Gap	-0.497*** (0.103)	-0.476*** (0.150)	0.004 (0.051)	-0.032 (0.028)
Finland	Initial Gap	-0.054 (0.165)	-0.361 (0.177)	0.008 (0.236)	0.467 (0.268)
	Convergence Coefficient	0.171 (0.231)	0.584 (0.395)	0.175 (0.245)	-0.368 (0.567)
	10-year Gap	0.154** (0.076)	0.249 (0.248)	0.183*** (0.040)	0.001 (0.237)

(continued on next page)

Table A3 (continued)

Country	Estimates	Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
France	Initial Gap	-0.391*** (0.104)	-0.626*** (0.054)	-0.474*** (0.081)	-0.623*** (0.054)
	Convergence Coefficient	0.426** (0.156)	0.608*** (0.184)	0.795*** (0.191)	0.520*** (0.097)
	10-year Gap	0.036 (0.092)	0.085 (0.181)	0.321** (0.133)	-0.104 (0.078)
Germany	Initial Gap	-0.222*** (0.046)	-0.521*** (0.027)	-0.067* (0.033)	-0.427*** (0.029)
	Convergence Coefficient	0.139 (0.090)	0.377*** (0.076)	0.035 (0.061)	0.295*** (0.070)
	10-year Gap	-0.043 (0.100)	-0.119* (0.070)	-0.031 (0.035)	-0.133*** (0.043)
Greece	Initial Gap	-0.147*** (0.033)	-0.129 (0.105)	-0.264*** (0.041)	-0.569*** (0.093)
	Convergence Coefficient	0.263*** (0.056)	0.096 (0.026)	0.159 (0.117)	0.418** (0.041)
	10-year Gap	0.126** (0.055)	0.014 (0.116)	-0.105 (0.157)	-0.215** (0.105)
Ireland	Initial Gap	-0.120 (0.019)	-0.217 (0.036)	-0.242** (0.005)	-0.413** (0.021)
	Convergence Coefficient	0.129 (0.056)	0.260* (0.026)	0.331 (0.117)	0.427* (0.041)
	10-year Gap	-0.063 (0.039)	0.023*** (0.005)	0.231* (0.137)	0.121*** (0.003)
Italy	Initial Gap	-0.258*** (0.080)	-0.383*** (0.048)	-0.554*** (0.046)	-0.557*** (0.050)
	Convergence Coefficient	0.265 (0.155)	0.282*** (0.096)	0.719*** (0.063)	0.534*** (0.101)
	10-year Gap	0.000 (0.073)	-0.068 (0.072)	0.177*** (0.053)	-0.030 (0.078)
Luxembourg	Initial Gap	-0.019 (0.063)	-0.375*** (0.068)	-0.084** (0.034)	-0.289*** (0.044)
	Convergence Coefficient	0.147 (0.134)	0.603*** (0.163)	0.302*** (0.097)	0.309** (0.141)
	10-year Gap	0.092 (0.112)	0.240* (0.127)	0.179** (0.076)	0.095 (0.110)
Netherlands	Initial Gap	-0.515*** (0.119)	-0.751*** (0.083)	-0.153 (0.155)	-0.391*** (0.120)
	Convergence Coefficient	0.726*** (0.207)	0.672*** (0.153)	0.455* (0.255)	0.063 (0.237)
	10-year Gap	0.206 (0.126)	-0.078 (0.108)	0.302** (0.151)	-0.328** (0.163)
Portugal	Initial Gap	-0.070 (0.052)	-0.275*** (0.069)	-0.295*** (0.029)	-0.550*** (0.045)
	Convergence Coefficient	0.366*** (0.097)	0.422*** (0.104)	0.417** (0.121)	0.695** (0.242)
	10-year Gap	0.230*** (0.064)	0.194 (0.123)	0.122 (0.105)	0.262 (0.177)
Spain	Initial Gap	-0.182*** (0.058)	-0.259** (0.102)	-0.327** (0.130)	-0.476*** (0.081)
	Convergence Coefficient	-0.021 (0.092)	0.030 (0.134)	0.481*** (0.163)	0.431** (0.200)
	10-year Gap	-0.238*** (0.066)	-0.101** (0.046)	0.259* (0.140)	-0.045 (0.140)
Sweden	Initial Gap	-0.344** (0.105)	-0.465*** (0.058)	-0.432*** (0.072)	-0.629*** (0.055)
	Convergence Coefficient	0.182 (0.133)	0.221 (0.191)	0.273*** (0.076)	0.605*** (0.061)
	10-year Gap	-0.163* (0.086)	-0.243 (0.188)	-0.159*** (0.054)	-0.014 (0.049)
Switzerland	Initial Gap	-0.271*** (0.061)	-0.436*** (0.072)	-0.042* (0.021)	-0.403*** (0.044)
	Convergence Coefficient	0.885** (0.244)	0.420 (0.216)	0.044 (0.028)	0.407*** (0.069)
	10-year Gap	0.614*** (0.184)	-0.016 (0.195)	0.002 (0.024)	0.015 (0.034)
United Kingdom	Initial Gap	-0.290*** (0.036)	-0.383*** (0.044)	-0.247*** (0.029)	-0.575*** (0.027)
	Convergence Coefficient	0.385*** (0.089)	0.575*** (0.054)	0.326*** (0.099)	0.597*** (0.052)
	10-year Gap	0.096 (0.061)	0.167** (0.069)	0.079 (0.103)	0.047 (0.065)

Note: Robust standard errors clustered by the sub-national regional level are in parentheses (not available for Luxembourg and the Netherlands). Those italicized coefficients and standard errors are estimated without Year-Education-Age fixed effects. Estimation is by OLS with sample survey weights. Dependent variable is employment status, which is defined as a binary variable equal to 1 if employed, and 0 otherwise. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A4
Regression Results, with Outlier.

	Initial Gap (Female)		Convergence Coeff. (Female)		10-year Gap (Female)	
	(1)	(2)	(1)	(2)	(1)	(2)
Initial Gap (Male)	0.629*** (0.189)	0.619*** (0.192)				
Convergence Coeff. (Male)			0.436*** (0.087)	0.447*** (0.085)		
10-year Gap (Male)					0.297 (0.179)	0.349* (0.180)
Constant	-0.299*** (0.065)	-0.301*** (0.064)	0.263*** (0.053)	0.259*** (0.054)	-0.081** (0.029)	-0.084*** (0.027)
Observations	32	32	32	32	32	32
R-squared	0.390	0.401	0.341	0.343	0.140	0.169
Period-fixed effects		Yes		Yes		Yes

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A5
Country-level Macroeconomic, Institutional, and Cultural Explanatory Factors.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
A: Macroeconomic Factors				
Average GDP growth	(+)	30	-2.063 (2.313)	-1.498 (1.903)
Migration Stock (Log)	(+)	30	0.183*** (0.060)	0.076 (0.061)
Recession	(-)	30	-0.005 (0.032)	-0.036 (0.026)
Output gap	(-)	30	-0.020 (0.015)	-0.004 (0.014)
Unemployment rate	(-)	30	0.015 (0.013)	0.009 (0.012)
B: Institutional Factors				
Protection of permanent workers against individual and collective dismissal	(-)	30	-0.120 (0.042)	-0.087 (0.193)
Protection of permanent workers against individual dismissal	(-)	30	-0.097 (0.319)	0.003 (0.179)
Specific requirements for collective dismissal	(-)	30	-0.119 (0.285)	-0.210 (0.142)
Regulation on temporary forms of employment	(-)	30	-0.088 (0.147)	-0.112 (0.099)
Barriers to entrepreneurship	(-)	30	-0.125** (0.057)	-0.050 (0.039)
Barriers to trade and investment	(-)	30	-0.081 (0.142)	0.025 (0.060)
Product market regulation	(-)	30	-0.163* (0.079)	-0.013 (0.054)
State control	(-)	30	-0.151** (0.057)	-0.024 (0.055)
C: Institutional factors - women specific				
Proportion of seats held by women in national parliaments	(+)	30		-0.010* (0.006)
Female to male tertiary enrollment ratio	(+)	26		-0.302 (0.680)
Female to male employment ratio	(+)	30		0.649 (2.158)
Women's political rights	(+)	30		-0.078 (0.212)
Women's economic rights	(+)	30		-0.056 (0.065)

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Table A5 (continued)

	Expected Sign	Estimated coefficients		
		Number of Observations	Male	Female
Women's social rights	(+)	16		0.069 (0.145)
D: Attitudes towards women				
Men should not have more right to a job than women	(+)	28		-0.600 (0.425)
Being a housewife not just as fulfilling	(+)	24		1.234 (2.027)
Women should not be prepared to cut down on paid work	(+)	24		-0.285 (1.766)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A6

The Number of Regions by Country.

Country	Level of the smallest NUTS available from the raw dataset	No. of regions available from the raw dataset	No. of NUTS1 included in the analysis	No. of NUTS2 included in the analysis
Austria	1	3	3	-
Belgium	2	11	3	11
Switzerland	2	7	1	7
Germany	1	16	16*	-
Denmark	2	5	1	5
Spain	2	19	7	19
Finland	2	5	1	5
France	2	26	14	26
Greece	2	13	4	13
Ireland	2	2	1	2
Italy	2	20	5	21
Luxembourg	1 and 2	1	1	1
Netherlands	-	1	-	-
Portugal	2	7	3	7
Sweden	2	8	3	8
United Kingdom	1	12	12	-
Total		156	75	124

Note: Region variable to construct NUTS1 variable in Germany is available from 2001. Source: Eurostat (2018)

Table A7

Between and Within Variation of Selected Variables.

	Overall	Between	Within
Average GDP growth	0.026	0.010	0.017
Number of recessions	1.133	2.155	0.945
Long-term unemployment	0.039	0.027	0.015
Law against ethnic discrimination	0.713	0.059	0.030
Not better if everyone shares customs	0.441	0.075	0.043
Migrants create new jobs	0.471	0.067	0.045
Migrants make country's crime problems better	0.344	0.058	0.026
Government more generous for refugee applications	0.492	0.097	0.062
Not important to speak country's official language	0.303	0.101	0.038
Men should not have more right to a job than women	0.134	0.146	0.058

Table A8
Regional-level Cultural Explanatory Factors in Binary Responses.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
B: Attitude variables				
B.1 Attitude towards migrants				
Do not mind if close relative married to migrant	(+)	111	0.918** (0.307)	0.178 (0.358)
Do not mind if your boss is migrant	(+)	111	1.840** (0.945)	0.769 (0.692)
Law against ethnic discrimination in workplace good	(+)	117	1.802*** (0.417)	-0.617 (0.382)
Not better for a country if everyone shares customs	(+)	117	0.285 (0.208)	0.425* (0.220)
Migrants create new jobs	(+)	117	0.268** (0.089)	0.004 (0.196)
Migrants make country's crime problems better	(+)	117	-0.085 (0.609)	-1.234* (0.577)
Government more generous for refugee applications	(+)	122	0.153 (0.240)	-0.036 (0.313)
Not important to speak country's official language	(+)	117	1.044*** (0.274)	1.044*** (0.474)
B.2 Attitude towards women				
Women should not be prepared to cut down on paid work	(+)	113		-0.009 (0.308)
Men should not have more right to a job than women	(+)	121		-0.002 (0.552)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A9
Regression Results.

	(1) Basic	(2) Multivariate	(3) Fixed effects	(4) Multiple fixed effects
Initial.Gap (All)	-1.124*** (0.083)	-1.193*** (0.106)	-1.398*** (0.171)	-1.399*** (0.163)
Component score 1		0.003 (0.006)	0.020*** (0.005)	0.021** (0.007)
Component score 2		0.018 (0.011)	-0.003 (0.035)	-0.005 (0.033)
Component score 3		0.022* (0.012)	0.027 (0.030)	0.033 (0.036)
Component score 4		-0.012 (0.018)	0.015 (0.031)	0.016 (0.030)
Constant	-0.104*** (0.036)	-0.126*** (0.043)	-0.196*** (0.066)	-0.196*** (0.063)
Observations	140	111	111	109
R squared	0.570	0.613	0.654	0.653
Country fixed effect			Yes	Yes
Period fixed effect				Yes

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A10
Characteristics of Migrants.

	Expected Sign	Number of Observations	Estimated coefficients	
			Male	Female
Panel A: Characteristics of migrants				
Origin from developing countries	(-)	31	-0.155 (0.190)	-0.129 (0.143)
Economic migration	(+)	26	-0.042 (0.238)	-0.063 (0.164)
Humanitarian migration	(-)	26	-1.105* (0.554)	-0.662 (0.395)
Participation in host country language course	(+/-)	26	-0.218 (0.194)	-0.184 (0.134)
Over-qualification for job	(+)	12	0.299 (0.408)	0.259 (0.234)
Proficiency in host country language	(+)	12	0.435 (0.414)	0.481** (0.210)
Panel B: Characteristics of labor market situation of migrants				
Limitation of duration of current residence	(-)	13	0.492* (0.236)	0.132 (0.191)
Restriction of legal access to labor market	(-)	13	0.051 (0.182)	0.142 (0.200)
Need to improve host country language	(-)	14	0.387 (0.674)	-0.599 (0.503)

Note: Robust standard errors clustered by the country level are in parentheses. Estimation is by OLS with country population weights. Dependent variable is the estimate of convergence coefficient. Marginal effects presented at the means of continuous variables. ***, **, * indicate $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively.

Table A11
Estimates of Probability of Being Employed with Country of Origin Fixed Effects.

		Male, Period 1	Female, Period 1	Male, Period 2	Female, Period 2
Mean	Initial Gap	-0.251 [0.124]	-0.413 [0.239]	-0.258 [0.136]	-0.388 [0.131]
	Convergence Coefficient	0.362 [0.267]	0.298 [0.331]	0.354 [0.210]	0.399 [0.150]
	10-year Gap	0.111 [0.276]	-0.115 [0.341]	0.097 [0.155]	-0.011 [0.102]
Median	Initial Gap	-0.270 [0.448]	-0.367 [0.251]	-0.216 [0.286]	-0.378 [0.400]
	Convergence Coefficient	0.339 [0.205]	0.314 [0.419]	0.296 [0.226]	0.404 [0.383]
	10-year Gap	0.177 [0.237]	-0.105 [0.206]	0.070 [0.098]	0.021 [0.072]

Note: Standard deviations (below means) and median absolute deviations (below medians) are in brackets. Estimation is by OLS with sample survey weights. Mean, standard deviation, median and median absolute deviation are calculated from the entire sample which includes the 16 Western European countries.

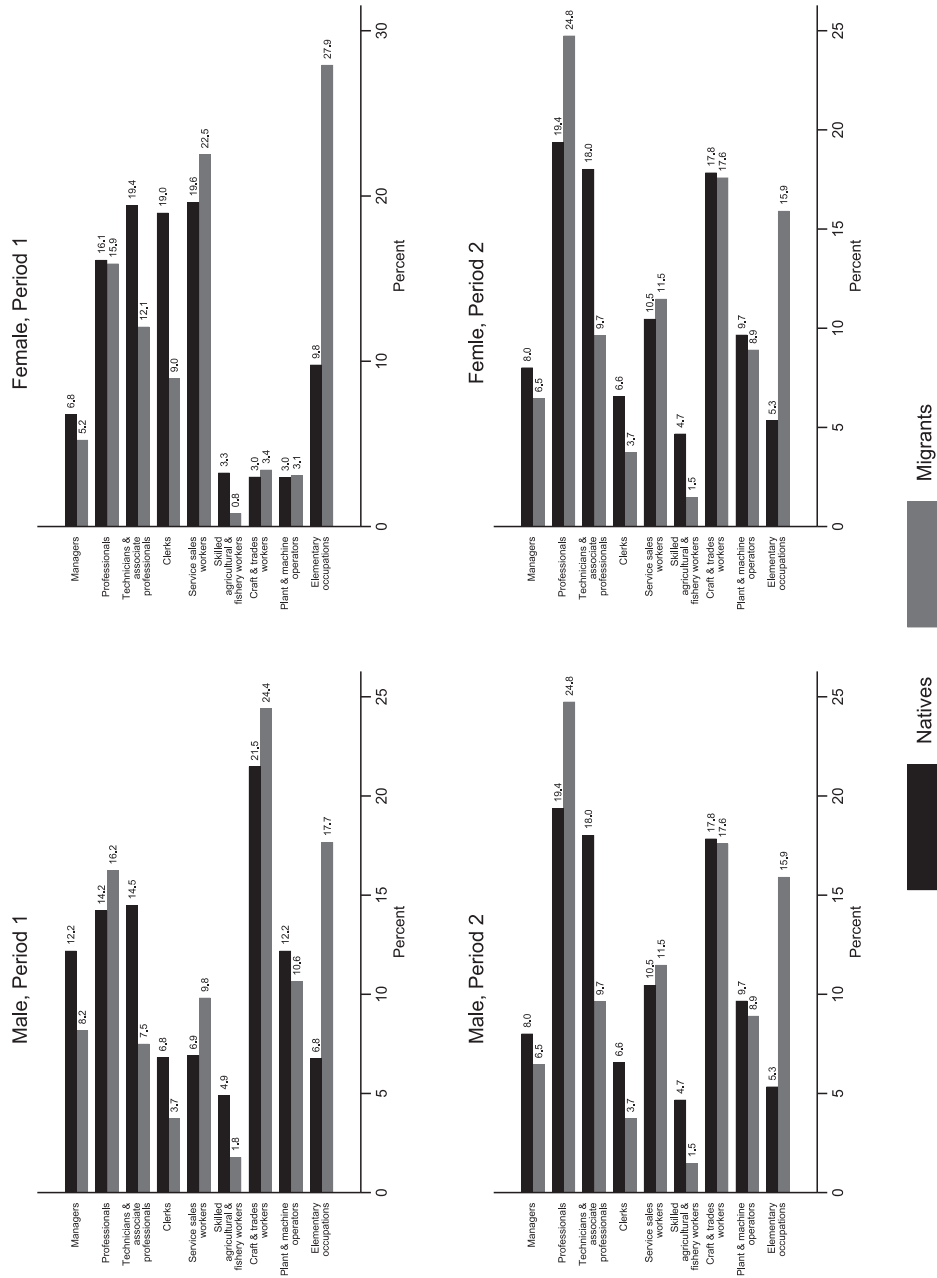


Fig. A1. Occupational Distribution by Gender and Period.

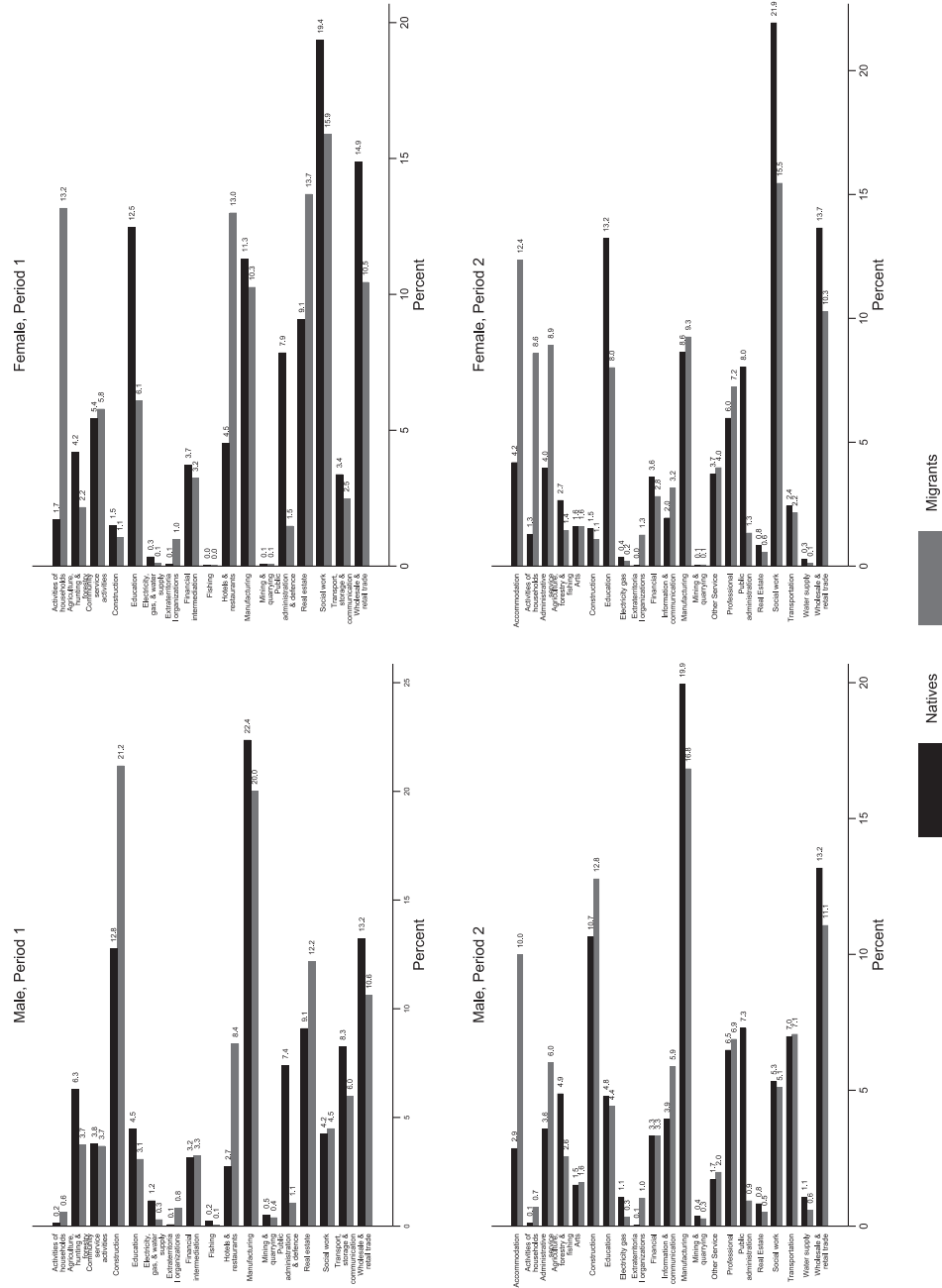
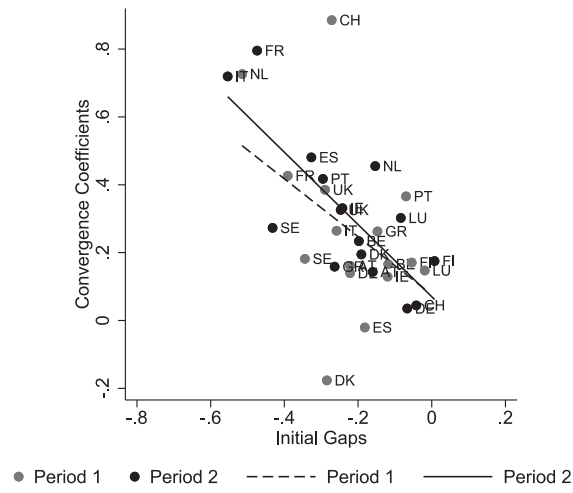
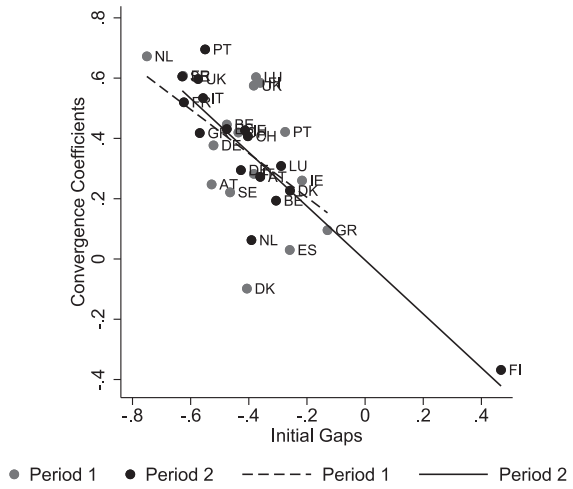


Fig. A2. Sectoral Distribution by Gender and Period.

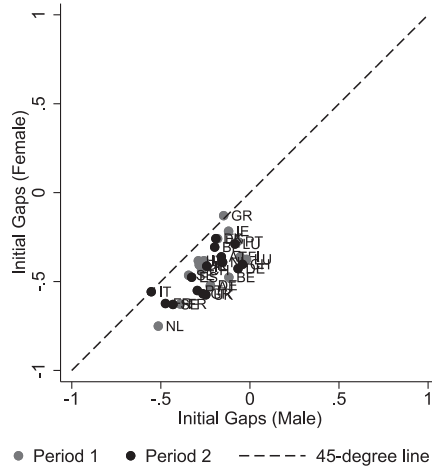


(a) Male

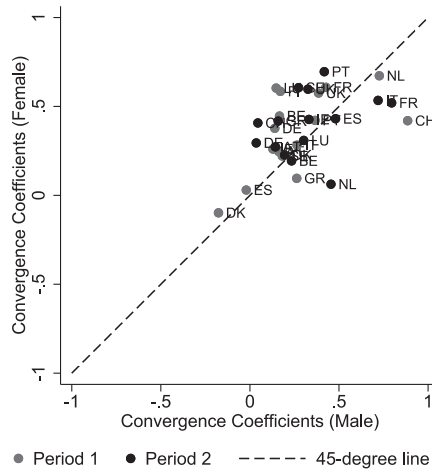


(b) Female

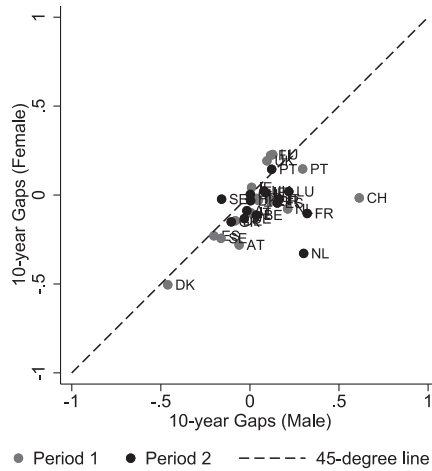
Fig. A3. Correlation between Assimilation Coefficients and Initial Gaps, with Outlier.



(a) Initial Gaps

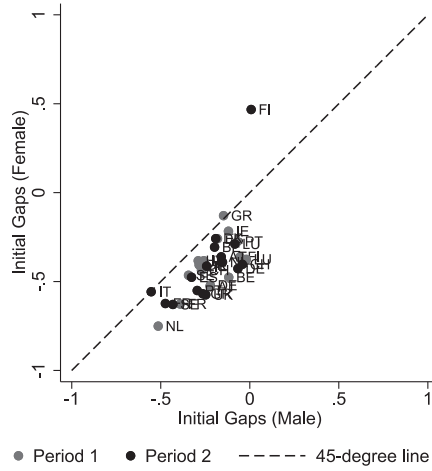


(b) Assimilation Coefficients

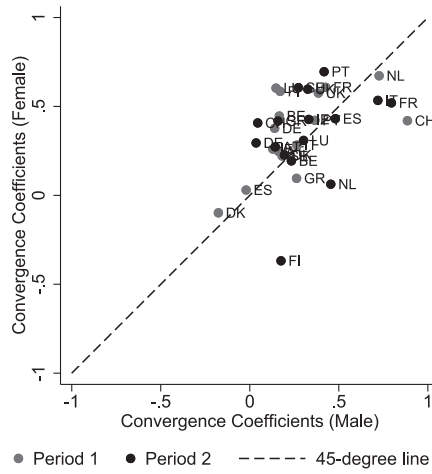


(c) 10-year Gaps

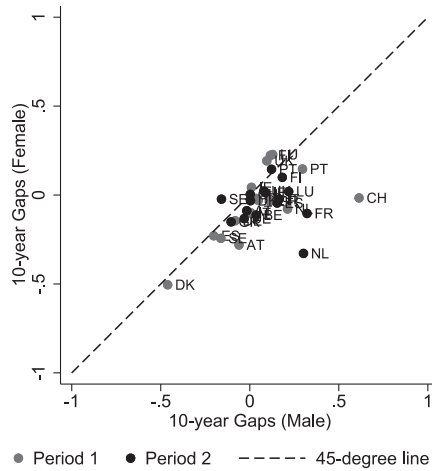
Fig. A4. Correlation between Men's and Women's Estimates.



(a) Initial Gaps



(b) Assimilation Coefficients



(c) 10-year Gaps

Fig. A5. Correlation between Men's and Women's Estimates, with Outlier.

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