

AMERICAN UNIVERSITY OF BEIRUT

THE EFFECT OF MINIMUM WAGE ON THE LABOR
MARKET OUTCOMES OF FOREIGN-BORN WORKERS IN
EUROPEAN COUNTRIES

by
BALSAM YOUSSEF HALAWI

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Arts
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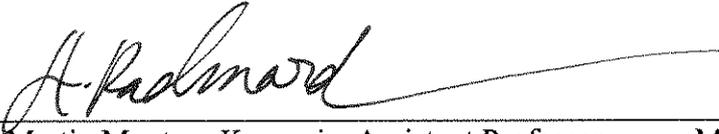
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AN ABSTRACT OF THE THESIS OF

Balsam Youssef Halawi for Master of Arts
Major: Economics

Title: The Effect of Minimum Wage on the Labor Market Outcomes of Foreign-born Workers in European Countries

This paper investigates the effect of the minimum wage on the labor market outcomes of foreign-born workers, natives and non-Europeans. We test this impact by using panel data on 20 European countries from 2002 to 2013, and running two major empirical models. We apply several econometrics approaches and control for several independent variables such as education, employment in specific sectors, and some of the macroeconomic indicators. We find that the employment effect is insignificant for the three subgroups. Moreover, we find that the earnings of foreign-born workers are positively affected by an increase in the minimum wage. These findings are consistent with previous empirical work. The effect of the minimum wage on the average earnings of natives in European countries is positive and highly significant as well. This is inconsistent with previous empirical work done on skilled and unskilled non-immigrants in the U.S.

When we try controlling for the average wage, we find that increases in the minimum wage that are not part of an overall increase in the wage scale do not significantly affect the earnings of immigrants. In this case, an increase in the minimum wage only affects native workers (with a positive effect on their earnings, and a slightly negative effect on their employment). However, when we try controlling for the unemployment rate, we find that the positive effect of the minimum wage on earnings of the subgroups remains the same as our main results with a slightly negative effect on the employment of immigrants. Finally, we notice that in the long run, the effect of minimum wage on earnings of the three subgroups remains positive, but is slightly negative on the employment of these subgroups, suggesting the possible existence of labor market rigidities.

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*To my
Beloved Family*

CHAPTER I

BACKGROUND OF THE STUDY

A. Introduction

This paper examines the effect of an increase in the minimum wage on the labor market outcomes of immigrants in European countries. We focus on the earnings and employment of the three subgroups which are natives, total immigrants and non-European immigrants. Our purpose is to test the impact of a variation in the real minimum wage on employment and real earnings of these subgroups.

There's an enormous literature on the effect of the minimum wage on labor market outcomes. Moreover, there are some literatures about the effect of immigrants on the minimum wage. However, there's an insufficient literature on the effect of minimum wage on immigrants or more specifically on the labor outcomes of immigrants.

We will be focusing in this paper on immigrants since the immigrants took less attention in the minimum wage literature as Ramirez (2013) has stated. Actually, there's only one empirical paper in the literature that is specifically related to our topic, and this is represented by the work of Orrenius and Zavodny (2008) that was done on foreign-born workers in the U.S.

We will be investigating the impact of the real minimum wage on the employment and earnings of the immigrants versus natives in European countries. In

order to do so, we will employ empirical models using the minimum wage as an independent variable to observe its effect in several regressions.

B. Literature Review

This section briefly mentions what has been written about this topic. It primarily refers to the literature of the minimum wage and employment in general. After that, it focuses on the minimum wage and employment of immigrants. In addition, there are two minor parts that present a brief overview about the foreign-born laborers in different countries. Later, the chapter continues with the Effect of the minimum wage on immigrants' employment and earnings. Finally, it shows the effect of the minimum wage on immigrants' mobility.

1. Effect of Minimum Wage on Employment

According to the neoclassical theory, in a labor market model of a downward sloping demand and upward sloping supply if the minimum wage is above equilibrium wage, then the supply of labor is more than the demand of labor leading to unemployment. If providing wages to workers will depend on their marginal productivity according to Meyer and Wise (1983, p.73), unemployment will result if the marginal productivity of labor is less than the minimum wage and employment will be sustained only if the marginal productivity exceeds the minimum wage level. So increasing the minimum wage will increase the price of labor (i.e. the supply of labor will increase), and accordingly will lead to a higher unemployment level. Moreover, since the labor is one of the factors of production, the increase of its price means an

increase in the cost of production as well. And therefore, according to Brown (1940), minimum wages are unfavorable to the community as a whole because of the high cost of production mentioned previously which will result in higher prices of goods and therefore a lower demand in the good market and in the labor market leading to unemployment (as cited in Volscho, 2005).

There is a constant worrying of the dominant theory that any rise in the minimum wage rate comes at the expense of employers and displaces low-wage workers (Gordon, 2014). However, there are Economists who advocate the increase in the minimum wage, for example Kaufman (2010) who believes that low wages reduce the potential of workers and prevent them from being efficient and constructive which results in a wasteful distribution of resources, and to inequitable profits earned by employers and capital owners (as cited in ICF GHK, 2014). This proves that the increase in the minimum wage to be equal to the laborer's marginal product in a competitive market is a fair and an efficient policy (Kaufman, 2010). Moreover, and according to latest studies, there's no evidence that raising the minimum wage leads to a decrease in employment (Card and Krueger, 1994).

2. Effect of Minimum Wage on Employment of Immigrants

We will be focusing in this paper on immigrants since the immigrants took less attention in the minimum wage literature as Ramirez (2013) has stated. Some old figures show that the number of immigrants as mentioned by the US Census in 1990 reached 14% of the U.S. population in 1990 and according to the 1991 Census, in

Australia, the total number of immigrants reached 30% of the population in 1991 (Miller and Neo, 2003).

Concerning the labor market outcomes of immigrants, it has been stated that since the minimum wage is low in the U.S., the probability of immigrants to be unemployed is accordingly low, and their wages will increase only after living there for some years and gaining high skills, but this will not significantly affect the unemployment level (Miller and Neo, 2003). Moreover, in their study, Orrenius and Zavodny (2008) have concluded that an increase in minimum wage in the U.S. has a positive impact on the earnings of less-skilled immigrants but no effect on ‘disemployment’ (i.e. an increase in the minimum wage does not deprive immigrants from their current jobs), Also Giulietti (2010) has reached this same conclusion, but by including all immigrants in general instead of focusing on the less-skilled immigrants.

Conversely, in Australia where the minimum wage is high, the newly arrived immigrants will be more likely to be unemployed, however after years of living there and acquiring high skills, the probability of unemployment will decrease (Miller and Neo, 2003). Cadena (2012) has stated that an increase in minimum wage will have significantly high impact on the newly arrived immigrants.

3. An Overview about the Foreign-born Workers in Different Countries

The total labor force in OECD countries was affected by the high unemployment rates that resulted from the economic crisis, but the foreign-born workers have suffered the most from these consequences (OECD Fact book, 2013). It has been also stated that

in contrast to the U.S, Australia, and New Zealand, in European countries, the foreign-born laborers are more negatively affected by unemployment than non-immigrant laborers (OECD Fact book, 2013). So what is the effect of an increase in the minimum wage on the labor market outcomes of immigrants vs. non-immigrants in Europe?

Jean (2006) has stated that a higher minimum wage has more unfavorable impact on immigrants than on natives in OECD nations (as cited in Orrenius, 2008), leading to a higher unemployment of male immigrants and lower integration of female immigrants in economic activity. Orrenius and Zavodny (2008) have referred to Jean (2006)'s declaration in order to conduct a case study in the U.S. that examines the effect of an increase in the minimum wage on immigrants' employment, earnings and hours of work by using state-level panel data models.

We use models that are somehow similar to what Orrenius and Zavodny (2008) have used, but are different than their work in a way that we focus on Europe not U.S. Moreover, the subgroups of our study are all foreign-born population, the non-European immigrants, and all natives excluding teenagers. We also use additional econometrics approaches, control for more variables, and use different years than the ones in their study. These details will be discussed in the methodology chapter.

4. The Effect of Minimum Wages on Immigrants' Employment and Earnings

Orrenius and Zavodny (2008) examine the influence of the minimum wage on low-skilled immigrant workers. Their main aim is to test the impact of the minimum wage on the labor market outcomes of immigrants and natives, including on earnings,

hours of work, and employment of these groups. They also test the effect of the minimum wage on native teenagers in order to compare the results with other research done before, knowing that the low-educated immigrants and native teens earn the minimum wage.

Orrenius and Zavodny (2008) collect annual state-level data from the US between 1994 and 2005 on low-skilled immigrants and low-skilled adult natives and teenagers, where “low-skilled” according to the paper represents workers who don’t hold a high school degree. They use panel-data analysis to test the association between the real minimum wage and each of these variables: employment, hours worked, and earnings.

Note: The regressions use year and state fixed effects.

(1) $\ln \text{Emp/Pop}_{s,t} = \alpha + \beta \ln \text{MW}_{s,t} + \gamma \text{BusCycle}_{s,t} + \sigma S_s + \tau T_t + \varepsilon_{s,t}$, is used to examine the effect of the minimum wage on employment, where the dependent variable is the log of employment rate for a specific group of the population, the independent variable is the log of real minimum wage (MW), where S and T are state and time fixed effects, respectively. Finally, among the controls are the measures of the business cycle such as “log of real gross state product (GSP) per capita, initial unemployment insurance claims, and the real value of permits issued for privately-owned residential construction” (Orrenius and Zavodny, 2008).

(2) $\ln \text{Wage}_{s,t} = \alpha + \beta \ln \text{MW}_{s,t} + \gamma \text{BusCycle}_{s,t} + \sigma S_s + \tau T_t + \varepsilon_{s,t}$ where the dependent variable represents log average earnings per hour.

(3) $\ln \text{Emp/Pop}_{s,t} = \alpha + \beta \ln(\text{MW}_{s,t} / \text{Wage}_{s,t}) + \rho \ln(\text{Wage}_{s,t}) + \gamma \text{BusCycle}_{s,t} + \sigma S_s + \tau T_t + \varepsilon_{s,t}$, to test the effect of the log of the relative minimum wage divided by the log real average wage, on the log of employment rate for a specific group of the population. In addition, they run a fourth equation using the “average weekly hours” of work as a dependent variable.

Orrenius and Zavodny (2008) mention that the educated native employees (i.e. workers who hold a college degree or more) are not supposed to be influenced by a variation in the minimum wage, and confirm it after testing its effect on the earnings of this group. Therefore, the result is similar to what they have anticipated; i.e. no correlation between these two variables.

According to the results, the minimum wage has a significantly positive effect on the earnings of the low-skilled immigrants when the regression doesn't control for the business cycle. After controlling for the business cycle, the minimum wage leads to the same significant results but with a relatively reduced impact. However, it does not lead to a significantly negative effect on the employment of immigrants, it does not decrease the average hours worked for low-skilled immigrants, and it doesn't reduce the average hours of work of immigrants. When it comes to low-skilled native workers, the results show that an increase in the minimum wage does not increase the hourly earnings of low-skilled natives, and it also doesn't have any negative impact on employment rates or working hours.

5. The Effect of Minimum Wage on Teens According to Empirical Work

According to Orrenius and Zavodny (2008), teens have the largest effect on earnings resulting from a minimum wage increase as compared to the low-skilled immigrants and low-skilled natives. It's worth mentioning here that male teens earn more than female teens. When they control for the economic situation which is represented by the "business cycle" at the state-level in the regressions above, they notice that an increase in the minimum wage has a negative effect on the employment of teens. This result is matching with the research of (Burkhauser, Couch, and Wittenburg, 2000; Neumark and Wascher, 1992, 1994 as cited in Orrenius and Zavodny, 2008). This total negative effect on employment is due to male teens not female teens because an increase in the minimum wage only decreases the hours of work of female teens and doesn't reduce their employment. However, there's no significant negative effect on the average hours of working for male teens, but an adverse effect on their employment in general as shown above.

ROBUSTNESS:

In order to control for the economic conditions across states, Orrenius and Zavodny (2008) used the unemployment rate, after that they added a control for the fraction of the population aged from 16 to 64, and later they controlled for the enrollment rate of teenagers. It's worth mentioning here that the main reason for focusing on other variables such as unemployment is that it delays economic activity. When it comes to teens, and after including the unemployment rate, they noticed a

decrease in the value of the negative impact of an increase in the minimum wage on the employment of male teens. This same result holds when they controlled for the fraction of population aged 16-64 of less-educated natives, less-educated immigrants and all teens to “control for any labor supply or cohort size effects” (Orrenius and Zavodny, 2008).

When they take into account the unemployment rate to control for the business cycle, they notice there’s a positive correlation between the real minimum wage and the employment rate among low-skilled adult male natives. Then when they control for the fraction of the population that measures the size of the tested group, there is also a positive correlation between the real minimum wage, and the employment rate of the low-skilled male immigrants. Only the male workers are significantly affected by an increase in the minimum wage.

Since the effects of a variation in the minimum wage may take some time, they choose to add a time lag to the three regressions of earnings, hours of work, and employment. However, they don’t find any difference in the results, except a negative impact on the employment of low-skilled immigrant women.

As a conclusion, Orrenius and Zavodny (2008) find an evidence of a drop in employment or hours of work of teens as a result of an increase in the minimum wage, depending on the gender. However, they don’t find any proof of an unfavorable employment or hours effects among low-skilled immigrants.

This result is different than what the competitive model has anticipated. Since earnings of low-skilled immigrants increase as a result of a rise in minimum wage, so

according to the competitive model, the amount of labor employed must decrease. This weird finding of minimum wage's effect on employment of low-skilled immigrants could be explained by the possible effect of the minimum wage on the destination's preferences of this group (Orrenius and Zavodny, 2008).

6. Immigrants and Mobility

In order to observe the effect of the minimum wage on the mobility of immigrants, Orrenius and Zavodny (2008) examine this effect on the different proportions of the population (of both immigrants and natives). They notice a negative correlation between the minimum wage and the low-skilled immigrants' allocation, but no correlation between the minimum wage and the low-skilled native's allocation. They discover that when the real minimum wage increases, the proportion of adult immigrants who don't possess a high school diploma decreases; a contradictory result is observed for adult female natives. They also find a positive correlation between the minimum wage and the "average number of years of education among the adult immigrants" (Orrenius and Zavodny, 2008), proposing that an increase in the minimum wage motivates well-educated immigrants to stay in (or move to) this state, the exact opposite happens to low-educated immigrants. However, they don't reach the same finding for adult natives.

Cadena (2012) conducts a study to test the effect of a rise in the state minimum wage on the mobility of immigrants in the United States, because he believes that through this process, he would be able to assess the disemployment outcome of the

minimum wage policy. Disemployment is a term used to describe the “slower growth of employment rather than from actual job loss” (Cadena, 2012). He uses a state-month panel data from January 1994 to December 2007, and discovers a significant verification that low-skilled immigrants desire to live in a state that has a stable minimum wage rather than a state that raises its minimum wage. Cadena (2012) also finds that an increase in the minimum wage tends to reduce the likelihood of a new low-skilled immigrant worker who is searching for a job to actually finding one. Therefore, he deduces that a rise in the minimum wage reduces the expected earnings for low-skilled immigrants who are seeking for jobs.

The choice of the newly arrived immigrants concerning the state to reside in depends on the expected earnings (Borjas 2001, Jaeger 2007, Cadena 2013, Cadena and Kovak 2013). Cadena (2012) concludes in his study, that low-skilled immigrants who are newly moving to the United States, have a tendency to stay in states with a stable minimum wage rather than working in states with increasing minimum wages. However, when it comes to skilled-immigrants, an increase in the minimum wage has no effect on their decision of moving to another state. Here it’s worth mentioning that the low-skilled immigrant’s case depends on the labor demand elasticity theory. The workers would choose to escape from a rise in the minimum wage in case the demand for low-skilled labors is elastic, and they would be attracted to an increase in the minimum wage only if the demand for them is comparatively inelastic (Cadena, 2012). Finally, he sheds light on the effect of low-skilled immigrants’ mobility on the employment of native teens since they both seek minimum wage jobs and they also

have similar levels of skills. This concept is also observed by Smith (2010) who proved that there's a correlation between the arrival of immigrants and the reduced employment rates for native teenagers.

7. Illegal Immigrants and the Minimum Wage

A study was conducted by Orrenius and Zavodny (2008) on a sample of low-skilled immigrants to the US coming from Latin America since in 2000. 80% of the total informal immigrants in the U.S. were Latin Americans according to (INS 2003; Passel, Capps, and Fix 2004, as cited in Orrenius, 2008). The results showed that when the minimum wage increases, the earnings per hour significantly increase, but there's no significant depressing impact on employment or hours of work.

This chapter refers to the literature review and the main studies that were conducted in order to respond to questions related to this topic. It also introduces the major findings of previous work. The next chapter expresses the data and the empirical methodology that we are using.

CHAPTER II

EMPIRICAL METHODOLOGY

This chapter describes the methodology by introducing all the data, variables and equations of the regressions that we have been using in order to estimate the results. In addition, it presents the approaches and the tables of results.

We use a panel data technique in order to examine the effect of the minimum wage on the real earnings and employment rates of all immigrants, natives, and non-Europeans. The term immigrants in this paper represents all the foreign-born populations that is residing in a specific European country, regardless whether they are Europeans or not. To distinguish between immigrants of different origins, we also use the data on non-Europeans to represent the immigrants with respect to Europe as a whole. We use annual data on 20 European countries¹ for the period 2002-2013 since there's no additional accurate data available for other years for our main variables. Then we apply OLS, fixed effects, and Random effects.

The main independent variable of our regressions is the real minimum wage and the dependent variables are real earnings and employment rate of each subgroup.

1. The number of countries is limited to 20 because the rest of European countries don't have an explicit national minimum wage. The countries included in this paper are all EU members: Belgium, Bulgaria, Czech Republic, Estonia, France, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and United Kingdom. However, the EU membership status changes for the countries which entered the Union during different years such as Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia in 2004 and Bulgaria and Romania in 2007. It's worth mentioning here that we include year dummies in our regressions (i.e. year fixed effects).

We try to follow the empirical approach used by Orrenius and Zavodny (2008) since it's the only article in the literature of the minimum wage and immigrants that is directly related to our topic.

A. Data and Measurement

We run two main regressions that have employment and real earnings as dependent variables, respectively. We collect data on earnings and employment for each of the immigrants, natives, and non-Europeans from Eurostat (2014). Moreover, we have data on the employment rate and earnings of males versus females that correspond to natives, immigrants and non-Europeans from the same source as well.

It's worth mentioning here, that earnings are measured as the "mean equivalised net income" (Eurostat, 2014). We convert the figures into real earnings using the Consumer Price Index (CPI) of base year 2010 from the World Bank, since previous empirical papers have used real variables. The Earnings data are reported yearly and measured in Euros instead of purchasing power standard (PPS). It's also worth mentioning that our "employment rates represent employed persons as a percentage of same age total population" (Eurostat, 2014), so the employment rate of each of our subgroups has its own population.

The main independent variable is the real minimum wage; the data of the national (nominal) indicator is available in Euros from (Eurostat, 2014). According to Eurostat (2014), the nominal minimum wage is a monthly rate collected in January of

every year. We convert it to the real minimum wage by using data on the CPI (base year 2010) from the World Bank.

Other independent variables that we control for are some macroeconomic indicators that are the Growth Domestic Product (GDP) per capita measured in purchasing power parity (PPP) terms, the growth rate of GDP per capita, and the inflation rate. The data for all these macroeconomic indicators are retrieved from the World Bank. We also control for education, by using data from Eurostat (2014) on the education attainment for each of the subgroups: immigrants, natives and non-Europeans. More specifically, we control for the “low-skilled” or “less-educated” to be the people aging from 19 to 64 that don’t hold a college degree

Moreover, we control for the percentage of employment in the services sector as a percentage of the total employment, and the percentage of employment in the industry sector as a percentage of the total employment. The data for these two indicators are retrieved from the World Bank. In addition, we control for corruption by using the corruption perceptions index as an indicator and its data is retrieved from Euromonitor International (2014).

Summary statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Minimum wage (monthly rate)	240	644.8022	493.7771	50.33	1874.19
Earnings of non-Europeans (yearly)	86	12303.15	8118.184	2119	36505
Earnings of Immigrants (yearly)	181	12712.14	8310.511	1947	35988
Earnings of Natives (yearly)	188	13822.4	9749.066	1698	43502
Employment rate of non-Europeans	139	63.76403	7.444695	39.3	78.5
Employment rate of Immigrants	223	64.53812	7.696725	27.8	78.5
Employment rate of Natives	226	68.32611	5.189826	53.2	80.6
Employment in services sector (% of total employment)	219	64.02785	9.849822	34.1	84.1
Employment in industry sector (% of total employment)	219	27.86027	6.485695	12.4	40.5
Low-skilled non-Europeans (as a % of all non-Europeans)	133	70.12857	11.4986	39.1	90.7
Low-skilled immigrants (as a % of total immigrants)	192	71.66146	12.9195	0	89.1
Low-skilled Natives (as a % of total Natives)	197	78.20203	6.906577	65.4	91.1
Corruption	238	5.886975	1.630368	2.6	9
Inflation	240	3.267917	2.779018	-4.5	22.8
Unemployment Rate	240	9.227083	4.445925	2.6	27.3

From the table above, the lowest minimum wage is in Bulgaria (51 Euro) in 2002, and the highest is in Luxembourg (for 1974 Euro) in 2013.

The low-skilled² variable includes anyone with less than a college degree. The high percentages in these variables' maximum in the Natives' subgroups are mainly due to the natives in Czech Republic, Portugal, Romania, Malta, and Slovakia.

2. The "low-skilled" variable of the three subgroups could be overstated here (because it accounts for people age 19 to 64 i.e. it includes people who are still in college as well), since there's no available data on this variable that starts from age 21 or 22.

B. Estimation Procedure

We run the regressions using OLS on the pooled data, Fixed Effects and Random Effects on the panel as a first step. Then we run Hausman test to choose between FE and RE. Furthermore, we also control for year dummies.

The FE approach controls for specific characteristics that belong to each country on a condition that they are stable over time. This method helps us avoid the omitted variable bias by excluding these time-fixed variables from the error term by controlling for them in the regressions (i.e. avoiding the risk that these variables could be correlated to one or more independent variables in our regressions).

The Random effects approach, on the other hand, doesn't control for these country-fixed effects because it immediately supposes that they are not related to any of the other independent variables in these regressions.

Mainly, we proceed by running OLS and FE controlling for some macroeconomic variables such as inflation, GDP per Capita and the percentage growth of GDP per Capita. Moreover, we control for other variables such as “low-skilled”, “employment in industry as a percentage of total employment”, and “employment in services sector as a percentage of total employment”.

The two major equations are:

$$\text{Log Earnings} = B_0 + B_1 (\text{log minimum wage}) + B_2 (\text{inflation}) + B_3 (\text{GDP per Capita}) + B_4 (\% \text{ growth of GDP per capita}) + B_5 (\text{low-skilled}) + B_6 (\text{employment in services}) + B_7 (\text{employment in industry}) + \text{Error term}$$

$\text{LOG Employment} = B_0 + B_1 (\text{log minimum wage}) + B_2 (\text{inflation}) + B_3 (\text{GDP per Capita}) + B_4 (\% \text{ growth of GDP per capita}) + B_5 (\text{low-skilled}) + B_6 (\text{employment in services}) + B_7 (\text{employment in industry}) + \text{Error term}$

These equations are applied to all natives, all foreign-born population, and also to non-Europeans specifically. Then we apply them to the females and males of these three subgroups. It's worth mentioning that all our regressions exclude teens.

CHAPTER III

RESULTS

A. Main Results and Analysis

Table 1. Effect of the Minimum Wage on Employment rates

TOTAL	NON-Europeans		Immigrants		Natives	
LOG EMPLOYMENT	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects
Log minimum wage	-0.228*** (0.0581)	0.0522 (0.0888)	-0.0755 (0.0458)	-0.0957 (0.0686)	-0.0256 (0.0159)	-0.0342 (0.0253)
GDP per capita	0.00122*** (0.000290)	0.000738** (0.000314)	0.000322** (0.000161)	9.98e-05 (9.34e-05)	8.04e-05 (5.89e-05)	5.62e-05* (3.10e-05)
Percentage growth of GDP per Capita	-0.0855** (0.0408)	0.0104 (0.0230)	-0.00116 (0.0132)	-0.00411 (0.00617)	0.00362 (0.00405)	0.00192 (0.00173)
Inflation rate	0.00483* (0.00253)	0.00316** (0.00144)	0.00671** (0.00275)	0.00117 (0.00145)	0.00119 (0.00108)	0.00104* (0.000538)
Employment in services as of total employment	-0.00225 (0.00148)	-0.00138 (0.00295)	-0.000166 (0.00107)	-0.00133 (0.00231)	- 0.00117*** (0.000376)	- 0.00293*** (0.000864)
Employment in industry as of total employment	-0.00152 (0.00165)	0.00956** (0.00416)	0.000453 (0.00130)	0.0137*** (0.00291)	0.000826* (0.000442)	0.00374*** (0.00106)
CPI #	0.00104 (0.00570)	0.0288*** (0.00825)	0.0212*** (0.00573)	0.0440*** (0.00658)	0.0165*** (0.00228)	0.00554** (0.00238)
Low-skilled NON-Europeans	0.000397 (0.000474)	-0.00200** (0.000859)				
Low-skilled immigrants			0.000348 (0.000488)	- 0.000739* (0.000392)		

Standard errors in parentheses

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

In table 1, the OLS regression indicates a negative effect of the minimum wage on the employment of non-Europeans. In column (1), a 10% increase in the real minimum wage is associated with a decrease in the employment of this group of 2.3% and the effect is highly significant (i.e. at 1% significance level). Whereas when we use FE regression, there's a positive but insignificant effect on the employment rate of non-Europeans.

When using the OLS, there's a negative correlation between the minimum wage and employment rate of immigrants and natives (coefficients of -0.0755 and -0.0256 in columns (3) and (5), respectively). This indicates that the increase in the minimum wage has a more negative effect on immigrants' employment than on the employment of natives.

However, the effect on natives and total immigrants is not significant. Also when using Fixed Effects approach, there's a negative correlation between the minimum wage and the employment rate of these two subgroups (coefficients of -0.09 and -0.03 in columns (4) and (6), respectively). This indicates that the increase in the minimum wage has a more negative effect on immigrants' employment than on the employment of natives. However these effects are also not significant.

In general, this first set of results is consistent with Card and Krueger (1994), there's no significant evidence that an increase in the minimum wage is associated with a decrease in the employment for the whole population. Moreover, this is also true when

we test this effect on each of the subgroups of the population, as shown in the table above. This is also proved in Orrenius and Zavodny (2008), and Giulietti (2010) for the U.S. case study.

Table 2 Effect of the Minimum Wage on Average Yearly Earnings

TOTAL LOG EARNINGS	NON-Europeans		IMMIGRANTS		NATIVES	
	(1) OLS	(2) Fixed Effects	(3) OLS	(4) Fixed Effects	(5) OLS	(6) Fixed Effects
VARIABLES						
Log minimum wage	0.637*** (0.0853)	0.310 (0.331)	0.553*** (0.0632)	0.639*** (0.115)	0.557*** (0.0454)	0.801*** (0.0917)
GDP per capita	0.000439 (0.000393)	-0.000531 (0.000857)	0.000956*** (0.000297)	0.000707* (0.000402)	0.00146*** (0.000227)	0.000579* (0.000318)
Percentage growth of GDP per Capita	-0.00390 (0.0156)	-0.00813 (0.0140)	0.0111 (0.0143)	0.00797 (0.00990)	0.0120 (0.0112)	0.0127 (0.00770)
Inflation rate	0.00146 (0.00433)	0.00324 (0.00598)	-0.000249 (0.00309)	-0.000908 (0.00246)	0.00289 (0.00242)	0.000337 (0.00192)
Employment in Services as a % of total employment	-0.00269 (0.00231)	0.000929 (0.0101)	0.00247 (0.00162)	0.00278 (0.00411)	0.00595*** (0.000853)	0.00226 (0.00330)
Employment in industry as a % of total employment	-0.00299 (0.00252)	0.00416 (0.0120)	0.00254 (0.00168)	0.0131** (0.00536)	0.00349*** (0.00107)	0.0115*** (0.00421)
CPI #	0.0368*** (0.00974)	0.0189 (0.0260)	0.0210*** (0.00663)	0.0189* (0.0109)	0.0158*** (0.00502)	0.0107 (0.00846)
Low skilled-immigrants			-0.00140* (0.000780)	0.000109 (0.00128)		
Low-skilled natives					0.00213*** (0.000782)	0.00602 (0.00394)
Number of Countries		19		19		20
Country FE		YES		YES		YES

Standard errors in parentheses

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

The OLS regression indicates a positive effect of the minimum wage on the real EARNINGS of non-Europeans. In column (1), a 10 % increase in the real minimum wage is significantly associated with a 6.37% increase in the real earnings of Non-Europeans at a 1% level of significance. Whereas when we use FE regression, there's a positive (3.10%), but insignificant effect on the real earnings of non-Europeans. This result is the same for all foreign-born and native workers as well where an increase in the minimum wage by 10% leads to an increase in the earnings of immigrants by 5.53% and natives by 5.57%. We notice that the OLS indicates a slightly more positive earnings effect for non-Europeans than for all foreign-born populations, and it also exceeds the effect for natives.

However, the fixed effects show opposite results, where the earning effect is positive and significant for natives and immigrants. We notice that with a 10% increase in the real minimum wage, the real earnings of natives increase by 8.01% which is relatively higher than the earning effect for immigrants of 6.39% in columns (4) and (6). The real earning effect for non-Europeans (when they are considered separately) is insignificant.

Orrenius and Zavodny (2008) conclude in their study on the U.S. that the increase in the minimum wage has no significant effect on the earnings of low-skilled and skilled adult natives. This is due to the fact that adult natives in U.S. don't even seek minimum wage jobs, unlike native teenagers and low-skilled immigrants who compete for such jobs as Cadena (2012) finds. Therefore, adult natives don't get affected by a change in the minimum wage.

However, we notice from the table above, that on average, European natives in general have significantly higher earnings as a result of an increase in the minimum wage, even as we hold fixed the fraction of them that have low skills: a 10% increase in the minimum wage results in 8% higher earnings. This is different than what Orrenius finds for U.S. non-immigrants when she intended to also observe the earnings effect on the educated non-immigrants by looking at this “skilled” group separately, she confirms that educated non-immigrants in U.S. are not influenced by a variation in the minimum wage.

Our tables above are different than what the competitive model predicts since the earnings of immigrants increase as a result of a rise in the minimum wage, the competitive model would have anticipated that the amount of labor employed must decrease. However, here it doesn't. Our finding is similar to what Orrenius and Zavodny (2008) find in their study (i.e. significant earnings effect on foreign-born workers, but insignificant employment effect).

Table.3 Effect of Minimum Wage on Male Employment rates

MALES	Non-Europeans		Immigrants		Natives	
LOG EMPLOYMENT VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects
Log minimum wage	-0.144** (0.0611)	0.164 (0.117)	-0.111** (0.0535)	-0.105 (0.0679)	0.0256* (0.0151)	-0.0226 (0.0267)
GDP per Capita	0.00116*** (0.000294)	0.000898** (0.000419)	0.000883*** (0.000256)	0.000566** (0.000236)	9.04e-05 (5.56e-05)	2.18e-05 (3.27e-05)
Percentage growth of GDP per Capita	-0.0395 (0.0527)	0.0256 (0.0367)	-0.00513 (0.0123)	-0.00655 (0.00609)	0.00422 (0.00382)	0.00300 (0.00182)
Inflation rate	0.00446 (0.00270)	0.00368* (0.00190)	0.00685*** (0.00262)	0.000618 (0.00143)	0.00191* (0.00102)	0.00113** (0.000567)
Employment in services as of total employment	-0.000304 (0.00151)	-0.00263 (0.00384)	0.00159 (0.00137)	-0.00420* (0.00227)	-0.000156 (0.000354)	- 0.00468*** (0.000912)
Employment in industry as of total employment	0.000527 (0.00169)	0.0103* (0.00541)	0.00124 (0.00139)	0.0108*** (0.00302)	0.00120*** (0.000417)	0.00531*** (0.00112)
CPI #	-0.0147** (0.00584)	0.0145 (0.0106)	0.00278 (0.00570)	0.0337*** (0.00649)	0.00794*** (0.00215)	0.00726*** (0.00251)
Low-skilled non-Europeans	-8.91e-05 (0.000491)	-0.00257** (0.00123)				
Low-skilled immigrants			0.00112* (0.000673)	- 0.00232*** (0.000776)		

Standard errors in parentheses

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects).

The OLS indicates that an increase in the minimum wage by 10% reduces the employment rate of non-European Males by 1.44% and reduces the employment rate of all foreign-born men by 1.11% in columns (1) and (3), respectively. These results are

significant at 5%. However, an increase in the minimum wage by 10% is associated with an increase in the employment rate of native MALES of 0.256 % (significant at 10%).

The Fixed Effects regressions don't indicate any significant negative effect of the minimum wage on the Male employment in any of the subgroups.

Table.4 Effect of Minimum Wage on Male Earnings

MALES	Non-Europeans		Immigrants		Natives	
LOG EARNINGS	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects
Log minimum wage	0.652***	0.263	0.499***	0.584***	0.539***	0.791***
	(0.132)	(0.561)	(0.0672)	(0.130)	(0.0456)	(0.0913)
Percentage growth of GDP per Capita	0.141	0.184	-0.102*	-0.133***	0.0123	0.0129*
	(0.144)	(0.188)	(0.0548)	(0.0441)	(0.0112)	(0.00766)
GDP per CAPITA	0.000786	-0.000712	0.00111***	0.00143***	0.00159***	0.000580*
	(0.000473)	(0.00124)	(0.000298)	(0.000421)	(0.000228)	(0.000317)
Inflation rate	0.00223	0.00911	0.00186	0.00104	0.00366	0.000909
	(0.00539)	(0.0109)	(0.00323)	(0.00261)	(0.00243)	(0.00191)
Employment in services as of total employment	0.000292	0.000207	0.00328**	0.000633	0.00594***	0.00207
	(0.00290)	(0.0145)	(0.00164)	(0.00427)	(0.000857)	(0.00328)
Employment in industry as of total employment	0.00162	0.00566	0.00321*	0.00599	0.00347***	0.0120***
	(0.00337)	(0.0161)	(0.00173)	(0.00565)	(0.00107)	(0.00419)
CPI #	0.0310***	0.00679	0.0192***	0.0230**	0.0152***	0.0110
	(0.0114)	(0.0362)	(0.00683)	(0.0110)	(0.00505)	(0.00841)
Low-skilled Immigrants			-0.00211**	-0.00380**		
			(0.000871)	(0.00147)		
Low-skilled natives					0.00183**	0.00593
					(0.000786)	(0.00392)
Observations	75	75	150	150	164	164
R-squared	0.940	0.443	0.952	0.608	0.980	0.718
Number of Countries		16		18		20
Country FE		YES		YES		YES

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

The OLS regressions indicate a positive Earning effect for the Males in the three subgroups, and it's highly significant (at the 1% level of significance).

An increase of 10% in the minimum wage increases the real earnings of native men by 5.39%, which is more than the effect on immigrant men of 4.99% in columns (5) and (3) respectively. Concerning this impact on non-European men in column (1), OLS indicates a positive earning effect of 6.52% as a result of a 10% increase in the minimum wage, which is higher than the effect on native and total foreign-born men.

It's worth mentioning here that the OLS for "non-Europeans" may be biased because it doesn't control for the "low-skilled" variable in all the "non-Europeans" Earnings regressions in order to avoid a very low number of observations.

FE indicates a highly significant positive earnings effect in columns (4) and (6) with an insignificant effect on the real earnings of non-European men in column (2). An increase of 10% in the minimum wage leads to a 7.9% increase in the real Earnings of native men which is relatively higher than the earnings effect of immigrant men of 5.8%.

Here also, according to Orrenius's work, there is an insignificant earnings effect for the low-skilled native men in U.S. Moreover, the earnings effect is positive for male immigrants (significant at 5%), yet it's insignificant for male natives.

However, this is different than our results in European countries, where the earnings effect for male natives is positive and significant (i.e. significant at 1%).

Moreover, the earnings effect for foreign-born men is also positive and significant in the table above.

Table.5 Effect of Minimum Wage on Female Employment rates

LOG EMPLOYMENT VARIABLES	Non-Europeans		Immigrants		Natives	
	(1) OLS	(2) Fixed Effects	(3) OLS	(4) Fixed Effects	(5) OLS	(6) Fixed Effects
Log minimum wage	-0.372*** (0.0707)	0.138 (0.109)	-0.313*** (0.0710)	-0.101 (0.0963)	-0.0901*** (0.0298)	-0.0475 (0.0350)
GDP per Capita	0.00134*** (0.000354)	0.000637* (0.000383)	0.00118*** (0.000341)	0.000374 (0.000337)	9.00e-05 (0.000110)	0.000107** (4.28e-05)
Percentage growth of GDP per capita	-0.0990** (0.0498)	0.0152 (0.0278)	-0.00759 (0.0164)	-3.76e-05 (0.00854)	0.00293 (0.00756)	0.000774 (0.00239)
Inflation rate	0.00528* (0.00310)	0.00516*** (0.00171)	0.0101*** (0.00345)	0.00184 (0.00202)	0.000454 (0.00202)	0.00122 (0.000742)
Employment in services as of total employment	-0.00424** (0.00180)	8.09e-06 (0.00351)	-0.00310* (0.00183)	0.00113 (0.00321)	- (0.000701)	-0.000882 (0.00119)
Employment in industry as of total employment	-0.00375* (0.00205)	0.0101** (0.00494)	-0.00372** (0.00186)	0.0122*** (0.00428)	0.000316 (0.000825)	0.00142 (0.00146)
CPI #	0.0194*** (0.00715)	0.0345*** (0.0102)	0.0387*** (0.00758)	0.0454*** (0.00920)	0.0270*** (0.00425)	0.00171 (0.00329)
Low-skilled non-Europeans	0.000297 (0.000595)	- (0.00283*** (0.00106)				
Low-skilled immigrants			0.000496 (0.000892)	- 0.00336*** (0.00107)		
Low-skilled natives					- 0.00539*** (0.000689)	-0.00288* (0.00154)
Observations	109	109	166	166	176	176
R-squared	0.448	0.581	0.340	0.526	0.519	0.347
Number of Countries		19		19		20
Country FE		YES		YES		YES

Standard errors in parentheses

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

In column (1), OLS indicates that a 10% increase in the minimum wage is associated with a decrease in the employment of non-European females of 3.7%. This also decreases the employment of immigrants and natives by 3% and 0.9%, in columns (3) and (5) respectively, and it's significant at 1%.

Table.6 Effect of Minimum wage on Female Earnings

FEMALE LOG EARNINGS VARIABLES	Non-Europeans		Immigrants		Natives	
	(1) OLS	(2) Fixed Effects	(3) OLS	(4) Fixed Effects	(5) OLS	(6) Fixed Effects
Log minimum wage	0.662*** (0.124)	0.162 (0.362)	0.553*** (0.0687)	0.438*** (0.122)	0.560*** (0.0456)	0.809*** (0.0905)
GDP per Capita	0.000281 (0.000442)	-0.000573 (0.000801)	0.000822*** (0.000305)	0.000873** (0.000396)	0.00146*** (0.000228)	0.000578* (0.000314)
% Growth of GDP per capita	-0.00431 (0.135)	0.0879 (0.121)	-0.0847 (0.0561)	-0.130*** (0.0415)	0.0117 (0.0112)	0.0137* (0.00760)
Inflation rate	0.00214 (0.00504)	0.0132* (0.00699)	0.000280 (0.00331)	0.000413 (0.00246)	0.00260 (0.00243)	0.000185 (0.00190)
Employment in services as a % of total employment	-0.00495* (0.00272)	0.00612 (0.00932)	0.000854 (0.00167)	-0.00101 (0.00401)	0.00530*** (0.000856)	0.00272 (0.00326)
Employment in industry as a % of total employment	-0.00550* (0.00315)	0.00886 (0.0103)	0.000436 (0.00177)	0.00639 (0.00531)	0.00328*** (0.00107)	0.0117*** (0.00416)
CPI #	0.0398*** (0.0106)	0.0204 (0.0233)	0.0219*** (0.00699)	0.0118 (0.0104)	0.0154*** (0.00504)	0.00991 (0.00834)
Low-skilled immigrants			-0.00176** (0.000891)	-0.00197 (0.00138)		
Low-skilled natives					0.00173** (0.000785)	0.00623 (0.00389)
Observations	75	75	150	150	164	164
R-squared	0.946	0.715	0.950	0.583	0.979	0.723
Number of Countries		16		18		20
Country FE		YES		YES		YES

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

OLS indicates a significant and positive effect of the real minimum wage on the real earnings of the three Female subgroups. Thus, a 10% increase in the minimum wage increases the Female earnings of non-Europeans, immigrants and natives by 6.6%, 5.5% and 5.6%, in columns (1), (3), and (5) respectively.

The FE regressions show an insignificant increase in the real earnings of non-European women in column (2). However, they show a significant increase in the real earnings of immigrant and native women by 4.3% and 8% in columns (4) and (6) as a result of a 10% increase in the minimum wage.

Orrenius and Zavodny (2008) conclude that the earnings effect for female immigrants in U.S. is positive but only (significant at the 10% level), whereas the earnings effect for female natives is negative and insignificant. However, in European countries, we conclude that an increase in the minimum wage is associated with positive earnings effect for native women and it's highly significant. It's even more than the real earnings for immigrant women and this effect is also highly significant (i.e. at 1% level of significance). However, the earnings effect for non-European women is low and insignificant.

Table.7 Effect of minimum wage on MALE ‘employment and earnings’

Effect of log minimum wage	(1)	(2)	(3)	(4)	(5)	(6)
On	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects
MALES	NON-Europeans		Immigrants		NATIVES	
LOG Employment	Negative Significant (at 5%)	Positive Insignificant	Negative Significant (at 5%)	Negative Insignificant	Positive Significant (at 10%)	Negative Insignificant
Log Earnings	Positive Significant (at 1%)	Positive Insignificant	Positive Significant (at 1%)	Positive Significant (at 1%)	Positive Significant (at 1%)	Positive Significant (at 1%)

OLS in table.7 reveals a negative effect of the minimum wage on the employment of the non-European men and all the non-foreign born men of the European countries in general. However, OLS shows a positive effect of the minimum wage on the employment of the native men. FE didn’t show any significant results for male employment in any of the subgroups. The FE results are consistent with Orrenius’s work in 2008, where they are insignificant on male employment.

FE regressions reveal a highly significant and positive earnings effect on male natives; this is inconsistent with Orrenius’s result that is insignificant for low-skilled male natives. The FE regressions reveal highly significant and positive earnings effect on male immigrants, which is consistent with Orrenius’s result. However, there’s an insignificant effect on the earnings for non-Europeans men.

Since the earnings of immigrants increase as a result of a rise in the minimum wage, the competitive model therefore anticipates that the amount of labor employed must decrease. However, here it doesn't.

Table.8 Effect of minimum wage on FEMALE employment and earnings

Effect of log minimum wage	(1)	(2)	(3)	(4)	(5)	(6)
On	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects
FEMALES	NON-Europeans		Immigrants		NATIVES	
LOG Employment	Negative Significant (at 1%)	Positive Insignificant	Negative Significant (at 1%)	Negative Insignificant	Negative Significant (at 1%)	Negative Insignificant
Log Earnings	Positive Significant (at 1%)	Positive Insignificant	Positive Significant (at 1%)			

OLS reveals a negative effect of the minimum wage on the employment of the non-European women, all the non-foreign born women and all native women of the European countries in general. FE didn't show any significant results for female employment in any of the subgroups. The FE results are consistent with Orrenius's work in 2008, where they are negative and insignificant for female employment.

FE regressions reveal a highly significant and positive earnings effect on female natives; this is inconsistent with Orrenius's result that is insignificant for low-skilled

female natives. The FE regressions show highly significant and positive earnings effect on foreign-born female workers, which is consistent with Orrenius's result. However, there's an insignificant effect on the earnings for non-European women. Our results are different than what the competitive model has predicted.

B. Robustness Checks

We report the RE results (that are favorable according to Hausman test) when we control for all the RHS variables in tables 9A and 9B.

Table.9 A. Random Effects (controlling for all the RHS variables)

TOTAL	Employment of immigrants	Employment of natives	Earnings of natives	Earnings of non-Europeans	Earnings of immigrants
VARIABLES	(1) Random Effects	(2) Random Effects	(3) Random Effects	(4) Random Effects	(5) Random Effects
Log minimum wage	-0.00290 (0.0479)	0.0185 (0.0182)	0.729*** (0.0601)	0.676*** (0.122)	0.619*** (0.0756)
GDP per capita	0.000128 (9.21e-05)	7.64e-05** (3.14e-05)	0.000941*** (0.000268)	0.000101 (0.000585)	0.000875*** (0.000334)
Growth of GDP per capita	-0.00253 (0.00626)	0.00211 (0.00179)	0.0147* (0.00788)	-0.00477 (0.0126)	0.00987 (0.0100)
Inflation rate	0.00259* (0.00142)	0.00161*** (0.000532)	0.00211 (0.00182)	-0.000492 (0.00413)	0.000828 (0.00231)
Employment in services as of total employment	-0.00240 (0.00184)	-0.00266*** (0.000720)	0.00447*** (0.00166)	-0.000385 (0.00427)	0.00262 (0.00257)
Employment in industry as of total employment	0.00858*** (0.00212)	0.00201** (0.000808)	0.00710*** (0.00198)	-0.00242 (0.00457)	0.00617** (0.00279)
CPI#	0.0450*** (0.00623)	0.00844*** (0.00233)	0.0151** (0.00726)	0.0279* (0.0161)	0.0218** (0.00896)
Low-skilled immigrants	-0.000777** (0.000387)				-0.000875 (0.00101)
Low-skilled natives		-0.00266*** (0.000835)	0.00183 (0.00171)		
Observations	171	176	164	86	157
Number of Countries	20	20	20	19	19

Standard errors in parentheses

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

CPI#: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

We notice that the effect of the minimum wage on earnings is positive for the three subgroups. Also the effect on employment is insignificant. The RE approach gives us the same results as the FE approach (when we control for all the RHS variables). However, the only difference between the two approaches is that the earnings effect for non-Europeans is significantly positive with RE.

Table 9.B. Random effects for males/females (controlling for all the RHS variables)

RE including all RHS	Earnings of Male	Earnings of MALE	Earnings of MALE	Earnings of FEMALE	Employment of FEMALE	Earnings of FEMALE	Earnings of FEMALE
Male/Female	non-Europeans	immigrants	natives	Non-Europeans	Immigrants	Immigrants	natives
VARIABLES	(1) random Effects	(2) random Effects	(3) random Effects	(4) random Effects	(5) random Effects	(6) random Effects	(7) random Effects
Log minimum wage	0.719*** (0.188)	0.519*** (0.0868)	0.724*** (0.0602)	0.753*** (0.167)	-0.0918 (0.0727)	0.555*** (0.0826)	0.726*** (0.0589)
Growth of GDP per capita	0.196 (0.150)	-0.138*** (0.0415)	0.0151* (0.00791)	0.110 (0.108)	-0.000707 (0.00859)	-0.114*** (0.0399)	0.0155** (0.00783)
Inflation rate	0.000806 (0.00637)	0.00192 (0.00239)	0.00281 (0.00182)	0.00598 (0.00514)	0.00303 (0.00194)	0.00215 (0.00229)	0.00184 (0.00180)
CPI#	0.0230 (0.0184)	0.0208** (0.00929)	0.0155** (0.00727)	0.0225 (0.0173)	0.0451*** (0.00862)	0.0163* (0.00886)	0.0143** (0.00713)
Employment in industry sector	0.00308 (0.00557)	0.00490 (0.00312)	0.00720*** (0.00198)	-0.000997 (0.00579)	0.00705** (0.00293)	0.00101 (0.00294)	0.00687*** (0.00191)
Employment in services sector	0.00221 (0.00492)	0.00139 (0.00278)	0.00439*** (0.00167)	5.01e-05 (0.00524)	-0.00140 (0.00267)	-0.000789 (0.00263)	0.00421*** (0.00161)
GDP per capita	0.000519 (0.000698)	0.00128*** (0.000350)	0.000995*** (0.000269)	6.61e-05 (0.000608)	0.000461 (0.000303)	0.00104*** (0.000335)	0.000947*** (0.000264)
Low-skilled immigrants		-0.00320*** (0.00116)			-0.00281*** (0.000970)	-0.00249** (0.00111)	
Low-skilled natives			0.00152 (0.00171)				0.00148 (0.00164)
Observations	75	150	164	75	166	150	164
Number of Countries	16	18	20	16	19	18	20

The significance of the results when we use the RE approach stays the same as the FE approach. However, the only difference is that the earnings effect for non-European males and females is significantly positive in RE results.

We run all the regressions we ran in the results chapter using fixed effects after excluding some of the RHS variables such as corruption, employment in the services sector, employment in the industry sector. This allows us to observe the overall effect on employment, regardless of the sectors in which people are employed in these economies. Then we run the regressions using Random effects approach and report the RE results only when Hausman Test indicates that RE is preferable.

Table.10 A. Robustness Checks (FE when we exclude some RHS variables)

Robustness Checks Totals	Employment of Non-Europeans	Employment of immigrants	Employment of Natives	Earnings of non-Europeans	Earnings of immigrants	Earnings of natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.0769 (0.0890)	0.286*** (0.0757)	0.0668** (0.0277)	0.432 (0.285)	0.671*** (0.104)	0.861*** (0.0845)
GDP per capita	0.00165*** (0.000242)	0.000213 (0.000130)	0.000100** (4.20e-05)	-0.000365 (0.000818)	0.00144*** (0.000328)	0.00105*** (0.000258)
Growth of GDP Per capita	-0.0308 (0.0240)	-0.000266 (0.00885)	0.00197 (0.00243)	-0.00686 (0.0136)	0.00854 (0.0102)	0.0137* (0.00793)
Inflation rate	0.00599*** (0.00137)	0.00640*** (0.00185)	0.00308*** (0.000658)	0.00418 (0.00555)	0.00346 (0.00219)	0.00372** (0.00169)
Low-skilled immigrants		-0.00157*** (0.000545)			-0.000219 (0.00114)	
Low-skilled natives			0.00147 (0.00126)			0.00799** (0.00336)
Low-skilled non-Europeans	-0.00292*** (0.000814)					
Observations	133	191	197	86	176	184
R-squared	0.531	0.254	0.365	0.602	0.518	0.683
Number of Countries	19	20	20	19	19	20
Country FE	YES	YES	YES	YES	YES	YES

From table 10 “A”, we notice that the minimum wage’s effects on the employment and earnings of foreign-born and native workers are positive and significant even when we exclude some of the right hand side variables. Moreover, the earnings effect for non-Europeans remains insignificant even after excluding the RHS variables. The employment effects for immigrants and natives become significant (and positive) after excluding some of the RHS variables, but they were insignificant in the FE of the “main results” section. The suitable RE results for the totals, according to Hausman Test, are reported in tables 10.B

Table 10.B. Robustness Checks (RE favored by Hausman test) when we exclude some RHS variables

TOTAL	Employment for immigrants	Employment for Natives	Earnings for immigrants	Earnings for Natives
VARIABLES	(1) Random Effects	(2) Random Effects	(3) Random Effects	(4) Random Effects
Log minimum wage	0.0682* (0.0374)	0.0273 (0.0175)	0.573*** (0.0613)	0.726*** (0.0517)
GDP per capita	0.000141 (0.000127)	8.94e-05** (4.15e-05)	0.00144*** (0.000299)	0.00129*** (0.000244)
Growth of GDP per capita	-0.00296 (0.00893)	0.00264 (0.00244)	0.00857 (0.0101)	0.0141* (0.00822)
Inflation rate	0.00563*** (0.00186)	0.00290*** (0.000659)	0.00289 (0.00217)	0.00337* (0.00175)
Low-skilled natives		-0.000580 (0.000856)		0.000874 (0.00160)
Low-skilled immigrants	-0.00122** (0.000494)		-0.00104 (0.000904)	
Observations	191	197	176	184
Number of Countries	20	20	19	20

Standard errors in parentheses

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

All regressions include year dummies (i.e. year fixed effects)

The effect of the minimum wage on the employment of immigrants is positive and significant at the 10% level when we use RE. In column (2), the effect of the minimum wage on the employment of Natives is positive but insignificant. In column (3), the coefficient is positive and highly significant. This reveals that a 10% increase in the minimum wage is associated with a 5.7% increase in the real earnings of

immigrants. In column (4), the effect of the minimum wage on the earnings of natives is positive and highly significant in both approaches. A 10% increase in the minimum wage is associated with a 7% increase in the earnings of natives.

We notice that according to Hausman Test, the RE approach is preferable for these four dependent variables (like table 9.A.) even after removing some of the RHS variables. The RE here gives us same significant results for the earnings effects on immigrants and natives, and the employment effect on natives (like table 9.A.).

However, when we exclude some of the RHS variables in the employment of immigrants' regression, the sign becomes positive and significant at 10% in column (1).

Table 11 A.: Robustness Checks (FE when we exclude some RHS variables): **MALE**

Robustness Checks MALE	Employment of MALE non-Europeans	Employment of MALE immigrants	Employment of MALE natives	Earnings of MALE non-Europeans	Earnings of MALE immigrants	Earnings of MALE natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Logminimum wage	0.187* (0.110)	0.0867 (0.0790)	0.106*** (0.0334)	0.371 (0.489)	0.599*** (0.122)	0.843*** (0.0847)
GDP per capita	0.00173*** (0.000294)	0.00136*** (0.000258)	7.15e-05 (5.06e-05)	-0.000593 (0.00118)	0.00177*** (0.000335)	0.00111*** (0.000259)
Growth of GDP per capita	-0.00726 (0.0361)	-0.00119 (0.00816)	0.00338 (0.00293)	0.190 (0.178)	-0.139*** (0.0431)	0.0138* (0.00795)
Inflationrate	0.00674*** (0.00170)	0.00482*** (0.00171)	0.00387*** (0.000791)	0.0108 (0.0101)	0.00436* (0.00232)	0.00441** (0.00170)
Low-skilled immigrants		-0.00444*** (0.000905)			-0.00331*** (0.00126)	
Low-skilled natives			0.00311** (0.00152)			0.00794** (0.00337)
Low-skilled non-Europeans	-0.00224** (0.00108)					
Observations	124	184	197	75	168	184
R-squared	0.498	0.408	0.470	0.440	0.576	0.682
Number of Countries	18	19	20	16	18	20
Country FE	YES	YES	YES	YES	YES	YES

All regressions include year dummies (i.e. year fixed effects)

Table 11.A shows that the effect of the minimum wage on earnings remains the same for the three subgroups as before excluding these RHS variables (i.e. significant only for native and immigrant men) in columns (5) and (6). However, the effect on the employment of native men becomes highly significant (and positive) in column (3) and also positive (significant at 10%) for non-European men in column (1).

Table 11.B Robustness Checks (FE when we exclude some RHS variables): **FEMALE**

Robustness Checks FEMALE	Employment of Female non-Europeans	Employment of Female immigrants	Employment of Female natives	Earnings of Female non-Europeans	Earnings of Female immigrants	Earnings of Female natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.0823 (0.102)	0.0844 (0.0944)	0.00675 (0.0316)	0.372 (0.320)	0.432*** (0.114)	0.871*** (0.0837)
GDP per capita	0.00159*** (0.000273)	0.00137*** (0.000309)	0.000148*** (4.79e-05)	-0.000349 (0.000772)	0.00125*** (0.000312)	0.00105*** (0.000256)
Growth of GDP per capita	-0.0354 (0.0269)	0.00160 (0.00968)	0.000325 (0.00277)	0.103 (0.117)	-0.139*** (0.0402)	0.0148* (0.00785)
Inflation rate	0.00777*** (0.00154)	0.00550*** (0.00203)	0.00228*** (0.000749)	0.0150** (0.00661)	0.00404* (0.00216)	0.00353** (0.00168)
Low-skilled immigrants		-0.00529*** (0.00105)			-0.00198* (0.00118)	
Low-skilled natives			-0.000245 (0.00144)			0.00822** (0.00333)
Low-skilled non-Europeans	-0.00417*** (0.000929)					
Observations	128	186	197	75	168	184
R-squared	0.499	0.383	0.264	0.705	0.549	0.691
Number of Countries	19	19	20	16	18	20
Country FE	YES	YES	YES	YES	YES	YES

All regressions include year dummies (i.e. year fixed effects)

The effect of the minimum wage on the employment of females remains insignificant for all subgroups. Moreover, the effect on earnings remains the same even after excluding some of the RHS variables (i.e. only significant for immigrant and native women).

Table 11.C. RE (after excluding some of the RHS): **Males / Females**

Robustness Checks	Employment for MALE Natives	Earnings for MALE Natives	Employment for FEMALE immigrants	Earnings for female natives	Earnings for female non-Europeans
Males and Females					
VARIABLES	(1) Random Effects	(2) Random Effects	(3) Random Effects	(4) Random Effects	(5) Random Effects
Log minimum wage	0.0534*** (0.0154)	0.735*** (0.148)	-0.132** (0.0666)	0.721*** (0.0511)	0.832*** (0.136)
GDP per capita	6.38e-05 (4.90e-05)	0.000941 (0.000642)	0.00127*** (0.000302)	0.00128*** (0.000241)	0.000250 (0.000573)
Growth of GDP per Capita	0.00412 (0.00292)	0.191 (0.128)	-0.00173 (0.00986)	0.0151* (0.00816)	0.132 (0.0985)
Inflation rate	0.00352*** (0.000788)	0.00256 (0.00621)	0.00517** (0.00206)	0.00314* (0.00174)	0.00710 (0.00488)
Low-skilled natives	0.000954 (0.000710)			0.000734 (0.00157)	
Low-skilled immigrants			-0.00416*** (0.000958)		
Observations	197	75	186	184	75
Number of Countries	20	16	19	20	16

Standard errors in parentheses

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

All regressions include year dummies (i.e. year fixed effects)

In column (1), the effect of the minimum wage for the employment of native men is positive and highly significant. A 10% increase in the minimum wage is associated with a 0.5% increase in the employment of native men.

In column (2), the effect on the real earnings of non-Europeans is positive and highly significant. Thus a 10% increase in the minimum wage is associated with a 7.5% increase in the real earnings of non-European men.

In column (3), the effect on the employment of immigrant women is negative and significant at (5% level of significance). Thus a 10% increase in the minimum wage is associated with a 1.3% decrease in the employment of immigrant women.

In column (4), the real earnings effect on real earnings is positive and highly significant. A 10% increase in the minimum wage is associated with a 7% increase in the real earnings of female natives.

In column (5), the effect on the earnings of non-European women is positive. Thus, according to the table, a 10% increase in the minimum wage is associated with an 8% increase in the real earnings of non-European women.

We summarize the preferable results according to Hausman test in two different sets of tables. The first set represents the results of using FE and RE (where favorable) when we control for all our RHS variables. The second set represents the results of using FE and RE (where favorable) when we exclude some of our RHS variables.

A summary to our Robustness Check results is reported below:

Tables.12. SET A. (Total – Males – Females) When we control for all RHS Variables

TOTAL:

Effects of Log minimum wage on	Employment for Natives	Earnings for Natives	Employment for immigrants	Earnings for immigrants	Employment for non-Europeans	Earnings for non-Europeans
TOTAL	RE is appropriate	RE is appropriate	RE is appropriate	RE is appropriate	FE is appropriate	RE is appropriate
Sign	Positive Insignificant	Positive Significant (at 1%)	Negative insignificant	Positive Significant (at 1%)	Positive Insignificant	Positive Significant

The only difference between using RE and FE (when we control for all the RHS variables) is that with RE, the earnings effect on non-Europeans becomes significantly positive, whereas when we use FE it was positive but insignificant.

MALE:

Effects of Log minimum wage on	Employment for MALE Natives	Earnings for MALE Natives	Employment for MALE immigrants	Earnings for MALE immigrants	Employment for MALE non-Europeans	Earnings for MALE non-Europeans
MALE	FE is appropriate	RE is appropriate	FE is appropriate	RE is appropriate	FE is appropriate	RE is appropriate
Sign	Negative insignificant	Positive Significant (at 1%)	Negative Insignificant	Positive Significant (at 1%)	Positive insignificant	Positive Significant (at 1%)

We notice that the results for males are almost the same in RE and FE. However, the only difference (as we mentioned before) is the effect on earnings of non-European men which is (positive) and highly significant with RE but insignificant with FE.

FEMALE:

Effects of Log minimum wage on	Employment for FEMALE Natives	Earnings for FEMALE Natives	Employment for FEMALE immigrants	Earnings for FEMALE immigrants	Employment for FEMALE non-Europeans	Earnings for FEMALE non-Europeans
FEMALE	FE is appropriate	RE is appropriate	RE is appropriate	RE is appropriate	FE is appropriate	RE is appropriate
Sign	Negative Insignificant	Positive Significant (at 1%)	Negative insignificant	Positive Significant (at 1%)	Positive Insignificant	Positive Significant (at 1%)

Here again, the only difference between the RE and FE when we control for all RHS variables, is that the effect on earnings of non-European women is highly significant (and positive) with RE, but with FE is insignificant.

The second set of the preferable results (according to Hausman Test) is reported in the appendix section in tables 13 (A, B and C).

We exclude some of the RHS variables in order to observe the overall effect on employment, regardless of the sectors in which people are employed in these economies. We find that the effect of the minimum wage on employment becomes positive and significant for immigrants in general (when RE is favorable according to Hausman Test). The minimum wage also has a positive impact on the employment of native men (1% level of significance when we use RE), and the employment of non-European men (10% level of significance when we use FE). However, the effect of the

minimum wage on the employment of female immigrants becomes negative (when RE is the appropriate approach).

In this part of Robustness Checks, we run the fixed effects regressions (including all the RHS variables), but we also control for the average wage. It's worth mentioning that the data on gross average wages is retrieved from the United Nations Economic Commission for Europe (UNECE statistical database). We convert it to Euro and then to real average wage by using the CPI of (base year 2010 from the World Bank). Then, we control for the unemployment rate instead of the average wage. Data on unemployment is retrieved from the World Bank. The results of controlling for the average wage are reported in tables 14 (A, B, C), and the results of controlling for the unemployment rate are reported in tables 15 (A, B, C)

Table.14. A. Robustness Checks controlling for average wage

	Employment of non-Europeans	Employment of Immigrant	Employment of natives	Earnings of non- European	Earnings of immigrants	Earnings of Natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.0260 (0.104)	0.0669 (0.0851)	-0.0584** (0.0268)	0.0857 (0.406)	0.168 (0.127)	0.335*** (0.0940)
Log average wage	0.0508 (0.123)	-0.236** (0.0946)	0.0534* (0.0299)	0.857* (0.453)	0.678*** (0.150)	0.683*** (0.104)
GDP per capita	0.000781** (0.000350)	0.000126 (0.000105)	4.22e-05 (2.69e-05)	-0.000985 (0.00088)	0.000915** (0.000398)	0.000559** (0.000274)
% growth of GDP per capita	0.00927 (0.0270)	0.0346* (0.0203)	-6.08e-05 (0.00198)	0.0834 (0.134)	-0.117*** (0.0356)	-0.0433** (0.0200)
Inflation rate	0.00318** (0.00149)	0.00118 (0.00142)	0.000976** (0.000456)	0.000304 (0.00664)	-0.000418 (0.00215)	0.000815 (0.00152)
Low-skilled non- Europeans	-0.00198** (0.000933)					
Employment in services as of total employment	-0.00114 (0.00311)	-0.000506 (0.00229)	-0.00388*** (0.000744)	-0.00294 (0.0101)	0.00111 (0.00362)	0.000708 (0.00261)
Employment in industry as of total employment	0.0103** (0.00446)	0.0148*** (0.00285)	0.00301*** (0.000904)	0.00180 (0.0119)	0.00944* (0.00485)	0.0104*** (0.00337)
CPI#	0.0273*** (0.00865)	0.0487*** (0.00657)	0.00672*** (0.00207)	0.00123 (0.0273)	0.00840 (0.00981)	0.00372 (0.00684)
Low-skilled immigrants		-0.000610 (0.000390)			-0.00268** (0.00121)	
Low-skilled natives			-0.00380*** (0.000957)			-0.000596 (0.00320)
Observations	10 8	164	169	84	151	158
R-squared	0.6 36	0.665	0.760	0.633	0.672	0.814
Number of Countries	19	20	20	18	19	20

Standard errors in parentheses

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

CPI #: Corruption Perception Index

All regressions include year dummies (i.e. year fixed effects)

When we control for the average wage we notice that the effect of the minimum wage on the employment of natives is negative but with a very small value. Thus a 10% increase in the minimum wage is correlated to a decrease in the employment of natives by 0.5% and an increase in the earnings of natives by 3%. This decrease in employment is due to the decrease in female employment of this subgroup (shown in table.14.C).

Table14.B. Robustness Checks (controlling for the average wage): MALES

	Employment of MALE non- Europeans	Employment of MALE Immigrants	Employment of MALE natives	Earnings of MALE non- Europeans	Earnings of MALE immigrants	Earnings of MALE natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.117 (0.144)	-0.00132 (0.0848)	-0.0490 (0.0317)	-0.167 (0.580)	0.235 (0.153)	0.331*** (0.0942)
Log average wage	0.0513 (0.180)	-0.0630 (0.0995)	0.0513 (0.0354)	1.346** (0.641)	0.690*** (0.179)	0.675*** (0.104)
GDP per capita	0.00117** (0.000453)	0.000284 (0.000260)	1.41e-05 (3.18e-05)	-0.00134 (0.00124)	0.00120*** (0.000442)	0.000516* (0.000274)
% growth of GDP per capita	0.0156 (0.0381)	0.0569** (0.0240)	0.00189 (0.00234)	0.269 (0.186)	-0.135*** (0.0422)	-0.0441** (0.0200)
Inflation rate	0.00385* (0.00196)	0.000539 (0.00140)	0.00107** (0.000539)	0.00225 (0.0110)	-0.000889 (0.00254)	0.00127 (0.00152)
Low-skilled Non-Europeans	-0.00258** (0.00125)					
Employment in services as of total employment	-0.00215 (0.00390)	-0.00178 (0.00225)	-0.00529*** (0.000880)	-0.00346 (0.0141)	0.00138 (0.00405)	0.000421 (0.00262)
Employment in industry as of total employment	0.0104* (0.00559)	0.0144*** (0.00305)	0.00489*** (0.00107)	0.00356 (0.0155)	0.00843 (0.00543)	0.0109*** (0.00338)
CPI#	0.0113 (0.0110)	0.0378*** (0.00651)	0.00809*** (0.00245)	-0.0230 (0.0377)	0.0182* (0.0109)	0.00523 (0.00685)
Low-skilled immigrants		-0.00231*** (0.000803)			-0.00396*** (0.00141)	
Low-skilled Natives			-0.00330*** (0.00113)		-0.000786 (0.00321)	
Observations	101	157	169	75	146	158
R-squared	0.588	0.698	0.823	0.492	0.662	0.813
Number of Countries	18	19	20	16	18	20

A 10% increase in the minimum wage is correlated to an increase in the earnings of native men by 3%.

Table 14.C. FEMALES (controlling for the average wage)

	Employment of Female non-Europeans	Employment of Female immigrants	Employment of Female natives	Earnings of Female non-Europeans	Earnings of Female immigrants	Earnings of Female natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.194 (0.118)	0.185 (0.117)	-0.0633** (0.0312)	-0.219 (0.357)	0.0331 (0.140)	0.344*** (0.0931)
Log average wage	-0.113 (0.137)	-0.360*** (0.135)	0.0523 (0.0348)	1.191*** (0.395)	0.808*** (0.164)	0.695*** (0.103)
GDP per capita	0.000640 (0.000408)	-0.000120 (0.000367)	7.46e-05** (3.13e-05)	-0.00113 (0.000762)	0.000655 (0.000405)	0.000512* (0.000271)
% growth of GDP per capita	-0.00143 (0.0309)	0.0698** (0.0338)	-0.00201 (0.00230)	0.163 (0.114)	-0.128*** (0.0387)	-0.0396** (0.0198)
Inflation rate	0.00491*** (0.00167)	0.00155 (0.00196)	0.00111** (0.000530)	0.00717 (0.00676)	-0.00142 (0.00232)	0.000499 (0.00150)
Low-skilled non-Europeans	-0.00202* (0.00108)					
Employment in services as of total employment	-0.00133 (0.00347)	0.00246 (0.00317)	-0.00251*** (0.000866)	0.00287 (0.00868)	-0.000209 (0.00371)	0.00116 (0.00259)
Employment in industry as of total employment	0.00941* (0.00498)	0.0158*** (0.00429)	0.000122 (0.00105)	0.00700 (0.00957)	0.00860* (0.00497)	0.0107*** (0.00334)
CPI=	0.0328*** (0.0101)	0.0559*** (0.00918)	0.00404* (0.00241)	-0.00597 (0.0233)	0.00508 (0.0100)	0.00415 (0.00678)
Low-skilled immigrants		-0.00189* (0.00112)			-0.00203 (0.00129)	
Low-skilled natives			-0.00423*** (0.00111)			-0.000339 (0.00317)
Observations	104	159	169	75	146	158
R-squared	0.596	0.577	0.542	0.762	0.660	0.816
Number of Countries	19	19	20	16	18	20

A 10% increase in the minimum wage is correlated to a decrease in the employment of native women by 0.6% and increase in their earnings by 3%.

Table.15.A. Robustness Checks (controlling for the unemployment rate)

Total	Employment of non- Europeans	Employment of Immigrants	Employment of Natives	Earnings of non- Europeans	Earnings of Immigrants	Earnings of Natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.0681 (0.0801)	-0.104* (0.0558)	-0.0222 (0.0154)	0.208 (0.319)	0.653*** (0.116)	0.845*** (0.0922)
unemployment	-0.00687*** (0.00155)	-0.00842*** (0.00101)	-0.00425*** (0.000272)	-0.0148** (0.00597)	-0.00255 (0.00220)	- (0.00172)
GDP per capita	0.000219 (0.000306)	-2.06e-05 (7.73e-05)	2.80e-05 (1.88e-05)	-0.00109 (0.000849)	0.000515 (0.000434)	0.000264 (0.000341)
% growth of GDP per capita	0.000667 (0.0209)	-0.0112** (0.00509)	-6.89e-05 (0.00105)	-0.0114 (0.0135)	0.00586 (0.0101)	0.00978 (0.00768)
Inflation rate	0.00203 (0.00132)	9.79e-05 (0.00119)	0.000803** (0.000326)	0.00788 (0.00601)	-0.00134 (0.00248)	-0.000218 (0.00190)
Low-skilled non-Europeans	-0.00185** (0.000775)					
Employment in services as of total employment	0.00238 (0.00279)	0.00292 (0.00195)	-0.000493 (0.000546)	-0.00139 (0.00967)	0.00452 (0.00437)	0.00540 (0.00352)
Employment in industry as of total employment	0.00374 (0.00398)	0.00585** (0.00255)	-0.000550 (0.000697)	-0.00438 (0.0120)	0.0118** (0.00547)	0.00946** (0.00423)
CPI#	0.0296*** (0.00744)	0.0344*** (0.00548)	0.000994 (0.00147)	-0.00782 (0.0270)	0.0173 (0.0109)	0.00805 (0.00840)
Low-skilled immigrants		-0.000522 (0.000320)			0.000389 (0.00130)	
Low-skilled natives			-0.00104 (0.000684)			0.00820** (0.00399)
Observations	113	171	176	86	157	164
R-squared	0.709	0.750	0.874	0.649	0.568	0.726
Number of Countries	19	20	20	19	19	20

When we control for the unemployment rate, the effect of the minimum wage on earnings remain the same as our original fixed effects results. Thus a 10 % increase in the minimum wage is correlated to an increase in the earnings of immigrants by 6% and natives by 8%. However, a 10% increase in the minimum wage is correlated with a 1% decrease in the employment of immigrants; this is due to a decrease in the employment of immigrant men.

Table.15.B. Robustness Checks (controlling for the unemployment rate): Males

MALES	Employment of MALE non- Europeans	Employment of MALE Immigrants	Employment of MALE Natives	Earnings of MALE non- Europeans	Earnings of MALE immigrants	Earnings of MALE natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.151 (0.104)	-0.0941* (0.0521)	-0.00929 (0.0146)	0.0965 (0.557)	0.562*** (0.129)	0.837*** (0.0917)
Unemployment	-0.00962*** (0.00208)	-0.00926*** (0.000970)	-0.00472*** (0.000259)	-0.0150* (0.00844)	-0.00416* (0.00246)	-0.00410** (0.00171)
GDP per capita	0.000305 (0.000393)	-9.60e-05 (0.000194)	-9.54e-06 (1.79e-05)	-0.00122 (0.00125)	0.00118*** (0.000442)	0.000255 (0.000339)
% growth of GDP per capita	-0.0223 (0.0341)	-0.0140*** (0.00473)	0.000799 (0.001000)	0.123 (0.187)	-0.167*** (0.0480)	0.00982 (0.00763)
Inflation rate	0.00131 (0.00176)	-0.000845 (0.00111)	0.000865*** (0.000309)	0.0126 (0.0108)	-0.000141 (0.00269)	0.000336 (0.00189)
Low-skilled non-Europeans	-0.00146 (0.00111)					
Employment in services as of total employment	0.00182 (0.00354)	0.00145 (0.00184)	-0.00196*** (0.000518)	-0.00333 (0.0143)	0.00293 (0.00445)	0.00531 (0.00349)
Employment in industry as of total employment	0.000820 (0.00521)	0.00501** (0.00240)	0.000554 (0.000661)	-0.00450 (0.0167)	0.00325 (0.00583)	0.00989** (0.00421)
CPI#	0.0156 (0.00943)	0.0268*** (0.00503)	0.00221 (0.00139)	-0.0161 (0.0377)	0.0204* (0.0111)	0.00828 (0.00834)
Low-skilled immigrants		-0.00105* (0.000610)			-0.00307** (0.00152)	
Low-skilled natives			-0.000448 (0.000650)			0.00818** (0.00396)
Observations	105	164	176	75	150	164
R-squared	0.668	0.798	0.938	0.479	0.618	0.730
Number of Countries	18	19	20	16	18	20

The effect of the minimum wage on earnings is still positive and significant for immigrant and native men. However, a 10% increase in the minimum wage is correlated to a 0.9% decrease in the employment of immigrant men.

Table.15.C. Robustness Checks (controlling for the unemployment rate)

FEMALE	Employment of Female non-Europeans	Employment of Female immigrants	Employment of Female natives	Earnings of Female non-Europeans	Earnings of Female immigrants	Earnings of Female natives
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Log minimum wage	0.140 (0.108)	-0.0883 (0.0900)	-0.0352 (0.0283)	-0.00148 (0.342)	0.417*** (0.122)	0.848*** (0.0914)
Unemployment	-0.00292 (0.00203)	-0.00748*** (0.00167)	-0.00436*** (0.000502)	-0.0147*** (0.00519)	-0.00401* (0.00231)	-0.00349** (0.00170)
GDP per capita	0.000405 (0.000413)	-0.000155 (0.000336)	7.81e-05** (3.47e-05)	-0.00107 (0.000768)	0.000637 (0.000416)	0.000301 (0.000338)
% growth of GDP per capita	0.0117 (0.0277)	-0.00662 (0.00812)	-0.00127 (0.00194)	0.0283 (0.115)	-0.162*** (0.0451)	0.0111 (0.00761)
Inflation rate	0.00464*** (0.00174)	0.000764 (0.00190)	0.000973 (0.000600)	0.0166** (0.00663)	-0.000725 (0.00253)	-0.000303 (0.00189)
Low-skilled non-Europeans	-0.00274** (0.00105)					
Employment in services as of total employment	0.00161 (0.00365)	0.00554* (0.00316)	0.00163 (0.00101)	0.00265 (0.00878)	0.00120 (0.00418)	0.00547 (0.00349)
Employment in industry as of total employment	0.00756 (0.00521)	0.00732* (0.00415)	-0.00299** (0.00128)	-0.00111 (0.0103)	0.00375 (0.00548)	0.00990** (0.00420)
CPI#	0.0352*** (0.0102)	0.0398*** (0.00870)	-0.00297 (0.00271)	-0.00206 (0.0232)	0.00935 (0.0104)	0.00756 (0.00832)
Low-skilled immigrants		-0.00246** (0.00102)			-0.00127 (0.00143)	
Low-skilled natives			-0.00105 (0.00126)			0.00814** (0.00395)
Observations	109	166	176	75	150	164
R-squared	0.592	0.589	0.577	0.757	0.594	0.732
Number of Countries	19	19	20	16	18	20

When we control for unemployment, there's no significant effect of the minimum wage on the employment of women in any of the subgroups. Moreover, a 10

% increase in the minimum wage is correlated to a 4% increase in the earnings of immigrant women and an 8% increase in the earnings of native women.

Finally, we run the regressions with RHS variables lagged by 3 periods in order to see if the effect of the minimum wage on our left hand side variables in the longer run remains the same.

Table 16. Robustness Checks (FE regressions with lagged RHS variables)

	Employment of non-Europeans	Employment of Immigrants	Employment of Natives	Earnings of non-Europeans	Earnings of immigrants	Earnings of Natives
VARIABLES	(1) 3 periods lag	(2) 3 periods lag	(3) 3 periods lag	(4) 3 periods lag	(5) 3 periods lag	(6) 3 periods lag
L3.logminimumwage	-0.221*** (0.0678)	-0.0686* (0.0399)	-0.0634*** (0.0193)	0.626*** (0.0435)	0.286*** (0.0793)	0.477*** (0.0493)
L3.gdpcap	0.000547* (0.000308)	7.40e-05 (0.000130)	2.28e-05 (6.56e-05)	0.000115 (0.000157)	0.00143*** (0.000363)	0.000847*** (0.000168)
L3.percentagegrowthofgdppercapita	-0.0779** (0.0389)	-0.000211 (0.00858)	-0.000158 (0.00429)	0.00480 (0.00917)	0.0127 (0.0160)	0.00154 (0.0110)
L3.inflationrate	-0.00393 (0.00240)	7.13e-06 (0.00228)	-0.00253** (0.00121)	-0.000893 (0.00501)	-0.00748** (0.00350)	-0.00856*** (0.00310)
L3.lowskillednoneuropeans	0.000425 (0.000525)					
L3.employmentinservicesasoftotalemp	0.000184 (0.00156)	-0.000846 (0.000972)	-0.000712 (0.000462)	0.000866 (0.00228)	0.00235 (0.00198)	0.00837*** (0.00118)
L3.employmentinindustryasoftotalemp	0.000136 (0.00183)	-3.92e-08 (0.00117)	-8.79e-05 (0.000539)	0.00129 (0.00220)	0.000116 (0.00201)	0.00499*** (0.00138)
L3.CPI#	0.0134** (0.00627)	0.0217*** (0.00519)	0.0201*** (0.00282)	0.0334*** (0.00942)	0.0305*** (0.00834)	0.0247*** (0.00719)
L3.lowskilledimmigrants		-0.000175 (0.000392)			-0.000821 (0.00101)	
L3.lowskillednatives			-0.00128*** (0.000439)			0.00134 (0.00112)
Observations	76	134	137	72	128	136
R-squared	0.312	0.208	0.518	0.960	0.939	0.965

When we run the FE regressions with lagged RHS variables (i.e. 3 periods lagged), we notice that the effect of the minimum wage on the earnings remains

positive. However, the effect of the minimum wage on the employment of the three subgroups is negative. Thus, a 10% increase in the minimum wage is correlated with a 2% decrease in the employment of non-Europeans, a 0.6% decrease in the employment of immigrants and the employment of natives. The effect of the minimum wage on earnings is positive for the three subgroups, where a 10% increase in the minimum wage is correlated with an increase in the earnings of non-Europeans by 6%, earnings of immigrants by 2.8% and earnings of natives by 4.7%.

When we control for the average wage (in table 14), we notice that the effect of the minimum wage is positive on the earnings of natives but slightly negative on the employment of natives. The insignificant effect of the minimum wage on the earnings of non-Europeans is consistent with our Fixed Effects results (but inconsistent with our favorable random effects according to Hausman Test). Moreover, there's an insignificant effect of the minimum wage on the earnings of immigrants and this is inconsistent with our fixed effects main results. So increases in the minimum wage that are not part of an overall increase in the wage scale do not significantly affect the earnings of immigrants.

In addition, when we control for the unemployment rate (in table 15), the effect of the minimum wage on the earnings remain the same as our original fixed effects results (positive and significant for natives and immigrants). However, a slight decrease in the employment of immigrants; this is due to a decrease in the employment of immigrant men.

CHAPTER IV

CONCLUSION

Since there are few empirical works that have addressed the effect of the minimum wage on foreign-born workers, we tend to investigate this impact in European countries.

Our results are consistent with previous empirical work in general. We get insignificant effect of the minimum wage on the employment of natives, foreign-born and specifically non-European workers. We also get positive and highly significant earnings effects for European natives and foreign-born workers as a result of an increase in the minimum wage.

The significant earnings effect for natives is inconsistent with previous empirical work where Orrenius and Zavodny (2008) find that the minimum wage does not affect the earnings of low-skilled or high-skilled Americans. However, we find that the minimum wage has a positive impact on the earnings of natives in European countries with fixed effects approach, and with RE when the latter is favorable. This is also true even when we exclude some of the RHS variables.

Moreover, we don't find any significant effect of the minimum wage on the earnings of non-Europeans when they are taken separately using the fixed effects approach. However, with random effects approach, when favored by the Hausman test,

it shows that an increase in the minimum wage leads to an increase in the earnings of non-Europeans. This similar result is applicable for men and women.

The effect of the minimum wage on earnings of the other subgroups remains positive and highly significant when RE is favored by the Hausman test, and the effect of the minimum wage on the employment of all subgroups remains insignificant. These effects of the minimum wage on employment and earnings are also true in regressions run separately for men and women. The only difference between using RE and FE is that with RE, the effect on the earnings of non-Europeans becomes significantly positive.

Our results representing the earnings effect for foreign-born population (with respect to each European country) are consistent with the previous work of (Orennius 2008) if we want to compare the immigrants in U.S., and the immigrants in European countries (but not with respect to Europe as a whole). Yet if we are talking about the immigrants according to Europe as a whole, then our results for the earnings of non-Europeans are only significant (when RE is favorable), and therefore consistent with previous work, but this is inconsistent with our FE results.

In theory, an increase in the minimum wage reduces the “employment-to-population” rate. However, we don’t find any significant negative employment effect on any of our subgroups. Therefore, our results are more consistent with the studies done by other researchers such as Card and Krueger (1994).

Moreover, theoretically, the effect of the minimum wage is expected to be larger on immigrants than non-immigrants. However, we don’t find any evidence to support

this prediction. Actually, we notice that with a 10% increase in the real minimum wage for example, the real earnings of native workers increase by 8% which is relatively higher than the earning effect for foreign-born workers of 6% (even as we hold fixed the fraction of them that have low skills).

When we control for unemployment rate, we notice that there's a slightly negative effect of the minimum wage on the employment of immigrants (significant at the 10% level), and when we control for the average wage, we find a slightly negative effect of the minimum wage on the employment of natives (significant at the 5% level). When we reckon these results with the main findings without controlling for average wage, it seems that the employment-and earnings-enhancing effects of the minimum wage are mostly linked to increases in the minimum wage that also translate into higher average wages. Changes in the minimum wage that otherwise keep the average wage unchanged (upward compression of the lower tail of the wage distribution) on the other hand, have slightly negative employment effects.

In the short run, an increase in the minimum wage has no significant effect on the employment of any of the subgroups, but a positive effect on earnings of the three subgroups (i.e. natives and immigrants as shown in our main FE results, and non-Europeans when RE is favorable according to Hausman test). Moreover, in the long run, the effect of the minimum wage on earnings remains positive and significant (even to non-Europeans according to our FE regressions with lagged RHS variables), however the effect of the minimum wage on the employment of the three subgroups is slightly negative. This finding is suggestive of the existence of labor market rigidities.

It's worth mentioning here that the labor market policies in Europe would support the proposal that a higher minimum wage has a huge real effect. However, the direct effect of this policy depends on the percentage of workers who earn the minimum wage (Eurofound, 2002). For example, only 2% of employees in Spain, Ireland, UK and Netherlands are paid the "national minimum wage" whereas that fraction is "6% in Portugal, 14% in France and 15.5% in Luxembourg" (Eurostat, 2001).

Finally, our findings suggest that a higher minimum wage is a favorable policy that improves earnings for all subgroups, and doesn't have any undesirable employment effect on any of the subgroups in the short run (but has a slightly negative employment effect in the long run).

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APPENDIX

A summary to our Robustness Check results (when we exclude some of the RHS variables)

Tables.13. SET B. (Total – Males – Females)

Effects of Log minimum wage on	Employment for Natives	Earnings for Natives	Employment for immigrants	Earnings for immigrants	Employment for non-Europeans	Earnings for non-Europeans
TOTAL	RE is appropriate	RE is appropriate	RE is appropriate	RE is appropriate	FE is appropriate	FE is appropriate
Sign	Positive Insignificant	Positive Significant (at 1%)	Positive Significant (at 10%)	Positive Significant (at 1%)	Positive Insignificant	Positive Insignificant

When we exclude some of the RHS variables, the effect of the minimum wage on Earnings are positive and highly significant for immigrants and natives, yet it's insignificant for non-Europeans. These results are consistent with our main FE results (i.e. when we control for all RHS variables). However, the employment of immigrants is positive and significant at 10% and this is inconsistent with our main FE results (i.e. when we control for all RHS variables).

MALE

Effects of Log minimum wage on	Employment for MALE Natives	Earnings for MALE Natives	Employment for MALE immigrants	Earnings for MALE immigrants	Employment for MALE non-Europeans	Earnings for MALE non-Europeans
MALE	RE is appropriate	RE is appropriate	FE is appropriate	FE is appropriate	FE is appropriate	FE is appropriate
Sign	Positive Significant (at 1%)	Positive Significant (at 1%)	Positive Insignificant	Positive Significant (at 1%)	Positive Significant (at 10%)	Positive Insignificant

The earnings effects remain significant and positive for native and immigrant men, yet insignificant for non-European men. These findings are consistent with the FE results that we get when we control for all the RHS variables. However, we notice that the employment effects for native and non-European men are positive and significant (at 1% and 10% levels of significance, respectively). This is inconsistent with our main FE results.

FEMALE

Effects of Log minimum wage on	Employment for FEMALE Natives	Earnings for FEMALE Natives	Employment for FEMALE immigrants	Earnings for FEMALE immigrants	Employment for FEMALE non-Europeans	Earnings for FEMALE non-Europeans
FEMALE	FE is appropriate	RE is appropriate	RE is appropriate	FE is appropriate	FE is appropriate	RE is appropriate
Sign	Positive Insignificant	Positive Significant (at 1%)	Negative Significant (at 5%)	Positive Significant (at 1%)	Positive Insignificant	Positive Significant (at 1%)

The earnings effects are positive for the three subgroups. However, the significant earnings effect for non-Europeans is inconsistent with our primary results (i.e. FE main results).

Moreover, the employment effect on female immigrants is negative and significant at 5% level. This is also inconsistent with our main FE results (where the employment effect was insignificant).