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Explaining Cross-Country Differences in Labor Market Gaps between Immigrants and Natives in the OECD

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Abstract

In most OECD-countries, immigrants have lower employment and higher unemployment than natives. This paper compares nine potential explanations of these gaps. Results are obtained for 21–28 countries using bivariate correlations, OLS-regressions and Bayesian model averaging over all 512 theoretically possible model specifications. Two robust patterns are found. The unemployment gap is bigger in countries where collective bargaining agreements cover a larger share of the labor market. The employment gap is bigger in countries with more generous social safety nets. Five variables have explanatory value in some specifications: Xenophobia, employment protection laws, social expenditure, asylum applications, and the share of immigrants in the population. The education of immigrants and migrant integration policies have no explanatory value. A trade-off seems to exist such that countries with smaller labor market gaps have higher income inequality.

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1. Introduction

It is well documented that immigrants in many rich countries have not been successfully integrated into domestic labor markets and that many are not productively employed (Nannestad 2009, OECD 2006, Jean et al. 2010). As a result, the potential "immigration surplus" (Borjas 1995, Levine et al. 2010) is smaller than it could be. Understanding why large immigrant populations are unproductive is arguably one of the most important questions facing OECD-countries today. Despite the pressing need, surprisingly little research has been devoted to examining available cross-country differences to find patterns and explanations.

From a standard neo-classic economic perspective, large groups remaining unemployed is a sign that labor markets are prevented from clearing at equilibrium wages. That explanation implies a trade-off for policy makers such that higher employment for marginal groups requires accepting larger wage differences (cf. Iversen and Wren, 1998). Empirically, the exact mechanism that prevents market clearing wages is unknown, and the current debate suggests several competing explanations of weak labor market integration of immigrants. Some of these explanations suggest that there is no integration-equality trade-off at all. For example, the weak labor market position of immigrants may be explained by xenophobic attitudes and racial discrimination (as discussed by, for example, Englund 2002, Knocke 2000 and Solé and Parella 2003).

This paper presents cross-country evidence supporting the existence of an integration-equality trade-off for the OECD-countries, and examines how well eight different factors explain the cross country differences in the labor market gap between immigrants and natives in the OECD-countries. Results indicate that immigrant unemployment is significantly positively

correlated with the share of the labor market covered by collective bargaining agreements. The evidence is thus consistent with an insider-outsider explanation (Lindbeck and Snower 1988) of labor market segregation. Moreover, welfare state generosity correlates with lower immigrant employment. Five variables have explanatory value in some, but not all, specifications: Xenophobia, employment protection laws, social expenditure, asylum applications per capita, and the share of immigrants in the population. Notably, the education of immigrants and migrant integration policies have no explanatory value.

As noted by Brekke and Mastekaasa (2008) cross-country comparative research on the labor market integration of immigrants is rare. To the author's knowledge, only one study similar to the present one exists: Fleischmann and Dronkers (2010) present a multilevel analysis of 1363 male and female first- and second-generation immigrants' unemployment rates in 13 destination countries in the EU. Immigrants are found to have higher unemployment in countries where natives have higher unemployment rates. They also find that immigrants are less unemployed in countries with a larger segment of low-status jobs, with higher immigration rates and with a higher GDP per capita. Integration policies and welfare state regimes do not affect the unemployment risk of immigrants.

This paper broadens the cross-country comparison to include all OECD-countries for which data exist (typically n = 25), but relies only country level data. To minimize the small sample problems and the model selection problem, baseline OLS-results are confirmed using Bayseian model averaging (BMA), which produces coefficients based on weighted averages over all possible model specifications.

2. Data and empirical strategy

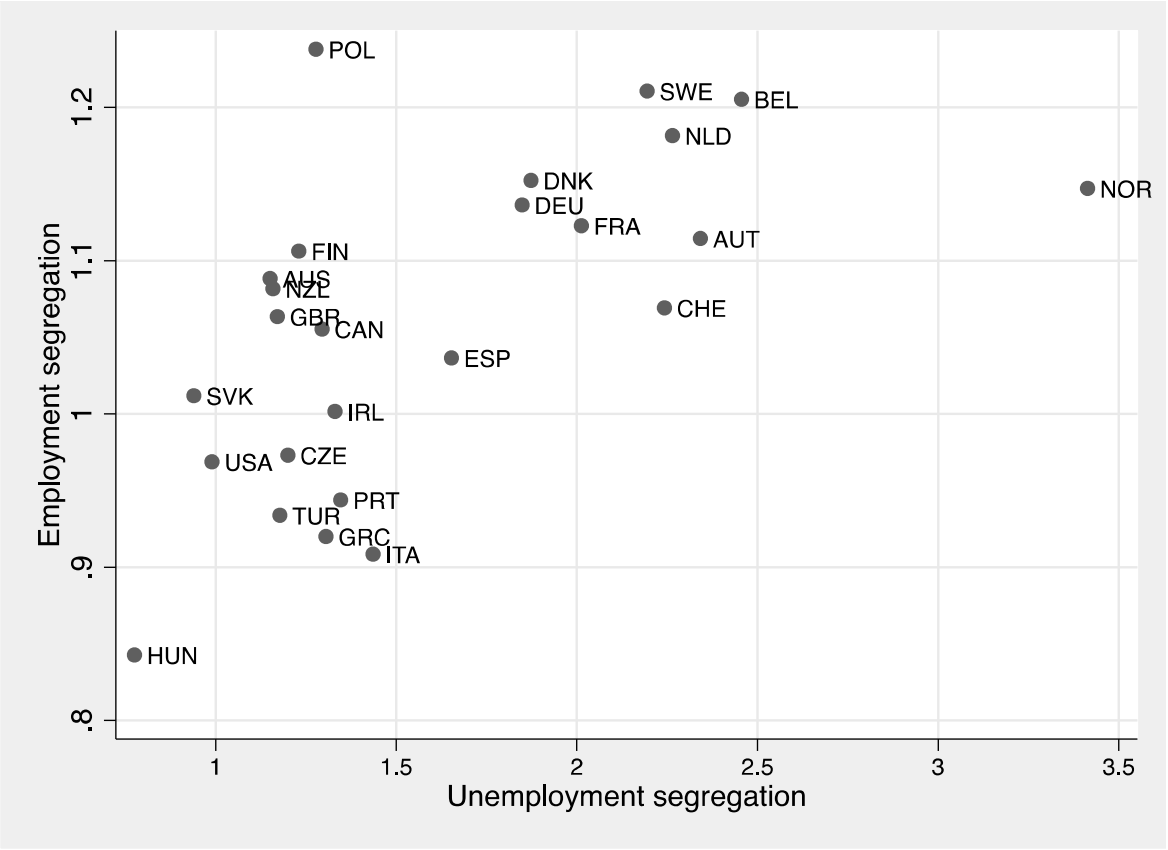
This section explains how the labor market gap between natives and immigrants is measured, examines the correlation with Gini inequality and continues with a description of nine different factors that have been suggested as potentially explaining the gap.

2.1 The immigrant-native labor market gap and income inequality

To quantify the immigrant-native labor market gap, the ratio between the unemployment rate of the native born and the immigrant population in a country is used. For example, in Germany unemployment for natives in 2009 was 6.6 per cent, but for immigrants it was 12.2 per cent, resulting in a labor market gap of 12.2/6.6 = 1.85. As a second measure, the ratio between immigrant and native employment is used, computed so that a higher ratio means a bigger gap.

The two measures are correlated but different: Unemployment is calculated as the number of unemployed divided by the labor force, whereas the denominator in the employment rate is the entire adult population. Factors that keep immigrants away from the labor force are thus more likely to affect the employment based measure of segregation, whereas factors that prevent immigrants from having a job once they are in the labor force, are better indicated by the unemployment based measure. Because labor market segregation can arise both as a result of immigrants not entering the labor force and because immigrants in the labor force are unemployed to a higher extent, the two ratios both contain valuable information.

Figure 1. The correlation between the two segregation measures



As shown in Figure 1, the two ratios are positively correlated (*r = 0.5*), but there are some interesting special cases. For example, in Norway, immigrants are almost 3.5 times more likely to be unemployed, but native employment rate is only about 15 percent higher. Note also that in Hungary and the US, immigrants are both more likely to be employed and less likely to be unemployed than natives.

Figure 2. Inequality and segregation (employment based measure)

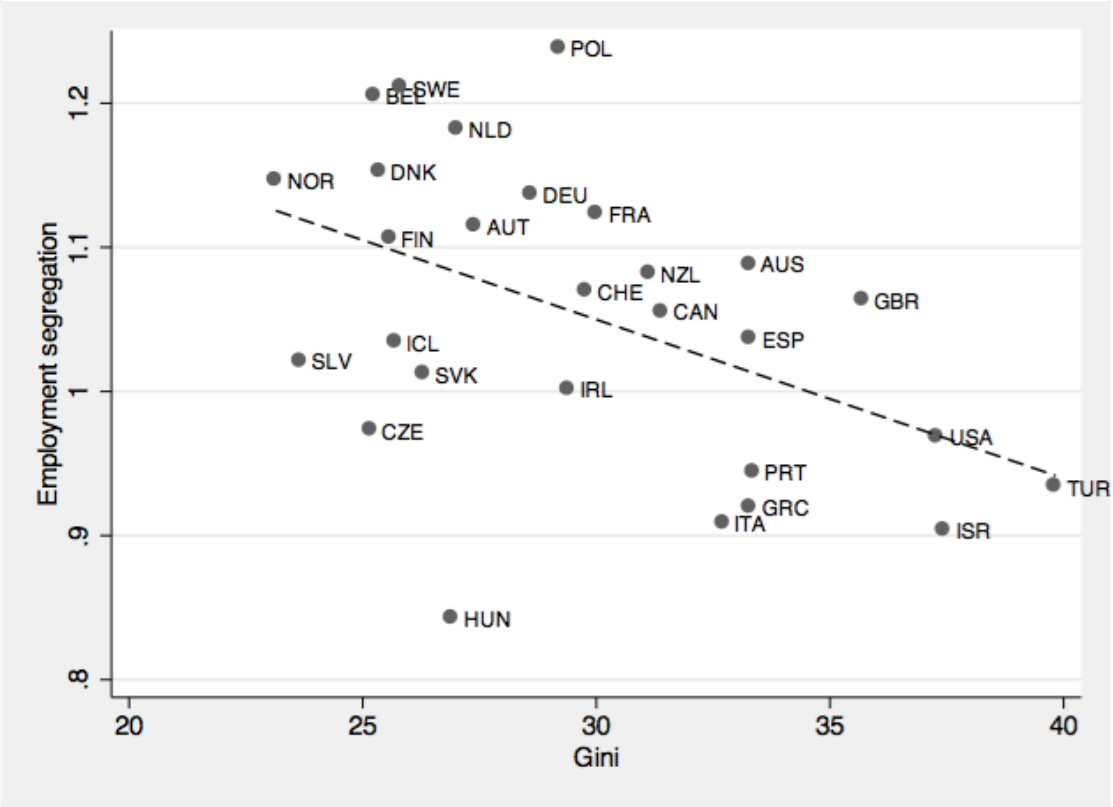


Figure 3. Inequality and segregation (unemployment based measure)

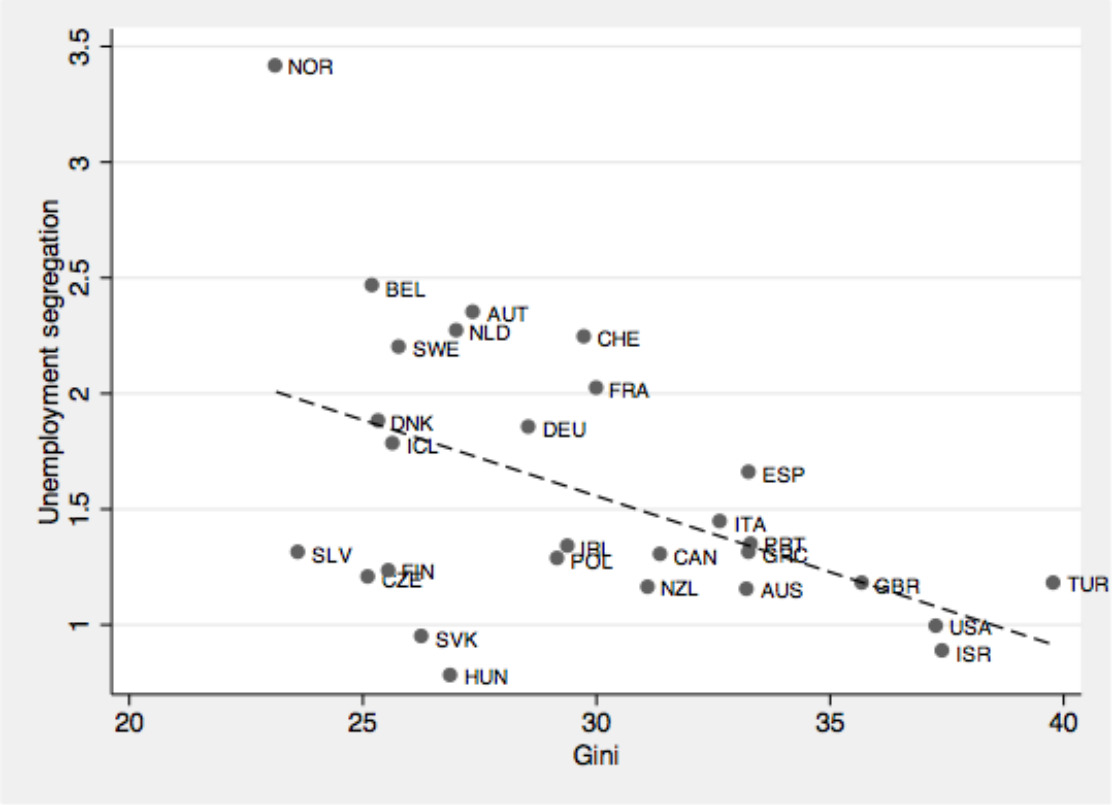


Figure 2 and 3 shows the correlation between the two segregation measures and inequality of disposable income.[1] Clearly, there seems to be a trade-off such that countries where income inequality is lower have higher labor market segregation. The pattern is consistent with standard economic explanations such that welfare state generosity and union power increase income equality by preventing some wages from falling to market clearing levels, resulting in excess unemployment among low-productive marginal groups on the labor market such as immigrants. But a number of other explanations are possible, some of which imply that there should be no such trade-off between inequality and segregation .

2.2 Nine potential explanations of labor market segregation

Xenophobia

Discrimination based on racist or xenophobic attitudes is a potential explanation of labor market segregation, as discussed by several scholars (cf. Englund 2002 and Knocke 2000 for Sweden and Solé and Parella 2003 for Spain). By sending fictitious applications to real job openings, Carlsson and Rooth (2007) provide convincing evidence of at least some degree of ethnic discrimination in the recruitment process in Sweden. For ten job applications, Swedish-named applicants get called to interview three times, while applicants with Middle Eastern names only get called two times. It is thus possible that differences in xenophobic attitudes between countries explain at least some of the variation in the labor market gaps.

To quantify xenophobia, a question from *the World Values Survey* is used. People were asked about their attitudes towards having different groups as neighbors. The measure used is the share stating that they would not want to have foreigners as their neighbors. The measure has

[1] Gini coefficients are taken from the Standardized World Income Inequality Database (SWIID) by Solt (2008).

substantial variation, from just below 3 per cent in Portugal and Sweden, to 39 per cent in Turkey.

Integration policies (Mipex)

Most countries work actively to foster the integration of immigrants, but the types of policies and the efforts made varies. The migrant integration policy index (Mipex) aims to assess and compare integration policy by quantifying integration policies across a broad range of differing environments on a scale from to 100. The index is based on public laws, policies and research. Independent scholars and practitioners in migration law, education and anti-discrimination have produced scores for several indicators based on publicly available documents in each country. Scores are anonymously peer-reviewed by a second expert. The index is produced by the Migration Policy Group, co-financed by the European Fund for the Integration of Third-Country Nationals.[2]

According to the aggregate Mipex score for 2007 (the year closest to 2005), Sweden has the best set of policies (scoring of 85 out of 100) whereas Slovakia is worst (score 38).

Welfare state generosity and social expenditure

When immigrants fail to find a job on the regular labor market, they are in most countries supported by welfare state transfers. Standard economic theory suggests that these transfers cause segregation by increasing the reservation wage of immigrants. A number of case studies support this explanation as immigrants seem to be net beneficiaries of the welfare state in countries with generous welfare states such as Denmark (Nannestad, 2004) and Sweden

[2] Further information is available on www.mipex.eu .

(Storesletten, 2003), but not in countries like Australia (Borooah and Mangan, 2007) or Canada (DeVoretz and Laryea, 2005).

Strictly speaking, generous welfare state transfers should increase reservation wages and weaken work incentives for both natives and immigrants. If immigrants are less productive due to for example weak language skills, a given level of welfare benefits will do more harm for immigrant employment than for native employment. Another possibility is that the disincentive effect of welfare state generosity is mitigated by social norms regarding for example female labor force participation for the native population, and that these norms are on average weaker among immigrants.[3] Nannestad (2007) argues that if the difference between the income earned from working and the level provided by social transfers is not enough to outweigh the individual immigrant's cost of integration, the rational choice of an immigrant is not to integrate and work, but to live instead off social transfers.

A measure of welfare state generosity was created using the OECD Taxes and Wages database, which contains data on the disposable income for different types of households. OECD also reports the average full-time wage in each country, making it possible to calculate the level of the disposable income of households with no labor market income relative to the average wage. The measure is based on two types of households: A single unemployed person with no income and no children, and a household with two unemployed adults without income and two children. The measure is based on the average for the two household types, and can be interpreted as a general measure of the generosity of the social assistance system in each country. According to the OECD-data, this type of support is close to absent in Italy and Greece, and highest in Ireland where the safety-net is 60 per cent of the average income.

[3] This is particularly relevant for the Nordic countries, where male and female labor force participation rates are more equal than in most other countries. As a result, immigrants are very likely to come from countries with a stronger male bread-winner norm (cf. Janssens, 1997).

As an alternative measure, social expenditure as a share of GDP from the OECD social expenditure database is used. While the measure described above captures only the relative level of the social safety net, social expenditure is a measure of the total size of the welfare state. The measure ranges from 9.9 per cent of GDP (Turkey) to 30.1 (France) per cent of GDP.

Employment protection laws (EPL)

Theoretically, laws that regulate hiring and firing practices increase the cost of employment for the employer. These costs should either reduce wages for the employed (when labor supply is inelastic) or result in less employment as a result of higher labor costs (when labor supply is elastic). These mechanisms should affect natives and immigrants in the same way. On the other hand, by increasing the costs of firing people, rules may induce employers to go for safe options when hiring people. Moreover, when rules take the form of "last hired, first fired" the impact should be to protect the employment of those who are well-established on the labor market, while using marginal groups such as young and immigrants to adjust the size of the labor force to changes in demand and the general state of the market.

Empirical evidence confirms that employment protection laws have little effect on overall employment, but does affect the composition of unemployment. For example, Breen (2005) find that relative to the level of adult unemployment, youth unemployment is high in regulated labor markets in which employers are restricted in their freedom to dismiss workers. In a recent summary of the literature, Skedinger (2011) concludes that employment protection laws affect the labor market situation for marginal groups.

Employment protection laws are captured by the OECD index on the overall strictness of employment protection laws, ranging from 0 to 6, with higher values indicating stricter laws. This index is provided in several versions, and the version used is version 3 (updated in july 2013), where the earliest values available start in 2008. The values used are the average for fixed and temporary contracts. The employment protection laws are weakest in the US (0.75) and strongest in Turkey (3.7).

The education of immigrants

As discussed by Wright and Maxim (1993), immigrants that are not selected on human capital or employability criteria are likely to do less well on average in the labor market. As a result, countries where the immigrant population on average has higher education are likely to be countries with less labor market segregation. The education of immigrants is captured using data on the share of foreign born with at least tertiary education. As a robustness test, the share of immigrants with only primary education or less is also used. The country with the most educated immigrants is Canada where 47 per cent have higher education, compared to only 11 per cent in Italy.

Coverage of collective bargaining agreements

Immigrants might compete for jobs by offering to work for lower wages, by working less convenient hours and by doing other tasks than native workers. In countries where a large part of the labor market is covered by collective bargaining agreements, unions will have more power to block such competition with immigrant unemployment as a result. In line with the logic of the insider-outsider theory (Lindbeck and Snower, 1988) unions will use their power to cater for the interests of their members, which are more likely to be employed native workers than to be unemployed immigrants. According to the OECD, the share of the labor

market covered by collective bargaining agreements is highest in Slovenia (100 per cent) and lowest in Mexico (10 per cent).

Immigrant share and recent asylum seekers

Finally, an argument sometimes raised by immigration skeptic parties in many countries, is that it is easier to integrate foreign born when they are relatively few, and that labor market segregation is a result of having too many immigrants in the population. Theoretically, one could imagine the opposite effect: that demand for immigrant labor is higher when there are more immigrants in the population, and this is also the pattern observed by Fleischmann and Dronkers (2010).

Nevertheless, two measures are included to capture the volume of different types of immigration: the number of asylum seekers 2000–2010 divided by population size, and also the total share of immigrants in the population. The former tells us something about countries with a recent large inflow of refugee migrants, while latter captures effects of all types of immigration, regardless of when and why.

The OECD-country with the highest immigrant share is Australia (24 per cent), with Turkey (1.9 per cent) and Poland (2.0 per cent) at the opposite end of the distribution. The pressure from asylum seekers is highest in Sweden (with 30 asylum applications per capita over the 2000-2010 period), and close to 0 for countries like Mexico and Portugal.

Descriptive statistics, definitions and sources are summarized in table 1.

Table 1. Descriptive statistics. (Unless otherwise stata, all variables are taken from OECD ilibrary.)

Variable	Obs	Mean	Std. Dev.	Min	Max	Explanation
Segregation (unemp.)	28	1.6	0.6	0.78	3.41	Unemployment rate for immigrants over unemployment rate for natives 2009.
Segregation (emp.)	28	1.1	0.1	0.84	1.24	Employment rate for natives over employment rate for immigrants 2010.
Immigrant employment	28	63.7	6.54	47.9	75.9	
Native employment	28	66.9	8.47	45.2	80.3	
Immigrant unemployment	28	11.9	4.66	6.1	28.1	
Native unemployment	28	8.3	3.47	2.9	17	
Xenophobia	25	13.1	8.22	2.5	39.2	Share who does not want immigrants as neighbors around 2005. From World values survey.
Collective bargaining share	28	62.5	26.57	13.7	100	Coverage rate of collective bargaining agreements 2005.
Immigrant share	25	10.3	6.47	1.9	24.2	Share of population born in another country 2005.
Immigrant education	22	25.3	10.02	11.2	47.3	Share of immigrant population with higher education 2005.
Employment protection laws (EPL)	28	2.1	0.76	0.75	3.71	Strictness of employment protection legislation, index 0-6, average fixed and temporary contracts. 2008. Data updated by the OECD july 2013.
Welfare state generosity	27	34.8	13.7	0	62.12	Disposable income for households with no income relative to average wage in 2005. See text for details.
Gini inequality	28	29.7	4.48	23.14	39.83	Gini-coefficient for household disposable income 2005. Solt (2008).
Asylum applications	28	9.3	8.57	0.17	30.49	Asylum applications 2000-2010 per capita
Social expenditure	28	21.2	4.87	9.9	30.1	Social Expenditure as a share of GDP
Mipex	24	57.8	13.08	38	85	Migrant integration policy index (www.mipex.eu)

2.2 Empirical strategy

The problem of substantial labor market segregation in OECD countries is a relatively recent phenomenon, and time series data are not available. Segregation is measured as recently as possible, and the potential explanatory variables are measured five years earlier. Subject to data availability, this means that unemployment is measured 2009 whereas employment and inequality are from 2010. The explanatory variables are measured 2005 or the closest year possible.

To identify patterns, the data are examined in three ways. First, a preliminary analysis is done by looking at pairwise correlations between all variables of interest. Second, baseline results are obtained by running standard linear OLS regressions as follows:

$$y = \alpha + \boldsymbol{X\beta} + \varepsilon, \varepsilon \sim N(0, \sigma^2)$$

Here, y is the dependent variable measuring the two labor market gaps, computed such that a higher value means larger segregation: Native employment divided by immigrant employment and immigrant unemployment divided by native unemployment. α is a constant, ε an error term with the standard properties, $\boldsymbol{X}$ is a the data matrix containing the nine potential explanatory factors, and $\boldsymbol{\beta}$ is the vector of coefficients that we are ultimately interested in. Third, Bayesian model averaging (explained below) is used to confirm the robustness of the baseline results.

3. Results

Table 2 displays pairwise correlations between the labor market outcome measures, the nine potential explanatory factors and Gini inequality. Only pairwise correlation with $p < 0.2$ are shown, and an asterisk (*) marks correlations with $p < 0.1$. Some patterns in the correlations are worth noting. First of all, employment and unemployment between immigrants and natives are highly correlated. Countries with high (un)employment among natives are likely to be countries with high (un)employment among immigrants.

Secondly, employment among immigrants is lower in less tolerant countries and higher in countries with many immigrants. Somewhat unexpectedly, (cf. Skedinger, 2011), stricter employment protection laws are associated with lower employment among both natives and non-natives. On the other hand, strict employment protection laws associate significantly with higher unemployment for immigrants, but not for natives.

There are also strong correlations among some potential explanatory factors. Countries with strong employment protection laws tend to have a smaller share of highly educated immigrants. Reflecting the institutional complementarity often seen in the Nordic countries, social expenditure and collective bargaining agreement coverage are strongly and positively associated, but these measures are actually uncorrelated to the measure of welfare state generosity. Finally, as one might expect, countries with better migrant integration policies have lower intolerance towards immigrants.

Table 2. Pairwise correlations
(shown ≥ 20% sig., * ≥ 10% sig.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. For. emp.	1.000													
2. Nat. emp.	0.677*	1.000												
3. For. unemp.	-0.464*	-0.293	1.000											
4. Nat. unemp	-0.428*	-0.645*	0.711*	1.000										
5. Xenophobia	-0.657*	-0.773*		0.334	1.000									
6. Collective barganing coverage		0.267	0.396*		-0.276	1.000								
7. Immigrant share	0.543*	0.632*	-0.282	-0.441*	-0.620*		1.000							
8. Immigrant education	0.294	0.321			-0.378*	-0.459*	0.485*	1.000						
9. EPL	-0.506*	-0.500*	0.437*		0.480*	0.418*	-0.585*	-0.733*	1.000					
10. Welfare state generosity		0.584*		-0.269	-0.390*		0.345*	0.448*	-0.435*	1.000				
11. Asylum seekers		0.441*		-0.452*		0.414*	0.286			0.316	1.000			
12. Gini		-0.459*		0.281		-0.548*				-0.509*	-0.492*	1.000		
13. Social exp.		0.293	0.260		-0.337*	0.654*		-0.500*			0.406*	-0.481*	1.000	
14. Mipex		0.319			-0.675*			0.333						1.000

To examine the pattern more closely, table 3 presents regressions with unemployment segregation as dependent variable using each of the potential explanations on their own, (column 1–9), confirming the negative association with inequality (column 10), then testing the significant variables against each other in a multivariate regression (column 11), and finally confirming that when controlling for these factors, inequality no longer matters (column 11).

Somewhat surprisingly, countries with more xenophobia have significantly less segregation (column 1). Migrant integration policies seem not to matter (column 2), while welfare state generosity and social expenditure both correlate with higher segregation (column 3 and 4). The same goes for collective bargaining agreements and asylum seekers per capita (column 6 and 9). On the other hand, the immigrant share and employment protection laws are positive but insignificant, and the coefficient on immigrant education is very close to zero.

In all, three factors are significant in bivariate regressions: Xenophobia, collective bargaining agreements and the Gini coefficient. When these three are simultaneously included, the coefficients for xenophobia and Gini inequality decrease and lose significance. In fact, adding Gini inequality to column 11 leaves the (adjusted) R2 unchanged, indicating that the bivariate correlation between integration and inequality is fully explained by collective bargaining agreements and asylum seekers. Overall, the results are in line with standard economic theory suggesting that unions can use collective bargaining agreements to minimize competition from immigrants on the labor market.

Table 4 repeats the analysis for the employment based segregation measure. In this case, large significant effects are found for welfare state generosity, social expenditure, collective

bargaining agreements and asylum applications per capita. When included simultaneously, only the significance of welfare state generosity remains.

Table 3. Explaning unemployment segregation (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Xenophobia	-0.0225**										-0.00522	-0.00536
	(0.0106)										(0.00851)	(0.00969)
Mipex		0.00936										
		(0.00923)										
Welfare state generosity			0.0107*								0.000454	0.000295
			(0.00625)								(0.00600)	(0.00783)
Social expenditure				0.0591***							-0.00416	-0.00458
				(0.0124)							(0.0250)	(0.0308)
EPL					0.182							
					(0.119)							
Collective bargaining coverage						0.0130***					0.00873**	0.00871**
						(0.00274)					(0.00387)	(0.00400)
Immigrant education							-0.00961					
							(0.00926)					
Immigrant share								0.0171				
								(0.0168)				
Asylum seekers									0.0506***		0.0380**	0.0378**
									(0.0112)		(0.0152)	(0.0141)
Gini										-0.0657**		-0.00127
										(0.0242)		(0.0353)
Constant	1.898***	1.086*	1.226***	0.322	1.183***	0.762***	1.934***	1.426***	1.105***	3.528***	0.848*	0.905
	(0.211)	(0.530)	(0.191)	(0.266)	(0.230)	(0.151)	(0.255)	(0.204)	(0.105)	(0.802)	(0.435)	(1.756)
Observations	25	24	27	28	28	28	22	25	28	28	25	25
R-squared	0.090	0.039	0.061	0.231	0.053	0.332	0.026	0.032	0.524	0.242	0.653	0.653

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

Table 4. Explaning employment segregation (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Xenophobia	-0.00411											
	(0.00248)											
Mipex		0.00195										
		(0.00170)										
Welfare state generosity			0.00384***								0.00319***	0.00346**
			(0.00114)								(0.00108)	(0.00145)
Social expenditure				0.0100***							0.00661	0.00686
				(0.00224)							(0.00443)	(0.00402)
EPL					-0.0162							
					(0.0213)							
Collective bargaining coverage						0.00149**					0.000103	0.000226
						(0.000646)					(0.000870)	(0.00111)
Immigrant education							0.000226					
							(0.00199)					
Immigrant share								0.00382				
								(0.00296)				
Asylum seekers									0.00571***		0.00216	0.00234
									(0.00158)		(0.00154)	(0.00184)
Gini										-0.0110***		0.00220
										(0.00316)		(0.00617)
Constant	1.114***	0.951***	0.925***	0.841***	1.087***	0.959***	1.073***	1.021***	1.000***	1.380***	0.779***	0.690***
	(0.0332)	(0.103)	(0.0377)	(0.0452)	(0.0450)	(0.0467)	(0.0653)	(0.0458)	(0.0273)	(0.103)	(0.0427)	(0.242)
Observations	25	24	27	28	28	28	22	25	28	28	27	27
R-squared	0.104	0.060	0.270	0.221	0.014	0.147	0.001	0.055	0.224	0.228	0.460	0.464

Robust standard errors in parentheses

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

3.1 Some robustness tests of the OLS-results

A number of robustness tests have been made. Including the share of immigrants with low education rather than high education only strengthens the conclusion that the educational background of immigrants does not explain the variation in segregation between OECD countries. Including union membership rates rather than collective bargaining agreements, gives insignificant results, suggesting that unionization per se is unproblematic when it comes to labor market segregation of immigrants. Finally, using older versions of OECD's index of employment protection laws, it is possible to produce a significant bivariate correlation with the expected positive sign, but the effect is no longer significant when controlling for collective bargaining agreements.

4. Bayesian model averaging

Explaining labor market segregation of immigrants is a clear-cut case of model uncertainty with respect to the choice of the explanatory variables. The model selection problem arises when there are many potential explanatory variables in the data matrix **X**. The size and significance of one variable, such as collective bargaining agreements, will depend on what other variables are included in the model – even when these variables are not significant themselves. A critical reader might correctly point out that with 9 explanatory variables, there are 512 (2^9) different possible models – of which only a handful have so far been shown.

Using Bayesian model averaging (BMA), the problem is tackled by estimating all 512 possible models and constructing a weighted average over all of them using weights derived from Bayes' theorem. In Bayesian probability theory, the

researcher is allowed to consider some models a priori more likely to be correct, but in applications such as this one it is customary to apply so-called naive priors, which means that all models are initially considered to be equally likely. The Bayesian model averaging updates the inclusion probability of each variable based on the explanatory power of models where the variable is included. When all possible models are run, the researcher obtains weighted coefficients for each X-variable, as well as posterior inclusion probabilities, which can be interpreted as the probability that the variable in question belongs in the model. The Bayesian approach to regressions with model uncertainty was made popular by Sala-i-Martin (1997), famously titled *I Just Ran 2 Million Regressions*. Note that the method used in that paper was Bayesian averaging over classical estimates (BACE) that requires the researcher to decide how many variables to include in the model. In contrast, the Bayesian model averaging allows also uncertainty with respect also to how many variables the model should include.

In the following, the Bayesian model averaging estimator introduced by Magnus, Powell and Prüfer (2010) is used to obtain weighted coefficients and posterior inclusion probabilities. This method allows two subsets of explanatory variables: So-called focus regressors are explanatory variables that with certainty belong in the model, for theoretical or practical reasons. A second set of auxiliary regressors contain additional explanatory variables which may or may not belong in the model.

The Magnus, Powell and Prüfer (2010) implementation of Bayesian model averaging is particularly useful here, because we can include the (un)employment of natives as a focus regressor, capturing the effect of factors that improve the

functioning of the labor market in general, while the remaining nine variables are considered auxiliary regressors that may or may not help to explain the labor market outcome for immigrants. This setup means that if any of the nine variables attain a posterior inclusion probability (Pip) higher than 1/9, they are useful in explaining the cross-country variation in (un)employment of immigrants, contingent on native (un)employment.[5]

Table 5a and 5b presents results from applying the BMA-procedure when immigrant employment is the dependent variables and native employment is the focus regressor. The difference between the two tables is that compared to table 5a, table 5b economizes on data by not using the explanatory variables Mipex and immigrant education, thereby increasing the number of countries included from 21 to 25.

Regardless of sample size, the variables (bolded) that substantially increase their inclusion probability compared to the prior are almost exactly the same: Collective bargaining agreements, xenophobia and welfare state generosity. Only social expenditure does much better in the smaller sample.

For employment, the Bayesian approach generates conclusions similar to the OLS analysis. The most noteworthy difference is that according to the Bayesian approach, xenophobia seems to matter with the expected sign: countries with higher xenophobia have lower immigrant employment.

[5] This setup also means that results are easier to interpret compared to the preliminary OLS-results with ratios as dependent variables. A correlation with a ratio can occur either because the variable is correlated with the nominator or with the denominator, or with both but with different signs.

Table 5. Baysian model averaging explaining foreign employment

a. Dependent variable: Foreign employment (N = 21)

	Coeff.	Std Error	t	Pip	[1-Std. Err. Bands]	
Focus regressors						
Constant	37.07454	15.93845	2.33	1.00	21.13609	53.01299
Native employment	.550727	.2116316	2.60	1.00	.3390954	.7623586
Auxiliary regressors						
Social expenditure	**-.2206421**	**.3038524**	**-0.73**	**0.44**	**-.5244945**	**.0832103**
Welfare state generosity	**-.064471**	**.0918361**	**-0.70**	**0.42**	**-.156307**	**.0273651**
Xenophobia	**-.1244011**	**.236953**	**-0.53**	**0.31**	**-.3613541**	**.1125519**
Collective bargaining agr.	**-.0229117**	**.0454874**	**-0.50**	**0.30**	**-.0683991**	**.0225757**
Mipex	-.0154612	.0568894	-0.27	0.16	-.0723506	.0414282
EPL	-.000321	.7890713	-0.00	0.13	-.7893923	.7887503
Asylum seekers	-.0106489	.0589054	-0.18	0.13	-.0695543	.0482565
Immigrant share	.0094768	.0879741	0.11	0.12	-.0784972	.0974509
Immigrant education	-.0009174	.0510035	-0.02	0.12	-.051921	.0500861

b. Dependent variable: Foreign employment (N = 25)

	Coeff.	Std Error	t	Pip	[1-Std. Err. Bands]	
Focus regressors						
Constant	36.85632	14.65059	2.52	1.00	22.20573	51.50691
Native employment	.4963757	.2026481	2.45	1.00	.2937276	.6990237
Auxiliary regressors						
Collective bargaining agr.	**-.0395272**	**.0495874**	**-0.80**	**0.49**	**-.0891146**	**.0100602**
Xenophobia	**-.1128132**	**.1836146**	**-0.61**	**0.37**	**-.2964278**	**.0708014**
Welfare state generosity	**-.0504634**	**.0824358**	**-0.61**	**0.37**	**-.1328992**	**.0319724**
Social expenditure	-.0376683	.1477626	-0.25	0.20	-.1854309	.1100944
EPL	-.2474296	1.010605	-0.24	0.20	-1.258034	.763175
Asylum seekers	-.0112236	.0648493	-0.17	0.16	-.0760728	.0536257
Immigrant share	.0104874	.0879591	0.12	0.14	-.0774718	.0984465

Table 6a and 6b presents the Bayesian model averaging results for immigrant unemployment. Two variables increase their inclusion probability substantially in

both samples: Collective bargaining agreements and employment protection laws, both being associated with higher immigrant unemployment. In the larger sample (table 6b), the coverage of collective bargaining agreements attains a posterior inclusion probability of 97 percent, indicating that the variable almost certainly belongs in a model that explains immigrant unemployment controlling for native unemployment. Moreover, the confidence interval indicated by the one standard-deviation error band is entirely on the positive side.

6. Baysian model averaging explaining foreign unemployment

a. Dependent variable: Foreign unemployment (N = 21)

	Coeff.	Std Error	t	Pip	[1-Std. Err. Bands]	
Focus regressors						
Constant	-5.197386	4.252717	-1.22	1.00	-9.450103	-.9446687
Native unemployment	1.140936	.1500705	7.60	1.00	.9908658	1.291007
Auxiliary regressors						
Collective barganing agr.	**.0657455**	**.0414862**	**1.58**	**0.79**	**.0242593**	**.1072318**
EPL	**.8373903**	**1.208543**	**0.69**	**0.42**	**-.3711531**	**2.045934**
Asylum seekers	**.0459162**	**.0762213**	**0.60**	**0.36**	**-.0303051**	**.1221375**
Immigrant education	.0213799	.0507587	0.42	0.24	-.0293788	.0721385
Immigrant share	.0254704	.0648308	0.39	0.22	-.0393604	.0903012
Social expenditure	.0339767	.107073	0.32	0.18	-.0730962	.1410497
Mipex	.0055652	.0217043	0.26	0.16	-.0161391	.0272695
Welfare state generosity	.0033705	.0160908	0.21	0.13	-.0127203	.0194613
Xenophobia	-.001937	.0358035	-0.05	0.11	-.0377405	.0338665

b. Dependent variable: Foreign unemployment (N = 25)

	Coeff.	Std Error	t	Pip	[1-Std. Err. Bands]	
Focus regressors						
Constant	-3.566288	3.194252	-1.12	1.00	-6.76054	-.3720357
Native unemployment	1.047059	.1403531	7.46	1.00	.9067055	1.187412
Auxiliary regressors						
Collective barganing agr.	**.0897348**	**.026083**	**3.44**	**0.97**	**.0636517**	**.1158178**
Immigrant share	**.0559001**	**.0916137**	**0.61**	**0.38**	**-.0357137**	**.1475138**
EPL	**.3612473**	**.7632424**	**0.47**	**0.29**	**-.401995**	**1.12449**
Xenophobia	-.0081356	.0420378	-0.19	0.17	-.0501734	.0339022
Welfare state generosity	.0050583	.0193216	0.26	0.17	-.0142633	.02438
Asylum seekers	.0074259	.0342547	0.22	0.16	-.0268287	.0416806
Social expenditure	.0041234	.0668301	0.06	0.14	-.0627067	.0709535

4. Concluding discussion

Despite the small sample, and the high number of plausible competing explanations, one result is strikingly robust: Countries where collective bargaining agreements cover a larger share of the labor market, have significantly higher unemployment among immigrants when controlling for native unemployment. The size of the association is also economically significant: One standard deviation higher collective bargaining agreement coverage associates with 0.5 standard deviation higher immigrant unemployment (based on the coefficient in table 6b).

Almost equally robust is the pattern that countries with more generous social safety net levels relative to the average income have lower employment among immigrants. This effect is actually economically more significant, as a one standard deviation increase in welfare state generosity associates with one standard deviation lower immigrant employment.

The results cast serious doubts on the idea that factors such as immigrant education and integration policies matter for the (un)employment gap. The remaining explanations are significant in some specifications, but mostly insignificant.

How should these results be interpreted? While the sample is small and the econometric techniques do not show causal effects, it bears emphasizing that results regarding welfare state generosity and collective bargaining agreements are very much in line with standard neo-classical predictions as well as with the insider-outsider hypothesis. Importantly, the measure of welfare state generosity

does not reflect the size of the welfare state in general but rather specifically the relative level guaranteed by the welfare state to households without labor income.[6] Note also that the coverage rate of collective barganing agreements is very different from unionization rates. One should therefore be careful not to blame the (un)employment gap on the unions and the welfare state, but rather on the specific features collective bargaining agreements and the social safety net level.

Overall, it seems as if the observed trade-off between labor market integration and income equality is explained by two factors: welfare state generosity, collective bargaining agreements. A regression of Gini inequality on welfare state generosity and collective bargaining agreements (not shown) confirms that both are significantly associated with lower Gini inequality. When combining the results regarding collective bargaining agreements, welfare state generosity and Gini inequality, an interesting pattern emerges. Countries with high coverage of collective bargaining agreements have lower inequality – but also higher labor market segregation. On average these countries also tend to have higher welfare state generosity.[7] Therefore, if unions use collective agreements to prevent immigrants from competing for jobs in these countries, the unemployed immigrants still enjoy a relatively high income standard thanks to the welfare state. Simply put, unions shift the costs for the job safety for their insiders to the welfare state and thus to the tax-payers. From this perspective it is worth probing deeper into the fact that the countries where bargaining agreement prevent labor

[6] The measure does not capture benefit conditionality. To varying degrees, countries require some kind of job-seeking activity from recipients. If conditionality works as intended, this should bias the results towards 0.
[7] The correlation between welfare state generosity and Gini is –0.46, and between collective bargaing agreements and Gini –0.55.

market integration tend to be countries where stated tolerance towards foreigners is the highest. A possible interpretation is that natives are more tolerant towards immigrants when immigrants are perceived to be a lesser threat on the labor market.

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