Will I see you at work?
Ethnic workplace segregation in Sweden 1985–2002

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by

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Abstract

We study ethnic workplace segregation in Sweden using linked employer-employee data covering the entire working-age Swedish population during 1985–2002. Segregation is measured as overexposure to a particular group, taking into account the distribution of human capital, industry and geography. We find considerable workplace segregation between immigrants and natives but the results differ substantially between ethnic groups. Segregation has increased during the period, mainly due to changes in the ethnic composition. Immigrants are particularly overexposed to workers from their own birth region but also to other immigrants. Children to immigrants are only overexposed to immigrants from their parents region of birth. Segregation—particularly in the immigrant-native dimension—is in general negatively correlated with economic status.

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1   Introduction

Increasing ethnic diversity and substantial problems of integrating immigrants in the host country economies has generated growing attention from politicians and social scientists in the last two decades. Numerous studies have documented the process of earnings assimilation and the role of host country language skills in fostering economic integration. Scholars in several disciplines have also been concerned with the issue of ethnic residential segregation. However, the explicit junction between segregation and labor market integration remains largely unexplored: there is still limited knowledge on the extent and the nature of ethnic segregation in the labor market (Charles 2000).[1]

We study ethnic workplace segregation in Sweden—between immigrants and natives as well as in finer groupings defined by region of origin. The basic purpose of the analysis is to describe and characterize ethnic segregation in the Swedish labor market. The study also aims at documenting the sources of segregation by separating "pure" ethnic segregation from segregation based on differences in e.g. human capital and industrial allocation. The investigation uses matched employer-employee panel data, covering the entire Swedish workforce in the period 1985–2002. We can thus study coworker and establishment characteristics for all Swedish workers in an eighteen-year period. Another great advantage of the database is that it is representative also for very small establishments, where segregation is likely to be strong.[2]

By the term segregation we mean systematic sorting by workers of different ethnicities over workplaces. According to economic and sociological theories, such sorting may occur for a number of different reasons. "Positive" explanations include preferences for working with peers, networks providing opportunities for work, and productive complementarities in languages or other skills. Examples of "negative" theories are that segregation may be a reflection of labor market discrimination as in Becker (1957), or of labor market segmentation where segregated workers are stuck in poor jobs with few opportunities. Unfortunately, it is difficult to discriminate between these theories since they in

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[1] This is particularly true outside the US and in comparison to the large literature on gender segregation. Swedish research on gender segregation in the labor market includes Nermo (1999), who also provides a summary of theories on labor market segregation. Schröder (1991) considers theories of segmented labor markets in the context of youth unemployment.
[2] Despite large efforts in construction new datasets, recent studies still overweight workplaces of larger size (see e.g. Hellerstein & Neumark 2005).

general do not provide mutually exclusive testable predictions. Thus, this paper does not attempt to provide the final answer to why segregation occurs. However, trying to shed some light on the influence of the various mechanisms, we present an array of results on labor market segregation in Sweden.

Segregation is measured by the extent of overexposure to a particular group (e.g. all other immigrants or people from one's own birth region). The analysis depicts the extent to which human capital, residential location and industrial allocation explain labor market segregation. We employ a method for conditioning on covariates in the measurement of segregation (see Åslund & Skans 2005) to separate explained segregation from "purely ethnic" overexposure in the labor market. Our statistical methods also allow us to study levels of exposure in many dimensions: to ethnic peers, to immigrants in general, to natives, to immigrants with a certain background. They also make it possible to consider the distribution of workplace segregation across individuals and firms.

We begin by describing segregation in the immigrant-native dimension and then turn to overexposure along finer ethnic lines. The analysis uses data for the period 1985–2002 but focuses on 2002 for some of the more detailed issues. We study differences in segregation by subgroups of the population and the situation of 2nd generation immigrants, i.e. natives with at least one immigrant parent. The analysis then considers the distribution of segregation, the correlation between segregation and group labor market status, and how segregation is related to the business cycle.

Empirical results from the US suggest that there is substantial racial segregation in the labor market, and that wage gaps to some degree can be explained by segregation in a statistical sense (see e.g. Bayard et al 1999). Hellerstein & Neumark (2005) find that differences in language proficiency—but not education—explain a large part of the observed ethnic workplace segregation in the US. There is little previous Swedish work on ethnic segregation across establishments. In the occupational dimension, however, le Grand & Szulkin (2002) show that there is segregation between natives and immigrants, mostly so among men born outside Europe or other Western countries.

Our analysis reveals substantial ethnic labor market segregation in Sweden. Immigrants are particularly overexposed to others from their own region of birth, but also to other immigrants. Segregation as measured by overexposure has increased over time, mostly as a result of a changing composition of the immigrant population toward more segregated groups. Overexposure particularly in the immigrant-native dimension is negatively related to economic

status. Even though there are patterns supporting ethnic sorting of well-established groups, the weight of the results is consistent with a situation where large immigrant groups are concentrated in a secondary labor market.

The paper is outlined as follows. Section 2 provides background information on immigrants in Sweden and the labor market during our observation period. Section 3 describes our matched longitudinal employer-employee data set. Section 4 presents the method we use to analyze workplace segregation. Section 5 contains the empirical analysis. Section 6 summarizes the results and discusses how the empirical findings relate to the different theories.

2 Ethnicity in the Swedish labor market

Most of the ethnic variation in Sweden stems from immigration in the last five decades. Since 1960, the number of first-generation immigrants has grown from 300,000 to more than one million. Today, the foreign-born constitute about 12 percent of Sweden's nine million residents. Concurrently, the ethnic diversity of the foreign-born has changed dramatically. Immigrants from other Nordic countries made up close to 60 percent of the immigrant population in 1960; in 2003 the corresponding figure was 26 percent. During the same period, the number of Asian-born individuals went from less than 1,000 to close to 300,000. The parts of the population born in Africa and South America also grew to significant sizes in these years.[3] We study labor market segregation between natives and immigrants (primarily first generation, but also second generation). Given Sweden's immigration history, it seems fair to say that the immigrant dimension captures most of the ethnic variation in the population.[4]

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[3] The population data presented here come from Statistics Sweden (2004). The figures for 2003 also reveal that approximately 100,000 people were born in non-Nordic EU countries, and 250,000 people originated in European countries outside the EU (2003 members) and the Nordic countries. About 55,000 immigrants have come from South America, and a slightly larger number from Africa (62,000).

[4] Five groups have been granted national minority status, partly due to their long-term presence in Sweden: the (indigenous) Sami, the Swedish Finns, the Tornedalers, the Roma, and the Jews. The Finns—of which most people are first or second generation immigrants—are by far the largest of these groups. See Ministry of Justice (2003) for details.

As in many other Western countries the labor market position of the immigrant population has deteriorated in Sweden during the last twenty or thirty years. In the 1950s and 1960s, labor migration from the Nordic countries (especially Finland) and continental Europe dominated the inflow. Until the mid-1970s, immigrants had higher employment rates than the native-born population. Immigration gradually shifted toward refugees and family reunification migrants. This also implied a shift in the source country composition.

The period we study, 1985–2002, saw dramatic developments in many dimensions. As shown in *Figure 1*, the fraction foreign-born in the population rose steadily from less than eight to almost twelve percent during this eighteen-year period. The change was driven by comparatively high levels of immigration, with two peaks caused by large refugee inflows (from the Middle East in 1989, and from former Yugoslavia in 1993–94). The most dramatic events, however, took place in the labor market. Open unemployment climbed from just over one percent during the boom in the late 1980s, to about ten percent in only about three years. The number of people in active labor market programs also increased rapidly; the sum of unemployed and program participants reached 15 percent in 1993. Toward the end of our observation period, unemployment fell sharply, although it remains on a high level in a Swedish historical perspective.
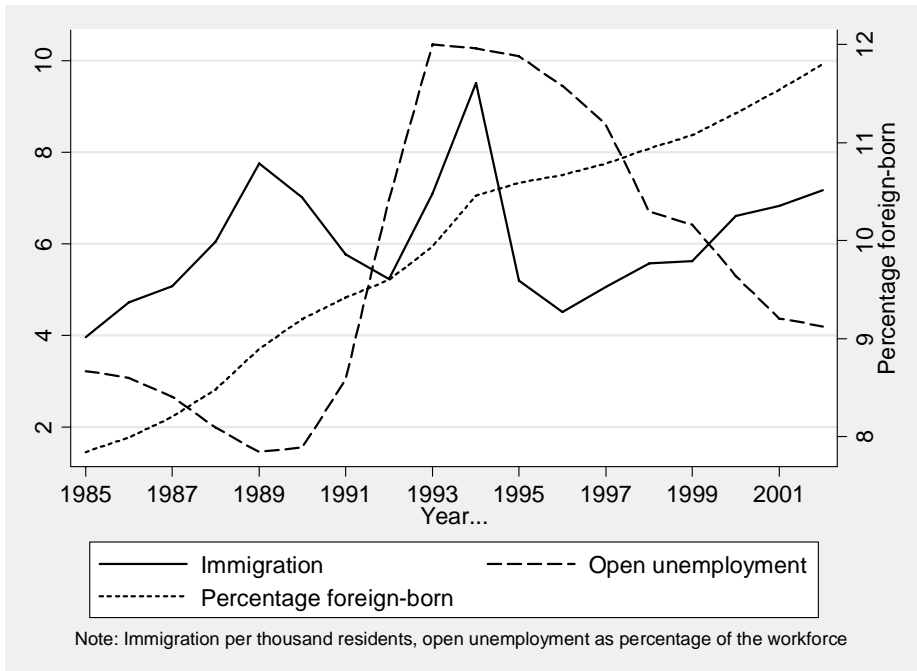
Figure 1 Immigration, foreign-born and unemployment in Sweden, 1985–2002.

The hardened conditions in the labor market did of course not facilitate the labor market integration of the many immigrants that arrived shortly before or during the economic crisis (Edin & Åslund 2001). Even though a marked improvement in employment rates in the most disadvantaged groups occurred in the late 1990s and the beginning of the new millennium, there are still vast differences between groups from different regions of origin. In 2002, the employment rate among natives was 76.8 percent. Among those born outside Europe, the corresponding figure was 53.5 percent. There are much smaller differences between native Swedes and people from other EU/EES countries; employment in the latter group was 69.3 percent in 2002. Having a job or not appears to be the great divider in the ethnic dimension in the Swedish labor market (see e.g. Arai & Vilhelmsson 2002). Wage differences are smaller, but follow the same pattern as the other measures. The average monthly (full-time) wage among natives was SEK 22,250 in 2002; for immigrants from non-

European countries it was SEK 19,050. EU-migrants had an average wage almost identical to the one received by natives.[5] Swedish studies of earnings and employment assimilation of immigrants suggest that the initial gap decreases over time, but does not disappear (Edin et al. 2000, Nekby 2002).

Immigrants and natives also differ in the distribution across industries. Relative to natives, Nordic and Eastern European immigrants are over-represented in the manufacturing industry, while the "Rest of the world" migrants are strongly overrepresented in staffing and cleaning services.[6] Similarly, the geographic distributions of immigrants and natives are not the same. The three metropolitan areas of Stockholm, Gothenburg, and Malmö hosted 50 percent of the foreign-born population in 2003, but only one-third of the total population. The immigrant fraction in the Swedish municipalities also spans a wide range, from 2 to 39 percent. Municipalities with few immigrants are typically small and rural. Among the 20 largest municipalities in 2003, only six had immigrant shares below the national average of 12 percent. By contrast, only two of the twenty smallest municipalities had figures above this average.

This study also considers the situation of so-called 2nd generation immigrants, i.e. natives with foreign-born parents. Our data contain about 300,000 individuals in this category.[7] Previous research has shown that there are smaller differences in the labor market between this group and other natives (Ekberg & Rooth 2004). However, the differences appear to follow the patterns of the first generation in the sense that problems are "inherited": a 10 percent difference in employment in the first generation gives an expected 7 percent difference in the second generation (Lundh et al 2002).[8]

Some of the themes from this background description have direct implications for the empirical analysis. First, the immigrant population in

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[5] Figures for employment and unemployment come from the Swedish labor force surveys. Wages are calculated from the LINDA database, which contains a three-percent representative sample of Sweden's population (see Edin & Fredriksson 2000 for further details). The industrial distribution found in our data corresponds well to the one presented in the Labor Force Surveys.

[6] See the descriptive statistics in *Table 1* in the next section. 36 % from "The rest of the world" included in the "Financial and corporate services" 1-digit industry works with "Cleaning"; the corresponding number for others in the industry is 4%.

[7] The official definition of "foreign background" was recently changed to include only those with two parents born outside Sweden. In total 325,000 individuals fulfil this requirement. Since we are interested in ethnic links, we include also those with one foreign-born parent.

[8] See also Österberg (2000) and Vilhelmsson (2002) for studies on natives with immigrant parents.

Sweden is heterogeneous. While there is a case for studying the immigrant-native dimension of segregation, several theories suggest that labor market clustering would be stronger in finer groupings. Second, there are substantial cross-group differences in employment, earnings and wages, making it interesting to relate segregation to the labor market position of a specific group. Third, the size and the composition of the immigrant population changes substantially during the years considered here. This calls for an analysis of the development of segregation over time. Fourth, the labor market goes through some very turbulent times, meaning that the impact of the business cycle on segregation can be investigated.

3 Data

The data used in this paper are from a linked employer-employee data set (the IFAU database) covering the entire Swedish economy from 1985 to 2002. The data are based on tax records and contain yearly information on all 16–65 year-old employees receiving remuneration from Swedish employers (both private and public).

Immigration status is measured by a grouped variable containing country or region of birth.[9] We also use a variable indicating (latest) year of immigration. Some of the largest immigrant countries are included in the data with unique codes, but in general this information is grouped for confidentiality reasons (see the appendix). Thus, our definition of an immigrant group does not correspond uniquely to an ethnic group. This would, however, not be the case even if the country of origin had not been grouped since many source countries (such as Iraq, Turkey and Iran) contain a complex ethnic mix. Thus, it is likely that any sorting that we find according to "ethnic" dimensions are underestimates of the sorting process within truly ethnic groups.

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[9] We consider workers as immigrants if they are born abroad, *excluding* adoptees arriving before age 3. The reason for this restriction is that we are interested in workplace sorting according to ethnic dimensions which should be a function of the foster parents rather than the biological parents for children that were adopted at a very young ageIn practice, the workers we consider as adoptees, and thus code as natives, are i) born outside of Sweden, ii) arrived to Sweden before age 3 and iii) have the country of birth of *both* their parents coded as missing. Some children arriving with relatives instead of biological parents could be miscoded as natives according to this procedure, but they are likely to be few.

In most of the empirical analysis, we use two different classifications according to region of birth: (i) two groups—immigrant and natives; (ii) by region of origin, meaning that we study exposure to other people from one's own country (or group of countries).

We use earnings information from the tax records included in the data to construct the employment-status of workers. The earnings data contain annual earnings, the first remunerated month and the last remunerated month. From this we construct a measure of monthly earnings for all employment spells that cover November each year. Since we primarily are interested in employment and not wages, we use a fairly low earnings cut-off of 25 percent of a minimum monthly wage when defining employment.[10] We only keep the job generating the highest monthly wage for each individual and year.

Using the individual employment data described above, we calculate the number of employees by workplace (note that this includes the self-employed). Our inquiry is based on analyzing coworker characteristics (most notably ethnicity), and thus we exclude workplaces with only one employee. Apart from the number of employees, we characterize the workplaces by the municipality (290 groups in 2002) and "industry" where industry is based on the "reduced" 2-digit industries that are the smallest common denominator between the classification systems SNI-92 and SNI-69 (40 groups). In addition to the workplace information we use data on standard human capital indicators. The characteristics are age groups (<30, 30-49 and 50+), educational groups (7 dummies) and gender.

Table 1 presents descriptive statistics on the sample used in the analysis of the final year in our data (2002). All-in-all there is 3.1 million natives and 360,000 immigrants in the used data for 2002. About one third of the immigrants were born in the Nordic countries, one third have come from other European countries or North America, and the remaining third are from the rest of the world. The table also displays how many observations that are dropped due to the restrictions of: (i) being classified as employed and (ii) having at least one colleague.

Immigrants are overrepresented in the prime-age group (30–49 years) compared to natives. Regarding education, we see that there is somewhat more of a polarization among the foreign-born. Larger fractions are found in the

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[10] The minimum wage is defined by the published mean monthly wage of janitors employed by local governments each year. The values are available upon request.

categories "Primary or less" and "Graduate", i.e. the lower and upper tails of the distributions of education. We also see that this pattern varies between the subgroups in the immigrant population. In the group "Western Europe and North America", 33 percent are in the two highest education classes, compared to 16 percent among Nordic immigrants. The fraction working in the private sector is roughly the same in all groups, but it is clear that the industrial distribution differs between groups.

Table 1 Descriptive statistics, 2002.

	Natives	All foreign-born	Nordic	W Eur + N Am	Eastern Europe	Rest of the world
Age	41.6	42.0	46.6	43.7	40.9	37.8
16–29	.196	.151	.064	.123	.177	.224
30–49	.494	.569	.491	.529	.583	.647
50–65	.310	.280	.444	.348	.241	.129
Female	.479	.487	.549	.389	.513	.443
Education						
Primary or less	.148	.195	.232	.131	.139	.224
2-year secondary	.302	.263	.336	.196	.244	.231
3-year secondary	.210	.188	.132	.162	.267	.194
Some tertiary	.149	.126	.119	.136	.125	.130
At least 3 year tert.	.179	.183	.152	.273	.191	.175
Graduate	.009	.021	.010	.055	.020	.020
Unknown	.001	.023	.020	.047	.014	.026
1-digit industry						
1-Agriculture etc	.012	.005	.007	.006	.005	.002
2-Manufacturing	.207	.245	.263	.202	.316	.190
3-Construction	.055	.027	.048	.027	.020	.013
4-Wholesale, retail	.194	.165	.159	.165	.165	.170
5-Financial, corporate services	.129	.126	.115	.151	.119	.133
6-Education, R&D	.122	.113	.107	.172	.099	.107
7-Health, Social	.158	.187	.198	.130	.171	.210
8-Personal & cultural services	.058	.091	.055	.108	.068	.136
9-Public admin. etc	.065	.039	.046	.036	.035	.035
Private sector	.610	.643	.619	.668	.670	.637
Monthly earnings	9.786	9.684	9.790	9.836	9.660	9.549
Standard deviation	.526	.537	.498	.589	.505	.540
N (used)	3,126,829	360,175	112,465	41,487	87,782	118,441
Not employed	1,491,123	399,165	79,132	39,213	94,682	186,138
1 person workplace	338,785	49,503	13,201	5,566	10,398	20,338

Note: Descriptions are for used data, i.e. for workplaces with 2+ employees. Earnings are in logs.

4 Measuring workplace segregation

In general, the concept of segregation aims to capture systematic sorting over units (e.g. workplaces) by individuals belonging to different groups (e.g. defined by ethnicity). Thus, segregation can be said to occur if the distribution of groups over units is different from what should be the result of a random allocation. In this paper we use the measures of *exposure* to quantify segregation. We define exposure as the fraction of a person's coworkers that belong to a certain ethnic group. If workers were randomly allocated, workers of every ethnicity should (on average) be equally exposed to a given ethnic group (including their own).[11] In other words, there is segregation if an individual is on average more exposed to a certain group than he should be if the distribution of workers across workplaces were random.

Workplace segregation can occur for several reasons, some of which we might want to control for. For example, when studying a whole economy as we are doing in this paper, we are likely to observe workplace segregation as a result of regional sorting. Also, if ethnicities differ with respect to important individual characteristics such as education, we are likely to see workplace segregation simply as the result of sorting by education. Thus, we may be interested in measuring workplace segregation in excess of what can be explained by the distribution of some underlying characteristics. An important note is however that the distribution of underlying characteristics may be the result of workplace sorting; immigrants may for example be regionally sorted just because they (for any reason) end up working together. Therefore, we are at risk of understating the phenomenon we are interested in; we will discuss this issue in more detail in *Section 5* below.

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[11] For example, if there are 10 % minority workers and workers are randomly allocated in a large number of 2-person firms, 1 % of firms would have only minorities, 18 % would be mixed and 81 % pure majority. Note that in firms with only minority workers there are two minority observations which implies that 2 out of 20 from the minority only would have minority colleagues while the other 18 have zero. At the same time 18 out of 180 majority workers would have only minority colleagues and the rest zero. Thus, minority exposure in both groups is 10 % which is the minority share.

4.1   The empirical method

Below we present the method used for conditioning on covariates in the measurement of segregation. The method was developed in Åslund & Skans (2005), and we refer to that paper for a more detailed presentation and comparisons to other measures of segregation.

Initially we can think of two groups, so that some individuals are immigrants ($D^m = 1$) and others are not ($D^m = 0$). There are N individuals in total, whereof N^m are immigrants, and a set of workplaces denoted by w, each of size s^w. We define individual i:s *actual exposure* (e) to immigrants within his workplace $w(i)$ as the fraction immigrants among *others* in the workplace:

$$e_{i,w(i)} = \frac{1}{s^{w(i)} - 1} \sum_{\substack{w(j)=w(i) \\ j \neq i}} D_j^m .$$

(1)

Our aim is to contrast this measure of actual exposure to the levels of exposure that would be the result if individuals only sorted themselves according to some observed characteristics X (and not according to minority status). We term the outcome such as it would look like if a person's coworkers only were determined by X (and otherwise random) the *expected exposure* and denote it by E. For each individual we calculate the expected exposure as:

$$E(e_i \mid x_{j \, \forall j: w(j)=w(i), j \neq i}) = \frac{1}{s^{w(i)} - 1} \sum_{\substack{w(j)=w(i) \\ j \neq i}} p^m(x_j),$$

(2)

where $p^m(x_j)$ is the immigrant fraction among all individuals with the realisation x_j of the vector X:

$$p(x_j) = \frac{N^m(X = x_j)}{N(X = x_j)} .$$

(3)

Think of $p(x)$ as the probability that a worker with certain characteristics is an immigrant and $E(e|x)$ as the average of these probabilities for each worker's coworkers. Note that when we do not condition on any X-variables, both (3)

and (2) collapses to N^m/N, i.e. the fraction of immigrants in the population. This corresponds to the logic presented in the introduction of this section: in the absence of segregation, both immigrants and natives should (on average) have a fraction of immigrants among their colleagues that corresponds to the fraction of immigrants in the population.

Note that we calculate (3), the probability that a given coworker is an immigrant completely non-parametrically (assuming that *X* only contains discrete variables). Thus, we do not impose any functional form on how the distribution of *X* is affecting the sorting process. Furthermore, *X*-characteristics may vary both between and within workplaces.

By contrasting the average values of (1) and (3) we get a measure of exposure in excess of what can be explained by the distribution of *X*. There are many ways of relating the observed level of exposure to its expected level. We use a simple measure of relative overexposure. In the two-group case it is defined as

$$ R^m = \frac{\sum\limits_{D^m=1} e_i \Big/ N^m}{\sum\limits_{D^m=1} E\big(e_i \mid x\big) \Big/ N^m} \,, \tag{4} $$

i.e. average observed exposure divided by average expected exposure. The interpretation of this measure is simple: the average immigrant has R^m as many immigrants compared to what would be expected under random allocation conditional on the distribution of *x*. However, in most cases we also report both the average actual and expected levels of exposure.

4.2   The multi-group case

The model has so far focused on the case where we only have two groups. This is somewhat restrictive, given that we are interested in the sorting according to ethnic dimensions. Fortunately, the model is easily extended to a multidimensional case: We can calculate measures of "own-group" exposure, by which we mean exposure to one's own ethnic group denoted by $g = (1,\ldots.G)$, correspondingly to (1) by:

$$e_{i,w(i)}^g = \frac{1}{s^{w(i)}-1} \sum_{\substack{w(j)=w(i)\\j\neq i}} D_j^g \;. \tag{5}$$

In this case we take the average over all *immigrants* ($g \in \Gamma$) to calculate *average own-group exposure*:

$$\varepsilon_\Gamma^g = \frac{1}{\sum_{g\in\Gamma} N^g} \sum_{i:g(i)\in\Gamma} e_i^g D_i^g \tag{6}$$

Then, by calculating the fraction of people belonging to *g* for all realizations of *X* by:

$$p^g(x_j) = \frac{N^g(X=x_j)}{N(X=x_j)} \tag{7}$$

we can get measures of average *expected own-group exposure* among immigrants:

$$E(\varepsilon_\Gamma^g \mid x_{j\,\forall j:w(j)=w(i),j\neq i}) = \frac{1}{\sum_{g\in\Gamma} N^g} \sum_{i:g(i)\in\Gamma} \frac{1}{s^{w(i)}-1} \sum_{\substack{w(j)=w(i)\\j\neq i}} p^{g(i)}(x_j) \tag{8}$$

The interpretation of the actual own-group exposure described by (6) and expected own-group exposure described by (8) is the average fraction of others in the same workplace that belong to (or are expected to belong to) the same ethnicity as oneself, calculated over all immigrants. By dividing (6) by (8) we get measures of overexposure that exactly corresponds to equation (4) above. Note also that the method described here also can be used to make various cross-group comparisons.

4.3   Simulations

In some cases we wish to go beyond the average exposure and look at the distributions of actual and expected exposure. This means that we are looking

at, for example, the fraction of immigrants who are having a majority of immigrants among their coworkers. In these cases we cannot rely on the calculations of (2) and (8). Instead we use the same logic and simulate the expected distributions treating (3) and (7) as probabilities. This procedure is described in more detail in Åslund & Skans (2005).

5 Ethnic workplace segregation in Sweden

In this section we use the empirical methods discussed above to study ethnic workplace segregation in Sweden. The analysis presents the development of segregation between 1985 and 2002 but in order to save space we focus part of the more detailed analysis on the final year. The presentation starts with the immigrant-native dimension in section 5.1, and proceeds to segregation along finer ethnic groups in 5.2. Then we study questions concerning differences depending on individual characteristics in 5.3. Section 5.4 considers the patterns of immigrant exposure among second generation immigrants. Section 5.5 considers the distribution of overexposure in both the individual and the workplace dimension. In 5.6, we look further into the issue of a segmented labor market by studying the relationships between average segregation and group labor market status and local labor market conditions respectively.

5.1 Segregation between immigrants and natives

In this sub-section we study the segregation between immigrants (irrespective of country of origin) and natives. We do this by using the concepts of actual and expected exposure explained in Section 4.

Table 2 displays actual and expected levels of immigrant exposure for immigrants and natives. The first row of the table shows that immigrants on average have 23 percent immigrants among their colleagues, whereas natives have less than 9 percent. If the distribution of people over workplaces had been completely random, the numbers for both groups would have been 10 percent, which is the fraction of immigrants among the employed (Row 2). Clearly, the actual distribution is significantly different from this "non-segregation" baseline. The standard errors show that statistical uncertainty is negligible due to the large number of observations and we thus abstract from statistical

inference and focus on point estimates in what follows. The estimates imply that immigrants have more than twice as many immigrant colleagues (since $R > 2$) as they "should" have, whereas natives have only 90 percent of the expected number of immigrants among their colleagues.

The next step is to study whether the deviation from a random allocation can be explained by observed characteristics. We first look at excess exposure over what is expected from the distribution of human capital variables such as age, gender and education. Thus, we study whether immigrants work with many immigrants because they have a specific composition of human capital among their colleagues. As is evident from row (3) of *Table 2*, this is not the case: the change in expected immigrant composition from the unconditional case is quite marginal. The observed human capital distribution can not explain the observed pattern. This finding is in line with Hellerstein & Neumark (2005) who find that education differences do not explain much of the ethnic segregation in the US labor market.

In row (4), we take the immigrant distribution over 290 municipalities (defined by the workplace) as given. It should be noted that this assumes that geographical segregation is driving workplace segregation rather than the other way around. This may be considered a strong assumption and we may thus underestimate the actual propensity of workplace segregation. The geographical distribution "explains" somewhat more of the observed segregation than did human capital. However, the results show that even after conditioning on the geographical distribution, the rate of overexposure as measured by R is 88 percent for immigrants. Furthermore, accounting for the distribution across industries (40 groups at a "reduced 2-digit level", row (5)) only moderately reduces the rate of overexposure.

Table 2 Immigrant exposure for immigrants and natives.

	Natives		Immigrants	
	Exposure	R = actual/expected	Exposure	R = actual/expected
(1) Actual mean	0.088		0.234	
Standard error	(0.001)		(0.003)	
Expected means:				
(2) Unconditional	0.103	0.854	0.103	2.267
(3) Conditional on human capital	0.102	0.861	0.110	2.121
(4) Conditional on municipality	0.101	0.875	0.124	1.883
(5) Conditional on industry	0.102	0.868	0.117	1.998
(6) Conditional on human capital, municipality and industry	0.096	0.919	0.166	1.407

Note: Human capital of colleagues is captured by gender, age (3 dummies) and education (7 dummies). There are 290 indicators for the municipality of the workplace, and 38 classes of industry affiliation. The models are completely interacted. The ratios (R) show how overexposed immigrants and native workers are relative to what is motivated by the distribution of the variables included in the corresponding model. Standard errors are cluster-corrected for error dependencies within workplaces.

Finally, in our most tightly specified model we combine human capital, geography and industry (row (6)). It is important to note that we condition on all interactions of these variables. In other words, we predict how many immigrant colleagues a worker should have conditional on working e.g. in the construction industry in the Stockholm municipality at a workplace dominated by low-educated old men, and contrast this to how many immigrant colleagues he actually has. In specifying this model, it is reasonable to assume that we are over-controlling in the sense that (parts of) the workplace composition is likely to be a function of the same forces that drive the segregation between workplaces within industries. Nevertheless, also when applying this model we still find strong deviations from the expected distribution: immigrants have 41 percent more immigrant colleagues ($R = 1.407$), and natives have 8.9 percent less ($R = 0.919$), than what can be explained by the interaction of the

municipality and industry of the workplace and the human capital distribution among the colleagues.

In much of the remaining presentation we will use the model of row (6) to measure expected exposure. Since this model probably explains too much of the observed exposure, it gives a conservative estimate of the overexposure present in the data. There is a straightforward parallel to regressions with a large number of fixed effects (e.g. neighborhoods, schools), where arguably much of the relevant variation is excluded, but where the remaining variation is less susceptible to alternative explanations.

Figure 2 below shows the development of average immigrant exposure among immigrants during the period 1985–2002. Actual coworker exposure among immigrants decreased marginally in the first part of the 1990s, presumably as a result of falling employment among immigrants in general (and many early labor migrants retiring). As more immigrants entered employment in the late 1990s, actual exposure increased. The overexposure to immigrants, however, increased during the entire observation period, suggesting that the labor market became more systematically segregated in this sense.[12]

We wish to investigate whether this is a result of a compositional change of the immigrant population toward more segregated ethnic groups. The figure therefore contains two "weighted" lines, where the data have been re-weighted so that they correspond to the 1985 composition concerning region of birth. In other words, a particular "ethnic" group is given the same weight in all years of observation. The time pattern of the weighted measure of exposure clearly deviates from that of actual exposure, particularly toward the end of our observation period. It is also striking to see that "weighted" overexposure is roughly constant over time. In other words, almost the entire increase in excess immigrant exposure between 1985 and 2002 can be attributed to the change in the ethnic composition of the immigrant population. This result suggests that differences between ethnic groups are substantial; we discuss this issue in detail below.

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[12] Other measures of segregation suggest a similar development. Carrington & Troske's (1997) measure of "systematic segregation" using the index of dissimilarity gives a value of 0.069 in 1985 and of 0.107 in 2002 conditional on human capital, municipality and industry. For the Gini coefficient the corresponding measure is 0.123 in 1985 and 0.192 in 2002. See Åslund & Skans (2005) for details on how to calculate the conditional values of these indices.

Given the increasing number of immigrants in the Swedish labor market we would like to test for "mechanical" explanations to the workplace segregation between immigrants and natives in Sweden. Suppose that firms hire large quantities of workers at certain points in time, and that they select these workers randomly from the pool of available workers. Then, we would expect to find segregation just because native and immigrant workers were hired at different points in time since immigrants on average entered the labor market later. Under such a scenario, there should be no difference in immigrant exposure between immigrants and natives among the newly-employed at any given point in time. Our data give no support to this hypothesis. Also the recently hired[13] natives are underexposed to immigrants, and for the newly hired foreign-born we find only slightly less overexposure than in the overall population of immigrants.

Another possibility is that the labor market is sorted according to unobserved skills that are not captured by our human capital variables, such as actual labor market experience and language proficiency. We therefore replaced the human capital variables by an indicator of which wage decile the individual belongs to. The results showed that the wage deciles per se explained even less of the differences in exposure. Interacted with industry and municipality, the estimated overexposure was similar to that in the baseline model of row (6) in *Table 2*. Apart from verifying that the observed sorting is not due to differences in skill levels, this result suggests that segregation is not a pure sorting between good and bad jobs but also occur for a given job quality.

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[13] Newly-hired individuals are defined as individuals not working in a plant with the same administrative identifier the year before.
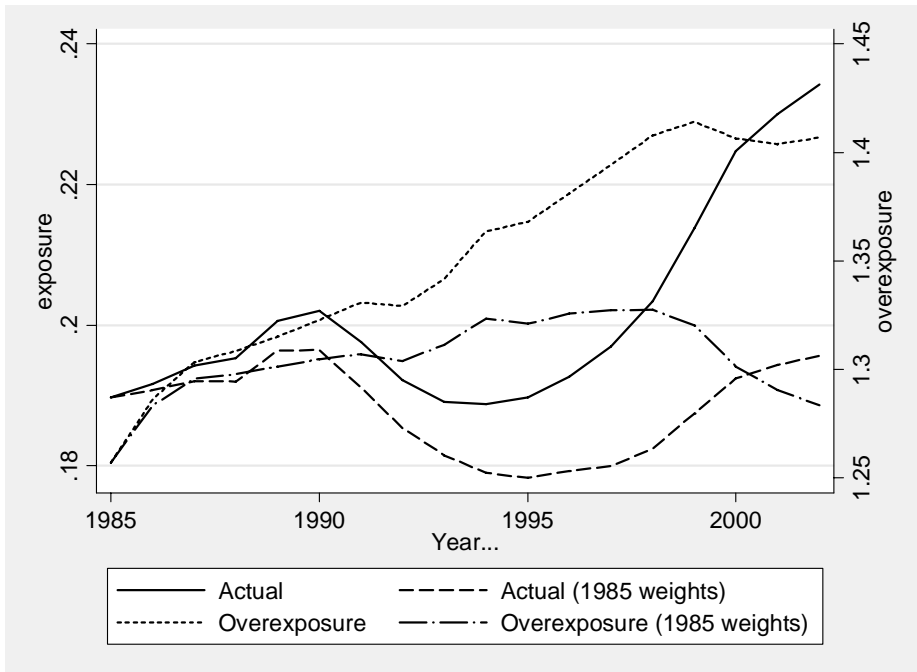
Figure 2 Immigrant exposure 1985–2002.

Notes: Immigrant workplace exposure among immigrants. Overexposure (R) is conditional on human capital, municipality and industry. "1985 weights" means that the data are re-weighted to comply with the 1985 region-of-birth composition.

5.2 Own-group and other-group exposure

This subsection studies how immigrants of different origins are sorted in the labor market. We are interested in whether the observed segregation is the result of sorting according to narrow ethnic lines or if the division between immigrants and natives tells the complete story. As explained in the data section, we proxy ethnicity by region of birth.

First, we calculate the degree of own-group exposure, defined as the average fraction of coworkers that were born in the same region as oneself. In correspondence with the analysis in the previous subsection we relate the actual own-group exposure to the expected own-group exposure under different specifications. We also show how exposed immigrants are to *other* immigrant groups, i.e. to those born in other regions.

IFAU – Will I see you at work?

Table 3 Own-group exposure and exposure to other immigrant groups.

	Own-group exposure		Exposure to other groups	
	Exposure	R	Exposure	R
(1) Actual value	0.065	--	0.169	--
Standard errors	(0.001)	--	(0.002)	--
Expected means:				
(2) Unconditional	0.009	7.604	0.095	1.784
(3) Conditional on human capital	0.010	6.869	0.101	1.674
(4) Conditional on municipality	0.014	4.501	0.110	1.537
(5) Conditional industry	0.011	6.160	0.107	1.584
(6) Conditional on human capital, municipality and industry	0.028	2.354	0.139	1.218

Note: Human capital of colleagues is captured by gender, age (3 dummies) and education (7 dummies). There are 290 indicators for the municipality of the workplace, and 40 classes of industry affiliation. The ratios (R) show how overexposed immigrant workers are relative to what is motivated by the distribution of the variables included in the corresponding model. See the appendix for a list of the regions of origin. Standard errors are cluster-corrected for error dependencies within workplaces. "Expected" exposure is based on the distribution of these covariates.

Table 3 shows "own-group" and "other-group" exposure. The former measures the fraction of coworkers from the same region of origin as oneself; the latter considers contacts with immigrants from other regions. As when studying the division between natives and immigrants in general, statistical uncertainty is negligible. The average immigrant has more than seven times as many colleagues from his/her birth region than what is given by an unconditional expectation (row (2)). Furthermore, even though the own-group segregation appears to be strong, the average immigrant is also significantly overexposed to other immigrant groups. This result is interesting since it suggests that the segregation we observe is not purely driven by preferences or networks that are related to specific ethnic groups. Rather, there appears to be a fundamental division between the "immigrant collective" and natives in general. By comparing row (6) of *Table 2* and *Table 3* respectively we see that roughly half (21.8%) of the total overexposure to immigrants (40.7%) remains

if we treat ethnic peers (as defined by our groups) as natives. This half is explained by overexposure to other immigrant groups.

As in *Table 2*, human capital does not explain much of the overexposure. The distribution over municipalities, on the other hand, is a more important explanation to own-group exposure than to general immigrant exposure. This reflects the fact that different immigrant groups are concentrated to different regions. It is also clear from row (6) that a substantial part of the overexposure cannot be attributed to any of the covariates. Even after conditioning on the interaction of human capital, municipality, and industry, immigrants have on average 135 percent more coworkers from their own region of origin than expected.

Note that using country of origin as a proxy for "ethnic group" is quite crude since the country or region of birth does not necessarily correspond to the ethnicity as perceived by the individual. The pattern of ethnic group sorting we observe is probably an underestimate of the actual sorting process at hand.

Figure 3 shows how own-group exposure has developed since 1985. The graphs show a sharp decrease in *actual* own-group exposure. Using 1985 weights we see that this decrease has been somewhat mitigated by the changing composition of the immigrant workforce. Turning to *overexposure* to one's own group we see a steady and quite rapid growth, supporting the picture of an increasingly segregated labor market shown in *Figure 2*. When using weights to keep the 1985 population composition constant, we see that even though some of the increase in overexposure survives this exercise, the bulk of the change in overexposure is due to the fact that the immigrant population in 2002 to a larger extent than in 1985 consists of ethnic groups with high levels of own-group overexposure.

The results for the development over time (in the immigrant-native and the own-group dimensions) show that the Swedish labor market has become more ethnically segregated in the last two decades. Some of the increase can be attributed to stronger ethnic sorting for a given nationality, but most of the change is caused by a composition change of the immigrant population where groups with higher overexposure has increased in size relative to other immigrant groups.
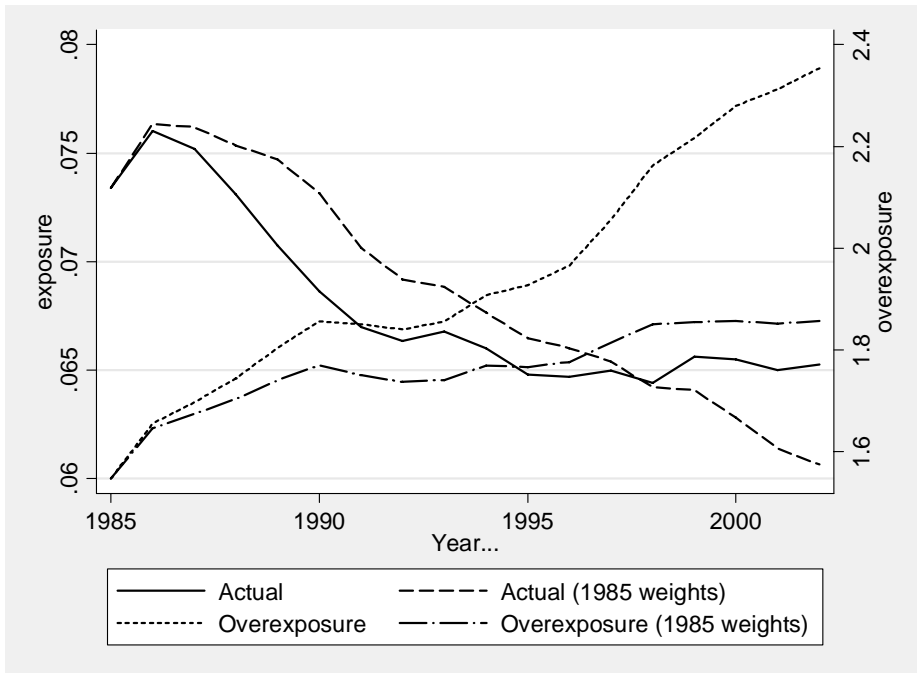
Figure 3 Own-group exposure 1985–2002

Notes: Own-group workplace exposure among immigrants. Overexposure (R) is conditional on human capital, municipality and industry. "1985 weights" means that the data are re-weighted to comply with the 1985 region-of-birth composition.

5.3 Segregation in different ethnic groups

So far we have studied average exposure in the entire immigrant population. *Figure 4* supplements this picture by showing the relationship between own-group and other-group exposure by region of origin. Nordic immigrants are not particularly overexposed in any dimension. Immigrants from East Asia, on the other hand, are highly overexposed to their peers, but very little to other immigrant groups. People in this category are more exposed to others from their own region than are the Finns, even though there are 20 times as many employed Finns in Sweden.[14] Another observation is that people from Africa and Iraq exhibit comparatively high levels of exposure to other immigrant

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[14] See the appendix.

groups. It is interesting to see that groups with frequent difficulties in terms of employment and earnings are often the ones mostly separated from the natives. We will return to this issue in section 5.6.

Table 4 shows rates of excess cross-exposure for selected country groups. It is shown that South American immigrants are more overexposed to each other than to other immigrant groups. East Asians are clearly overexposed to people from South East Asia, but underexposed to Middle Eastern and African immigrants. Iraqis are more overexposed to people from other Middle Eastern countries. There is also more excess exposure between people originating in Iran and Iraq, which possibly could be explained by interactions between Kurdish immigrants from the two countries. Even though small group sizes give reason to be cautious in the interpretation, it seems that linguistic or cultural links are a determinant of cross-group overexposure. Note, however, that there is often substantial cross-group overexposure between groups where there is no obvious a priori connection, other than being immigrants (e.g. South Americans and workers from "Other Asia").
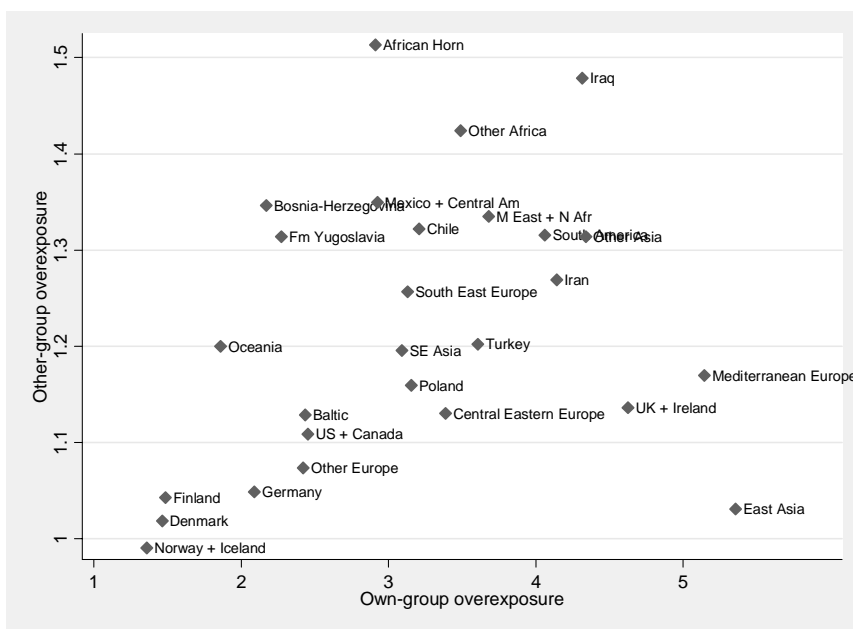
Figure 4 "Own-group" and "other-group" overexposure in different immigrant groups, 2002.

Note: See Table A3 in the appendix for further results on overexposure by region of origin.

Table 4 Cross-ethnicity overexposure between selected immigrant groups.

Colleagues from: / Country group:	Central Am	Chile	S.America	African horn	N.Africa,M.East	Other African	Iran	Iraq	Turkey	E Asia	SE Asia	Other Asia
Central Am	2.924	2.108	2.567	1.708	1.406	1.680	1.355	1.363	1.114	1.065	1.208	1.430
Chile	2.084	3.207	2.572	1.698	1.380	1.713	1.335	1.405	1.267	0.917	1.211	1.418
S. America	2.542	2.536	4.061	1.473	1.288	1.629	1.249	1.493	1.172	0.934	1.330	1.408
African horn	1.909	1.721	1.621	2.913	1.901	2.271	1.725	1.997	1.620	1.106	1.511	1.978
N.Africa,M.East	1.444	1.390	1.306	1.879	3.681	1.656	1.654	2.346	1.553	0.755	0.862	1.396
Other african	1.761	1.654	1.679	2.167	1.625	3.490	1.455	1.624	1.242	0.964	1.455	1.726
Iran	1.318	1.286	1.212	1.573	1.624	1.378	4.144	2.140	1.429	0.971	1.098	1.540
Iraq	1.317	1.372	1.501	1.848	2.356	1.594	2.217	4.316	1.672	0.901	1.020	1.787
Turkey	1.190	1.255	1.257	1.656	1.611	1.291	1.480	1.589	3.607	0.370	0.671	1.152
E Asia	0.979	0.842	0.888	0.955	0.651	0.823	0.937	0.777	0.286	5.356	2.504	1.361
SE Asia	1.286	1.325	1.464	1.664	0.865	1.520	1.160	1.079	0.627	2.530	3.093	1.722
Other Asia	1.522	1.417	1.422	1.907	1.346	1.669	1.596	1.823	1.123	1.452	1.612	4.339

Notes: Table entries show the rate of overexposure for each country group (rows) to every other group (columns). Overexposure is actual exposure divided by expected exposure conditional on human capital, municipality and industry.

5.4   Segregation and individual characteristics

So far, we have found that immigrants are overexposed to immigrants in general, but particularly to others from their own birth region. The degree of overexposure varies substantially between birth regions. A related question is whether the patterns differ if we split the sample according to other criteria. *Table 5* presents actual, expected (conditional on human capital, workplace municipality, and industrial affiliation), and excess exposure for immigrants divided by individual characteristics. We present values for own-group exposure and immigrant exposure separately.[15] All pair-wise differences in both exposure and over-exposure are statistically significant at the 5% level.

Let us first consider differences in segregation by standard individual characteristics: age, gender, education, and time since immigration. Apart from gender, we find that characteristics indicating weaker positions in the labor market are associated with higher exposure (low education, young age, recently arrived). However, the differences in overexposure are moderate compared e.g. to the differences between country of birth groups discussed above. A more direct relationship between segregation and labor market outcomes is given by the calculations where the observations are split according to whether the wage is higher or lower than the median immigrant wage. Clearly, those with low wages experience substantially higher levels of exposure as well as over-exposure. Thus, it seems that the ethnic sorting is stronger in the low-wage labor market in Sweden.

Table 5 also presents results by region of residence. Workplace segregation is much more pronounced in metropolitan areas than in other parts of Sweden. This can be because ethnic groups with much overexposure are concentrated to the larger cities. However, regressions (on regional-municipal averaged data) controlling for region of birth, still suggest a higher rate of overexposure in metropolitan areas. One interpretation is that there is more scope for sorting (or isolation) in the more diverse labor markets of larger cities. Alternatively, the result could reflect that groups are generally more separated from each other in these areas.

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[15] "Overexposure" is not defined at the individual level, meaning that we cannot perform regressions of overexposure on the included characteristics at the individual level. When calculating standard errors for the differences in overexposure between groups we treat average expected exposure in each group as predetermined.

The table also reveals that overexposure varies by industry. It is not so surprising that own-group overexposure is high in the category including retailers, where many family-run businesses are found. A closer inspection of the data discloses that the high level of segregation displayed within the "Financial, corporate services" category reflects a strong presence of immigrants in staffing and cleaning companies but limited participation in other parts of the industry. Quite expectedly, we find that own-group overexposure is comparatively higher than the immigrant overexposure in the category including restaurants ("Personal, cultural"). The construction industry also stands out as more segregated than many other sectors. In line with these findings, we see that segregation is much larger in the private sector compared to the public sector.

Table 5 Segregation and individual characteristics among immigrants, 2002.

Subgroup	Immigrant exposure			Own-group exposure		
	Actual	Expected	R	Actual	Expected	R
All	.234	.166	1.407	.065	.028	2.354
≤5 years in Sweden	.293	.190	1.542	.084	.026	3.181
>5 years in Sweden	.227	.163	1.387	.063	.028	2.254
Men	.248	.171	1.448	.077	.029	2.642
Women	.220	.161	1.361	.053	.026	2.016
Low education	.249	.174	1.435	.074	.032	2.304
High education	.197	.149	1.326	.043	.018	2.397
Under 40 years	.253	.174	1.453	.068	.025	2.740
40 or older	.220	.161	1.369	.063	.030	2.113
Low earners	.282	.183	1.544	.085	.030	2.831
High earners	.186	.150	1.239	.045	.025	1.786
Metropolitan areas	.269	.187	1.440	.070	.025	2.792
Other areas	.169	.128	1.314	.057	.033	1.725
1-Agriculture etc	.218	.145	1.500	.117	.064	1.826
2-Manufacturing	.209	.179	1.172	.051	.037	1.365
3-Construction	.180	.089	2.033	.106	.031	3.415
4-Wholesale, retail	.235	.136	1.731	.080	.020	4.025
5-Financial, corporate	.303	.168	1.808	.081	.023	3.487
6-Education, R&D	.180	.135	1.333	.031	.016	1.976
7-Health ,Social	.204	.167	1.221	.034	.022	1.507
8-Personal, Cultural	.392	.281	1.397	.164	.049	3.336
9-Public admin. Etc	.129	.089	1.452	.018	.014	1.305
Public	.173	.142	1.219	.026	.020	1.264
Private	.267	.179	1.487	.087	.032	2.736

Notes: "Immigrants" are those born outside of Sweden. "Own-group" are those born in the same region as the individual. See the appendix for a list of the regions of origin. Human capital of colleagues is captured by gender, age (3 dummies) and education (7 dummies). There are 290 indicators for the municipality of the workplace, and 40 classes of industry affiliation. "Expected" exposure is based on the distribution of these covariates. The ratios (R) show how overexposed immigrant workers are relative to the expected exposure. Difference by education in own-group overexposure is significant at the 5% level, all other pair-wise differences at 1%.

5.5   Second generation immigrants

Given that immigrants and natives in general are segregated from each other in the Swedish labor market, an interesting question that arises is whether immigrant segregation is transferred to subsequent generations. Thus we study whether "2nd generation immigrants" (i.e. natives with foreign-born parents) are sorted as other natives or as 1st generation immigrants.

Table 5 disseminates the exposure to 1st generation immigrants among 2nd generation immigrants. In the first row we present a baseline consisting of average immigrant exposure among all natives. Note that, as shown above, native individuals *in general* are under-exposed to immigrants. Turning to 2nd generation immigrants, we see that they as a group are more exposed to immigrants than the average natives; the numbers are 11.8 compared to 8.8 percent. Much of this higher exposure can be explained by the covariates included in the model for computing expected exposure. As an example, the geographic distribution of the 2nd generation resembles that of the 1st generation for natural reasons. The R-value of 1.008 says that, on average, 2nd generation immigrants are as exposed to immigrants as what we would expect if there was no segregation at all conditional on human capital, industry and municipality.[16]

Studying exposure to the ethnic group of the immigrant parent (defined by the parent of the same gender as the individual if both parents are immigrants) we find a different picture: the 2nd generation is overexposed to the countrymen of their parents even after controlling for geography, industry and human capital. This suggests that it is mainly the "pure" ethnic segregation that is transferred to the next generation, and not the immigrant-native division.

Previous research has shown that people with two foreign-born parents are disadvantaged in terms of employment and earnings, particularly those with parents born outside Europe (Ekberg & Rooth, 2003; Behtoui, 2004). Interestingly, *Table 5* below shows that these groups also are the most segregated. Own-group overexposure is much stronger for those with two foreign-born parents. When looking at segregation separately for different regions, we see fairly large differences, especially for own-group exposure; those with parents from outside the Western world are much more overexposed to immigrants form the countries of their parents.

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[16] The value is insignificantly different from 1.

Given that the distribution of immigrant origin countries has changed over time, there are substantial differences between 1st and 2nd generation immigrants' source countries. However, even when weighting the 2nd generation immigrants by the 1st generation proportions we find (not in the table) that immigrant overexposure is only 8 percent whereas own-group overexposure is 65 percent, further supporting the picture that assimilation over generations removes the segregation between immigrants and natives, but not the own-group overexposure.

Table 6 Segregation and individual characteristics among 2nd generation immigrants.

Subgroup	Immigrant exposure			Own-group exposure		
	Actual	Exp.	R	Actual	Exp.	R
All natives	.088	.096	.919	--	--	--
All 2nd gen	.118	.117	1.008	.023	.018	1.318
Two foreign parents	.150	.134	1.122	.039	.025	1.563
One foreign, one native	.106	.111	.955	.017	.015	1.164
Males	.115	.114	1.006	.025	.018	1.383
Females	.121	.120	1.009	.021	.017	1.239
Low education	.125	.119	1.046	.027	.020	1.376
High ed	.104	.113	.924	.015	.013	1.126
low income	.132	.122	1.080	.027	.019	1.466
high income	.104	.112	.929	.019	.016	1.149
Nordic	.112	.112	.996	.030	.026	1.169
Western	.114	.118	.969	.009	.004	2.157
Eastern	.125	.122	1.025	.014	.007	1.859
Rest of the world	.183	.154	1.187	.033	.012	2.838

Notes: "2nd generation" are those born in Sweden with at least one foreign-born parent. Total sample is 301,251 individuals. "Own-group" measures exposure to people born in the birth region of: (i) the foreign-born parent (ii) the parent of the same gender if both parents are foreign-born. See the appendix for a list of the regions of origin. Human capital of colleagues is captured by gender, age (3 dummies) and education (7 dummies). There are 290 indicators for the municipality of the workplace, and 40 classes of industry affiliation. "Expected" exposure is based on the distribution of these covariates. The ratios (R) show how overexposed immigrant workers are relative to the expected exposure. Gender difference in immigrant overexposure is insignificant; all other pair-wise differences are significant at the 1 % level.

5.6   The distribution of overexposure

Until now we have focused on average exposure rates in different parts of the immigrant population. We now turn to the distribution of immigrant exposure. This addresses whether the observed overexposure among immigrants found

above is driven by a small number of pure immigrant firms, or by a more "smooth" process that separates the distributions. We also investigate the relation between firm size and exposure.

Figure 5 shows density distributions of immigrant exposure for immigrants. We show actual exposure, "random" exposure (i.e. unconditional expectation) and expected exposure (conditional on human capital, industry and municipalities). Each bar shows the fraction of immigrants having (expected) exposure of immigrant coworkers in the relevant interval.

Since some of the actual workplaces are small, even a randomized process will generate some variation in immigrant exposure between workplaces.[17] This point can be seen in the bars for the random distribution. In a world with fully random allocation over workplaces, 13.8 percent of the immigrants would have no immigrant coworkers, and 0.5 percent would have more than 50 percent immigrants among their colleagues. Looking at the actual distribution, it is clear that many more immigrants work in immigrant dominated workplaces. As much as 9.6 percent have a majority of immigrant coworkers while only 7.5 percent have no immigrant colleagues at all.

Conditioning the random process on the distribution of covariates reveals that the combination of human capital, geographical location and industry predicts relatively well the fraction of workers with more than zero but less than 30 percent immigrants in the workplace, but hardly at all why so few have no immigrant coworkers or why so many work in immigrant-dominated firms.[18] Overall, the figure suggests that the "anomaly" of segregation that cannot be explained by our model mainly comes from the existence of workplaces where a majority of employees are immigrants, but where also some natives work.

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[17] See Carrington & Troske (1997) for a discussion of the basic problem of measuring segregation in small units and Åslund & Skans (2005) for details on creating the counterfactual distributions. Random and expected distributions are achieved through randomizations, the figure present averages from 50 repetitions but there is virtually no variation between randomizations.

[18] The expected fraction with no immigrant coworkers is 11.9 percent. The expected fraction in workplaces with an immigrant majority is 2.4 percent. Note also that the expected distribution suggests that about one percent of the immigrants should have more than 90 percent immigrant coworkers. This is because data include very small firms (with down to one colleague).
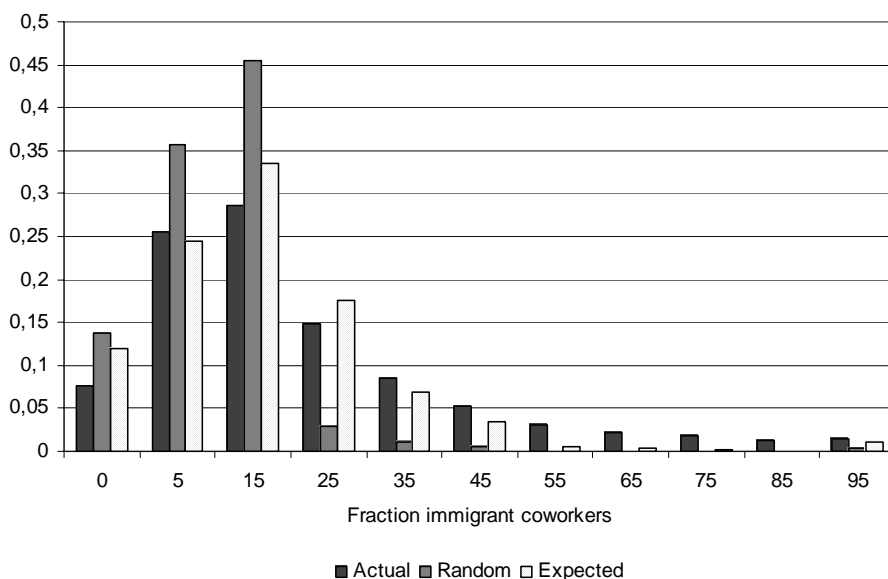
Figure 5 Density histograms of actual, random and expected immigrant expo-
sure among immigrants.

Note: "Actual" denotes the observed distribution of immigrant coworker exposure. "Random" is
the distribution predicted by a random allocation with no covariates. "Expected" is based on a
random allocation conditional on human capital, municipality and industry.

A related question is how segregation depends on the size of the workplace.
Table 7 shows immigrant and own-group exposure among immigrants by
workplace size. Not surprisingly, overexposure is most marked in very small
workplaces. Family-run businesses, e.g., imply exposure to people with a
similar background as oneself. Since such firms are typically small, we would
expect to find high own-group exposure among some of the foreign-born
working at small workplaces. This is also what we find: the small-plant factor
is more important for own-group exposure, and as plant size increases
own-group overexposure approaches immigrant overexposure.

What is also interesting is that we find workplace segregation between im-
migrants and natives also in fairly big plants. Up to and including the 8th decile
of plant size, with almost 400 workers per plant, immigrants still have 36 per-
cent more immigrant coworkers than what can be explained by human capital,
geography, or industrial affiliation.

The results of this subsection suggest that jobs in small immigrant or ethnic firms do not account for anyway near all the workplace segregation observed in Sweden. The distribution is far from a random allocation, but most of the "un-explained" difference comes from firms with an immigrant majority among the employees. Even though segregation is typically highest in small firms, there is a division between immigrants and natives that is present also in fairly big establishments.

Table 7 Plant size and exposure.

Decile of firm sizes	Max size in decile	Immigrant exposure			Own-group exposure		
		Actual	Expected	R	Actual	Expected	R
1	6	.424	.215	1.973	.250	.055	4.551
2	13	.259	.169	1.527	.098	.031	3.210
3	25	.207	.152	1.360	.056	.025	2.225
4	44	.202	.153	1.317	.047	.025	1.910
5	72	.207	.154	1.344	.041	.024	1.717
6	114	.204	.158	1.289	.034	.023	1.494
7	193	.229	.165	1.389	.037	.024	1.533
8	375	.239	.176	1.358	.036	.026	1.390
9	1,091	.203	.166	1.217	.028	.023	1.225
10	8,296	.170	.156	1.089	.024	.022	1.111

 Notes: "Immigrants" are those born outside of Sweden. "Own-group" are those born in the same region as the individual. See the appendix for a list of the regions of origin. Firm size deciles are defined from the total number of employees in the firms where the immigrants work. The ratios (R) show how overexposed immigrant workers are relative to what is motivated by the distribution of human capital, municipality and industry.

5.7   Is the labor market segmented?

Labor market segregation may arise for several different reasons and the relationship to economic outcomes differs between these theories. Some causes are not obviously related to the economic well-being of the individual (e.g. differing transaction costs, preferences for interactions with peers). According to other theories, however, segregation is a reflection of e.g. discrimination in the labor market. Much of the results presented above suggest that groups with poorer labor market status are more segregated from natives and more overex-

posed to their ethnic peers than are groups with a comparatively stronger position. This subsection looks further into the issue of a segmented labor market.

The analysis above is restricted to people who have at least some attachment to the labor market. In this group we have seen that at the individual level there is a negative link between wages and segregation. This is also the conclusion from the tentative individual-level analysis presented in Åslund & Skans (2005). Yet, given the low employment rates in many immigrant groups, it is interesting to see how segregation among those who have jobs is related to outcomes in the group as a whole. *Figure 6* below considers the relationship between labor market outcomes and a region-of-birth group's average immigrant and own-group overexposure. Each number in the graphs of *Figure 6* represents a region-of-birth group (see *Table A1*). It is startling how strongly correlated immigrant overexposure is with both the employment rate of the group and the earnings among the employed individuals. Regressing immigrant overexposure on the employment rate yields an R^2 of 0.56. For earnings the explanatory power is even stronger: R^2 is 0.74.[19] For own-group overexposure, the correlation is not as strong. Particularly for earnings, there are some highly segregated groups where outcomes are comparatively good. These include Mediterranean Europe, UK and Ireland, and East Asia. With these notable exceptions, the findings suggest that well-established ethnic groups do not tend to work where immigrants or ethnic peers are much over-represented.

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[19] We get very similar estimates with "our" definitions of employment and monthly earnings, which are based on the restrictions described in section 3.
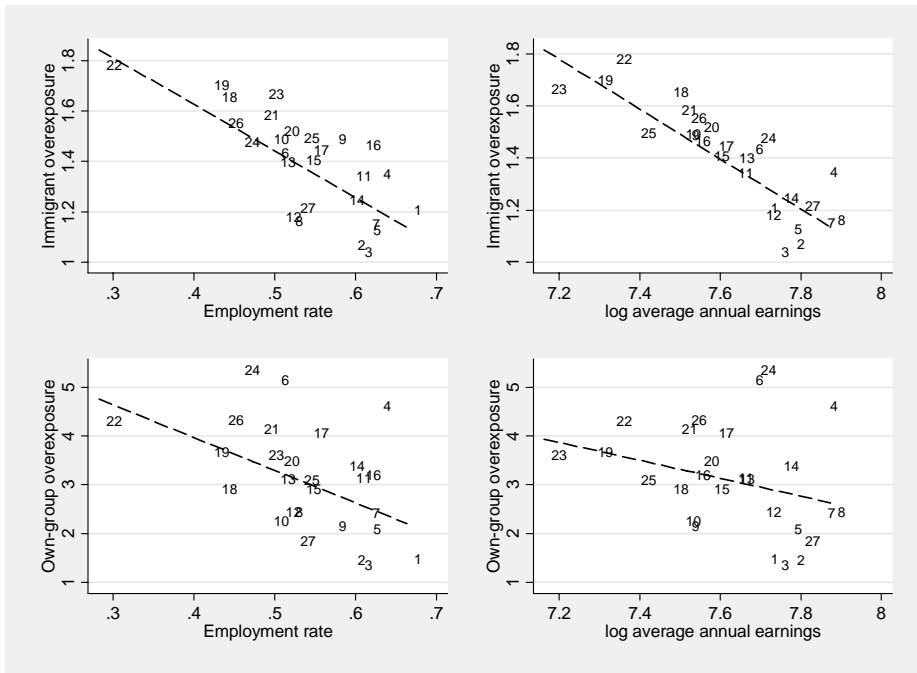
Figure 6 Average immigrant (own-group) overexposure and labor market outcomes by region of origin.

Notes: Immigrant and own-group overexposure is conditional on human capital, municipality and industry. The numbers correspond to the regions of origin described in Table A1. "Employment rate" follows Statistics Sweden's official definition of employment. Annual earnings included only for those who are employed according to the SCB definition.

We now turn to the relationship between segregation and macroeconomic conditions. According to queuing theories, employers are choosier in terms of background characteristics when there is a lot of available labor. When employment increases, they consider also "secondary" workers (Thurow 1975). Another way to put it is that the employers respond to the price of discrimination.

To investigate this possibility we use data on local labor market conditions for the years 1985–2002 to estimate the following model:[20]

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[20] During the observation period, a few municipalities have been split up. We have modified the data to the smallest common denominator to get a common number of municipalities for all years.

$$\text{overexposure}_{jt} = \alpha + X_{jt}\beta + \gamma\text{empl}_{jt} + \delta D_j + \tau T_t + \varepsilon_{jt} \tag{9}$$

where overexposure is average immigrant or own-group overexposure in municipality j in year t. X contains the following characteristics: (i) the fraction of immigrants in the municipality with 0–2, 3–5, 6–10, and 11–15 years of residence in Sweden; (ii) the industrial composition of the municipality (fraction working in each of 9 categories). The model also includes dummies for the municipality and the year of observation, which means that the estimates of γ are based on differences across municipalities in the variation in employment over time.

The estimates presented in *Table 8* suggest that overexposure decreases when the labor market gets more favorable. When the local employment rate increases by one percentage point, immigrant overexposure is estimated to fall by roughly 0.9 percentage points. For own-group overexposure, the corresponding figure is 3.8 percentage points. One interpretation of these results is that when competition for labor toughens, immigrants come into question for more jobs than otherwise.

Table 8 Regression estimates: overexposure and local employment

	Immigrant	Own-group
Local employment	–0.867**	–3.818**
	(0.231)	(0.954)
Observations	5,112	5,112
R-squared	0.87	0.94
Time-varying regional characteristics	Yes	Yes
Regional dummies	Yes	Yes
Time dummies	Yes	Yes

Notes: Table entries are estimates from regressions of average local overexposure (conditional on human capital, municipality, and industry) on local variables (284 municipalities in 18 years 1985–2002). The standard errors are clustered by municipality. The time-varying characteristics are: (i) the fraction of immigrants in the municipality with 0–2, 3–5, 6–10, and 11–15 years of residence in Sweden; (ii) the industrial composition of the municipality (9 groups). The estimates are weighted according to the number of included immigrants in each municipality-year "cell".

6   Discussion

Given the increasing diversity of most industrialized societies and the frequent problems faced by many immigrants in the labor market, there is a need for better knowledge regarding the immigrants' situation in the labor market. Economic studies of ethnic workplace segregation outside the US are few. The purpose of this paper is to analyze the patterns and sources of ethnic workplace segregation in Sweden.

To frame the discussion, let us first briefly outline some implications from the abundant theoretical literature in the field. Segregation may be the result of an efficient matching of productive skills. A common language or business culture can for example lower transaction and communication costs (Lazear 1999, den Butter et al 2004). Closely related is the possibility that skill-sorting in general causes segregation (Saint-Paul 2001), if the skill distributions differ across groups. To the extent that "ethnic enterprises" provide specific "ethnic" goods and services (e.g. restaurants), there is also reason to believe that skill sorting will generate some workplaces with a strong ethnic presence.

Yet another explanation to labor market segregation is that job search may be more frequent and efficient within one's own group. We know that a large fraction of the job finding occurs via personal contacts or networks. If interaction is common within a particular minority, it is not surprising to find minority concentration also in the labor market. Furthermore, if frequent intra-group contacts are driven by minority preferences, people from ethnic minorities may work together simply because they derive non-pecuniary benefits from doing so.

In the cases discussed so far, segregation does not necessarily cause or indicate adversities in terms of earnings or career opportunities.[21] However, a segregated labor market is also a prediction from the Becker (1957) discrimination model. If some—but not all—employers are unwilling to hire minority workers at the majority wage, the minority will to some degree be concentrated to non-discriminatory employers. This implication is closely related to theories on dual or segmented labor markets, where subordinated groups are concen-

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[21] In the context of black–white residential segregation in the US, Bayer et al (2005) show that segregation may increase when a minority's socioeconomic position improves.

trated in low-paying, poor-prospect jobs.[22] Groups may be denied access to the "good" jobs since they lack usable networks or because of the preferences of other workers (i.e. discrimination). Occupational separation in the labor market is, however, not necessarily a result of the ethnic majority's refusal to take "bad" jobs in the secondary labor market. Sociological theories also suggest the importance of occupational labeling (i.e. a presumption that some jobs are best suited for members of a certain group). When an occupation has received its label, the label itself reinforces the segregation process (Charles 2000).[23] .

Even though it is difficult to clearly distinguish between different theoretical hypotheses in an empirical investigation, some lessons can be drawn. Efficiency arguments have more credibility if segregation is primarily observed along linguistic or cultural lines. "Voluntary" segregation is also more likely when it is (also) the economically stronger who segregate, whereas discrimination and "dualist" models suggest a negative correlation between segregation and economic outcomes. According to "queuing" theories on labor market segmentation, segregation should decrease in economic upturns when employers turn to "secondary" workers after emptying the primary pool of the workforce. Occupational labeling implies that segregation should be "explained" by differences in the industrial allocation. Skill-sorting would mean that across-group differences in human capital accounts for much of the segregation, whereas "ethnic enterprises" suggest that much of the segregation is driven by small businesses in certain sectors

We use data covering the entire Swedish workforce during the years 1985–2002 to study these issues. Our primary measure of segregation is an index of exposure that excludes the individual him-/herself from the calculations. An advantage of this index is that we can study levels of exposure in many dimensions: to ethnic peers, to immigrants in general, to natives, to immigrants with a certain background.

The analysis reveals substantial workplace segregation in Sweden. Segregation has increased over time, much due to a change in the composition of the immigrant population toward more segregated groups. Immigrants are mostly overexposed to others from their own region of birth, but also to other immi-

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[22] See Lang & Dickens (1987) for a discussion of segmented labor markets from neoclassical and sociological perspectives.
[23] It should also be noted that combinations of segmentation and efficient sorting are likely to occur. If one group is excluded from certain jobs through discrimination or network effects, it is likely the members of the group use their own networks instead.

grant groups. Natives are on average underexposed to immigrants. Compared to a completely random distribution, the average immigrant has more than twice as many immigrant colleagues as expected, and over seven times as many ethnic peers.

This may, however, not be a correct picture of purely "ethnic" segregation. If there are skill differences between two groups, it is not surprising that they are not randomly allocated across workplaces. The same thing is true if there is (exogenous) residential and industrial sorting among the workers. Accounting for such covariates gives information on the sources of workplace segregation. It turns out that differences in standard human capital indicators or industrial distribution do not explain much of the segregation. Somewhat more can be accredited to differences in municipal allocation, but a large share of the "raw" overexposure remains also when we combine all covariates to get "expected" exposure. Even in our tightest model, the average immigrant has 40 percent more immigrants in his/her workplace than expected. The overexposure to people from one's own country of origin is 135 percent in the same specification.

Overexposure varies heavily depending on country of origin. Well-established groups such as the Nordic immigrants are not particularly overexposed in any dimension. Other groups are mostly overexposed to their countrymen, whereas some groups exhibit ample own-group overexposure, but also excess exposure to other immigrant groups. The latter type of exposure to some extent follows linguistic and cultural delineations.

Not surprisingly, segregation varies across industries and is more pronounced in the private sector compared to the public sector. The highest levels of overexposure are found among people working in very small workplaces, which is where we would expect to find e.g. family businesses. It is still obvious that segregation is not fully about the ethnic firm possibly catering to its own community. Workplace segregation is present in all industries and also at large establishments.

In general, the results suggest that segregation is higher in groups with poor economic positions. The low-wage immigrant workers are more overexposed to immigrants than are those with higher wages. Also, among 2nd generation immigrants there is more excess exposure for people whose parents originate outside the Western world. The negative correlation between average immigrant overexposure and group labor market outcomes is also strikingly strong. Overall, we find that overexposure in the immigrant-native (or across-group)

dimension is more strongly linked to poor outcomes than overexposure to own-group peers. Also, workplace segregation is countercyclical at the local level.

The findings of this paper can be taken to give at least *some* support to most of the theories discussed above. In many cases a given pattern can be interpreted in several ways. A positive perspective on the observed own-group overexposure emphasizes efficient sorting and preferences for working with peers. A negative perspective points out discrimination and exclusion from other parts of the labor market.

The clear negative correlation between socioeconomic status and segregation is, however, unlikely to be the result of a completely voluntary sorting process. It is therefore tempting to infer that there is a segmented labor market in Sweden. There are good reasons to believe that certain groups of workers are considered "secondary" by some employers. However, whether the observed segregation is a big problem or not depends on the answers to questions not studied here. Do people leave the segregated jobs for better-paid work elsewhere? Do segregated "immigrant firms" in fact provide important opportunities for young people entering the labor market and for the unemployed striving to come back into employment? Or do people remain in the secondary jobs with poor prospects of advancing?

The analysis of this paper concerns the patterns and sources of ethnic workplace segregation in Sweden. Addressing the above-mentioned questions is important for getting to the next level: the consequences of labor market segregation. We will study this question in the near future.

References

Arai, Mahmood & R Vilhelmsson (2004), "Unemployment-Risk Differentials Between Immigrant and Native Workers in Sweden", Industrial Relations Vol. 43(3), 690–698.

Åslund O & O N Skans (2005) "Measuring Conditional Segregation: Methods and Empirical Examples", Working Paper 2005:12, IFAU, Uppsala.

Bayard K, J Hellerstein, D Neumark & K Troske (1999) "Why Are Racial and Ethnic Wage Gaps Larger for Men than for Women? Exploring the Role of Segregation Using the New Worker-Establishment Characteristics Database" in Haltiwanger J et al. (eds.) *The Creation and Analysis of Employer-Employee Matched Data*, Amsterdam: Elsevier Science, 175–203.

Bayer P, H Fang & R McMillan (2005) "Separate When Equal? Racial Inequality and Residential Segregation", NBER Working Paper 11507.

Becker G (1957) *The Economics of Discrimination*, University of Chicago Press, Chicago.

Behtoui A (2004) "Unequal Opportunities for Young People with Immigrant Backgrounds in the Swedish Labour Market" *Labour* 18(4), 633-660.

Carrington WJ & KR Troske (1997), "On Measuring Segregation in Samples with Small Units", *Journal of Business & Economics Statistics* 15 (4), 402–409.

Charles M (2000) "Divisions of Labour. Social Groups and Occupational Allocation", *European Sociological Review* 16(1), 27–42.

den Butter FAG, E Masurell & RHJ Mosch (2004) "The Economics of Co-Ethnic Employment", Tinbergen Institute Discussion Paper 2004–027/3.

Edin P-A & O Åslund (2001), "Invandrare på 1990-talets arbetsmarknad", in Bergmark Å (ed) *Ofärd i välfärden*, SOU 2001:54, 101–142.

Edin P-A & P Fredriksson (2000), "LINDA – Longitudinal INdividual DAta for Sweden", Working Paper 2000:19, Department of Economics, Uppsala University.

Edin Per-Anders, RJ LaLonde & O Åslund (2000) "Emigration of immigrants and measures of immigrant assimilation", Swedish Economic Policy Review, vol 7, 163–204

Ekberg J & D-O Rooth (2003), "Unemployment and Earnings of Second Generation Immigrants in Sweden. Ethnic Background and Paper Composition", *Journal of Population Economics* 16(4), 787–814.

Hellerstein J & D Neumark (2005), "Workplace Segregation in the United States: Race, Ethnicity, and Skill.", NBER working paper 11599.

Lang K & WT Dickens (1987), "Neocalssical and Sociological Perspectives on Segmented Labor Markets", NBER Working Paper No. 2127.

Lazear E (1999) "Culture and Language", *Journal of Political Economy* 107(6), 95–126.

le Grand C & R Szulkin, (2002), "Permanent Disadvantage or Gradual Integration: Explaining the Immigrant-Native Earnings Gap in Sweden", Labour 16(1), s 37–64.

Lundh C, L Bennich-Björkman, R Ohlsson, P Pedersen & D-O Rooth (2002), Arbete? Var god dröj! Invandrare i välfärdssamhället, Välfärdspolitiska rådets rapport 2002, SNS Förlag.

Ministry of Justice (2003), *National Minorities and Minority Languages*, Fact Sheet Ju 03.10e, June 2003.

Nekby, Lena (2002), "How Long Does it Take to Integrate? Employment Convergence of Immigrants and Natives in Sweden", FIEF Working paper No. 185.

Nermo M (1999) *Structured by Gender. Patterns of Sex Segregation in the Swedish Labour Market. Historical and Cross-National Comparisons*, PhD thesis, Swedish Institute for Social Research Dissertation Series no. 41.

Österberg, T (2000) "Economic Perspectives on Immigrants and Intergenerational Transmissions", Doctoral Dissertation, Department of Economics, Handelshögskolan, Göteborg University.

Saint-Paul G (2001) "On The Distribution of Income and Worker Assignment Under Intrafirm Spillovers, With an Application to Ideas and Networks", *Journal of Political Economy* 109(1), 1–37.

Schröder L (1991) "Springpojkar och språngbrädor", PhD thesis, Department of Economic History, Uppsala University, Institutet för social forskning 18, 315 pp.

Statistics Sweden (2004), *SCB Befolkningsstatistik 2003, del 3*, Örebro, Statistics Sweden.

Thurow LC (1975) *Generating Inequality: Mechanisms of Distribution in the U.S. Economy*, Basic Books, New York

Vilhelmsson, R (2002) "Ethnic Differences in the Swedish Youth Labor Market", in Wages and Unemployment of Immigrants and Natives in Sweden, Doctoral Dissertation, Swedish Institute for Social Research: 56

Appendix A. Birth regions

Table A1 Birth regions.

Region	Countries included
Sweden	*0-Sweden*
Nordic	*1-Finland*
	2-Denmark
	3-Norway+ Iceland
Western Europe and North America	*4-GB + Ireland*
	5-Germany
	6-Mediterr. Europe (Greece + Italy + Spain + Portugal + the Vatican + Monaco + Malta + San Marino)
	7-Other Europe (Andorra + Belgium + France + Liechtenstein + Luxemburg + the Netherlands + Switzerland + Austria)
	8-US + Canada
Eastern Europe	*9-Bosnia-Herzegovina*
	10-Former Yugoslavia (Yugoslavia + Croatia + Macedonia + Slovenia)
	11-Poland
	12-The Baltic states (Estonia + Latvia + Lithuania)
	13-Eastern Europe 1 (Rumania + The former USSR + Bulgaria + Albania)
	14-Eastern Europe 2 (Hungary + The former Czechoslovakia)
The rest of the world	*15-Mexico and Central America*
	16-Chile
	17-Other South America (Argentina + Bolivia + Peru + Colombia + Uruguay + Ecuador + Guyana + Paraguay + Surinam + Venezuela)
	18-African Horn (Ethiopia + Somalia +Sudan + Djibouti),
	19- North Africa + Middle East (Lebanon + Syria + Morocco + Tunisia + Egypt + Algeria + Israel + Palestine + Jordan + South Yemen + Yemen + the United Arab Emirates + Kuwait + Bahrain + Qatar + Saudi Arabia + Cyprus)
	20- Other African (all African countries not included elsewhere)
	21-Iran
	22-Iraq
	23-Turkey
	24-East Asia (Japan + China + Korea + Hong Kong + Taiwan)
	25-Southeast Asia (Vietnam + Thailand + the Philippines + Malaysia + Laos + Burma + Indonesia + Singapore)
	26-Other Asia (Sri Lanka + Bangladesh + India + Afghanistan + Pakistan + Brunei + Bhutan + Kampuchea + the Maldives + Mongolia + Nepal + Oman + Sikkim)
	27-Oceania (Australia + New Zealand etc…)

Table A2 Segregation by birth region (2002).

		Immigrant exposure			Own-group exposure		
Group	Share	Actual	Exp.	R	Actual	Exp.	R
Nordic							
1 – Finland	.024	.178	.147	1.210	.081	.054	1.487
2 – Denmark,	.004	.131	.122	1.070	.020	.013	1.464
3- Norway, Iceland	.005	.125	.120	1.040	.022	.016	1.361
Western Europe and North America							
4-GB, Ireland	.002	.212	.157	1.349	.045	.010	4.625
5-Germany	.003	.150	.133	1.130	.021	.010	2.090
6-Mediterr. Europe	.002	.262	.183	1.437	.062	.012	5.146
7-Other Europe	.002	.165	.144	1.152	.019	.008	2.423
8-USA, Canada	.001	.156	.134	1.165	.013	.005	2.453
Eastern Europe							
9-Bosnia	.006	.235	.158	1.491	.060	.028	2.171
10-Fm.Yugosl.	.008	.249	.167	1.493	.069	.030	2.273
11-Poland	.005	.204	.152	1.343	.044	.014	3.156
12- Baltic states	.001	.171	.145	1.182	.013	.005	2.437
13-Sout East Europe	.003	.224	.160	1.401	.038	.012	3.130
14-Central E Eur.	.002	.182	.146	1.247	.026	.008	3.388
Rest of the world							
15-Central Am.	.001	.236	.168	1.408	.016	.005	2.924
16-Chile	.004	.277	.189	1.467	.047	.015	3.207
17-South Am.	.002	.256	.177	1.447	.035	.009	4.061
18-African horn	.003	.358	.216	1.656	.066	.023	2.913
19-N Africa,M East	.004	.366	.215	1.702	.123	.033	3.681
20-Other African	.002	.293	.193	1.520	.031	.009	3.490
21-Iran	.005	.277	.175	1.584	.079	.019	4.144
22-Iraq	.003	.372	.209	1.781	.097	.023	4.316
23-Turkey	.003	.431	.258	1.667	.181	.050	3.607
24-E Asia	.001	.320	.217	1.479	.119	.022	5.356
25-SE Asia	.003	.317	.212	1.497	.103	.033	3.093
26-Other.Asia	.002	.323	.208	1.554	.072	.017	4.339
27-Oceania	.000	.175	.144	1.217	.007	.004	1.860

Note: The regions are described in more detail in Table A1 above. Share is the share of employed people belonging to the group. Expected exposure is based on the distribution over municipality, industry and human capital. R is overexposure calculated as the ratio between actual and expected exposure.

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