The long-term integration of European refugees

Swedish experiences after the Yugoslav Wars

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by

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June 27, 2023

Abstract

We study the short- and long-term economic and social integration of European war refugees. The population under study left former Yugoslavia for Sweden in the early 1990s. In the first years, there were significant human capital investments in language training, adult education, and active labor market programs. The Yugoslav refugees then exhibited a remarkably sharp increase in employment and earnings, possibly helped by improving labor markets and pre-existing contacts in Sweden. Many entered jobs in manufacturing and service industries and remained there to a considerable extent. Among those above 50 at arrival, labor market outcomes were not as good. Despite strong development during the early years, the long-term labor market position of the Yugoslavs is broadly on par with previous cohorts of refugees. Residential segregation first increased and then declined, whereas workplace segregation was most marked among the early entrants.

Keywords: Refugees, migrants, economic and social integration
JEL-codes: F22, J15, J18

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1   Introduction

This paper studies the short- and long-term economic integration of European war refugees. The case in focus, people arriving to Sweden from former Yugoslavia in the first half of the 1990s, in many ways resembles today's situation with substantial refugee flows across the European continent, political turmoil, and economic uncertainty. The study is also relevant for the general debate on how to accommodate recent, current, and expected flows of humanitarian migrants.

The wars forced a large number of people to leave their homes in a short period of time. The factors driving the migration are thus similar to those behind the movements linked e.g. to the wars in Ukraine and Syria, and the potential flows from other ongoing conflicts. During the period, Sweden received a substantial per capita inflow of asylum seekers during a severe economic recession where unemployment had recently gone from less than 2 to almost 10 percent. Nevertheless, the Balkan refugees were met with substantial policy efforts, and there was a pre-existing ex-Yugoslav diaspora in the country. The Swedish experiences thus provide an indication on the role of overall economic conditions, active labor market and education policy, and the significance of ethnic networks in the integration of refugees.

The analysis is based on pseudonymized population-wide administrative records compiled for research purposes by Statistics Sweden and held by the Institute for Evaluation of Labour Market and Education Policy (IFAU). The primary population in focus are people born in former Yugoslavia who received residence permit in Sweden in 1993 or 1994, at ages 20–55.[1] A total of more than 66,000 individuals were granted protection, and almost 11,000 family reunification migrants immigrated in the same two years. The number of asylum seekers started to increase already in 1991, and peaked in 1992, but most people did not get their permits before 1993.[2] Even though other countries (e.g. Germany) received higher numbers of people seeking refuge, the refugee inflow to Sweden was unprecedented and substantial per capita (Barslund et al. 2016).

People in this group often immigrated as families. A 1994 snapshot of our sample shows that the average age was 34, 78 percent were married, and 69 percent had children in the household. The refugees were relatively well educated; around 20 percent had only primary schooling and about one in four had tertiary education. This made them more on par with the native population than with previous cohorts of Yugoslavian (predominantly labor) migrants.

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[1] We do not differentiate by type of residence permit. The vast majority are refugees and their families, but the sample may include individuals immigrating for other reasons. We refer to the group as refugees and migrants interchangeably. As will be described further below, the data contain two country of birth categories related to former Yugoslavia: former Yugoslavia and Bosnia-Herzegovina. We combine these two categories into one. The data contain no information on ethnicity or nationality.

[2] In 1991 and 1992 the number of humanitarian migrants from former Yugoslavia were about 1,000 per year. All figures on the total number of asylum seekers and residence permits come from the Swedish Migration Board, https://www.migrationsverket.se/Om-Migrationsverket/Statistik/.

We follow these individuals from their first year in Sweden through 2019. We document human capital investments reflected by participation in language training, active labor market programs, as well as adult and higher education. Our analysis of labor market integration-/assimilation relates the performance of the migrants from former Yugoslavia to those of natives of comparable age and gender, and to other groups of foreign-born. We also investigate residential and workplace segregation and how this measure of social integration develops over time.

As already mentioned, the labor market conditions encountered at arrival were very harsh. Unemployment had risen dramatically during the first years of the 1990s as a result of an economic recession first hitting primarily the export industry, then firms relying on domestic demand, and later the public sector due to cut-backs in spending (Bergmark and Palme 2003). Active labor market policies and education initiatives expanded in general during the time period, and the former Yugoslavs were included to a large degree. In year 2000, 90 percent had participated in language training, about half the group in adult education at the primary or upper secondary level, and 6 percent in higher education. Around 70 percent had been enrolled in a labor market program through the PES, with participation peaking 2–3 years after immigration.

During the first five years after immigration, labor market progress was quite remarkable in relative terms. From an employment rate of less than five percent in 1994 to almost 70 percent in year 2000. While this was somewhat below native employment, it surpassed the employment rate of similarly aged migrants from other parts of the world, including the EU and the US. Gender differences in employment were relatively small, especially compared to other migrants from outside the EU.

The refugees from former Yugoslavia reached an employment level of 80–85 percent of that of same-aged natives around the year 2002. Then the development levelled off, and there was thus not full assimilation in this sense. In 2019, employment was around 85 percent of that of same-aged natives among women and around 90 percent among men. Relative to other migrant groups arriving from Iran/Iraq or the African Horn in the 1985–1994 period, it appears that the process was quicker among those from former Yugoslavia. The other groups narrowed the employment gap to natives more gradually, although Yugoslavian men were employed to greater extent and earned more than these groups throughout the period. A similar pattern is present for earnings, where the former Yugoslavians move up the overall earnings distribution quickly but end up at around 80 percent of the earnings of same-aged natives. Compared to migrants from the EU, the earnings trajectories are at a lower level among the Yugoslavs, but Yugoslav men earn more than migrants from Iran/Iraq or the African Horn throughout the period. Among women, the gap to these groups narrows over time, and disappears towards the end of the period.

A large proportion of the refugees and reunification migrants had their first job in the manufacturing industry and in the health care sector, with women being much more common in the latter and men in the former. Relative to the gender-specific industry allocation of natives, however, it is in manufacturing we see a strong overrepresentation. In 2005, almost 50 percent of men from former Yugoslavia worked in this industry, compared to between 20 and 30 percent of native men. For women, relative overrepresentation was even stronger: around 20 vs. around 8 percent. In line with this, there is overrepresentation in occupations such as machine operators. We also find a short- and long-term excess presence in relatively low-skilled service jobs. Compared to natives in the same industry (and of the same age, gender and education), the average earnings rank among the former Yugoslavs amounted to 88 percent of the mean native outcome in 2005.

Finally, we document residential and workplace segregation using measures of exposure and overexposure conditioning on background characteristics (Åslund and Skans 2009). We consider segregation in two origin-based dimensions: exposure to other foreign-born in general, and to other individuals born in former Yugoslavia (regardless of year of immigration). Not unexpectedly, there is strong segregation in both dimensions. In 1994, the average newly arrived individual in our sample had more than 25 percent foreign-born neighbors. The expected level (had allocation to neighborhoods been random) was about 15 percent. In relative terms, the overexposure to countrymen was greater: 6 percent ex-Yugoslavs in the area, compared to 1–2 percent in expectance. Exposure to countrymen increased in the first few years in Sweden, but then there was a decline both in absolute and relative terms. Exposure to foreign-born in general increased as the fraction of immigrants in the overall population grew substantially in the two decades studied. Since the expected level increased more in relative terms, overexposure measured as the ratio between actual and expected exposure, decreased.

Workplace segregation is by definition conditional on employment, and thus subject to selection issues especially as the fraction employed changes a lot. Our results show that those that entered employment shortly after coming to Sweden, did so in immigrant dense establishments, and in particular in workplaces with a presence of countrymen. In 1994–1995, the average fraction of coworkers born in former Yugoslavia was around 18 percent. After a couple of years, it fell to around 10 percent, where it remained through 2017. Still, this means a strong overexposure given that the group never constituted more than 2 percent of the employed. It is, however, worth noting that this segregation is typically not about people working in establishments fully dominated by one country of origin group. Looking at the distribution of coworker exposure, most of the mass is below 20 percent, and rather few individuals have a value above 50 percent.

We are of course not the first to study the outcomes of this particular group of refugees and reunification migrants in Sweden. There is a significant number of studies in several disciplines, e.g. economics, political science, sociology, and economic geography. We do not aim to give a full and correct account of this literature. For a recent overview with an emphasis on qualitative work, and a discussion of Swedish migration and integration policies during the past decades, see (Bucken-Knapp, Omanović, and Spehar 2020). The authors compare the experiences and outcomes of the Bosnia-Herzegovina refugees in the 1990s to those of more recent Syrian refugees. Results point to administrative obstacles, issues in the implementation of interventions (such as language training), and hopes that the integration process would move forward more quickly. The study also confirms the importance of labor market integration for connecting to Swedish society, and the possibility to utilize one's human capital and fulfil aspirations and hopes in the host country.

There are also studies more similar to ours, i.e. quantitative work based on administrative records. Early follow-ups indicated vast regional differences in employment, and remarkably good outcomes among those located in rural areas characterized by high concentration of small manufacturing firms (Ekberg and Ohlson 2000).[3] More recent descriptions show that over time the labor market position continued to improve and that regional differences diminished (Ekberg 2016). Compared to e.g. Germany, Sweden had an inclusionary approach offering permanent residence to refugees from former Yugoslavia (Barslund et al. 2016). The same study notes that the high unemployment rate and the deep recession slowed down the economic integration in Sweden, but that the long-term outcomes were successful there too. Other studies comparing outcomes of this refugee group (and others) in Sweden relative to other countries tend to show that outcomes are rather similar once one controls for background characteristics (Bevelander and Pendakur 2014). For further descriptions, references, and a discussion of integration policies in Sweden, see also Åslund, Forslund, and Liljeberg (2017).

2   Institutional background

This section provides a brief description of refugee migration to Sweden, focusing on the development of institutions and policies relevant to those arriving from former Yugoslavia in the early 1990s. We first give an overall view and then summarize by describing the conditions for an individual asylum seeker/refugee.

In the 1970s, migration to Sweden shifted from predominantly labor to humanitarian and family migration. During this decade and in the first years of the 1980s, refugees came from e.g.

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[3] This correlation can of course be due to self-selection, and should not be considered causal.

Chile, Vietnam, Poland, Lebanon and Turkey. The geographical concentration of asylum seekers and refugees combined with deteriorating labor market performance, initiated a political debate on reforming the refugee reception system. From 1985, the responsibility was transferred from the National Labour Market Board to the municipalities (about 280 at the time). In practice this meant a decreased focus on labor market entry, since the reception was typically administered by local social offices. Due to an increasing number of asylum seekers, the idea of selecting a limited number of locations with suitable conditions was abandoned in favor of "sharing the burden" and an emphasis on the advantages of small communities. In practice, almost all municipalities signed contracts with the National Migration Agency as part of the "Whole of Sweden strategy" (also known as the Sweden-wide strategy) where a vast majority of the refugees were assigned to their first location (Andersson 1998; Edin, Fredriksson, and Åslund 2003). The reform appears to have had a negative impact on economic integration, although secondary relocations undid some of its potential effects due to placement in poor locations (Edin, Fredriksson, and Åslund 2004).

Concerns about individual passivity and the poor incentive structure brought by the reimbursement system (essentially running expenses) from the national to the local level soon appeared. A lump-sum compensation scheme from the central government to the municipalities was implemented in 1991. This reform came together with requirements on individual "introduction plans" regulating the responsibilities of the individual and public agencies involved. Experience shows, however, that the plan sometimes played a less significant role in reality (Kadhim 2000). Two years later the municipalities were offered the possibility to use "introduction benefits" instead of social assistance for financial support. In 1992, asylum seekers were given the right to work under certain conditions (Calleman 2017). A number of research publications and government reports describe the overall developments (Statens Invandrarverk 1997; Kadhim 2000; Regeringskansliet 2003; Lidén and Nyhlén 2014).[4]

The number of asylum seekers from former Yugoslavia increased significantly to about 13,000 in 1991, and then reached almost 70,000 in 1992. After that, asylum applications decreased gradually (to 29,000 in 1993 and 11,000 in 1994). The number of residence permits granted to people born in former Yugoslavia increased dramatically to 30,000 in 1993 and 36,000 in 1994. According to statistics from the National Migration Agency, about 47,000 came from Bosnia-Herzegovina and 18,000 from Serbia-Montenegro. This inflow of refugees during a short time period was unprecedented in Sweden. As can be seen in

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[4] Other work describes Sweden's overall approach to immigration and the welfare institutions (Borevi 2012; 2014), more recent accounts of asylum policies (Parusel 2016) and refugee and immigrant integration policies (Riksrevisionen 2014).

Figure 1, however, the following decades have seen total immigration increase to much higher levels. Another thing to note is that while there was a pre-existing Yugoslav-born population in Sweden, immigration in the 1990s was at a different scale than the previous peaks during labor migration in the late 1960s and early 1970s.

Even though Sweden in the end provided asylum for a large number of people, offered comparatively generous conditions, and invested substantially in integration measures, there were attempts to limit the number of asylum seekers and refugees through e.g. visa requirements and altered implementation of regulations (Calleman 2017). After the recognition of Bosnia-Herzegovina in May 1992, visas were required from its citizens until October the same year. This requirement was then abolished and instead introduced for asylum seekers from Serbia, Montenegro, and Kosovo. In June 1993, visas were again required for Bosnia-Herzegovina. A government decision in April 1994 (SFS 1994:189) in practice granted 40,000 people status as de facto refugees or in need of protection due to humanitarian reasons. Combined, these steps can be regarded as an attempt to speed up processing times while restricting the number of new applications. Sweden differed from many other countries in offering permanent residence for most refugees from former Yugoslavia and their families.

Immigration from former Yugoslavia also coincided with and sometimes influenced other regulations. The 1992 introduction of work permit exemptions to provide opportunities for asylum seekers to work, was at least in part an attempt to mitigate the costs of supporting the many people waiting for long periods of time. The dispersal policy enacted in 1985 gradually eroded when the Yugoslav refugees more often than previous cohorts used contacts and connections to find accommodation during the waiting period (which required the municipality's approval) and a first place of residence after receiving asylum in Sweden. This coincided with political discussions about the need to "normalize" conditions and decrease institutionalization during the asylum process. From July 1994, a new law entitled asylum seekers to financial benefits also if they arranged their own housing.

The same law also considered the perceived problems with inactivity during long periods, both from a public opinion perspective (asylum seekers should provide for themselves), and from its potential impact on future integration prospects (human capital decline, scarring from past unemployment). It introduced an obligation to participate in language training (but not the more extensive Swedish for immigrants provided for those granted residence) and to do some work in the asylum centers, such as cleaning and gardening. In practice, how much of such activities were actually offered/required varied.

Another important aspect of the overall conditions was the economic turmoil during the 1990s. The economic crisis has been characterized by an "international phase" driven by an economic

downturn in Western economies, then spreading to firms more dependent on domestic demand, and then affecting the public sector through cutbacks due to deficits following tax revenue losses and increases in support payments. Employment fell by 13 percent of the workforce (Bergmark and Palme 2003), unemployment increased dramatically and active labor market programs were rapidly expanded. The asylum seeker, and later refugee, did thus not have an easy landscape to navigate. However, previous work suggests that at least some of the newly arrived saw possibilities in the otherwise poor conditions, e.g. through the increased availability of housing due to the fall in house prices and the fact that some firms were expanding during the crisis (Bucken-Knapp, Omanović, and Spehar 2020).[5]

After being granted asylum (or residence permit as reunification migrant), those who had stayed in refugee centers pending the decision were assigned to a municipality or sought housing on their own. There were no restrictions regarding relocating, and the refugees could take on any job in any location. In practice, language training in Swedish for immigrants (Sfi) was the first destination for many. Anecdotal evidence suggests that the PES considered completed Sfi as a prerequisite for other active measures. As we describe in detail below, participation in labor market programs and subsidized employment was quite common. The refugees encountered several authorities at different levels during the first years in Sweden, e.g. The National Migration Agency regarding the asylum application, where to stay during the waiting period, and where to go when asylum was granted; the municipality administration on social assistance, language training, and local integration measures; and the PES for unemployment support and ALMPs. In addition, many programs were run jointly with NGOs. Sometimes, contacts and interactions were perceived as slow and ineffective (Statens Invandrarverk 1997; Bucken-Knapp, Omanović, and Spehar 2020).

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[5] There are indications that the sample interviewed by Bucken-Knapp, Omanović, and Spehar (2020) is positively selected relative to the overall group of Yugoslavian refugees, e.g. a very high reported fraction of people taking on tertiary education in Sweden.

Figure 1. Immigration to Sweden 1980–2017 (1000s) and year of first migration among Yugoslavia-born individuals (percent)
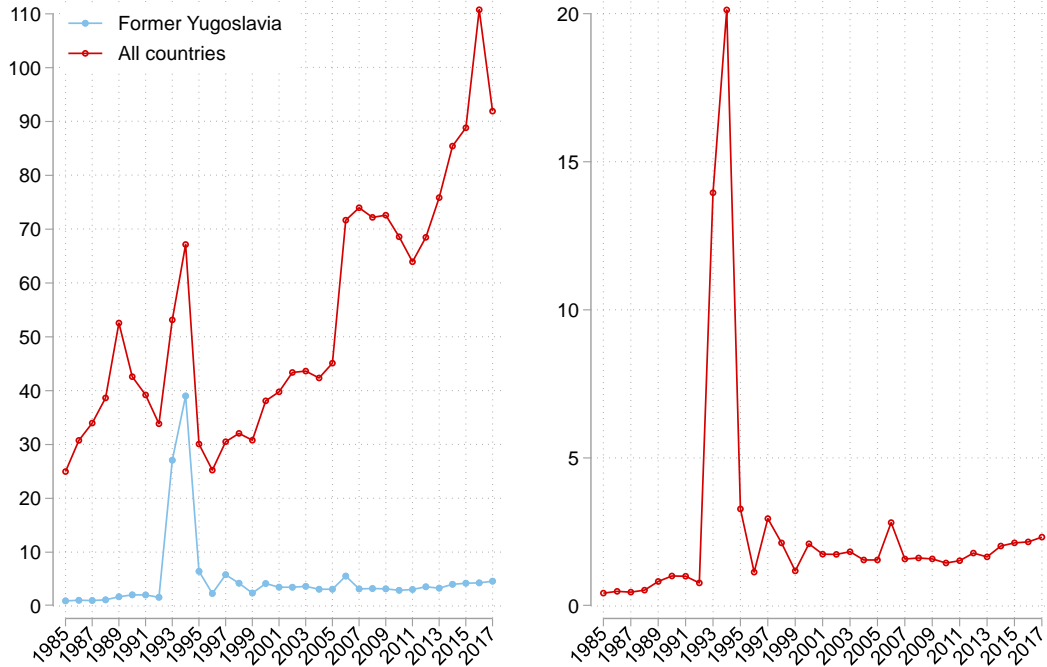
Notes: Left panel shows immigration to Sweden. Right panel shows year of first migration among former-Yugoslavia-born individuals residing in Sweden. Based on non-natives (Yugoslavia-born individuals) observed in registers between 1985 and 2017 and year of first immigration.

3   Data, definitions, and methods

The analyses are based on pseudonymized register data covering the entire working-age Swedish population (ages 16–64). These data are held by the Institute for Evaluation of Labour Market and Education Policy (IFAU) and come from several sources, including population registers, tax records, the Swedish Public Employment Service (PES) and the National Board of Education.

We have access to detailed information on households and individuals, including year of birth, country/region of birth, year of receipt of residence permit (for immigrants), gender, marital status, number of children, level of education, county of residence and residential area. We also utilize annual information from linked employer-employee data, providing information on employment status, income from work, and occupational and workplace characteristics (e.g. industry and co-worker composition). Information on occupation comes from Statistics Sweden's salary structure statistics. These data are collected annually during the fall and covers all workers in the public sector (about one third of all workers in Sweden in 2017) as well as private firms with 500 employees or more. Smaller firms are randomly sampled. All in all, data covers approximately 50 percent of private sector workers.

Our data also cover participation in various forms of education as well as days registered at the PES in open unemployment, active labor market programs and subsidized employment.

We restrict our main sample to first time immigrants born in former Yugoslavia who were granted residence permits in 1993 and 1994 at ages 20–55. We do not observe the reason for receipt of residence permit, but the year restriction is intended to capture primarily refugees and reunification migrants. The terms refugees/migrants are for expositional reasons in this case used interchangeably. We have no information on ethnicity and observe only whether a person is recorded as born in Bosnia-Herzegovina or elsewhere in former Yugoslavia. We aggregate these two categories. Aggregation is also motivated by the fact that there is likely to be self-selection in who reports her-/himself as born in the newly recognized country. We use (former/ex) Yugoslavia/Yugoslavs to denote the source region and the group.

Table 1 reports characteristics of our main sample as measured in 1994. Natives and immigrants from former Yugoslavia before 1990 are included for comparison. Many of the Yugoslavs immigrated as families; 78 percent were married, and 69 percent had children at home. The group was similar to natives in terms of education, in contrast to earlier immigrants from the Balkan region, most of whom came as labor migrants; 16 percent had at least some tertiary education, 22 percent had only primary education or less. The average age was 34.

Figure 2 shows that most of the individuals in our main sample remain throughout the observation period. Less than five percent emigrated, most within the first ten years. The most common reason for leaving the sample is the age restriction (about 15 percent of the initial population), and about five percent are registered as deceased. In other words, the role of selective emigration (or attrition in general) may be less of a concern than in other contexts (Dustmann and Görlach 2015). On the other hand, one should note that most of the analysis is at the group level, meaning that changes in sample composition (among those from former Yugoslavia and/or in other groups) may affect the results.

Table 1. Characteristics of Yugoslavian refugees and comparison groups in 1994

	Yugo	Native	Earlier Yugo	Ages 20–29 Yug	Ages 20–29 Nat	Ages 30–49 Yug	Ages 30–49 Nat	Ages 50+ Yug	Ages 50+ Nat
Female	0.49	0.49	0.48	0.50	0.49	0.48	0.49	0.51	0.49
Married	0.78	0.46	0.64	0.57	0.12	0.88	0.56	0.90	0.68
Child 0–17	0.69	0.44	0.43	0.55	0.30	0.82	0.60	0.24	0.16
Age	34.3	37.7	44.3						
Education:									
Compulsory	0.19	0.21	0.42	0.16	0.13	0.19	0.21	0.33	0.36
Upper sec	0.50	0.52	0.46	0.59	0.64	0.47	0.49	0.28	0.40
Post-sec	0.26	0.26	0.10	0.20	0.23	0.29	0.29	0.24	0.23
Unknown	0.06	0.00	0.03	0.05	0.00	0.05	0.00	0.15	0.00
N	36459	3851998	35228	11959	1085207	22328	2101497	2172	665294

Notes: Based on individuals observed in 1994. "Yugo"/"Yug" refers to former Yugoslavia-born individuals who received residence permits in Sweden 1993–1994 and were then aged 20–55. "Native" refers to natives aged 20–55. For the Yugoslavian refugees, education is measured 2 years after receipt of residence permit (i.e., 1995 or 1996). "Compulsory" refers to compulsory education or lower, "Upper secondary" includes those with at least 2-year upper secondary education. "Post-sec" includes those with any post-secondary education (or 4-year technical upper secondary education). "Earlier Yugo" refers to former Yugoslavia-born individuals who received residence permits before 1990 and were aged 20-65 in 1994.

Figure 2. Exits from the main sample (percent)
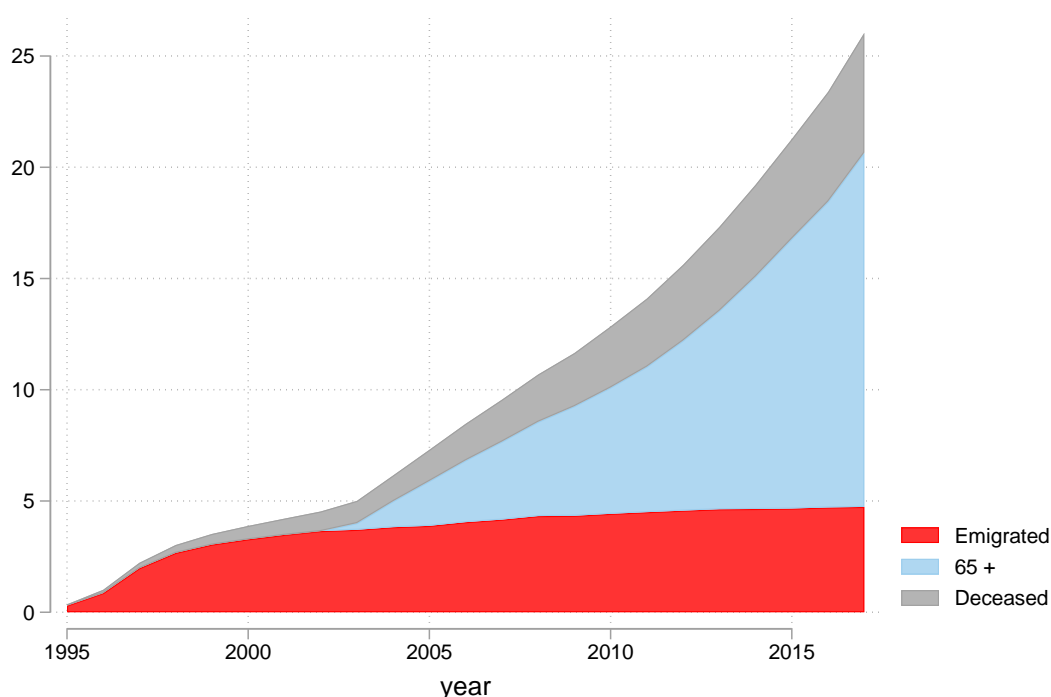
Notes: Percent that exit the sample. Based on individuals observed in 1994.

We relate outcomes for the Yugoslavs in our sample to those of natives, as well as immigrants born in Iran/Iraq and countries on the Horn of Africa who received residence permits in 1985–94,

at ages 20–55. In some analyses we also compare outcomes to a group consisting of immigrants from the early EU member states ("EU 15"), Norway, Iceland, the US and Canada, with the same restrictions on residence permits and age at immigration. The following paragraphs describe the outcomes we study.

We use Statistics Sweden's definition of employment status, which is based on tax records and indicates whether an individual is employed in November each year. Our earnings measure is defined as CPI-adjusted annual income from work, including self-employment. Earnings rank is defined as the percentile rank of earnings in the overall earnings distribution of those aged 20-55. We also construct an outcome we call "first job", which indicates the first year an individual earns at least half the median earnings among 45-year-olds. This measure has been used previously (Åslund et al. 2006; Åslund, Forslund, and Liljeberg 2017) and implies stronger labor market attachment than being employed as defined here.[6] We also calculate days registered in unemployment, active labor market programs and subsidized employment using data form the PES, and define workplace annually using employer data. If an individual has more than one employer during a year, the one associated with the highest earnings is considered the workplace. Workplaces are categorized into industries using the Swedish Standard Industrial Classification (SNI). SNI is based on the EU's recommended standards.[7] We use information on occupation on one-digit level, which indicates skill level as well as working area in a broad sense. Occupations are reported according to the Swedish Standard Classification of Occupations (SSYK). We also construct annual indicators of whether an individual has been registered in language training for immigrants ("Sfi"), adult education,[8] and higher education.

In measuring workplace and residential segregation, we use a method relating observed exposure to a particular group to expected exposure conditional on background characteristics (Åslund and Skans 2009). Covariates include human capital (age, education and gender), geographic location (municipality) and, in the case of workplace segregation, industry. We study exposure to former Yugoslavia-born and foreign-born individuals, respectively. For each group and type of segregation (workplace or residential), we construct four measures: 1) observed exposure, 2) unconditional expected exposure, 3) expected exposure conditional on age, gender and education, and 4) expected exposure conditional on age, gender, education, municipality and, in the case of workplace segregation, industry.

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[6] The amount equals roughly equals six months wages for a janitor employed full-time in the public sector (Forslund et al 2017).

[7] NACE Rev. 2. Statistical classification of economic activities.

[8] Adult education includes both primary and secondary education, and both theoretical and vocational training.

Observed exposure is defined as the fraction of individuals from the group in question among co-workers (co-residents[9]). We exclude workplaces with only one employee in this case. Unconditional expected exposure is defined as the fraction of group members in the population of workers (households). To construct the conditional expected exposure measures we first define the "group propensity" by characterizing individuals (households) according to a vector of discrete characteristics on which we want to condition. Within each combination of characteristics, or for each "type" of person (household), the group propensity is the ratio of the number of group members of type X to the total number of individuals (households) of type X. Conditional expected exposure is then defined as the average group propensity among co-workers (neighboring households).

We use information on Small Areas for Market Statistics (SAMS) to measure residential area[10], and age, gender and education to capture human capital.

An overview of the variables used is given in appendix table A1.

4   Human capital investments and ALMP participation

We begin by describing investments in human capital through education and participation in active labor market policies (ALMP) among the Yugoslavian refugees.

Figure 3 reports rates of participation in Swedish for immigrants (Sfi) year 1994–2004. Most of the Yugoslavs started language training shortly after immigration. About 80 percent of the group was registered in Sfi in 1994–95. Participation then levelled off to less than ten percent in 2000 and by 2003, no one was registered.[11] But participation does not always mean graduation. Despite 90 percent participating at some point before the end of year 2000, only 55 percent had a grade recorded.

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[9] In the case of residential segregation, we base the analysis on households rather than individuals. We use the highest age and education in the household (and omit gender) in these calculations.

[10] SAMS is a division of municipalities into local residential areas made by Statistics Sweden. The division is based on the subdivision of municipalities in large municipalities and on election districts in small municipalities. There are approximately 9200 SAMS.

[11] Sfi is available for all foreign-born lacking knowledge of the Swedish language (with some exceptions). The individual has the right to proceed to the highest level, and durations are sometimes long and interrupted.

Figure 3. Participation in language training (percent)
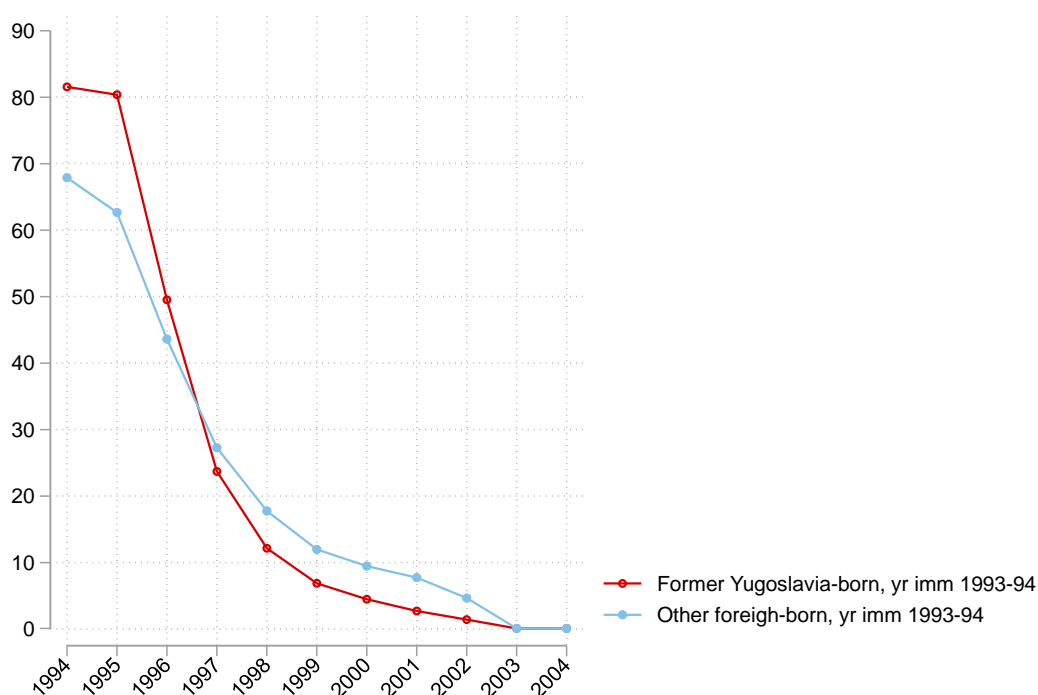
Notes: "Yr imm" refers to the year an individual received residence permit. Restricted to those aged 20–55 at receipt. Participation is defined as having been registered in language training ("Sfi") a given year.

As mentioned above, being granted asylum/residence also meant access to the education system and to labor market policy. As can be seen in Figure 4, the immigrants from former Yugoslavia participated in active labor market programs to a high extent. Between 1994 and 2000, 70 percent had been registered in an ALMP at least one day, and 52 percent had participated in primary or secondary education for adults. Participation in ALMPs peaked in 1996 at about 42 percent and then decreased gradually. The figures for immigrants from Iran/ Iraq and the countries on the Horn of Africa show that high ALMP involvement was a general feature of recently arrived immigrants and refugees. However, it appears that the entry process was particularly quick among the Yugoslavs, and that participation rates were 7–10 percentage points lower than that of the Yugoslavs around 1996. Not unexpectedly, natives participated in ALMPs to a much lower degree than the immigrant groups over the whole period, although rates were relatively higher during the 1990s than the 2000s.

As shown in Figure 4, around 25 percent of the Yugoslav immigrants were registered in adult education in 1997 and 1998. Participation then levelled off to just above 5 percent in 2004. Like for Sfi, participation was more or less in line with that of other recently arrived groups of migrants. Immigrants from the Horn of Africa saw somewhat higher rates of participation during the whole

period, whereas immigrants from Iran and Iraq participated to a lesser extent than the Yugoslavs between 1996 and 2000 but ended up just above the rate of the Yugoslavs in 2004, at around 8 percent. Adult education was much less common among natives than immigrants over the whole period, as expected.

As an indication of the cumulated human capital investments made in the first years in Sweden, Table 2 reports the share of immigrants from former Yugoslavia who had participated in different types of education and activities by 2000 and 2005 respectively. The figures suggest substantial participation in different measures: nine out of ten in language training, more than half in adult education at upper secondary or lower, and about 70 percent in a labor market program. Participation in higher education was less common; 3.7 percent enrolled by year 2000. Among those 20–29 at arrival, 10 percent acquired tertiary education in Sweden. The idea of human capital investments is of course that they should improve labor market opportunities. In the next section, we describe the development of employment and earnings.

Figure 4. Participation in ALMP and adult education (percent)
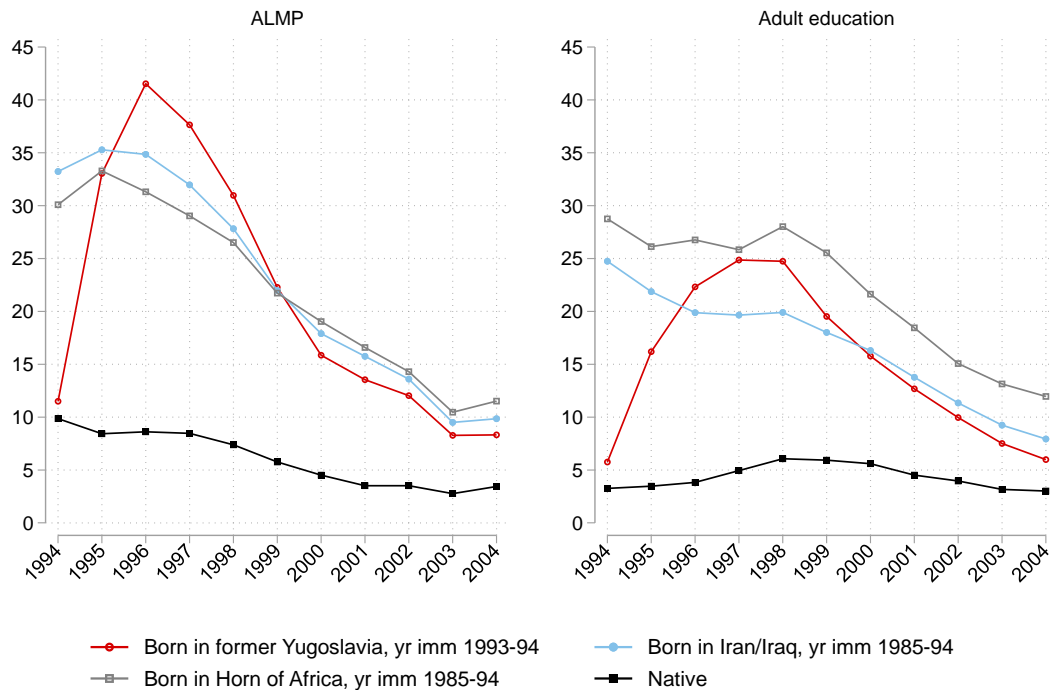
Notes: Graphs show the share registered in an ALMP >0 days/registered in adult education a given year. "Yr imm" refers to the year an individual received residence permit. Restricted to those who were aged 20–55 at receipt.

Table 2. Percent of Yugoslavian refugees registered in training and education

|	Adult education	Higher education	Active labor market program	Language training ("Sfi")
1994–2000	52.2	3.7	70.4	89.8
1994–2005	58.0	5.6	76.7	89.8

Notes: The sample consists of former Yugoslavia-born individuals who received residence permit in Sweden 1993–1994 and were then aged 20–55. Percentage in ALMP include those registered >0 days in an ALMP.

5 Employment and earnings

The Yugoslavs made quite remarkable advances on the labor market between 1994 and 2000, despite the harsh conditions they met. Employment increased rapidly among both men and women. Starting off at less than five percent in 1994, it reached around 70 percent in 2000. Employment then remained high relative to other groups of migrants and not that far below natives throughout the observation period. Taking age compositions and (to some extent) time spent in Sweden into account,

Figure 5 shows that by 1998, Yugoslav employment had surpassed that of similarly aged immigrants from Iran/Iraq and the Horn of Africa. Among men, employment also surpassed that of similarly aged immigrants from the EU and the US. After 2000, however, progress slowed down and the gaps to immigrants from Iran/Iraq and the Horn of Africa narrowed. In 2019, the Yugoslavs' employment was about 90 percent of that of similarly aged natives. Differences were small relative to the other immigrant groups at this point, although women from the EU and the US were employed to a higher degree than other immigrant women. The major difference between the Yugoslavs and the other groups thereby appears to have been in the short to medium term progress. The Yugoslavs rapidly increased their employment, whereas the other immigrant groups progressed more gradually. In the long run, differences were not pronounced and none of the groups quite reached the employment rate of same-aged natives.

Figure 5. Employment of Yugoslavian refugees relative to same-aged natives
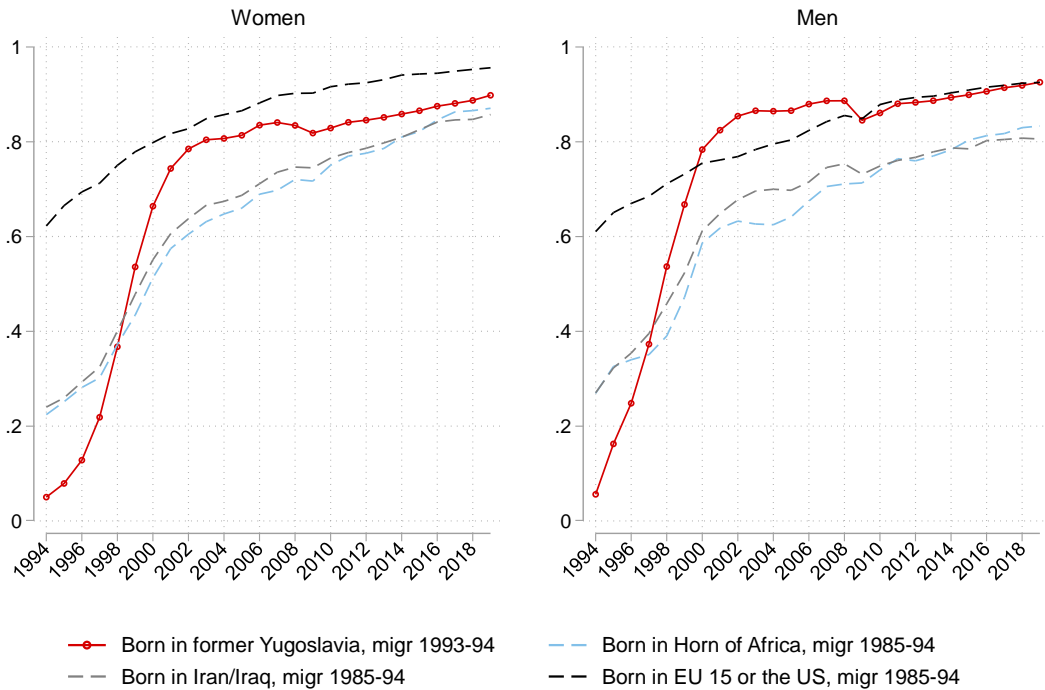
Notes: Lines show employment shares in the immigrant groups as a fraction of same-aged native-shares (matched cohort composition). "Yr imm" refers to the year an individual received residence permit. Restricted to those aged 20–55 at receipt and those aged 20–55 in each year-observation.

The Yugoslavs' earnings trajectory was similar to that of employment, although at lower levels relative to natives. Earnings increased quickly between 1994 and 2000, surpassing that of similarly aged migrants from Iran/Iraq and the Horn of Africa. But after 2000, progress slowed down. As shown in Figure 6, in 2019, average earnings amounted to about 80 percent of those of same-aged natives. By this time, the gap relative to immigrants from Iran/Iraq and the Horn of Africa had closed among women and was relatively narrow among men. Immigrants from the EU and the US, however, earned on average considerably more than the Yugoslavs over the whole time period. Gender differences in earnings progression were small.

Figure 6. Earnings rank of Yugoslavian refugees relative to same-aged natives
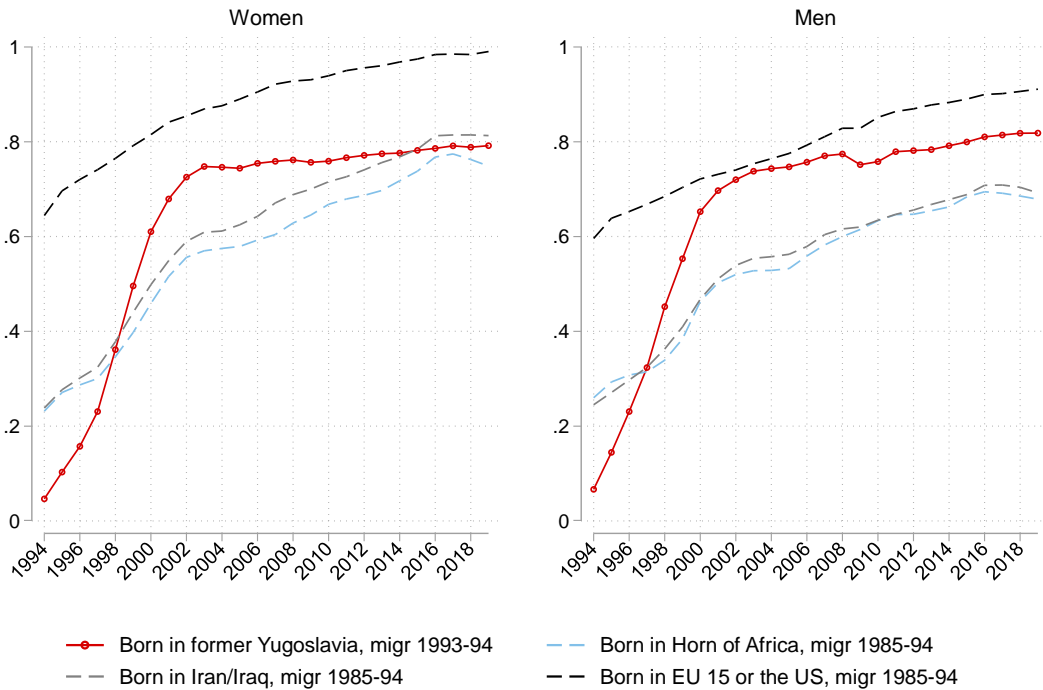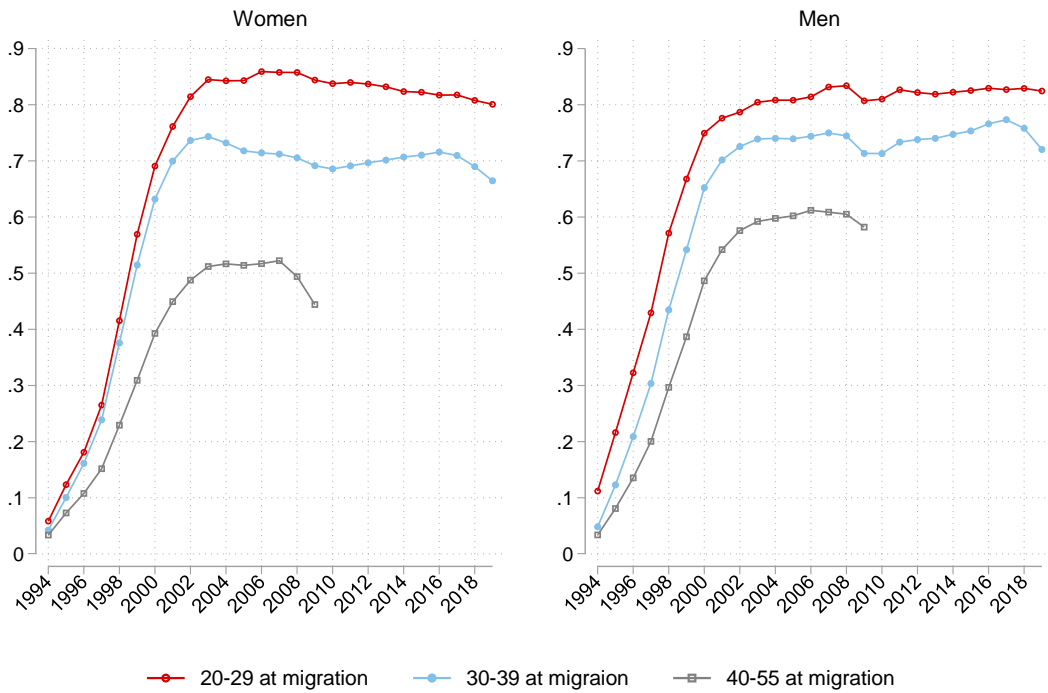

Notes: Lines show mean earnings rank in the immigrant groups as a fraction of mean earnings rank among same-aged natives (matched cohort composition). "Yr imm" refers to the year an individual received residence permit. Restricted to those aged 20–55 at receipt and those aged 20–55 in each year-observation.

There was, however, considerable variation in earnings progression within the group depending on age at immigration and education. As seen in Figure 7, earnings increased rapidly in all groups between 1994 and around 2003, but the development levelled off differently depending on age at immigration. Among those oldest at migration (ages 40–55) mean earnings rank amounted to 50–60 percent of that of same-aged natives in 2003, and throughout the period, with slightly lower earnings among women. Corresponding shares were instead around 70–75 percent among those aged 30–34 at migration, again with slightly lower relative rank among women. Those who migrated at ages 20–29, saw relative earnings at around 80 percent throughout the period.

How can we understand the relatively poor performance of those above 40 at immigration? First, the qualitative patterns are expected: younger individuals have longer investment horizons, are arguably more flexible, and are not affected by age discrimination (or its interaction with ethnic discrimination). Second, parallel work describing the receipt of social benefits (Laun, Liljeberg, and Åslund 2020) provides another possibility. Historically, also economically successful cohorts of migrants to Sweden have in the longer term been overrepresented in receipt of early retirement benefits. In later years, reforms have decreased uptake in general, and even more among the foreign-born. Among the Yugoslav refugees, there was significant excess receipt

(relative to comparable natives) starting about 10 years after immigration and growing with time. This indicates that labor market outcomes may be linked to alternatives offered by public support systems.
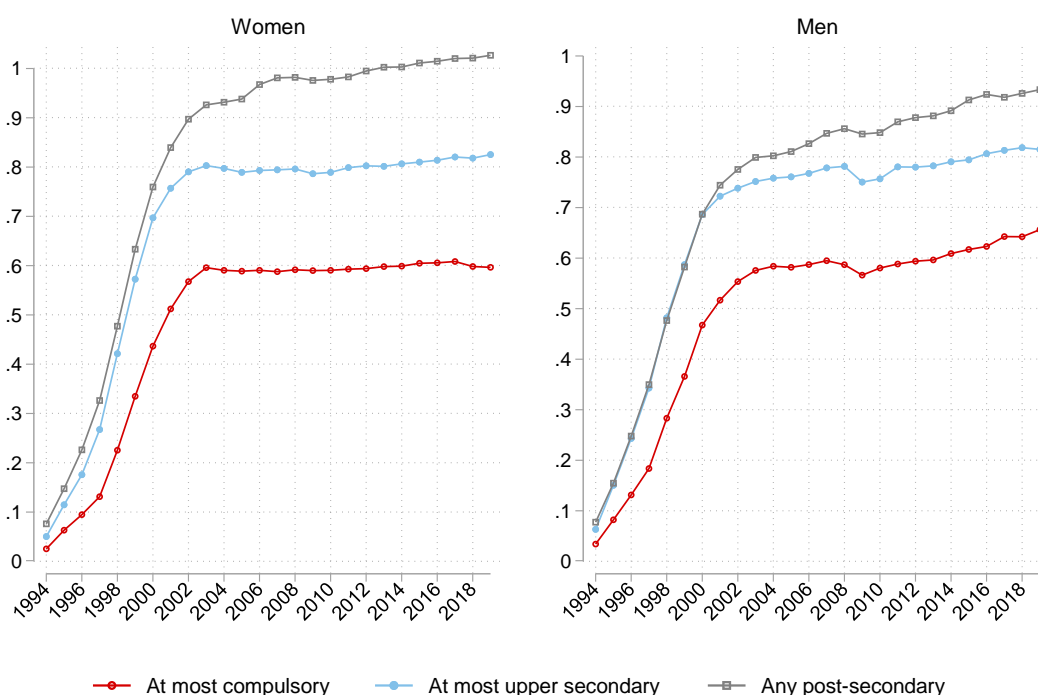
Figure 7. Earnings rank relative to same-aged natives by age at migration

Notes: Lines show mean earnings rank in the immigrant group as a fraction of mean earnings rank among same-aged natives (matched cohort composition) by age-at-migration. Restricted to those aged 20–55 at receipt and those aged 20–55 in each year-observation.

Figure 8 shows earnings rank relative to same-aged natives by education at arrival. The least educated (compulsory schooling or less) had a mean earnings rank of 50–60 percent of that of same-aged natives in 2003, which largely remained throughout the period, although men saw a slight increase over time. Those with (at most) upper secondary education earned more, around 75–80 percent compared to natives in 2003, and onwards, again with a slight increase among men. The highest educated (at least some post-secondary education) displayed the highest relative earnings: 90 percent among women and 75 percent among men in 2003. This group moved up the earnings distribution gradually, and by 2006 women saw full assimilation, while a small gap remained among men.

Figure 8. Earnings rank relative to same-aged natives by education at migration

Women | Men

— At most compulsory — At most upper secondary — Any post-secondary

Notes: Lines show mean earnings rank among Yugoslavian refugees who received residence permit in 1993 –1994 at ages 20–55 as a fraction of mean earnings rank among same-aged natives (matched cohort composition). Education in the Yugoslav group is measured in 1996. Restricted to those aged 20–55 in each year-observation.

6 Industries and occupations

It is well-known that immigrants in general tend to work in certain parts of the labor market, and that the entry jobs in particular are found in certain types of firms (Ansala, Åslund, and Sarvimäki 2018). This section describes the industries in which the Yugoslavs found their first jobs and where they later worked. We also illuminate the development of the occupational distribution.

We define first job as that at which earnings for the first time equal at least half the median earnings of employed 45-year-olds (for each gender separately).

Figure 9 shows a very clear pattern of gender-specific industrial concentration in absolute numbers. Almost half of the men in our sample found their first job in the manufacturing industry. Among women, about 33 percent worked in health care. Relative to natives of the same gender, however, the overrepresentation of Yugoslavs in manufacturing was actually even stronger among females. Figure 10 shows that in 2005, almost 50 percent of the men from former Yugoslavia worked in the manufacturing industry, compared to around 25 percent of the native men. For women, the corresponding figures were just above 20 versus around 10 percent. In health care, on the other hand, there was almost no overrepresentation. These features of the industry allocation of natives and Yugoslavs remained relatively similar in 2010.

Looking again at the entry jobs, we find that business services and retail were relatively common industries for first jobs for both men and women. Men more often found worked in the transport industry whereas women worked in education. Comparing with natives in later observation years, however, this seems to reflect general gender segregation in the Swedish labor market.

How does the earnings gap discussed above relate to the industry distribution? Taking industry into account means conditioning on positive earnings (only those who work have an industry affiliation). In 1998, the earnings rank among Yugoslav refugees aged 20–55 with an industry affiliation amounted to around 70 percent of that of same-aged and educated natives of the same gender. This fraction had increased to about 80 percent in 2000 and was 89 percent in 2018. Conditioning on having an industry affiliation thus reduces the earnings gap relative to natives. This reduction, however, does not appear to be due to the differential industry allocation described above. Average earnings progression relative to natives does not change much if we compare Yugoslavs to similar natives in the same (3-digit) industry. In other words, the "average" industry among the Yugoslavs in terms of earnings appears to be on par with the overall labor force. Figure 11 shows the distribution over broad (1-digit) occupation categories indicating qualification levels in the years 2000, 2010, and 2019. Clearly, the Yugoslavs were strongly overrepresented in low-skill occupations initially, and less often found in high-qualification positions. Despite some attenuation over time, in terms of occupations, the basic pattern also remained in 2019. If we instead look at the 3-digit occupation level, the three most common occupations are in personal care, machine operations, and in elementary sales/service. In line with the industry statistics, a strong overrepresentation relative to natives is seen in machinery and plant operators, but also in low-qualification service jobs.[12] In line with the overrepresentation in manufacturing, the Yugoslavs are found in more routine-intense occupations than same-aged natives, as seen in Figure 12. They are also underrepresented in occupations high in abstract tasks. This pattern remains over the entire study period.[13] Despite the overrepresentation in low-qualification service jobs, the Yugoslavs are underrepresented in service-intense occupations, possibly due to underrepresentation in high-qualification service intensive jobs.

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[12] The classification system changes between 2010 and 2017, so figures are not directly comparable.
[13] Some caution is warranted in the interpretation of the task intensity of work as the share for which we observe occupation differs across years and between the Yugoslav refugees and same-aged natives. The occupational classification also changes between 2013 and 14. The jumps seen between these years likely results from poor translation of occupational codes.

Figure 9. Industry allocation, first job
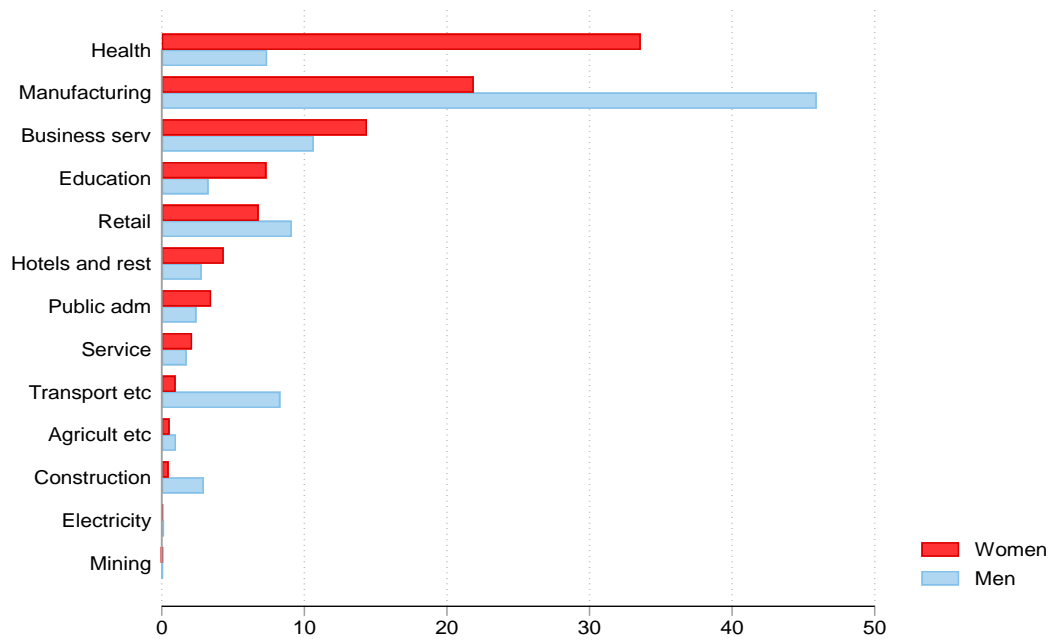
Notes: The industry of the first job refers to the industry of the job from which a person earned the most of their income the first year their yearly earnings equaled or exceeded half of the median earnings of a 45-year-old person of their own gender. Those who never reached this threshold have been excluded. The category missing industry information is not shown (4% of both women and men) nor is the category "Activities of extraterritorial organizations" (which includes very few individuals).

Figure 10. Industry allocation 2005, Yugoslavs and natives
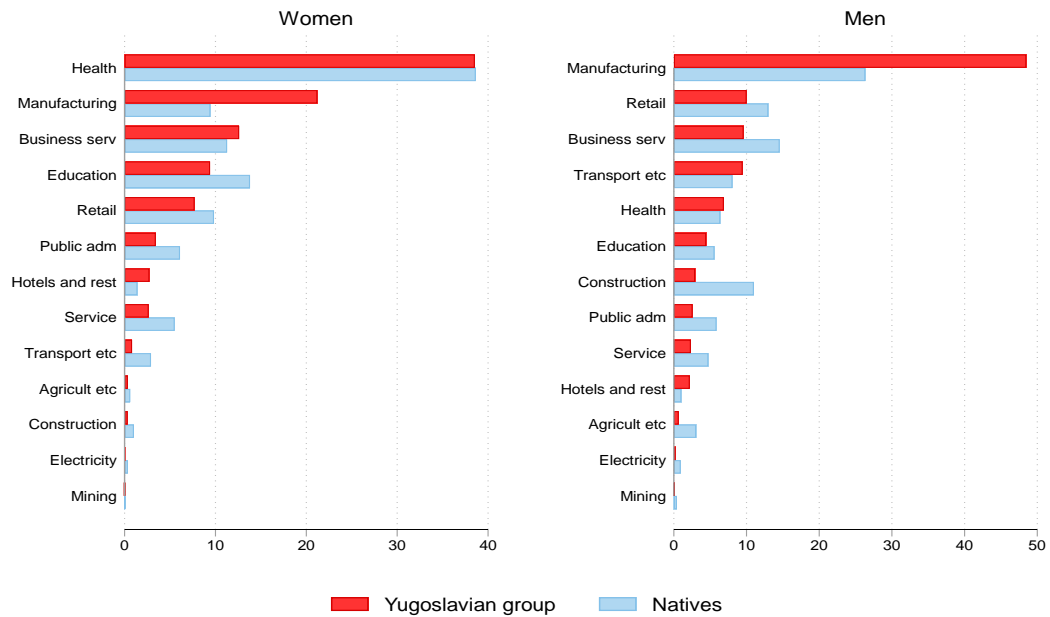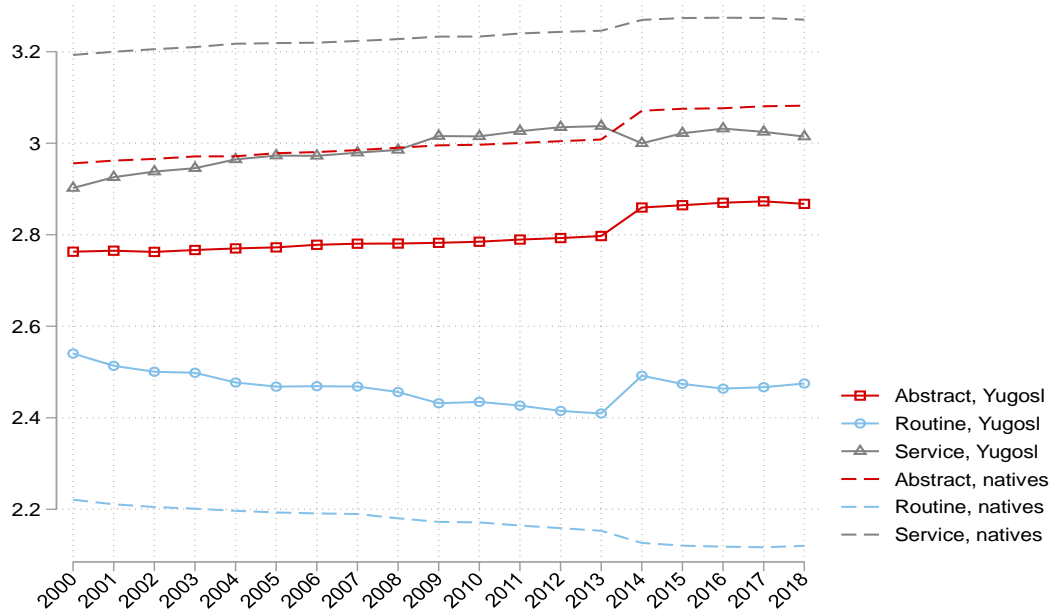

Notes: Industry is based on the employer associated with the highest earnings in 2005. The birth cohort composition of the native group has been matched to that of the Yugoslavian group.

Figure 11. Occupational distribution in different years (percent)

2000　　　**2010**　　　**2019**

Born in former Yugoslavia　　Natives
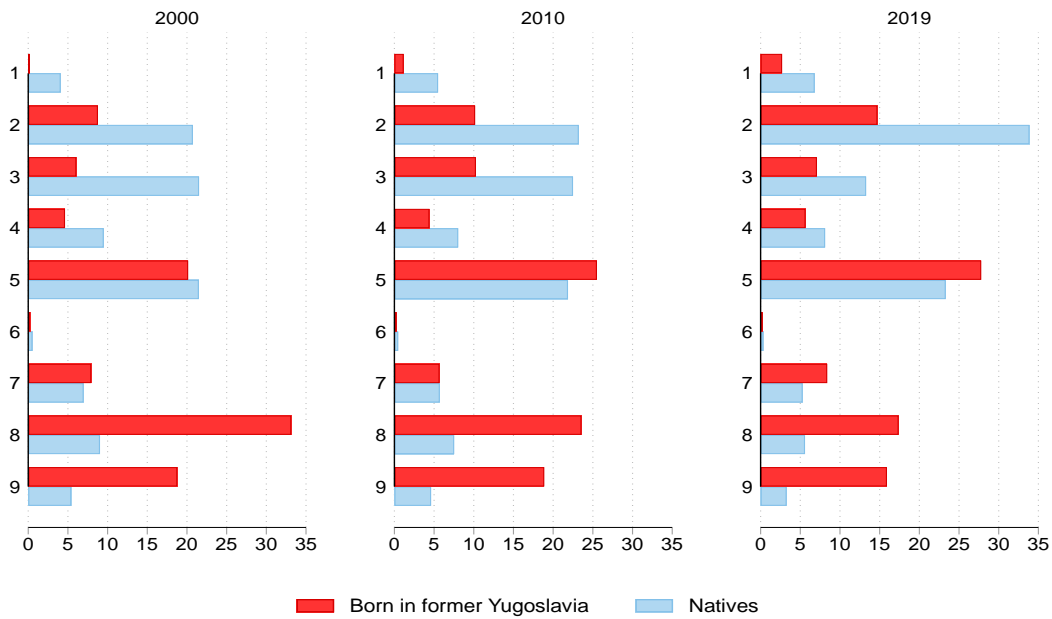
Notes: Occupation classification (1-digit level). Grouping according to Statistics Sweden. 1. Managers; 2 Occupations requiring advanced level of higher education; 3 Occupations requiring higher education qualifications or equivalent; 4 Administration and customer service clerks; 5 Service, care and shop sales workers; 6 Agricultural, horticultural, forestry and fishery workers; 7 Building and manufacturing workers; 8 Mechanical manufacturing and transport workers, etc.; 9 Elementary occupations.

Figure 12 Task intensity in occupation

Abstract, Yugosl
Routine, Yugosl
Service, Yugosl
Abstract, natives
Routine, natives
Service, natives

Notes: Graphs show mean task score (range 1–5) in the occupation a given year for the Yugoslavian group and same-aged natives (matched cohort composition). Based on the sub-sample for which information on occupation ("SSYK") is available. This share differs across years and between the groups. The SSYK classification also changed between 2013 and 2014; the jumps between these years are likely the result of poor translation. The underlying task scores come from Goos et al. (2009).

7   Residential and workplace segregation

As in many other countries, there is substantial ethnic residential and workplace segregation in Sweden (Andersson 1998; Åslund and Skans 2010). This section describes the extent and development of segregation experienced by the Yugoslav refugees. To this end we use a measure based on observed and expected exposure (Åslund and Skans 2009). As described in section 3, the idea is to contrast the origin composition among people in one's context (e.g. the fraction foreign-born in one's area of residence) with expectations under random assignment (potentially conditional on background characteristics).

Figure 13 shows the groups' exposure to Yugoslav-born and foreign-born neighbors, respectively, as well as the exposure to these groups expected under random allocation to residential areas conditional on different sets of covariates. The Yugoslavs had on average around 25 percent foreign-born neighbors in 1994. Of these, around 6 percent were born in former Yugoslavia. The expected fraction of foreign-born neighbors conditional on human capital and municipality was around 15 percent, and the corresponding expected share for Yugoslavia-born neighbors was 2 percent. There was thus considerable segregation in both dimensions at this point, although overexposure to countrymen was greater.

Exposure to countrymen increased after 1994 and peaked in 2000 at just above 8 percent. It then levelled off to around 7 percent in 2016. In other words, secondary relocations were initially directed toward areas with a relatively high presence of countrymen, which is in line with findings for other groups of migrants (Åslund 2005). Expected exposure varied between 2 and 4 percent. The Yugoslavs thereby had significantly more Yugoslavia-born neighbors than expected during the entire period. However, the combination of the decrease in exposure over time and compositional changes in municipal populations (leading to an increase in expected exposure) meant that overexposure decreased over time.

Exposure to foreign-born neighbors (in which Yugoslav immigrants are included) increased steadily up until 2016 to just above 35 percent, primarily due to a substantial to inflow of immigrants over the period. The relative increase in the expected fraction of foreign-born neighbors was somewhat smaller. Overexposure therefore decreased somewhat over time.

Figure 13. Residential segregation (percent exposure) by year
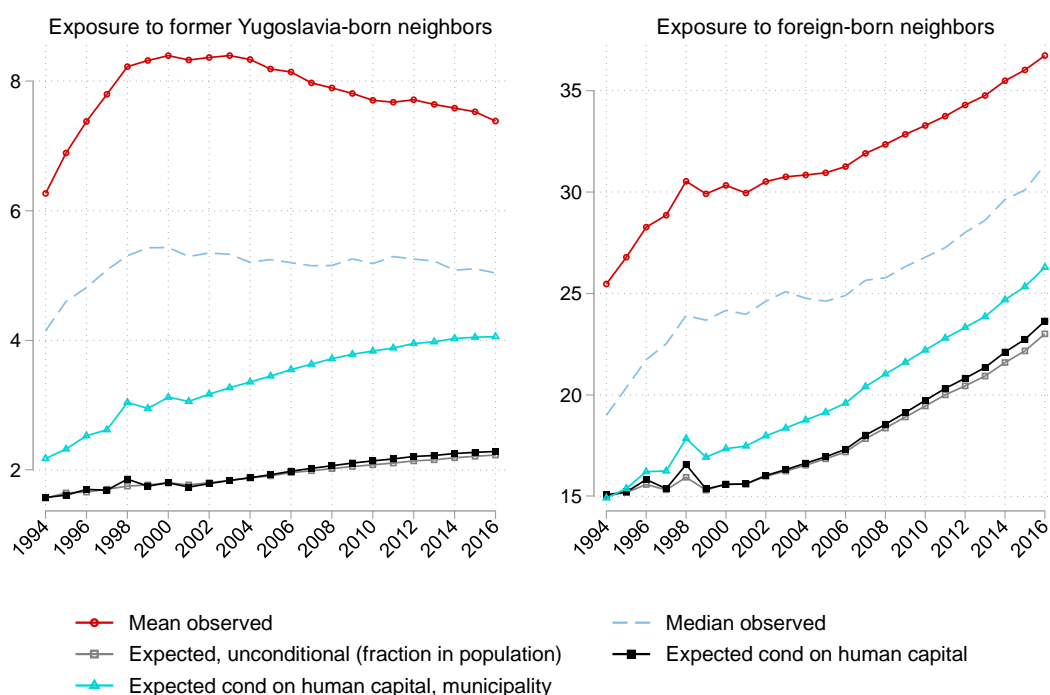
Notes: Based on households. Exposure is defined as the share of neighboring households within in local areas (Small Area of Market Statistics, SAMS). Expected exposure is defined as the average "group propensity" among neighboring households, where the group propensity is defined as the share of households with a given background in classes defined by covariates. Human capital refers to age and education (highest age and education in the household used).

We now go on to describe workplace segregation.

Figure 14 shows that among the Yugoslavs who entered the labor market in 1994, exposure to countrymen was on average around 18 percent. Exposure to foreign-born co-workers was around 35 percent. This was considerably higher than expected in both dimensions, but particularly for countrymen for whom expected exposure was around 6 percent. Exposure to countrymen then decreased substantially. This was most likely due to compositional changes following the increase in employment (the analysis is by definition conditional on employment since only those who work can be included). Put differently, those who found work rapidly more often did that in workplaces with a high representation of other Yugoslavs.

The stable level around ten percent observed from 1996 and for the rest of the observation period still implied rather strong overexposure. Due to changes in municipal compositions and inflow of Yugoslavs into the working population, expected exposure to countrymen increased over time, thus causing a decrease in overexposure. Exposure to foreign-born co-workers dropped to around 24 percent in 1996 and then increased somewhat to around 32 percent in 2016. There was clear workplace segregation during the whole period. The relative increase in expected exposure was, however, greater than that of exposure, which meant a decrease overexposure even

after 1996. For exposure to foreign-born in general, the qualitative pattern was the same, but less pronounced.

Figure 14. Exposure and expected exposure to Yugoslavs and immigrants, workplace
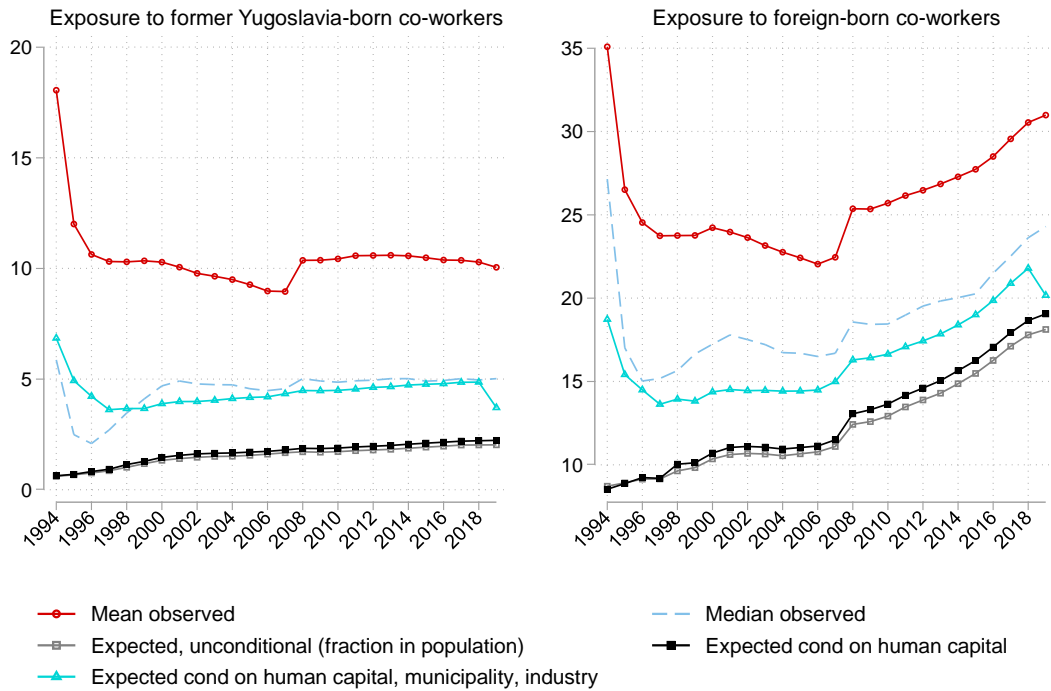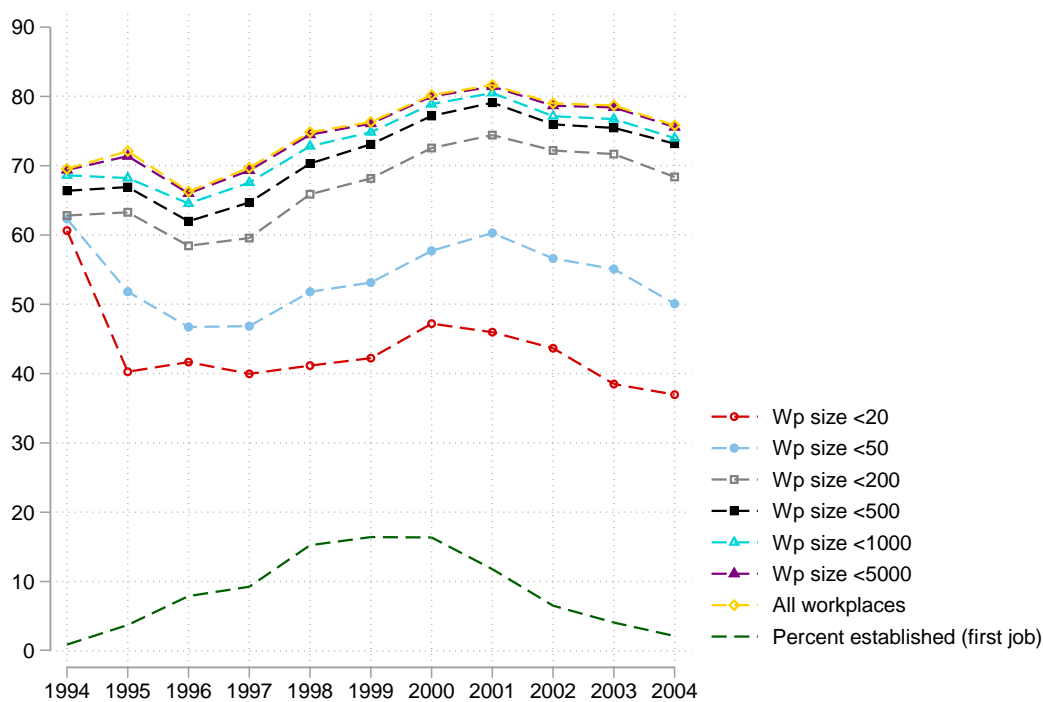

Notes: Workplace is defined according to the employer associated with the highest earnings a given year. Exposure is defined as the share of co-workers from a given group. Expected exposure is defined as the average "group propensity" among co-workers, where the group propensity is defined as the share of individuals with a given background in classes defined by covariates. Human capital refers to gender, age, and education.

Average exposure hides substantial heterogeneity. As suggested by the difference between mean and median exposure, most of the Yugoslavs in our sample tended to have only a small fraction of countrymen at the workplace. Only a few worked in places dominated by people born in former Yugoslavia, and the fraction working with a majority of foreign-born was only around 10 percent in year 2000.

Another perspective on segregation is to consider the share of the Yugoslavs who had at least one co-worker born in former Yugoslavia at their first job. As shown in Figure 15, 1999 was the year when most people in our sample found their first job. Among those who did, around 75 percent had at least one former Yugoslavia-born co-worker. Not surprisingly, this share varied with workplace size. Among those who found their first job in establishments with less than 20 employees, about 45 percent were exposed to at least one person born in former Yugoslavia. As the number of co-workers increased, so did the share of people with at least one countryman at work. The pattern was similar other years, although shares varied somewhat.

Figure 16 reports the share of all workers who had at least one co-worker born in former Yugoslavia in 1999, by workplace size and for different groups. Clearly, the difference between the Yugoslavs in our sample and the comparison groups (Iran/Iraq, the Horn of Africa, and natives) are greatest in smaller establishments. This signals the potential role of networks and contacts for entering the labor market. However, an overrepresentation is seen in workplaces with up to 499 employees, which includes most of the working population (about 85 % of workers were found in establishments including 500 or fewer workers). It is worth noting that the two other immigrant groups were also exposed to Yugoslavs to a greater extent than natives in all but the largest establishments. It appears Yugoslavs were sorted to workplaces with other Yugoslavs, and natives to workplaces with fewer immigrants relative to the immigrant groups considered. Not surprisingly, virtually everyone at the largest establishments had at least one co-worker born in former Yugoslavia.

Figure 15. Percent exposed to at least one Yugoslavia-born co-worker at the first job

Notes: Industry is determined by the employer associated with the highest earnings a given year. "Wp size" refers to number of individuals at the workplace. Bottom dashed line shows percent that had their first job the year in question.

Figure 16. Percent of workers with at least one Yugoslavia-born co-worker in 1999, by size of workplace
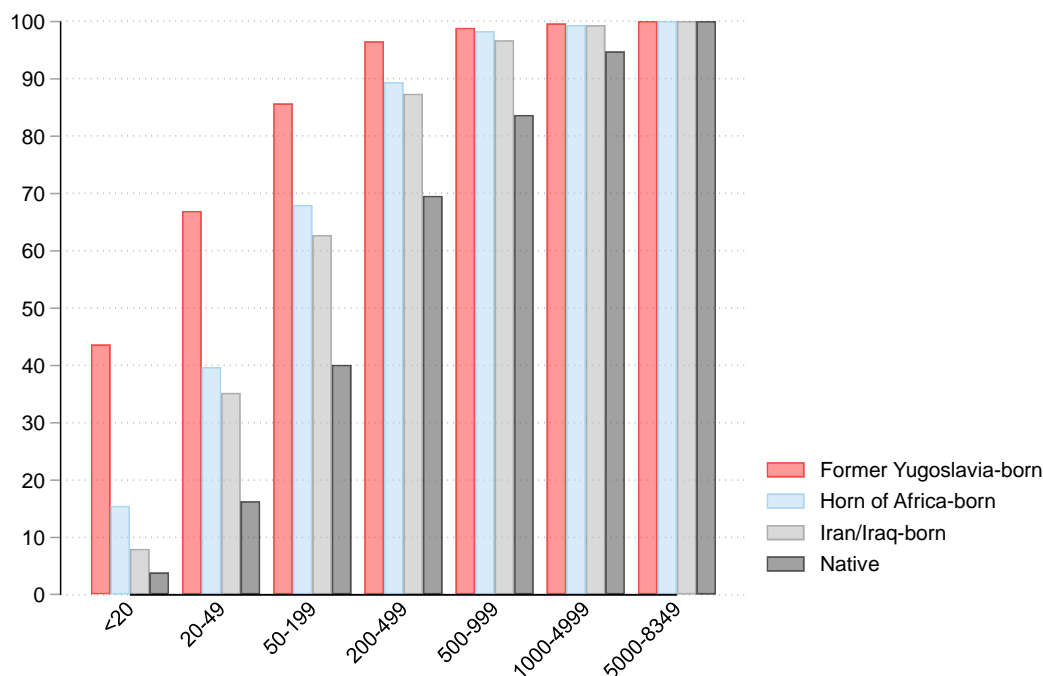
Notes: X-axis shows number of individuals at the workplace. Workplace is defined according to the employer associated with the highest earnings a given year.

8   Conclusions

This study describes the short- and long-term economic integration of adult refugees and reunification migrants from former Yugoslavia to Sweden in the early 1990s. The migration flows caused by the war resulted in an unprecedented number of asylum seekers to Sweden, arriving in a new country during a severe economic recession with high unemployment and constrained public finances.

Our analysis shows that individuals and society invested significantly in language training, adult education, and active labor market programs. Whether it was these investments (or qualifications already present), generally improving labor markets, or pre-existing contacts in Sweden, that caused a rapid increase in employment and earnings among the Yugoslavs is beyond the scope of this paper. But the development for both men and women stands out compared to other groups of humanitarian migrants, and it seems reasonable to assume that several factors mattered.

However, the long-term labor market position of the Yugoslavs is more on par with previous cohorts of refugees. In this respect, the experiences of our study population seems to follow the regularity that many migrants remain at a long-term stable disadvantage vis-à-vis comparable

native workers (Åslund, Forslund, and Liljeberg 2017). We find that the degree of integration was higher among those younger at arrival, and that higher education was associated with a relatively better position. The Yugoslavs were disproportionately concentrated to certain industries, manufacturing in particular. There is also a long-run overrepresentation in low-qualified service occupations. We also find significant ethnic segregation in the residential as well as in the workplace dimensions, much in line with previous work.

Should the economic and social integration of the refugees from former Yugoslavia be considered a success or failure? It seems that it is possible to see it both ways. They came as refugees to an economy in a very poor state with constrained public finances. In the light of this, the relatively quick process of labor market integration can be seen as surprisingly positive. On the other hand, one could have hoped that the strong initial developments would have made possible a more complete closing of the gaps to native workers. Instead, significant differentials remain. It could, however, be argued that the real long-term test of success or failure is how child migrants and children of immigrants fare in the host country. Such an analysis is beyond the scope of this paper, but on our immediate research agenda.

Do the experiences of the refugees from former Yugoslavia tell us anything about what to expect for more recent arrivals to Sweden? Also before the peak in 2015, the country received a large number of asylum seekers compared to neighboring and other European countries (Dustmann et al. 2017; Brell, Dustmann, and Preston 2020). In fact, the number of residence permits granted to refugees and their families annually in 2013–2015 were of about the same magnitude as the average of the 1993–1994 (and then increased significantly to 2016).[14] The pace of labor market entry has been increasing across later cohorts; employment rates at a given length of residence has gradually been higher than among those arriving slightly earlier. For example, the employment rate for 20–64-year-old humanitarian migrants received in a municipality in 2015 was 47 percent three years later, compared to 43 (38) for the 2014 (2013) cohorts. However, the recent refugees do not quite match the transition speed of the Yugoslavs presented in this paper.[15] On the other hand, the long-term integration of rather diverse refugee groups in Sweden has been quite comparable (Åslund, Forslund, and Liljeberg 2017), suggesting that short-term differences tend to disappear.

There are of course many potential reasons for differences in outcomes across groups and cohorts of refugees. The Yugoslavs may as discussed above have benefited from a pre-existing

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[14] According to statistics from the National Migration Agency, the number of residence permits issued to "refugees or comparable" and "refugee relatives" was 44,000 in 1993; 58,000 in 1994; 40,000 in 2013; 49,000 in 2014; 53,000 in 2015; 87,000 in 2016; 56,000 in 2017; 42,000 in 2018; 25,000 in 2019.
[15] See https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__AA__AA0003__AA0003B/MotFlyktUtbKon/# Note, though, that the age restriction differs somewhat; we only include those 20–55 at arrival.

community of peers, and were relatively well educated and (as shown by statistics) able to take on jobs in e.g. manufacturing relatively quickly. It is also possible that they faced less risk of discrimination than e.g. people from Syria, Afghanistan and Somalia. One factor that most likely benefitted the Yugoslavs was the improvement in labor market conditions during the second half of the 1990s. Similarly, improving outcomes in recent cohorts were arguably influenced by Sweden's seeing several years of positive labor market indicators before a slow-down began in 2019. The dramatic developments of 2020, with sharp declines in businesses in service sectors hosting many entry jobs, have of course affected the prospects for continued labor market integration of marginal groups. It remains to be seen what the long-term impact will be, and how individual actions and policy are able to adapt to the changing conditions.

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Appendix

Table A 1. Variable description

	Description
Region of birth variables	
Former Yugoslavia	Born in Bosnia-Herzegovina or other parts of former Yugoslavia, granted residence permit 1993-94 at the age of 20-55.
Horn of Africa	Born in Djibouti, Eritrea, Ethiopia, Somalia, Sudan.
Iran/Iraq	Born in Iran, Iraq.
EU15 +, Canada and the US	Born in Finland, Denmark, Iceland, Norway, Ireland, Great Britain, Germany, Greece, Italy, Malta, Monaco, Portugal, San Marino, Spain, Vatican City, Andorra, Belgium, France, Liechtenstein, Luxembourg, the Netherlands, Switzerland, Austria, Canada, USA.
Outcome variables (measured annually)	
Employment status	Employed in November.
Earnings	Income from work, including self-employment.
Earnings rank	Percentile rank of earnings in overall earnings distribution of those aged 20–55.
First job	First time earnings from work or self-employment of at least half the median earnings of employed 45-year-olds (within gender).
Registered as unemployed	Registered in open unemployment at the PES at least one day.
Registered as participating in an ALMP	Registered as participating in an active labor market program at least one day.
Days in unemployment	Number of days registered in unemployment.
Workplace	Defined according to employer. The employer associated with the highest earnings in a year is defined as the workplace.
Industry	Industry of workplace. Swedish Standard Industrial Classification (SNI). SNI is based on the EU's recommended standards (NACE Rev. 2. Statistical classification of economic activities).
Occupation	Occupation according to the Swedish Standard Classification of Occupations (SSYK 96 for years before 2012 and SSYK 2012 for later years). The base for SSYK is the international classification (ISCO-08).
Participation in SFI	Registered in language education for immigrants, "Swedish for immigrants".
Participation in adult education	Registered in adult education, either primary or secondary education for adults.
Participation in higher education	Registered in any type of higher education.
Exposure to [group]	Fraction of co-workers (co-residents) belonging to [group].
Unconditional expected exposure to [group]	Fraction of group among workers (residents).
Expected exposure to [group] conditional on human capital (municipality, and industry in the case of workplace segregation)	Average group propensity among co-workers (co-residents), see Section 3.
Overexposure in residential area/workplace	The ratio of observed to expected exposure conditional on human capital, municipality, and industry in the case of workplace segregation.