

# Beyond hiring: the dynamics of ethnic disparities in unemployment

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Many ethnic and racial minorities experience higher unemployment rates than majority populations. Recent research in this area has largely focused on inequalities in getting a job—through employer discrimination in hiring—using field experiments. While these studies typically identify significant levels of discrimination, they rarely examine or discuss how hiring discrimination contributes to ethnic employment penalties at the aggregate level. Our study draws attention to the role of ethnic and racial inequalities in getting a job but also in remaining employed and avoiding unemployment as factors contributing to aggregate ethnic employment penalties. Our analysis employs population register data from Sweden to estimate unemployment entry and exit rates for the majority and ten groups of children of immigrants (the second generation, G2). Based on counterfactual scenarios we conclude that the substantially higher unemployment rates among the G2 are driven by their higher risk of becoming unemployed rather than their lower chances of becoming employed. Our findings indicate that hiring discrimination and other reasons for inequalities in getting a job play a less significant role than sometimes assumed in explaining ethnic employment penalties—at least in the context of Sweden.

**Keywords** job loss, unemployment, discrimination, ethnic and racial inequality, second-generation, migrants.

## Introduction

The integration of the children of immigrants (also called second generation immigrants, G2) provides a litmus test of whether migrants attain full membership in their country of settlement

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(Drouhot and Nee 2019). Despite being born and raised in the host country and generally not facing similar language and educational obstacles as their parents (Crul and Vermeulen 2003), the G2 has poorer labor market outcomes and are twice as likely to be unemployed as children of natives across Europe (OECD 2015). Explanations of these unemployment gaps have focused largely on disadvantages in getting a job (Drouhot and Nee 2019) and particular attention has been paid to employer discrimination against racialized groups in hiring, which correspondence studies have shown to be sizeable across Europe (e.g., Quillian et al. 2017; Quillian et al. 2019).

The unemployment rate is a function of the flow of workers into and out of unemployment. By implication, ethnic group differences in unemployment rates are functions of differences in entering unemployment (inflows) and exiting unemployment (outflows). Disadvantages that the G2 face in getting a job have been well-established, but fewer studies have analyzed whether first- and second-generation immigrants are also disadvantaged in keeping a job and avoiding unemployment (Datta Gupta and Kromann 2014; Uhlenborff and Zimmermann 2014; Aeberhardt, Coudin, and Rathelot 2017; Bratsberg, Raaum, and Røed 2018; Longhi 2020; Auer 2022). Even fewer studies have analyzed whether disparities in unemployment outflows are more important than those in inflows for ethnic inequalities in unemployment rates. The two studies that have done so (Aeberhardt, Coudin, and Rathelot 2017; Couch and Fairlie 2010), concluded that disparities in unemployment inflows may be at least as important as disparities in outflows in accounting for ethnic and racial inequalities in unemployment.

In this study, we analyze the importance of unemployment entries and exits in accounting for G2 gaps in unemployment in Sweden. We use population register data on 418,655 individuals born in Sweden to Swedish or foreign-born parents from ten regions of origin to estimate unemployment entry and exit rates. We estimate these rates using correlated random-effects (RE) dynamic logit models (Rabe-Hesketh and Skrondal 2013), which adjust for observed and unobserved time-constant compositional differences between the ancestry groups. We then estimate two sets of counterfactual unemployment rates, (1) in which the G2 have the same unemployment exit probabilities as majority natives, and (2) in which the G2 have the same unemployment entry probabilities as majority natives.

Our study makes the following contributions to the literature on ethnic and racial disparities in unemployment and in the labor market in general. First, ours is one of the first studies to estimate the relative importance of unemployment inflows and outflows. Our key finding is that G2 disadvantages in unemployment are driven by inequalities in becoming unemployed (inflows), rather than in exiting unemployment by getting a job (outflows). This finding aligns with that from Aeberhardt et al.'s (2017) study on the employment gap between native French and North African origin males in France and in particular with the results of Couch and Fairlie's (2010) study on racial (black vs. white) unemployment gaps among men during peaks and downturns in the business cycle in the United States. Our findings suggest that more attention should be paid to the reasons why minorities have difficulties in keeping a job and remaining employed, in addition to the reasons for being less likely to get a job when unemployed.

Second, we leverage the statistical power provided by large population register data to compare ancestry groups of diverse origins from Sweden's large and growing G2 population. We report a similar ethnic hierarchy in unemployment dynamics by social and cultural distance from the majority population as found for employer discrimination in hiring (Quillian et al. 2019). The register data also include information on a large set of confounders that allow comparisons of ancestry groups similar according to a rich set of socioeconomic and demographic characteristics.

Finally, unlike previous research, we study group differences in unemployment dynamics for both men and women. The Swedish labor market shows strong sectoral and occupational gender segregation (Statistics Sweden 2018), women are more likely to have longer periods outside of the labor market due to family leaves, while minority men face harsher employer discrimination than minority women do (e.g., Arai, Bursell, and Nekby 2016). Despite gendered labor markets, we find that the role of unemployment dynamics for ethnic gaps in unemployment is similar for both genders.

## Background

### Unemployment flows and the unemployment rate

The unemployment rate—which measures the fraction of unemployed workers of the total labor force—is a function of the rates of entry into and exit out of unemployment. In a “steady state”, where entry and exit rates remain constant, the aggregate-level unemployment rate in a given year can be expressed as follows:

$$\text{Unemployment rate} = \frac{\text{Entry rate}}{\text{Entry rate} + \text{Exit rate}}$$

According to the above equation, the higher the entry rate (the risk of becoming unemployed) and the lower the exit rate (the chances of finding a job if unemployed), the higher the unemployment rate will be at any given time.<sup>1</sup> It follows that ethnic inequalities in unemployment rates result from ethnic group differences in the risks of becoming unemployed (entry rates) and/or in the chances of getting a job (exit rates). For instance, a high unemployment rate in a group could result from a high entry rate, a low exit rate, or both. This dynamic approach, which addresses the causes of unemployment disparities and is important for designing effective strategies to reduce them, has been used to analyze unemployment disparities by ethnic background (Aeberhardt et al. 2017; Couch and Fairlie 2010) and by gender (Azmat et al. 2006).

### Reasons for ethnic and racial disparities in getting a job

Job search can be seen as a demand–supply process where job seekers apply to job vacancies and employers select among a pool of applicants (Logan 1996). Much recent research in this area has focused on the employer side of this process by examining the extent to which employer preferences shape the distribution of labor market outcomes among job seekers. With respect to ethnic and racial minorities, employer discrimination has been identified as a salient barrier faced by minorities in several countries. This is supported by robust empirical evidence generated by correspondence test experiments showing significantly lower call-back rates for applications with clear markers of racial and ethnic minority status (Quillian et al. 2019). As reported by Zwysen, Di Stasio, and Heath (2021), there is a positive association between the extent of hiring discrimination experienced by a group and its overall disadvantage in the labor market, which they concluded as being indicative of ethnic penalties being an important driver of minority labor market disadvantage (also, Quillian and Lee, 2023).

Research examining the supply side dimension has identified an ethnic penalty in the labor market that is often associated with group differences in individual characteristics, human capital being the most relevant one. The chief premise of human capital theory is that education is a key resource to labor market success. Higher unemployment rates among immigrants may thus be due to immigrants’ lower educational qualifications as compared to ancestral individuals. However, while education is relevant in explaining unemployment differences between groups, it does not eliminate the ethnic penalty (Heath et al. 2008).

Scholars have also stressed explanations other than education to explain the immigrant disadvantage in unemployment, such as socioeconomic background usually characterized by parental occupation and/or parental education—often considered a proxy of the knowledge about labor market opportunities. Furthermore, socioeconomic background is also associated with the social context in which individuals live and with the size and quality of networks that can be activated for finding a job—not to mention that ethnic segregation tends to take place beyond immigrants’ socioeconomic characteristics (Pedulla and Pager 2019). Socioeconomic background affects labor market outcomes—beyond its indirect effect that operates through education, but it is not able to fully account for the remaining part of ethnic penalty in unemployment, thus leaving room for other explanations (Heath et al. 2008).

A separate, albeit less discussed, angle in relation to ethnic inequalities in unemployment concerns the decisions and strategies of job seekers. Racial and ethnic minorities may self-select into labor market opportunities as a strategy to avoid employer discrimination (Heckman 1998; Pager and Pedulla 2015). This type of strategic job search, as a preemptive reaction to employer discrimination, may reinforce labor market segregation along racial and ethnic lines (Lundberg and Startz 2007). As such, employer discrimination may not affect minority applicants' risk of remaining unemployed, but rather influence the types of jobs to which they apply. Importantly, this may include jobs for which they are overqualified or where the employment/contract conditions are not ideal (e.g., temporary contract employment).

## Reasons for ethnic and racial disparities in becoming unemployed

The transition from employment to unemployment (unemployment entry) has received much less attention in existing research so far. Ethnic inequality in unemployment entry may exist for several reasons.

Becoming unemployed can be seen as a process where a worker loses their job—by being laid off, having a temporary contract end or voluntarily quitting—without immediately having alternative employment. Minorities may be more likely to be laid off simply as a result of discriminatory practices by employers (Auer 2022; Datta Gupta and Kromann 2014). On this argument, discrimination in firing should not reflect the use of ethnic group membership as a productivity proxy (statistical discrimination) because firing, unlike hiring, concerns already proven employees (Auer 2022). This argument should be qualified, however. Where G2 workers are over-represented in temporary or probationary contracts, employers may hold limited information about realized productivity at the point at which separation decisions are made, so statistical discrimination can plausibly operate in separations as well as in hiring.

Minorities may face a higher risk of being laid off due to a poorer match between their skills and the job requirements. This can result from statistical discrimination in hiring. Employers who practice statistical discrimination have less information about the skills of minority than majority workers, which can lead to higher dismissal rates of the former when employers learn of the workers and vice versa (Aeberhardt et al. 2017).

Discrimination and other difficulties in getting a job can also increase minorities' risks of becoming unemployed due to job precarity. If minorities are the last ones to get a job, they have less seniority that may lead them to be the first ones to lose their jobs especially in labor markets where downsizing regulations protect workers with longer tenure, such as in Sweden. Discrimination can mean that minorities are more likely to be offered jobs with less stability, and minorities facing discrimination may also be more willing to accept such jobs in the absence of more stable alternatives (Aeberhardt, Coudin, and Rathelot 2017). Previous research shows that minorities are more likely to have fixed-term contracts particularly in labor markets where such forms of employment are widely used (Muñoz-Comet and Arcarons 2022), such as Sweden (Berglund et al. 2021; Statistic Sweden 2020; Svalund and Berglund 2018). Labor market segmentation—that is generally considered sizable in Sweden (Thelen 2014)—may therefore affect ethnic differences in pay (Hermansen et al. 2025) as well as in job precarity.

Finally, groups may differ in voluntary employment termination. According to the Swedish Labor Force Survey, however, only roughly 10 percent of job losses are for voluntary reasons unrelated to dropping out of the labor force and, as such, is unlikely to play a major role in driving inequalities in the unemployment rate (see Appendix Table A1).

After losing a job, minorities are likely to be disadvantaged in securing a new one during the job termination period and before becoming unemployed. They are likely to experience the set of disadvantages in job search that were discussed above and thus face a higher risk of becoming unemployed after losing their job. For example, research has clearly documented that employers discriminate against minority applicants who already have a job (Birkelund et al. 2017; Pedulla 2018). Ethnic and racial disparities in becoming unemployed can therefore exist

through a number of factors that disadvantage minorities both in keeping a job and in securing a new one.

### Previous findings on ethnic and racial differences in unemployment dynamics

Ours is among the few studies to examine how both entry and exit dynamics relate to ethnic inequality in unemployment rates. [Zwysen, Di Stasio, and Heath \(2021\)](#) found that although ethnic penalties from hiring discrimination relate to employment penalties, the former are imperfect predictors of the latter, leaving scope for additional factors.

Two previous studies have estimated the contributions of unemployment dynamics disparities more directly. [Couch and Fairlie \(2010\)](#) found that inequalities in entering unemployment from employment accounted for almost all of the Black-White male unemployment gap during downturns in business cycles. [Aeberhardt, Coudin, and Rathelot \(2017\)](#) similarly reported that transiting from employment to non-employment (either unemployment or inactivity) were more important than hiring in accounting for the employment gap between French men with North African born parents and their native-born counterparts. Although relevant for our study, the comparison between employment and non-employment masks dynamics around unemployment and inactivity which are particularly consequential when comparing ethnic and racial groups to majority populations and especially in the case of women. In terms of assessing the relative contributions of unemployment inflows and outflows on ethnic unemployment disparities, our study extends this hitherto limited literature by comparing a large range of ancestries, both women and men, in an increasingly ethnically heterogeneous society.

Other studies have analyzed ethnic differences in transitions from employment to unemployment—sometimes together with the opposite transition—but did not assess the relative importance of these transitions to differences in unemployment rates, and produced varying results. [Datta Gupta and Kromann \(2014\)](#) reported higher layoff rates for Danish second generation males with low or middle levels of education, but not for females; [Auer \(2022\)](#) reported excess layoff rates during the COVID-19 pandemic for workers with a migrant background in Germany; and [Bratsberg, Raatum, and Røed \(2018\)](#) reported higher layoff rates for immigrant workers in Norway. [Uhlendorff and Zimmermann \(2014\)](#) and [Longhi \(2020\)](#) on the other hand did not find statistically significant migrant background inequalities in moving from employment to unemployment in Germany and the UK.

### Contextualizing unemployment inequality in Sweden

The Swedish coordinated labor market has undergone progressive dualization over time presenting nowadays a segmented labor market with strong employment protection for permanent contracts (insiders) coexisting with an expanded periphery of fixed-term, agency, and on-call employment (outsiders, often minorities) ([Piore 1979](#); [Thelen 2014](#)). Sweden has stricter employment protection legislation (EPL) than most of its Nordic neighbors, but some of the loosest regulations surrounding temporary contracts ([OECD 2020](#)). The contrasting employment protection regulations afforded to permanent and temporary employees exposes the latter to disproportionate risks of precariousness ([Barbieri and Cutuli 2016](#); [Berglund et al. 2021](#); [Giesecke 2009](#)). While non-stable jobs expose all individuals to unemployment, ethnic segregation in low quality occupations expose immigrants to higher unemployment risks [as well as lower earnings ([Hermansen et al. 2025](#))] as compared to the majority population. They are more likely to be employed in sectors (in particular, service sectors) that rely more than others on a temporary workforce ([O'Reilly et al. 2019](#)). Altogether, our own estimates from the Labour Force Survey show that while 14 percent of the Swedish-born workforce was on temporary contracts in 2019, the corresponding prevalence among the foreign-born was 25 percent (no statistics exist for the G2). Labor market segmentation and ethnic minorities' higher concentration in temporary jobs—which can result

from their challenges in securing quality jobs—are thus potential explanations for their higher unemployment risks.

For unemployed workers, the unemployment insurance system combines income-related benefits replacing up to 80 percent of prior earnings, capped at 300 days, with conditionality on registration and active job search (Bennmarker et al. 2007). This combines with a comprehensive infrastructure of re-employment services through the Public Employment Service (Arbetsförmedlingen), including training, wage subsidies, and activation guarantees for the long-term unemployed (Calmfors et al. 2001; Forslund and Vikström 2011). Together with the EPL asymmetry discussed above, these features describe a regime in which strong activation compresses between-group differences in unemployment exit, while a substantial fixed-term periphery generates elevated inflow for groups concentrated in it.

Ethnic minorities face a high degree of hiring discrimination in the Swedish labor market (Bursell et al. 2021; Quillian et al. 2019; Quillian and Midtbøen 2021). Similar to other Western countries, discrimination in hiring follows patterns of perceived cultural and social distances between natives and different ancestry groups (Quillian et al. 2019; Hagendoorn 1995; Hrabá et al. 1989; Strabac and Listhaug 2008). Field experiments from Sweden find a negative correlation between ethno-cultural distance and call-back rates (Vernby and Dancygier 2019), with applicants with Arabic/North African/Middle Eastern names having the lowest call-back rates (Arai et al. 2016; Bursell 2012, 2014; Carlsson 2010; Carlsson and Rooth 2007). This ethnic hierarchy is mirrored among G2 job applicants (Carlsson 2010).

## Data

Analyses are based on a collection of Swedish total population registers called the Immigrant Trajectories Dataset. We linked information from several administrative registers for a study population which separately includes 215,516 men (2,391,138 person-years) and 203,139 women (2,108,340 person-years) born in Sweden between 1977 and 1981, and followed from the age of 25, or since they transited from education to the labor market, to the age of 39. Accordingly, we focus on the study period 2002–2016. The second half of this period overlapped with the aftermaths of the financial crisis, the effects of which, however, were comparatively small in Sweden which experienced a fast and robust recovery in the first half of the 2010s.<sup>2</sup>

We set the lower age limit to 25 to exclude years in which many individuals are not fully attached to the labor market. By international standards, Swedish school-to-work transitions are extended and heterogeneous, with an average age at tertiary education entry at 24 years (OECD 2025) and with early adults typically combining part time work, study, military service, travel, and labor market exploration before establishing a stable position in either tertiary education or the labor market (Olofsson and Kvist 2021; Olofsson and Wadensjö 2012). Our focus therefore starts from the ages at which young Swedes become more firmly attached to the labor market.

Following standard practice in research on unemployment, we limited the data of our main analyses to person-years in which the individual was active in the labor market, defined as receiving any labor earnings or being registered as unemployed in the public employment office. Person-years in education (measured by reciprocity of student allowances), long-term illness (reciprocity of long-term sickness benefits) and other forms of inactivity were excluded, although we present additional analyses in which transitions into and out of inactivity are included.

## Outcome variable

Our outcome of interest is unemployment, which we measure using information on the number of days a person has been registered as unemployed during a calendar year. Specifically, we define an individual as unemployed during a given year if he or she was registered in the public employment service (Arbetsförmedlingen) as unemployed for 90 days or more—irrespective of whether the days of unemployment were consecutive or not.<sup>3</sup> Conversely, an individual is

considered employed if he/she is registered as unemployed for fewer than 90 days and receives any labor earnings.<sup>4</sup> Although registration with Arbetsförmedlingen is voluntary, it is the institutional gateway to almost every form of public income support during joblessness, and the great majority of individuals who lose work register immediately. The Swedish concept of registered unemployment is, in substantive terms, close to the ILO definition used by the Labour Force Survey: both require that the individual be without a job, willing and able to work, and actively seeking employment. We are therefore confident about the validity of our measure as it reproduces official unemployment rate statistics from the European Union Labour Force Survey. See [figure A2](#) and the related discussion in the Appendix.

As robustness checks, we performed our analyses using different cut-offs for defining individuals as unemployed, namely 2 months (60 days) and 4 months (120 days) of registered unemployment. While differences across cut-offs in the levels of unemployment exist, we observe very similar patterns in the differences between origin groups (see Appendix [figs A3–A4](#)). This suggests that our findings hold regardless of whether a more or less restrictive definition of unemployment is applied.

## Main independent variable

The independent variable of interest captures the individual's immigrant background.<sup>5</sup> The G2 are defined according to their parents' country of birth; if the parents' foreign countries of birth differ, we define ancestry based on the father. In the case of 2.5 generation immigrants (one parent was born in Sweden while the other one abroad), individuals are categorized according to the country of birth of the foreign-born parent. In our model we include a variable to identify the 2.5 generation. We distinguish between the following eleven origins based on the parents' country of birth (see Appendix [Table A3](#)): Sweden, Finland, Other Nordic, Other Western (including both European and non-European Western countries, such as the United States and Australia), Eastern Europe, Yugoslavia and Bosnia, Southern Europe, Middle East, Iran, Turkey, and Other (Non-European). While we mainly classify countries within broader geographical areas, we also separate particular origin groups that have had unique integration experiences in Sweden, for example Finland, Iran, and Turkey.<sup>6</sup>

## Analytical strategy

### Steady state unemployment rate

In a two-state situation where workers in the labor force are either employed or unemployed, the aggregate-level annual unemployment rate or stock in a given year depends on two labor market flow rates: the annual rate of moving from employment to unemployment (the inflow or entry rate) and the annual rate of moving from unemployment to employment (the outflow or exit rate).

As already discussed above, the relationship between the flows and the unemployment rate can be expressed by a measure of steady state unemployment (SSU), which can be interpreted as an individual's probability to be unemployed in any given year. In a "steady state", where inflow and outflow rates remain constant, the SSU equals the cross-sectional unemployment rate. SSU ( $U_j$ ) is given by Equation (1):

$$U_j = \frac{I_j}{I_j + O_j} \quad (1)$$

where  $I_j$  represents the unemployment inflow rate of group  $j$  while  $O_j$  stands for the unemployment outflow rate of group  $j$ . Specifically, the unemployment inflow rate  $I_j$  is given by the number of people who were in employment in the previous year but unemployed in the current year, over the total number of people who were in employment in the previous year. Similarly, the unemployment outflow  $O_j$  is given by the number of people who were in unemployment in the previous year but are employed in the current year, over the total number of people who were

in unemployment in the previous year. We refer to the measure in Equation (1) as the unadjusted SSU rate.

Unadjusted measures inform about observed group specific unemployment flows and the resulting unemployment rates, but do not account for compositional differences between the groups that may be responsible for differences in the flows. To adjust for compositional differences as well as for unobserved heterogeneity, we predict unemployment inflow ( $\hat{I}_j$ ) and outflow ( $\hat{O}_j$ ) rates for each group, as described in the next section. These predictions are then used to compute an adjusted SSU rate  $\hat{U}_j$  for each group  $j$  by plugging the two estimated quantities  $\hat{I}_j$  and  $\hat{O}_j$  into Equation 1 as follows:

$$\hat{U}_j = \frac{\hat{I}_j}{\hat{I}_j + \hat{O}_j} \quad (2)$$

As the final step, for both the unadjusted and the adjusted SSU rates, we evaluate the extent to which each unemployment flow accounts for inequalities in unemployment rates between majority Swedes and G2 groups by generating two hypothetical scenarios. In the first scenario—explicated by unadjusted unemployment rates and dynamics—all origin groups have their own unemployment inflow rate ( $I_j$ ) but the unemployment outflow rate ( $O_s$ ) of the majority Swedish group. In other words, we equalize the unemployment outflow rates across the groups. The counterfactual unadjusted SSU is estimated as:

$$U_j^* = \frac{I_j}{I_j + O_s} \quad (3)$$

where the subscript  $s$  indicates flows specific to majority Swedes.

Conversely, in the second scenario we keep the observed group-specific unemployment outflow rates ( $O_j$ ) but reassign all groups the majority Swedish unemployment inflow rate ( $I_s$ ) as in the following equation for the unadjusted SSU:

$$U_j^{**} = \frac{I_s}{I_s + O_j} \quad (4)$$

For both scenarios, the counterfactual adjusted SSU is estimated similarly using predicted entry and exit rates and Equation (2). Comparing the observed with the counterfactual SSU rates, we can evaluate the role that group differences in unemployment exit and entry, respectively, play for ethnic inequalities in unemployment. Specifically, if employer discrimination or other hiring-side factors are the main drivers, we expect that equalizing unemployment outflow rates (Equation 3) equalizes disparities in unemployment rates. However, the opposite where equalizing unemployment inflow rates equalizes inequalities in unemployment would indicate that inequalities in losing a job and becoming unemployed are likely mechanisms (Equation 4).

### Estimation of predicted inflow and outflow rates

The predicted unemployment inflow and outflow rates are estimated using correlated RE dynamic logit models. Building on [Rabe-Hesketh and Skrondal \(2013\)](#), the dynamic model that we estimate is specified as follows (see [Grotti and Cutuli \(2018\)](#) for its implementation):

$$y_{ijt}^* = \gamma Z_{ijt} + \rho y_{ijt-1} + \delta X_{ij} + \beta y_{ijt-1} * X_{ij} + c_{ij} + u_{ijt} \quad (5)$$

where  $y_{ijt}^*$  in Equation (5) represents unemployment for individual  $i$  ( $i = 1, \dots, N$ ) in group  $j$  at time  $t$ . It is a function of a set of time-constant and time-varying explanatory variables  $Z_{ijt}$  which are considered exogenous, conditional on the unit-specific unobserved effect  $c_{ij}$ .  $y_{ijt-1}$  represents the

unemployment status in the previous year and in our model it is interacted with origin ( $X_{ij}$ ). Finally,  $u_{ijt}$  represents an idiosyncratic error term.

The unit-specific unobserved effect  $c_{ij}$  is expressed as

$$c_{ij} = \alpha_0 + \alpha_1 y_{ij0} + \alpha_2 \bar{Z}_{ij} + \alpha_3 Z_{ij0} + \alpha_4 y_{ij0} * X_{ij} + a_{ij} \quad (6)$$

where  $y_{ij0}$  and  $Z_{ij0}$  stand for the initial values of the outcome and of the time-varying explanatory variables, respectively.  $\bar{Z}_{ij} = \frac{1}{T} \sum_{t=1}^T Z_{ijt}$  represents the within-individual averages of the time-varying explanatory variables. The time-varying variables we rely on to capture unobserved heterogeneity were described above. Furthermore, following Wooldridge (2005), ethnic group is interacted with the initial condition  $y_{ij0}$ . Finally,  $a_{ij}$  is an individual specific time-constant error term.

Under the assumption that unobserved heterogeneity is absorbed by  $c_{ij}$ , the parameter  $\rho$  measures genuine state dependence—that is the causal effect of unemployment in the previous year on unemployment in the current year. Based on the above equations, the model is then estimated as a standard RE logit model. All analyses are conducted separately for men and women (see Appendix Table A4).

Following Immervoll et al. (2015), we predict inflow rates ( $\hat{I}_j$ ) and outflow rates ( $\hat{O}_j$ ) based on the model in Equation (5) (see Appendix Table A5). We impose the observed characteristics of the total population on each group when estimating the transition rates. This ensures that group-specific transition rates are net of compositional differences. This also implies that time-constant unobserved heterogeneity is taken in to account in the prediction. It is worth noting, however, that this empirical strategy does not address time-varying unobserved confounding which may threaten our conclusions if time-varying confounding systematically differs across origin groups.

Predicted unemployment inflow rates for each group  $j$  are estimated as:

$$\hat{I}_j = \Pr(1|0) = \Pr(y_{ijt} = 1 | y_{ijt-1} = 0, Z_{ijt}, c_{ij}) \quad (7)$$

and the predicted unemployment outflow rates are estimated as:

$$\hat{O}_j = 1 - \Pr(1|1) = 1 - \Pr(y_{ijt} = 1 | y_{ijt-1} = 1, Z_{ijt}, c_{ij}) \quad (8)$$

where  $Z_{ijt}$  includes all the time-constant and time-varying explanatory variables, and  $c_{ij}$  all the variables capturing unobserved heterogeneity.

## Covariates

Our models control for a set of characteristics that are known to be associated with unemployment dynamics and may explain group differences. Time varying controls include age, ranging between 25 and 39 (we also include age squared); level of educational attainment, separating between primary, lower secondary, upper secondary (vocational or academic), post-secondary (vocational or university), and doctoral education; field of study (of the highest education achieved) which is used to capture individual preferences regarding the occupation and sector in which individuals decide to select and distinguishes between General education, Teaching methods and teacher education, Humanities and arts, Social sciences, law, commerce, administration, Natural sciences, mathematics and computing, Engineering and manufacturing, Agriculture and forestry, veterinary medicine, Health care and nursing, Social work and other services. We further control for marital status (single, in couple, and separated or divorced) and the number of children below 8 years of age (none, 1, 2, 3, or 4 or more children). In addition, we include a measure of individual health status proxied by whether he/she receives any sickness benefits. Finally, we control for region of residence at the NUTS 2 level and year dummies.

The time-constant controls include academic achievement, captured by a standardized measure of GPA at age 16, as an additional variable to capture human capital. In addition, we control for the number of years from completing education (when the highest educational level is achieved) to the year of entering the sample (most individuals enter at age 25). We also control for parental SES, which is defined by parental occupation when the individual was 15 years old, and distinguishes between farmers; unskilled; low-skilled; medium-skilled; high-skilled and professionals; self-employed; not employed; and those with missing information. We followed the dominance criterion and took the highest occupation of the mother and father.

## Results

G2 groups represent 13 percent of our target population of Swedish-born individuals born between 1977 and 1981, while ancestral Swedes make up the remaining 87 percent (see Appendix Table A6). We classify G2 groups into ten categories representing the heterogeneity of the G2 in Sweden and the size of these groups ranges from 0.1 to 5.2 percent of the population for G2 Iranian and Finnish individuals, respectively. Overall, individuals are followed up between 10.8 (G2 Iranians) and 12.2 (G2 Finns) years on average. These differences reflect variations in age at labor market entry, and G2 Iranians are those who enter the labor market at the oldest age—22.1 years old. Age at labor market entry reflects educational achievements—G2 groups characterized by higher age at labor market entry also display higher shares of tertiary education. It is worth noting, however, that there are no large differences in the average number of years of follow up. Results for women show a similar pattern to men, although the follow up period is slightly shorter since they enter the labor market at later ages on average.

### Unemployment rates, inflows and outflows—unadjusted estimates

Table 1 displays the starting point of our study, namely group disparities in unemployment rates observed for our population. The observed unemployment rate is defined as the ratio between individuals classified as unemployed and individuals in the labor force (unemployed and employed individuals). The average unemployment rate over the period 2002–2016 for the study population was 6.2 percent for men and 5.7 percent for women. There are differences across origin groups. Among men, the unemployment rate for majority Swedes is the lowest at 5.7 percent. For the other groups, unemployment ranges between 6.6 percent for G2 Other Western men and 11.4 percent for G2 Turkish men. The unemployment rate for women displays larger variation, ranging between 5.3 percent and 12.6 percent for majority Swedes and G2 Turkish women, respectively. In general, G2 Other Western and Iranian men and women report among the lowest rates of unemployment, whereas G2 Turkish, Middle Eastern, and former Yugoslavians and Bosnians report the highest unemployment rates.

Unemployment inflow and outflow rates measure the percentage of individuals who were employed at  $t-1$  but unemployed at  $t$  (inflow rate) and the percentage who were unemployed at  $t-1$  but employed at  $t$  (outflow rate) without accounting for compositional factors that differ across groups. Both majority Swedish men and women experience the lowest annual inflow rates (2.5 percent) across all groups. G2 Turks experience the highest inflow rates which are more than twice as high as compared to majority Swedes (5.1 and 5.3 percent, respectively, for men and women).

Unemployment outflow rates show that across all groups, roughly half of the unemployed are employed the next year, while the other half experience persistent unemployment. In this case, the group with the highest outflow rates were G2 Iranian men and women at 57.6 and 58.2 percent, respectively. Importantly, there were much smaller relative differences across groups in outflow rates among both sexes, and majority Swedes do not stand out as the group with the lowest outflow rates.

Based on inflow and outflow rates reported in Table 1, we use Equation (1) to estimate unadjusted SSU rates, shown in figure 1 for men (left) and women (right). The top panels of figure 1,

**Table 1** Descriptive statistics of the study population.

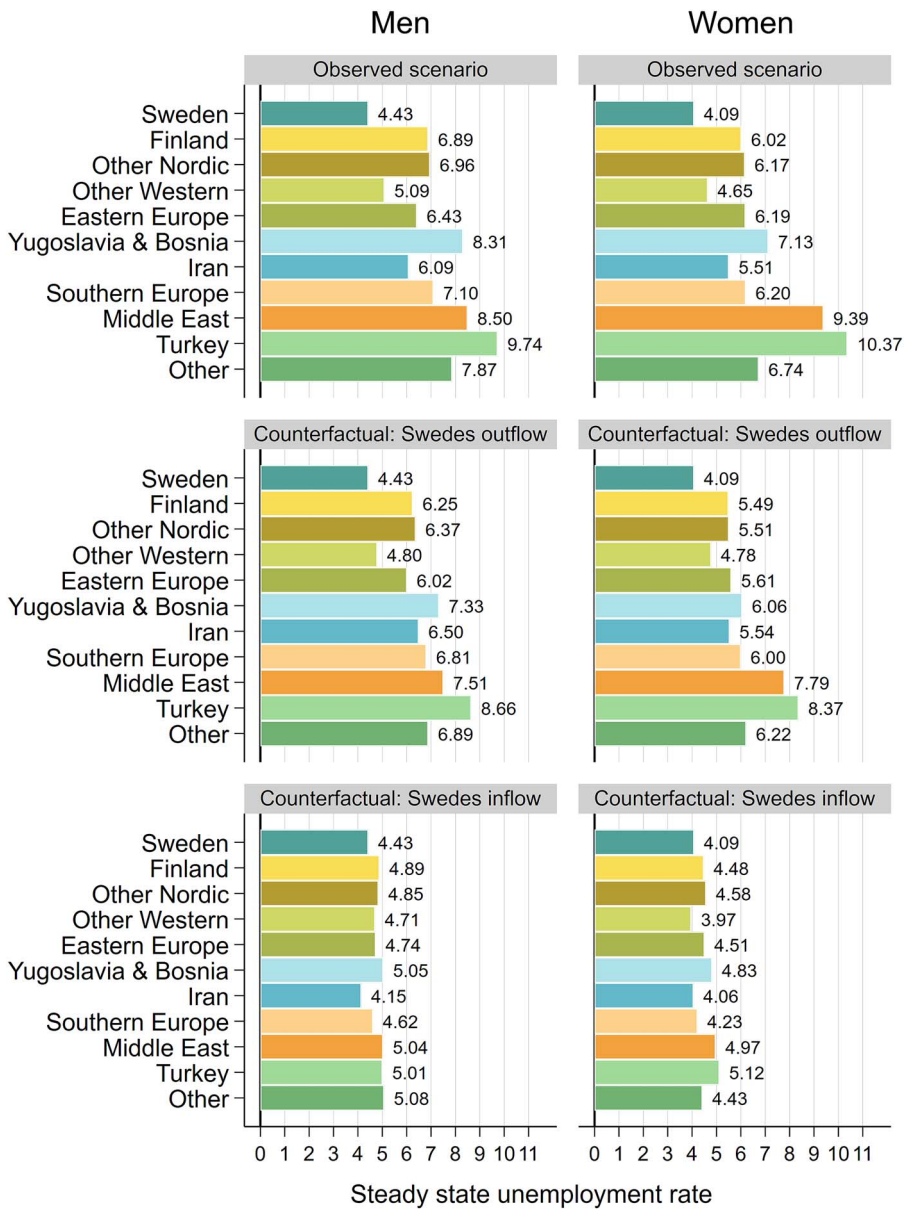
|                     | Men               |             |              | Women             |             |              |
|---------------------|-------------------|-------------|--------------|-------------------|-------------|--------------|
|                     | Unemployment rate | Inflow rate | Outflow rate | Unemployment rate | Inflow rate | Outflow rate |
| Sweden              | 5.73              | 2.49        | 53.78        | 5.30              | 2.46        | 57.82        |
| Finland             | 8.70              | 3.59        | 48.49        | 7.61              | 3.36        | 52.44        |
| Other Nordic        | 8.62              | 3.66        | 48.94        | 7.74              | 3.37        | 51.32        |
| Other Western       | 6.56              | 2.71        | 50.48        | 5.82              | 2.91        | 59.60        |
| Eastern Europe      | 8.20              | 3.44        | 50.12        | 7.72              | 3.44        | 52.09        |
| Yugoslavia & Bosnia | 10.27             | 4.25        | 46.91        | 9.20              | 3.73        | 48.58        |
| Iran                | 7.57              | 3.74        | 57.64        | 6.54              | 3.39        | 58.16        |
| Southern Europe     | 8.97              | 3.93        | 51.43        | 7.75              | 3.69        | 55.81        |
| Middle East         | 10.52             | 4.37        | 47.01        | 11.63             | 4.88        | 47.09        |
| Turkey              | 11.43             | 5.10        | 47.24        | 12.62             | 5.28        | 45.64        |
| Other               | 9.87              | 3.98        | 46.61        | 8.43              | 3.84        | 53.14        |
| Total               | 6.16              | 2.65        | 52.78        | 5.68              | 2.61        | 56.67        |

reporting observed unadjusted SSU rates, show substantial heterogeneity across groups. Majority Swedes have the lowest observed rates at 4.4 percent (men) and 4.1 percent (women) while G2 Turkish men and women have the highest rates at 9.7 percent and 10.4 percent, respectively.

Unadjusted SSU rates present the same group differences, but at lower levels as compared to the observed unemployment rates presented in [Table 1](#). The differences between the rates can be attributed to two factors. First, the analyses presented do not consider flows into and out of the labor force (see Appendix [Supplementary text A1](#)). Sensitivity checks show that incorporating the transitions between employment/unemployment and inactivity in our analyses has a small impact on the SSU rate and importantly inactivity flows do not affect origin groups differently (see Appendix [Table A7](#) and [fig. A7](#)). Second, differences between observed and adjusted unemployment rates reflect the fact that the labor market is not in a steady state but unemployment inflow and outflow rates varied from 1 year to the next over the period 2002–2016 (see Appendix [Table A8](#)) as well as by age (see Appendix [Table A9](#)).

The middle and bottom panels of [figure 1](#) allow us to answer the main research question of this study: to what extent do differences in unemployment exit or entry dynamics explain ethnic inequality in unemployment rates? The middle panels report the results from the first counterfactual scenario, where all G2 groups were assigned the same unemployment outflow rate as majority Swedes and their own observed unemployment inflow rates. If inequality in unemployment rates is driven by differences in finding a job, hiring discrimination being one inhibiting factor, we should observe a substantial reduction in the gap between majority Swedes and G2 groups. In this scenario, however, we observe that equalizing unemployment outflow rates only marginally explained inequalities in unemployment rates across groups. For example, G2 Turkish men and women, the groups with the highest SSU rates, experienced a decrease from 9.7 to 8.7 percent and from 10.4 to 8.4 percent, respectively. G2 Iranians are the only group who would experience increased unemployment rates because they have even higher chances of finding a job compared to majority Swedes. Overall, unemployment rates for all G2 groups in this scenario remain notably higher than among majority Swedes which implies that differences in unemployment exit are not a major determinant of unemployment rate inequalities. This also questions the direct contribution of hiring discrimination of unemployed workers to ethnic inequality in unemployment rates at the population level.

The bottom panels of [figure 1](#) report the second counterfactual scenario where all G2 groups were assigned the same unemployment inflow rate as majority Swedes and their own observed unemployment outflow rates. In this scenario, we find inequality in unemployment rates is



**Figure 1** Unadjusted steady-state unemployment rates. Observed and counterfactual scenarios.

substantially reduced as compared to the observed scenario. Unemployment rates among G2 Turkish men and women, for example, decrease from 9.7 to 5.0 and from 10.4 to 5.1 percent, respectively, which are now far closer to the majority Swedes (4.4 and 4.1). G2 Iranian men and women even displayed lower unemployment rates compared to majority Swedes of the same gender.

Comparing our results from the first and second scenarios, we find strong evidence that unemployment disparities between the ancestry groups are driven by disparities in unemployment

entry—G2 groups are more likely than majority Swedes to become unemployed. How can we understand this finding, given the visible differences in unemployment outflow rates that are often larger than the differences in inflows (Table 1)?

We refer back to the definition of the SSU rate in Equation (1) and compare Turkish and Swedish background men as a pedagogical example. The Turkish inflow rate is twice the Swedish one (5.10 percent vs. 2.49 percent) whereas the Swedish outflow rate is 14 percent larger than the Turkish one (53.78 percent vs. 47.24 percent). Imposing the Swedish inflow rate on the Turks while letting them keep their outflow rate halves the numerator in Equation (1) and decreases the denominator (a sum of the in- and outflow rates) by 5 percent. As a result, the Turks' SSU almost halves from 9.74 percent to 5.01 percent (fig. 1). Imposing the Swedish outflow rate, on the other hand, increases the denominator by 12.5 percent but leaves the numerator unchanged, resulting in the 11 percent drop in SSU. Even though the absolute (percentage point) differences in outflow rates are larger than those in inflow rates, the larger ratios in inflows dominate in shaping inequalities in unemployment.

### Unemployment rates, inflows and outflows—adjusted estimates

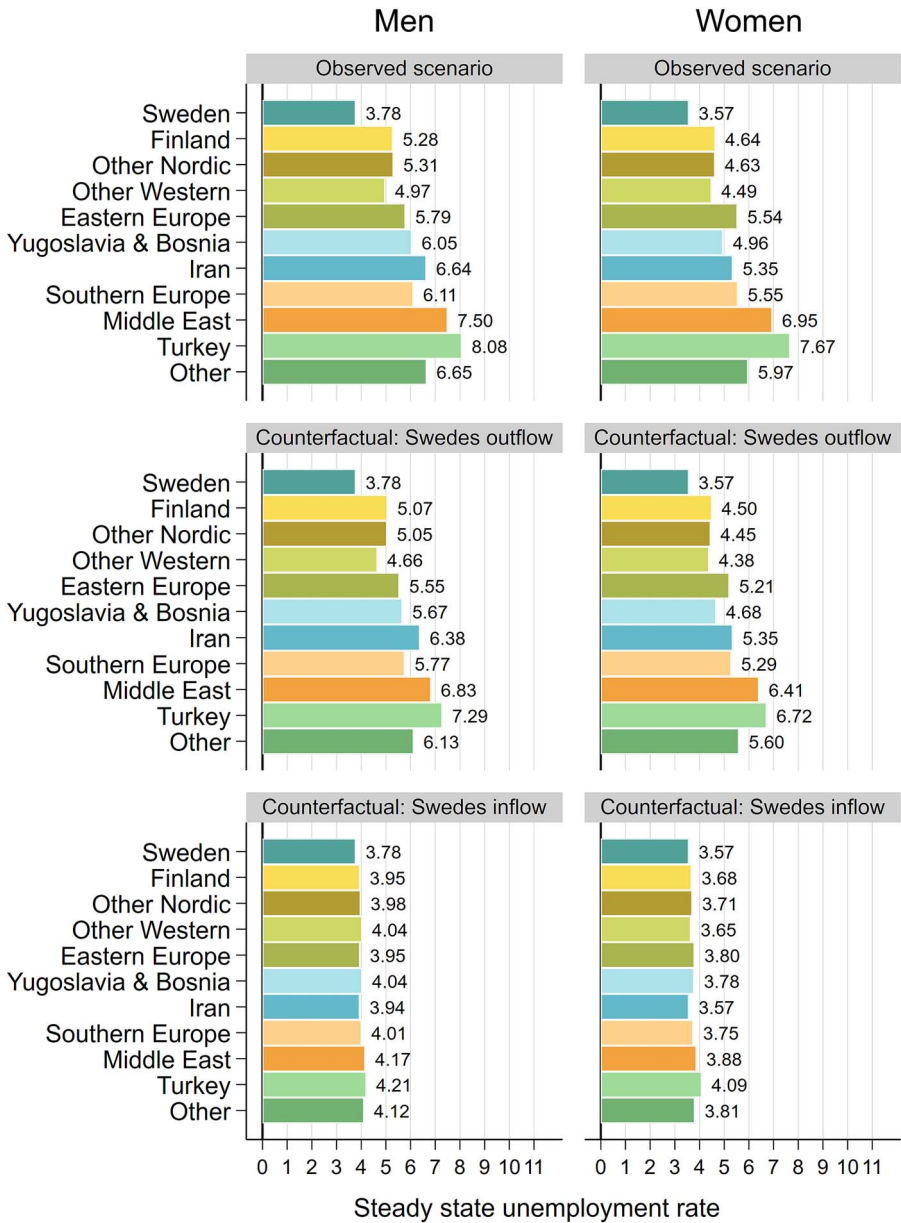
Results presented so far are unadjusted for group differences in relevant characteristics. On the one hand, this has the advantage of reproducing the actual dynamics that we observe in the population. On the other hand, it may mask the role of compositional differences. For example, G2 groups may have lower levels of education which increases their unemployment risks. As such, we provide the same SSU scenarios based on adjusted transition rates, controlling for both observed and time-constant unobserved characteristics. Adjusted inflow and outflow rates are computed based on Equations (7) and (8), respectively, and derived from the model estimates following Equation (5).

Figure 2 displays the observed SSU rates based on the adjusted inflow and outflow rates. As expected, these results show substantially lower inequalities as compared to the unadjusted results presented in figure 1 since compositional differences account for part of the unemployment gap between G2 groups and majority Swedes. It is worth noting that after adjustment, group differences in unemployment rates become *tiered* by G2 origin. The *first tier* of countries, which presents the smallest unemployment differences with respect to majority Swedes, includes G2 Finnish, Nordic and other Western groups. A *second tier*, characterized by higher unemployment rates, includes G2 from Eastern Europe, Former Yugoslavia and Bosnia, Iran, Southern Europe, and Other origin. The *third tier* with much higher unemployment rates includes G2 with Middle Eastern and Turkish origin. The clustering, which is most salient among men, reflects an ethnic hierarchy whereby unemployment is particularly high among groups who have traditionally experienced larger challenges integrating into Swedish society (Aradhya et al. 2023), including higher degrees of discrimination (Quillian et al. 2019).

Turning to the counterfactual scenarios, the results are similar to the unadjusted estimates. Unemployment inequalities are driven by group differences in the probability of becoming unemployed, or, in other words, assigning the same unemployment inflow rates to all groups almost completely equalizes unemployment rates across groups (bottom panel in fig. 2). Barriers to accessing employment, unemployment exit, play a limited role in accounting for ethnic inequality in unemployment rates (middle panel in fig. 2). The ethnic hierarchy in unemployment remains salient when exit rates are equalized, but disappears when entry rates are equalized. This implies a large ethnically stratified inequality in keeping a job and in avoiding unemployment, which is more consequential than the previously reported inequality in getting a job (Quillian et al. 2019).

## Discussion

At the onset of this study, we asked to what extent differences in unemployment entry and exit dynamics explain ethnic disparities in unemployment rates, focusing on children of immigrants (the second generation, G2) in Sweden.



**Figure 2** Adjusted steady-state unemployment rates. Observed and counterfactual scenarios.

Unemployment rates among the G2 in Sweden are up to twice as high as those of Swedes with Swedish-born parents, which is in line with figures from other European countries (OECD and European Union 2015) and similar to the Black-White unemployment gap in the United States (Austin 2013; Couch and Fairlie 2010). This is noteworthy. Although the G2 is born, raised and socialized in Sweden and to a large extent are more likely to attend tertiary education than those of native ancestry (Jackson, Jonsson, and Rudolphi 2012; Jonsson, Rudolphi 2011), their labor market outcomes remain markedly different.

Group disparities in unemployment rates reflect differences in becoming unemployed, in exiting unemployment, or both, which was the starting point of our analysis. The extant literature has emphasized ethnic inequalities in getting a job, especially since correspondence test studies have shown consistent and widespread discrimination in hiring (Drouhot and Nee 2019; Quillian et al. 2017; Quillian and Lee 2023). Despite presenting overwhelming evidence of the prevalence of discrimination in hiring, results from correspondence studies do not as such inform about how much of labor market inequalities can be attributed to it.

We decomposed unemployment rate differences between ancestral Swedes and ten G2 groups into those emerging from disparities in unemployment inflows as well as outflows. Our main finding is that most of origin group differences in unemployment can be attributed to differences in unemployment entry rather than exit rates, even after a range of observed and time-invariant unobserved factors are accounted for. Our results align with the two previous studies assessing the relative importance of (un)employment inflows and outflows, that is, with Couch and Fairlie's (2010) findings of the drivers of the Black-White unemployment gap among American men and those by Aeberhardt et al. (2017) who studied employment gaps between French men with North African and French-born parents. After adjusting for differences in socioeconomic and demographic composition, we also found a clear ethnic hierarchy in unemployment rates and in the risks of becoming unemployed where unemployment rates increase with the social distance from the native group. Importantly, this hierarchy corresponds to the one found in correspondence studies of hiring discrimination (Quillian et al. 2019). A similar ethnic hierarchy shapes G2 groups' chances of getting a job and in remaining unemployed.

In addition, notwithstanding theoretical reasons to expect gender differences (discrimination, sectoral and occupational segregation, and inactivity), our results tell a consistent story: the inequality in steady-state unemployment rates across groups is of comparable magnitude for both men and women, and in both cases it is driven primarily by differences in inflow rates rather than outflow rates. This convergence across gender is itself a substantively important finding, suggesting that the ethnic gradient in unemployment dynamics is robust to the very different labor market contexts that men and women navigate in Sweden.

Ethnic gaps in becoming unemployed thus dominate over gaps in exiting unemployment in explaining disparities in unemployment rates. What can explain ethnic gaps in becoming unemployed? First, our statistical model accounts for compositional differences in human capital factors such as educational level, field of study and performance but also in time-invariant unmeasured group differences such as any cultural ones. Our results cannot thus be attributed to differences in such factors.

As discussed in the background section of the paper, disparities in becoming unemployed can reflect inequalities in keeping a job and those in finding a new one, either during the job termination period or immediately post-termination. We revisit and elaborate this model that can guide future research into minorities' higher chances of becoming unemployed.

Ethnic minorities can face a higher risk of job termination. Here, we concentrate on involuntary job terminations, while acknowledging possible group differences in voluntary quits (which, however, constitute a small share of job terminations leading to unemployment). First, when employers lay off people, they can discriminate against equally qualified minorities in the same way as when they hire employees (Auer 2022).

Second, minorities can face a higher risk of job termination if they are overrepresented in jobs with weaker contracts. Workers on temporary contracts have a seven to eight times higher risk of becoming unemployed than workers on permanent contracts (see Appendix Table A10) and temporary contracts are more common among G2 groups, which expose them to higher risks of transiting from employment to unemployment (Berglund et al. 2021; Svalund and Berglund 2018). The G2 overconcentration in temporary contracts can itself result from hiring discrimination, where the G2 are less likely to be offered stable contracts or become more willing to accept temporary contracts in the face of discrimination (cf. Pager and Pedulla 2015). The latter, sorting, mechanism can also lead minorities to be overrepresented in jobs where their skills provide a

poorer match with the demands of the job, and increase the risk of dismissal or of a temporary contract not being renewed (Kim 2024).

Third, G2 groups can face higher unemployment risks if they have shorter tenure in the workplace—as the Swedish labor market protects workers with longer tenure. Again, this can result from disadvantages in getting a job as well as previous unemployment experiences, if minority workers become overrepresented in shorter tenures after having experienced prior unemployment and having waited longer to (re-)enter employment.

Finally, G2 group members who lose a job can be disadvantaged in finding a new one during the job termination period and before becoming unemployed. This disadvantage can result from discrimination and other inequalities in getting a job that characterize minorities' job search in general, but in addition from disparities in the notice period that structures how much time workers have for securing a new job before becoming unemployed. In Sweden, statutory minimum notice periods increase from 1 month to 6 months as a function of tenure and can be longer than the minimum based on collective and individual agreements (in addition, temporary contracts did not have official notice periods of non-renewal unless one had accumulated 24 months of them).

Summing up, disparities in becoming unemployed are a function of disparities in losing a job and in finding a new one. Our data do not include necessary information on contract types or job terminations that would allow us to test the above model, but we discuss its implications for research interested in ethnic and other group disparities in (un)employment. It invites research into (inequalities in) the process of becoming unemployed, from (an anticipation of) the job termination through the process of finding a new job before the end of the termination period. More specifically, it calls for more research into inequalities in job terminations and its causes. In addition to these inequalities, our model highlights how disparities in becoming unemployed may result from hiring discrimination and other disadvantages in getting a job either directly (if minorities cannot get a new job before unemployment) or indirectly [if they are sorted in worse-fit jobs, unstable contracts or shorter tenures due to difficulties in entering the primary job market (Pager and Pedulla 2015)]. Research has shown that employer discrimination is not restricted to call-backs (Quillian et al. 2017), which has been the main focus in field experiments of discrimination and our model calls for more analyses of the downstream effects of discrimination and related labor market inequalities.

Next to academic implications, the findings have policy relevance for addressing ethnic and racial differences in unemployment rates. Similarly to the focus of research into ethnic labor market inequalities, policy has targeted the hiring side, for example with anti-discrimination policies. We have argued that hiring discrimination and related disadvantages can have downstream effects also on the risk of becoming unemployed. In addition, policy should assess and address more proximate risk factors for becoming unemployed, including inequalities in contract types and other factors that shape job security. Work precarity is a central preoccupation in many job markets, which shapes ethnic minority integration.

Whether our results generalize to other contexts than Sweden remains another question for future research. They align with those by Couch and Fairlie (2010) on the male Black-White unemployment gap in the United States and by Aeberhardt et al. (2017) on ethnic employment disparities among French men. Disparities in becoming unemployed have also been found in Denmark (Datta Gupta and Kromann 2014), Norway (Bratsberg et al. 2018), and Germany (Auer 2022). Other studies have not found these inequalities in Germany (Uhlendorff and Zimmermann 2014) and the UK (Longhi 2020). Ethnic and racial disparities in unemployment exist across a range of countries but the relative importance of unemployment entry and exit can vary cross-nationally, reflecting among other factors the openness and dynamism of labor markets and the specific hiring and firing regulations that exist. Despite relatively strong protections for permanent employees in Sweden, the Swedish labor market is more dynamic than many others in Europe such as Italy (Cutuli and Grotti 2020) but less so than the United States (DiPrete 2002). Sweden also reports among the highest levels of hiring discrimination in comparative perspective (Quillian et al. 2019; Quillian and Midtbøen 2021) and the combination between the strength of discrimination and the

dynamism of the job market can contribute to ethnic inequalities in getting and keeping a job, and consequently, in unemployment levels.

It is important to mention a few limitations of the study. First, although our large register-based study allowed us to present a comparison of the unemployment dynamics of exceptionally fine-grained G2 populations, we are unable to identify spells of unemployment within any given year. For instance, the situation that an individual is classified as employed in year  $t$  and unemployed in year  $t + 1$  is compatible with the following scenarios: (1) the individual loses his/her job and transits to unemployment; and (2) the individual transits several times within the year  $t + 1$  such that they are classified as unemployed in that year. This presents a tradeoff. On the one hand, register data allows group differences to be examined over long periods with the limitation that data are recorded annually. On the other hand, more fine-grained data, for example monthly data on unemployment activities, would allow us to identify scenario 2; however, to the best of our knowledge, no data exists at this level of detail that would allow this analysis to be conducted for second-generation immigrant groups. In addition, it is unclear under which scenario more detailed unemployment spell data would alter the conclusions drawn from this study. For example, a study conducted in the United States examining differences in unemployment dynamics between black and white individuals using monthly unemployment spell data present findings that are in line with our study (Couch and Fairlie 2010). Thus, despite this limitation we argue that our study is a marked contribution to this body of work. Second, we are unable to identify the mechanisms that drive inequalities in unemployment entry rates. In the discussion, we hypothesize that possible explanations relate to disadvantages in immediately securing a new job if a worker loses one and to the widespread use of temporary contracts in the Swedish labor market and inequalities therein. Third, we use steady-state probabilities that are valid under the assumption of a steady scenario where individual characteristics are assumed not to change over time and where entry and exit probabilities are constant over individuals' working careers (Boskin and Nold 1975; Cappellari and Jenkins 2008). Of course, these are strong assumptions, but nonetheless we second Cappellari and Jenkins (2008) in arguing that the steady-state probability is a useful summary measure of unemployment at the societal level and especially when focusing on inequalities across groups.

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## Endnotes

1. When unemployment entry and exit rates remain constant, the unemployment rate converges over time to the steady-state unemployment rates, which is a widely used analytical tool to study unemployment dynamics in labor economics (e.g., Couch and Fairlie 2010; Shimer 2012;

Aeberhardt, Coudin and Rathelot 2017). Denote the number of employed workers at time  $t$  as  $E$  and the fraction of them transitioning to unemployment in  $t + 1$  as  $s$ , and  $U$  and  $f$  respectively for unemployment and the transition rate to employment. A steady-state yields the balance condition  $E \cdot s = U \cdot f$ . Dividing by the labor force  $L$ , we get  $(E/L) \cdot s = (U/L) \cdot f$ , where  $U/L$  is the unemployment rate  $u$  and  $E/L$  is the employment rate  $(1 - u)$ , so that  $(1 - u) \cdot s = u \cdot f$ . With some arithmetic, solving for  $u$  gives us  $u = s / (s + f)$ .

2. As a robustness check, we replicated our analysis starting from 2012, thereby excluding the years most affected by the financial crisis (see [fig. A1](#) in the Appendix). Results confirmed the patterns observed in the main analyses.
3. Unfortunately, while our data include information on the total number of days individuals spent unemployed in a given year, they do not record whether these days were part of a single continuous spell or multiple shorter spells. This means we cannot determine whether a given individual experienced a prolonged uninterrupted unemployment episode or a series of short ones.
4. Self-employed individuals are included in the analyses.
5. Details about all variables employed in the analyses are reported in [Table A2](#) in the Appendix.
6. Regarding country of origin, we performed two robustness checks. First, we replicated our analysis defining immigrant background based on the mother's country of birth, see [figure A5](#) in the Appendix; second, we replicated the analyses excluding individuals with mixed background, see [figure A6](#) in the Appendix. Results from these sensitivity analyses are in line with the main results presented in the main text of the manuscript, which suggest that inequality patterns we observe are not driven by the specific definition immigrant groups that we use.

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## Supplementary material

[Supplementary material](#) is available at *Social Forces* online.

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## Conflicts of interest

None declared.

## Data availability

Data may be obtained from a third party and are not publicly available. Aggregated data can be made available by the authors, conditional on ethical vetting. The authors access the individual-level data through Statistics Sweden's micro-online access system MONA.

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