The Power to Discriminate

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Abstract

We investigate the relationship between employer power and labor market discrimination. Using mass layoffs to induce job search, we compare real job seekers of equal quality with matching labor market signals but different migration backgrounds. Our findings reveal widespread wage and employment discrimination. We show that this discrimination stems from employers' control over labor markets, and that product market power has no effect on the discrimination practices of employers. We then reveal that discrimination arises from incorrect beliefs about immigrants' productivity. Finally, we show that continuous employer interactions with immigrants help correct these misconceptions, ultimately closing the wage and employment gaps.

JEL Codes: J7; J61; J42; J63
Keywords: Discrimination; Immigration; Market Power

1   Introduction

Employer power and labor market discrimination are two fundamental policy issues with widespread implications for economic efficiency, equity, and the trade-off between the two (e.g., Smith (1776); Robinson (1933); Becker (1957); Arrow (1973); Card (2022)). These two sources of economic inequality are also strongly connected, as non-competitive market forces and the presence of supernormal profits may be a prerequisite for firms' ability to engage in discriminatory practices.

The well-established theoretical link between market power and employer discrimination has spurred significant focus on enhancing competition in *product markets* (e.g., Black (1999); Levine and Rubinstein (2014); Hirata and Soares (2020); Meireles et al. (2021)). However, despite over fifty years of research linking competition and discrimination, a fundamental question remains unresolved: how strongly do power dynamics in *labor markets* drive employer discrimination? Amidst declining worker power (e.g., Stansbury and Summers (2020)), rising employer concentration (e.g., Azar et al. (2020a)), and a stagnating convergence of the native/immigrant wage gap (e.g., Amo-Agyei et al. (2020)), understanding the interplay between labor market competition and employer discrimination is critical for shaping effective policy.

This paper offers the first empirical insight into how labor market power shapes employer discrimination, comparing real job seekers of equal quality in the same setting and time period with matching labor market signals but different migration backgrounds. Using linked employer-employee data from Norway, we leverage quasi-random job search variation induced by involuntary job displacement, which occurs beyond workers' control and prompts significant job search activity. The longitudinal structure of our data allows us to compare workers with identical employment histories and earnings, laid off from the same occupation and firm simultaneously, but differing in their migration backgrounds.[1]

We measure labor market power using the Herfindahl–Hirschman Index of employment at the local labor market (commuting zone) by 3-digit occupation level in the year prior to the displacement episode. This is equal to the sum of the squared employment shares in a given occupation and geographic region. By comparing the post-displacement re-employment gap between natives and immigrants in more concentrated labor markets to those in less concentrated markets, we can uncover how labor market power shapes discriminatory hiring practices.

Next, we expand our empirical framework to include product market power, an essential

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[1]In the absence of discrimination, wages should be a function of a worker's marginal productivity. If wage gaps between equally qualified natives and immigrants emerge post-layoff, this rejects the null hypothesis of no employer discrimination (e.g., Fryer Jr et al. (2013)). If pre-layoff earnings reflect discrimination, our estimates offer a lower bound on discrimination (e.g., Bohren et al. (2022)).

addition since product market power also enables firms to absorb the costs of discrimination through supernormal profits. However, firms are limited in their ability to discriminate based solely on product market power. Specifically, unless a firm also controls the labor market, it cannot practice *wage discrimination* because workers with a perfectly elastic labor supply will simply seek better opportunities elsewhere. Nonetheless, firms can engage in *employment discrimination* by favoring less productive workers from preferred groups over more productive workers from disfavored groups, using their product market profits to offset the costs of this discrimination.

Finally, we investigate the sources of discrimination underlying our results, emphasizing the relative importance of belief-based versus preference-based discrimination. To do this, we draw on insights from Bohren et al. (2019) and analyze the dynamic adjustment path following displacement episodes. If our findings stem from belief-based discrimination, ongoing employer interactions with workers from disfavored groups should correct erroneous productivity beliefs, thereby eliminating earnings and employment gaps, even in the presence of labor market power. Conversely, if discrimination is driven by preferences (i.e., taste-based discrimination), these gaps are likely to persist over time.

To perform our analysis, we use Norwegian employer-employee linked register data and leverage shocks to employment between 2008 and 2012. We follow individuals for 11 years in the window before and after the separation event through a stacked event-study design (Cengiz et al. (2019)). Workers are categorized into two groups: non-Western immigrants and the rest. This classification aligns with standard conventions in the Nordic context, where segregation and discrimination occur against immigrants who physically, linguistically, or culturally differ from the majority population (e.g., Böhlmark and Willén (2020)). Throughout the paper, we focus on three core outcomes: employment, part-time work, and annual labor earnings.

We present four core results. First, we present clear evidence of significant wage and employment discrimination. After controlling for pre-displacement earnings, employment history, and layoff from the same firm and occupation within the same labor market, non-Western immigrants are hired at significantly lower rates than their native or Western immigrant counterparts. When hired, they are also marginally more likely to work part-time. Additionally, among those who secure a job, their annual earnings are substantially lower. Importantly, these disparities are not due to differences in the types of jobs they obtain post-displacement but rather reflect unequal compensation for similar roles.

Second, discrimination is almost exclusively confined to highly concentrated labor markets. This suggests that labor market competition serves as an efficient tool for reducing employer discrimination. However, it does not completely eliminate the gaps between non-Western immigrants and the rest. This finding is consistent with the canonical discrimination

theories of Becker (1957), Arrow (1957), and Black (1995), which stipulate that competition will push profits to zero and eliminate firms' ability to discriminate. Notably, this relationship has never been documented empirically before.

Third, when focusing solely on product market power, we find no employer discrimination. This finding aligns with the idea that firms operating in competitive labor markets encounter a perfectly elastic labor supply and must compensate workers according to their marginal revenue product, irrespective of their power in product markets. Although it is theoretically possible for firms with product market power but lacking labor market power to engage in employment discrimination, we find no evidence supporting this. This study is the first to underscore the importance of the source of employer power in explaining labor market discrimination through causal analysis, offering valuable insights into ongoing discussions about product market power and discrimination.

Finally, we reveal that the employment discrimination we observe is primarily driven by belief-based factors, with minimal influence from preferences against non-Western immigrants. This conclusion is drawn from an analysis of the dynamic adjustment of employment and earnings gaps following displacement, incorporating insights from Bohren et al. (2019). Our examination shows substantial labor market gaps in employment and earnings between identical natives/Western immigrants and non-Western immigrants immediately after displacement episodes in concentrated labor markets. However, these gaps gradually diminish over time, completely vanishing within five years. This pattern aligns with the idea that ongoing interactions with workers from the disfavored group can rectify erroneous productivity beliefs, thereby eliminating discrimination-driven gaps. To ensure these findings stem from continuous interactions with employers at the same firm rather than through external networks we conduct an auxiliary analysis that includes *current* firm fixed effects. This approach allows us to compare the re-hiring of laid-off natives within the *same firm* as laid-off non-Western immigrants, revealing that the closure of earnings gaps predominantly occurs within firms over time. Despite the elimination of discrimination over time, we uncover significant efficiency costs for firms stemming from the discriminatory practices we identify, with important implications for economic growth, productivity, and overall labor market efficiency.

To gather further evidence on preference-based and belief-based discrimination, we conduct three auxiliary analyses: (a) we use information on managers to measure their past exposure to non-Western immigrants; (b) we examine discrimination patterns toward Western immigrants and second-generation non-Western immigrants; and (c) we assess discrimination against long-term non-Western immigrants. Our findings show that managers with more experience working with non-Western immigrants are less likely to engage in discrimination, that long-term non-Western residents face significantly less discrimination, and that West-

ern immigrants and second-generation non-Western immigrants experience no detectable discrimination in the labor market. These findings support the notion of belief-based discrimination, where decision-makers such as hiring managers rely on inferences from group averages in the absence of full information about individual workers. This evidence reinforces our analysis of the dynamic adjustment path of employment and earnings gaps post-displacement and helps strengthen those findings.

The core contribution of this paper is to deliver the first empirical analysis of how market power dynamics shape inequality and opportunity in society through employer discrimination. The paper assesses which sources of employer power lead to discriminatory behavior and investigates whether this behavior stems from preferences or beliefs about disfavored groups. By integrating key components of the modern labor market such as declining worker power, increasing firm labor market power, growing labor migration, and persistent wage gaps between natives and immigrants, we advance the literature across multiple dimensions.

First, there is an extensive theoretical literature on employer discrimination, covering preference-based, belief-based, monopsonistic, and systemic discrimination (e.g., Robinson (1933); Becker (1957); Arrow (1957); Aigner and Cain (1977); Black (1995); Coate and Loury (1993); Bertrand et al. (2005); Bohren et al. (2022)). There is also rich empirical literature studying the implications of employer discrimination in various contexts (e.g., Bertrand and Mullainathan (2004); Fryer Jr and Levitt (2004); List (2004); Lang and Manove (2011); Lang and Spitzer (2020); Gerard et al. (2021); Benson and Lepage (2024)).

We build on this literature and break new ground in understanding the dynamics of discrimination in labor markets. First, we present novel evidence on the relationship between labor market competition and discrimination. While conventional models predict a strong connection, empirical investigations in this area are lacking. Second, despite extensive studies on discrimination in labor markets, no research has utilized real-world data outside laboratory settings to disentangle the relative impacts of belief-based versus preference-based discrimination. Finally, prior studies have not differentiated between product and labor market power when assessing competition's effect on employer discrimination. We demonstrate that employer discrimination is driven by firm power in labor markets, emphasizing that the source of employer power is crucial for understanding the dynamics of labor market discrimination. This work advances the literature linking product market power to discrimination across groups (e.g., Black (1999); Levine and Rubinstein (2014); Hirata and Soares (2020); Meireles et al. (2021)).

Additionally, there is growing literature on monopsony power in labor markets (e.g., Schubert et al. (2020); Azar et al. (2020c); Qiu and Sojourner (2019); Rinz (2018); Prager and Schmitt (2021); Azar et al. (2020b); Benmelech et al. (2022); Marinescu et al. (2021a); Hershbein et al. (2018); Bassanini et al. (2022); Dodini et al. (2024a)). This literature has

deepened our understanding of labor market imperfections and their impact on wage-setting. However, none of these studies have employed recent monopsony frameworks to examine a crucial prediction: that increased competition should reduce and eventually eliminate discrimination. We expand on this literature by isolating the causal effects of labor market power on discrimination against minority workers, thereby advancing our comprehension of how market power and employer institutions influence inequality.

Finally, we contribute to literature on integrating immigrants into host labor markets (e.g., Rica et al. (2015); Chin and Cortes (2015); Martín et al. (2016); Becker and Ferrara (2019); Dorn and Zweimüller (2021); Brell et al. (2020); Arendt and Bolvig (2020); Arendt et al. (2020); Lochmann et al. (2019); Battisti et al. (2022); Bratu et al. (2020); Dodini et al. (2024b); Butschek and Walter (2014); Ottosson (2022); Bratsberg et al. (2017); Silliman and Willén (2024)). We show how weak labor market competition exacerbates native-immigrant gaps, especially when firms rely on uncertain beliefs about immigrants' productivity.

2   Background

2.1   Conceptual framework

To examine the relationship between labor market power and employer discrimination, we require a situation in which equally productive individuals are exposed to the same employer decision across markets with more or less labor market power. To accomplish this, we rely on mass layoff events across differentially concentrated markets that induce observationally identical individuals to search for new jobs. The job loss events we exploit induce the laid-off workers to engage in job search for reasons exogenous to their own labor market choices.

In a perfectly competitive labor and product market, firms are price and wage takers, making wage discrimination impossible due to a perfectly elastic labor supply; any deviation from paying workers their marginal revenue product results in immediate worker loss. Similarly, employment discrimination is infeasible because zero economic profits prevent firms from hiring less productive workers based on group preference as this would drive up costs and cause the firm to be outcompeted. Consequently, employer discrimination is unsustainable and would eventually lead to firm exit. Thus, observationally identical natives and non-Western immigrants searching for jobs in such markets should experience similar employment and earnings at the hiring stage.[2]

Unlike in a competitive labor market, a monopsonistic employer can exploit its power by paying workers less than their marginal revenue product, regardless of its product market power. In these markets, firms can engage in discrimination against specific subgroups and differentiate the wage between natives and non-Western immigrants without the risk of los-

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[2]These dynamics might help explain why minority workers tend to disproportionately benefit when labor markets are tight and competition for labor is high (e.g. Autor et al. (2023)).

ing productive workers or being forced to exit the market. Thus, observationally identical natives and non-Western immigrants who are induced to search for jobs in such markets may experience substantially different employment and earnings depending on the discrimination practices or preferences of employers. This is true irrespective of whether the discrimination is belief-based, preference-based, or monopsonistic. Specifically, in a *preference-based* framework, the firm pays certain workers less because they get disutility from working with them. This is only possible in an imperfect market in which firms either have wage-setting power (monopsonistic market) or the ability to absorb the cost of employment discrimination (monopsonistic labor and monopolistic product markets). In a *belief-based* framework, employers infer productivity based on group membership because this is cheaper than uncovering workers' true productivity. As the market power of the firm increases, the cost of mistakes in the belief-based framework declines because firms with supernormal profits can absorb the cost, especially if it is cheaper than seeking out correct information. In a *monopsonistic* framework, firms exploit the fact that different groups have different outside options and set wages accordingly in order to maximize profit. This is only possible in monopsonistic markets in which there is no market-level wage available to all workers.

In a setting where a firm holds power in the product market but no power in the labor market, firms can discriminate, but with considerable limitations. In particular, if the firm pays disfavored workers less than their marginal revenue product, these workers, facing a perfectly elastic labor supply, can simply leave for better options. This strongly limits wage discrimination in the market. However, the firm can still engage in employment discrimination by favoring less productive workers from the preferred group over more productive workers from the disfavored group, covering the cost of discrimination with its product market profits.

2.2   Labor Markets in Norway

Local labor markets in Norway display greater competition than those in the US. However, labor market concentration is still widespread, and several markets have HHIs exceeding the thresholds used by the EU, UK, and the US to signal substantial monopsonistic competition (Dodini et al., 2024a).

In terms of employment contracts, Norway has a high degree of employment protection, making it difficult to terminate workers without cause. Typically, these contracts mandate a three-month notice period for termination, and there is no general legal requirement for severance pay (Salvanes et al., 2024). In cases of mass layoffs or firm closures, firms can shorten the notice period considerably. There is no mandated order for laying off workers (Salvanes et al., 2024).

Upon contract termination, the Norwegian government operates a relatively generous unemployment insurance system. Unemployment benefits are available to all workers who

have been laid off or experienced a reduction in work time greater than 50 percent. Benefits are conditional on having worked the four months leading up to the termination and having earned a sufficiently large income in the year prior to termination ($16,500 in 2019). The replacement rate is 62.4% of the previous year's pay or 62.4% of the average pay over the last 3 years. The standard entitlement period during our analysis was 104 weeks. Approximately 78% of displaced workers in our sample are re-employed one year after displacement (Huttunen et al., 2011).

2.3 Immigration in Norway

Norway has seen a significant inflow of migrants over the past several decades, with immigrants now constituting about 15 percent of the population. This growth has been fueled by both Western and non-Western immigrants, each making up approximately 50 percent, though recent inflows are predominantly non-Western. We define Western immigrants as those born in Sweden, Denmark, Finland, Iceland, Belgium, France, Ireland, Luxembourg, the Netherlands, Great Britain and Northern Ireland, Germany, Austria, Switzerland, Israel, the United States, Canada, or Oceania (Böhlmark and Willén (2020); Aldén et al. (2015); Korpi et al. (2023)). The most common immigrant countries include Poland (97,197), Lithuania (37,638), Sweden (36,315), Somalia (28,696), Germany (24,601), Iraq (22,493), Syria (20,823), the Philippines (20,537), Pakistan (19,973), and Eritrea (19,957). The immigrant population is relatively evenly distributed but is slightly overrepresented in Norway's four major metropolitan areas: Oslo, Bergen, Stavanger, and Trondheim.

Discrimination and segregation in Norway primarily occur between non-Western immigrants and the native population (e.g., Böhlmark and Willén (2020); Aldén et al. (2015); Grand and Szulkin (2002)). This dynamic is likely related to non-Western immigrants' physical differences, distinct cultural backgrounds, and languages unfamiliar to natives (e.g., Chiswick and Miller (2005)).

3 Empirical Design

3.1 Data

Our primary data come from linked employer-employee records that cover all Norwegian residents. A unique person identifier enables us to follow workers over time, and unique firm and establishment identifiers allow us to observe their employers and identify whether establishments are downsizing or closing down.

We merge these data with information from the demographic and immigration register, the tax register, and the social security register. Combined, these data provide us with detailed information on age, gender, immigration status, source country, occupation, employment, employer, location, earnings, and contract hours for every individual between 2003 and 2017.

Our measure of earnings is individual annual pre-tax labor income, which includes regular labor income and income from self-employment. Employment status is defined based on the individual's status in the labor register. Hours worked are based on a categorical variable that indicates whether the worker is contractually employed as a part-time or a full-time worker.

To measure labor market power, we rely on a Herfindahl-Hirschman Index for each 3-digit occupation in each local labor market in Norway. Local labor markets are defined based on commuting distance and divide Norway into 160 regions (Gundersen and Jukvam, 2013). The HHI is the sum of the squares of the employment shares across establishments within the occupation and local labor market. The measure can range from 0 to 1, where 1 indicates a single monopsonist in the market. Hence, the HHI measures the concentration of labor demand for a given occupation *across establishments* in a local labor market.

While labor market concentration, as measured by the HHI, does not fully encapsulate firms' labor market power, recent research demonstrates its reliability as a proxy. It effectively captures a significant portion of the power firms exert over labor, negatively impacting employment and wages (e.g., Dodini et al. (2024a); Azar et al. (2020c); Marinescu et al. (2021b)). Descriptive data show a strong negative relationship between concentration and firms' employment of non-Western immigrants (Figure A-1).

3.2 Sample Construction and Empirical Method

Our estimation approach utilizes a stacked layoff design based on involuntary displacement events that induce job search among observationally equivalent workers who are separated in differentially concentrated labor markets. This approach relies on examining four levels of differences, akin to a quadruple difference-in-differences design. Specifically, we compare the changes in outcomes after displacement (difference 1) for workers who are displaced relative to those who are not (difference 2) in more or less concentrated markets (difference 3) among natives/Western immigrants in one group and non-Western immigrants in the other (difference 4).

We define involuntary job loss events if establishments either close down or terminate more than 30 percent of their workforce (e.g., Salvanes et al. (2024)). To overcome issues associated with staggered difference-in-differences designs, we follow Cengiz et al. (2019) and "stack" the dataset into base year panels by displacement year (2008 through 2012).[3] For each base year panel, we follow workers employed in a private-sector firm in the base year

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[3]Recent advances in difference-in-difference estimation have shown that these estimators can be biased when there are time-varying treatments and treatment effects (Goodman-Bacon (2021); De Chaisemartin and d'Haultfoeuille (2020)). The bias stems from post-treatment outcomes being used as control observations without accounting for the time-varying nature of the treatment effect. Our approach overcomes this problem by using stacked panels (Cengiz et al. (2019)), where the control group in each panel consists solely of untreated workers (i.e., those who do not experience a mass separation in the base year).

for a total of 11 years, from event year $t-5$ through $t+5$, using data from 2003-2017.

We fix our HHI measure in the year prior to separation. This allows us to overcome any potential endogeneity issues caused by the displacement events directly impacting the HHI of the local market.[4]

To ensure that we are capturing the effects of concentration on similar types of workers regardless of immigration status, we limit our sample to those who worked consistently at full-time status in the three years before the displacement event.[5] This ensures that our sample is not skewed by recent arrivals or seasonal workers in the country. In addition, it allows us to compare workers with a similar work history regardless of their immigration background. We limit the sample to those exposed to a layoff event when they are between the ages of 25 and 65, representing the period after college and before retirement.

For individual i in local labor market l, industry s, occupation o, relative time t, base year b and year y, we estimate the following regression:

$$
\begin{aligned}
y_{ilsotby} = {} & \alpha + \beta_1 P_{it} + \beta_2 I_i + \beta_3 D_i + \beta_4 H_{ilso} \\
& + \gamma_1 (P \times I)_{it} + \gamma_2 (P \times D)_{it} + \gamma_3 (P \times H)_{itlso} + \gamma_4 (I \times D)_i + \gamma_5 (I \times H)_{ilso} + \gamma_6 (D \times H)_{ilso} \\
& + \delta_1 (P \times I \times D)_{itlso} + \delta_2 (P \times I \times H)_{itlso} + \delta_3 (I \times D \times H)_{ilso} + \delta_4 (P \times D \times H)_{itlso} \\
& + \zeta_1 (P \times I \times D \times H)_{itlso} + \eta_l + \theta_s + \kappa_o + \tau_t + \phi_y + \omega_b + \psi Earnings_{ib} + \epsilon_{ilsotby},
\end{aligned}
$$

$$(1)$$

where P denotes the post displacement period, I denotes immigrant status, H denotes HHI in the base year, and D denotes displacement (treatment) status. We include fixed effects for base local labor market, base industry, base occupation, base (layoff) year, and current year as well as a control for baseline earnings. We cluster the standard errors at the baseline firm.

We also estimate a more saturated model in which we include individual fixed effects. These fixed effects subsume variation based on baseline earnings, education, birth cohort, local labor market, occupation, industry, base firm, overall treatment status, and displacement year. It also absorbs any unobserved time-invariant productivity differences across individuals. This specification, therefore, allows us to compare natives and immigrants who had the same employment history and earnings and were laid off from the same occupation in the same firm at the same time. This is our preferred specification:

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[4]The average displacement event induces less than 3% of the local market to search for a job, such that the direct effect on HHI is negligible. Further, since we are interested in the relative effect across groups, this is less of a concern.

[5]We also use a five-year tenure requirement and find identical effects. See Appendix Table A-4.

$$y_{ilsoty} = \alpha + \gamma_1(P \times I)_{ity} + \gamma_2(P \times H)_{itylso} + \gamma_3(P \times I \times H)_{itylso} + \eta_i + \tau_t + \phi_y + \epsilon_{ilsoty}. \quad (2)$$

Finally, we take advantage of the longitudinal dimension of our data by estimating event studies using the following specification:

$$y_{ilsoty} = \alpha + \sum_{\tau=-5,\ \tau\neq-1}^{5} [\delta_\tau(1|t=\tau) \times H_{ylso}] + \sum_{\tau=-5,\ \tau\neq-1}^{5} [\varphi_\tau(1|t=\tau) \times I_i]$$
$$+ \sum_{\tau=-5,\ \tau\neq-1}^{5} [\theta_\tau(1|t=\tau) \times H_{ylso} \times I_i] + \eta_i + \tau_t + \phi_y + \varepsilon_{ilt} \quad (3)$$

There are two key benefits to the event study specification. First, we can examine if the pre-period data support the common trends assumption required for a causal interpretation of our results. Second, by tracking individuals over time and examining the dynamic adjustment path after displacement episodes, we can distinguish whether any observed employer discrimination is due to preference-based or belief-based factors (Bohren et al., 2019).

4 Results

4.1 Labor Market Power and Employer Discrimination

Difference-in-Differences Results. Table 1 shows the effect of job search induced by involuntary displacement on reemployment and earnings using our quadruple difference-in-differences design (Equation (1)) as well as our more saturated approach that incorporates individual fixed effects (Equation (2)) for the first three years after displacement. In Figure 2 (Figure A-3 for a binarized version), we show event study estimates of the dynamics from five years prior to displacement until five years after displacement.

Starting with the results based on Equation (1), columns (1) through (3) show that involuntary job displacement episodes generate negative employment, hours, and wage effects for natives/Western immigrants in competitive markets (the DD coefficient). These results are economically meaningful, with a drop in employment probability of 7 percentage points, an increase in the probability of part-time work by almost 3 percentage points, and a reduction in earnings by 0.08 log points.

The coefficient on $DD \times HHI$ shows that the effects of involuntary job displacements are approximately 4 times larger for natives/Western immigrants in purely monopsonistic markets relative to natives/Western immigrants in perfectly competitive markets. This result is consistent with the negative earnings and employment effects of labor market concentration and firm market power identified in prior literature (e.g., Dodini et al. (2024a)).

In terms of differential impacts on non-Western immigrants relative to other workers, the coefficient on $DD \times NWI$ shows that non-Western immigrants experience somewhat larger adverse effects of job loss in competitive markets relative to natives (-0.073 versus -0.121 in terms of employment, and -0.078 versus -0.164 in terms of log earnings), indicating that even in ostensibly competitive labor markets, discrimination may generate labor market gaps between demographic groups.

The key coefficient of interest in our empirical analysis, $DD \times NWI \times HHI$, shows that the effect of firm labor market power has a much stronger effect on non-Western immigrants than it has on natives/Western immigrants, revealing considerable native-immigrant labor market gaps in reemployment effects as a function of labor market concentration. For example, the negative employment effect is over 160 percent greater for non-Western immigrants in fully concentrated markets than for natives or Western immigrants in those markets. This significantly steeper effect gradient among non-Western immigrants suggests that labor market power allows firms to engage in differential hiring and wage-setting for observationally identical workers.

Our baseline model results may reflect unobservable productivity differences between non-Western immigrants and natives within occupation-industry-experience cells, potentially masking factors unrelated to employer discrimination. To address this, we estimate more saturated models by incorporating individual fixed effects into the regression framework (Equation (2)). This allows us to compare natives and immigrants who had the same employment history and education, had the same baseline earnings, and were laid off from the same occupation in the same firm at the same time. The results in Table 1 show that this more saturated model produces identical results to our baseline model. Interestingly, the effects we identify are not driven by differences in the types of occupations that non-Western immigrants are offered post-displacement, but rather by differences in the compensation they receive for doing similar jobs (Appendix Table A-5).

Marginal Effects. To better visualize the employer discrimination effects and examine the significance of the native-immigrant gaps in reemployment probability and earnings, Figure 1 plots the marginal effects of displacement-induced job search among natives and immigrants across the distribution of labor market concentration. These results are based on the more saturated individual fixed effects model.

Across all three outcomes (employment, part-time status, and earnings), we observe small and often not statistically significant differences in effects between natives and non-Western immigrants in perfectly competitive markets, but substantial differences as the power of firms in labor markets increases. For two of the three outcomes – employment and earnings – these differences are highly statistically significant, and the magnitude of the differences are substantial. Specifically, in the least competitive markets, the negative reemployment

and earnings effects among non-Western immigrants are more than twice the size of those experienced by natives.[6]

The results displayed in Figure 1 are consistent with the notion of employer discrimination being a function of labor market power, where supernormal profits bestow upon firms the ability to engage in discriminatory practices because they can absorb any cost disadvantage associated with employer discrimination.

4.2   The Role of Product Market Power

We expand our empirical framework to include product market power, an essential addition since product market power also enables firms to absorb the costs of discrimination through supernormal profits.

The results from running a horse race between local labor market concentration and workers' base industry revenue concentration are shown in Table 2. Product market power by itself has no economically meaningful or statistically significant effect on the employer discrimination practices exercised by the firm.

This finding is consistent with the notion that firms are limited in their ability to discriminate based solely on product market power. Specifically, unless a firm also controls the labor market, it cannot practice *wage discrimination* because workers with a perfectly elastic labor supply will simply seek better opportunities elsewhere. While it is theoretically possible for firms with product market power but no labor market power to engage in *employment discrimination*, we see no evidence of this. This highlights the importance of the source of employer power in explaining labor market discrimination and provides important insights into existing debates on product market power and discrimination that have previously been overlooked.

4.3   Dynamic Effects and Discrimination Type

To identify the relative importance of belief-based and preference-based discrimination in our setting, we draw on insights from Bohren et al. (2019); Fryer Jr (2007); Fryer Jr et al. (2013) and analyze the dynamic adjustment path over time following displacement episodes. If our findings are rooted in belief-based discrimination, continuous employer interactions with workers from the disfavored group should correct erroneous productivity beliefs and eliminate earnings and employment gaps—even in the presence of labor market power. Conversely, if discrimination is driven by preferences (i.e., taste-based discrimination), these gaps are likely to persist over time. Results from our event study regressions (Equation (3)) are shown in Figure 2.

The event studies reveal significant gaps in reemployment rates and earnings between na-

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[6]Like in Fryer Jr et al. (2013), if pre-displacement earnings reflect both marginal productivity and differential treatment by demographic group, then post-layoff interactions controlling for prior earnings will reflect a *lower* bound on the level of discrimination in the market.

tives and non-Western immigrants during the first year post-displacement. However, these gaps gradually narrow, and by five years after the initial displacement, there are no statistically significant differences in labor market outcomes between the two groups. This dynamic adjustment path supports the idea of employer discrimination rooted in incorrect beliefs, suggesting that continuous exposure to workers can rectify misconceptions about productivity. It is also worth noting that the relative pre-treatment trends are moving in a parallel fashion across all outcomes. This evidence supports the common trends assumption.[7]

To ensure that continuous interactions with employers from the same firm rather than networks or external factors drive this result, we estimate our event study model with *current* firm fixed effects in Figure A-2. We observe nearly identical time paths to Figure 2. Controlling for this intermediate outcome (current firm) conceptually limits comparisons to instances where a laid-off native is re-hired in the *same firm* as a laid-off non-Western immigrant. This result indicates that the closing of earnings gaps primarily occurs within firms over time.

To collect further evidence on preference-based and belief-based discrimination, we conduct three auxiliary analyses: (a) we use information on managers to measure their past experience with non-Western immigrants in their workplace as an outcome in our models (Panel D of Table 3); (b) we examine discrimination patterns toward second-generation non-Western immigrants and Western immigrants (Panels A and B of Table 3); and (c) we assess discrimination against non-Western immigrants who have been in the country longer (Panel C of Table 3). Our findings show that managers with more experience working with non-Western immigrants–i.e. those more likely to possess accurate information on the productivity of non-Western immigrants–are less likely to engage in discrimination and are disproportionately more likely to hire non-Western immigrants. The firms that hire non-Western immigrants after the layoff have managers with more past work experience with non-Western immigrants. Furthermore, we show that non-Western immigrants who have resided longer in the country, Western immigrants, and second-generation non-Western immigrants—i.e. immigrants that look more similar to natives on a range of observable characteristics and for whom there exists more information that the employer can extract—face little or no employer discrimination on the dimensions we examine.

The findings from our auxiliary analyses are consistent with belief-based discrimination, where decision-makers rely on inferences from group averages in the absence of full information, and managers with more prior experience possess better signals of productivity as a result of their experience. These results align well with our analysis of the dynamic adjustment path of employment and earnings gaps post-displacement.[8]

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[7]The resulting pattern is the same when we instead estimate the interaction with a binary indicator of being in a "highly concentrated" market, using the US DoJ threshold of 0.25 (Appendix Figure A-3).

[8]Our secondary analyses rule out manager homophily (Appendix Table A-1), the thickness of social

Although we observe that discrimination gaps narrow over time, we find strong evidence of costs to allocative efficiency and productivity. This arises from firms hiring workers with lower AKM fixed effects when they rely on belief-based inferences about productivity. Such practices can result in suboptimal workforce compositions, which ultimately hinder overall productivity in the labor market (Appendix Figure A-4).

5   Discussion

Discrimination is a persistent and prevalent feature of many labor markets. In theory, the presence of competition eliminates the risk of such employer behavior. However, the average market is not perfectly competitive, and the average firm possesses both price-setting power as well as wage-setting power. Despite decades of discussions of market power or discrimination, no empirical work has been conducted on the combination of labor market power and employer discrimination.

We show that employer discrimination in the Norwegian labor market is substantial and that labor market competition can dramatically reduce the extent of discrimination in markets. We then show that the source of employer power matters and that employer power in product markets does not generate employer discrimination unless accompanied by significant labor market power. Finally, we show that the observed discrimination is based on incorrect beliefs about immigrants' productivity and that preferences are likely to play only a minor role.

Amidst a period of rapid decline in worker power, an increase in employer labor market power, and a slowdown in the convergence of the native-immigrant wage gap, it is of key policy relevance to understand the relationship between employer power and discrimination, to trace which source of employer power matters, and to disentangle whether the discrimination is preference-based or belief-based. This understanding is essential not only for combating unfair compensation practices and preventing an exacerbation of persistent forms of inequality across groups but also for the broader social goals of market efficiency and growth.

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networks or social proximity to managers (Appendix Tables A-2 and A-3), and post-layoff occupational sorting (Appendix Table A-5) as explanations or mechanisms for the employment gaps we find.

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Table 1: Difference-in-Differences Estimates

	Base Model			Individual Fixed Effects		
	(1) Employment	(2) Pr(Part Time)	(3) Log Earnings	(4) Employment	(5) Pr(Part Time)	(6) Log Earnings
DD	-0.073***	0.027***	-0.078***			
	(0.005)	(0.003)	(0.007)			
DD × HHI	-0.244***	0.060***	-0.488***	-0.237***	0.056**	-0.484***
	(0.045)	(0.023)	(0.089)	(0.047)	(0.023)	(0.093)
DD × NWI	-0.048***	0.003	-0.086***	-0.056***	0.005	-0.086***
	(0.018)	(0.004)	(0.023)	(0.020)	(0.004)	(0.024)
DD × NWI × HHI	-0.390***	0.060	-0.583***	-0.383***	0.056	-0.587***
	(0.132)	(0.056)	(0.202)	(0.142)	(0.060)	(0.225)
N	4,428,176	4,428,176	4,411,883	673,488	673,488	668,808

Source: Authors' calculations of Norwegian register data.
Notes: Estimates correspond to Equations 1 and 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01. "NWI" refers to Non-Western Immigrants.

Table 2: Labor Market Power Vs. Product Market Power

	(1) Employment	(2) Pr(Part Time)	(3) Log Earnings
DD × NWI	-0.065***	0.016***	-0.110***
	(0.018)	(0.005)	(0.026)
DD × Revenue HHI	0.042**	-0.017***	0.044*
	(0.017)	(0.005)	(0.024)
DD × Occupation HHI	-0.235***	0.053**	-0.378***
	(0.058)	(0.027)	(0.087)
DD × NWI × Revenue HHI	0.026	-0.032***	0.064
	(0.058)	(0.007)	(0.060)
DD × NWI × Occupation HHI	-0.450**	-0.018	-0.501
	(0.185)	(0.066)	(0.324)
N	506,312	506,312	502,798

Source: Authors' calculations of Norwegian register data.

Notes: Estimates correspond to Equation 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. "NWI" refers to Non-Western Immigrants.

Table 3: Additional Evidence: Individual Fixed Effects Model

	Panel A: Second-Generation Immigrants		
	(1)	(2)	(3)
	Employment	Pr(Part Time)	Log Earnings
DD × HHI	-0.237***	0.056**	-0.483***
	(0.047)	(0.023)	(0.094)
DD × 2nd Gen NW	0.012	0.001	0.097***
	(0.011)	(0.007)	(0.023)
DD × 2nd Gen NW × HHI	0.072	-0.046	0.165
	(0.119)	(0.115)	(0.189)
N	634,280	634,280	630,237

	Panel B: Western Immigrants vs Natives		
	Employment	Pr(Part Time)	Log Earnings
DD × HHI	-0.231***	0.054**	-0.485***
	(0.047)	(0.023)	(0.094)
DD × Western Imm.	0.002	-0.000	0.016
	(0.007)	(0.004)	(0.013)
DD × Western Imm. × HHI	-0.160	0.050	0.052
	(0.126)	(0.056)	(0.162)
N	634,280	634,280	634,280

	Panel C: NWI, Long Time in Norway (>P75)		
	Employment	Pr(Part Time)	Log Earnings
DD × HHI	-0.236***	0.055**	-0.483***
	(0.047)	(0.023)	(0.093)
DD × NWI	-0.040*	0.001	-0.110***
	(0.022)	(0.006)	(0.032)
DD × NWI × HHI	-0.272	0.019	0.210
	(0.210)	(0.087)	(0.248)
N	645,640	645,640	645,640

|	Panel D: Re-Hire Firm, Manager Average Experience with NWI	
	Manager Experience, t-3 to t-1	Manager Experience, t-1
DD × HHI	0.024	0.026**
	(0.019)	(0.013)
DD × NWI	-0.020	-0.019**
	(0.013)	(0.010)
DD × NWI × HHI	0.197***	0.125**
	(0.073)	(0.059)
N	351,396	351,396

Source: Authors' calculations of Norwegian register data.
Notes: Estimates correspond to Equation 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01. "NWI" refers to Non-Western Immigrants. The 75th percentile of time in Norway among non-Western immigrants in the sample with at least three years of work experience was 23 years at the time of the displacement event. Manager experience with NWI is measured by taking the average share of all workers the manager has worked with at their firm for the prior three years (or one year), averaging over all managers at the firm.

Figure 1: Marginal Effects of Employer Discrimination, by HHI
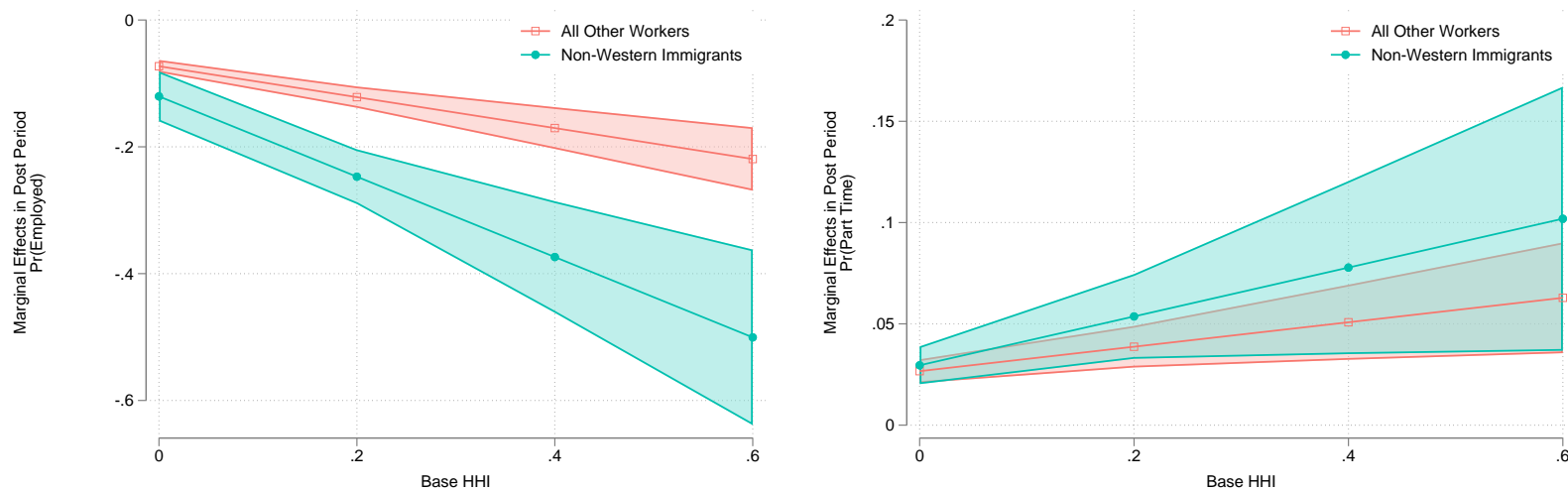
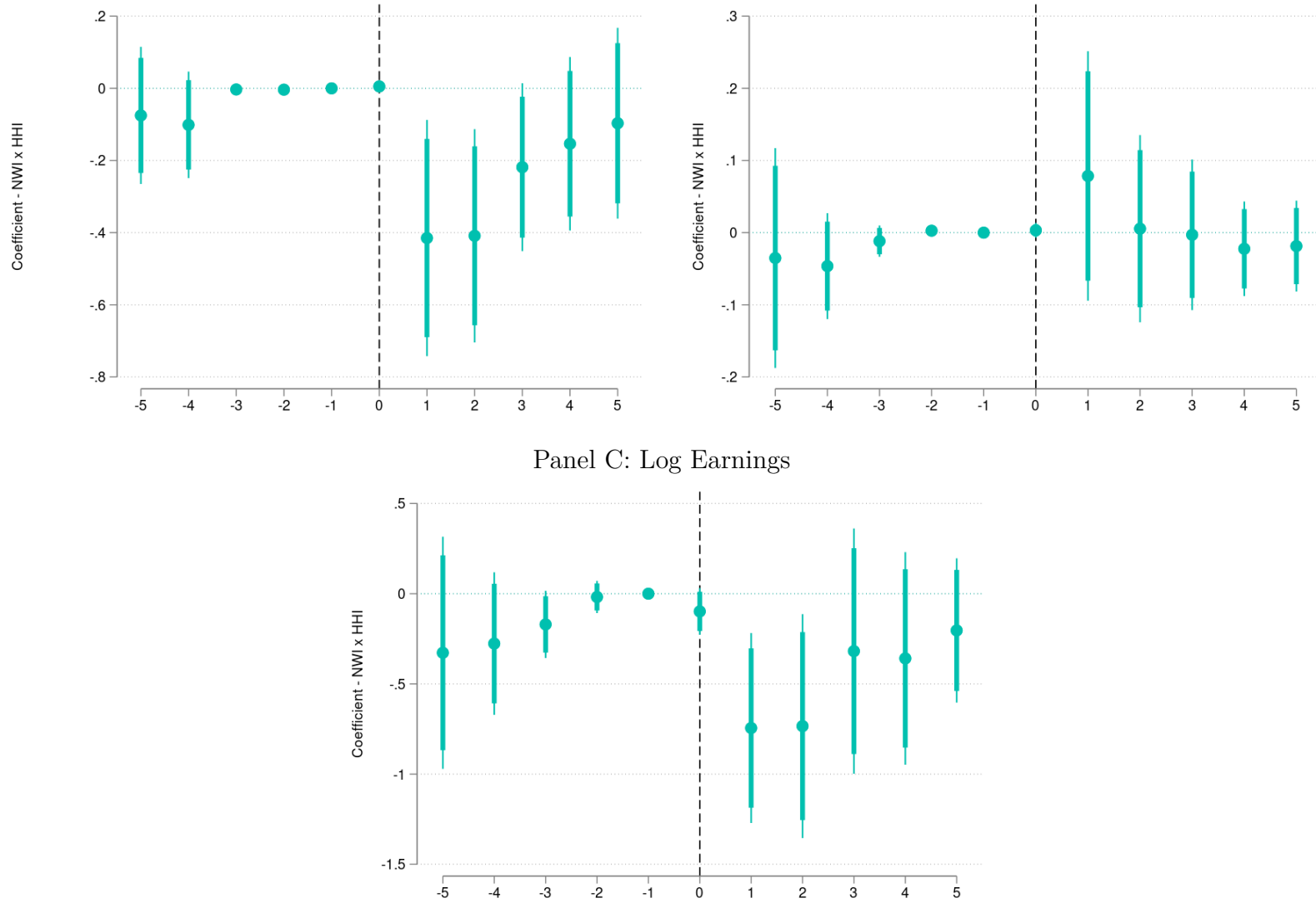**Panel A: Employment**   **Panel B: Part-time Work**

Panel C: Log Earnings
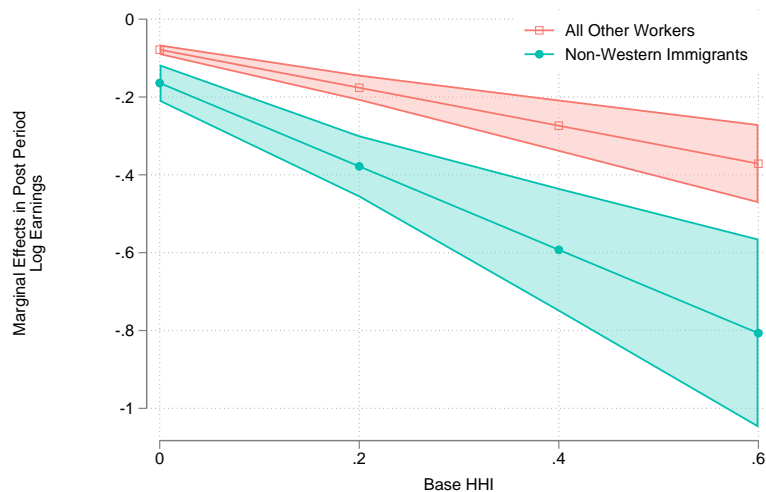
Source: Authors' calculations of Norwegian registry data from 2003 to 2017.

Notes: "NWI" refers to Non-Western Immigrants. Estimates correspond to Equation 2 in the text and those presented in Table 1. Shaded areas represent the 95% confidence intervals for standard errors clustered at the base firm level.

Figure 2: Dynamic Effects of Employer Discrimination, by HHI

Panel A: Employment   Panel B: Part-time Work

Panel C: Log Earnings

Source: Authors' calculations of Norwegian registry data from 2003 to 2017.

Notes: "NWI" refers to Non-Western Immigrants. Estimates correspond to the θ parameters of Equation 3 in the text. Bars represent the 90% and 95% confidence intervals for standard errors clustered at the base firm level.

Online Appendix

Table A-1: Manager Characteristics

	(1) Manager Share Female	(2) Manager Share Norwegian Female	(3) Manager Share Norwegian	(4) Manager Share NW Immigrant
DD × HHI	-0.016	-0.051	-0.294**	0.057
	(0.092)	(0.072)	(0.135)	(0.050)
DD × NWI	0.001	0.006	-0.007	0.011
	(0.022)	(0.022)	(0.015)	(0.011)
DD × NWI × HHI	0.053	0.045	0.135	0.003
	(0.157)	(0.150)	(0.168)	(0.076)
N	353,585	353,585	353,585	353,585

Source: Authors' calculations of Norwegian register data.

Notes: Estimates correspond to Equations 1 and 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01.

Table A-2: Neighborhood Characteristics - Manager Shares of Neighbors

	(1) Low Share Nhood in Management Employment	(2) High Share Nhood in Management Employment	(3) Low Share Nhood in Management Log Earnings	(4) High Share Nhood in Management Log Earnings
DD × HHI	-0.213***	-0.254***	-0.456***	-0.457***
	(0.051)	(0.061)	(0.111)	(0.115)
DD × NW immigrant	-0.061***	-0.041**	-0.101***	-0.049*
	(0.023)	(0.017)	(0.029)	(0.026)
DD × NW Immigrant × HHI	-0.370**	-0.446**	-0.585***	-0.534
	(0.151)	(0.221)	(0.217)	(0.483)
N	344,336	329,152	341,686	327,122

Source: Authors' calculations of Norwegian register data.

Notes: Estimates correspond to Equation 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01. The manager shares of neighbors value is defined as the share of workers within a displaced worker's neighborhood that were in a management occupation at any firm during the year in which the worker was displaced. Low and high shares are defined by a split at the median.

Table A-3: Neighborhood Characteristics - NWI Shares of Neighbors

	(1) Low Nhood Immigrant Employment	Share NW	(2) High Nhood Immigrant Employment	Share NW	(3) Low Nhood Immigrant Log Earnings	Share NW	(4) High Nhood Immigrant Log Earnings	Share NW
DD × HHI	-0.220***		-0.251***		-0.433***		-0.490***	
	(0.047)		(0.068)		(0.095)		(0.122)	
DD × NW immigrant	-0.037***		-0.062***		-0.053*		-0.104***	
	(0.013)		(0.023)		(0.032)		(0.027)	
DD × NW Immigrant × HHI	-0.416***		-0.387*		-0.603**		-0.641*	
	(0.134)		(0.205)		(0.244)		(0.334)	
N	325,472		348,016		323,314		345,494	

Source: Authors' calculations of Norwegian register data.

Notes: Estimates correspond to Equation 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01. NWI shares of neighbors value is defined as the share of workers within a displaced worker's neighborhood that were non-Western immigrants during the year in which the worker was displaced. Low and high shares are defined by a split at the median.

Table A-4: Difference-in-Differences Estimates, Five-Year Tenure Requirement

	Base Model			Individual Fixed Effects		
	(1) Employment	(2) Pr(Part Time)	(3) Log Earnings	(4) Employment	(5) Pr(Part Time)	(6) Log Earnings
DD	-0.073***	0.027***	-0.078***			
	(0.005)	(0.003)	(0.007)			
DD × HHI	-0.244***	0.060***	-0.488***	-0.237***	0.056**	-0.484***
	(0.045)	(0.023)	(0.089)	(0.047)	(0.023)	(0.093)
DD × NW immigrant	-0.048***	0.003	-0.086***	-0.056***	0.005	-0.086***
	(0.018)	(0.004)	(0.023)	(0.020)	(0.004)	(0.024)
DD × NW Immigrant × HHI	-0.390***	0.060	-0.583***	-0.383***	0.056	-0.587***
	(0.132)	(0.056)	(0.202)	(0.142)	(0.060)	(0.225)
N	4,428,176	4,428,176	4,411,883	673,488	673,488	668,808

Source: Authors' calculations of Norwegian register data.
Notes: Estimates correspond to Equations 1 and 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * p<0.10, ** p<0.05, *** p<0.01.

Table A-5: Difference-in-Differences Estimates, Occupational Sorting

	Base Model		Individual Fixed Effects	
	(1) Occupation Percentile Rank	(2) AKM Occupation FE	(3) Occupation Percentile Rank	(4) AKM Occupation FE
DD	0.383	0.009***		
	(0.289)	(0.003)		
DD × HHI	-0.166	-0.017	-2.154	-0.023
	(3.726)	(0.025)	(3.850)	(0.025)
DD × NWI	0.651	0.003	0.557	0.002
	(0.466)	(0.004)	(0.478)	(0.004)
DD × NWI × HHI	-0.410	-0.031	-2.296	-0.037
	(5.069)	(0.040)	(5.163)	(0.042)
N	4,216,197	4,202,959	617,737	616,528

Source: Authors' calculations of Norwegian register data.
Notes: Estimates correspond to Equations 1 and 2 in the text and measure the difference-in-differences estimates over the first three years after the layoff event. Standard errors clustered at the base firm level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Occupation percentile ranks are based on the average annual earnings in each occupation fixed at the base year in which the layoff event occurred (1 = highest paid). AKM occupation fixed effects are extracted from a regression of log annual earnings on worker and occupation fixed effects and subsequently used as the outcome variable in Equations 1 and 2.
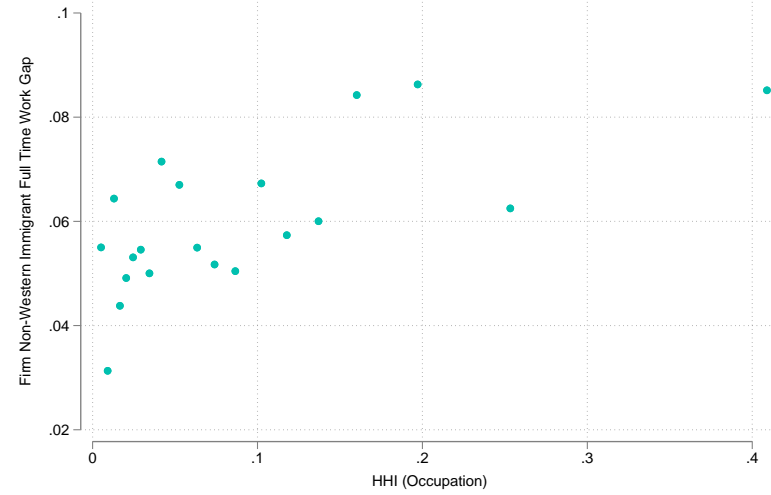
Figure A-1: Non-Western Immigrant Employment Gaps in Firm, by HHI

Panel A: Share NWI, All Sectors

Panel B: Share NWI, Private Sector
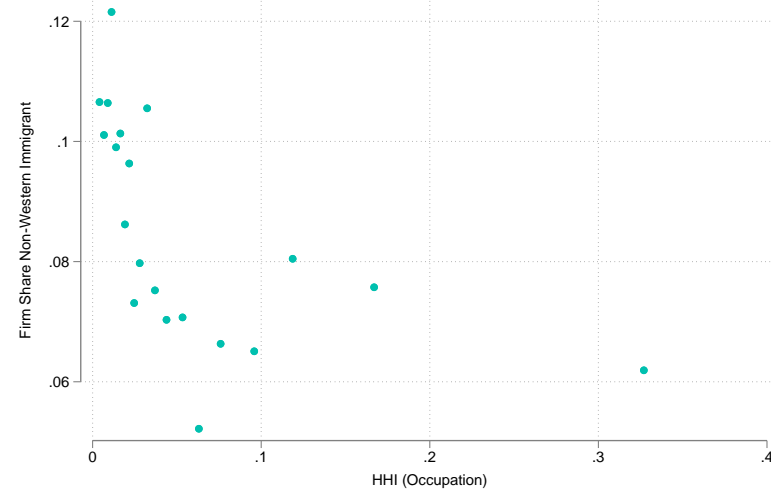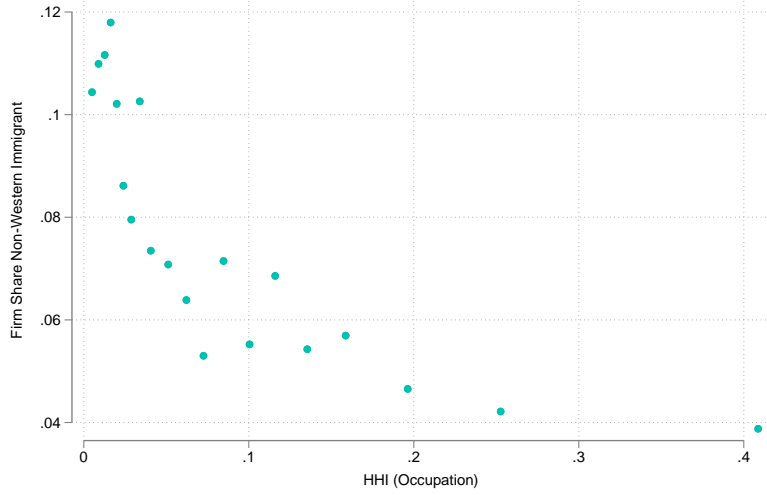
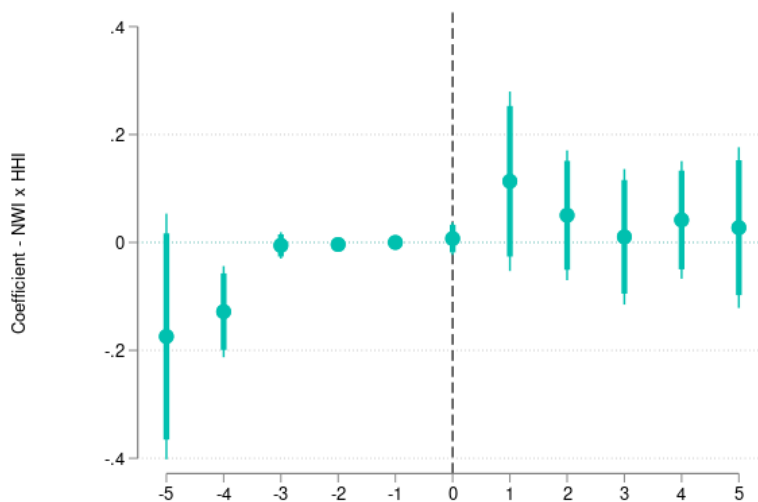Panel C: Share NWI, All Sectors with Industry Fixed Effects
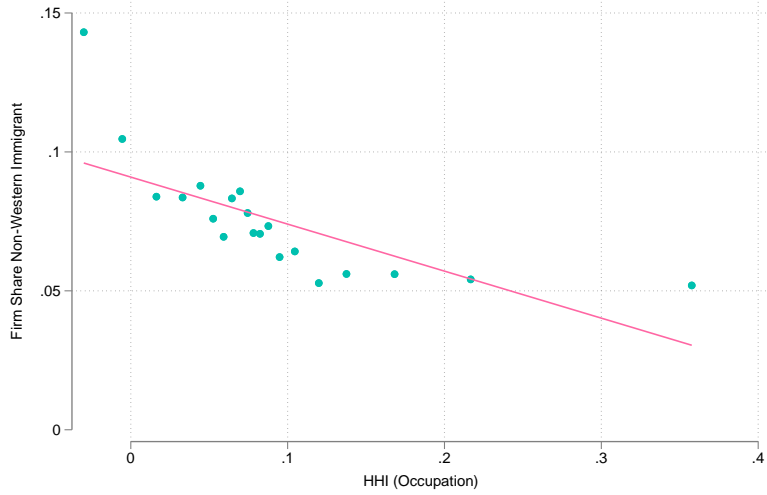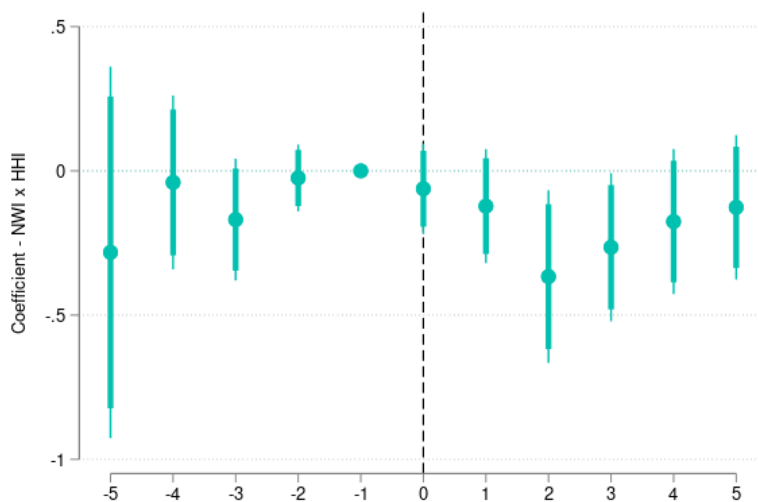
Panel D: NWI Full-Time Status Gap within Firm

Source: Authors' calculations of Norwegian registry data from 2003 to 2017.
Notes: "NWI" refers to Non-Western Immigrants.

Figure A-2: Dynamic Effects of Employer Discrimination with Current Firm Fixed Effects
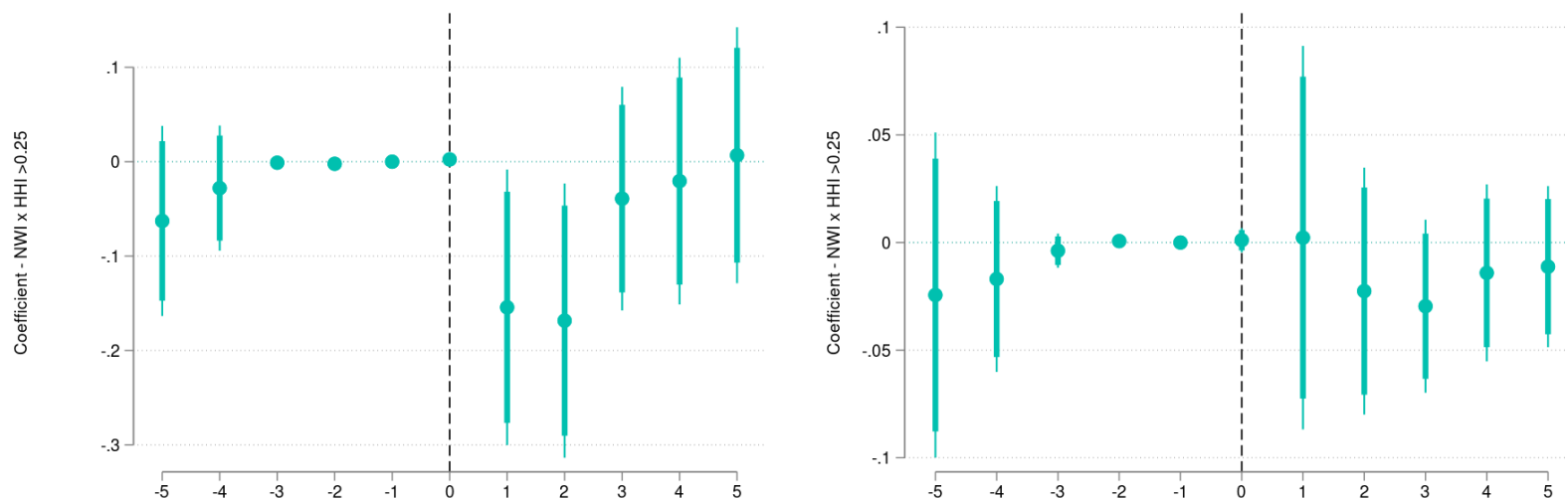Panel A: Part Time Work
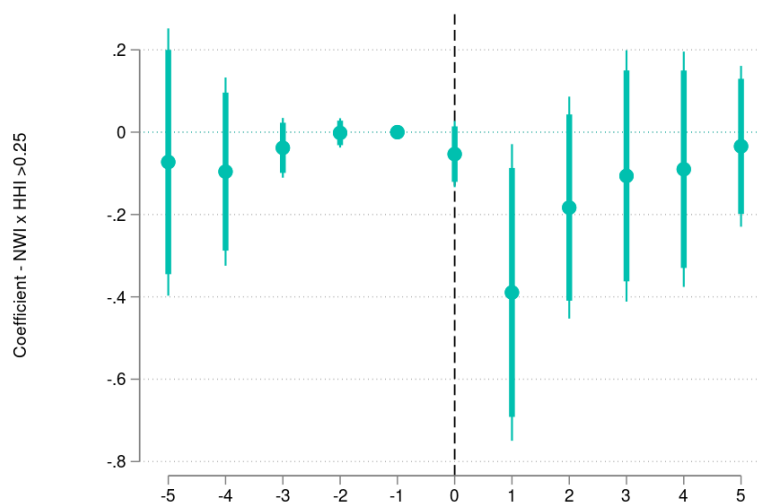

Panel B: Log Earnings

Source: Authors' calculations of Norwegian registry data from 2003 to 2017.
Notes: "NWI" refers to Non-Western Immigrants. Estimates correspond to the θ parameters of Equation 3 in the text, except this model adds a fixed effect for each worker's *current* firm. Bars represent the 90% and 95% confidence intervals for standard errors clustered at the base firm level.

Figure A-3: Dynamic Effects of Employer Discrimination, by HHI > 0.25

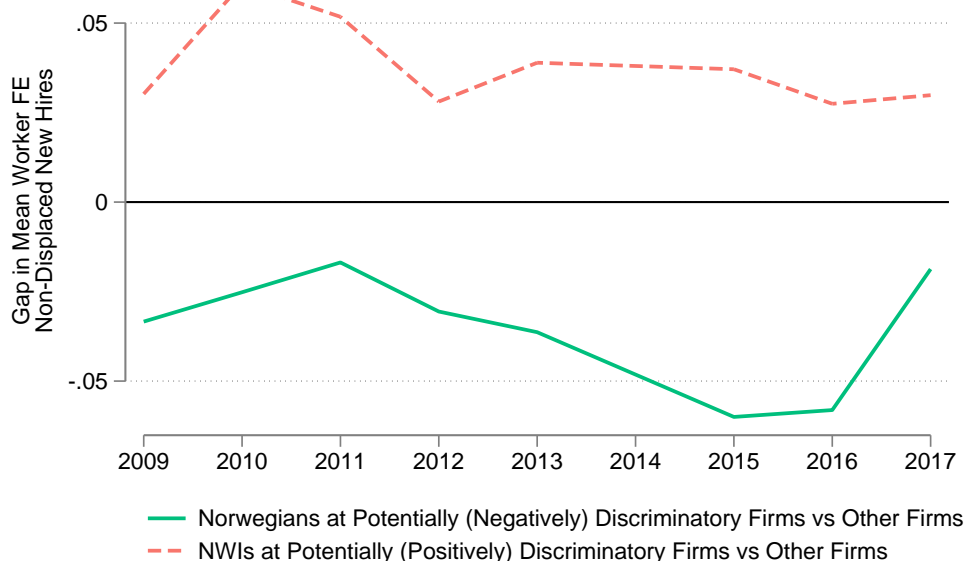Panel A: Employment   Panel B: Part-time Work

Panel C: Log Earnings

Source: Authors' calculations of Norwegian registry data from 2003 to 2017.

Notes: "NWI" refers to Non-Western Immigrants. Estimates correspond to the θ parameters of Equation 3 in the text, but replace the linear HHI term with an indicator for HHI above 0.25. Bars represent the 90% and 95% confidence intervals for standard errors clustered at the base firm level.

Figure A-4: (Negatively) Discriminatory Firms Hire Less Productive Norwegians, (Positively) Discriminatory Firms Hire More Productive Immigrants

Source: Authors' calculations of Norwegian registry data from 2003 to 2017.

Notes: "NWI" refers to Non-Western Immigrants. The graph is calculated by first estimating an AKM model with worker and firm fixed effects between 2003 and 2017 for all workers in Norway. We then divide workers into demographic groups (i.e. Norwegians and Non-Western immigrants), displacement status groups (formerly displaced by a mass layoff or firm closure versus not), and new hire status. We then calculate the average worker fixed effect from the AKM model among new hires that were not previously displaced in each firm-year cell for each demographic group.

We identify potentially negatively discriminatory firms as those that hired a displaced Norwegian from our layoff sample that year and no displaced non-Western immigrants. We identify potentially positively discriminatory firms as those that hired a displaced non-Western immigrant in that year and no displaced Norwegians. We then calculate the gap in the average worker fixed effect among these hires for firms that were likely to discriminate (positively or negatively) versus those that were not.

The results suggest that there is an allocative efficiency cost of the belief-based discrimination we document: firms that hired displaced Norwegians over non-Western immigrants hired marginally less productive Norwegians from the non-displaced pool. Firms that likely had better information on the productivity of non-Western immigrants and hired a displaced non-Western immigrant instead of displaced Norwegians ended up hiring more marginally more productive non-Western immigrants from the non-displaced pool. This may be in response to being able to hire marginally more productive non-Western immigrants who may have been subject to discrimination. These findings imply that firms engaging in belief-based discrimination suffer efficiency losses by hiring less productive natives, while those that do not achieve efficiency gains by hiring more productive workers from diverse backgrounds.