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# Ethnic Diversity and Firm Performance in Norway[1]

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**ABSTRACT**

*Ethnic diversity has received increased research attention in Nordic countries; however, only a few studies have looked at it from the perspective of firms. In this study, we analyze whether changes in ethnic diversity among staff and in management affect firm performance. We also test whether productivity gains from diversity are due to immigrants being hired in low-paying jobs by analyzing how the association between diversity and productivity is affected by immigrants' positions in firms' wage distributions. Our results suggest a positive relationship between changes in ethnic diversity within firms and firm productivity. The association strengthens if firms have more diversity in management and immigrants higher up in their wage distribution. This suggests that our results are not driven by firms that hire immigrants in low-paying positions. Possible mechanisms to increase firm productivity through ethnic diversity include wider recruitment and activation of diversified human capital and more inclusive firm policies.*

**KEYWORDS**

*ethnic diversity / profitability / firm productivity / management*

## Introduction

A central tenet in the 'business case for diversity' literature is that ethnic diversity can increase productivity and innovation in firms. Yet, research on the profitability of ethnic diversity presents mixed results. While some studies have described how ethnic diversity makes firms profitable and innovative (Trax et al. 2015; Marchal & Nedoncelle 2019; Ottaviano et al. 2018), others have shown how diverse teams may increase conflict and decrease efficiency and firm performance (Parotta et al. 2014; Dale-Olsen & Finseraas 2020). In this article, we investigate the relationship between firm-level diversity and productivity outcomes. We argue that to detect whether ethnic diversity influences firm performance, we need to investigate the *context* in which

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diversity is played out—namely, the characteristics of the firm (Greer et al. 2012; Minbaeva et al. 2021). This is because research suggests that the profitability of diversity is particularly strong in competitive industries in which innovation and the development of new products are important (Andrevski et al. 2014; Ottaviano et al. 2018). Moreover, studies have also indicated that ethnic representation in management is associated with higher firm performance (Andrevski et al. 2014; Nathan 2016; Roberson & Park 2007). We build on these findings as we examine if firm characteristics and specific industries, as well as ethnic representation in management, influence the impact of ethnic diversity on firm performance.

However, a positive correlation between ethnic diversity and performance can also occur if ethnic minorities have lower earnings. As pointed out by Ortlieb & Sieben (2013), research on the 'business case for diversity' undermines equality issues and fails to answer why ethnic minorities face wage penalties or are concentrated in jobs with poor working conditions. Studies that have departed from a critical perspective on the business case of diversity have shown that organizations employ ethnic minorities as a staffing strategy to keep salaries low (Soni-Sinha & Yates 2013; Ortlieb & Sieben 2013). A key argument underpinning this strand of literature is that the business case for diversity can contribute to undermining equality and reproducing ethnic inequality (Bendick et al. 2010; Romani et al. 2018). Thus, to address the relationship between diversity and firm performance, it is necessary to examine whether this relationship is because of ethnic inequality within organizations. We use the position of immigrants in firms' wage distribution to measure ethnic inequality within firms and investigate if inequality is associated with firm performance.

We contribute to the literature in two ways. First, this study provides valuable grounds for further research on diversity, performance, and equality. Although previous studies have come a long way in detecting the relationship between diversity and firm performance, few have engaged with the critical perspectives of the business case for diversity that suggest it may contribute to continuing ethnic inequality through wage substitution. Second, we use high-quality linked administrative register data from Norway that consist of detailed information on individual- and firm-level characteristics to answer the call for a large-scale, employee–firm panel data analysis to investigate the relationship between diversity and productivity in the economy (Nathan 2016). We study the development from 2008 to 2018, a period which coincides with a doubling of Norway's immigrant population, mainly due to increased immigration from the new EEA-East countries and Asia and Africa.[1] Moreover, Norway had low unemployment rates at this time;[2] hence, increased country-level ethnic diversity and high labor demand can result in more firm-level diversity.

## Ethnic diversity and firm performance

The literature on diversity and firm performance suggests that diversity represents a 'double-edged sword'. This metaphor sums up two competing perspectives on how diversity can affect firm performance. One branch of the literature emphasizes the 'business case for diversity', and argues that diversity enhances performance and is an asset for firms. A diverse staff provides opportunities to connect to new markets and customers (Richard et al. 2017; Dwertmann & Kunze 2020), extends the scope of business

and products (Nathan & Lee 2013; Moon & Jung 2018) and develops creative and innovative work environments (Ozgen et al. 2014). A conflicting perspective, however, emphasizes that the potential trade-offs from diversity, such as cultural agreement and similarities in normative expectations and language, can *decrease* firm performance. This branch of research points to how more complex and potentially conflicting social relations in the workplace may impede workers' ability to coordinate tasks (Weber & Camerer 2003). Moreover, language and cultural differences can hinder collaboration and firm development and reduce productivity (Dale-Olsen & Finseraas 2020; Parrotta et al. 2014), although these issues are temporary while immigrants adapt to new cultural norms and learn the language (Dale-Olsen & Finseraas 2020).

Factors both inside and outside firms are important to explain why diversity can be profitable in some contexts and create challenges in others (Moon & Jung 2018; Andrevski et al. 2014; Nathan 2016). Thus, to extend our knowledge of the profitability of diversity, it is necessary to critically examine the context in which diversity is played out (Greer et al. 2012; Minbaeva et al. 2021). We examine three such factors in this study, namely the characteristics of firms and industries, ethnic representation in management, and the position of immigrants in firms' wage distribution.

## Diversity in management and industry characteristics

Minorities in positions of management can be important advocates for change and the implementation of diversity programs in organizations (Dobbin et al. 2011). A consistent finding is that ethnic representation in management is associated with higher firm performance (Andrevski et al. 2014; Nathan 2016; Roberson & Park 2007). Studies have shown that this relationship may be due to the use of wider recruitment and the activation of diversified human capital and more inclusive firm policies. Low racial representation is associated with low productivity, and as the proportional representation of racial minorities in management increases, so too does firm-level productivity (Roberson & Park 2007). To explain this, scholars have pointed to the relevance of a critical mass of diversity to promote organizational change (Robertson & Park 2007) and to enable a diversity-friendly climate. Diversity in management can provide favorable conditions for individuals with diverse knowledge and facilitate knowledge exchange that can in turn increase the capacity to recognize and exploit opportunities for new competitive actions (Andrevski et al. 2014:836). To occupy a minority position in an organization can imply vulnerability both in the sense of being a numerical minority and due to stereotype threats (Nishii & Mayer 2009; Apfelbaum et al. 2016). Managers who ensure a diversity-friendly climate in their firms can contribute to employees feeling safe enough to engage in interpersonal risk-taking and to share and express their perspectives and skills—a precondition for positive interaction and use of diversity. The literature clearly shows that diversity in management can both signal a diversity-friendly climate and constitute a critical mass that is necessary for organizational change.

Another important insight from the research literature is that the characteristics of firms and industries influence the impact of ethnic diversity on productivity (Richard et al. 2007; Iversen et al. 2017). It is especially in competitive industries where innovation and the development of new products are important that ethnic diversity influences firm performance (Andrevski et al. 2014). Across different countries, studies have

identified a positive correlation between diversity and firm performance in the competitive offshore and export industries (Ottaviano et al. 2018; Marchal & Nedoncelle 2019; Parrotta et al. 2016). To explain this, studies have pointed to the critical role of immigrants' culture and language resources in process innovation. Employees with an ethnic minority background contribute to reducing inter-country communication costs, which in turn increases firm performance and exports (Ottaviano et al. 2018). Moreover, ethnically diverse employees can increase contact with new markets abroad (Parotta et al. 2016). These studies have demonstrated that in some types of industries, competencies that stem from various ethnic backgrounds are highly critical to firm performance.

Building on these insights, this study examines if ethnic representation in management and the type of industry influences the relationship between diversity and firm performance in Norwegian firms. However, a positive correlation between ethnic diversity and firm performance can also occur if ethnic minorities work for low wages or in precarious jobs (Ortlieb & Sieben 2013). Thus, to address the relationship between diversity and firm performance, it is also necessary to examine whether this relationship is tied to ethnic inequality within organizations.

## Firm performance and ethnic inequality

Researchers who apply critical perspectives to the business case for diversity have stressed that business logics can undermine equality issues instead of advancing them (Bendick et al. 2010; Ortlieb & Sieben 2013). The promotion of diversity in organizations may reinforce stereotypes and deny minority individuals subjectivity and agency (Zanoni, Thebela & Ybema 2017). A key argument in these critical accounts is that the business case for diversity research offers no satisfying answer to why ethnic minorities are often demoted to the secondary labor market, employed beneath their qualifications or not employed at all (Ortlieb & Sieben 2013). As pointed out by Ortlieb and Sieben (2013), the existing diversity research has not recognized the economic rationales for the use of low-paid labor. Nevertheless, studies have shown that organizations employ ethnic minorities as a staffing strategy to keep salaries low (Soni-Sinha & Yates 2013; Ortlieb & Sieben 2013). The use of immigrant labor correlates with increased profitability *and* reduced wage growth in firms (Iversen et al. 2017). Even in organizations that promote and value ethnic diversity, minorities work in lower positions and have temporary jobs and lower salaries than the majority (Bendick et al. 2010; Romani et al. 2018). Thus, firms may also *add value through mere labour* (Ortlieb & Sieben 2013). In particular, in entry-level jobs that do not require formal requirements, immigrants are seen as less demanding than native workers, and employers tend to see them as flexible, hard-working, and docile (Shih 2002; Waldinger & Licher 2003; Friberg & Midtbøen 2018; Orupabo & Nadim 2020). Ethnic and racial minorities' willingness to take precarious jobs is often interpreted as a sort of skill or 'work ethic', rather than a reflection of their vulnerable situation in the labor market (Wills et al. 2009).

An important insight from this critical literature is that diversity without inclusion rapidly turns counterproductive (Bendick et al. 2010). In an organization that is not willing to reshape its power structure to incorporate ethnically diverse employees, an increase in ethnic diversity can instead reinforce stereotypes and the reproduction of

social hierarchies defined by ethnicity (Ely & Thomas 2001, 2020; Ortlieb & Sieben 2013). This study pays particular attention to whether the correlation between ethnic diversity and performance is interrelated with ethnic inequality within firms.

## Research hypotheses

The relationship between ethnic diversity and productivity is multifaceted, with several potential mechanisms linking the two. The literature review provides the basis for three hypotheses about these mechanisms.

H1: Ethnic representation in management strengthens the association between ethnic diversity and firm productivity.

H2: Firms with low ethnic wage inequality display a stronger association between ethnic diversity and firm productivity.

H3: Firms in industries for which innovation and the development of new products are important display a stronger association between ethnic diversity and firm productivity.

The first two are related to firm-internal characteristics and include representation in management and ethnic integration in the firm; that is, diversity in management and low ethnic inequality are proxies for integration, as these measures signal opportunities for firm-internal occupational mobility, and the former can signal a stronger awareness and commitment to diversity management in the firm. The third mechanism concerns the type of industry, as competencies related to ethnic background can be highly critical for performance enhancement in specific types of competitive and innovative industries.

We operationalize the measures of ethnic diversity in two capacities: the Blau index and the proportional measure. More precisely, we measure diversity from the number of distinct countries of birth among the employees of a company, and the proportional measure is the share of individuals born in a non-Nordic country. These are the two most frequently used measures in prior research and display different qualities of ethnic composition. Having a high proportion of immigrants can imply that a firm values diversity and uses it to develop itself. However, a firm that primarily hires immigrants from one country can have a high proportion of immigrants but low diversity. Single-country recruitment can imply that a firm uses foreign labor primarily as a staffing strategy or to gain access to, and legitimacy in, new markets. In this regard, the added value of diversity can be negative or even negligible (Ely & Thomas 2001). The Blau index, in contrast, provides information about the composition of firms' ethnic diversity. Firms with a high Blau index value recruit foreign workers from many different countries. Having higher levels of complex diversity can imply that a firm sees diversity as a central characteristic of work and work processes or that the firm requires and can retain specialist competence from many parts of the world. Because of this, we argue that the Blau index comes closest to the concept of diversity. Our firm-level outcome is operating margin, which measures how

much profit a company makes on 1 kroner of sales after paying for variable costs of production, such as wages and raw materials, but before paying interest or tax.

## The Norwegian context

Immigrants make up a significant proportion of the Norwegian population. At the beginning of 2021, around 800,000 immigrants lived in Norway, constituting just under 15% of the population (Statistics Norway 2021). The immigrant population is diverse, with most stemming from countries within the European Union (EU) (7%), followed by Asia (including Turkey) (6.2%), Africa (2.6%), and non-EU countries (1.9%). Immigrants from North and South America and Oceania constitute less than 1% of the population. Among the regions, immigration from specific countries dominates the statistics. Of the immigrants from EU countries, most originate from Poland, Lithuania, and Sweden; Asian immigrants mainly come from Pakistan, Syria, Iraq, the Philippines, Vietnam, and Turkey; the largest country groups from the African continent are Somalia and Eritrea; and immigrants from Bosnia-Herzegovina and the UK make up a significant share of the non-EU European category. Taken together, these 13 countries make up 50% of the immigrant population (Statistics Norway, table 09817).

Although there are significant immigrant populations in all municipalities in Norway, the capital city of Oslo has the highest number of immigrants and immigrant descendants (Dzamarija 2017). The education and skills profile of the immigrant population is diverse. Whereas the share of individuals with only a lower secondary education is significantly higher among immigrants than natives,[3] at the other end of the spectrum, almost one-third of research personnel in Norway are immigrants (Gunnes & Steine 2020).

The Norwegian economy can be characterized as consisting predominantly of small- and medium-sized enterprises. Most firms have fewer than 10 employees (90%), and less than 2% of firms have more than 50 employees (Statistics Norway, table 07091). For firms with more than 10 employees, the most common industries are repairs (11.6%), skilled services (11.3%), the primary sector (10.8%), property sales and services (10.3%), and health and social services (9%) (Statistics Norway, table 10309).

The Norwegian labor market is well-regulated with relatively high organizational levels at both the employee and employer's side. According to recent statistics, 70% of employees work in an organized firm and 52% of surveyed firms reported membership of an employer association (Alsos et al. 2021). The share of organized firms and firms with collective agreements is the lowest in property sales and services, skilled services, hospitality, retail and repairs, and the primary sector (Alsos et al. 2021). These are also industries that have a large share of immigrant workers.

## Data

We use Norwegian linked employer–employee (LEE) registry data from Statistics Norway (SSB), which hold information about employee characteristics such as age, gender, education, country of origin, and parents' country of origin. Our sample includes

all individuals employed in Norway between 2008 and 2018 in the 20–66 years age group. We link the LEE data with the Norwegian Business and Enterprise Register, which provides information on firm-level outcomes, from which we can calculate the operating margin of each firm in the private sector in Norway. One caveat is that these data do not cover the informal sector. Hence, we have no information on unregistered firms, unregistered profits, and uncontracted labor in our sample. Immigrant employees or owners may be overrepresented in these firms because immigrant employees are more likely to have a marginalized labor market position that can be exploited, and owners may have less information about, or incentive to fulfil, the requirements in the Work Environment and Tax legislation (Gulliksen 2014). Nevertheless, since we are interested in how ethnic diversity relates to firm-level productivity, the informal part of the economy is less of a concern because work-related crime cannot further labor market inclusion.

## Independent variables

We use two measures of ethnic diversity among firms' management and the rest of the their staff, namely the share of employees who are immigrants from outside of the Nordic region and the Blau diversity index. The Blau index is given by

$$\text{Blau} = 1 - \sum_{i=1}^{k} p_1^2,$$

where $p$ is the share of employees in a firm from country $k$ summed over all the country groups that exist in that firm. For example, if all members of staff have the same country of origin, then THE Blau index will be 0. If everyone in the firm is from a different country, the index will near 1 (Rushton 2008). The more countries that are represented, the closer the value of the index will be to 1.

We use immigrants' position in firms' wage distribution to measure ethnic inequality within firms. More precisely, we calculate the average relative wage (percentile) of immigrants for each of the firms in our sample. This gives an indication for the extent to which immigrants are integrated into all aspects of firms or whether ethnic niches exist within firms, reflected in pay differences between immigrants and natives.

In our analyses, we control for other firm-level characteristics, which aggregate from the individual-level data and include the share of employees with the highest level of education at primary school, college, and university levels; average age of employees; share of female employees; average tenure among employees; number of employees in the firm; share of employees in management; average wage; and year.

We look at the differences in the relationship between ethnic diversity and productivity for different industries in Norway. Next, we divide the economy into categories following the Nomenclature of Economic Activities (NACE), a standard classification system of similar European industries that groups together business activities that have common features. We use the level 1 NACE codes that divide the economy into 13 categories based on the types of goods or services that are produced. Thus, our results can be compared with those of studies from other countries that have also used the same standard classification of economic activity.

### Dependent variables

We use operating margin as a measure of performance. The operating margin shows how much a firm makes on each Norwegian crown (NOK) of sales (before interest and tax). A high operating margin means that the firm earns a significant amount per NOK traded. An advantage of this measure is that it considers both turnover and costs. For example, one reason why a firm may have a higher turnover per employee, compared to another, may be the difference in costs related to the production of goods or services. With the operating margin, however, it is easier to compare companies with different financial sizes and expense levels. We use the inverse hyperbolic sine transformation (IHS) of the operating margin variable to enable our results to be interpreted as percentage changes in the outcome variable. We use the IHS, instead of log transformation, because some companies have a zero or negative operating margin. In contrast to logarithmic transformation, the IHS transformation works with data defined on the entire real line, including negative values and zeros (Burbidge et al. 1988).

## Methods

### Regression analysis

We estimate the relationship between ethnic diversity and firm performance with operating margin as our measure. First, we estimate ordinary least squares (OLS) regressions, followed by a fixed-effects estimation, where the latter is given by

$$y_{ft} = \alpha + \beta_1 diversity_{ft} + \beta_1 diversity\_management_{ft} + \beta_2 X_{ft} + \phi_f + \varepsilon_{it},$$

where $y_{ft}$ represents the IHS transformation of firm *f*'s operating margin in year *t*. The explanatory variables of interest are $diversity_{ft}$ and $diversity\_management_{ft}$, which are measures of ethnic diversity in firm *f* in year *t* for all workers in the firm and among managers, respectively. Diversity is measured either as the share of non-Nordic immigrants or as the Blau index of the number of countries represented in firms. We control for time-variant firm-specific variables $X_{ft}$, such as share of workers in various education categories and occupations, number of employees, average age of workers, and share of female employees. $\phi_f$ is a firm fixed effect.

The key advantage of the fixed-effects model is that it allows us to control for all time-invariant omitted variables. This is especially important in our setting, in which observable and unobservable differences in firms are likely to impact both ethnic diversity and firm-level outcomes, which we cannot fully control for in the OLS setting. During the period of our study, immigration to Norway increased steadily, especially from Eastern and Central European EU countries. This increase in total immigration allows us to utilize the differences in the changes in immigrant workers at the firm level to identify a within-firm effect on operating margin. We adjust the regressions for possible confounders that could affect the relationship between ethnic diversity and operating margins. This serves to isolate as much as possible the impact of changes in diversity on operating margin; for example, to hire many immigrants could increase productivity through confounders such as having more staff, altering

the average age of staff, or changing the level of education among staff. We therefore want to control for these variables to get as close as possible to estimating the relationship between ethnic diversity and productivity. Our choice of control variables is guided by these considerations as well as the availability of data and the controls used in the existing literature.

## Results

### Descriptive statistics

Table 1 provides an overview of the key variables and categories used in the analysis.

**Table 1** Descriptive statistics

| Variable | N | Mean | Std. Dev. |
|---|---|---|---|
| **Diversity measures** | | | |
| Non-Nordic Immigrant % | 311,640 | 14.094 | 21.334 |
| Non-Nordic Immigrant, leader % | 249,434 | 4.193 | 17.006 |
| Blau index | 311,640 | .196 | .21 |
| Blau index, leader | 249,434 | .032 | .108 |
| **Dependent variable** | | | |
| Operating margin (IHS trans) | 243,243 | .02713 | .233 |
| **Control variables** | | | |
| *Share with highest education:* | | | |
| Primary school | 311,640 | .2 | .168 |
| College | 311,640 | .48 | .227 |
| University | 311,640 | .274 | .262 |
| Average age | 311,640 | 40.1 | 6.467 |
| Share female | 311,640 | .392 | .308 |
| Years in firm | 311,640 | 5.761 | 2.164 |
| Employees in firm | 307,442 | 67.542 | 360.554 |
| Share in management | 311,640 | .104 | .108 |
| Average wage | 311,598 | 453,970 | 210,202 |
| Year | 319,464 | 2013.245 | 3.168 |

The descriptive statistics in Table 2 display the firm-level ethnic diversity of all firms[4] as well as the differences in firm-level ethnic diversity by private and public sectors, number of employees, regions of Norway, exports, and size of capital stock. Table 2 shows how diverse Norwegian firms are and the extent to which diversity is evenly distributed across different types of firms and labor market segments. Because we use fixed-effects

**Table 2** Percentage share of immigrants in firms and Blau index by firm characteristics

| Share of immigrants | Share % | Blau |
|---|---|---|
| All countries | 20.08 | |
| Outside of Nordics | 18.16 | |
| World region 2 | 8.57 | |
| **Private/public sector** | | |
| Private sector | 21.73 | 0.22 |
| Public sector | 10.67 | 0.2 |
| **Number of employees** | | |
| 10–19 | 18.85 | 0.23 |
| 20–49 | 18.55 | 0.25 |
| 50–99 | 19.92 | 0.26 |
| 100–249 | 17.3 | 0.25 |
| 250–499 | 15.17 | 0.24 |
| 500+ | 13.76 | 0.25 |
| **Regions of Norway** | | |
| Oslo and Akershus | 24.6 | 0.25 |
| Southern and Eastern Norway | 19.61 | 0.21 |
| Western Norway | 18.34 | 0.21 |
| Agder and Rogaland | 18.27 | 0.2 |
| Northern Norway | 15.7 | 0.17 |
| Hedmark and Oppland | 14.28 | 0.16 |
| **Export** | | |
| No export | 20.98 | 0.21 |
| Export | 13.59 | 0.21 |
| **Capital** | | |
| Capital below average | 19.82 | 0.25 |
| Capital above average | 13.04 | 0.22 |

regressions in our analysis, any time-invariant firm characteristics will be incorporated in the fixed portion of the regression. The descriptive statistics in the table thus give an overview of the landscape.

On average, 20% of employees in firms are immigrants, including those from Nordic countries, whereas the proportion of immigrants from countries outside of the Nordic region is 18%. Next, the average private sector firm is more diverse than public sector firms. Third, small- and medium-sized firms are more diverse than large firms. Fourth, firm-level diversity is more pronounced in the capital region of Oslo and Akershus. This pattern is consistent with the central-peripheral axis, since there is a higher concentration of people with an immigrant background in cities and suburbs. Fifth, firms

that export products have a lower proportion of immigrants than non-exporting firms, whereas the Blau index is similar across exporting and non-exporting firms. This suggests that ethnic diversity in exporting firms is more heterogeneous, with several country backgrounds represented, compared with non-exporting firms. These results are in line with the findings of other studies, which have shown that firms targeting an international market can benefit from employees with an international background (Solheim & Fitjar 2018). Alternatively, it is possible that exporting firms require more specialized labor, which implies that these firms needed to search internationally for specialist competence. Finally, firms with below-average capital are more diverse than those with capital above average.

Figure 1 presents the variation in firm-level ethnic diversity by industry. The industry with the highest share of non-Nordic immigrants is hospitality/dining, followed by business services (security services and cleaning) and construction. According to the Blau index of diversity, the most diverse firms are in hospitality, business services, and manufacturing. The least diverse industries according to both measures are scientific/academic services, IT/communications, and public services. The differences between the proportional measure and the Blau index of diversity suggest that firms have different motives for recruiting foreign workers, which might affect the relationship between diversity and firm-level productivity. A high proportion of immigrants but low scores on the Blau index of diversity can, for example, signal that firms use foreign workers to meet short- to medium-term staffing shortages. This is typically seen in the construction and agriculture sectors, where employers hire many workers from a limited number of countries, often using local staffing agencies (Friberg & Midtbøen 2017).

**Figure 1** Ethnic diversity by industry.

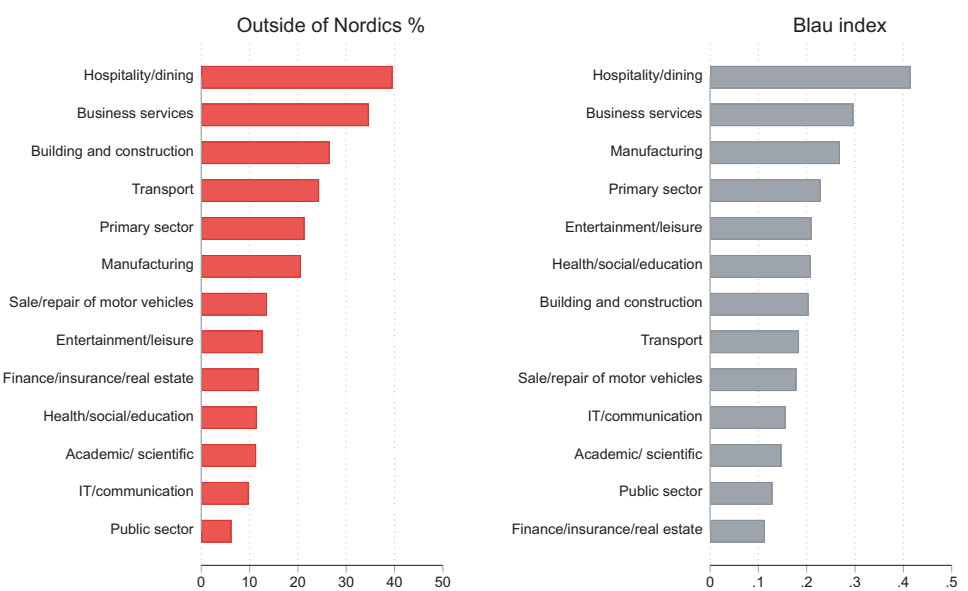
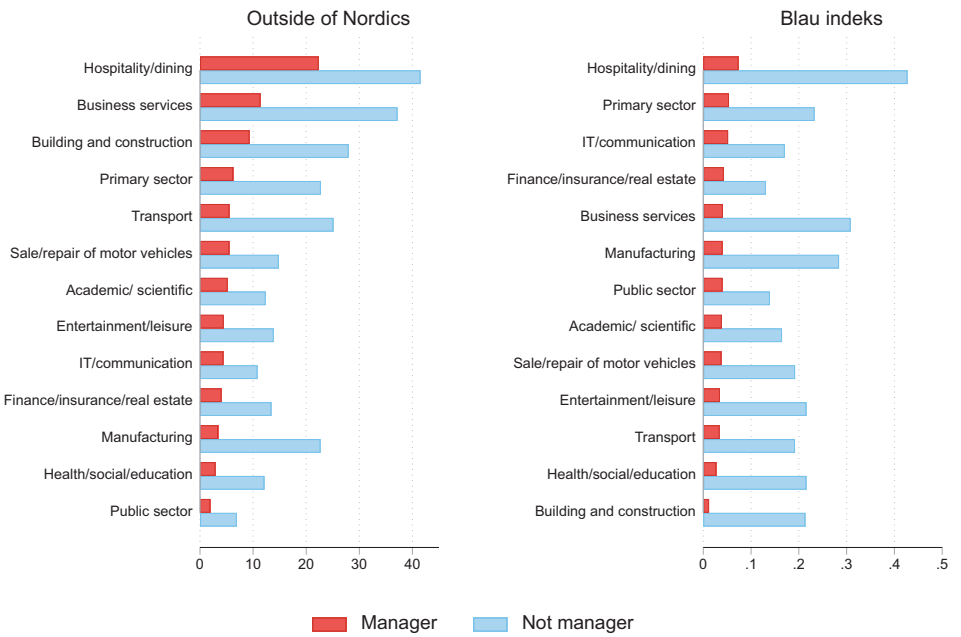


Figure 2 shows that the highest proportion of immigrant managers is in the hospitality industry, followed by business services. Thus, firms in the most diverse industries also have the most diverse managerial groups. The lowest representation of immigrants among management is in public administration, health, and social services. The Blau index values, in contrast, are mostly consistent across sectors. One explanation for this could be that there are relatively few management positions within most firms, which limits opportunities for high diversity in management.

**Figure 2** Ethnic diversity in managerial and non-managerial occupations.




## Regression results: Ethnic diversity and firm performance

Table 3 shows the OLS regression results for all private sector firms, with operating margin as the dependent variable. The four model specifications include ethnic diversity among all employees as well as this measure interacted with ethnic diversity among managers for the proportional measure and the Blau index, respectively. All four columns display no statistically significant correlation between ethnic diversity and the operating margin, neither for all employees nor when the measure is interacted with diversity in management.[5]

The results from the OLS regressions show average differences between *and* within enterprises over time in the association between ethnic diversity and operating margin. Therefore, the correlations between ethnic diversity and productivity in Table 3 are a combination of sorting (how immigrants are distributed between different types of enterprises) and within-firm changes over time. Hence, we cannot interpret these results, as ethnic diversity is attributed to lower or higher firm performance. For example, it is

possible that there are entry barriers to more profitable firms for immigrants; thus, unobserved firm characteristics determine both the level of diversity and firm performance. To account for this, we also include fixed-effects regressions. Because fixed-effects regressions estimate the impact of changes in ethnic diversity over time within enterprises, the results are less biased by being sorted into different types of companies.

Table 4 displays the relationship between changes in firm-level diversity over time and the firms' operating margin in a fixed-effects estimation.

**Table 3** Relationship between ethnic diversity and operating margin (OLS)

*Dependent variable: operating margin (logarithm)*

| | (1) Imm.% | (2) Imm.% | (3) Blau index | (4) Blau Index |
|---|---|---|---|---|
| Diversity | −0.0000601 | −0.000147 | −0.0165 | −0.0142 |
| | (−0.58) | (−0.98) | (−1.59) | (−1.43) |
| Diversity, manager | | −0.000358 | | −0.0253 |
| | | (−1.36) | | (−1.00) |
| Diversity # Diversity, manager | | 0.00000670 | | −0.0279 |
| | | (1.84) | | (−0.70) |
| Constant | 0.0932*** | 0.115*** | 0.107*** | 0.129*** |
| | (6.05) | (4.82) | (6.98) | (5.84) |
| Control var. | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes |
| R-squared | 0.0366 | 0.0381 | 0.0368 | 0.0385 |
| Observations | 174,298 | 144,992 | 174,298 | 144,992 |

*t* statistics in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Note: The table shows the results from least squares (OLS) regressions. The control variables are the share of employees with the highest level of education at the primary school, college, and university levels; average age of employees; share of female employees; average tenure among employees; number of employees in the firm; share of employees in management; average wage; and an indicator variable for each region and industry.

**Table 4** Ethnic diversity and operating margin (fixed-effects model)

*Depending on variable: operating margin (logarithm)*

| | (1) Imm.% | (2) Imm.% | (3) Blau index | (4) Blau Index |
|---|---|---|---|---|
| Diversity | 0.000126* | 0.000150 | 0.00803 | 0.00941 |
| | (2.00) | (1.92) | (1.62) | (1.59) |
| Diversity, manager | | −0.0000591 | | −0.00448 |
| | | (−0.69) | | (−0.43) |
| Diversity # Diversity, manager | | 0.00000229 | | 0.0484* |
| | | (1.33) | | (2.31) |
| Constant | 0.0718*** | 0.0741*** | 0.0756*** | 0.0768*** |
| | (6.03) | (5.18) | (6.58) | (5.57) |

(*Continued*)

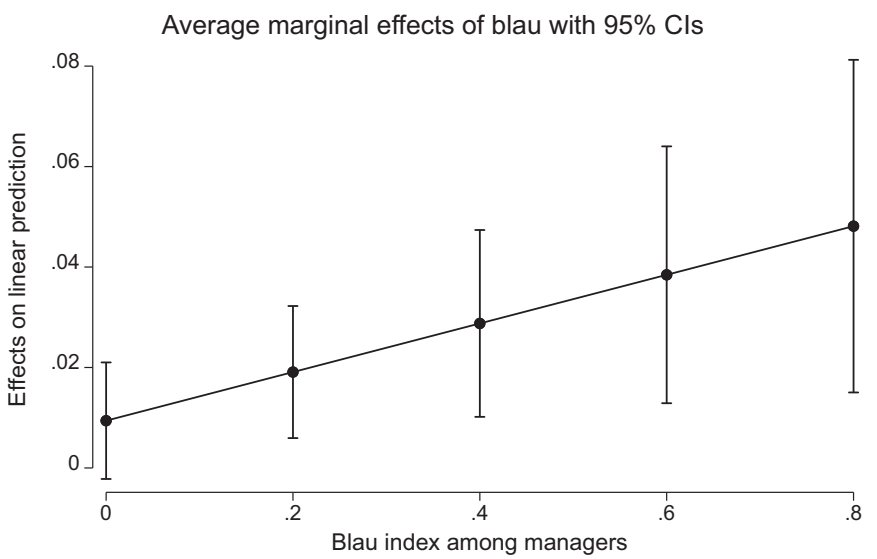
**Table 4** (*Continued*)

| | (1) Imm.% | (2) Imm.% | (3) Blau index | (4) Blau Index |
|---|---|---|---|---|
| Control var. | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes |
| R-squared | 0.721 | 0.740 | 0.721 | 0.740 |
| Observations | 155,582 | 130,631 | 155,582 | 130,631 |

*t* statistics in parentheses. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.
Note: The table shows the results from fixed-effects regressions. The control variables are the same as those in Table 4.

We find a positive and significant relationship between the percentage of immigrants in the firm and the operating margin (Table 4, column 1). The coefficient is not significant for the interaction between the proportion of immigrants in management and the rest of the firm (column 2). We do, however, find that the interaction term between diversity in the firm and diversity among managers is positive and statistically significant (Table 4, column 4).[6] To illustrate this relationship, Figure 3 plots the marginal effects of the significant interaction effect, showing that while the relationship between the Blau index and the operating margin is not statistically significant for firms with no immigrants in management positions, it is statistically significant and rises with increasing diversity among managers. One possible explanation for this can be that companies whose management is ethnically diverse are better able to utilize the diversity among the rest of the staff to improve productivity.

**Figure 3** Blau index and operating margin for various levels of diversity among managers.

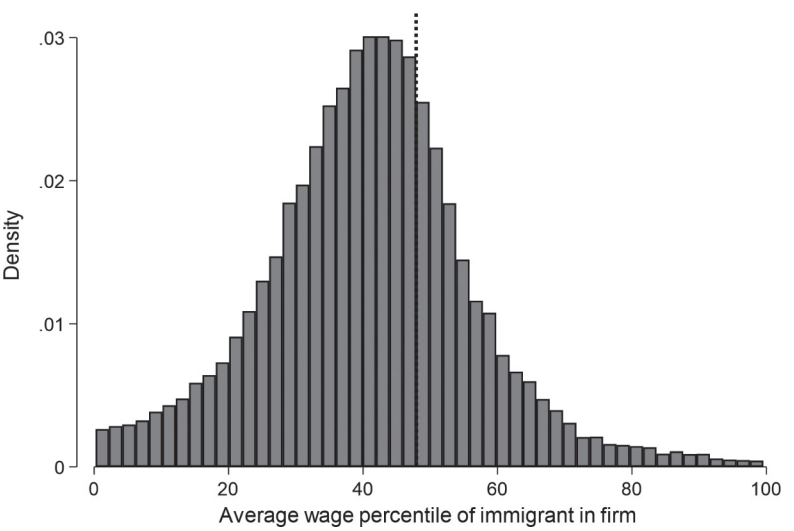


Overall, the coefficients of the fixed-effects models in Table 4 are larger/less negative than those in the OLS model in Table 3. This shows that changes in ethnic diversity within firms are more positively associated with productivity than the differences in ethnic diversity between firms. It also suggests that there is negative sorting (in terms of productivity) of immigrants in firms, which may either be due to the different preferences of immigrants regarding the sector and firms in which they choose to work or barriers to entry for immigrants to more profitable firms.

### *Placement of immigrants in firm wage distribution*

We now turn to investigating our second hypothesis that firms with small ethnic wage inequality display stronger associations between ethnic diversity and firm productivity. Figure 4 shows the distribution of the average wage percentiles of all the firms in our sample. The average percentile for immigrants is 43 of 100, and the figure shows that the distribution is skewed somewhat to the left, toward firms at which the average immigrant earns less on average than their native colleagues. We can also see significant differences in the extreme ends of the distribution, since there are more firms in which the average immigrant is in the bottom 20% of earners, compared to the top 20%.

**Figure 4** Distribution of the average within-firm wage percentile for immigrants.




We estimate the fixed effects equation for the relationship between the Blau index and operating margin separately for five quintiles of immigrants' positions in the wage distribution (Table 5). For all firms, the results suggest that the relationship between firm diversity and operating margin is negative and statistically significant for the lowest quintile, that is, firms in which immigrants are in the bottom 20% of the wage distribution. The relationship between firm diversity and operating margin is positive and statistically significant for the third quintile and positive but not statistically significant for the other quintiles.

We repeat our analysis for firms that have at least one immigrant employee in management (Table 6), which account for around 10% of the firms in our sample. For this sample, we find significant positive results for the third and fifth quintiles.

To compare the results in Tables 5 and 6, we show the coefficients of the relationship between the Blau index and the operating margins for all firms and for firms with diversity in management in Figure 5. The figure suggests that firms with immigrants in management positions follow a similar but more exaggerated pattern when compared with relative wage quintiles. The largest difference between the two types of firms is for firms whose immigrant wages are in the top quintile. For these firms, increased ethnic diversity is associated with a much higher operating margin, since one standard deviation in the Blau index is associated with an operating margin that is around 10 percentage points higher.[7]

**Table 5** Diversity and profitability by immigrant placement (All firms)

*Depending on variable: operating margin (logarithm)*

| | (1) 0–20th percentile | (2) 21st–40th percentile | (3) 41st–60th percentile | (4) 61st–80th percentile | (5) 81st–100th percentile |
|---|---|---|---|---|---|
| Diversity | −0.0861* | 0.0139 | 0.0260** | 0.00774 | 0.0119 |
| | (−2.53) | (1.10) | (2.69) | (0.32) | (0.25) |
| Constant | 0.163+ | 0.0596* | 0.0967** | 0.172** | −0.0717 |
| | (1.95) | (1.97) | (4.48) | (2.98) | (−0.68) |
| Control var. | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.847 | 0.790 | 0.739 | 0.814 | 0.782 |
| Observations | 11,489 | 35,266 | 48,201 | 10,526 | 9373 |

*t* statistics in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

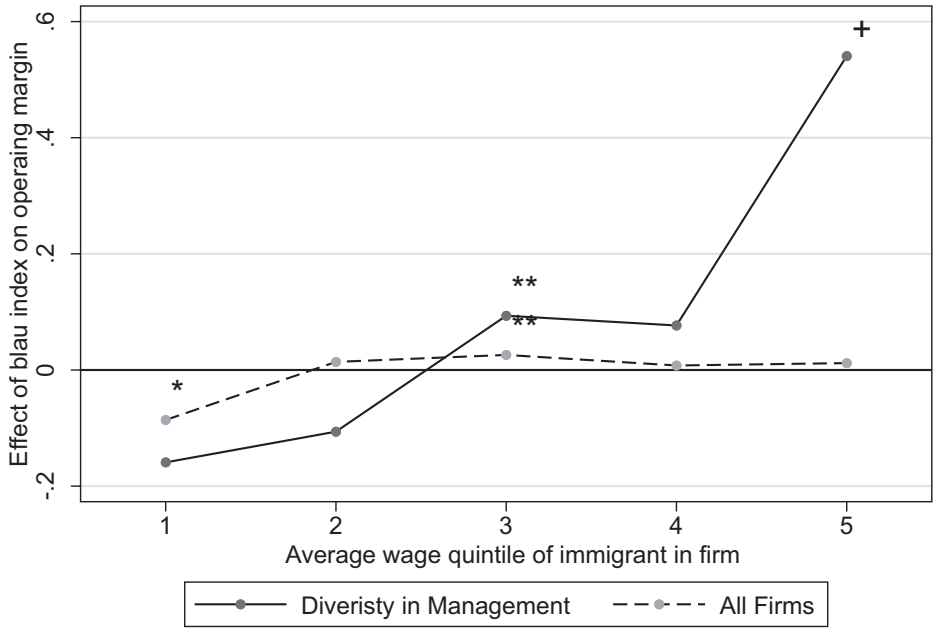
**Table 6** Diversity and profitability by immigrant placement: firms with diversity in management

*Dependent variable: operating margin (logarithm)*

| | (1) Blau index | (2) Blau index | (3) Blau index | (4) Blau index | (5) Blau index |
|---|---|---|---|---|---|
| Diversity | −0.159 | −0.106 | 0.0934** | 0.0767 | 0.541+ |
| | (−0.37) | (−0.91) | (2.95) | (0.92) | (1.89) |
| Constant | 1.908 | 0.127 | 0.131+ | 0.465* | 0.0141 |
| | (0.98) | (0.47) | (1.93) | (2.15) | (0.02) |
| Control var. | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.992 | 0.839 | 0.800 | 0.853 | 0.780 |
| Observations | 121 | 2377 | 10,208 | 1963 | 707 |

*t* statistics in parentheses +$p < 0.10$, *$p < 0.05$, **$p < 0.01$.

**Figure 5** Diversity and operating margin by immigrants' wage position.




Note: The following symbols denote statistical significance (+ p < 0.10, * p < 0.05, ** p < 0.01)

### *Industry*

Our third hypothesis states that firms in industries in which innovation and the development of new products are important display a stronger association between ethnic diversity and firm productivity. We explore this hypothesis with industry interaction terms in our OLS and fixed-effects specifications. We look at the differences in the relationship between ethnic diversity and productivity for the same categories of sectors as in Figure 1. Further, we exclude the public sector and primary industries because a significant share of firms in these sectors is owned by the government or is heavily subsidized, which would make operating margin an inaccurate measure of productivity for those sectors.

Table 7 shows that the correlations between ethnic diversity and operating margin vary considerably between different parts of the economy. The proportional measure displays a significant negative correlation between diversity and productivity for the IT/communications, academic and business sectors but a significant positive correlation for the finance and health/social/education sectors (Table 7, column 1). Moreover, the relationship between the proportion of non-Nordic immigrants among managers and the operating margin is statistically significant and positive for the sales, hospitality/dining, finance, and business services sectors, and significant and negative for the manufacturing and academic sectors.

The correlation between the Blau index and productivity also shows mixed results, as one sector shows positive correlation, four show negative correlation, and five show nonsignificant correlation between diversity and operating margin (Table 7, column 3). Furthermore, the Blau index among managers is positively linked to the operating

**Table 7** Relationship between ethnic diversity and operating margin OLS (industry)

*Average marginal effects. Dependent variable: operating margin (logarithm)*

| | (1) Imm. % | (2) Imm. %, manager | (3) Blau index | (4) Blau index, manager |
|---|---|---|---|---|
| *Economic Sector* | | | | |
| Manufacturing | 0.0000209 | −0.000651*** | −0.0100** | −0.0879*** |
| | (0.55) | (−5.58) | (−3.49) | (−4.99) |
| Building and construction | 0.0000544 | 0.000159 | −0.00487 | −0.0495 |
| | (1.30) | (1.28) | (−1.34) | (−2.21) |
| Sale/repair of motor vehicles | 0.0000633 | 0.000225* | −0.00237 | 0.0546* |
| | (1.93) | (2.33) | (−1.02) | (2.83) |
| Transport | −0.0000200 | −0.000165 | −0.00969* | −0.0522 |
| | (−0.66) | (−0.76) | (−2.88) | (−1.97) |
| Hospitality/dining | 0.0000728 | 0.000176* | −0.00813 | −0.0135 |
| | (1.89) | (2.53) | (−2.19) | (−1.63) |
| IT/communication | −0.00105*** | 0.000169 | −0.0853*** | −0.0274 |
| | (−6.72) | (1.54) | (−6.85) | (−2.06) |
| Finance/insurance/ real estate | 0.00112*** | 0.000267* | 0.0985*** | −0.209*** |
| | (6.19) | (2.61) | (7.37) | (−13.67) |
| Academic/scientific | −0.00149*** | −0.00179*** | −0.120*** | −0.330*** |
| | (−9.79) | (−17.08) | (−9.05) | (−15.71) |
| Business services | −0.0000477 | 0.000227* | −0.0176 | 0.0168 |
| | (−0.57) | (2.72) | (−2.05) | (1.52) |
| Health/social/ education | 0.000186** | 0.0000725 | 0.00769 | −0.0131 |
| | (4.27) | (1.79) | (2.16) | (−1.02) |
| Observations | 174,298 | 144,992 | 174,298 | 144,992 |

*t* statistics in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Note: The table shows results from least squares (OLS) regressions, where the variables for ethnic diversity are interacted with the industry categories. The results show average marginal correlations for each industry. The control variables are the same as those in Table 4.

margin for the sales industry but is either negatively linked or not significant for all other industries (Table 7, column 4).

The results, separated by industry, suggest significant variation in the relationship between ethnic diversity and firm performance, with most significant relationships being negative. Note, however, that the OSL estimates include sorting effects, that is, the possibility that negative relationships are driven by immigrants working in less productive firms.

In Table 8, we run the fixed-effects regressions for the Blau index separately for each industry category. With a fixed-effects approach, we look at the effect of a change

**Table 8** Ethnic diversity and operating margin (fixed-effect model), by industry

| | (1) Manufacturing | (2) Building and construction | (3) Sale/repair of motor vehicles | (4) Transport | (5) Hospitality / dining | (6) IT/ communication | (7) Finance/ real estate | (8) Academic/ scientific | (9) Business services | (10) Health/ social/ educ. |
|---|---|---|---|---|---|---|---|---|---|---|
| Blau index | 0.00814 | 0.0109 | 0.00249 | −0.0668 | 0.0281** | 0.0139 | 0.0336 | 0.0426 | 0.00888 | −0.0173 |
| | (0.70) | (1.11) | (0.47) | (−1.93) | (3.28) | (0.48) | (0.31) | (1.08) | (0.64) | (−1.61) |
| Blau index, manager | −0.0225 | 0.0263 | 0.0124* | 0.0127 | 0.0170* | 0.0234 | −0.0132 | −0.0127 | −0.0209 | −0.00845 |
| | (−1.69) | (1.53) | (2.02) | (0.31) | (2.02) | (1.06) | (−0.12) | (−0.33) | (−1.46) | (−0.58) |
| Constant | 0.142*** | 0.0204 | 0.0118 | 0.278** | −0.000649 | −0.0427 | −0.251 | 0.460** | 0.132*** | 0.206*** |
| | (4.91) | (0.94) | (0.69) | (2.63) | (−0.01) | (−0.40) | (−0.76) | (3.27) | (4.07) | (5.13) |
| Control var. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.657 | 0.510 | 0.586 | 0.645 | 0.726 | 0.675 | 0.806 | 0.666 | 0.623 | 0.506 |
| Observations | 23,638 | 23,318 | 43,877 | 7270 | 10,037 | 8916 | 1754 | 9070 | 7053 | 8183 |

*t* statistics in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Note: The table shows results from fixed-effects regressions by industry. The regressions include the following control variables: share of employees with the highest level of education at the primary school, college, or university level; average age of employees; share of female employees; average tenure among employees; number of employees in the firm; share of employees in management and average wage.

in diversity within firms for each of our industry categories. The results show a positive relationship between the Blau index and the operating margin for most industries (exceptions being the transport and health sectors). However, this relationship is only statistically significant for the hospitality industry, which has a positive coefficient (Table 8, column 5). For the hospitality industry, there is a statistically significant positive relationship between diversity and productivity for diversity among both managers and all staff. We also find a statistically significant positive relationship between diversity among managers and productivity for those in the sale/repair of motor vehicles sector. The results show that when considering industries separately, a within-firm increase in ethnic diversity is not statistically associated with changes in the operating margin of firms for most sectors, with the important exceptions being the hospitality and sales sectors. This suggests that the statistically significant coefficients in the OLS specification are predominantly driven by sorting effects—differences in the type of firms in which immigrants are more likely to work.

## Discussion

The rapid increase in the immigrant population in Norway over recent decades has placed immigration policies high on the political agenda. Although policies and the public discourse on immigrant integration often center on individual employability and cost to public finances, research on the scope and consequences of ethnic diversity at the firm level, and how it may contribute to firm performance, is limited. This study improves our understanding of the relationship between ethnic diversity and firm performance, since it explores how ethnic diversity contributes to firm productivity.

We used linked employer–employee registry data to measure ethnic diversity in Norwegian firms and assess how changes in ethnic diversity within firms relate to firm performance. The descriptive statistics showed that Norwegian firms are ethnically diverse, since approximately every fifth employee has a non-Nordic immigrant background. Next, the OLS estimations showed marginal and insignificant correlations between ethnic diversity and firm performance. This is in line with most previous studies (Herring 2017; Stojmenovska et al. 2017; Parotta et al. 2014; Trax et al. 2015; Richard et al. 2007). Moreover, the OLS estimations showed no correlation between diversity at the managerial level and firm-level productivity. The fixed-effects estimations, however, showed an increase in the proportion of immigrants in firms to be associated with higher productivity. When using the Blau index for diversity, we found the interaction between diversity in management and diversity for the rest of the firm to be positive. Yet, the relationship between ethnic diversity and operating margin was only positive and significant for higher levels of diversity among managers. Our findings give conditional support to hypothesis 1, since the interaction term between diversity and management and diversity in the firm was positive and statistically significant for the Blau measure of diversity. Nevertheless, this finding suggests that diversity among management can play an important role in ensuring that ethnic representation in firms is associated with higher performance—something that has been found in previous research (Andrevski et al. 2014; Nathan 2016; Roberson &

Park 2007). One argument from this body of literature is that diversity in management may signal both a diversity-friendly climate and a 'critical mass' that is necessary for organizational change. Increasing the number of minorities does not, by itself, promote profitability and effectiveness; what matters is whether the organization is willing to reshape its power structure to include new perspectives and individuals (Ely & Thomas 2001, 2020). Nevertheless, although this study demonstrates the importance of diversity in management positions to enhance firm performance in diverse organizations, it does not provide information about how management matters or which types of management styles may facilitate a diversity-friendly climate. An important task for future research is to explore in more detail the mechanisms between diversity among management and firm performance.

We found that firms for whom immigrants' wages are in the bottom 20% of their wage distribution have a negative association between ethnic diversity and operating margin, whereas firms with average or above average immigrants' wages have a positive association. This suggests that our results showing a positive relationship between ethnic diversity and operating margin are not driven by hiring immigrants in less well-paid positions in firms. To have diversity in management appears to accentuate these differences, since firms in the lowest quintile have a more negative coefficient and firms in the top quintile have a much larger positive coefficient, compared to companies without diversity in management. Our results support hypothesis 2, since firms at which the average immigrant has relatively higher wages display a stronger association between ethnic diversity and firm productivity that is even more pronounced among firms with diversity in management (Figure 3).

Finally, the analyses of sectorial differences suggest that the hospitality and dining industry contributes most to the positive statistically significant relationship of within-firm changes in ethnic diversity and firm performance. This finding is in line with that of Iversen et al. (2017), who also found significant and positive associations between the share of immigrant employees and firm performance in this industry. According to Iversen et al. (2017), the mechanisms involved are both higher productivity and substitution through cheaper labor when hiring immigrants. Comparing our fixed-effects with the OLS results shows that many of the statistically significant results at the sector level become insignificant when moving from OLS to the fixed-effects model. This suggests that many of the results of the OLS model are driven by sorting effects and not from changes in ethnic diversity in firms over time. Again, we conclude in support of our third hypothesis, since we found significant variation in the association between ethnic diversity and firm-level performance across industries (Tables 7 and 8).

## Conclusion

The most important takeaway message from this study is that changes in ethnic diversity within firms, on average, either display positive or no association with firm-level performance. This implies that increasing ethnic diversity does not threaten firm performance (Brunow & Nijkamp 2018). The positive associations that appear when a firm has ethnic diversity at the managerial level suggest that firms can stand to

gain from using ethnic diversity as a strategic resource in future development. Our analysis of where immigrants are placed in firms' wage distribution rejects the idea that the positive relationship between ethnic diversity and productivity is driven by hiring immigrants in low-paying positions. In fact, we find that for firms that hire immigrants in the lowest wage quintile, diversity is negatively associated with operating margin. This negative association suggests that while hiring immigrant workers predominantly in low-paying occupations may reduce firms' wage bills, it can also lead to negative effects on productivity. Ethnic niches at the bottom of firms' wage distribution can lead to immigrant workers feeling that they are being unfairly treated and undervalued, which can in turn lead to lower overall productivity for the firms. In such cases, even firms with ethnically diverse management do not experience the positive productivity effects identified for other firms that place immigrants higher in their wage distribution.

We hypothesized that ethnic diversity would display positive associations with firm-level performance. Our hypotheses were based on previous research and theories about complementarities in human and social capital in ethnically diverse firms. These hypotheses received conditional support. This is not surprising, considering that firms are complex organizations in different market niches. Our results show a great deal of heterogeneity between sectors regarding the relationship between ethnic diversity and firm performance. This difference between sectors could be due to the extent to which tasks within firms can be carried out in different ways. For example, while some sectors are dominated by occupations that have standardized repetitive tasks that have little scope for innovation, others include jobs where skills and levels of innovation at the individual level directly affect firm productivity. However, employers' desire for increased productivity should not be the main motivation for the inclusion of ethnic minorities. As evident from our results, a positive association between diversity and productivity appears under specific conditions. However, irrespective of whether ethnic diversity is profitable or not, it is necessary for maintaining principles of fairness and inclusion in employment. These principles are reflected in the national regulatory framework, which is designed to prevent discrimination and promote fair hiring procedures. Furthermore, our results suggest that discriminating against immigrants by paying them less than native workers will not increase firm-level productivity or contribute to economic growth.

Our findings should be generalizable to other countries. The national institutional setting, however, is important, and the relationship between ethnic diversity and productivity is likely to be affected by the balance of power between employees and employers. Therefore, our findings are most relevant for the Nordics and other countries with similar institutional settings.

Overall, this study accentuates recent contributions that demonstrate the relevance of zooming in on the context in which diversity is played out. The profitability of diversity depends on both firm-internal characteristics, such as ethnic diversity at the management level, and firm-external characteristics, such as the type of industry. By shifting the focus from diversity as a key explanatory variable toward the interaction effect between diversity and contextual influences, this study has contributed to identifying important mechanisms that explain the association between diversity and firm performance.

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## Notes

[1] Statistics Norway, table 05183.

[2] The unemployment rate was between 2% and 4.5% in the 20–64-years age group (Statistics Norway, table 08518).

[3] Forty percent among immigrants, compared with 17% among Norwegians without an immigrant background (SSB 2020).

[4] These descriptive statistics are a snapshot of 2018. More detailed statistics are provided in Umblijs, Orupabo & Drange (2022).

[5] Table A1 in the Appendix shows the results for the immigrant share when this group is defined as consisting of those coming from Africa, Asia, Latin America, and Europe (outside the EEA). The results were also not significant for this group.

[6] Tables A2 and A3 provide results with different immigrant groups and definitions of Blau index; the results are similar to those in Table 5.
[7] One standard deviation of the Blau index is 0.2102.

## Appendix

**Table A1** Ethnic diversity and operating margin (OLS), different immigrant groups

| | (1) Not Nordic % | (2) Not Nordic % | (3) World region 2 % | (4) World region 2 % |
|---|---|---|---|---|
| Diversity | −0.0000123 | −0.000271 | −0.0165 | −0.0142 |
| | (−0.12) | (−1.61) | (−1.59) | (−1.43) |
| Diversity, manager | | −0.0000777 | | −0.0253 |
| | | (−0.34) | | (−1.00) |
| Diversity # Diversity, manager | | 0.00000639 | | −0.0279 |
| | | (1.54) | | (−0.70) |
| Constant | 0.0846*** | 0.104*** | 0.107*** | 0.129*** |
| | (6.45) | (5.78) | (6.98) | (5.84) |
| Control var. | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes |
| R-squared | 0.0366 | 0.0381 | 0.0368 | 0.0385 |
| Observations | 174,298 | 144,992 | 174,298 | 144,992 |

*t* statistics in parentheses. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table A1 shows the relationship between share of immigrants and operating margin for immigrants from World region 2 (columns 3 and 4), where this group is defined as countries in Asia, Africa, Latin America, Oceania (outside Australia and New Zealand), and Europe (outside the EU/EEA).

**Table A2** Ethnic diversity and operating margin (FE), different immigrant groups

| | (1) Not Nordic % | (2) Not Nordic % | (3) World region 2 % | (4) World region 2 % |
|---|---|---|---|---|
| Diversity | 0.000126* | 0.000150 | 0.0000343 | 0.0000729 |
| | (2.00) | (1.92) | (0.43) | (0.71) |
| Diversity, manager | | −0.0000591 | | 0.000130 |
| | | (−0.69) | | (1.19) |
| Diversity # Diversity, manager | | 0.00000229 | | 0.000000866 |
| | | (1.33) | | (0.35) |
| Constant | 0.0718*** | 0.0741*** | 0.0806*** | 0.0850*** |
| | (6.03) | (5.18) | (7.31) | (6.44) |
| Control var. | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes |
| R-squared | 0.721 | 0.740 | 0.721 | 0.740 |
| Observations | 155,582 | 130,631 | 155,582 | 130,631 |

Table A2 shows the fixed-effects results for the immigrant share when this group is defined as those coming from Africa, Asia, Latin America and Europe (outside of the EEA), instead of all non-Nordic countries. For this grouping, none of the specifications are significant.

**Table A3** Ethnic diversity and operating margin (OLS), World region Blau index

| | (1) OLS | (2) OLS | (3) FE | (4) FE |
|---|---|---|---|---|
| Diversity | −0.0345 | −0.0109 | 0.00866 | 0.00148 |
| | (−1.99) | (−1.09) | (1.46) | (0.24) |
| Diversity, manager | | −0.0507 | | −0.0161 |
| | | (−1.37) | | (−1.58) |
| Diversity # Diversity, manager | | −0.0829 | | 0.0724*** |
| | | (−0.76) | | (3.35) |
| Constant | 0.0335*** | 0.0329*** | 0.0813*** | 0.0815*** |
| | (7.08) | (7.64) | (5.96) | (5.96) |
| Control var. | No | No | Yes | Yes |
| Year dummies | No | No | Yes | Yes |
| R-squared | 0.000930 | 0.00431 | 0.740 | 0.740 |
| Observations | 186,379 | 186,379 | 130,631 | 130,631 |

*t* statistics in parentheses. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table A3 shows OLS and fixed effects results using the Blau index for diversity, where the Blau index is defined by diversity in eight world region groups, instead of country of birth. The results are like those in Table 5, with a somewhat higher coefficient for the interaction term with diversity among management.