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# **FIRM-LEVEL HIRING DIFFICULTIES IN MANUFACTURING SMEs: THE ROLE OF WORKFORCE MIGRATION, FIRM CHARACTERISTICS, AND GROWTH EXPECTATIONS**

UDC / UDK: 331.55:334.012.61-022.51/.55(497.115)  
JEL classification / JEL klasifikacija: J23, J24, J60, L25  
DOI: 10.17818/EMIP/2025/7  
Original scientific paper / Izvorni znanstveni rad  
Received / Prilmljeno: June 13, 2024 / 13. lipnja 2024.  
Accepted / Prihvaćeno: November 11, 2024 / 11. studenoga 2024.

## ***Abstract***

*Skilled workforce shortages pose a significant challenge to the growth and development of small and medium-sized enterprises (SMEs), particularly in transition economies like Kosovo. This study examines the impact of workforce migration, firm characteristics, and growth expectations on hiring difficulties faced by manufacturing SMEs. Using a probit binary choice model, the research explores how employee migration, firm growth ambitions, and training practices affect the likelihood of firms encountering difficulties in filling vacancies for skilled labor. Data from a sample of 217 randomly selected manufacturing firms in Kosovo, drawn from the Database of Active Taxpayers, forms the basis of the analysis. The findings reveal that firms experiencing employee migration and those with growth ambitions are more likely to struggle with recruitment, particularly when investing in employee training. Conversely, exporting firms report fewer hiring challenges. The study offers several managerial and policy recommendations to mitigate skills shortages and improve recruitment outcomes in Kosovo's SMEs.*

***Keywords: SMEs, Skills Shortage, Hiring Difficulties, Migration, Labor Market, Workforce Development, Economic Growth***

## 1. INTRODUCTION

The availability of a skilled workforce is critical to the success of small and medium-sized enterprises (SMEs), particularly in the manufacturing sector, which relies heavily on technical expertise and specialized labor. However, skills shortages have become a pervasive challenge, especially in transition economies like Kosovo, where the emigration of skilled workers (often referred to as brain drain) exacerbates existing recruitment difficulties. This outflow of talent leaves local firms struggling to attract and retain the skilled workers necessary for business growth, ultimately limiting their ability to compete in both domestic and global markets.

In addressing the central issue of hiring difficulties, this paper focuses on two key concepts: skills shortage and highly skilled workers. A shortage of skills occurs when firms cannot find candidates with the necessary qualifications to fill job vacancies, while highly skilled workers are those who possess specialized knowledge, technical abilities, or advanced qualifications critical to industries like manufacturing. In Kosovo, the scarcity of such workers is further intensified by the migration of skilled labor, as high levels of emigration deplete the local talent pool.

While there is substantial research on hiring difficulties and skills shortages, much of the existing literature centers on developed economies where the issue is framed around labor market inefficiencies and mismatches between educational output and industry needs (Fabling et al., 2022; Glennon, 2024). Fabling et al. (2022) examine the impact of skilled migrants on firm productivity in New Zealand, demonstrating that the inflow of migrant labor can mitigate domestic skills shortages. Similarly, Glennon (2024) explores how skilled immigration drives innovation and productivity in U.S. firms, emphasizing the positive effects of immigration policies that facilitate the hiring of highly skilled foreign workers.

In contrast, this paper shifts the focus to a transition economy – Kosovo – where the outflow of skilled labor, rather than inflows, creates significant recruitment challenges for SMEs. This study explores how workforce migration, combined with firm characteristics and growth expectations, intensifies hiring difficulties in Kosovo's manufacturing sector. The interplay between these factors has not been adequately examined in existing research, particularly in contexts where high emigration rates exacerbate skills shortages, making this study unique in its focus and regional context.

Moreover, while previous studies like Le Barbanchon, Ronchi, and Sauvagnat (2023) and Bertheau et al. (2023) examine the role of hiring frictions – such as search costs and training investments – on firm growth, they primarily focus on labor market frictions in developed countries. These studies highlight that non-wage factors like training time and recruitment inefficiencies are often more significant barriers to hiring than wages alone. However, they do not account for the unique pressures faced by SMEs in economies like Kosovo, where high emigration rates further complicate recruitment.

This study makes three key contributions to literature. First, it highlights the critical role of workforce migration in shaping hiring difficulties in a transition

economy, demonstrating how the outflow of skilled workers compounds the recruitment challenges faced by manufacturing SMEs. Second, it introduces firm growth expectations as a variable that intensifies hiring difficulties, particularly for firms that aim to expand but struggle to secure the necessary talent. This focus on growth expectations fills an important gap in the existing literature, as previous studies have primarily examined the effects of hiring difficulties on firm performance without exploring the impact of firms' ambitions on their recruitment outcomes. Third, this study provides policy recommendations tailored to the unique challenges of Kosovo's labor market, offering strategies to mitigate the effects of brain drain and improve the recruitment and retention of skilled workers.

In summary, this paper addresses the pressing issue of hiring difficulties in Kosovo's manufacturing SMEs by examining the intersection of workforce migration, firm characteristics, and growth expectations. It contributes to the broader understanding of how labor market frictions and migration trends shape recruitment challenges, offering insights that are critical for both policymakers and business leaders aiming to enhance workforce development and economic growth in transition economies.

## **2. DEFINITIONAL ISSUES OF "SKILLS SHORTAGE" AND "HIGHLY SKILLED WORKERS"**

Before exploring the impacts of workforce migration, education quality, and other influencing factors on the hiring challenges faced by SMEs, it is essential to clarify the terms skills shortage and highly skilled workers. These definitions are central to understanding the labor market dynamics that drive the recruitment difficulties experienced by firms in Kosovo.

Despite the wide recognition of skills shortages as a critical issue for firms and policymakers, its definition remains debated. According to Arrow and Capron (1959), a skills shortage occurs when firms have unfilled vacancies at prevailing market wages, indicating a mismatch between labor supply and demand. Barnow, Trutko, and Lerman (1998) similarly define skills shortages as a situation where the demand for workers exceeds the supply of available and willing labor at prevailing wage levels. Shah and Burke (2005) provide a slightly different perspective, describing a skills shortage as an imbalance between demand and supply in specific occupations, where there are not enough qualified candidates to fill vacancies under existing market conditions. Hard-to-fill vacancies, therefore, serve as an indicator of a skills shortage, as recognized by institutions like the Commonwealth Department of Employment and Workplace Relations.

Bosworth and Warren (1992) make an important distinction between external and internal skills shortages. External shortages occur when the overall labor market does not provide sufficient skilled workers to meet firms' needs, often due to geographical mismatches or high emigration rates, which is particularly relevant for Kosovo. In contrast, internal shortages arise when existing employees lack the necessary skills to perform their duties, or new hires fall short of meeting

job-specific requirements. Furthermore, skills gaps – a subset of skills shortages – refer to cases where employees do not possess the skill levels required by their roles. Firms experiencing rapid technological change are particularly vulnerable to these gaps, as they often need to upskill their workforce to maintain competitiveness (Bennet & McGuinness, 2009; Maré & Fabling, 2013).

In OECD countries, increasing shortages of highly skilled labor are anticipated in the coming years, with immigration often seen as a potential solution (Jonathan & Lemaître, 2009). Highly skilled workers are generally defined by their tertiary education levels or by the nature of their occupations. Some definitions also consider wage thresholds as a practical measure of skill level (Weinnar & Koppenfeils, 2020). While educational attainment is commonly used as a benchmark, some sectors recognize individuals without tertiary degrees, such as vocationally trained professionals – including welders or healthcare practitioners – as highly skilled due to their specialized technical expertise (Green & Green, 1995; Walsh, 2008). Similarly, professionals in niche fields like athletics or the arts are often regarded as highly skilled even in the absence of formal academic qualifications.

Educational reforms, such as the Bologna process, have influenced both skill alignment and job satisfaction, impacting the perceived adequacy of educational outcomes in addressing labor market needs. Despotović and Globan (2024) found that highly educated employees under the Bologna framework report higher levels of job dissatisfaction due to misalignment with market demands, highlighting how such reforms can exacerbate skills mismatches and contribute to hiring difficulties.

The globalization of industry in the 1990s underscored the need for international recruitment and the mobility of highly skilled workers, as firms faced growing demand for talent that could not be sourced locally (Salt, 1997). This shift led many countries to adapt their immigration policies to attract highly skilled individuals, resulting in a more context-dependent definition of the term. Contributions from various disciplines, including sociology and education, have enriched this understanding, allowing for a more adaptable definition based on the needs of different sectors and industries (Weinnar & Koppenfeils, 2020).

Given the specific context of this study – examining hiring difficulties in Kosovo's manufacturing SMEs – the definitions by Shah and Burke (2005) for skills shortage and a broad understanding of highly skilled workers are the most suitable. The Shah and Burke definition emphasizes the demand-supply mismatch under current market conditions, which aligns closely with the external shortages Kosovo faces due to high emigration rates. Furthermore, for highly skilled workers, a flexible definition that includes both tertiary-educated individuals and those with vocational training is appropriate. This reflects the realities of Kosovo's labor market, where both types of skilled labor are critical to the functioning of manufacturing SMEs. Therefore, this paper adopts these definitions to frame the analysis of how workforce migration, firm characteristics, and growth expectations impact hiring difficulties in Kosovo's SMEs.

### 3. WORKFORCE MIGRATION

The migration of the workforce is a historical and ongoing phenomenon, particularly dynamic in recent times with a focus on skilled labor migration. Since the mid-1990s, Western industrialized nations have spearheaded the transition to knowledge-based economies, promoting immigration policies aimed at attracting the skilled workers necessary for this shift (Czaika & Parsons, 2017; Williams & Baláz, 2014). These policies are driven by factors such as aging populations and skill shortages in knowledge-intensive sectors (Basri & Box, 2008; Kerr et al., 2016; Isaakyan & Triandafyllidou, 2016). Globalization has also played a significant role, increasing the frequency, distance, and duration of migration, facilitated by advancements in transportation technology (Faggian et al., 2017). Migration has evolved to become more voluntary and selective, with degree holders being more mobile than their less educated counterparts, necessitating separate analyses for high-skilled migration (Faggian et al., 2017).

The migration of skilled workers, or brain drain, from developing to developed economies, is a pressing issue. Talents and skills are now highly valued assets, and their migration has significant impacts, especially on smaller countries that suffer the most from the emigration of highly skilled individuals (Kuznetsov & Sabel, 2006). Highly skilled migrants are often high-earners and integrate quickly, making them a "wanted" migration flow (Triadafilopoulos, 2013). Rapoport (2016) notes that a significant portion of South-North migration is composed of highly skilled individuals, with the number of college-educated immigrants from developing countries doubling between 1990 and 2000 and now constituting over 40 percent of such migration (Beine et al., 2007). By 2008, most of the 27 member states had policies to attract highly skilled migrants, with post-communist Eastern European states being notable exceptions due to their underdeveloped industries (Cerna, 2009; Kloc-Nowak, 2013; Kaczmarczyk et al., 2012).

The introduction of the E.U.'s Blue Card Directive in 2009 addressed the need for a standardized mechanism for attracting highly skilled migrants, filling a critical policy gap (Cerna, 2013a). Projections indicate that the composition of the labor force in E.U. countries by 2030 will change significantly, with an increasing share of tertiary-educated workers driven by aging populations and policy adjustments (Spielvogel, G. and M. Meghnagi (2018).

#### 3.1. Consequences of Workforce Migration for Emigrant Countries

Workforce migration is typically categorized into low-skilled and high-skilled streams, each with distinct costs and benefits for both emigrant and receiving countries. Kuznetsov and Sabel (2006) highlight that while high-skill migrants are welcomed for their contributions to human capital and business creation, low-skill migrants often face legal and social challenges. Despite these differences, the global circulation of both high- and low-skill labor presents new

economic development opportunities, particularly through diaspora networks that help build new opportunities in their home countries.

Ellerman (2006) discusses the policy challenges from the perspective of emigrant countries, emphasizing the often-overlooked adverse consequences of migration. Reviewing the debate on brain drain, Adams (1968) contrasts Harry Johnson's "Internationalist" Model, which acknowledges both positive and negative externalities of brain drain, with Don Patinkin's "Nationalist" Model, which focuses on retaining skilled workers for national development. Patinkin argues for creating conditions that encourage skilled workers to stay, emphasizing the loss of more than 10-15 percent of nationals who study abroad as alarming.

Ellerman (2006) also explores the concept of "Temporary" Labor Migration as a mechanism for technology transfer, citing historical examples such as Slovenia's post-WWII industrial development. Kuznetsov and Sabel (2006) illustrate how expatriates can accelerate technology exchange and foreign direct investment, with examples from China, India, Israel, and the United States. This "brain circulation" can benefit both emigrant and receiving countries by leveraging diaspora networks.

Other scholars identify both negative and positive consequences of high-skilled migration for the countries of origin (Faggian et al. 2017 and Beine et al. 2011). While brain drain can lead to reduced growth and occupational shortages, it also incentivizes investment in education and human capital. However, when emigration rates exceed 20-30 percent, the loss of human capital can be significant, necessitating further exploration of regional contexts (Beine et al., 2011).

Rapoport (2016) emphasizes that migration networks facilitate bilateral economic transactions, removing informational and cultural barriers and promoting the circulation of goods, capital, technology, and ideas. These networks play a crucial role in integrating developing countries into the global economy, highlighting the dual role of migration in fostering both challenges and opportunities for the emigrant countries.

### **3.2. Training to Reduce the Skills Gap**

Faggian et al. (2017) indicate that the migration of highly skilled workers can have positive effects on the countries of origin. Specifically, the prospect of migration can incentivize individuals in the origin country to invest in their education, thereby increasing human capital and fostering regional growth. If there is a significant wage differential between the origin and destination countries, this potential for higher earnings can drive educational investments (Beine et al., 2001, 2008; Beine, Docquier, & Oden-Defoort, 2011; Stark, 2004; Stark, Helmenstein, & Prskawetz, 1997, 1998; Vidal, 1998).

According to Docquier and Rapoport (2012), if migration prospects increase the expected return on human capital, educational investments in the

origin country are likely to rise. Kanbur and Rapoport (2005) suggest that high-skilled migration influences human capital in two primary ways: directly, through the physical movement of skilled workers, and indirectly, by affecting incentives for education in the origin country. These studies highlight that the stock of human capital in a country is influenced by the potential for emigration.

Using panel data from 1975 to 2000, Beine et al. (2011) analyzed the impact of high-skilled out-migration on educational incentives in rich, intermediate, and emerging countries. Their findings suggest that the prospects of skilled migration promote human capital accumulation in low-income countries, while the impact is negative for richer and intermediate countries. In their micro-level analyses, Batista, Lacuesta, and Vicente (2012) and Gibson and McKenzie (2011) show a net positive effect of brain drain on human capital formation in countries such as Cape Verde, Tonga, and Papua New Guinea. They also suggest that lower barriers to internal migration may reduce incentives for education aimed at improving migration prospects.

An alternative perspective argues that local development might be compromised if skilled migration continues indefinitely (Ellerman, 2006). Ellerman (2006) proposes viewing the training of skilled workers as an export industry, where benefits come in the form of remittances. However, if training is publicly funded, it can be seen as a waste of public resources, leading to multiple losses: human capital, public money for training, and later fiscal loss. Developing countries lose productive potential when educated individuals migrate, and the fiscal loss from migration adds to this burden.

## 4. LITERATURE REVIEW

The issue of hiring difficulties in small and medium-sized enterprises (SMEs) has garnered significant attention in both academic and policy discussions, particularly as firms contend with challenges such as skills shortages, workforce migration, and firm growth expectations. Numerous studies have sought to understand the underlying factors contributing to recruitment difficulties, focusing on variables such as firm characteristics, labor market conditions, and migration trends. This review highlights key studies relevant to the present research on manufacturing SMEs in Kosovo, comparing methodologies, variables, and conclusions from other work, while identifying the gaps that this study aims to address.

Institutions play a critical role in shaping labor market outcomes, particularly in transition economies where structural adjustments and evolving regulations significantly impact employment rates and workforce stability. Zdilar (2021) highlights the positive and statistically significant relationship between formal institutions and employment outcomes in EU countries, demonstrating that countries with robust institutional frameworks tend to experience higher overall and youth employment rates. For SMEs in Kosovo, however, institutional challenges – such as limited support for workforce development, regulatory

uncertainties, and a lack of incentives for skills training – can exacerbate hiring difficulties. This is especially pressing in a constrained labor market where skills shortages are prevalent, and SMEs face additional pressures to compete for limited talent against larger, often more resource-rich organizations. Thus, strengthening institutional support and aligning policies with labor market needs could play an essential role in alleviating some of the hiring difficulties faced by SMEs in Kosovo.

Skills mismatches are another major factor exacerbating hiring difficulties in SMEs, often linked to gaps between higher education outputs and the demands of the labor market. Štimac and Bilandžić Tanasić (2023) found that while certain competencies offered in higher education align with labor market needs, a gap persists that requires further adaptation and responsiveness from educational institutions. This misalignment is particularly challenging for SMEs in transition economies, such as Kosovo, where hiring difficulties are intensified by skills shortages that education systems have not adequately addressed. Addressing these gaps through closer alignment between education providers and market requirements could potentially ease recruitment challenges for SMEs and improve labor market efficiency.

In response to skills shortages, SMEs frequently adopt internal strategies beyond wage adjustments, focusing on fostering a culture of learning and adaptability to build resilience. Talaja and Dumanić (2023) found that organizational learning capacity plays a crucial mediating role in achieving successful change outcomes, emphasizing the benefits of a learning-oriented environment. For SMEs in Kosovo, investing in organizational learning could support internal skill development, reduce reliance on external hires, and enable firms to better manage workforce shortages. This adaptability is a key strategy, particularly in constrained labor markets, where cultivating internal talent can help offset the limitations of external hiring pools.

In many cases, firms respond to hiring difficulties by adjusting wages in an attempt to attract and retain skilled workers. Armstrong (2021) examines the role of wage increases in addressing labor shortages in U.S. manufacturing firms. Using qualitative interviews, Armstrong finds that while wage increases help alleviate some recruitment pressures, they are not a complete solution, especially in industries where skills shortages are severe. Firms that offer competitive wages still face challenges related to non-wage factors, such as limited training opportunities and the need to fill highly specialized roles.

Several studies have examined the relationship between labor market frictions and hiring difficulties in firms. Le Barbanchon, Ronchi, and Sauvagnat (2023) explore how hiring frictions, such as search costs and training investments, impact firm growth and recruitment outcomes. Using a shift-share identification strategy and data from the French Public Employment Services, the authors show that hiring difficulties negatively affect employment, sales, and profits, with smaller firms and those in high-skill industries experiencing more pronounced challenges. The study's key variables include time-to-hire, wage increases, and employee retention. Notably, the authors find that firms facing greater hiring



difficulties are more likely to adjust by raising wages or lowering hiring standards, though this does not fully resolve recruitment problems.

Similarly, Bertheau, Larsen, and Shao (2023) analyze linked survey-administrative data from Danish firms to investigate how non-wage factors, such as search frictions and training costs, contribute to hiring difficulties. They find that while wages can play a role in easing recruitment challenges, other factors – like the time needed to train new employees and the inefficiencies in the hiring process – are often more significant barriers. These findings are directly relevant to manufacturing SMEs in Kosovo, where wage increases alone may not be sufficient to address the recruitment challenges associated with high-skilled emigration and limited labor market flexibility.

Workforce migration, particularly the emigration of skilled workers, has been identified as a major factor exacerbating hiring difficulties in transition economies. Fabling, Maré, and Stevens (2022) explore the impact of migration on firm productivity using linked employer-employee data in New Zealand. Their study reveals that the inflow of skilled migrants has a positive effect on firm productivity, particularly in industries facing domestic labor shortages. The authors conclude that long-term migrants contribute more significantly to productivity than short-term or lower-skilled migrants, suggesting that firms that can attract and retain skilled migrants enjoy higher levels of output and innovation.

The findings of Glennon (2024) further emphasize the role of skilled immigration in firm success. Glennon's study uses U.S. data to show that firms employing skilled immigrants experience gains in innovation capacity and global competitiveness, particularly in sectors that rely on high-skill labor. However, the study also highlights that firms facing restrictive immigration policies are likely to experience reduced innovation and productivity losses, as they are unable to access the skilled talent necessary for growth. These findings contrast with the situation in Kosovo, where outmigration of skilled labor leads to a depletion of the talent pool available to local firms, further compounding recruitment challenges.

However, in contrast to the positive effects of migration observed in New Zealand, Bilan et al. (2020) find that high-skilled labor migration has a detrimental impact on SMEs in Ukraine. Using survey data, they show that the emigration of skilled workers leads to persistent hiring difficulties, particularly in sectors requiring specialized skills. Firms that struggle to compete with higher wages and better working conditions offered abroad face longer recruitment periods and higher recruitment costs. This is particularly relevant for Kosovo, where brain drain limits the availability of skilled workers for SMEs, leading to recruitment challenges and productivity losses.

While the existing literature provides valuable insights into the factors contributing to hiring difficulties, particularly in relation to labor market frictions and workforce migration, there are significant gaps that remain underexplored. First, much of the research, including studies by Le Barbanchon et al. (2023) and Fabling et al. (2022), focuses on developed economies with robust labor markets

that can attract skilled immigrants. In contrast, transition economies like Kosovo face high rates of skilled emigration, which depletes the labor market and increases competition for remaining skilled workers.

Second, while wage dynamics and non-wage factors such as training costs have been extensively studied, fewer studies have examined how firm growth expectations specifically interact with hiring difficulties in transition economies. In regions like Kosovo, where firms may have ambitious growth plans but limited access to skilled labor, the interaction between firm characteristics, growth ambitions, and workforce migration presents unique challenges that are not fully addressed in the current literature.

This study aims to fill these gaps by focusing on how firm growth expectations and workforce migration interact to create hiring difficulties in Kosovo's manufacturing SMEs. By investigating the relationship between firm-level characteristics, migration trends, and hiring practices, this research provides new insights into the strategies SMEs can adopt to mitigate the impact of skills shortages and emigration on firm growth.

## 5. METHODOLOGY

This study employs survey data to identify factors influencing the likelihood of entrepreneurs reporting difficulties in filling vacancies with skilled labor. The analysis uses probit econometric modeling to explore the association between firm-level variables and the probability of employers encountering challenges in hiring skilled workers.

### 5.1. Sample and Survey Data Collection

The research utilizes data collected by the ALLED2 project<sup>1</sup>, focusing on the sub-sample of 217 manufacturing businesses in Kosovo to understand the labor market needs for skills. However, in Models 2 and 3, the usable sample size is slightly smaller – 187 and 188 businesses, respectively. This reduction in sample size is due to the fact that some of the independent variables have missing observations, which leads to a smaller subset of data being available for these specific regression models.

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<sup>1</sup> Aligning Education and Training with Labour Market Needs – Phase 2 - ALLED2 Project is financed by the European Union as part of its Instrument for Pre-accession Assistance (IPA II 2017) for Kosovo. It is co-funded by Austrian Development Cooperation. The specific purpose of ALLED2 is to strengthen the quality of education and training programmes and their relevance for the labour market as well as to support the adaptation of the legislative framework and mechanisms as a precondition for increased employability. The project especially focuses on emphasizing the further step in aligning education with the labour market and on building specific cooperation models and measures between the sphere of education and training and the private sector with systemic effects.

When running regression analyses, it is common to encounter missing data for certain variables. As a result, only firms with complete data across all relevant variables are included in the analysis for each model. This explains why the sample size in Models 2 and 3 does not fully utilize all 217 businesses, but the overall analysis remains representative of the original dataset. This sample is representative of the manufacturing sector within the economy. Data was gathered through face-to-face interviews using a standardized questionnaire administered to senior company managers or owners. The sample was randomly selected from the Agency of Business Registration's records, utilizing NACE Rev. 2 sectors to identify priority sectors outlined in the situational analysis. The sampling framework included the number of companies in each sector, ensuring the industry/manufacturing sectors were proportionately represented to reflect their share of the total population.

Identifying employees with the necessary skills and competencies is crucial for developing a robust private sector. Kosovar companies face significant obstacles in filling vacancies with suitably skilled employees. Over 46% of companies reported difficulties in finding adequate labor, with the manufacturing and food processing sectors being the most affected (see Table 1).

Table 1 Obstacles to filling vacancies with skilled labour

Sectors	Do you face obstacles in filling vacancies with adequate skills and competencies?		What is the biggest obstacle in developing skills/competencies?			
	Yes	No	Primary school	Secondary general	Secondary vocational	University or higher
All sectors	46.6%	53.4%	13.3%	6.7%	60.9%	19.1%

Source: ALLED2 project (2019), Collection of company-level data

Survey findings indicate that the quality of secondary vocational education is the primary obstacle to filling vacancies, highlighting the need to support vocational education schools to enhance employment and private sector growth.

Migration poses a significant challenge to Kosovo's future development. Interviews with Business Associations, private companies, and policymakers reveal that the migration of skilled workers is a critical issue affecting the country's competitiveness. The survey confirmed that 47.9% of employers experienced employee migration abroad. Data shows that 11% of the workforce left Kosovo in the 12 months preceding the data collection period, hindering business growth. The manufacturing and food processing sectors in E.U. countries are particularly affected, as entrepreneurs reported the departure of their most productive employees. This suggests the need for careful policy measures to address migration and mitigate its impact on future intervention programs, considering the potential threat of skilled labor migration.

## 5.2. Variables

The study uses a probit binary choice model to investigate how various firm-level, entrepreneurial, and sector-specific variables affect the probability of reporting difficulties in accessing skilled workers. The dependent variable is binary, taking the value of 1 if the firm reported difficulty in filling job positions with skilled employees and 0 otherwise. Independent variables include:

- **Firm Age:** The natural logarithm of the firm's age, expressed in years since establishment.
- **Firm Size:** The natural logarithm of the firm's size, expressed in the number of employees.
- **Owner's Gender:** A dummy variable taking the value of 1 if the business is male-owned, and 0 otherwise.
- **Employee Migration:** A dummy variable indicating whether the firm reported employee migration (1 if yes, 0 otherwise).
- **Percentage of Employees Migrated:** The percentage of employees who have migrated abroad.
- **Growth Expectations:** The expected percentage growth of the firm over the next five years.
- **Export Status:** A dummy variable taking the value of 1 if the firm is an exporter, and 0 otherwise.
- **Employee Training:** A dummy variable indicating whether the firm reported training incidence of employees (1 if yes, 0 otherwise).
- **Time to Satisfactory Performance:** The reported time (in months) it takes for newly hired employees to achieve satisfactory performance.

The variables in this study were selected based on insights from the literature review and were chosen to develop a comprehensive empirical model that accurately reflects the dynamics of hiring difficulties in manufacturing SMEs, particularly in transition economies like Kosovo. Each variable represents a factor identified in prior research as having a significant impact on labor market frictions, workforce migration, or firm characteristics, all of which are relevant to this study's context.

For example, variables related to workforce migration are crucial, as previous studies (e.g., Bilan et al., 2020; Fabling et al., 2022) have shown that migration flows – especially the emigration of skilled workers – create significant recruitment challenges for firms in transition economies. By including migration-related variables, this study captures the impact of brain drain on the ability of Kosovo's SMEs to fill vacancies. Similarly, firm characteristics such as size, growth expectations, and exporting status are commonly used in the literature to account for differences in firms' capacity to attract and retain skilled labor. Le Barbanchon et al. (2023) and Bertheau et al. (2023), for instance, highlight the importance of firm size and growth ambitions as factors that shape firms' hiring experiences, especially in high-skill sectors. Therefore, incorporating these

variables helps model how firm-specific factors interact with labor market conditions to influence hiring outcomes. Moreover, the inclusion of employee training as a variable follows from studies like Armstrong (2021), which found that firms that invest in training may face greater hiring challenges, as they often need specialized skills that are harder to source in the open labor market. Thus, the chosen variables reflect both the theoretical and empirical foundations established in the literature, allowing the study to build a model that explains the key drivers of hiring difficulties in Kosovo's manufacturing SMEs.

Table 2 Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Firm age (log)	1.000								
(2) Firm size (log)	0.283	1.000							
(3) Owner's gender	0.191	-0.059	1.000						
(4) Migration of employees (dummy)	0.156	0.418	0.100	1.000					
(5) Migration of employees (percentage)	0.028	-0.050	-0.102	0.510	1.000				
(6) Expecting growth in 5 years from now	-0.013	0.222	-0.170	0.069	0.082	1.000			
(7) Export status	0.128	0.061	-0.075	-0.019	0.059	0.215	1.000		
(8) Training of employees	-0.052	0.420	-0.014	0.095	-0.078	0.032	-0.061	1.000	
(9) Time it takes employees to achieve satisfactory performance (months)	0.255	0.020	-0.001	-0.018	0.065	0.093	0.148	0.003	1.000

## 6. FINDINGS

Before turning to a discussion of results, we provide the general statistics for the probit model regression. Likelihood Ratio chi-squared test values (24.67, 45.68, and 22.84) indicate the test statistics for the overall model fit. Also, Prob > chi<sup>2</sup> values smaller than 0.01 suggest that the model is statistically significant overall. Finally, the Pseudo R<sup>2</sup> indicates the portion of the variation in the dependent variable, which in our final Model 3 is relatively high, suggesting that our independent variables explain more than 14% of the variation in the dependent variable.

To facilitate interpretation and provide a more explicit analysis, we use marginal effects to illustrate the change in probability when an independent variable increases by one unit. For continuous variables, this change represents an immediate impact, while for binary variables, it reflects the shift from 0 to 1. Our analysis focuses on Model 2, specifically examining the effect of employee migration on the difficulty of filling vacancies with skilled labor. The results reveal a positive and statistically significant relationship between employee migration and the likelihood of reporting hiring difficulties.

In Model 2, firms that reported employee migration had a 33.2 percentage point higher probability of reporting difficulty in filling job vacancies with skilled employees, compared to those that did not report migration. This effect is statistically significant ( $P > |z| < 0.01$ ). For robustness, Model 3 uses the percentage of the workforce that migrated as an alternative measure. This model shows that a one percent increase in workforce migration raises the probability of reporting difficulty in filling vacancies by 0.68 percentage points, also statistically significant ( $P > |z| < 0.01$ ).

There is evidence supporting the claim that employee migration is linked to hiring difficulties. Research by the World Economic Forum shows that attracting and retaining skilled migrant workers has become crucial for companies facing labor shortages, as migration can influence the availability of talent needed to fill vacancies. Firms that manage migration effectively are more likely to succeed in addressing skill gaps and staying competitive in the labor market, indicating that employee migration plays a significant role in hiring challenges (World Economic Forum, 2022).

Firms with growth ambitions, in terms of expected employee numbers over the next five years, have a 31.8 percentage point higher probability of reporting hiring difficulties compared to those without such ambitions ( $P > |z| < 0.01$ ). This finding suggests that companies aiming for significant growth are more likely to struggle with skill shortages. Firms with growth ambitions also tend to export and internationalize. On the other hand, our results indicate that export companies are less likely to report hiring difficulties, with a 17-percentage point lower probability ( $P > |z| < 0.1$ ) in Model 2 and a 19.4 percent lower probability ( $P > |z| < 0.05$ ) in Model 3. This aligns with evidence suggesting that entrepreneurs with growth ambitions often face greater challenges in accessing qualified labor (Lajqi and Krasniqi, 2017).

By adopting a multifaceted approach and investing in human capital, SMEs can overcome these challenges and unleash their growth potential (Udegbum et al., 2024). This suggests that entrepreneurs with growth ambitions and export strategies may implement better incentive schemes to attract and retain skilled employees.

Companies providing employee training report a 5.32 percentage point higher probability of hiring difficulties in Model 2, although this effect is not statistically significant. This may suggest that firms are using training to address low initial skill levels among their workforce, investing in education and re-education to meet skill demands. The time required for new employees to reach satisfactory performance levels is another significant factor. Each additional month needed for new hires to achieve satisfactory performance increases the probability of reporting hiring difficulties by 2 percentage points in both Model 2 and Model 3 ( $P > |z| < 0.1$ ). Training of employees is found to be an important factor that positively impacts SME growth (Hairunisya et al., 2024; Zake et al., 2024). Therefore, firms could benefit from training their employees to alleviate hiring difficulties for skilled labor. At the same time, companies should ensure the implementation of proper schemes and incentives to retain skilled employees.

Table 3  
Probit Regression Results

VARIABLES	Model 1		Model 2		Model 3	
	Probit coeff.	Marginal effects	Probit coeff.	Marginal effects	Probit coeff.	Marginal effects
<b>Firm and owner characteristics</b>						
Firm age (log)	0.0161 (0.131)	0.00644 (0.0524)	0.0889 (0.162)	0.0355 (0.0645)	0.0250 (0.163)	0.00993 (0.0650)
Firm size (log)	0.370*** (0.0978)	0.148*** (0.0390)	0.0816 (0.136)	0.0325 (0.0542)	0.324** (0.126)	0.129** (0.0503)
Owner's gender			-0.278 (0.111)	-0.111 (0.0373)	-0.0373 (0.0149)	
<b>Migration</b>						
Migration of employees (dummy)			0.833*** (0.219)	0.332*** (0.0872)		
Migration of employees (percentage)					0.0171*** (0.00518)	0.00680*** (0.00205)
<b>Export and growth expectations</b>						
Expected growth in 5 years from now			0.797*** (0.260)	0.318*** (0.104)	0.715*** (0.255)	0.285*** (0.101)
Export status (1=exporter, 0=otherwise)			-0.429* (0.222)	-0.171* (0.0884)	-0.488** (0.220)	-0.194** (0.0876)
<b>Employee performance and training</b>						
Training of employees			0.133 (0.258)	0.0532 (0.103)	0.0814 (0.255)	0.0324 (0.101)
The time it takes employees to achieve satisfactory performance (months)			0.0502* (0.0266)	0.0200* (0.0106)	0.0503* (0.0269)	0.0200* (0.0107)
Constant	-0.852** (0.363)		-1.268*** (0.477)		-1.544*** (0.500)	
Observations	217	217	187	187	188	188
LR chi2	24.67		45.68		22.84	
Prob > chi2	0.0000		0.0000		0.0036	
Pseudo R2	0.0696		0.1370		0.1414	

Source: Regression analysis company-level data based on ALLED2 project (2019)

## 7. CONCLUSIONS AND RECOMMENDATIONS

This study investigated the relationship between workforce migration, firm characteristics, and growth expectations on hiring difficulties in Kosovo's manufacturing SMEs. Using a probit binary choice model, the study analyzed data from 217 randomly selected firms. The findings reveal that firms experiencing employee migration face significant challenges in filling vacancies, with smaller firms and those with growth ambitions particularly affected. Additionally, firms offering employee training reported greater difficulty in hiring skilled workers, while exporting companies appeared to experience fewer recruitment challenges. The results align with prior studies on the influence of migration and labor market frictions on firm performance. For instance, Fabling et al. (2022) found that in countries like New Zealand, the inflow of skilled migrants positively impacts firm productivity by addressing labor shortages, whereas the brain drain experienced by firms in transition economies like Kosovo reflects Bilan et al. (2020)'s findings in Ukraine, where high-skilled labor migration exacerbated skills shortages and recruitment difficulties. Moreover, the significant impact of hiring frictions on firm growth, as shown by Le Barbanchon et al. (2023), is confirmed here, with Kosovo's firms struggling to fill critical roles due to skilled worker outflows. The study also echoes Armstrong (2021), emphasizing that wage increases alone are insufficient to resolve hiring difficulties, as non-wage factors – such as training costs and recruitment inefficiencies – play a crucial role. In Kosovo's case, firms offering training to bridge educational gaps still face persistent hiring challenges, indicating the need for comprehensive strategies, especially in regions impacted by migration. Addressing these hiring difficulties requires several targeted measures: firms should implement incentive schemes, such as career development opportunities and benefits packages, to retain younger employees and mitigate the pull factors driving them abroad. Firms that invest in employee training may consider binding contracts to ensure that trained employees remain with the company for a reasonable period, protecting firms from losing employees shortly after training and reducing hiring difficulties. Government support programs that involve collaboration with firms to create migration policies offering social benefits and housing incentives would also be beneficial, as policies such as lowered housing interest rates and health benefits could reduce emigration. Additionally, aligning education policies with manufacturing sector needs by strengthening quality assurance in secondary and tertiary engineering programs, updating curricula, and improving teaching infrastructure could significantly help bridge the skills gap faced by Kosovo's SMEs. Implementing these measures can mitigate the adverse effects of workforce migration and skills shortages, enabling Kosovo to unlock its growth potential in the manufacturing sector.

**Author Contributions:** Conceptualization, A.D.; Methodology, B.K. and A.D.; Software, A.D.; Validation, B.K. and A.D.; Formal Analysis, A.D. and B.K.; Investigation, A.D.; Resources, A.D.; Data Curation, A.D.; Writing – Original Draft Preparation, A.D.; Writing – Review & Editing, A.D.; Visualization, A.D.; Supervision, B.K.; Project Administration, A.D.



**Funding:** The research presented in the manuscript did not receive any external funding.

**Conflict of interest:** None.

**Acknowledgments:** We extend our heartfelt gratitude to Prof. Iraj Hashi of Staffordshire University, UK, for his invaluable suggestions during the preparation of this paper. Additionally, we are indebted to the insightful comments and recommendations provided by participants at The 7th ECFED International Workshop, hosted at the University of Dubrovnik, Croatia, from September 12 to 13, 2022.

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## **POTEŠKOĆE PRI ZAPOSŁJAVANJU NA RAZINI PODUZEĆA U PROIZVODNIM MALIM I SREDNJIM PODUZEĆIMA: ULOGA MIGRACIJE RADNE SNAGE, KARAKTERISTIKA PODUZEĆA I OČEKIVANJA RASTA**

***Sažetak***

*Nedostatak kvalificirane radne snage predstavlja značajan izazov za rast i razvoj malih i srednjih poduzeća (SME), posebno u tranzicijskim gospodarstvima poput Kosova. Ova studija analizira utjecaj migracije radne snage, karakteristika poduzeća i očekivanja rasta na poteškoće pri zapošljavanju s kojima se suočavaju mala i srednja poduzeća u proizvodnji. Koristeći se modelom probiti binarnog izbora, istražuje se kako migracija zaposlenika, ambicije rasta poduzeća i prakse obuke utječu na vjerojatnost da će poduzeća imati poteškoće u popunjavanju slobodnih radnih mjesta za kvalificiranu radnu snagu. Osnovu analize čine podaci iz uzorka od 217 nasumično odabranih proizvodnih tvrtki na Kosovu, izvučeni iz baze aktivnih poreznih obveznika. Nalazi otkrivaju da će tvrtke s migracijom zaposlenika i one s ambicijama rasta vjerojatnije imati problema sa zapošljavanjem, osobito kada ulažu u obuku zaposlenika. Suprotno tome, izvozne tvrtke prijavljuju manje izazova pri zapošljavanju. Ovo istraživanje nudi preporuke na razini uprave i politika za ublažavanje nedostatka vještina i poboljšanje ishoda zapošljavanja u malim i srednjim poduzećima na Kosovu.*

***Ključne riječi:*** mala i srednja poduzeća, nedostatak vještina, poteškoće pri zapošljavanju, migracija, tržište rada, razvoj radne snage, gospodarski rast.

***JEL klasifikacija:*** J23, J24, J60, L25.