

REGIONAL LABOR SHORTAGES IN THE CONTEXT OF DEMOGRAPHIC DECLINE AND EU COHESION: THE CASE OF BIHOR COUNTY, ROMANIA

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Abstract. *Demographic decline and economic challenges have become pressing issues in the European Union (EU), where balanced development and social cohesion remain central objectives. Romania, similar to other Central and Eastern European states, faces the combined pressures of negative natural population growth and sustained emigration of skilled workers. This study investigates how these demographic shifts shape labor market dynamics in Bihor County, Romania, focusing on employers' perspectives.*

The research is based on a sociological survey conducted with 254 companies across various economic sectors. The analysis explores employer perceptions of labor shortages, identifies the main occupational areas affected, and examines preferred long-term policy responses. Results indicate that 67.7% of employers experience persistent difficulties in filling certain or most positions, with acute shortages reported in vocational professions related to heavy industry (metal processing, chemical industry) and construction. Salary levels are perceived as having only a moderate impact on recruitment difficulties, while structural factors—such as the misalignment between the educational system and labor market needs, as well as outward migration to higher-wage EU regions—emerge as key concerns.

Correlation analyses between company size, workforce deficits, and other survey variables revealed weak and inconsistent relationships, suggesting that these factors are poor predictors of employer evaluations. Importantly, while employers reject importing labor from outside the EU, they express strong support for policies aimed at reinforcing the domestic workforce, including improved working conditions and pro-natalist measures.

The findings underscore the importance of EU-level frameworks, particularly Cohesion Policy and the European Social Model, in supporting regions disproportionately affected by demographic decline and labor shortages, thereby promoting inclusive and sustainable growth across the Union.

Keywords: *economic growth, labor scarcity, labor market policies, Romania, Bihor County, EU cohesion.*

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1. Introduction and literature review: The relationship between economic growth, demographic decline and the labor market

In the literature, the relationship between demographic decline and economic growth is not emphasized sufficiently, although the problem appears increasingly prominent in developed countries, including European Union (EU) member states (Hu et al., 2021, Liao, 2021, Jones, 2022, Fraumeni, 2019). Long-term population decline, even if not incompatible with economic growth, makes it more difficult to achieve in regions striving for inclusive development, an objective at the heart of EU Cohesion Policy. Assuming limited fluctuations in productivity, access to capital, and external markets, demographic decline will lead to a slowing in economic growth, stagnation, or even negative growth. This problem has been studied mostly in Asian countries like Japan, which has gone through an economic stagnation for almost two decades, the main cause being the demographic decline caused by low birth rates and restrictive immigration policies that limited the country's productive capacities and domestic consumption (Wackernagel et al., 2019, Ashford et al., 2012), and, more recently, in China, after a long period of economic growth, there has been a trend of accelerated population decline as a result of misguided demographic policies that threaten the potential for further economic expansion (Luo et al., 2021, Liao, 2021). Yet within the EU, several Central and Eastern European countries have also encountered low birth rates and persistent emigration, prompting concern about regional imbalances and the need for better cohesion strategies.

Over the past decades, many countries, especially those in Central and Eastern Europe, including Russia and independent countries resulting from the former USSR dissolution, have experienced a combination of low growth rates, stagnation, or even population declines, with uneven rates of economic development. This revived interest in the theories of economic growth but also fueled the fear that a decrease in the population will negatively affect the economy (Filipov and Dorbritz, 2003). In an EU context, this phenomenon underscores how demographic shifts can hinder the long-term goal of a cohesive society, as outlined by the European Social Model and the EU's ambition for "inclusive growth."

The primary argument is that population decline affects both supply and aggregate demand. A decrease in the population implies a reduction in labor supply and its role in production, simultaneously with a reduction in the demand for consumer goods and services and, implicitly, in the demand for investments. A smaller population means a diminished labor pool for production, along with weaker demand for consumer goods, services, and investment. In the medium and long term, such a decrease could reduce gross domestic product (GDP), or even GDP per capita, if shrinking output surpasses the contraction of the working-age population. At the same time, an aging population can strain public revenues and social protection systems (Schwarz et al., 2014), an issue watched closely by EU institutions seeking to uphold social cohesion and fiscal sustainability.

Despite these concerns, many researchers argue that population decline and per capita consumption growth can coexist (Elgin and Tumen, 2012, Jones, 2022), provided there is a focus on high-quality human capital, technology adoption, and well-designed migration flows. Analyzing data from 19 European countries Lianos et al. (Lianos et al., 2023) concluded that the introduction of technology, increased productivity, and other structural changes often prevent GDP from falling, even when total population declines. Still, demographic growth can also be a double-edged sword: higher population growth

in developing countries may translate into environmental challenges and inefficient resource usage (Meadows and Randers, 2012, Bradshaw et al., 2021, Wackernagel et al., 2019).

Economic growth creates pressure on the demand for labor and, in combination with demographic factors such as low birth rates and emigration, leads to a contracting labor supply. From the EU's perspective, free movement of workers—while a pillar of European integration—can intensify outflows from regions with lower wages, thereby fueling regional disparities. Labor availability is among the most critical external factors for sustainable business operations. While certain intra-organizational strategies (Acikgoz, 2019; Das and Baruah, 2013) can mitigate recruitment and retention challenges, the deeper causes lie in demographic trends, immigration policies, and especially the alignment of educational or vocational training systems with real labor market needs. Labor is thus a prerequisite for all the other factors that determine the sustainability of economic agents' activity and the long-term potential for regional development (Figure 1).

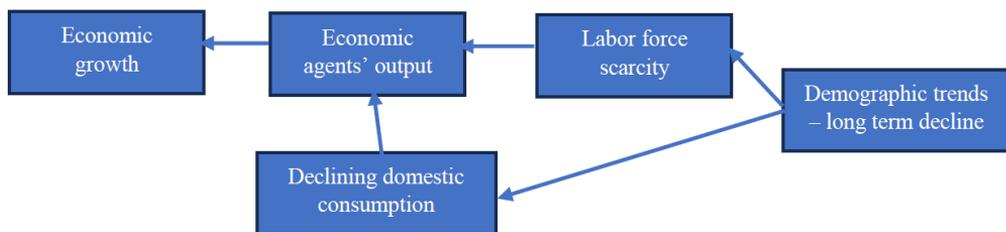


Figure 1 Theoretical model: the influence of demographic trends on economic growth
Source: research

There is considerable literature on the complex relationship between sustainable economic growth and employment. Mediated by the contemporary phenomena of globalization and innovation (Ashford et al., 2012), this relationship also explains how economies and organizations can recruit, train, and reward individuals willing to adapt and innovate (Lasisi et al., 2020b). Decent employment is essential for resource productivity as well as for sustainable development (Lasisi et al., 2020a; ILO, 2023), as it reflects both the global challenges of economic development as well as environmental protection, and the issue of social inclusion, as mentioned in the Sustainable Development Goals (SDG-8) or in other policy statements endorsed by international and regional bodies (United_Nations, 2023; European Commission). Studies such as Zhao and Luo (Zhao and Luo, 2017) analyzed China's economic development during 1980–2013 related to renewable energy sources, environmental quality, employment, and regulation, and considered employment and labor skills to have a significant impact on sustainable development. Tatli and Barak (Tatli and BARAK, 2019) in a survey of 29 OECD countries, found a direct relationship between energy consumption and female unemployment. The relationship between sustainable economic growth and labor market changes in Central and Eastern European states has been addressed either within the particularities of the Visegrad Group Countries (Bieszk-Stolorz and Dmytrów, 2020), discrimination (Stanila et al., 2020), or the impact of the COVID-19 pandemic (Radulescu et al., 2020).

From an EU policy standpoint, a shrinking labor force compromises the potential for balanced growth, one of the core aims of the Cohesion Policy designed to reduce disparities across European regions.

2. Aspects regarding demography and the labor market in Romania and Bihor County

In Bihor County, Romania, the link between demographic trends and economic growth is acutely visible among private companies, which generate most of the local GDP (over 90%, *insse.ro*). As in other newly integrated EU regions, Bihor County faces low birth rates and emigration to more prosperous parts of Europe, resulting in ongoing labor shortages. These challenges illustrate how demographic decline interacts with labor force availability, domestic consumption, and, ultimately, the sustainable development of local businesses.

2.1. Shrinking workforce

Romania's total labor force has been on a consistent downward trajectory from 1990 to 2023. It stood at 12,086,487 in 1995 and declined to 8,282,417 in 2023, a drop of approximately 31%, or 3.8 million people (*WorldBank.org*).

Following its accession to the EU in 2007, Romania recorded an average unemployment rate of 5.96% between 2007 and 2023, with a general downward trend, starting at 6.4% in 2007 and reaching 3.9% in 2019, the year before the pandemic (*WorldBank.org*). Labor force participation (ages 15–64) from 2007 to 2022 averaged 65.93%, peaking at 68.89% in 2020 (*WorldBank.org*). Meanwhile, job vacancy rates rose from approximately 0.5% in 2013 to 0.91% in early 2023¹, indicating an increasing strain on the labor supply.

The evolution of the unemployment rate at the Bihor County level is similar to that recorded at the national level, indicating that the unemployment rate values are lower on average by 2 percent. The highest values were recorded in 2009 and 2010 of 5.8% and 5.9%, respectively, as a result of the effects of the economic crisis in that period, while the lowest values of 1.4% and 1.2 % were recorded in 2018 and 2022. The civilian employed population decreased by approximately 15% from 2007 to 2022, from 275,600 to 235,100 (*insse.ro*).

In the period 2007–2022, the employment rate in Bihor County was above the national employment rate, in 2022, 67.6% in Bihor County, and 65.2% nationally. The labor force participation rate followed a trend similar to that of the employment rate. The employment rate in Bihor County decreased starting in 2008 after Romania's integration into the EU, primarily due to the county's location on the western border, which made it more affected by emigration (*insse.ro*).

2.2. Demographic decline: low birth rates and high emigration

Romania's demographic decline stems primarily from negative natural population growth and emigration to Western Europe.

During 1967–1989, the country's average fertility rate was 2.58 (*WorldBank.org*), pushing Romania's population from 19.53 million to 23.16 million by 1989. This growth was propelled by pro-natalist policies under the communist regime

¹ Romania Job Vacancies Rate. Link: <https://tradingeconomics.com/romania/job-vacancies>. (Accessed in 2024)

(Rotariu and Dumănescu, 2014). After 1989, Romania abolished strict pro-natalist measures, including bans on abortion and contraception, and experienced high abortion rates due to economic and cultural factors (Otovescu and Otovescu, 2019). The transition to a market-based economy brought unemployment, inflation, and reduced social services, complicating the ability of many families to support multiple children. Evolving social norms, inequality, and emigration further contributed to a sustained drop in fertility, averaging 1.51 between 1990 and 2022. Consequently, Romania's population had fallen to 19.06 million by 2023 (WorldBank.org).

Large-scale temporary emigration to Western Europe intensified after the 1989 collapse of the communist regime. Salary differentials make Romanian jobs less attractive for qualified workers, many of whom do not return after initially migrating (Anghel et al., 2017; Hinks & Davies, 2015). Net migration fell from -39,265 in 1990 to -138,327 in 2008, later easing somewhat post-2008 crisis (WorldBank.org). Overall, Romania has sustained an average negative net migration of -73,384 annually since 1989, losing around 4 million people, roughly 20% of its population, to emigration. While remittances have bolstered domestic consumption (over 3% of GDP since 2015), they have not offset the labor loss (Bunduchi et al., 2019; Cismaș et al., 2020).

The same demographic trends can be observed in Bihor County, where the total population decreased from 631,741 in 2002 to 610,726 in 2022, a decrease of 3.33%. During this period, emigration from Bihor County is increasing, and the maximum number of emigrants (681) was registered in 2022 (insse.ro).

Romania's relatively low immigration levels are influenced by its cultural homogeneity and comparatively lower standard of living than other EU member states. Attitudinal measurements suggest that Romanians have a generally positive outlook on immigrant integration (Pogan, 2021), although the country has not experienced the immigration pressures seen elsewhere. Hungary, for instance, shares historical parallels with Romania and also grapples with labor shortages (Matyas, 2019) but faced a strong influx of migrants in 2015, which led to significantly different attitudes (Barna & Koltai, 2019).

3. Research objectives and methodology

To explore employers' perspectives on these issues, we conducted a sociological survey in Bihor County with a representative sample of 254 companies. The research aims to (1) determine how employers evaluate current labor market conditions, (2) identify the factors they believe are primarily responsible for labor scarcity, and (3) highlight which long-term policies—particularly those aligned with EU cohesion strategies—employers favor for skill development and workforce retention. These objectives align with broader European Commission goals of fostering inclusive labor markets, reducing regional disparities, and enhancing social cohesion.

Research objectives:

- Examine the perceived impact of demographic trends—specifically low birth rates, aging, and emigration—on local labor supply.
- Identify the extent to which employers believe systemic factors (e.g., education, wage levels, EU freedom of movement) shape labor shortages.
- Investigate how employer size and the severity of workforce deficits influence their policy preferences, including EU-aligned reforms.

Methodology:

- **Sample:** The sample was constructed through a stratified approach, accounting for the main categories of employers in Bihor County: heavy industry, light industry, services requiring medium-to-low qualifications, and services requiring medium-to-high qualifications. Microenterprises, small, medium, and large enterprises were included, but we ensured significant representation of small, medium, and large companies due to the prevalence of inactive microenterprises.

- **Data Collection:** We administered 254 questionnaires to employer representatives visiting the Bihor County Employment Agency between January and February 2023. The instrument investigated local labor market perceptions, the role of EU-level factors like cross-border labor mobility, and the feasibility of potential policy interventions.

- **Analysis:** Correlation tests and contingency tables were used to examine associations between employer characteristics (e.g., size, workforce deficit; see Figure 2) and their assessments of labor scarcity. Results were interpreted within the framework of EU social and economic cohesion policies.

By focusing on Bihor County, we illustrate how demographic challenges, labor market changes, and European integration intersect. In doing so, we provide empirical evidence for debates on demographic decline and underscore the importance of EU-level initiatives—especially Cohesion Policy and the European Social Model—in mitigating labor shortages and ensuring inclusive regional development.

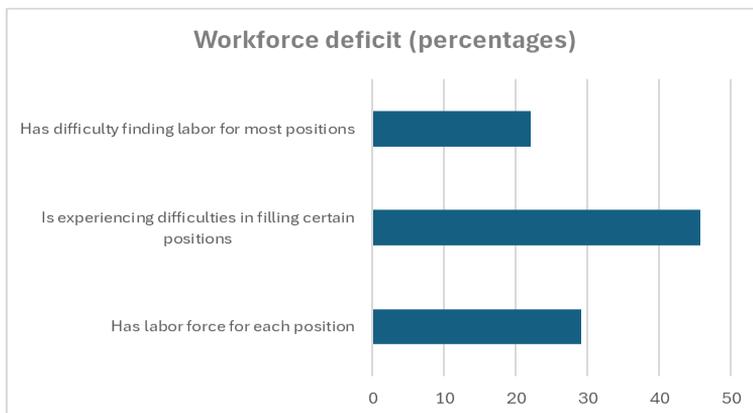


Figure 2 Workforce deficit experienced by the employers in our sample (percentages)
Source: research data

2. Results & Discussion

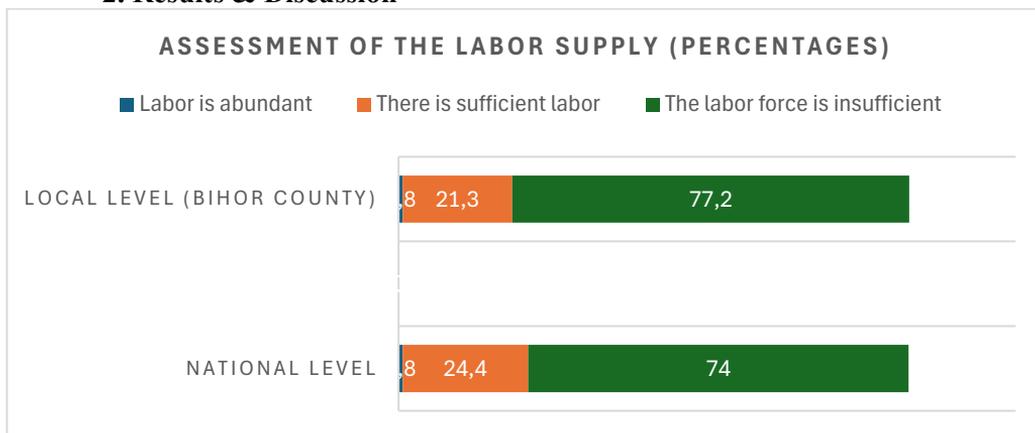


Figure 3 Assessment of the labor supply at national level (percentages)

Source: research data

The sample largely confirms macroeconomic and demographic expectations, with more than 70% of employers stating that both local and national labor markets face a labor shortage (Figure 3). At the local level, 77.2% of employers report insufficient labor (Figure 3). Employer size negatively correlates with labor market assessments at the national (Kendall's tau-b: -0.198 , $p < 0.001$) and local (Kendall's tau-b: -0.365 , $p < 0.001$) levels, indicating that larger employers perceive labor supply more adversely. Workforce deficit also shows a moderate negative correlation with assessments at both the national (Kendall's tau-b: -0.355 , $p < 0.001$) and local (Kendall's tau-b: -0.365 , $p < 0.001$) levels.

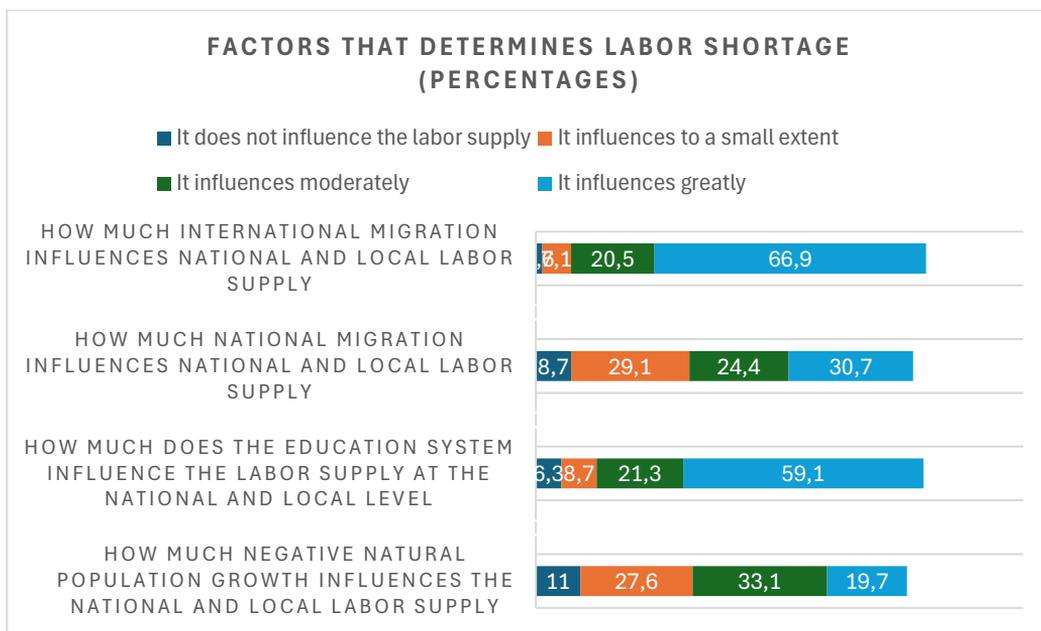


Figure 4 Factors that determines labor shortage at national and local level (percentages)

Source: research data

The data in Figure 4 show that the employers consider the educational system (59.1%) and international migration (66.9%) as the main factors that influence labor supply. Negative population growth is considered less of a problem by employers, as it was less debated in Romania, unlike the issue of emigration to work abroad. On the other hand, national migration is perceived differently, as it has a balancing contribution to the labor market. Employer size seems to be associated with the extent to which negative natural population growth influences national and local labor supply in the opinion of employers ($p < 0.001$). From the contingency table, we observed that the demographic situation is considered a problem for the labor market, mostly by the representatives of micro enterprises and significantly less by the representatives of medium and large enterprises. We found no significant association between employer size and the other factors presented in Figure 4 ($p > 0.005$). The workforce deficit presents a statistically significant association with the extent to which national migration influences national and local labor supply in the opinion of employers ($p = 0.003$). The data from the contingency table show that, as the workforce deficit increases, the perceived influence of national migration on labor supply increases slightly.

The data from Figure 5 (see below) show that employers' representatives consider that their labor shortage experienced by them is determined by the inadequacy of the educational system and emigration, and to a lesser extent by competition in the local market. There was a statistically significant positive correlation between employer size and the opinion expressed by the employer's representative that the emigration of specialized personnel is a factor for labor shortage for the employer (Kendall's tau-b: 0.172, $p = 0.002$), which means that representatives of larger companies would consider this factor to be more responsible for labor shortage. There was no statistically significant correlation between employer size and the other two variables from Figure 5 ($p > 0.005$). In addition, we did not observe a statistically significant correlation between the workforce deficit and the variables presented in Figure 5 ($p > 0.005$).

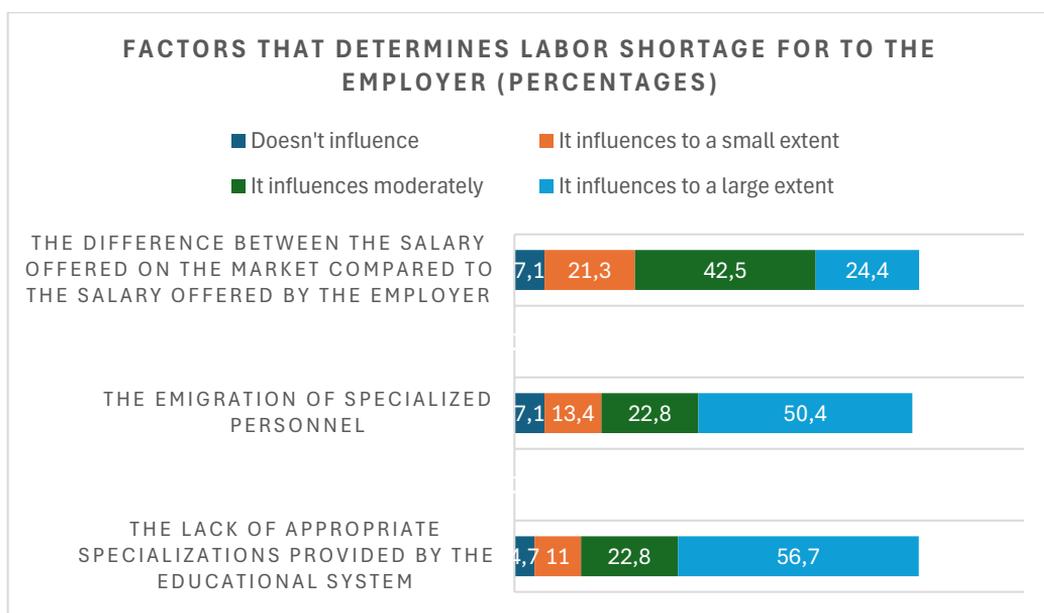


Figure 5 Factors that determines labor shortage for to the employer (percentages)

Source: research data

Regarding long-term measures that would affect the labor market (Figure 6, see below), employers consider that a reform of the educational system is necessary, along with public policies of the Romanian state that encourage the remaining in the country of the working population. Policies to encourage the return of Romanians who have gone to work in the West, the adoption of pro-natalist policies, and the creation of working conditions similar to those in the West by the private sector are also seen favorably. Employers have a strong reserve against the idea of importing labor from outside the EU as a long-term solution. The idea of limiting the right to work in the EU is also rejected, emphasizing the pro-Europeanism of Romanians, despite the fact that emigration to work in the West generates labor shortages in Romania and Bihor County, undermining the sustainability of economic growth. The data showed no statistically significant results regarding the effect of employer size and workforce deficit on the variables in Figure 6 ($p > 0.005$).

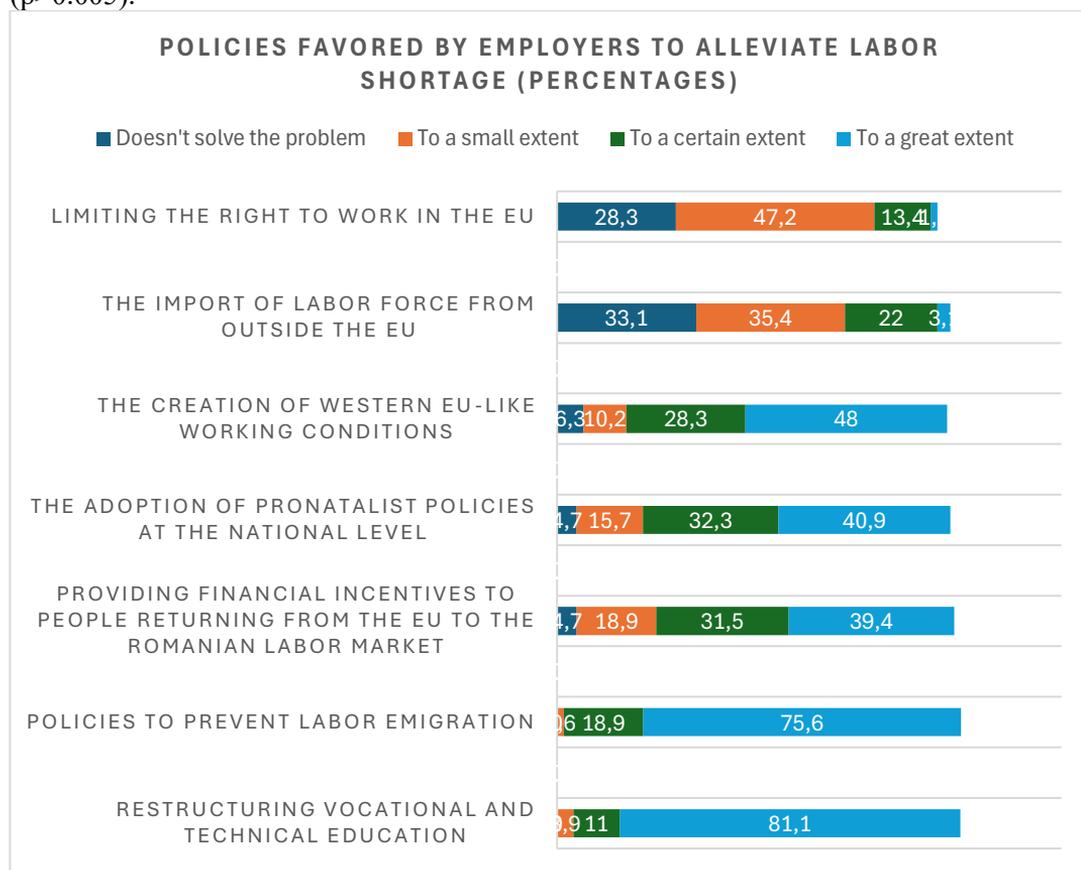


Figure 6 Policies favored by employers to alleviate labor shortage (percentages)

Source: research data

Turning to long-term policy measures (Figure 6), employers support educational reforms and Romanian state policies aimed at retaining the workforce. They also favor pro-natalist policies and creating working conditions more closely resembling those in Western Europe. By contrast, they remain hesitant about importing labor from outside the EU, and they reject any notion of restricting the right to work within the EU, reflecting

strong pro-European sentiment. Interestingly, neither employer size nor workforce deficit significantly affected views on these long-term policy proposals ($p > 0.005$).

3. Conclusions

This study finds that Bihor County experiences significant labor market pressure resulting from declining birth rates, persistent outmigration to more prosperous EU regions, and an educational system misaligned with local employer needs. Over two-thirds of respondents report difficulties filling positions, particularly in vocationally demanding sectors like heavy industry and construction. The most commonly cited drivers of labor scarcity are skilled-worker emigration and educational shortfalls relative to market requirements.

In response to these challenges, local employers overwhelmingly support broader, long-term policies that address root causes. They endorse reforms to modernize education, promote competitive wages, and encourage skilled workers to remain in or return to Romania. Although participants generally hold positive attitudes toward immigrant integration, enthusiasm for large-scale workforce imports from outside the EU is limited—likely reflecting cultural factors and apprehensions about labor-market competition.

From a European standpoint, these findings underscore the need to align local and national strategies with EU-level programs, notably Cohesion Policy, which aims to reduce regional disparities and foster inclusive growth. By synchronizing local educational reforms with broader EU objectives around skill development, and by leveraging existing instruments for labor mobility and social cohesion, Romanian policymakers can strengthen economic resilience in Bihor County. While demographic decline poses serious challenges, coordinated efforts by local stakeholders, national authorities, and EU institutions can mitigate its impact and pave the way for more balanced, sustainable development in Bihor and other similarly affected regions.

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