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## Closing Europe's Skills Gap:

### *Sector-Specific Lessons for EU Skills Policy*

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## Closing Europe's Skills Gap: Sector-Specific Lessons for EU Skills Policy

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### Executive Summary

Skill shortages represent one of the most pressing structural challenges facing European businesses, with nearly half of both small-to-medium-sized enterprises (SMEs) and multinational enterprises (MNEs) reporting high or very high shortages, particularly in healthcare, ICT, and manufacturing and construction. Demographic pressures and the demands of digital and green transitions show no sign of abating.

Drawing on a large-scale survey of 4,409 businesses across four countries, this brief examines how firms respond to skill shortages and under what conditions those responses succeed. The central finding is that effective responses are combinations of strategies, not single interventions, and their value depends on firm size, sector, and regulatory context.

SMEs rely predominantly on training and local labour market strategies, whereas MNEs make greater use of migration-related instruments. Sectoral analysis reveals distinct winning configurations: automation paired with talent inflow programmes in IT and manufacturing; outsourcing alongside automation in healthcare; and outsourcing as the dominant lever in construction.

Key recommendations include bundling automation and talent inflow support, regulating outsourcing arrangements in health and construction, targeting skill inflow initiatives more precisely, and treating workforce training as productivity policy, particularly for SMEs, for whom it remains the most widely used response. Realising Europe's competitiveness ambitions will ultimately require policy mixes that reflect the genuine diversity of firms navigating an increasingly constrained labour market.

**Keywords:** Skills shortages, automation, intra-corporate mobility, outsourcing, MNEs, SMEs

**JEL Code:** F23, J24, L25

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## 1. Introduction

Skill shortages represent a critical operational obstacle for the majority of SMEs in Europe, and for nearly three quarters of larger European firms (European Commission, 2023). The persistent shortage of workers and skills, with the most critical shortages in health, ICT, and manufacturing/construction (European Labour Authority, 2024). Forward-looking projections offer little relief, suggesting conditions will deteriorate further in the places and industries already under the greatest strain (Council of the European Union, 2024). Two forces are converging to drive this. First, a shrinking European working-age population, projected to fall by 95 million by 2050 (Dempster et al., 2024), and rapidly shifting skill requirements brought about by digital and green transitions (Cedefop, 2023).

Governments have strong reasons to act, since vacancies left unfilled represent direct losses to economic and social welfare. Policy toolkits have expanded accordingly, encompassing measures to boost participation, develop skills, and open channels for labour migration (European Commission, 2021; Minbaeva et al., 2025). For example, amendments passed to the Aliens Act in Estonia aim to relax requirements to bring in third country nationals and alleviate a shortfall of qualified labour (ERR, 2026).

Such government initiatives provide a useful backdrop for businesses, but firms must still navigate a wide and poorly mapped landscape of possible responses (Pereira et al., 2022). Although there is a wide array of response strategies, including automation, re- or upskilling, intra-corporate mobility, and outsourcing, we know little about which strategies are used when successfully. This calls for clear guidance on which strategies work under what circumstances. Research to date has examined only a narrow slice of the available options, focusing on recruitment choices (e.g., Pereira et al., 2022) or expatriation models (e.g., Kiessling et al., 2023), while paying far less attention to the full range of strategies firms actually use, or how these might be combined effectively.

This policy brief sheds light on how businesses—multinational enterprises (MNEs) and small-to-medium-sized enterprises (SMEs)—navigate skill shortages by accounting for the diversity of firm-level strategies and structural barriers they encounter. In line with the EU Intra-Corporate Transfer (ICT) Directive (2014/66/EU), we define an MNE as an undertaking that has a presence in more than one country. We also adopt the EU definition of an SME as businesses that employ less than 250 employees. The brief draws on new survey data, collected in March–September 2025, to understand business responses to skill shortages and the broader institutional conditions shaping these responses. The insights from the analyses can inform policies that target MNEs and SMEs in sectors that are strategically important to the EU's competitiveness and resilience, including the healthcare, ICT, and manufacturing/construction.

The remainder of the policy note is structured as follows: Section 2 discusses our research approach, followed by our key findings, in Section 3, highlighting differences



between MNEs and SMEs in their skill shortage filling strategies across targeted sectors and countries. Section 4 presents policy recommendations for addressing labour shortages experienced by MNEs and SMEs caused by lacks of skills, labour costs, and regulatory burden. Section 5 summarises the key points of the policy brief.

## 2. Methods

To generate actionable evidence on how businesses actually respond to skill shortages, the GS4S WP4 team conducted a large-scale comparative survey across four countries and three economically critical sectors. The study design was built to capture not only the presence of skill shortages but also the effectiveness of different responses, bridging a significant gap in the existing evidence base. Table 1 provides an overview of the survey characteristics.

### 2.1. Scope and Sample

Table 1. Overview of the business insights survey

<b>Survey size</b>	4,409 businesses responded across MNEs (EU Intra-Corporate Transfer (ICT) Directive (2014/66/EU) definition) and SMEs (under 250 employees)
<b>Countries</b>	Estonia, Germany, the Netherlands, and Switzerland, providing variation in institutional environments
<b>Sectors</b>	Health, ICT, and manufacturing/construction, selected for high exposure to skills shortages
<b>Firms covered</b>	Both MNEs and SMEs, allowing direct comparison of firm-size effects

The full survey dataset is publicly available via the following link:

<https://doi.org/10.5281/zenodo.20676409>

### 2.2. Analytical Approach

We applied regression analysis and fuzzy-set Qualitative Comparative Analysis (fsQCA) to analyse strategies of SMEs and MNEs to mitigate skill shortages. The regression analysis focused on the conditions under which employers opt for different types of immigrant labour.



FsQCA was employed to identify which combinations of conditions, rather than single factors, are associated with successful skill shortage filling outcomes. This approach is particularly well-suited to understanding skill shortage responses, because no single strategy works universally. In other words, success depends on the interaction between institutional barriers and the type of response strategy employed by MNEs across different sectors.

The analysis distinguished between:

- *Hard barriers*: formal regulatory obstacles such as visa requirements, qualification recognition rules, and work permit regimes.
- *Soft barriers*: informal factors that create friction but do not constitute formal prohibitions such as language requirements and limited labour market access for spouses.
- *Firm responses*: including automation, outsourcing/offshoring, hiring within the EU, hiring outside the EU (via standard and non-standard contracts), and participating in government-backed talent inflow programmes.

### 3. Key Findings

#### 3.1. Firm Heterogeneity in Responses to Skill Shortages

Skill shortages are substantial among both SMEs and MNEs. 42% of MNEs and 49% of SMEs report rather high or very high shortages. This indicates that skill constraints are not confined to one segment of firms. The relevant difference lies not in the incidence of shortages, but in the strategies and constraints through which firms address them.

Legal and administrative regulations feature prominently in the factors that help prevent skill shortages for both MNEs and SMEs (95% and 90% respectively; Figure 1). The same also holds for internal capacity constraints (94% of MNEs; 69% of SMEs). These findings suggest that skill shortages are not simply a matter of insufficient labour supply. They are also shaped by the capacity of firms to navigate rules, reorganise production, and mobilise available instruments.

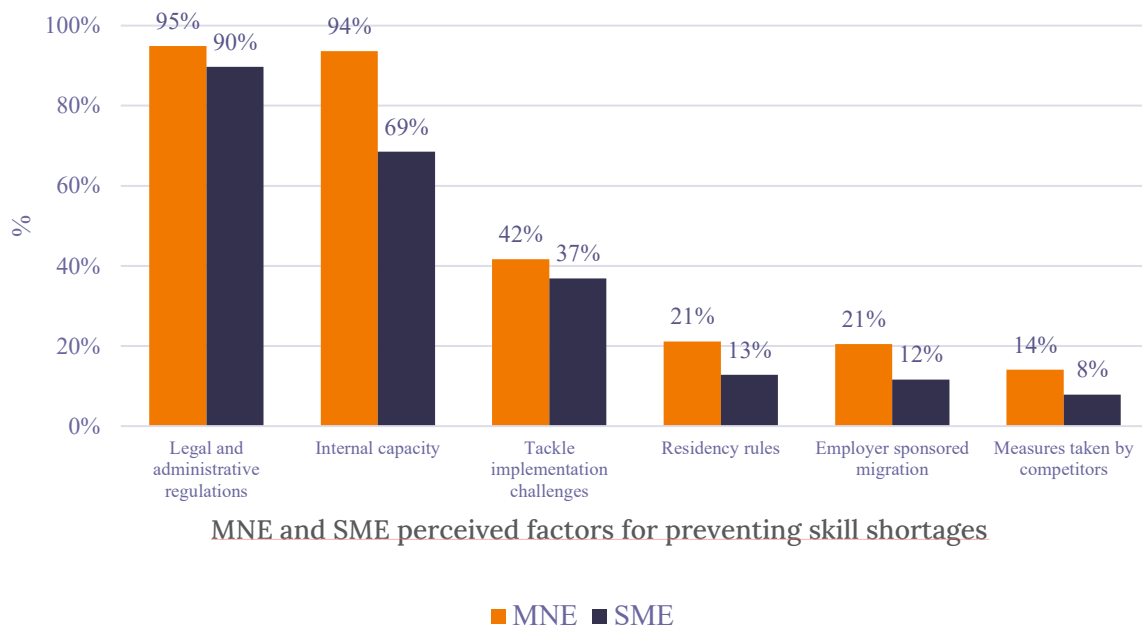
A distinction between SMEs and MNEs emerges with respect to migration-related responses to skill shortages. MNEs more often report that migration-specific factors help reduce skill shortages. Residency rules are mentioned by 21% of MNEs, while only 13% of SMEs mention this as an important factor. The same also holds for employer-sponsored migration. 21% of MNEs and 12% of SMEs indicate that it is an important factor that contributes to the reduction of skill shortages.<sup>1</sup>

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<sup>1</sup> Additional regression analysis supports this interpretation: migration-related factors appear to matter more for MNEs than for SMEs.

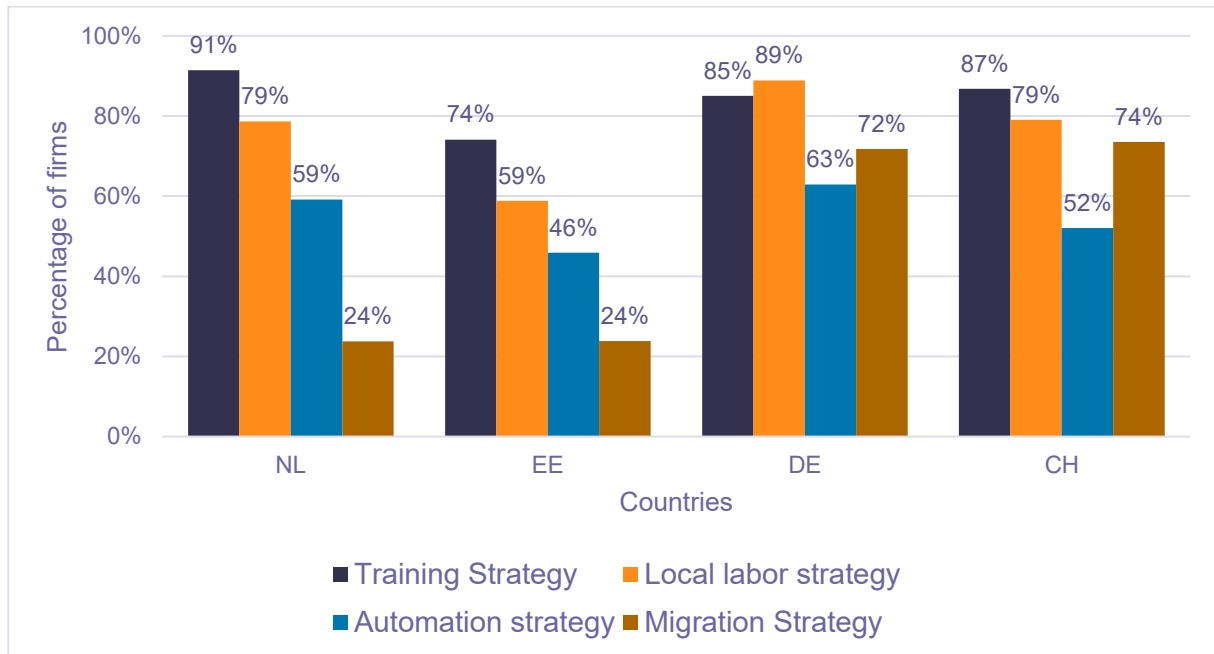


Figure 1. MNE and SME perceived factors for preventing skills shortages



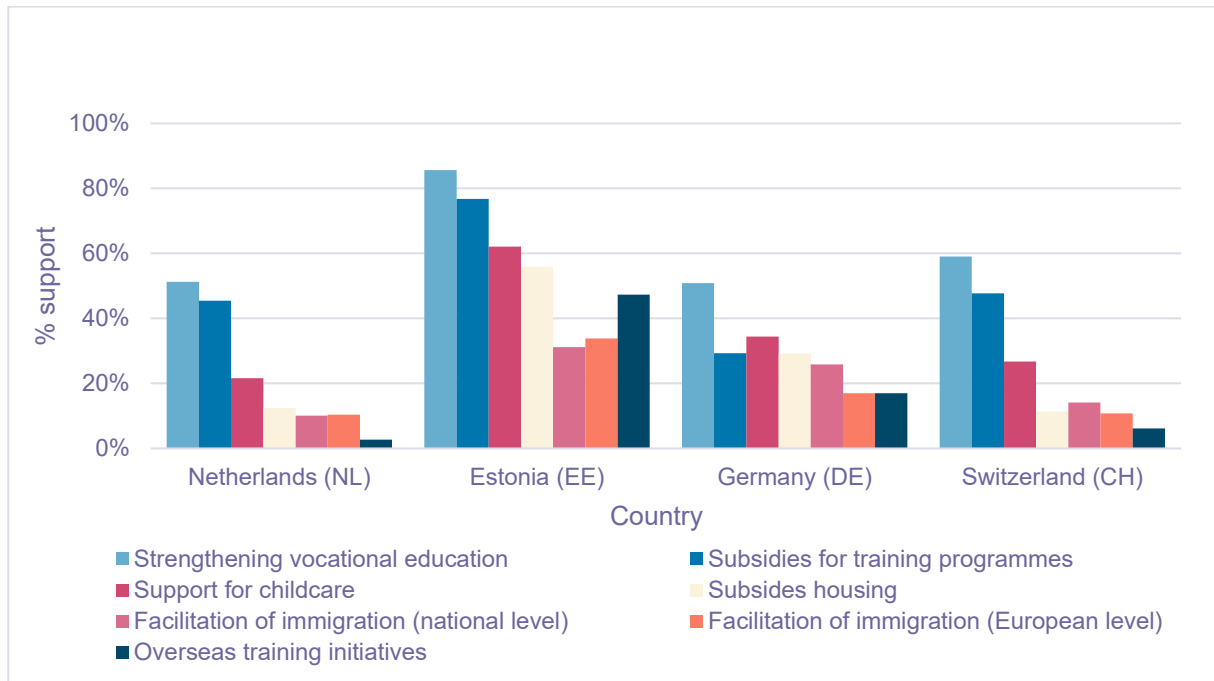
Given this weaker reliance on migration, SMEs adjust primarily through strategies closer to their existing workforce and local labour market (domestic labour conditions). Figure 2 distinguishes four adjustment strategies among SMEs: training, automation, local labour, and migration. Training is the most widely used strategy in all four countries, ranging from 74% in Estonia to 91% in the Netherlands. Local labour strategies are also common, with an uptake ranging from 59% in Estonia to 89% in Germany. Automation is less consistently adopted (46%–63%). Migration strategies remain the least used in the Netherlands and Estonia (both 24%), although the uptake in Germany and Switzerland is substantially higher (72% and 74%, respectively).

Figure 2. SME Strategies to reduce skill shortages



SMEs' preferred policy interventions mirror these observed adjustment strategies (Figure 3). Across all four countries, the most widely supported measures are strengthening vocational education and subsidising training programmes. This aligns with the finding that training is the most widely used SME response to skill shortages. Childcare and housing subsidies rank third and fourth. This suggests that SMEs also attach importance to policies that make it easier for people to take up or remain in work. By contrast, measures facilitating migration at the national or European level receive lower support. This corresponds with the relatively limited use of migration as a workforce strategy among SMEs in several countries (Netherlands and Estonia).

Figure 3. SME strategies reflected in policy preferences



Taken together, these findings suggest that SMEs respond to skill shortages through a relatively stable set of response strategies. Training is the most widely used response, followed by local labour strategies. Automation plays a more intermediate role, while migration is used less consistently and varies more strongly across countries. This pattern indicates that SMEs primarily rely on strategies that are close to their existing workforce and local labour market. Migration can be part of the response, but it appears to be more conditional on the national and institutional context.

The comparison with MNEs reinforces this point. While both firm types face regulatory and organizational constraints, MNEs are more likely to report migration-related factors as relevant for reducing skill shortages. SMEs, by contrast, rely more heavily on training and local labour market adjustment.

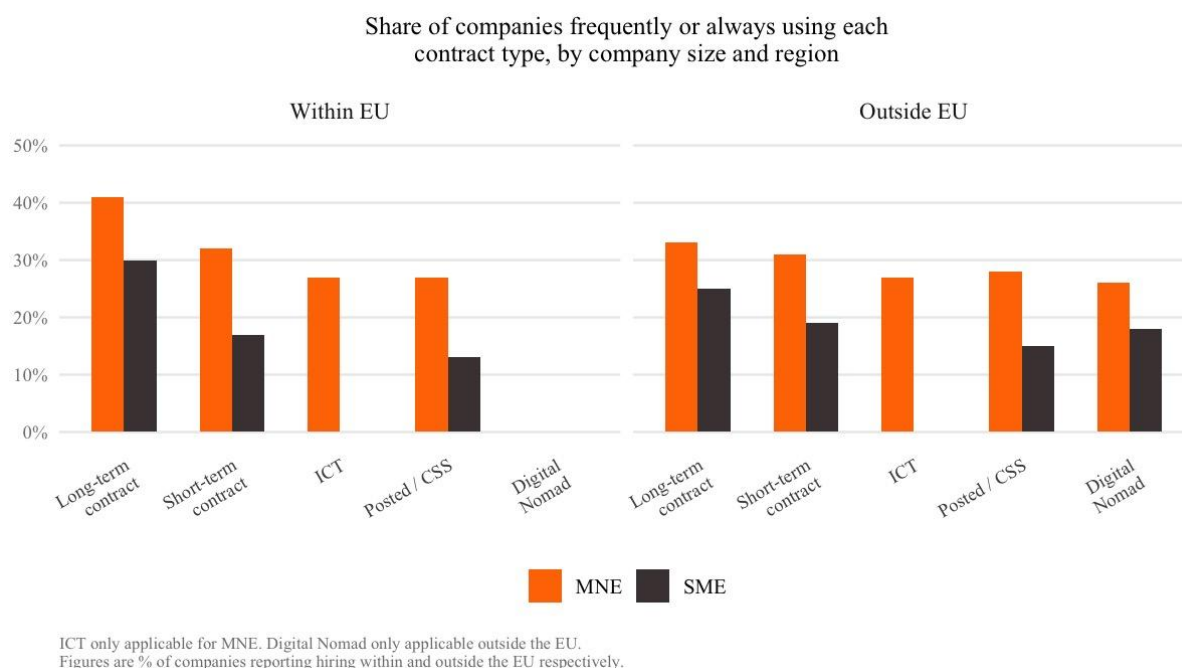
### 3.2. Skill filling strategies within and outside the EU

In relation to migration-related strategies, we examined the extent to which companies address skill shortages by hiring workers from abroad using non-traditional contracts. These arrangements are characterized by a decoupling between the worker's physical presence (in a host state) and the legal and contractual locus of their employment (in another state), and include Intra-Corporate Transferees (ICT), posted workers, contractual service suppliers (CSS) and digital nomads. Figure 4 below, which shows the frequency with which companies hire workers from abroad using different labour mobility schemes (reflected in different types of contracts) provides multiple insights. It shows, first, that even though these types of contracts do not figure



prominently in public debates they are actually quite widespread, with companies reporting to use them to hire workers from abroad with almost the same frequency as they use standard short-term contracts. Second, that while it is often thought that it is primarily MNEs that make use of these hiring strategies, they are also frequently used by SMEs. And even though SMEs use them to a lesser extent than MNEs, they also use them almost as much as regular short-term contracts. Third, that among the companies facing skill shortages in our sample, both MNEs and SMEs report hiring workers from outside the EU less frequently than within it. That said, among those MNEs and SMEs who do hire outside the EU, these types of contracts are used roughly at the same rates (if not somewhat higher) as within the EU.

Figure 4: Share of MNEs using different labour mobility schemes



### 3.3. Sectoral overview of MNE strategies for filling skill shortages

Our fsQCA (see Table 1) shows that there is not a one-size-fits-all solution. What works depends on the sector, the firm's size, and the barriers it faces. Successful responses are always combinations of conditions, not single interventions.

**IT and Manufacturing: Automation Plus Talent Inflow:** In IT and manufacturing, the most effective combination is automation paired with government-backed talent inflow programmes. Where this combination is not available, some MNEs substitute automation with recruitment from outside the EU, through long-term or short-term contracts,



particularly where talent inflow initiatives are absent. In contexts where regulatory barriers are acutely felt, participation in skill inflow initiatives alone tend to be sufficient.

Firm size shapes which pathway is viable. Among IT firms without automation, 77% are large multinationals (more than 500 FTE), with only 23% falling in the 251–500 FTE range. This pattern reverses sharply among automating firms: 63% are in the smaller 251–500 FTE bracket, with only 37% exceeding 500 FTE. In other words, it is the smaller multinationals in IT that are successfully deploying automation. Organisational inertia may be the likely explanation for why larger MNEs are lagging behind. These larger MNEs tend to compensate for their less frequent use of automation by recruiting talent from outside the EU.





This size dynamic also shapes attitudes toward government support. Among IT firms that do not automate, 62% say training subsidies would not help, suggesting that large MNEs with strong internal capabilities see limited value in government training programmes. Among automating firms, the picture is similar: 64% report that subsidies would not help, reinforcing that MNEs successfully using automation have largely self-sufficient talent development pipelines.

**Health: Multiple Pathways, Outsourcing Plays a Key Role:** In healthcare, both automation-focused and migration-focused approaches are successful means of closing skill gaps. Outsourcing and offshoring play an outsized role, particularly where international recruitment pipelines, through long-term or short-term contracts, are absent. Where such contracts are used regularly, firms additionally benefit from automation. Notably, while a formal qualification-recognition regime applies in this sector (e.g., the BIG-registratie in the Netherlands), it was not experienced by respondents as an asymmetric regulatory barrier in the way comparable requirements were in IT. However, similar to those in IT, larger firms in health rely less on automation.

**Construction: Outsourcing Over Automation:** In construction, outsourcing and offshoring are significant in accessing skills, while automation plays a considerably smaller role than in IT or manufacturing.

Table 1: Combinations of institutional conditions and firm response strategies

Sector	IT						HEALTH				CONSTR- UCTION		MANUFACTURING			
	1	2	3	4	5	6	1	2	3	4	1	2	1	2	3	4
<b>Reason shortage:</b> difficulty finding skilled workers due to lack of education and training	⊗	⊗	⊗	⊗			⊗	⊗	⊗		⊗		⊗	⊗	⊗	⊗
<b>Response:</b> outsourcing or offshoring*		☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	⊗	⊗	☑	☑
<b>Response:</b> automation		⊗	☑	☑	☑	☑	☑			☑	☑	☑	⊗	☑	☑	☑
<b>Response:</b> participating in skill inflow initiatives	☑		☑	☑	☑	☑		☑	☑	☑	☑	☑	☑	☑	☑	☑
<b>Response:</b> hiring within EU via long-term or short-term contracts*	☑	☑	☑		☑	☑	☑	⊗	☑	☑	☑	☑	⊗		☑	☑
<b>Response:</b> hiring outside EU via long-term or short-term contracts*	☑	☑		☑	☑	☑	☑	☑	⊗	☑		☑		☑		☑
<b>Institutions:</b> hard barriers	☑	☑	☑	☑	☑	⊗	☑	☑	☑	☑	☑	☑	☑	☑	☑	⊗
<b>Institutions:</b> soft barriers	⊗	⊗	⊗	⊗	⊗	☑	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	☑
<b>Number of cases in pathway</b>	<b>27</b>	<b>13</b>	<b>19</b>	<b>18</b>	<b>25</b>	<b>6</b>	<b>13</b>	<b>4</b>	<b>4</b>	<b>14</b>	<b>14</b>	<b>13</b>	<b>5</b>	<b>6</b>	<b>15</b>	<b>3</b>

Legend:  = core present condition,  = peripheral present condition,  = core absent condition,  = peripheral absent condition.

Notes: \* on any of the listed strategies



#### 4. Tackling Skill Shortages: Policy Recommendations

In this section, we present policy recommendations for policymakers in the EU. Our recommendations focus specifically on policy mix targeting MNEs and SMEs in key sectors of the GS4S project. We build on the central finding of this research that effective responses to skill shortages are not single measures but combinations of strategies whose effectiveness depends on firm size, sector, and the regulatory barriers firms face. EU skills policy has largely been designed around individual instruments such as talent attraction, automation support, and vocational training. The recommendations below are structured around the combinations that work.

- **IT and Manufacturing: Fund the Combination, Not Just the Components**

For smaller IT multinationals, the evidence points to a clear winning configuration: automation combined with participation in government-backed skill inflow initiatives. Neither element works as well in isolation. Yet current EU policy funds these as separate streams, the *Apply AI Strategy* on one side, the *Union of Skills and Skills Portability Initiative* on the other, with little coordination between them.

The *Apply AI Strategy*, launched in October 2025, explicitly targets SMEs as a priority group for AI adoption, which is consistent with our finding that smaller IT MNEs execute automation more effectively than larger ones. However, the bulk of EU AI investment continues to flow toward large-scale infrastructure such as AI Factories and Gigafactories, with a €20 billion commitment from the Commission (European Commission, 2025). This concentration of funding at the infrastructure level does not address the implementation challenges that firms actually face. Hence, we recommend:

- i. Designing co-investment packages that explicitly bundle automation implementation support with facilitated access to skill inflow programmes for smaller IT and manufacturing MNEs. The combination matters as funding automation without supporting the talent pipeline, or vice versa, leaves firms with an incomplete response.
- ii. Channelling this support through European Digital Innovation Hubs, now being refocused as Experience Centres for AI, intended to serve as single entry points to the AI ecosystem for SMEs and explicitly mandating that these centres offer integrated advice on both automation adoption and talent inflow pathways.
- iii. For larger IT and manufacturing MNEs, where organisational inertia may hinder automation and the preferred response shifts toward non-EU recruitment, developing ‘automation readiness’ diagnostics alongside streamlined long-term contract pathways.

- **Health and Construction: Regulate the Combinations Used by Firms**

In health, two distinct configurations emerge as effective: automation-led responses, and migration-focused approaches where outsourcing and offshoring play a central



role, particularly in the absence of active international recruitment pipelines. In construction, outsourcing and offshoring are prominent across configurations, while automation plays a smaller role. Current EU skills policy largely ignores these firm-level combinations, focusing instead on direct employment and formal recruitment pipelines.

Posted workers are already heavily concentrated in precisely these sectors, 42% work in construction and 14% in health and social work. However, the regulatory framework governing these arrangements remains fragmented, posing risk to workers within them in exposure to gaps in oversight and protection. The forthcoming Fair Labour Mobility Package, expected from the Commission in mid-2026, represents an important opportunity to close this gap (FinUnions, 2026). We, therefore, recommend:

- i. Acknowledging outsourcing and offshoring as legitimate components of firm-level response combinations, while emphasising that they complement rather than substitute for domestic skills development, workforce retention, training, and talent attraction. Given the concentration of posted workers in these sectors and the fragmented oversight of their working arrangements, this could take into account regulatory guidance on quality standards, accountability, and protections for the workers employed through these arrangements in health and construction.
- ii. Recognising that outsourcing matters most *in the absence* of international recruitment pipelines. Where those pipelines are active, automation becomes an additional lever. Policy design should therefore support firms in building both rather than treat outsourcing as a permanent substitute for better-designed inflow programmes.
- iii. Commissioning a dedicated EU-level assessment of the skills gaps currently filled via outsourced and offshored labour, to determine whether these arrangements are masking systemic training deficiencies that a better-configured combination of inflow programmes and domestic training could address more sustainably.
- iv. Developing EU-wide frameworks for mutual recognition of qualifications in health and manufacturing. Our survey finds that hard barriers in this area burden businesses, making it a sector-wide constraint on the full range of response combinations available to them.

- **All Sectors: Design Inflow Initiatives Around the Configurations that Need Them**

Skill shortages are substantial among both SMEs and MNEs. The findings in this brief show that firms do not address them through the same channels. MNEs are more likely to report migration-related factors as relevant for reducing shortages, while SMEs rely more strongly on training and local labour market adjustment. Policy should therefore avoid treating firms as homogeneous. Hence, measures aimed at easing skill shortages should distinguish between SMEs and MNEs.



This distinction is particularly relevant for EU-level initiatives. One example is the Skills Portability Initiative, announced as part of the Union of Skills in March 2025 and expected to be presented as part of the Fair Mobility Package. By making skills more transparent and enable skilled workers to move more easily across Europe, the initiative can help reduce skill shortages. However, our findings show that skill inflow initiatives do not function as a universal solution. Rather, they gain significance specifically in configurations where firms face hard regulatory barriers *and* lack viable alternatives such as automation or outsourcing. Firms that have access to these alternatives largely bypass inflow programmes. Designing these initiatives as general-purpose tools will likely result in low uptake and misallocated resources. Consequently, we recommend:

- i. Acknowledging differences in SMEs' and MNEs' capacity to address skill shortages. Skill shortages are substantial among both SMEs and MNEs, but firms do not address them through the same channels. MNEs are more likely to report migration-related factors as relevant for reducing shortages, while SMEs rely more strongly on training and local labour market adjustment. Policy should therefore distinguish between firm types and take into account firms' internal capacity to implement different solutions. This is particularly important for migration policy. Migration can help reduce skill shortages, but the evidence suggests that it is less important for SMEs when compared to training or local labour strategies. Migration should therefore not be treated as a 'general' solution for skill shortages, but as one instrument whose relevance depends on firms' internal capacity.
- ii. Redesigning skill inflow initiatives around the specific configurations in which they add value, i.e., in sectors with hard regulatory barriers where automation is limited and outsourcing is not a viable substitute. In practice, this means targeting construction and parts of health more precisely than IT, where automation-inflow combinations already function well for smaller firms.
- iii. Using the Skills Portability Initiative's design phase to build in explicit targeting criteria, based on firm size, sector, and the regulatory barriers firms actually face, rather than defaulting to a one-size-fits-all portability mechanism. Given that the initiative spans transparency, credential digitalisation, recognition of regulated professions, and validation of non-formal learning, differentiated targeting matters across each of these strands, not only for cross-border diploma recognition. For example, modernised recognition processes are most consequential in regulated, qualification-gated sectors such as health, whereas transparency and skills-matching tools may deliver more value in sectors where automation-inflow combinations already function well for SMEs and where formal recognition is less of a binding constraint. Embedding firm- and sector-sensitivity across the Skills Portability Initiative's full scope would allow it to support intra-EU mobility, ease employer administrative burdens, improve skills matching, and facilitate third-country talent attraction.
- iv. Establishing a dedicated EU monitoring mechanism for non-standard employment contracts across all sectors. Where firms use non-standard contracts as part of their response configuration, the terms attached to these





- arrangements can leave workers with materially worse pay and working conditions than locally employed staff (ETUC, 2025).
- v. Ensuring that the Fair Labour Mobility Package's proposed strengthening of the European Labour Authority explicitly covers monitoring of the non-standard contract arrangements that our research identifies as a structurally important, and currently under-regulated, component of how multinationals respond to skill shortages across sectors (European Commission, 2026).
  - vi. Strengthening the schooling and training agenda as part of Europe's productivity strategy. The Draghi report frames Europe's competitiveness challenge as a productivity challenge. The findings in this brief suggest that skills are central to that agenda. Among SMEs, training is the most widely used response to skill shortages across all countries. In addition, SMEs express strong support for vocational education and training subsidies. Investing in training should therefore be treated as productivity policy. However, the challenge is not only to expand training provision, but also to make education and training systems more responsive to changing labour market needs. This requires closer coordination between vocational education providers, employers, and public authorities, so that training content can adjust more quickly to new skill demands. Chambers of commerce, employer organisations, sectoral associations, and other intermediaries can play an important role in this process by translating firm-level skill needs into training provision. It builds on the strategy that SMEs already use the most, while strengthening their capacity to compete in a more knowledge-intensive European economy (Draghi, 2025).

## 5. Summary and Concluding Remarks

This policy brief draws on survey evidence from 4,409 businesses across four European countries to examine how MNEs and SMEs respond to skill shortages and what those responses mean for EU policy design. The central finding is that there is no single fix. Effective responses are configurations of strategies whose composition depends on firm size, sector, and the regulatory environment businesses operate in. Treating automation support, talent inflow programmes, and labour mobility initiatives as independent instruments, as current EU policy largely does, leaves many businesses without a workable combination and risks directing resources toward businesses and sectors where demand is the weakest.

The recommendations outlined in this brief focus on three areas: redesigning AI and automation funding to support the firm-level combinations that actually work, particularly for smaller MNEs in IT and manufacturing; bringing outsourcing and offshoring into EU skills frameworks as legitimate and regulated components of firm-level responses in health and construction; and recalibrating skill inflow initiatives to target the configurations and contexts where they add genuine value, while strengthening oversight of the non-standard contract arrangements on which businesses increasingly rely.



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## GS4S Policy brief series (D2.3)

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### About GS4S

GS4S seeks to better understand global skills shortages in selected sectors (Digital, Care and Construction) and strengthens evidence-based and multi-level policies on labour migration governance. The project provides new knowledge on alternative and equitable ways for addressing skills shortages in six regions (EU, EEA, Western Balkan, Middle East and Northern Africa, West Africa, and South/South-East Asia).

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