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Spain's Productivity Gap Vis-à-Vis Europe and the United States: Diagnosis and Remedies

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Spain's Productivity Gap Vis-à-Vis Europe and the United States: Diagnosis and Remedies

Prepared by Ippei Shibata*

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ABSTRACT: Spain's GDP per capita gap with highest-income euro area economies and the US is mainly due to a productivity shortfall. Spanish tech firms lag in productivity and innovation, partly due to weaker R&D investment. Beyond leading firms, there's a broader lack of dynamism; firms enter small and fail to scale up, resulting in fewer high-growth firms compared to Europe and the US. This scarcity of "gazelles" is linked to limited venture capital, human capital, and regulatory obstacles. Policy remedies include enhancing market integration, improving access to long-term risk capital, and boosting the innovation ecosystem and higher education quality.

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SELECTED ISSUES PAPERS

Spain's Productivity Gap Vis-à-Vis Europe and the United States: Diagnosis and Remedies

Spain

Prepared by Ippei Shibata[1]

[1] "The author(s) would like to thank" footnote, as applicable.

SPAIN'S PRODUCTIVITY GAP VIS-À-VIS EUROPE AND THE UNITED STATES: DIAGNOSIS AND REMEDIES

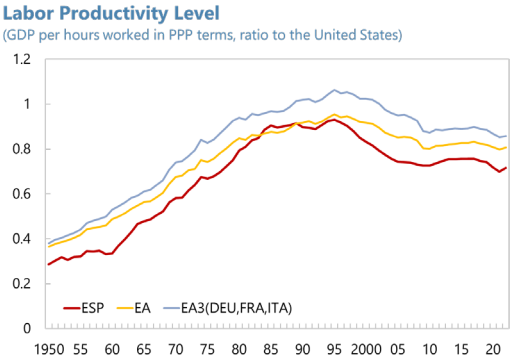
Spain's large GDP per capita gap with highest-income euro area economies and the US is primarily driven by a productivity shortfall. Spanish leading firms, particularly in the tech sector, trail leading global counterparts in productivity and innovation, partly reflecting much weaker R&D investment rooted in lesser reliance on equity. Looking beyond Spain's leading firms also uncovers a broader lack of dynamism. Firms enter the market small and fail to scale up, resulting in a much smaller economic footprint of young high-growth firms in Spain compared to European peers and—even more so—the US. This much rarer occurrence of "gazelles" in Spain partly reflects limited access to venture capital and adequate human capital, as well as tax and regulatory obstacles to firms' growth. Taken together, this comparative lack of dynamism of leading and young high-growth firms alike account for Spain's notoriously large share of small firms. Potential policy remedies include enhancing Spain's product market integration and young firms' access to long-term risk capital through both domestic and EU-level initiatives, and improving the innovation ecosystem including the quality of higher education.

A. Background and Motivation

1. Spain's significant per capita income gap with highest-income euro area economies and the United States primarily reflects a wide productivity shortfall (Figure 1). In 2024, Spain's income per capita in PPP terms stood nearly 40 and 16 percent below that of the US and the other three largest euro area economies (Germany, France and Italy), respectively. While both lower capital intensity and fewer total working hours accounted for some of the gap vis-à-vis the US, weaker total factor productivity drove over two-thirds of it. In the second half of the 20th century, European

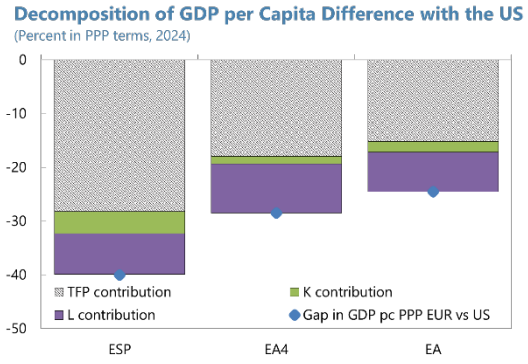
Figure 1. Aggregate Productivity Gap: Spain vis-à-vis Europe and the US

Spain lags the US and its European peers in terms of labor productivity.



Sources: Long-term Productivity Database, WEO and IMF staff calculations.

The GDP per capita gap vis-à-vis the US mainly reflects comparatively lower total factor productivity (TFP).



Sources: WEO, AMECO and IMF staff calculations.

economies significantly narrowed—and for some of them closed—their hourly productivity gap with the US, often considered to define the "global productivity frontier" in many industries and overall. Meanwhile, following its democratic transition in the late 1970s and subsequently its EU accession in 1986, Spain reduced its productivity gap vis-à-vis other leading European economies. However, since the late 1990s, the productivity gap of European economies with respect to the US has widened again, while that of Spain vis-à-vis Europe has reopened and is now about as wide as it was 25 years ago despite some reduction in the last few years. Furthermore, it remains to be seen whether Spain's favorable recent productivity performance vis-à-vis the rest of Europe will be temporary or structural.

2. This paper examines the underlying factors behind Spain's productivity gap from a firm-level perspective, offering key insights into how Spanish firms compare to their counterparts in other European countries and the US. Drawing on the IMF (2024) and Adilbish and others (2025), it analyzes these issues through the lens of the life cycle of firms, focusing on both frontier firms (leading firms) and those behind the frontier (particularly young firms). The paper first compares the performance of leading (listed) Spanish firms to their European and US counterparts in terms of productivity growth and innovation. It then turns to firms behind the frontier, exploring the dynamics of young and small firms in Spain including compared to their counterparts in other countries. The paper specifically zooms onto high-growth young firms or "gazelles" and the challenges they encounter in scaling up, given the well-documented importance of these firms for innovation and productivity. Finally, the paper presents policy options to boost productivity in Spain.

3. This paper leverages extensive cross-country datasets at firm, sector and aggregate levels. It utilizes five distinct corporate datasets (see Adilbish and others (2025) for more details). Aggregate comparisons rely on three databases: (i) Business Dynamics Statistics (BDS), which provides aggregated statistics based on firm-level data for the U.S. (see Decker and Haltiwanger (2024)), (ii) CompNet, which enables us to replicate many of the data points available in BDS for European countries, and (iii) the OECD's DynEmp database, which tracks entry and exit similarly to BDS. Additionally, our two firm-level databases are (iv) Compustat, used to analyze the performance of listed firms in Europe and the U.S., and (v) Orbis, which we use for firm-level analysis of young high-growth firms. A few additional databases are also employed including AMECO—an annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs, the Long-term Productivity Database to measure labor productivity, and Pitchbook for the venture capital landscape. Finally, to assess the Spanish innovation ecosystem, various data sources are used including the Program for the International Assessment of Adult Competencies (PIAAC), European Innovation Scoreboard, WIPO Statistics Database, and European University Association Autonomy Scoreboard.

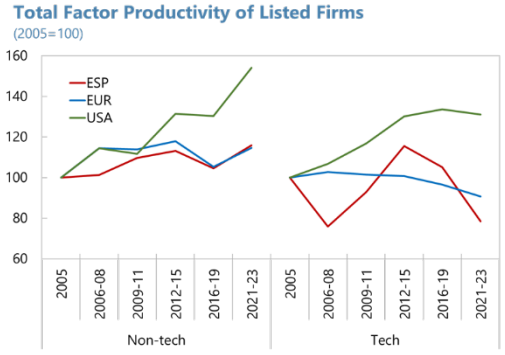
B. Dynamism at the Frontier: Leading Listed Spanish Firms

4. Leading Spanish firms are trailing behind their competitors on both productivity growth and—even more so—innovation, especially in the tech sector (Figure 2). Today, no

Spanish firm features among the top 100 global firms in terms of market capitalization.[1] Moreover, the top two Spanish firms in terms of sales in 2022 were already the top two firms back in 2000, with such lack of churn at the top hinting at lack of business dynamism. Looking across sectors, in non-tech sectors US listed firms have increased their average productivity by around 60 percent between 2005 and 2023, while Spanish and European listed firms achieved cumulative productivity growth of just around 20 percent—one third of US gains—over the same period. In the tech sector, US listed firms increased their measured productivity by over 30 percent, while their Spanish and European counterparts experienced productivity declines of around 20 and 10 percent, respectively. This wide productivity growth gap partly reflects the lower R&D investment of European and—even more so—Spanish firms. For instance, despite some improvement in the last few years, Spanish firms' R&D investment is still only about one-sixth of that of European firms, and only one-tenth of that for US firms. Related to this, leading Spanish firms also issue significantly less equity, which is a key source of innovation financing given the difficulty to collateralize R&D investments.

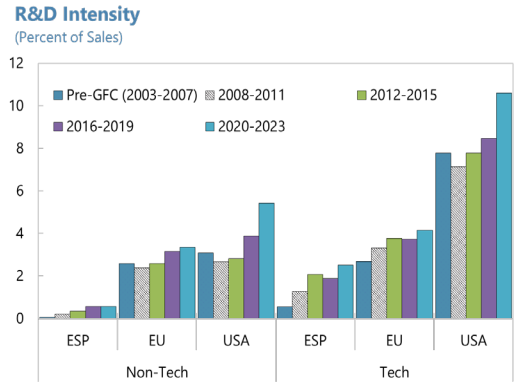
Figure 2. Spanish Listed Firms in International Comparison: Productivity, R&D, and Equity Issuance

TFP in large firms lags US counterparts, particularly in tech…



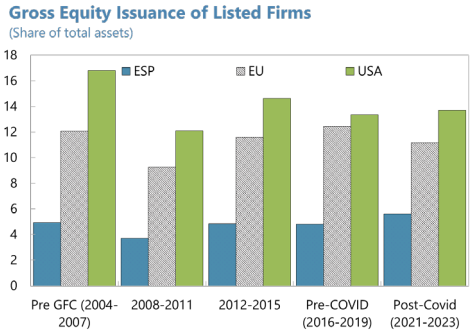
Sources: Compustat and IMF staff calculations.

… reflecting Spanish firms' much lower R&D investment.



Sources: Compustat and IMF staff calculations.

Listed Spanish firms also issue less equity compared to peers.

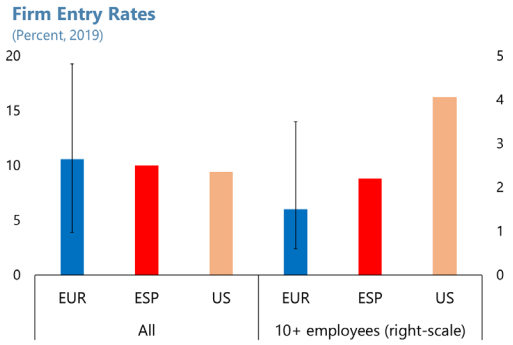


Sources: Compustat and IMF staff calculations.

[1] PWC 2022 report.

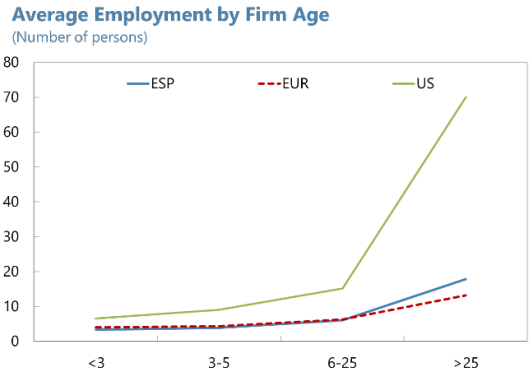
Figure 3. Firm Dynamics in Spain

Spanish firms' entry rates are broadly similar to those in Europe and the US, but they enter smaller than in the US.



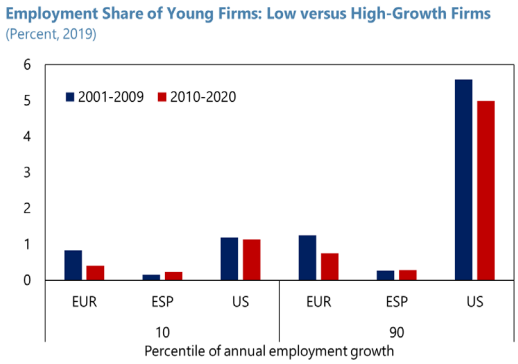
Sources: OECD DynEmp, BDS (US) and IMF staff calculations.

After entry, (surviving) Spanish firms also grow much less rapidly on average than their US counterparts.



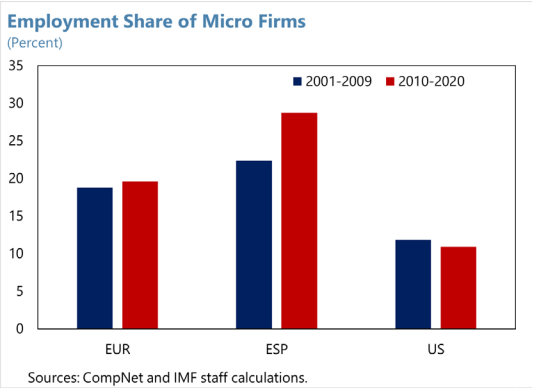
Sources: CompNet and IMF staff calculations.

Young Spanish firms grow much less, and thereby account for a much lower share of overall employment, than peers in Europe and the US…



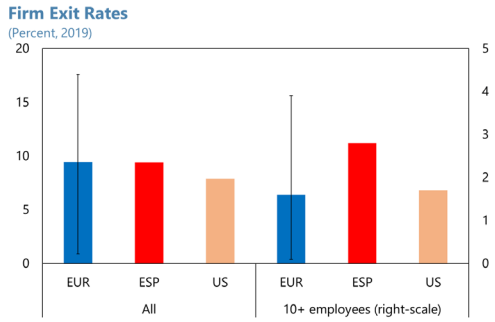
Sources: CompNet and IMF staff calculations.

resulting in a predominance of micro firms



Sources: CompNet and IMF staff calculations.

The exit rate of large (generally more productive) firms is comparatively higher in Spain.



Sources: OECD DynEmp, BDS (US) and IMF staff calculations.

5. The Spanish economy is less dynamic than European peers and—most strikingly—the US, particularly with respect to the footprint of young high-growth firms, resulting in an overabundance of small firms (Figure 3)**.** While average entry and exit rates are broadly comparable across Spanish, European and US firms, Spanish and European firms enter small—entry rates of larger firms (those with 10 or more employees) are lower than in the US. Even more importantly, Spanish and European firms struggle to scale up; as a result, the average employment size of older Spanish firms (aged at least 25 years) is five times smaller than that of their US counterparts. Most striking and Spain-specific is the small footprint of young high-growth firms (above 90th percentile of annual employment growth), which in terms of overall employment share (on average between 2010 and 2020) is about three and eighteen times smaller compared to Europe and the US, respectively. As a result, many Spanish firms remain small, and a sizable fraction of the workforce is employed in less productive micro firms. Turning to firms' exit rates, while they are comparable on average to those in the US and European peers, exit rates for larger firms (with 10 or more employees) are comparatively higher in Spain. This could potentially suggest insufficient exit selection of unviable low-productivity firms as larger firms are typically more productive. Continued improvements in insolvency proceedings, building on recent progress, will be needed to ensure that insolvent but viable firms—which typically enjoy higher productivity and growth prospects compared to their unviable counterparts—are restructured rather than liquidated.

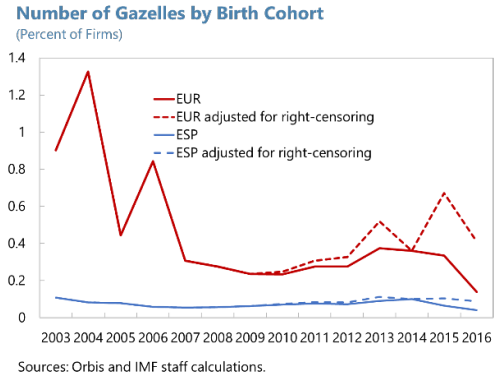
C. Zooming Onto the Emergence of "Gazelles" and their Challenges

6. Young high-growth firms or "gazelles" are rare in Spain (Figure 4)**.** We define "gazelles" as firms that are younger than 10 years old, achieve at least 20 percent annualized sales growth for three consecutive years, and eventually reach 100 employees at some point. On average, gazelles outperform mature large firms in sales growth by nearly 10 percentage points, although this overperformance has diminished compared to pre-GFC years. However, as a fraction of their birth cohort, gazelles are much rarer in Spain compared to other countries. While a typical European country sees about 0.5 percent of a given cohort of firms grow into gazelles, only about 0.1 percent of businesses in Spain reach this status at some point. On a more encouraging note, high-tech firms have been increasing their share among Spanish gazelles in recent years.

7. The scarcity of gazelles in Spain reflects in part financing challenges. Gazelles are underfinanced relative to large mature firms, as indicated by their higher average revenue per unit of assets—which, under some conditions, is indicative of greater marginal productivity of capital. They also face higher borrowing costs compared to their large mature counterparts. These financing difficulties are further reflected in the significantly lower levels of venture capital investment in Spain compared to leading European countries or the US. This shortage of venture capital is concerning, as such investments are typically used to support risky ventures that could foster the emergence of gazelles and boost productivity, particularly in industries (such as high tech) where hard-to-collateralize intangible capital is predominant.

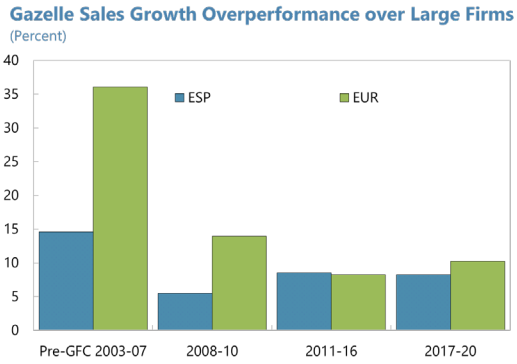
Figure 4. Gazelles in Spain

Gazelles are rarer in Spain compared to European peers….



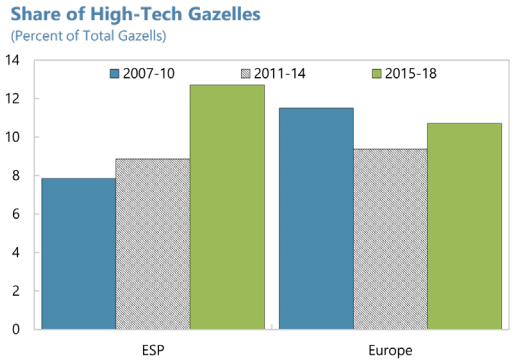
Sources: Orbis and IMF staff calculations.

Gazelles' overperformance vis-à-vis large firms is sizeable although smaller than it was before the GFC.



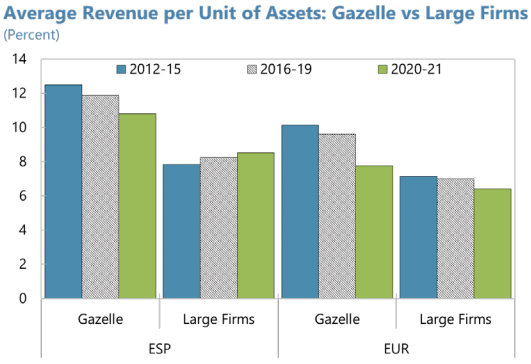
Sources: Orbis and IMF staff calculations.

While Spanish gazelles are rare, the share of high-tech firms among them has grown in recent years….



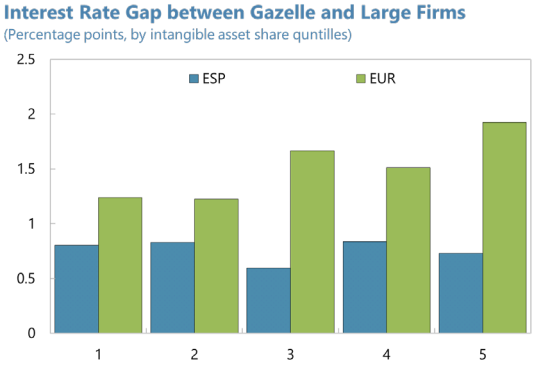
Sources: Orbis and IMF staff calculations.

Gazelles' higher average revenue per unit of assets indicates more binding financial constraints compared to large firms.



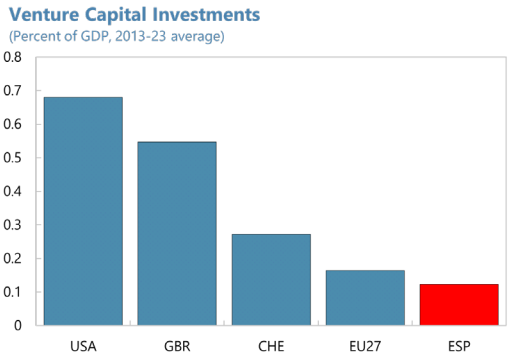
Sources: Orbis and IMF staff calculations.

Accordingly, Spanish gazelles face higher borrowing costs than larger firms, albeit less so than their European peers.



Sources: Orbis and IMF staff calculations.

Aggregate venture capital investment is much smaller in Spain compared to leading advanced countries.



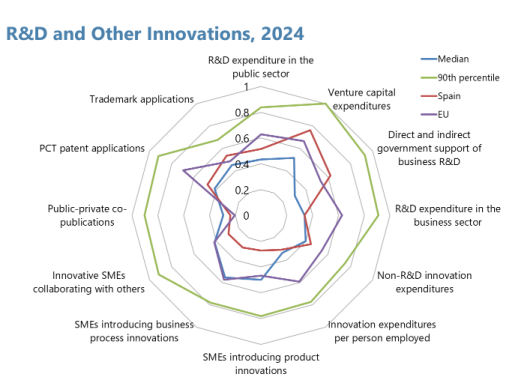
Sources: Pitchbook and IMF staff calculations.

D. Spain's Lagging Innovation Ecosystem and Recent Policy Initiatives to Strengthen it

8. Spain's innovation ecosystem—the interplay between R&D policies, tertiary education and businesses—is lagging behind global and European technological frontiers (Figure 5). In particular, Spain invests less in R&D. Despite the increase in both public and overall R&D expenditures in recent years, they stood at 0.53 and 1.41 percent of GDP in 2022, respectively, which is still below the EU averages of 0.65 and 2.11 percent of GDP and lags some top R&D spenders—for instance, Sweden and Belgium spent 3.47 and 3.29 percent of GDP on overall R&D. For Spain, achieving the targets set by the 2022 Law on Science, Technology, and Innovation (1.25 and 3 percent of GDP for public and overall R&D expenditures by 2030) will require doubling the R&D spending share in GDP. In turn, weak investment in R&D undermines both leading firms' ability to

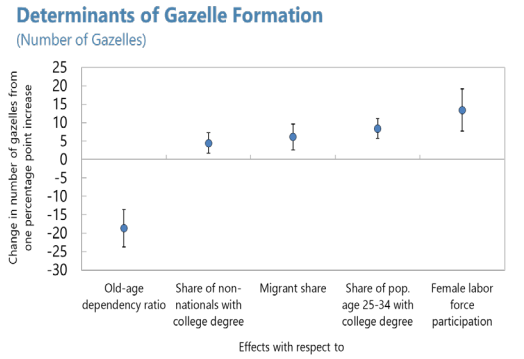
Figure 5. Spain's Innovation Ecosystem

Spain is lagging behind global and European technological frontiers on both R&D expenditures and innovation outcomes



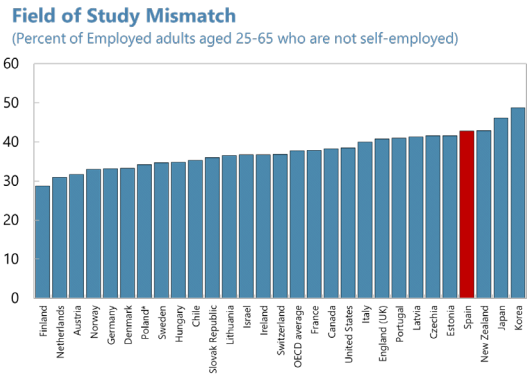
Source: European Commission - European Innovation Scoreboard.

Human capital matters for the emergence of gazelles.



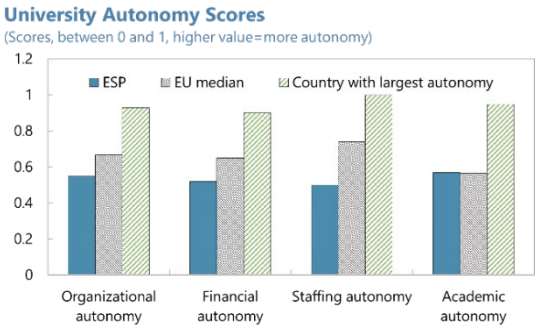
Sources: Orbis; and IMF staff calculations.
Note: Coefficients show the correlation of each variable on the number of gazelles depending on the unit of respective variables. For instance, for regressions on logs, coefficients are interpreted as the change in the number of gazelle formations in response to 1 percent change of the regressor. In Figure 1.10, Europe includes Austria, Belgium, the Czech Republic, Denmark, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. FTE = Full-time equivalent.

Mismatch in field of study is severe in Spain.



Source: OECD 2023 PIACC Survey.

Spanish university is lagging other European peers in organizational, financial, and staffing autonomy.



Sources: European University Association Autonomy Scorecard 2023 and IMF staff calculations.
Note: Organizational autonomy covers academic and administrative structures, leadership and governance. Financial autonomy covers the ability to raise funds, own buildings, borrow money and set tuition fee. Staffing autonomy includes the ability to recruit independently, promote and develop academic and non-academic staff. Academic autonomy including study fields, student numbers, student selection as well as the structure and content of degrees. Spain's data does not reflect the 2023 University Law Reform.

catch up to the global frontier and lagging firms' innovation and technological absorption capacity. Indeed, Spain is also trailing European and global technological leaders when it comes to patent applications. Spain's Patent Cooperation Treaty (PCT) applications remain at 68.7 percent of the EU average. As for human capital, another key pillar of the innovation ecosystem which IMF staff analysis also finds to be an important driver of gazelles' emergence (Adilbish and others, 2025), it remains hampered by mismatch and limited collaboration between universities and businesses. The share of people aged 25-34 who have completed tertiary education exceeds the EU average (52 vs. 43 percent in 2023), but there is a significant mismatch between educational training and the skills required in the job market—in particular, the share of STEM college graduates has been declining in the last 10 years despite strong demand. Compared to successful European peers, lack of autonomy along several key dimensions—organizational, financial, and staffing—has been one reason why the Spanish university education system has struggled to address mismatch and promote innovation.

9. Recent initiatives have been taken by the Spanish government to strengthen the innovation ecosystem and boost productivity. These include:

- Law on the Creation and Growth of Companies in 2022 (Law 18/2022), which aims to simplify the process of starting a business by offering greater flexibility in alternative financing options and encouraging the participation of small firms in public procurement tenders.

- Reform of the Insolvency Law in 2022 (Law 16/2022), which provides greater flexibility and scope for early restructuring. In particular, restructuring plans (pre-insolvency mechanisms) were introduced to enable business debt forbearance at an early stage.

- Law on developing the ecosystem of emerging businesses (Law 28/2022), known as start-up law, which complements the aforementioned two laws and aims to boost entrepreneurship and R&D activities by simplifying the process of setting up innovative firms and offering tax and employment incentives. The law eases the taxation of start-ups by reducing the corporate tax rate from 25 percent to 15 percent for a maximum of four years, as long as the company maintains its start-up status. Additionally, all start-ups benefit from a deferral of tax debt payments during their first two years of operation. Furthermore, to attract investment, individuals can now benefit from a 50 percent (previously 30 percent) tax deduction on investments of up to €100,000 (previously €60,000) in new or recently established companies.

- Science Law (Law 17/2022), which sets a target for government funding of R&D of 1.25 percent of GDP in 2030.

- The Organic Law on the University System (Law 2/2023 or LOSU, by its Spanish abbreviation) enacted in April 2023, which introduces a series of measures aimed at improving the quality of education and adapting the system to the structural challenges facing the Spanish economy. Among other aspects, it sets a minimum public spending target of a one percent of GDP for public university education.

- "Regime 20"—a common regulatory framework to cut administrative barriers to doing business across Spanish regions—that aims to promote a single market within Spain to enable firms to operate more easily across different autonomous regions. Some progress has been made, particularly in identifying key areas for harmonizing and simplifying regional regulatory frameworks. To reduce the informational barriers that firms may encounter when operating across different regions, the government is considering creating a single virtual platform to list and summarize all current local regulations.

E. Policy Options to Boost Productivity

10. Closing Spain's productivity gap vis-à-vis leading European economies and the US requires actions on both EU-level and domestic fronts to facilitate firms' scaling-up and strengthen the innovation ecosystem, including:

- **More integrated markets**, by supporting the Competitiveness Compass initiative and Regime 28 at EU level while domestically making further progress on the "Regime 20" initiative. Such efforts should lower cross-country and cross-region barriers to trade in goods and services, and thereby facilitate the expansion of highly productive young firms. However, being fundamentally a bottom-up initiative starting from the individual topic level, Regime 20 will likely take sustained effort and time to bear fruit.

- **Increasing availability of long-term risk capital**, including further developing the domestic venture capital market through tax incentives and enhanced information provision to investors, as well as advancing the EU Capital Market Union. This is needed to ease financing constraints on the creation and growth of highly-productive young firms. As such, it is a key complement to enhanced product market integration.

- **Streamlining size-based tax and regulatory thresholds**, with a focus on the more stringent labor regulation and stricter tax monitoring that kick in once firms have 50 or more employees and over 6 million euros in annual operating revenue, respectively, as these thresholds can discourage business growth. There is also a need to move toward targeted and temporary support to young innovative firms as opposed to SMEs more broadly, as SMEs include older, less productive and less dynamic firms.

- **Continued improvements in solvency proceedings** to make the firm exit process more productivity-enhancing by ensuring that insolvent but viable firms—which typically enjoy higher productivity and growth prospects compared to their unviable counterparts—are restructured rather than liquidated.

- **Promoting a more innovation-friendly ecosystem by strengthening university autonomy, building on best European practice.** Central to this agenda is to enhance universities' autonomy in the recruitment, promotion and renumeration of professors, make curricula more responsive to evolving labor market demands, strengthen research collaboration with businesses, and increase the share of performance-based public funding of universities.

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