



ITALY

SELECTED ISSUES

July 2026

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June 30, 2026

Approved By
European Department

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CLOSING EDUCATION AND SKILL GAPS IN ITALY UNDER FISCAL CONSTRAINTS THROUGH EFFICIENCY REFORMS¹

Italy's low productivity and growth reflect, in part, persistent human capital gaps due to limited education spending and low spending efficiency. In addition, an aging population that is shrinking the effective labor supply and a rising demand for digital and adaptable skills make it macro-critical to improve education outcomes. With high public debt constraining fiscal space, policies must raise both the adequacy and efficiency of education spending. This paper examines reforms to close skill gaps within existing resources. It highlights lifelong learning as an important pillar and emphasizes that stronger coordination and targeting, alongside early childhood education and vocational education pathways, is essential to improve AI preparedness, support technological adaptation, and sustain inclusive growth.

A. Introduction

1. Escaping the protracted state of low productivity and low growth requires, among other reforms, a lasting improvement in skill levels in Italy's workforce. Relative to peers, Italy has a weaker skilled human capital base, reflecting both gaps in educational attainment and legacy shortfalls across cohorts. With the added challenges of an aging population and a shrinking workforce, it is macro-critical to improve education outcomes and enable longer, more productive working lives. The urgency of enhancing skill levels is heightened by rapid technological change, including advances in artificial intelligence, which raises demand for adaptable foundational and digital skills and amplifies the costs of persistent skill gaps. In this context, it is critical to assess whether current returns on education spending are sufficient to meet Italy's medium- and long-term education and development objectives.

2. Amid fiscal constraints, enhancing the efficiency of education spending will be essential. Weak returns on education spending limit the contribution of education to labor supply, productivity, and inclusive growth. At the same time, high public debt and fiscal consolidation pressures limit the scope to scale up spending, making it essential to finance education without undermining debt sustainability. Investment should strategically prioritize high-impact areas such as early education, effective pathways to higher learning, and vocational training that is closely aligned with firms' needs and growth-enhancing sectors. Achieving a material improvement in skill outcomes also calls for a scaled-up, coordinated lifelong learning ecosystem.

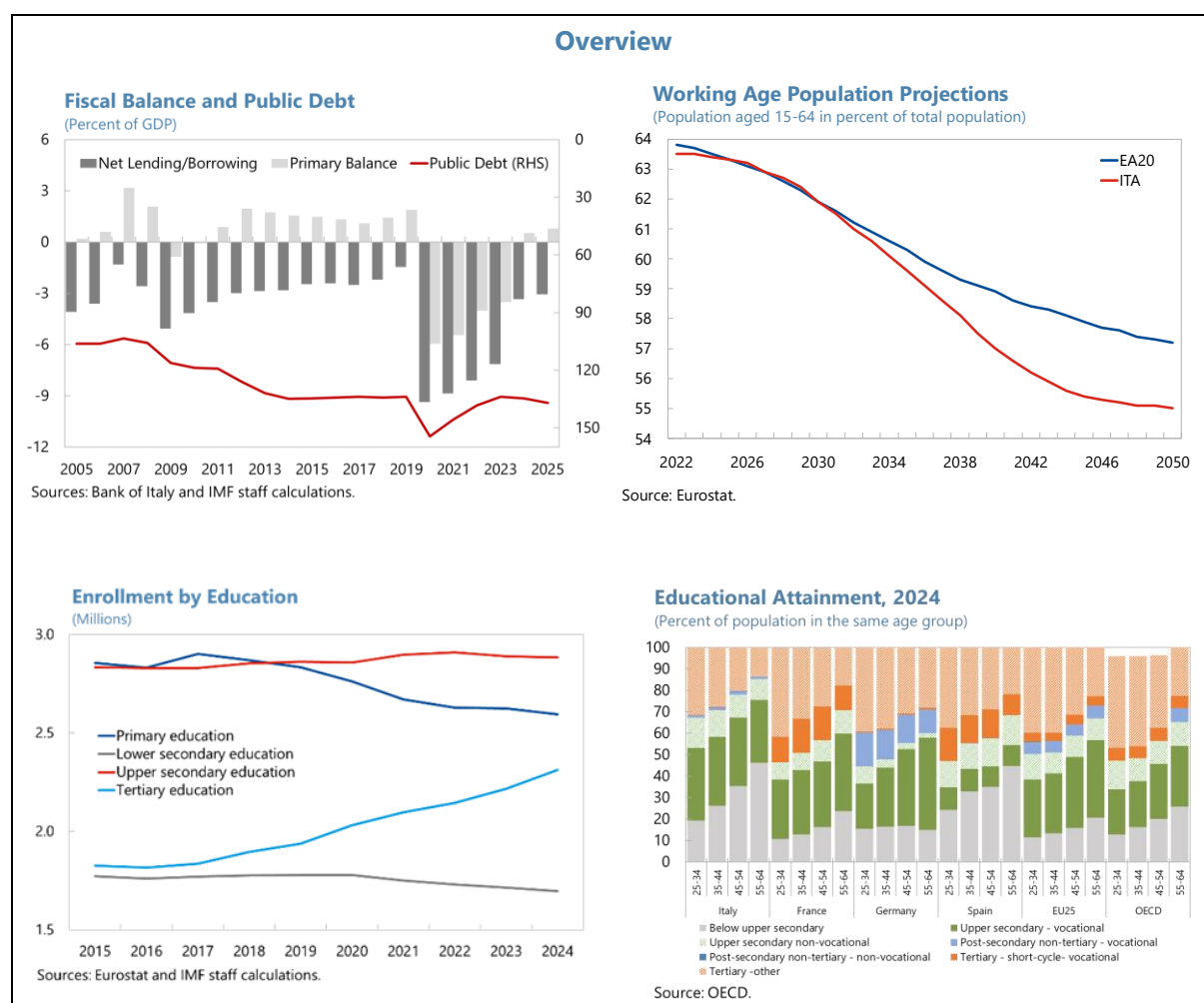
3. Synthesizing these challenges, this study highlights that Italy's education system faces persistent gaps in outcomes, spending, and efficiency. These gaps underscore the need to

¹ Prepared by Yu Ching Wong, with invaluable support from Jenny Lee. We thank the Italian authorities for the constructive discussions.

ensure adequate investment and, critically, improve the efficiency and targeting of education spending within tight fiscal constraints.

- *Attainment gaps:* High shares with below upper-secondary and low tertiary completion limit the stock of skilled workers.
- *Weak and uneven learning outcomes:* Performance lags peers (notably in science) with large regional disparities.
- *Skill mismatches:* Notwithstanding recent improvements, high rates of young people not in employment, education, or training (NEET) and low STEM/ICT attainment weaken school-to-work transitions and alignment with labor market needs.
- *Underinvestment:* While targeted investment in skills development has increased gradually in recent years, education spending is below the EU average, especially at the tertiary level.
- *Low spending efficiency:* Outcomes relative to spending are weak, and system inefficiencies reduce returns.
- *Limited lifelong learning:* Adult training participation is low and uneven, constraining reskilling amid demographic and technological change.

4. The analysis is performed through the lenses of spending adequacy, spending efficiency, and fiscal sustainability. It draws on Soto and others (2025) and discusses policy actions that could support higher productivity and inclusive growth. The remainder of the paper is structured as follows. Section B reviews Italy's education inputs and outcomes, using cross-country input-output indicators to benchmark spending and performance internationally. Section C discusses the need to enhance education outcomes to reduce skill mismatches and counter demographic headwinds. Section D reviews progress under recent education reforms and investments under the National Recovery and Resilience Plan (NRRP) and highlights reforms that deliver, and Section E concludes.

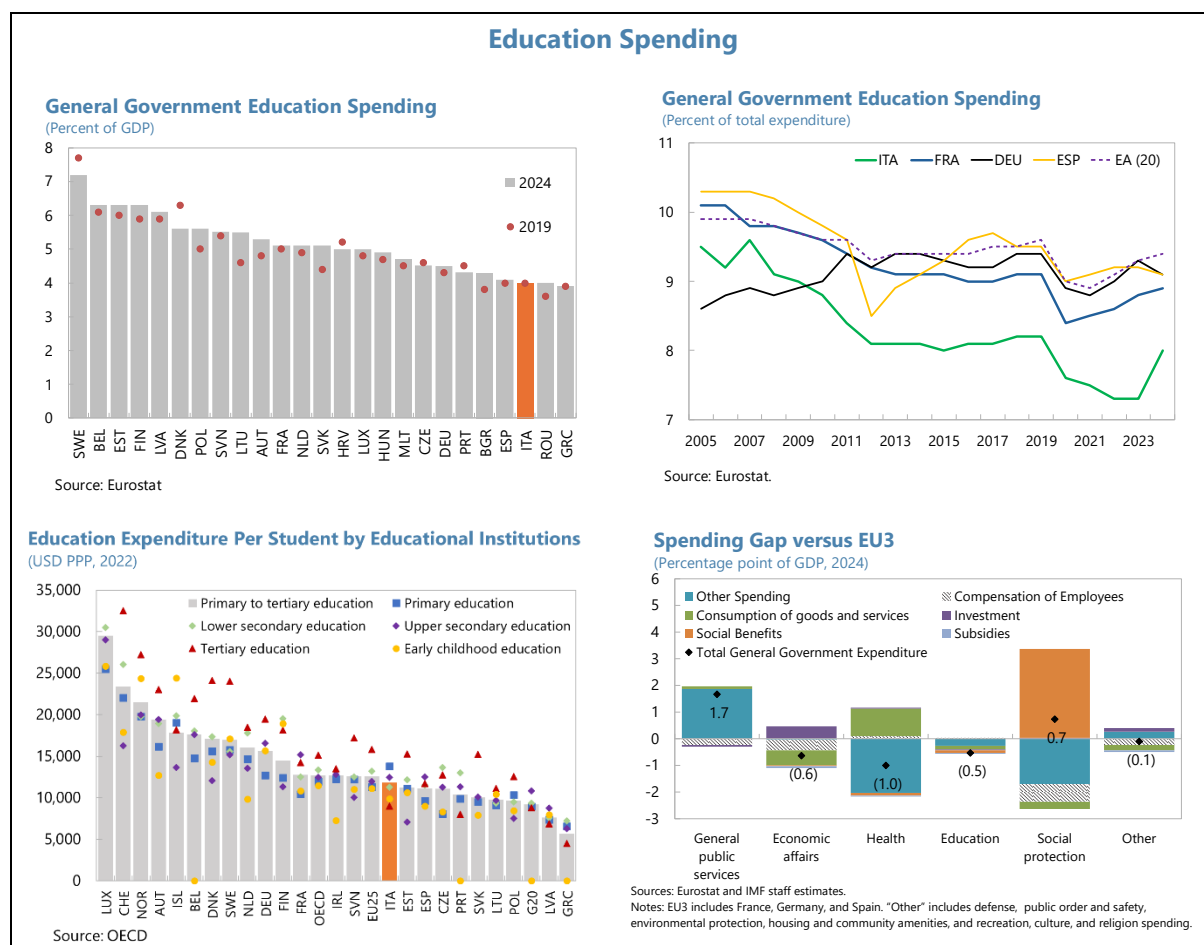


B. Spending Less, Achieving Less?

5. Fiscal constraints and competing priorities have limited fiscal space for education spending. High public debt and sizable debt-servicing costs have constrained fiscal space for discretionary increases in growth-enhancing expenditure such as education. At the same time, rapid population aging has increased age-related spending, including pensions, healthcare, and other social benefits. Against this backdrop, the level of education spending and outcomes reflect long-standing fiscal and structural tradeoffs.

6. In turn, Italy's education funding is below the EU average, both as a share of GDP and of public expenditure, indicating persistent underinvestment—particularly at the tertiary level. In 2024, Italy spent 4 percent of GDP in education, about 1.2 percentage points below the EU average, and among the lowest in the EU. In addition, education spending accounted for only 8 percent of total public expenditure, the lowest among the EU4. For example, general government spending per student was USD 11.8 thousand in 2022 on average across primary, secondary, and tertiary education, below the EU25 average of USD 12.5 thousand. There are also large differences by level of education: while Italy spends at above the EU25 average on primary education, it spends

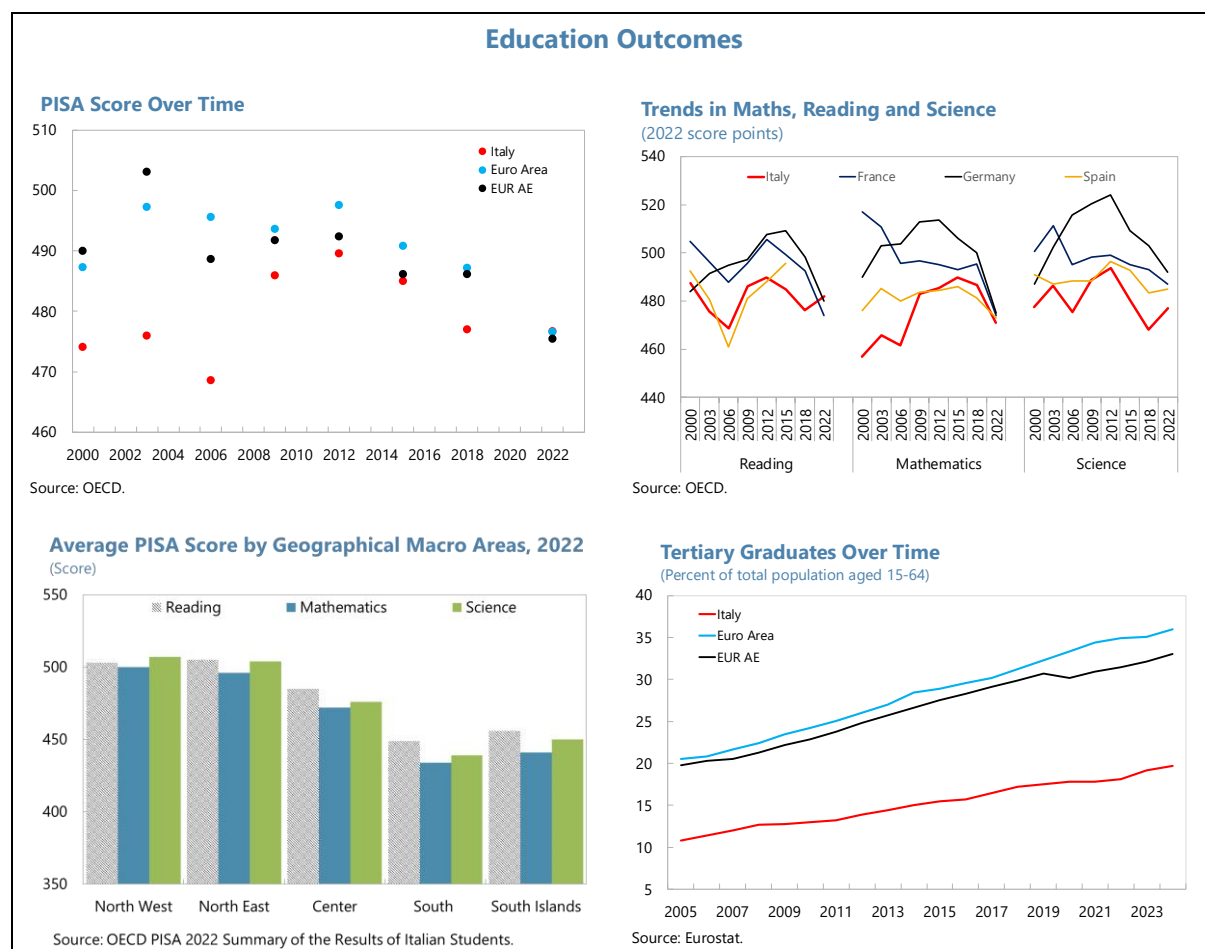
significantly less on lower secondary education, and the shortfall is especially large at the tertiary level (about 40 percent lower per student, at about USD 9 thousand versus the EU25 average of close to USD 16 thousand).² Italy also invests about ½ percentage point of GDP less than the EU3, a gap spread across spending categories. This persistent gap contrasts with higher spending in other functions (such as general public services and social protection), underscoring a long-standing underinvestment in education.



7. In addition, learning outcomes are relatively weak, reflecting persistent performance gaps and regional disparities. PISA scores for Italian students have long trailed the euro area average, although the gap narrowed in 2022 (the latest available data). By subject, reading scores were above, while math aligned with the OECD average, and science scores remained below. However, outcomes vary markedly across regions, and Italy is among the countries with relatively large regional gaps in student performance. The north–south divide is pronounced, with northern

² OECD data show that cross-country differences in tertiary education spending are heavily influenced by how much publicly funded R&D activity is performed within universities. Italy spent 0.9 percent of GDP in tertiary education (0.6 percent of GDP excluding R&D) compared to EU22 average of 1.2 percent of GDP (0.8 percent of GDP excluding R&D). Italy combines relatively low overall tertiary spending with comparatively weak national R&D intensity, contributing to lower tertiary expenditure levels relative to peers.

regions outperforming the Center, South, and Islands in all subjects. Notably, weaker outcomes in the South and Islands reflect both lower average scores and weaker performance among low achievers. Within-region inequalities are also large, even in high-performing areas, with 90th–10th percentile score gaps exceeding 200 points (OECD, 2023).



8. High dropout rates further weaken returns. While access to higher education has improved, a relatively large share of students who enter university fail to complete their programs, limiting the stock of tertiary-educated workers in Italy, weakening the efficiency of education spending.³ Therefore, expanding tertiary education would likely yield high returns if paired with a stronger pipeline (improving student quality and preparedness at entry) and broader structural reforms to translate skills into productivity (EC, 2025; Soto and others, 2025).

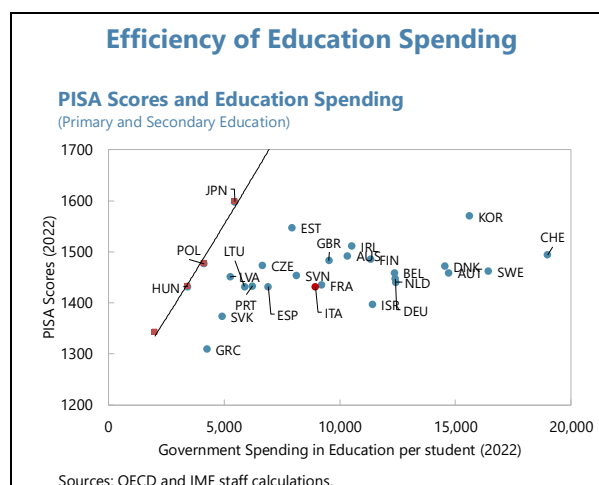
9. Several additional factors compound weak spending efficiency. Italy combines below-peer public education spending with comparatively weak learning outcomes, pointing to a need for improving spending composition, including through a better balance across personnel,

³ Completion rates of new entrants to bachelor's programs by the end of the theoretical duration of the program is 37 percent for Italy, below the EU25 average of 44 percent in 2023 (OECD 2025).

infrastructure, early interventions, and targeting of disadvantaged students.⁴ In Italy's case, factors that weaken spending efficiency likely relate to an education system that is relatively centralized in governance and limits adaptation to local conditions; complex administration that results in uneven accountability; and insufficient focus on quality inputs (such as teacher skills) and evaluation mechanisms. Stronger monitoring, outcome reporting, and targeting to improve spending efficiency or doing better with less could therefore make a notable difference.

10. An analysis of the efficiency frontier suggests that efficiency-enhancing reforms could improve educational outcomes at current spending or could achieve the same outcomes with less.

As an illustration, the Data Envelopment Analysis (DEA) efficiency frontier that relate spending per student to PISA performance suggests that Italy's PISA scores could be 117 points or 8 percent higher while spending at a broadly unchanged level (e.g., similar to that in Estonia). Conversely, Italy's PISA score level is broadly similar to that in Hungary, Portugal, and Spain, while Hungary's spending per student (on the efficiency frontier) is about 40 percent lower.⁵



11. Recent developments in school staffing policy highlight the role of demographic trends in shaping resource allocation and efficiency of education spending. Between 2021–22 and 2025–26, the declining number of students (down 6.2 percent) reduced the need for classes (down 2.8 percent) and core teaching posts. These savings were reallocated to expand policy priorities, including more support teachers (driven by legal entitlements), introducing physical education in primary schools, and additional classes to reduce overcrowding. As a result, overall staffing continued to rise (up 6.7 percent) even as enrollment declined amid smaller cohorts. Starting in 2025–26, the 2024 Budget Law partially realigned staffing with demographics by reducing common (regular teaching) posts (a cut of 5,660 posts) while continuing to expand support teachers and other staff. Overall, the spending adjustment is gradual, as demographic savings are only partly used for consolidation, and a significant share continue to finance quality-improving measures.

⁴ See the analytical framework in Soto and others (2025).

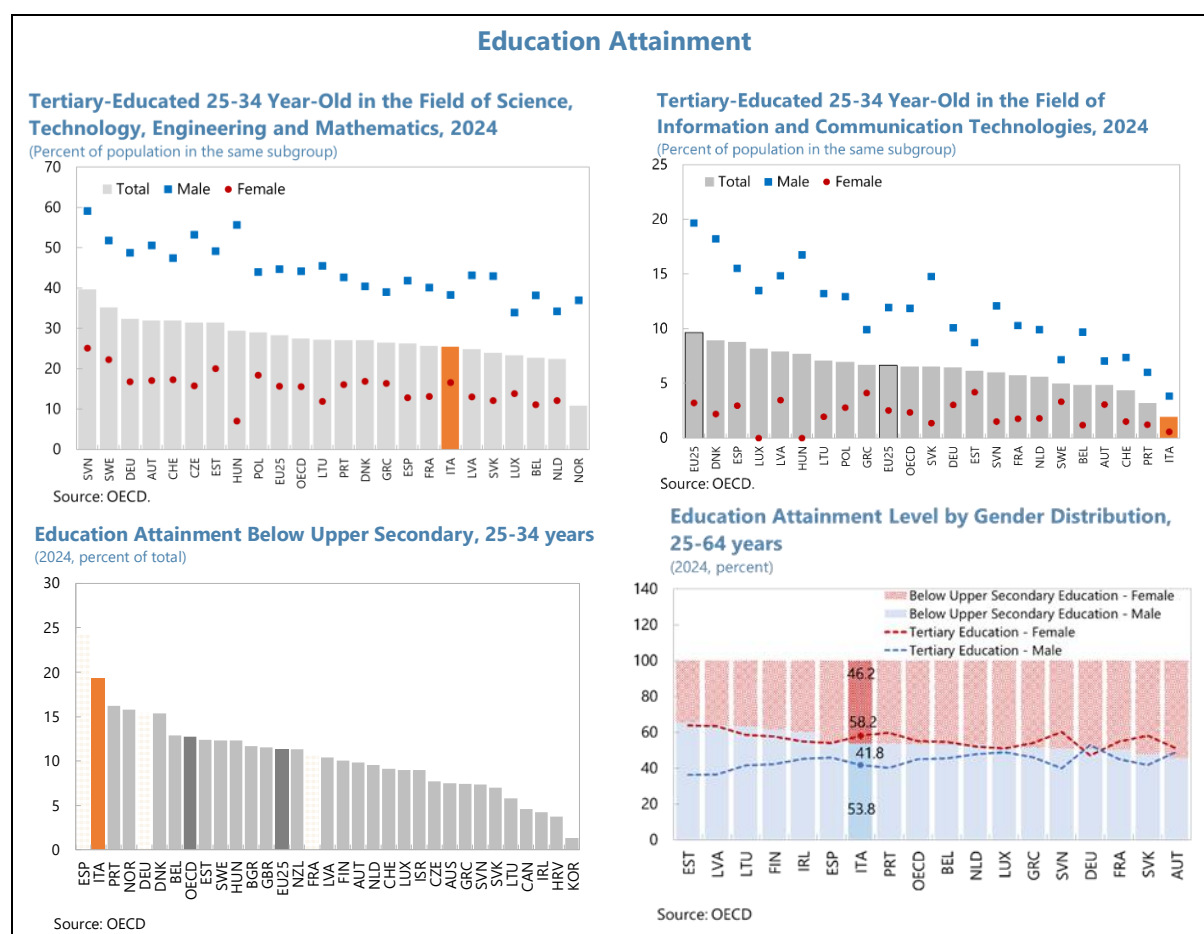
⁵ The analysis is based on the latest available PISA data and predates the implementation of education-related NRRP reforms.

C. Better Education Outcomes to Address Skill Mismatches and Demographic Headwinds

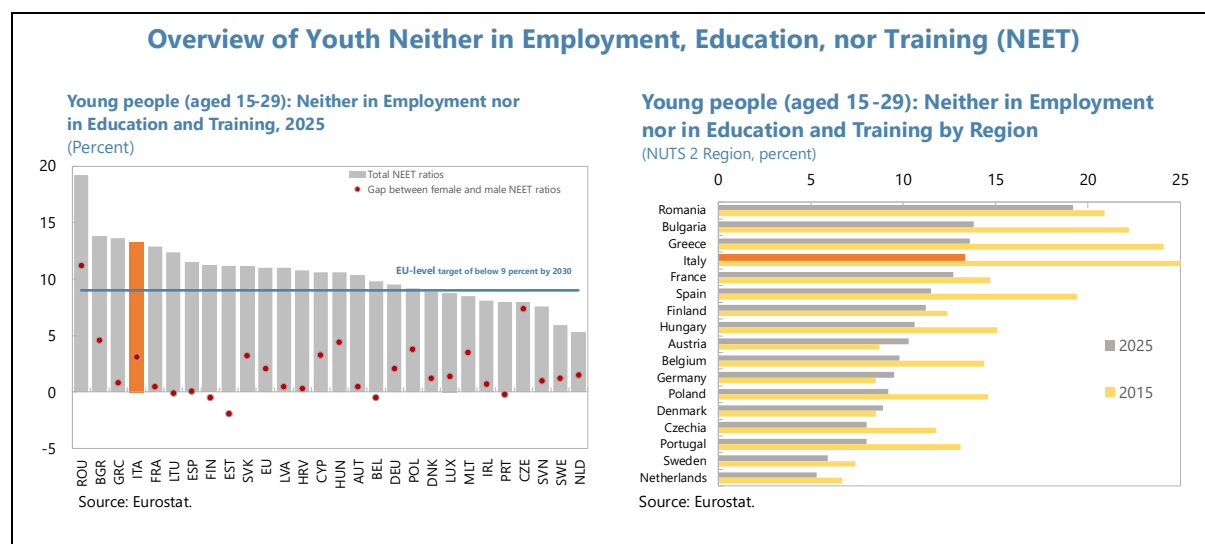
12. Education outcomes continue to present structural challenges, although recent reforms are beginning to address these gaps. While Italy has made notable progress in reducing early school leaving, structural gaps remain. The early leaving from education and training (ELET, ages 18-24) rate declined markedly, from 15 percent in 2014 to 9.8 percent in 2024, and further to 8.2 percent in 2025⁶, below the EU average (9.1 percent). However, reflecting past educational outcomes, close to one-fifth of 25–34-year-olds still lacks an upper secondary education, although this share has declined from about 24 percent in 2019. At the same time, Italy has a comparatively low share of 25–34-year-olds with tertiary STEM qualifications and ranks among the lowest in ICT-related education. STEM shares in Italy have increased only modestly between 2018 (24.5 percent) and 2024 (25.4 percent), compared to a larger rise in the EU25 (from 25.4 to 28.3 percent). In turn, the relatively low number of STEM graduates continues to weigh on innovation, the diffusion of new technologies, and the capacity to adapt to AI-driven changes.⁷ Important differences are also present across gender, with women accounting for more than half (58 percent) of tertiary graduates, and the share of tertiary STEM-educated women in Italy exceeding the corresponding average in other G4 economies and the EU25. However, while male labor force participation rates are broadly in line with those in European peers and broadly similar across education attainment, employment among women tends to be concentrated among the highly educated. About 73 percent of tertiary-educated young women are employed (comparable to 75 percent of their male peers), but only 36 percent of young women without an upper secondary education are employed (72 percent for young men) (OECD, 2024).

⁶ Based on Istat data.

⁷ The NRRP measure “*New skills and new languages*” (€1.1 billion) aims to strengthen STEM competencies and promote gender equality across the education system, although its impact will take time to materialize.

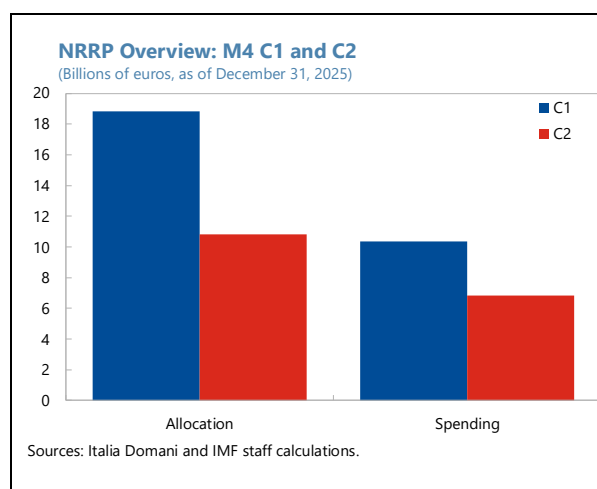


13. Moreover, education gaps continue to weigh on school-to-work transitions, even as outcomes have improved in recent years. Due to historically weak links between education pathways and labor-market entry, a relatively large share of young people completes their formal education without successfully transitioning into employment or further training. Italy's share of young people (aged 15–29) not in employment, education, or training (NEET) has declined significantly, to 13.3 percent in 2025 from 23.5 percent in 2020, representing one of the largest reductions in the EU over this period. Despite this progress, the 2025 NEET remains above the EU average (11 percent), and peers such as France (12.9 percent) and Spain (11.5 percent), and well above Germany (9.5 percent), as well as the EU target of below 9 percent by 2030. In addition, the NEET rate in Italy remains higher among young women (14.9 percent) than among young men (11.8 percent).



D. Doing Better with Less: Reforms That Deliver

14. Italy has taken important steps toward modernizing the education system. The NRRP Futura education and research reforms target key structural challenges identified earlier, such as skills mismatches, regional disparities, and gaps in vocational and tertiary pathways, through reforms and investment in infrastructures and competencies (Box 1; Annex I). Mission 4 under the NRRP (M4C1: school system reform and M4C2: research and higher education) covers infrastructure, digitalization, curricular reform, early-childhood education expansion, teacher recruitment and training, and vocational/tertiary measures.⁸ While progress to date has been uneven, the goals are broadly aligned with these priorities. By end-2025, the Ministry of Education (M4C1) had recorded about €10.4 billion in spending (of €18.8 billion, ~55 percent) and the Ministry of University and Research (M4C2) about €6.8 billion (of €10.8 billion, ~63 percent). To address absorption weaknesses, for example, €13.4 billion was reallocated in 2025 from slower-moving to higher absorption projects (Mission 4 received €150 million for scholarships). In addition, just above 40 percent of territorial investments



⁸ Complementing the NRRP reforms, EU Cohesion Policy funds also provide substantial support to the education system, with around €25.7 billion allocated over the 2000–2025 programming cycles to improve academic performance, reduce school dropout, and strengthen staff training, including through targeted initiatives such as Agenda Sud and Agenda Nord aim to reduce regional learning disparities and early school leaving.

are directed to Southern Italy, meeting the NRRP's 40 percent "South quota" target. Sustaining the reform implementation momentum and ensuring effective coordination across funding streams would help translate these investments into durable improvements in education outcomes.

15. However, while Futura reforms show progress, lasting gains require extending reforms beyond the 2021–26 NRRP horizon and strengthening institutions and execution.

Since Futura is explicitly designed as a time-bound (2021–2026) accelerator, its success in delivering sustained improvement in education outcomes will require continued reforms beyond the NRRP period as well as additional reform initiatives. In this regard, Italy's Medium-Term Fiscal Structural Plan (MTFSP) extends the reform and investment

horizon to 2029, supporting continuity in key priority areas, such as childcare expansion, education reforms, and labor market policies. Nevertheless, several reforms with high potential GDP impact would require sustained effort over a medium-to-long horizon (Table 1). For example, early childhood education and childcare provision tend to be positively associated with higher female labor force participation. Expanded vocational education and training (VET) could also act as structural growth drivers. Moreover, sustaining reform implementation and ensuring durable gains will require building permanent institutional capacity—especially in lagging regions and for complex programs—to translate resource allocations into outcomes.

Table 1. Italy: Education Reform: Growth Impact and Risk

Reform	GDP Impact	Risk	Time Horizon
Early childhood education	H	M	L
VET expansion	H	M	M-L
Teacher reform	M	H	M-L
STEM/curriculum reform	M	L	M/M-L
Digital pedagogy change	L-M	H	M
Governance/accountability	L-M	H	M
Digital Infrastructure	L-M	L	S-M/M

High, Medium, Low impact and risk

Long, Medium, Short term

Box 1. Education Reforms under the NRRP

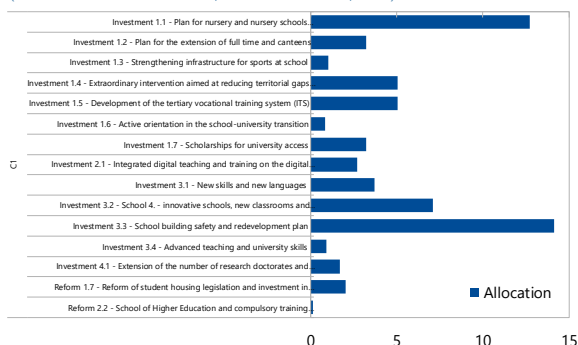
The NRRP commits significant resources for education reforms, but execution rates vary markedly. In particular, absorption varies across measures and regions, suggesting uneven regional implementation, administrative capacity constraints, and likely system inertia.

- School system reform (M4C1): Scholarships for university access (~82 percent), innovative schools/labs (79 percent), and school-university transition orientation (~65 percent) are among the top performers in spending. However, student housing and higher education staff training show near-zero spending execution, suggesting implementation bottlenecks.
- Research and higher education (M4C2): Research projects of significant national interest (PRIN) (95 percent) perform well, while Important Projects of Common European Interest IPCEI (~18 percent) and the Digital Transition Fund (~18 percent) lag. This suggests that more complex instruments face the steepest execution hurdles.
- Across regions: Allocations are broad and uneven. Spending accounts for a fraction of allocations and is unevenly distributed across projects—suggesting that the gap is less about resource availability and more about constraints in implementation capacity.

Box 1. Education Reforms under the NRRP (Concluded)

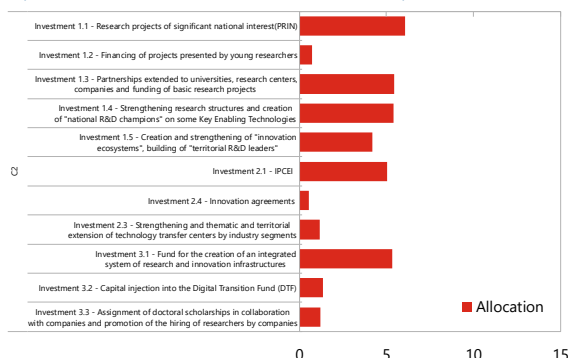
Allocation by Mission: M4C1

(Percent of total M4 allocation, as of December 31, 2025)



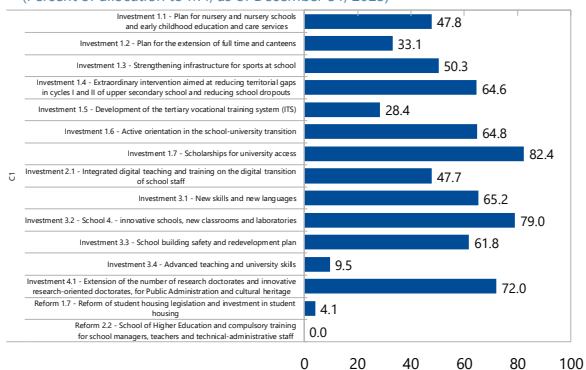
Allocation by Mission: M4C2

(Percent of total M4 allocation, as of December 31, 2025)



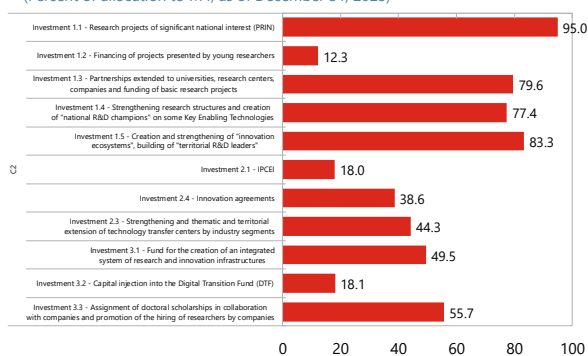
Spending Ratio by Mission: M4C1

(Percent of allocation to M4, as of December 31, 2025)



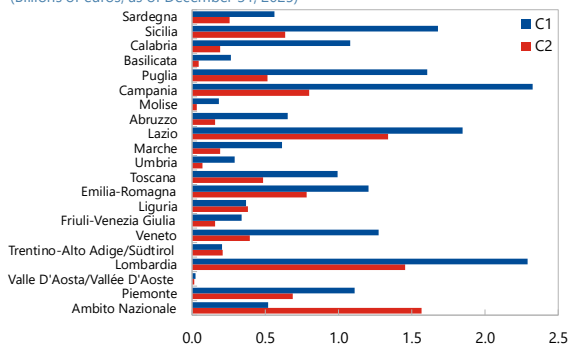
Spending Ratio by Mission: M4C2

(Percent of allocation to M4, as of December 31, 2025)



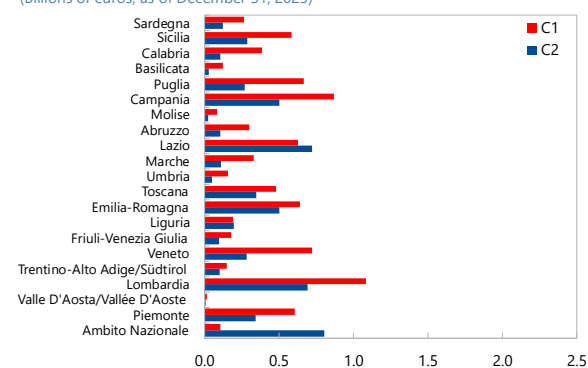
Allocation by Region: M4

(Billions of euros, as of December 31, 2025)



Spending by Region: M4

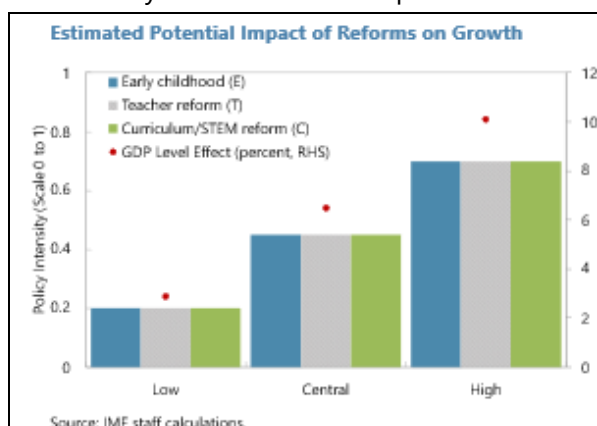
(Billions of euros, as of December 31, 2025)



Sources: Sources Italia Domani (Spesa per misura del PNRR; Progetti del PNRR; Pagamenti dei progetti del PNRR) and IMF staff calculations.

For a Successful Start and Smooth Transitions: Strengthening Early Childhood Education and Vocational Education and Training

16. Closing education and skill gaps can support growth through multiple channels. Four main channels include: (i) raising skill levels, particularly through strengthened early childhood education, teacher quality, and curriculum; (ii) improving labor market matching efficiency through strengthening vocational education and training (VET), and the Istituti Tecnologici Superiori (ITS) system—both are key vocational-skills interventions under the NRRP;⁹ (iii) expanding labor supply, particularly by expanding childcare and by strengthening early childhood education, which can help increase female labor force participation; and (iv) generating productivity spillovers through innovation and technology adoption. A back-of-the-envelope analysis suggests that a comprehensive, sustained overhaul of the education and skills system could raise long-run GDP by about 5–7 percent in a central scenario materializing over about two decades. These estimates, however, are sensitive to underlying assumptions and should be interpreted with caution (see details in Annex II). Realizing these potential gains will depend critically on the effective implementation and continuation of ongoing reforms, including the expansion and consolidation of ITS and related pathways, where enrollment is rising but the full impact will take time to materialize, as well as on continued efforts to improve coordination across policy instruments and funding streams. In this regard, efforts under the NRRP, complementary Cohesion Policy programs, and medium-term commitments under the MTFSP are helpful.



For Gains Across the Workforce: Fostering Life-Long Learning

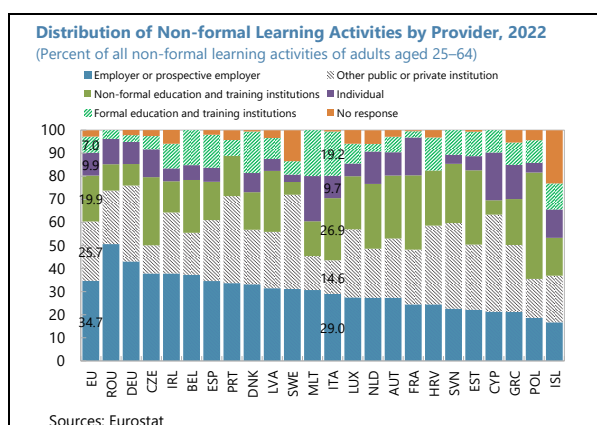
17. Italy has persistently low lifelong learning participation despite recent reforms. Adult learning participation was around 10.4 percent in 2024, below the EU average (13.5 percent), and far below the Nordic levels (Sweden 37.5 percent, Denmark 31.2 percent, Finland 29.1 percent).¹⁰ This is also well below the EU's 2030 target of 60 percent adult learning participation. Moreover, participation in adult learning remains highly unequal in Italy between low-skilled (10.3 percent) and high-skilled (60.2 percent) adults, suggesting that those most in need are least likely to receive

⁹ The "4+2" technical-professional pathway, introduced in 2024, links four years of upper-secondary technical or vocational education to two years of post-secondary training in ITS Academies. While not itself a core NRRP milestone, it supports the NRRP-backed expansion of the ITS system by strengthening the pipeline of students entering higher technical education and better aligning vocational training with labor-market needs, particularly in skills relevant to the digital and green transitions.

¹⁰ The Eurostat indicator measures participation in education and training in the last 4 weeks for those age 25-64, including formal and non-formal education, including, job-related training courses, professional certification programs, company training sessions, and public employment service training (e.g., re-skilling programs like Italy's GOL), but with strict criteria. The indicator may not captured informal learning-by-doing in Italy with high presence of SMEs.

reskilling and upskilling. Italy's learning system is also less employer-led and relies more on formal education and non-formal providers. While programs such as GOL (Garanzia di Occupabilità dei Lavoratori), funded under the NRRP, and interprofessional training funds provide financial support, their uptake remains highly uneven across regions and worker groups (OECD, 2019; EU, 2025). Beyond culture and incentives, several factors likely help explain these structural gaps in adult learning, including fragmented governance (see below), and the predominance of small firms (EU, 2025).

18. Lifelong learning represents only a small part of Italy's skills system. Spending on active labor market policies (ALMPs) and training remains structurally below that of peers, reflecting weaker and less comprehensive adult learning provision. Unlike the largely tax-financed, universal systems that are prevalent in the Nordic countries, Italy relies heavily on a fragmented mix of regional programs, EU funds, and payroll-based training funds, resulting in uneven coverage and limiting scale and continuity. Existing training funds, financed by a 0.3 percent payroll levy, appear uneven in utilization and are not consistently directed toward reskilling purposes. While the NRRP's GOL initiative has made progress in linking training of the unemployed to ALMPs, its long-term sustainability is uncertain after NRRP funding. Enhanced coordination is therefore essential to achieving lasting improvements in workforce's participation in upskilling.¹¹



E. Concluding Remarks

19. Closing education and skill gaps is essential to boost productivity and growth, but progress must be achieved within fiscal constraints. While longstanding structural challenges persist, Italy has made important efforts in recent years as part of a broad reform and investment agenda, supported by the NRRP and the 2021–2027 Cohesion Program, to address skill gaps, reduce regional disparities, and strengthen school-to-work transitions. Building on this momentum, continued progress should focus on achieving more with less, by investing strategically in high impact areas, such as early childhood education (with clear links to higher female labor force participation), stronger pipelines to higher learning, and vocational education and training pathways that are aligned with firms' demand for skills. In addition, extending and deepening education reforms under the NRRP beyond 2026, supported by the MTFSP, with a strong emphasis on effective implementation will be critical for sustaining gains within fiscal constraints.

20. Increasing efficiency in education spending is central to this strategy. Better targeting, improved monitoring of outcomes, and continued reallocation of resources toward priority areas

¹¹ Both the OECD and EC emphasize the need to improve governance, system integration, and targeting, rather than solely increasing funding.

can improve outcomes and support more efficient use of public spending. Efficiency gains should be used to create fiscal space, with realized savings reinvested strategically in high-return initiatives, without relying on increasing headline spending. Aligning educational policies with evolving labor market demands—particularly in digital and technical skills—and continuing to strengthen school-to-work linkages, including through vocational pathways and ITS systems, can further support employment outcomes. Although challenges remain, recent policy efforts under the NRRP and complementary programs are increasingly targeting this transition phase, including through strengthened vocational pathways, training opportunities, and school–work linkages.

21. Strengthening lifelong learning will become increasingly important in the face of demographic pressures and rapid technological change. Italy could move toward a more universal and portable lifelong learning model, supported by repurposed public resources, private sector and employer co-financing, and stronger coordination across national and regional programs. International experience offers useful guidance: individual learning accounts in France and Singapore provide targeted, portable incentives for continuous training, while Nordic systems combine broad access with active labor market policies to sustain high participation. The key policy objective should be to raise participation while narrowing skill access gaps ([EU, 2025](#)), with focus on training low-skilled workers and addressing evolving skill needs. Embedding lifelong learning more firmly within the broader education and labor market systems would help expand the supply of labor, support longer and more productive working lives, and ensure inclusive and sustained human capital development.

Annex I. Summary of Key Education Reforms under the NRRP

Project	Target	Progress
Expansion of Early Childhood Education (M4C1)	Create 150,000 new childcare places (nursery and preschool) by 2026Q2.	As of end-2025, the number of new places financed had increased to around 150,000. Almost all Italian regions are on track to exceed the 33% childcare coverage target by 2025, narrowing historical North–South gaps in service provision. Regions such as Puglia and Calabria are expected to reach about 33%, while Campania and Sicily are projected to reach about 20% (an increase of about 10 percentage points from 2021).
“School 4.0” – Digital Classrooms and Labs (M4C1)	Transform 8,000 schools with new digital laboratories and classrooms. Originally scheduled for the ninth installment, this target was brought forward to the eighth installment (achieved in 2025) as part of the plan’s revision.	By late 2025, 8,254 schools had been equipped with state-of-the-art digital devices and labs, exceeding the target of 8,000 schools. More than 100,000 classrooms have been digitized and over 2,800 next-generation labs created in secondary schools through this investment (103% of the target achieved). This milestone was achieved ahead of schedule, reflecting efficient implementation.
Combating Learning Gaps and School Dropout (M4C1)	Provide tutoring, mentoring, and extracurricular training to at least 820,000 students and young people to reduce territorial learning gaps and high school dropout rates.	As of end-2025, this nationwide tutoring program is being implemented, targeting disadvantaged areas especially in the South. The milestone targets 820,000 participants; this target is on track with tutoring activities having reached the expected scale to date.
Teacher Training and Digital Skills (M4C1)	Activate 8,000 STEM orientation programs in schools (M4C1-16) and deliver 1,000 specialized teacher-training courses on language and innovative teaching methods (M4C1-17).	By 2025, 8,171 schools had launched new STEM programs (102.1% of target) and 1,123 teacher training courses were completed (112.3% of target). Both targets were exceeded ahead of schedule. Additionally, a related milestone (M4C1-13) aimed at training 650,000 school staff (principals, teachers, administrative personnel) in digital skills by 2025; this target was achieved on time with participation exceeding the target.
Recruitment of New Teachers (M4C1 – Reform)	Recruit 70,000 new permanent teachers through a reformed, merit-based hiring system.	By the end-2024, 20,000 teachers had been hired under the new system. To reach the target of 70,000, the government extended the special recruitment procedure to a third nationwide competition (as planned in the NRRP revisions). This reform, enacted via multiple legislative decrees in 2022–2024, modernized teacher hiring and qualification processes.
University Student Scholarships (M4C1)	Fund 55,000 need-based and merit-based scholarships for tertiary students by 2024. Revised Target: 83,000 scholarships by 2026Q2, after an additional €150 million was allocated to meet higher-than-anticipated demand.	By the 2023/24 academic year, 61,213 scholarships were awarded, exceeding the initial goal of 55,000. The funding increase will support awards in the 2024/25 and 2025/26 academic years to reach the expanded target of 83,000 scholarships, aimed at broadening university access.

Project	Target	Progress
Student Housing (M4C1)	Create 30,000 new affordable student bed places by 2026 The plan was revised in 2023–2025 to accelerate progress: instead of direct grants, a dedicated Student Housing Fund (€599 million) was established with Cassa Depositi e Prestiti to finance dormitory construction via public-private partnerships.	The new fund has been established, and projects for student housing are being selected. The final batch of investments will be formalized by the last NRRP tranche. Specific conditions for the fund: supported housing projects must offer rents at least 15% below market rates, and 30% of new places are reserved for students eligible for need-based aid (Right to Education). The change in the delivery mechanism was made to ensure the 30,000-bed target can be met on time despite initial delays in the grant-based approach.
National Research Projects – PRIN (M4C2)	Fund 5,350 “PRIN” research projects of national interest and hire 900 associated early-career researchers.	Both targets have been surpassed ahead of schedule. By mid-2025, 5,533 PRIN projects had been selected for funding (103% of target) and 916 fixed-term researchers (“Type B” junior professors) had been hired by universities to work on these projects (102% of target).
Young Researchers (“Seal of Excellence” Grants – M4C2)	Fund ≥550 research grants for early-career researchers.	588 young scientists have received grants (107% of the target). All recipients had their projects endorsed (many via EU programs) and obtained positions in Italian research institutions, satisfying the NRRP conditions.
Extended Partnerships (Public-Private R&D Networks – M4C2)	Establish 14 “extended partnership” research programs uniting universities, research centers, and companies, and hire 1,400 researchers across these partnerships.	All 14 national research partnerships have been launched with formal agreements, and 1,698 researchers have been recruited into their projects. This exceeds the hiring target (121% of plan), and about 45% of the new researchers are women.
Innovative Doctorates (Industry-Oriented PhDs – M4C2)	Fund 6,000 new PhD scholarships focused on innovative and interdisciplinary topics, in collaboration with enterprises.	By mid-2025, 5,780 “innovative doctorate” scholarships had been awarded (96.3% of the target). The slight shortfall in the specific sub-target for “innovative” doctorates reflects a policy change: the planned company incentive to hire PhD researchers was removed in the 2025 revision due to RRF timing constraints. The €150 million from this sub-measure was reallocated to expand the university scholarships program.
Innovation Agreements (Large R&D Projects – M4C2)	Conclude 32 innovation agreements between the Ministry of Enterprise and Made in Italy and private firms, co-financing major R&D and industrial innovation projects.	As of end-2025, all 32 innovation agreements were in the final stages of completion. These agreements involve investments in strategic sectors and are a key part of Italy’s industrial innovation support under the NRRP.
IPCEI – Important Projects of Common European Interest (M4C2)	Support 20 projects under European IPCEI initiatives (e.g., microelectronics, cloud computing, hydrogen technology), through a dedicated fund of €1.5 billion	20 IPCEI projects have been approved and co-funded by Italy, for a total of €1.5 billion in NRRP resources, fully achieved this target by the 2025 deadline.
Source: Italian Government, 2025. <i>Seventh Report to Parliament on the State of Implementation of the National Recovery and Resilience Plan (NRRP), Section I.</i> , Rome, December 22.		

Annex II. Education and Labor Market Reforms and Growth: Key Policy Inputs and Parameters

The back-of-the-envelope calibration is based on a standard Cobb–Douglas production function with human capital–augmented labor.

- Substituting skills (S), matching (M), labor supply (L), and TFP (A) channels into the production function yields:

$$\frac{\Delta Y}{Y} \approx (1 - \alpha)(\Delta S + \Delta M + \Delta L) + \Delta A$$

- Substituting the individual reform channels:

$$\frac{\Delta Y}{Y} \approx (1 - \alpha)[(\phi_E E + \phi_T T + \phi_C C) + (\psi V) + (\theta E)] + \gamma(\phi_E E + \phi_T T + \phi_C C)$$

where: **variables / policy inputs** are Y : real GDP; E : early childhood education expansion; T : teacher quality / school system reform; C : curriculum / STEM reform, and V : Vocational Education and Training (VET) / ITS reform intensity; and **parameters** are $\alpha \in (0,1)$: capital share in production (set at $\alpha \approx 0.33$); ϕ_E, ϕ_T, ϕ_C : elasticities of skills to education reforms; ψ : effectiveness of vocational reforms in reducing mismatch; θ : elasticity of labor supply to childcare availability; and γ : elasticity of TFP with respect to skills.

- The calibration ranges are broadly in line with estimates used in studies for advanced European and OECD countries: ϕ_E, ϕ_T, ϕ_C : =0.05-0.08; ψ =0.03-0.06; θ : 0.04-0.08 and γ : 0.02-0.04.

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LEVERAGING TECHNOLOGICAL CHANGE TO BOOST PRODUCTIVITY¹

Italy's weak productivity performance reflects persistent structural constraints, such as bureaucratic hurdles, size-based tax incentives, and gaps in human capital and intangible capital accumulation. The result is a predominance of micro and small firms, limited reallocation toward more productive sectors, and slow technological innovation and diffusion, which weigh on aggregate productivity growth and potential output. Against this backdrop, the ongoing wave of digitalization and artificial intelligence (AI) offers a timely opportunity for firms, including smaller ones, to raise their productivity. These gains will be strongest if paired with reforms that boost firm growth and reduce regulatory burdens. This Selected Issues Paper focuses on two key complementary factors—human capital and risk capital—and discusses how national reforms and EU-level integration can help overcome domestic constraints and unlock Italy's productivity potential.

A. Technological Change is an Opportunity to Lift Productivity

1. Italy's long-standing weak productivity performance remains a central constraint on medium-term growth, fiscal sustainability, and convergence with EU peers and the frontier.

Despite strong manufacturing capabilities and areas of technological excellence, aggregate productivity growth in Italy has lagged many advanced economies for decades. This outcome largely reflects persistent structural features, such as underinvestment in skills and intangible capital, bureaucratic hurdles, and size-based incentive schemes, resulting in a persistent predominance of small firms, a sectoral composition characterized by more traditional and less productive sectors, and slow technological innovation and diffusion (IMF SIP 2025).

2. Digitalization and AI, coupled with reforms that ease constraints on firm growth and reallocation, can lift productivity. Digital and AI technologies provide an opportunity to raise productivity² by enabling efficiency gains in traditional sectors and supporting innovation in emerging ones. Whether this opportunity translates into broad-based productivity gains, however, depends on whether the economy is ready to adopt these technologies. International evidence suggests that the productivity impact of advanced digital technologies depends critically on complementary investments in skills, management practices, and intangible capital, as well as the ability of firms to scale up and reorganize production (Aldarso and others, 2026). At the macro level, productivity gains require a supportive regulatory framework and strong mechanisms for labor reallocation (Cazzaniga and others, 2024).

¹ Prepared by Silvia Albrizio and Yueling Huang, with invaluable support from Jenny Lee. We thank the Italian authorities for the constructive discussions.

² See Acemoglu (2024), Mish and others (2025), Aldasoro and others (2026), and Filippucci and others (2024b), among others, for a quantification of the productivity effect.

3. A broadened technological diffusion could help overcome Italy's long-standing small-size and low-productivity trap.

In Italy, the adoption of advanced digital technologies remains uneven and concentrated among larger and more productive firms, raising the risk that gains from the current technology wave accrue primarily to a narrow set of frontier firms, largely located in the Northern region. Yet, emerging technologies, such as cloud computing and generative AI, are easily accessible and can enable even small firms to enhance managerial practices and automate routine tasks. AI, in particular, can augment both cognitive and non-cognitive tasks and thereby improve efficiency in areas ranging from logistics and quality control to marketing and customer relations (Brynjolfsson and others, 2025; Gambacorta and others, 2026; and Filippucci and others, 2024b). Hence, facilitating the diffusion of innovation for small firms is essential to reap broad-based productivity gains from technological change.

4. This paper assesses Italy's preparedness to harness digitalization and AI as engines of productivity growth.

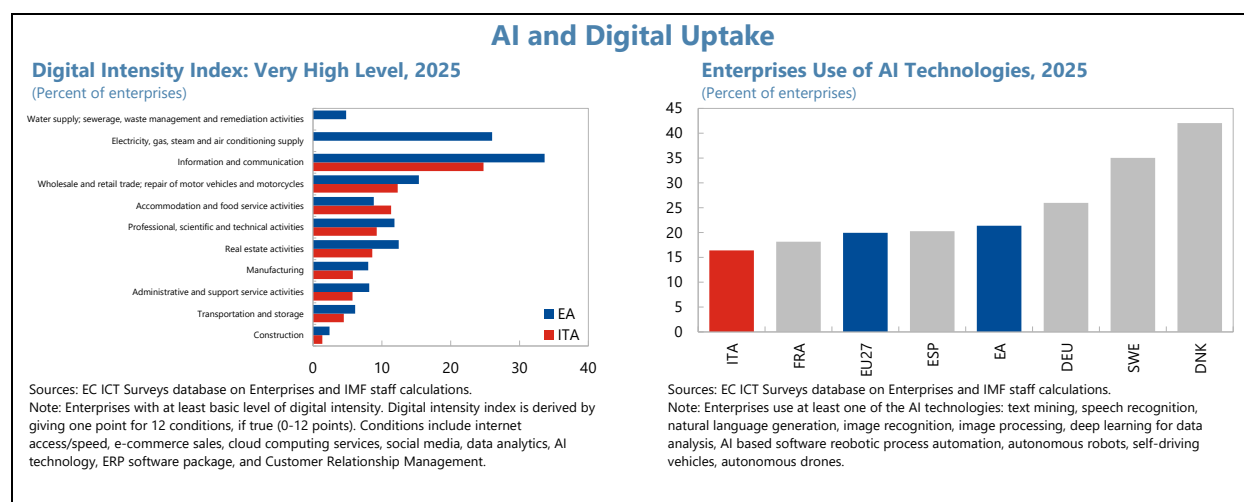
The same structural constraints that have long weighed on Italy's productivity also hinder the adoption of digital and AI technologies. For example, Italy falls short on both the demand and supply of skilled human capital and risk capital, contributing to leaving the country with a lower-than-desirable potential growth rate. Notably, firms under-invest in technology and innovation, which weakens their demand for skilled labor and venture financing. Simultaneously, the education and financial system provide insufficient advanced skills and risk finance at scale. These mutually reinforcing frictions point to a broader issue of relatively weak preparedness, whereby technological change does not translate efficiently into higher productivity, particularly among SMEs and in lagging regions. A comprehensive package of reforms that encourage both the demand and supply of human capital and risk capital, alongside ongoing EU Single Market and Savings and Investment Union initiatives would incentivize skill and technological upgrading, thereby lifting the economy out of the weak demand and weak supply cycle.

5. The paper is organized as follows. Section B documents Italy's gap in digital and AI adoption relative to peers. While reforms across several areas will be important to close these gaps, this analysis examines two critical and complementary inputs of a firm's production: human capital, with a focus on digital literacy and emerging skills (Section C), and intangible capital, with a focus on access to risk capital (Section D). The paper concludes with Section E summarizing the main takeaways.

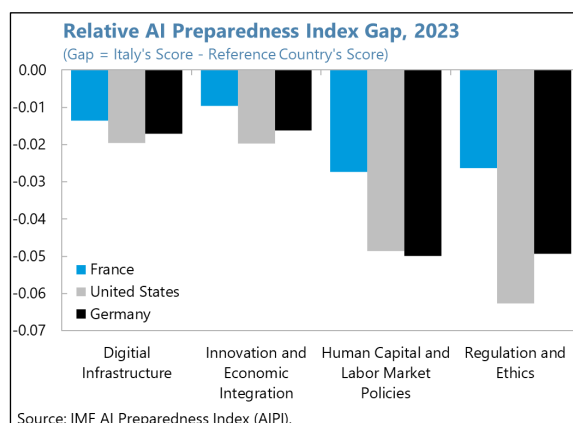
B. Untapped Productivity Gains: Digital and AI Adoption in Italy Lags Peers

6. Digital and AI uptake remains limited. Italy performs relatively well in cloud adoption and basic firm-level digitalization, with the share of firms that have at least a basic level of digital intensity above the euro area average. However, the proportion of firms with high digital intensity is well below the EU benchmark, except for firms operating in accommodation and food services. Similarly, while AI adoption has increased rapidly in recent years, it remains low when compared to other advanced economies. In 2025, 16.4 percent of Italian firms reported using AI for at least one business purpose, a notable increase relative to previous years but still well below the EU average and increasingly divergent from early adopters such as Sweden and Denmark. Moreover, when focusing on firms that

use AI intensively, rather than sporadically or experimentally, the share drops sharply.³ These patterns suggest that while awareness and initial experimentation are spreading, effective and scalable use of AI remains limited.



7. In addition, low AI preparedness constrains diffusion. Italy's relatively low level of AI adoption is consistent with its performance in the IMF's AI Preparedness Index,⁴ where it scores below many advanced economy peers. Sub-categories of the index reveal that this gap is driven mainly by (i) weak educational outcomes and a low supply of STEM graduates; (ii) shortcomings in labor market institutions; and (iii) slower adaptation of the legal and regulatory framework to digital business models. In this context, limited wage flexibility and a low skill-wage premium reduce incentives for workers to invest in advanced digital skills.



8. Firm-level survey evidence corroborates the country level evidence on AI preparedness. Among firms that do not use AI, the most frequently cited obstacle is the lack of relevant expertise (58.6 percent), followed by uncertainty about the legal and regulatory implications of AI use (47 percent). In addition, a larger share of Italian firms (42 percent) does not adopt AI due to concerns about high cost compared to the EU average (38 percent). Perceived cost of adoption exhibits the greatest dispersion across firm size,

³ See [Survey on Inflation and Growth Expectations - 2026 Q1](#).

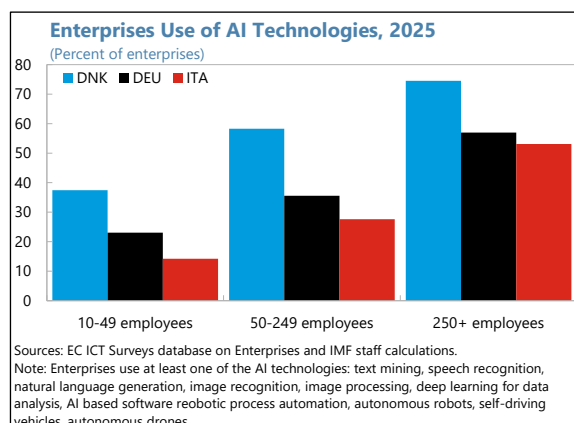
⁴ The IMF's AI Preparedness Index spans four key dimensions: digital infrastructure, human capital, technological innovation, and legal frameworks. Each is constructed by normalizing and averaging a broad set of sub-indicators capturing, among other aspects, the availability of digital infrastructure, sustained investment in human capital, inclusive STEM expertise at the graduate level, labor and capital mobility, the strength of the R&D ecosystem, and the adaptability of legal frameworks to digital business models. See [AIPI website](#) for further information and cross-country comparison.

with small and micro firms significantly more likely than large firms to cite affordability as a binding constraint. Consistent with this, large gaps persist in software investment and AI use between large firms and small and medium-sized enterprises (SMEs). Despite similar industry composition of SMEs, about 38 percent of smaller firms in Germany have adopted AI versus 14 percent in Italy, indicating that much of the difference in AI adoption lies within industry. Given that economic activity in Italy remains dominated by micro and small enterprises, these barriers reinforce existing structural constraints, limiting firms' incentives and capacity to adopt new technologies, scale up, and close productivity gaps.

9. Moreover, fear of failure contributes to a self-reinforcing cycle of low risk-taking, weak skill accumulation, and limited innovation.

According to the Global Entrepreneurship Monitor (2024), 49.5 percent of Italian respondents report fear of failure being a deterrent from entrepreneurship, compared with 44.4 percent in the United States, 42.7 percent in France, and 45.3 percent in Germany. This reflects both cultural and institutional factors. On the one hand, education systems that place limited emphasis on

experimentation and entrepreneurial learning can discourage risk-taking.⁵ On the other hand, slow and inefficient insolvency and judicial processes increase the cost of failure and weigh on business dynamism (OECD, Economic Survey of Italy, 2026). In this environment, firms underinvest in intangible capital and worker upskilling, reducing demand for high-skill labor. Lower expected returns to skills then discourage workers from investing in human capital or induce high-skill workers to emigrate abroad, reinforcing a negative feedback loop that depresses productivity growth. Addressing skill gaps and expanding access to risk capital are therefore critical to enable firms—especially SMEs—to undertake the human-capital upgrading and intangible investment needed for effective technology adoption.

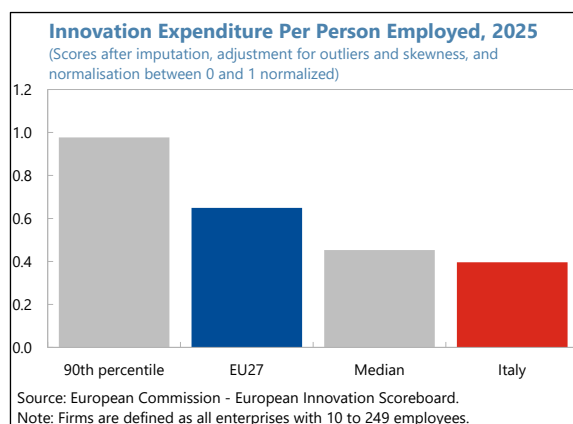


⁵ Italy's education system shows relatively weaker outcomes in creative thinking and problem-solving, key drivers of experimentation and innovation, pointing to a more limited emphasis on non-routine, exploratory learning (OECD, PISA 2022). Consistent with this, European Commission (Eurydice, 2025) highlights the absence of a comprehensive strategy for entrepreneurship education, including core competencies such as financial literacy, initiative-taking, and planning.

C. Skill Gaps Blunt Firms' Capacity to Adopt New Technologies

10. Digital literacy gaps and limited firm-level training constrain digital diffusion. Human capital constraints are a salient factor underlying Italy's slower diffusion of advanced digital technologies.

- Relatively low share of population with basic digital skills.* At the country level, only 45.8 percent of the population possesses at least basic digital skills, compared with about 60 percent in France and other advanced EU economies (Digital Skills and Jobs Platform).⁶ Given the strong correlation between education and digital skills in Italy, the national educational system plays a key role in helping to catch up.
- Relatively low firm-level spending on innovation and digital skills training.* At the firm level, innovation expenditure per employee, including spending on training, software, machinery, and digitalization, remains below the EU median. Lower investment in digital skills is associated with slower adoption and less effective use of advanced digital tools, particularly among small and medium-sized firms, where internal training capacity is more limited and learning is more costly.

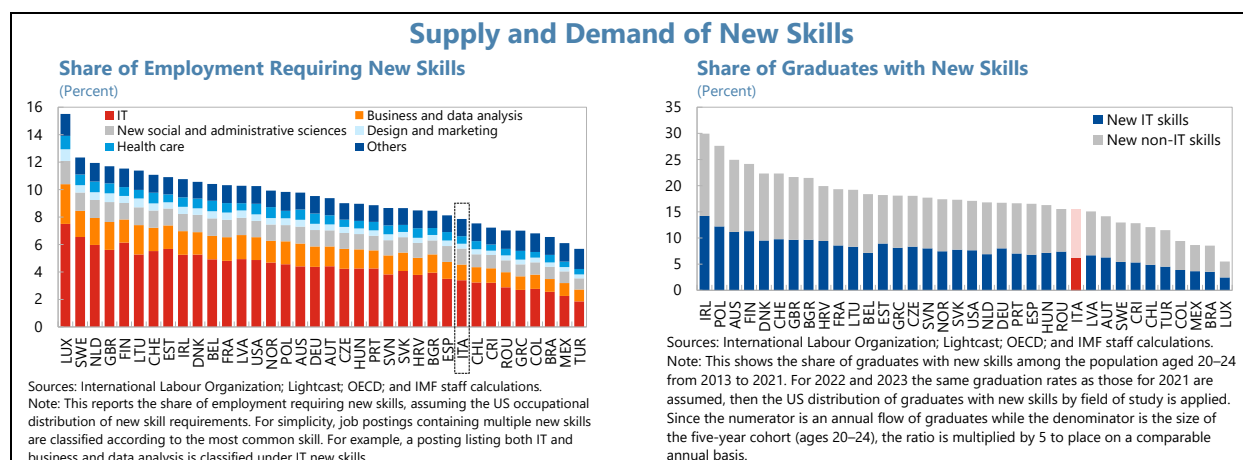


11. Both demand for and supply of emerging skills⁷ remain lower than in peer economies. Emerging skills combine digital and entrepreneurial capabilities, spanning IT and AI competencies alongside business and data analysis, project and change management, digital marketing, organizational coordination, and sector-specific applied skills that enable firms to fully exploit new technologies. However, Italy ranks near the bottom among advanced economies in both demand for emerging skills (in terms of the prevalence of occupations that require new technical skills), and supply of new skills (in terms of graduates with the set of emerging skills required currently in the labor market) (Jaumotte and others, 2026). In turn, this weak demand and weak supply outcome reflects Italy's traditional sectoral structure, a relatively low share of STEM graduates (particularly in ICT), and an education system that places limited emphasis on experimentation and entrepreneurial learning. However, firms' digital adoption could boost demand in emerging skill occupations and industries, and workers' digital adoption could improve their productivity and facilitate reallocation towards new skill-intensive jobs. In turn, adoption by both firms and workers could jointly help move

⁶ Eurostat data suggest that, although starting from lower levels, digital skills in Italy are improving at a pace comparable to or faster than EU peers. Between 2021 and 2025, the share of individuals with at least basic digital skills rose from 45.6 to 54.3 percent in Italy—an increase similar to Germany (49.0 to 59.5 percent) and stronger than in France (62.0 to 65.7 percent).

⁷ Emerging skills are defined as a skill if less than 1 percent of job postings that list this skill from 2010 to 2024 in the United States are posted in 2010–11 (Jaumotte and others, 2026). Most emerging skills are IT-related. However, job postings also indicate growing demand for business and data analytics, social and administrative skills, including social media marketing and management, and new healthcare competencies associated with remote care.

the economy towards an industry structure that relies relatively more on emerging skills, especially if complemented with reforms and policies facilitating resources reallocation.



12. New skills formation is faster in countries where education systems are tightly connected to firms through applied training and lifelong learning. Cross-country evidence shows that the supply of new skills is strongest where tertiary education is complemented by applied training and adult learning systems and where non-IT skills are also acquired through on-the-job learning and workplace exposure rather than formal STEM curricula alone. Moreover, regions and countries with more developed retraining systems and institutional support display better employment outcomes and faster diffusion following new-skill adoption. Consistent with this, the OECD STI Outlook (2025) highlights that close university–industry collaboration, apprenticeships, and firm–education partnerships are central diffusion mechanisms. These connections enable faster adjustment of curricula and training content to firms’ evolving needs and facilitate learning-by-doing, particularly for SMEs and general-purpose, non-IT skills.

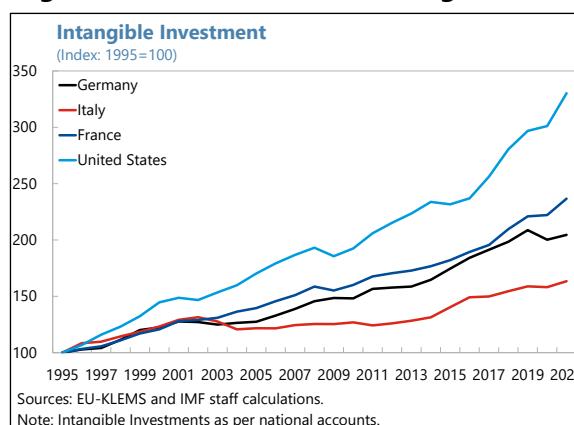
13. Recent reforms have targeted the quality of education, skills formation, and industry linkages. Italy has implemented a broad set of reforms and investment programs to improve the alignment between education and labor market needs and to deepen links between universities, research institutions, and firms. A central pillar has been the expansion and 2022 reform of the Istituti Tecnici Superiori (ITS) Academy system, aimed at scaling up tertiary vocational education closely connected to local firms and strategic sectors, including digital technologies. Through the National Recovery and Resilience Plan (NRRP), significant resources have been allocated to expand ITS enrollment, modernize laboratories, and strengthen firm partnerships. Additional measures have supported university and industry collaboration through technology transfer, industrial PhDs, innovation ecosystems, and research partnerships under National Centers and Extended Partnerships. Digital skills and lifelong learning have also been promoted through targeted programs, such as the Futura initiative, which invests in digital education infrastructure, teacher training, STEM capacity, and training incentives. Continuing these efforts can help further strengthen

skills outcomes.⁸ In turn, boosting the supply of emerging skills can help provide the talent needed for the emergence and scaling of innovative firms, including as firms are increasingly supported by risk capital (see below).

D. Thin Risk Capital Markets Slow Innovation and Intangible Investment

14. Limited access to risk capital constrains intangible investment and technological

adoption, diffusion, and innovation. In addition to the need for skilled labor, intangible investment—including digital technologies, software, data, R&D, and organizational capital—has also become increasingly important, as productivity growth crucially depends on firms' ability to adopt and scale new technologies. Yet, while intangible investment in Italy has risen over time, it has grown more slowly than in the United States or European peers.⁹ In this respect, risk capital is crucial for intangible investment because intangible assets have uncertain payoffs, lack collateral value, and therefore require investors willing to bear risk without guaranteed or easily recoverable returns. Unlocking risk capital—with venture capital (VC) being a prominent example of such capital—could therefore play a crucial role in helping further boost innovation and enable innovative Italian firms to grow and reap the benefits of technological advances.



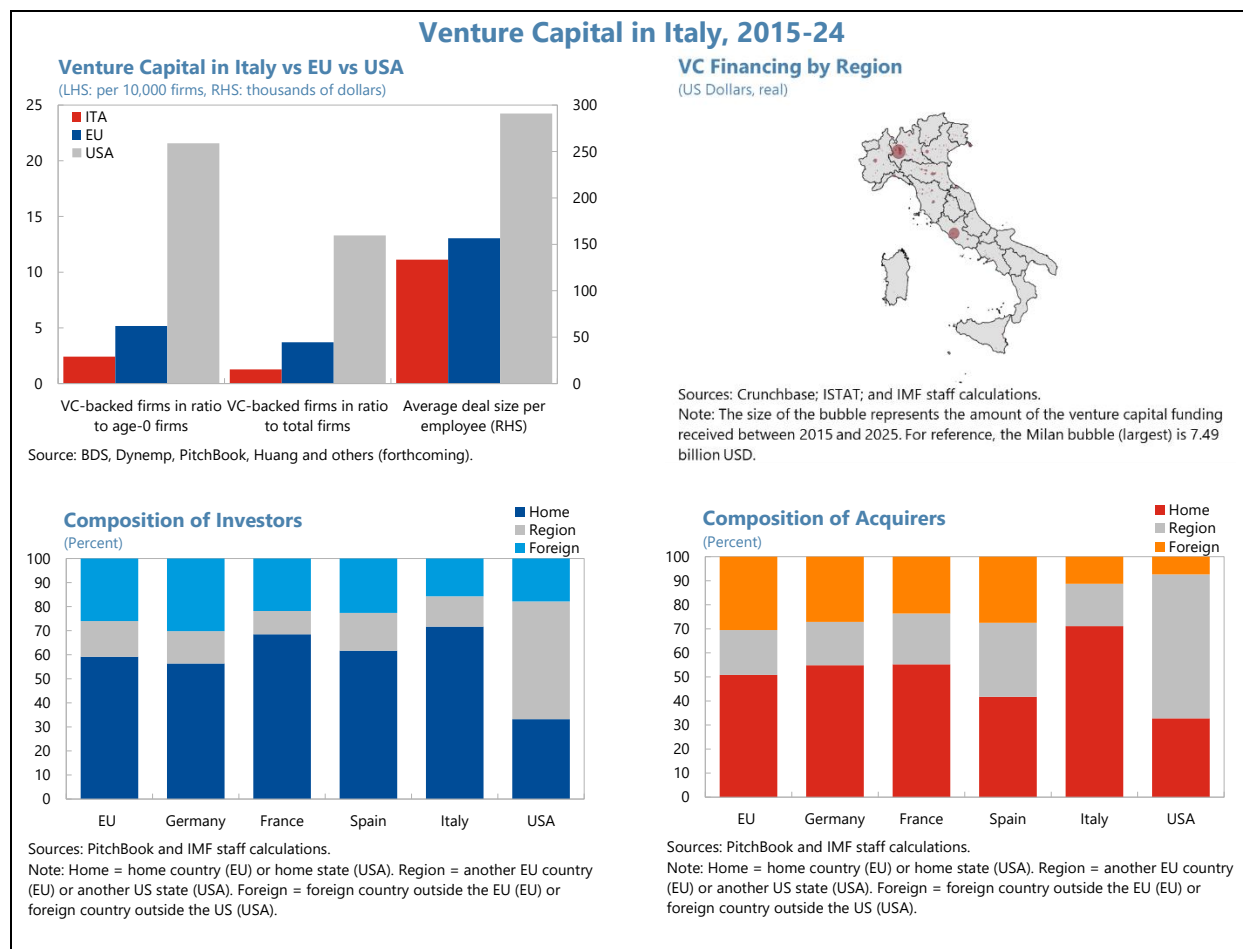
15. Italy's venture capital ecosystem remains underdeveloped and more domestically oriented than in peer European economies. The share of firms receiving VC financing in Italy is about half of the EU level and roughly one-eighth of the U.S. level. Even conditional on receiving VC financing, Italian firms receive only about half the amount obtained by their U.S. counterparts. VC activity is also heavily geographically concentrated, with two main clusters, centered around Milan (Lombardy) and, to a lesser extent, Rome (Lazio), attracting the bulk of investments. In contrast, the South receives only a marginal share, reinforcing existing regional disparities in innovation and productivity. In addition, Italy exhibits one of the strongest home biases in Europe.¹⁰ VC investors are predominantly domestic (70 percent), compared to 40–50 percent in EU peers and 30 percent in the U.S. Exits of VC-backed firms are also greatly driven by domestic acquirers rather than cross-border M&A. This combination of small scale, few clusters, and home bias could further weaken the local

⁸ The accompanying study, "Closing education and skill gaps in Italy with efficiency increasing reforms," discusses educational gaps and reviews progress under recent education reforms and investments under the NRRP (see first study in this Selected Issues Paper).

⁹ Focusing on investment in intellectual property products (a subcomponent of intangibles), national account data indicate an increase of 21 percent in Italy between 2019 and 2024, compared with 29 percent in France and 17 percent in Germany. However, over a longer horizon, Italy's accumulation of investment in intellectual property products as well as intangible capital more broadly has been weaker than that of the United States and European peers.

¹⁰ Among EU countries, Italy is among the top in terms of share of investors and acquirers from the home country.

VC ecosystem's ability to attract and complement foreign investment, by limiting local lead investors, follow-on financing capacity, and integration into international VC networks. In turn, these features constrain Italian firms' ability to start up, scale up, and gain exposure to international expertise and networks.¹¹



16. Venture capital can stimulate innovation beyond funded firms through expectation effects and signaling. Italy's VC activity picked up notably after the launch of Cassa Depositi e Prestiti (CDP) Venture Capital SGR in 2019, as it also helped crowd in private risk capital.¹² Based on an event study exploiting the announcement of the establishment of CDP Venture Capital SGR in 2019, staff analysis (Albrizio and others, forthcoming) finds a 17 percent increase in the probability of patenting, a proxy for innovation effort, among firms operating in sectors targeted by CDP VC

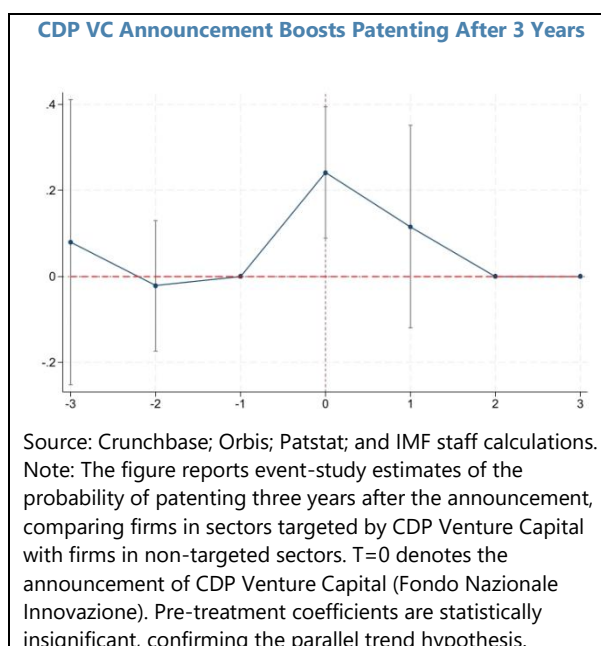
¹¹ See Gallo and others (2025) for a comprehensive analysis of the VC ecosystem in Italy.

¹² Research has shown that firms receiving private funds tend to perform better than those receiving only government VC (Brander and others, 2015; Breschi and others, 2021).

funds, relative to firms in non-targeted sectors.¹³ This effect holds regardless of whether firms ultimately receive financing, consistent with an ex-ante response to expected funding availability. The increase materializes about three years after the announcement, in line with the typical time required for patents to be granted. The results are consistent with a signaling mechanism whereby patenting raises firms' likelihood of attracting VC financing. When firms anticipate a larger and more stable supply of venture capital, they face stronger incentives to invest in innovation up front, as successful innovation increases expected access to future funding. As a result, expanding and stabilizing VC supply can strengthen innovation incentives not only for funded firms, but more broadly across firms operating in VC-exposed sectors. A back-of-the-envelope calculation suggests that an economy-wide VC funding equivalent to 0.06 percent of GDP is associated with a one percent rise in sectoral TFP.¹⁴

17. Innovation clusters amplify the impact of venture capital through ecosystem

spillovers. VC is most effective where dense innovation ecosystems link research, entrepreneurship, and finance. Moreover, the analysis (Albrizio and others, forthcoming) shows that firms' probability of receiving VC funding is significantly higher when they are located in established clusters. Firms in those clusters also patent more, possibly reflecting strong complementarities between research activity, entrepreneurial networks, and risk financing. In contrast, firms outside dense innovation ecosystems face more challenging access to finance, talent, and knowledge spillovers, which slows the adoption, diffusion, and scaling of intangible-intensive technologies. In this context, Italy has scope to strengthen the international visibility and geographic reach of its innovation hubs. According to the World Intellectual Property Organization (WIPO)'s Innovation Cluster Ranking,¹⁵ Italy hosts only two clusters among the global top-100, Milan (56th in the ranking) and Rome (around 82nd), compared with 22 clusters in the United States, 24 in China, and 7 in Germany.



¹³ The inclusion of industry and time fixed effects mitigates concerns that the estimated effects are driven by concurrent external factors or expectations of broader policy changes. Moreover, the difference-in-differences framework further alleviates these concerns, as any common macroeconomic shocks would affect both treated and non-treated firms.

¹⁴ This quantification builds on Berkes, Manysheva, and Mestieri (2022), who estimate that a one standard deviation increase in patenting activity raises sectoral TFP by about 1 percentage point. In the CDP case study, the increase in patenting among firms in targeted sectors corresponds to roughly 0.7 standard deviations. See also Cassinis and others (2025) for analysis on VCs and start-up growth.

¹⁵ See [Innovation Cluster Ranking 2025](#).

In addition, the relatively small number of clusters in Italy limits firms' exposure to global innovation and financing networks.

18. While the availability of risk capital is important, deeper structural reforms and EU integration are critical to generate investable projects and unleash risk capital's full productivity potential. As shown in the figure below, lowering financial frictions for pension funds and insurers could expand funding for high-potential startups and support productivity gains (Arnold and others, 2024; Brandao-Marques and others, 2026).¹⁶ In this respect, regulatory reforms that encourage equity investment, life-cycle investment strategies, and tax incentives to institutional investors—including pension funds—have helped increase available financing. However, the relatively shallow VC market in Italy and the EU more broadly reflects not only supply constraints but also a limited pipeline of investable projects, shaped by structural weaknesses in business dynamism, skills, innovation, and firms' ability to scale. In this context, expanding VC supply without parallel reforms may lead to limited absorption and muted impact. IMF staff analysis (Brandao-Marques and others, 2026) highlights that structural reforms, especially those that improve human capital and the business environment, yield sizable impact on VC by increasing investable projects and hence VC demand. In addition, EU-level initiatives under the Savings and Investment Union (SIU) can reinforce these efforts by mobilizing long-term savings, reducing regulatory fragmentation, fostering competition among financial intermediaries, and encouraging institutional investor participation in equity markets. Partial equilibrium estimates indicate that VC inflows in Italy could increase by about 5 percent through legal harmonization (that proxies the elements of a 28th corporate regime) and 40 percent through withholding tax reforms. The results suggest that the potential gains from harmonizing the dividend withholding tax¹⁷ are sizable for Italy compared to the EU average. Furthermore, Brandao-Marques and others (2026) find that EU financial market integration would further amplify the gains from structural reforms on GDP.

19. Broad policy support and reform have been targeted to improve the business environment. Italy has introduced a broad set of measures to support productivity, digitalization, AI adoption, and innovation financing, primarily through the NRRP, including the Transition 4.0 and 5.0 programs. These initiatives have relied heavily on tax credits and fiscal incentives to stimulate investment in tangible and intangible capital, while also promoting the green transition. Additional NRRP-related reforms aimed at promoting innovation and technology transfer, especially for SMEs, as well as supporting the digital transition in the public administration. These efforts have been complemented by investments in research infrastructures and deep-tech sectors (including AI, semiconductors, and quantum technologies), as well as initiatives to expand STEM education, scholarships, and innovative PhDs co-designed with firms. Moreover, Italy is planning to boost technology transfer centers through European Digital Innovation Hubs and the Strategic Technologies for Europe Platform (STEP). On the financing side, support for innovative firms has

¹⁶ See Brandao-Marques and others (2026) for technical details.

¹⁷ Harmonizing the dividend withholding tax considers a reduction of bilateral withholding taxes to zero (similar to the level across states in the U.S.) to provide an upper bound on the effect of proposals to simplify withholding tax procedures.

been strengthened through CDP Venture Capital, enhanced tax incentives for startup investment, reforms to mobilize private pension savings that can be invested toward venture capital and private equity,¹⁸ and reduced administrative and legal burdens embedded in the traditional Italian fund structure (2026 reform of Italy's Testo Unico della Finanza). In addition, the 2026 Budget Law included measures aimed at stimulating private demand for equity investment through private pension funds, including through the implementation of an auto-enrollment mechanism for first-time entrants and a life-cycle investment strategy. To date, mobilization of pension savings remains limited, potentially indicating the need for increased awareness (Edufin Report, 2025).¹⁹ Finally, new funding instruments, such as the Italian Science Fund (FIS), PRIN Hybrid, and Synergy Grants, aim to strengthen both basic and applied research and foster public–private collaboration and technology transfer.

20. In addition, policy predictability can enhance the impact of reforms. Many of the recent measures have helped stimulate investment²⁰ and enhance digital adoption. However, at the same time, frequent policy changes, such as changes to eligibility criteria and temporary extensions, have added to policy uncertainty. For example, Transition 4.0 incentives have been progressively scaled back, especially for intangible assets, and then partially expanded again under the 2026 Budget Law; while Transition 5.0 initially saw limited uptake and underwent several revisions and simplifications before gaining traction. In this respect, a more predictable policy framework would support investment planning, and could thereby help strengthen the diffusion of digital technologies and AI across firms. That said, the recent introduction of a Three-Year Research Plan aims to provide stable, multi-year funding and strengthen the coordination of research and innovation policies. In addition, systematically assessing the effectiveness of NRRP policy instruments can help inform future policy design.

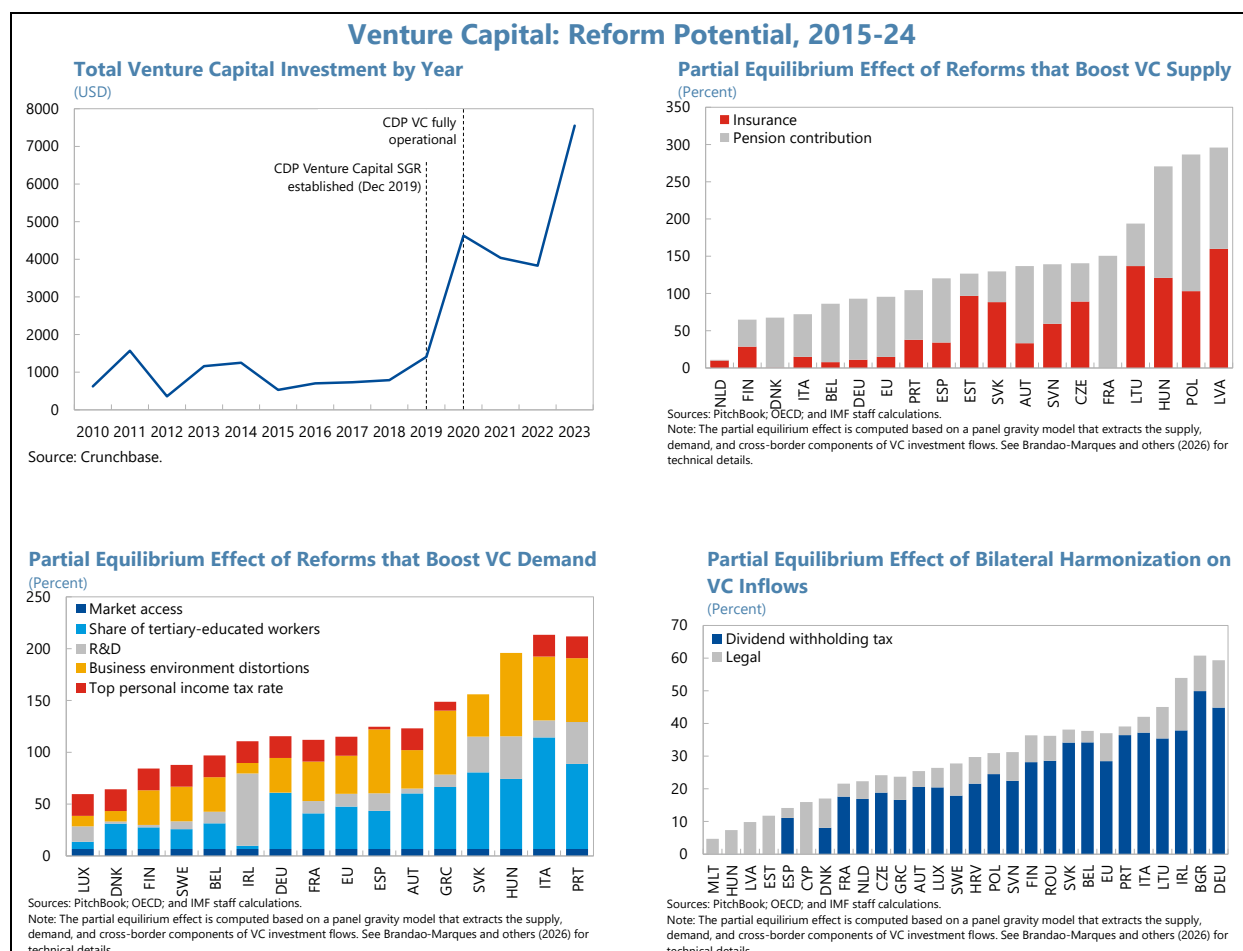
21. Effective ex-post evaluation and continuous policy effort will be key to maximizing the impact of recent reforms. With the need for continued reform efforts beyond the NRRP to support growth, systematically assessing the effectiveness of policy instruments will be critical to inform future policy design. For example, tax credits have been widely used to support investment and innovation across multiple schemes; and a comprehensive and comparative evaluation of their effectiveness is now warranted. Progress in judicial and insolvency reforms also highlights the need for continued monitoring. For example, Italy has undertaken a deep overhaul of its judicial, insolvency and restructuring frameworks, supported by legislative changes, increased use of out-of-court procedures, and significant investments in digitalization and court capacity. However, while these reforms have improved forward-looking indicators, outcomes remain uneven: legacy cases are

¹⁸ The tax exemption applies not only to pension funds but also to 'Casse di Previdenza', the mandatory First-Pillar schemes for self-employed individuals and professionals.

¹⁹ Castagno and others (2025) show, for the case of Italy, that pension literacy has a positive and causal effect on the probability to participate in a private pension fund.

²⁰ "Transition 4.0 Plan: An Assessment of Investment, Employment and Productivity Effects", a joint work of a group of experts from Bank of Italy and Italian Ministry of Economy and Finance, finds that Transition 4.0 was effective in stimulating investment and increasing the stock of productive capital, but it did not generate widespread improvements in firm-level productivity over the period 2020-2023.

still lengthy, and performance varies widely across districts, suggesting that efficiency targets have yet to be fully met. Sustained implementation and closer monitoring of outcomes, while limiting changes to performance indicators and evaluation methodologies over time, would help consolidate recent gains and ensure that reforms deliver durable improvements in efficiency and economic outcomes.



E. Concluding Remarks

22. Italy's ability to harness digitalization and AI for productivity growth depends critically on strengthening human capital. Advanced digital tools are increasingly accessible and have the potential to raise efficiency even in small firms and traditional sectors. Given the predominance of micro and small firms in Italy, closing human capital gaps and lowering barriers for firms to scale up are essential to avoid a widening divide between frontier firms and the rest of the economy. Policies that foster entrepreneurship education, reinforce applied tertiary education, expand vocational and adult-learning systems, and cultivate stronger links between firms and education providers, such as the ITS, would help accelerate skill formation and enhance firms' absorptive capacity in technological change.

23. Unlocking risk capital and carrying out broader structural reforms are crucial for innovation and translating risk capital into scalable productivity gains. Italy's underdeveloped and home-biased venture capital market limits firms' ability to start up and scale up as well as to access external expertise, networks, and markets. In this respect, sustained productivity gains require mobilizing private financing and deepening structural reforms that strengthen the innovation ecosystems and expand the pipeline of investable projects. In addition, progress on EU Single Market and Savings and Investment Union initiatives can further amplify the effects of national reform. Taken together, a comprehensive package of reforms in skills and risk capital, alongside EU integration, would help Italy to leverage technological change and escape its low-productivity trajectory and support stronger, more inclusive medium-term growth.

24. Translating reforms into durable gains will require strong evaluation, clear prioritization, and policy predictability. As Italy moves beyond the NRRP phase, systematically assessing the effectiveness of the NRRP policy instruments would help identify and scale up the most impactful measures. Embedding robust ex-post evaluation, streamlining policy design, and sustaining reform efforts would help consolidate recent progress and support durable productivity growth.

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