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Investing in skills to accelerate job transitions

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Abstract

The paper reviews the dynamics of human capital – mostly skills –accumulation and utilization during successful and static episodes of structural transformation in a sample of more than 90 countries over the last thirty years to identify cases when improvements in human capital are not met by skills demand - signaling an unbalance between investment in skills and other factors of production. A framework is proposed to differentiate inefficient skills investments by cases of over- and under-investment relative to skills demand, cases of skills underutilization, even at the right level of investment, and cases of skills mismatches due human capital's misallocation across geographical areas and field of study. Based on country case studies, the paper examines the different forms of inefficient human capital accumulation and utilization and the potential market and policy failures that lead to such inefficiencies across individuals, firms, and governments. The framework is used to differentiate policy priorities depending on the constraints to efficient human capital accumulation and utilization and the stage of the structural transformation.

Keywords: jobs, education, skills, growth, employment.

JEL codes: I26, I31, I38, J21, J24, L16, O10, O50.

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1. Introduction

Vietnam and Indonesia have both experienced significant episodes of successful structural transformation accompanied by substantial investments in education; however, they have had very different jobs outcomes. In Vietnam, a significant expansion of universities between 2006 and 2013 led to an increase in enrollment and tripled the share of the workforce with a college degree. The increased supply of tertiary-educated workers was balanced with increases in technology and capital investments as evidenced by high returns to education. A recent careful study shows that, during this expansion, firms adjusted their input mix by adopting skill-biased capital and substituting college workers for non-college workers, driving a rise in productivity and a move out of agriculture into manufacturing and services (Vu-Thanh and Vu 2022). In contrast, in Indonesia, a large investment in primary education was not met by increases in labor demand between 1986 and 1999, a period that saw very high rates of economic growth in the country. Indonesia built more than 61,000 primary schools[2] in the 1970s, leading to increased enrollment and completion rates for young cohorts targeted by the program and a long-term increase in the rate of human capital accumulation in the regions most affected by school construction. More than a decade later, the higher enrollment rate led to an increase of 10 percentage points in the proportion of primary school graduates in the labor force and a reduction in the wages of older cohorts who were out of school at the time of the construction boom. The fall in wages is explained by the little-to-no growth in physical capital investments in reaction to the increase in education opportunities (Duflo 2004).

This chapter aims to shed light to the possible factors explaining divergent paths such as those in Vietnam and Indonesia between skills investments and jobs outcomes by focusing on the critical mediating role that labor market demand, education quality, and complementary factors of production have in determining jobs outcomes. Finding the right balance between physical and human capital, in particular, is a central challenge to boosting successful transformations. If one goes too fast ahead of the other, investments will be inefficient; when they are balanced, they are a reinforcing force for transformation.

Human capital is necessary for a country's structural transformation and better jobs outcomes, but alone it is insufficient. Sometimes not having the right skills or, more broadly, human capital (see Box 1) is itself the main barrier to economic transformation, as some industries may fail to take off or innovation does not materialize because more productive jobs cannot be created and filled with workers with the appropriate mix of skills. However, as we discuss in this paper, the lack of education or skills is not always the immediate binding constraint to more and better jobs. To transform, a country needs a bundle of productive inputs—physical capital, land, technology, and human capital—and getting the balance right among these factors is critical to create jobs and ignite a period of transformation efficiently. As a result, the level and type of skills investments (within and outside the formal education system) needed depend on the presence of complementary investments that ensure appropriate returns. In the absence of this balance, resources are wasted, and people may go idle or be underemployed.

[2] Sekolah Dasar INPRES program.

Box 1.1: Skills in this Paper: Definition and Measurement

Skills refer to the cognitive and non-cognitive capabilities acquired by individuals during their lifecycle from early childhood to old age. They include cognitive skills both foundational (e.g., literacy, numeracy) and higher-order skills (i.e. critical thinking), socioemotional (i.e. self-management, self and social awareness) and technical or job-specific skills (e.g., professional qualifications or digital skills), entrepreneurial and managerial skills developed in the formal education system or outside the formal education system, including on-the-job (World Bank 2018a).

The empirical literature relies on direct and indirect metrics of skills. *Direct* measurements are gathered via test-based surveys, such as those of the Program for International Student Assessment (PISA) and the Program for the International Assessment of Adult Competencies (PIAAC), both housed at the OECD; the World Bank's STEP Skills Measurement Program; or skills self-assessments. To maximize the inclusion of developing countries and allow for country comparability, the analysis presented in this paper largely measures skills *indirectly* through years of schooling, educational attainment, occupations (linked to skills levels commonly associated with them) and years of work experience (to approximate skills development at work). Relying on indirect measures of skills likely underestimates their impact on a country's income because improvements in the quality of education and human capital externalities are not factored in (Deming 2022).

While human capital is commonly defined as the knowledge, skills, competencies, and health of individuals who are employed in the creation of individual, social, and economic well-being (Healy and Côté 2001), in this paper we use skills and human capital interchangeably.

The paper is organized as follows. Section II reviews the evidence on the role of skills in structural transformation and the evolution of skills investments and their utilization in labor markets globally. Section III presents the dynamics of human capital accumulation, returns to education, and human capital utilization during successful and static episodes of structural transformation to understand the extent to which skills investments match labor demand, that is, whether they are in balance with investments in physical capital and technology. Based on this evidence, Section IV proposes a framework to understand the underlying market and policy failures that can lead to "unbalanced", inefficient skills investments. Section V relies on the same framework to differentiate policy priorities depending on countries' stage of structural transformation and the nature of inefficiencies in skills accumulation and utilization.

2. Human Capital and the Structural Transformation: what do we know?

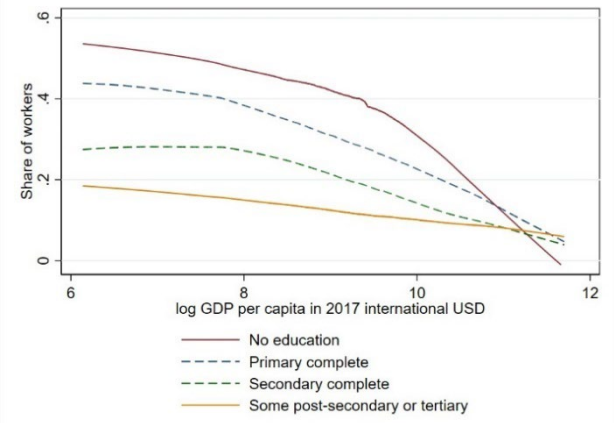
2.1 Skills and structural transformation

There is ample evidence that skills can be an important driver of the structural transformation from agriculture to other sectors. Human capital accumulation can accelerate the structural transformation process, as more educated workers are more likely to move from agriculture and low-productivity sectors into more skill-intensive sectors.[3] The increase in years of schooling alone accounts for about 20 percent of the global decline in agricultural employment over a 27-year period (Porzio et al. 2022). A one percentage point increase in human capital growth is associated with a 0.11 percentage point increase in the rate of reallocation of labor, land, and capital across agriculture, manufacturing, and services in a pooled sample of 40 countries in Africa, Asia, and Latin America between 1960 and 2010, although results indicate that this effect is driven mostly by Africa (Woldemichael and Shimeles 2019). In China, education accounted for 11 percent of the growth of output per worker between 1978 and 2004, with 9 percent coming from labor reallocation from agriculture to other sectors and 2 percent from human capital increases within the sector (Lee and Malin 2013).

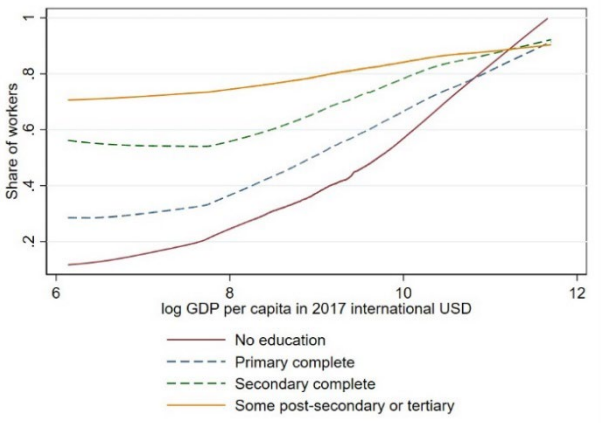
In addition to accelerating the transition away from agriculture, skills facilitate the transition along the organizational, occupational, and spatial dimensions of the structural transformation. Better educated workers are more likely to be engaged in organized forms of labor than be self-employed (Figure 2.1). There are also important spatial spillovers since non-agricultural jobs are more abundant in urban areas. An analysis based on data from Kenya and Indonesia found that people born in rural areas who acquired higher education levels were more likely to migrate and work in urban areas (Hicks et al. 2017).

Figure 2.1: Higher levels of education are associated with organizational transformation.

A. Self-employed



B. Wage employees



Note: the sample includes 1,638 surveys for 166 countries between 1990 and 2021. Log GDP refers to the logarithm of Gross Domestic Product in 2017 USD purchasing power parity and is from World Development Indicators (WDI)

[3] The decline in the cost of non-agricultural skills is at the center of theories of structural transformation (Caselli and Coleman 2001), along with the change in the demand for goods (less for food and more for other products) (Kongsamut et al. 2001) and the change in productivity across sectors (Ngai and Pessaries 2007; Gollin et al. 2002).

and Penn World Table (PWT) 10.0. The lines represent the fitted values of the probability to be in self-employment (panel A) and wage employment (panel B) at each level of income for people in each of the four categories of highest educational attainment, based on a locally weighted regression.
Source: World Bank Jobs Indicators Database (JOIN).

Importantly, higher levels of education are strongly associated with transitions to better jobs. In a cross-section analysis of 90 countries from 1990 to 2020, higher levels of education are associated with formal wage employment. Workers who have attained above secondary-education levels account for 50 percent of formal wage workers, about 60 percent of upper-tier informal self-employed people, and 65 percent of upper-tier informal wage workers, but only about 20 percent of employment among lower-tier informal wage workers and the lower-tier self-employed.[4] A 10-percentage point shift in the share of the working-age population who had completed post-secondary education relative to those who had only completed primary school is associated with a 4 percentage-point increase in formal wage jobs, a nearly 4 percentage point decline in informal lower-tier wage jobs, and an almost 1 percentage point decline in informal upper-tier wage jobs (Choi et al. 2024).

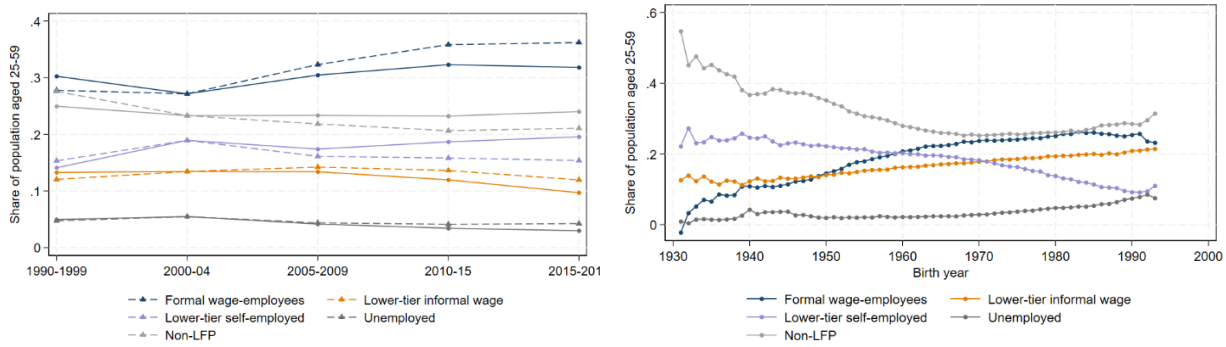
Cohort effects also account for part of the increase in formal wage jobs. The increase in formal wage jobs obtained by following a given birth cohort over time accounts for part of the aggregate increase in formal wage jobs.[5] This means that the aggregate increase in formal wage jobs over time is not only driven by country-wide trends across individuals of all birth cohorts but also by compositional changes in countries' age structure, as a result of younger cohorts entering the labor market and older ones exiting.. After 2000, for a given cohort (solid lines), the share of formal wage jobs is lower, inactivity is higher, and lower-tier informal self-employment is higher than the equivalent without controlling for birth-year dummies (dashed line, figure 2.2, panel A). Panel B shows that the probability of being formally employed increases with age up to 37 years old, to then remain constant until the age of 50, to then decrease with age. Younger birth cohorts of prime-age adults (age 25 -29, born between 1991 and 1995[6]) are more likely to be unemployed and employed in informal lower tier wage jobs. Adults aged 30 -50 (born between 1970 and 1990) are more likely to be employed in formal wage jobs and in informal lower tier self-employment than youth aged 25-29. Overall, adults older than 50 years old are more likely to be engaged in informal lower-tier self-employment and less likely to be in wage jobs either formal or informal lower-tier than younger cohorts. Part of the labor reallocations from lower tier self-employment to formal and informal

[4] The definition of informal upper- and lower-tier jobs is adapted from UN-WIDER "*Jobs Ladder*" (Fields et al. 2023), which classifies workers by employment status (wage vs. self-employment), formality, and occupations to distinguish informal jobs that are "free entry" and those that require either capital or a minimum level of skills. "Formal wage employees" are defined as those waged workers with either social security, health insurance, or a written contract; "upper-tier self-employed" are defined as self-employed workers who are professionals, managers, technicians, clerks, or employers with at least one employee; "upper-tier informal wage workers" are waged employees who are professionals, managers, clerks, or technical employees; "lower-tier informal self-employed" workers are own-account and self-employed people who are not professional, managers, clerks, or technical workers; "lower-tier informal wage workers" are waged employees without social security, health insurance, or a written contract who are neither professionals, managers, clerks, technical employees, or unpaid workers.
[5] Replicating Porzio et al. 2022 methodology, we decompose changes over time in the share of the working-age population that is engaged in formal wage jobs and informal lower tier jobs for every country at any point in time into a component that captures country-wide trends (meaning averages across individuals of all birth cohorts) and one that captures changes in the age structure of the active labor force (restricting the sample to age 25-59 to focus on WAP with completed education).
[6] The latest survey year is 2020.

wage jobs, but also the increase in unemployment, likely reflect the transformation out of agriculture and the urbanization process.

Figure 2.2: Over time cohorts effects played a more important role in labor reallocations to formal jobs.

A: Year effects B: Cohort effects



Source: Replicating the methodology in Porzio et al. 2022 based on 500 household surveys harmonized in the I2D2 between 1990 and 2019 for 93 countries (3 HICs, 18 UMICs, 33 LMICs and 39 LICs based on the income classification of countries the first year they enter the sample). Panel A: the dashed line shows the estimates for the 5-years effects conditional on country fixed effects only, while the solid line shows the estimates for the 5-years effects conditional on country and cohort fixed effects. Estimates are from OLS regressions of the share of WAP in formal wage jobs (and separately for other lower tier informal workers, the unemployed and the inactive shares) for each country, year, and cohort on country fixed effects and dummies that take value one for each five-year period from 1990 to 2020. Estimates are normalized to the average of each group (share of WAP in formal wage jobs, informal lower tier jobs, unemployment and inactivity) in the sample. Panel B shows the estimates for the cohort effects, conditional on country and year fixed effects.

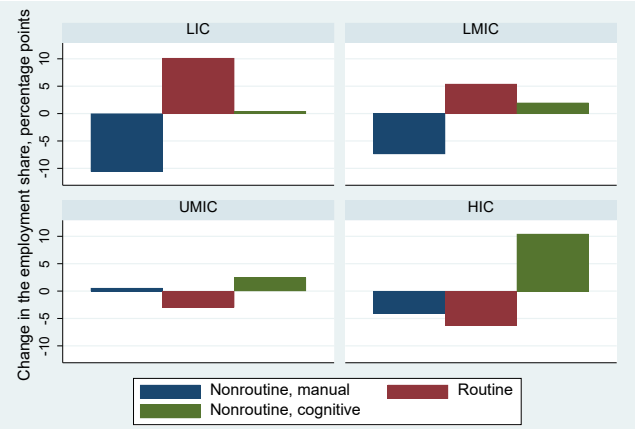
The acquisition of advanced cognitive, technical, and socio-emotional skills is central to technology adoption and productivity. Firms become more productive as their workforce is equipped with the skills to upgrade their capital and adopt technology. Total factor productivity growth in human capital-intensive sectors in China occurred because companies were able to adopt more cutting-edge technologies, import more advanced capital goods, increase their R&D output, and hire a more educated workforce (Che and Zhang 2018). Li et al. (2022) find that increases in skills demand in China can be explained by a rise in the imports of capital goods, which represent advanced technology. According to the skill-biased technological change theory, technology progress explains increases in labor and skills demand toward high-skilled workers (Autor et al. 1998; Katz et Autor,1999; and Acemoglu and Restrepo, 2020)). Consistent with these findings, recent evidence from European Union (EU) countries finds that automation (of both routine and non-routines tasks) enabled by the adoption of artificial intelligence is associated with aggregate increases in employment among young and skilled workers, suggesting complementarities between skills and new technologies (Albanesi et al. 2023).

Overall, the demand for more advanced skills, for example non-routine cognitive skills, rises as countries develop and transform (Figure 2.3, panel A).[7] As the scale of production increases and firms adopt new technologies, new opportunities for specialization arise because the increased division of work makes production more profitable The specialization of tasks (measured by the number of different occupations present in the economy as per Bandiera et al. 2022b) is also increasing as countries develop: it is low at early stages of development when self-employment and subsistence agriculture dominate the economy and higher in countries with more complex economies (Figure 2.3, panel B).

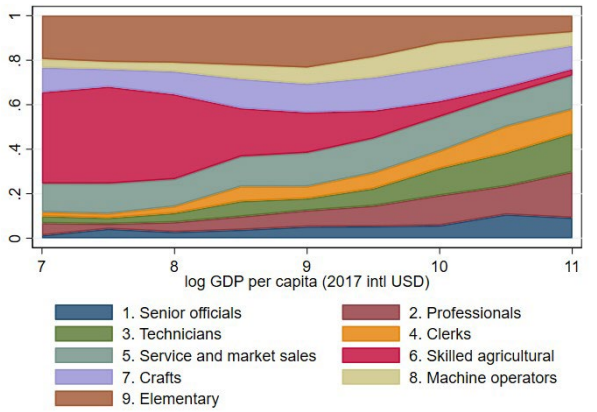
In turn, economic growth and structural transformation create the necessary incentives for people and firms to invest and use skills as they generate labor demand. Jobs require skills, but j also foster the development of those skills (e.g., through on-the-job learning) and generate demand for skills (Hentschel 2017; World Bank 2012). Raising awareness about available job opportunities in the business process outsourcing industry in rural India, for example, led to increased employment and investment in schooling and training among women (Jensen 2012).

Figure 2.3: Demand for higher-order cognitive skills increases as countries develop.

A. Change in employment by task content type



B. Distribution of occupations.

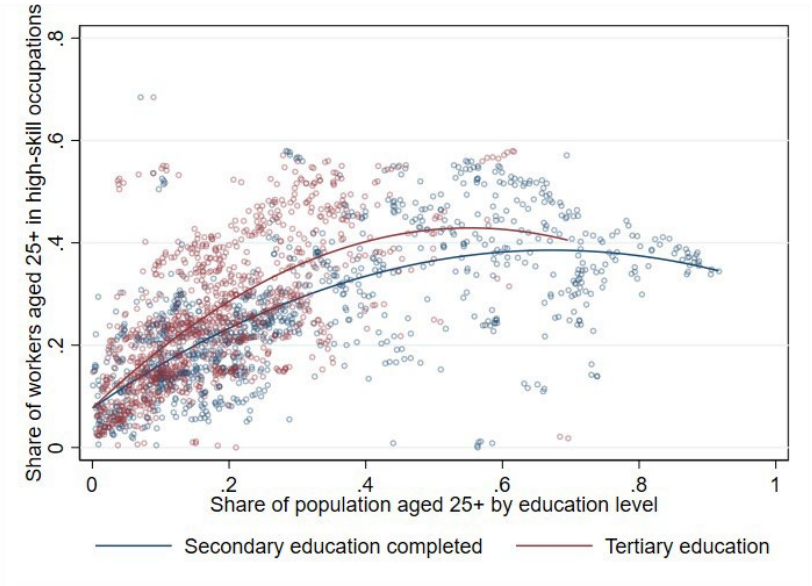


Source: Panel A: based on ILO occupation-level data following O*NET information on job characteristics (work activities, work context, and abilities), Acemoglu and Autor (2011) and Bussolo and at. (2018). The Figure reports the percentage change in employment between circa 2000 and 2015 for 51 countries having information (at least two points in time) about employment by occupation in both the 1995-2005 and 2010-2020 periods: 33 HICs, 2 LICs, 6 LMICs, and 10 UMICs. The income group is the one defined at the end of the period—for example, Chile was an UMIC in 1996 (earliest in circa 2000) and HIC in 2017 (latest circa 2015), thus it is classified among the 33 HICs. Panel B reports the distribution of employment by occupation classified by the ISCO-08 1 digit as countries develop based on harmonized labor force surveys and household surveys in the JOIN database. The underlying sample includes 148 countries from 1970-2021.

[7] This is consistent with routine task intensity indexes measured at the worker level based on STEP and at the occupation level based on O*NET task measures as in Lewandowski et al. 2019; Caunedo et al. 2021; and Deming 2022. Indexes based on the US and developing countries lead to similar conclusions regarding the stock, changes, and drivers of the non-routine cognitive and routine manual content of jobs but not for the routine cognitive and non-routine manual skill content of jobs (Lo Bello et al. 2019).

A better educated workforce is associated with occupational transformation. While it is difficult to assert causality broadly, the increased supply of workers with secondary and tertiary education is associated with the emergence of more high-skilled jobs; a marginal increase in the share of tertiary graduates is associated with faster occupational transformations (Figure 2.4).

Figure 2.4: A more educated workforce is associated with high skilled jobs.



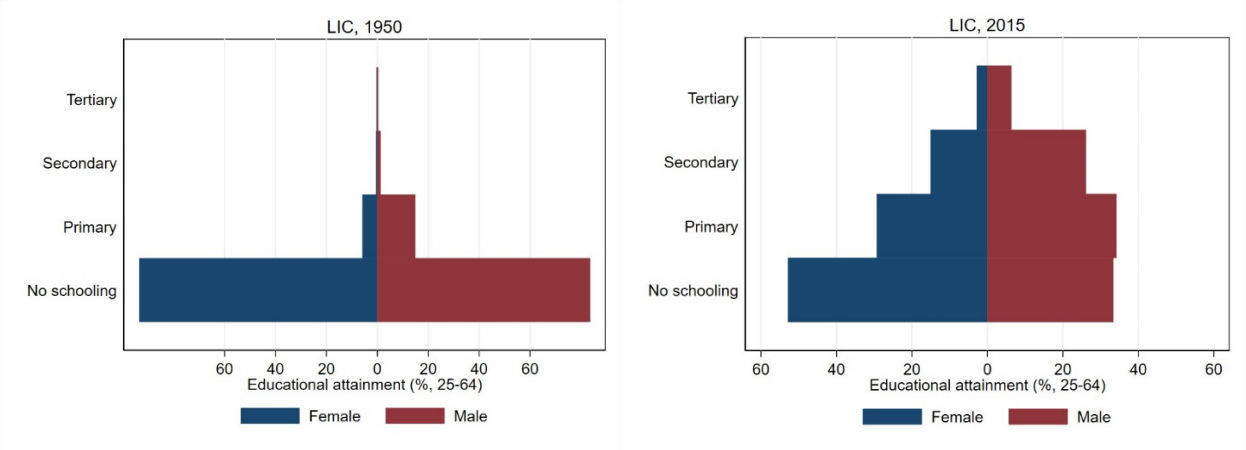
Note: Based on 1,044 harmonized household surveys in GLD, GMD and I2D2 for 142 countries between 1990 and 2021. "High-skilled" jobs defined as occupations with ISCO categories 1-3. "Tertiary education" refers to having either complete or incomplete post-secondary education.

However, skills investments may not pay off if complementary investments in technology, physical capital and other production inputs are not adequate to absorb a larger, more skilled workforce, leading to inefficiencies that may hamper structural transformation. Progress along the occupational transformation occurs as the scale of production increases, firms adopt new technologies, and new forms of organized labor develop. However, if this does not happen, investments in skills can go underutilized and not generate the expected societal or individual gains, leading to inefficiencies. Evidence from the OECD, Eastern European, and Mediterranean countries shows that human capital can positively impact labor productivity when the industrial structures have also been developed well enough to integrate the highly educated workers into the system (Teixeira and Queirós 2016). Sometimes, countries start the process of structural transformation but get stuck half-way (the middle-income trap) as has happened in Mexico, Colombia, and South Africa. In some countries in Latin America and the Caribbean, the increased investment in physical capital (and capital deepening) may not have led to increases in firm productivity because of inefficient allocation of resources (labor, skill, and capital) across firms induced by taxation, regulation of markets, and social protection policies (Levy and Cruces 2021). Policy failures then translated into slower skilled-labor demand to absorb the increased skilled-labor supply. As discussed above, the expansion of primary schools in Indonesia between 2006 and 2013 led to an increase of workers being employed outside of agriculture and increased wage employment (Karachiwalla and Palloni 2019), contributing to Indonesia's successful transformation, although the increased supply of educated workers was not entirely met by skilled labor demand increases, leading to slower wage growth in affected regions (Duflo 2004).

2.2 The state of skills accumulation, returns to education and human capital utilization.

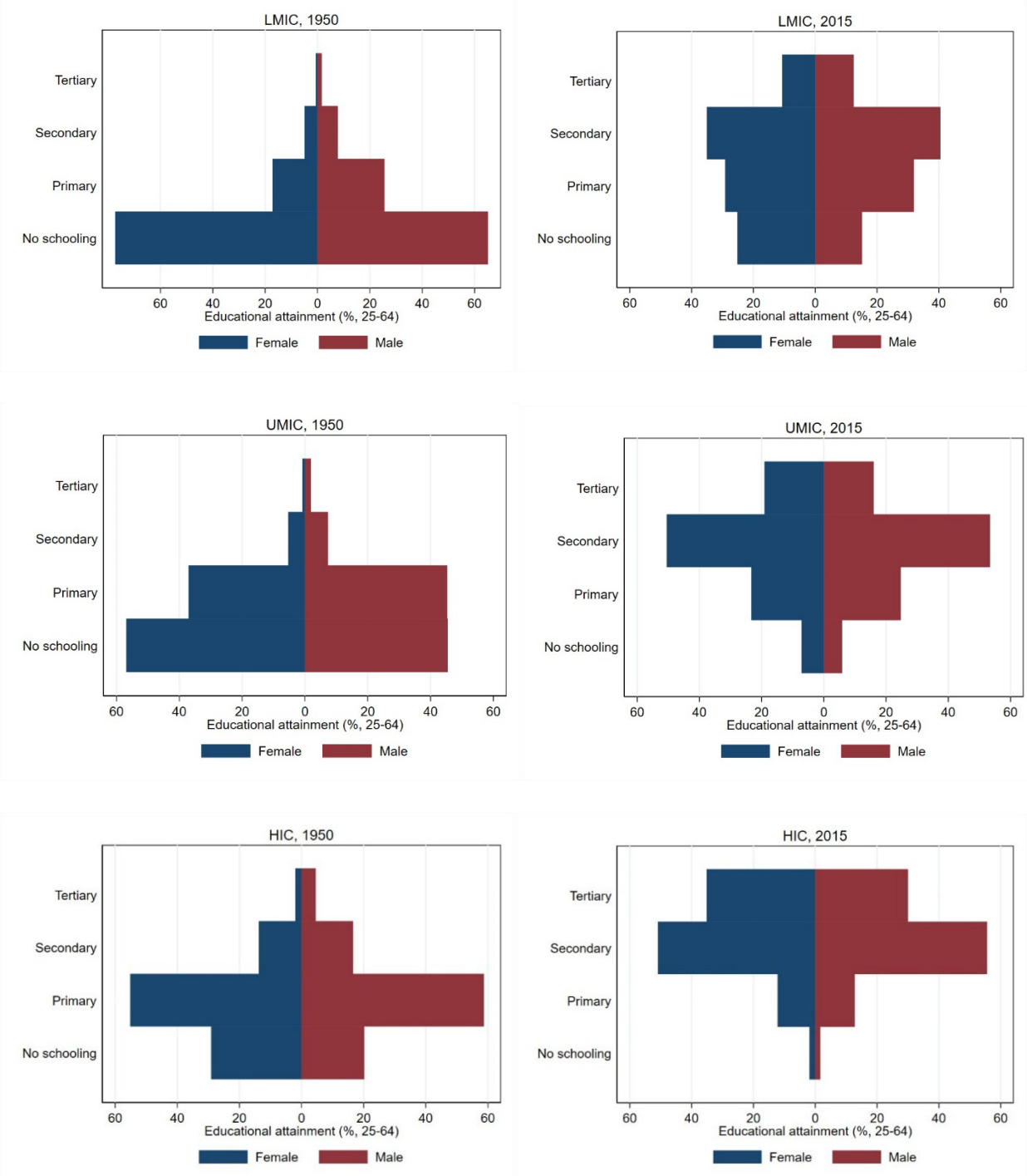
Access to early and basic education has improved over the past three decades, but significant gaps across and within countries remain. Worldwide, access to pre-school education increased by 29 percentage points since 2000 (Bendini and Devercelli 2022), but only 60 percent of children between age 3 and 6 attend pre-primary school. In LICs, this figure drops significantly to one in five children (Devercelli and Beaton-Day 2020). The average years of schooling of the world population age 25 and older was 5.25 in 1970 and doubled to around 10.5 in 2019.[8] However, significant gaps across country income groups remain—only 29 percent of the population age 25 and older have some lower secondary education in LICs, compared to 51 percent in LMICs, 70 percent in UMICs, and 85 percent in HICs (WDI). Assuming similar investments in coming years, the gap in secondary enrollment rates between LICs and UMICs is expected to decrease (from 20 to 16 percentage points difference), while the gap in tertiary enrollment rates in both LMIC and UMICs is projected to increase by five percentage points by 2040.[9] Finally, there are still significant gender gaps, although they tend to decrease as countries become richer (Figure 3.6).

Figure 2.6: Gaps in educational attainment over time by gender



[8] UNESCO data for 44 countries. Based on Penn World Table (PWT) estimates, the average number of years of schooling was lower and grew from 3.8 in 1970 to 8.5 in 2019 over a broader sample of countries (120). In both cases, the average years of education have at least doubled in this time period.

[9] Based on 2010 data on educational attainment by age group as benchmark figures to project the educational attainment of the population for the next three decades and UN Population data. For a detailed explanation of the estimation method, see Barro and Lee 2015.[10] The probability of individuals with five years of schooling being able to read a full sentence decreased about 10 percentage points for women and six percentage points for men.

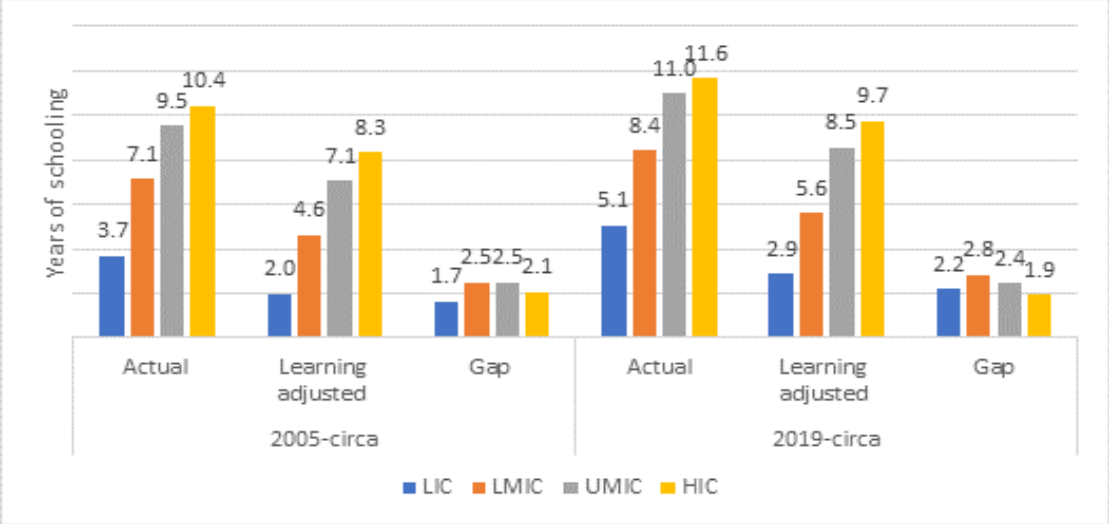


Note: the graphs show the percentage of adults (aged 25-64) reaching each level of education (either incomplete or complete). The income classification used is as of 2015.
Source: Barro and Lee accessed in February 2023.

Despite improvements in educational enrolment and attainment, the quality of education remains poor in most low- and middle-income countries. It is the quality and relevance of what students learn that matters to build skills and translate these investments into higher productivity gains. Unfortunately, many

students are not learning at school: in several countries, the 75th percentile of PISA test takers performs below the 25th percentile of the OECD average (World Bank 2018a). And school closures due to the COVID-19 lockdowns aggravated the global learning poverty (Shady et al. 2023). An exception here is the quality of secondary education in SSA (World Bank 2018a; World Bank 2019; Filmer et al. 2020; Angrist et al. 2021). The gap between the actual and the learning-adjusted years of schooling is larger in MICs than in LICs. As enrollment and completion rates increase, improvements in the quality of education are relatively slower. In fact, the gap widened over time for lower-income countries, while it remained mostly stable for UMICs and decreased for HICs between 2005 and 2019 based on the latest average years of schooling and harmonized learning outcome available per country (Figure 2.7). Correcting for cohort effects, average school literacy quality did not change, but rather decreased in 87 developing countries (Le Nestour, Moscoviz & Sandefur, 2022).[10]

Figure 2.7: The gap between actual and learning-adjusted years of schooling has expanded over time for lower-income countries.



Note: Unweighted averages on a balanced sample of 116 countries with data on both circa 2005 and circa 2019: 21 LICs, 35 LMICs, 25 UMICs, and 37 HICs. Income classification is based on the baseline year, circa 2005. "Learning adjusted years of schooling" is obtained by multiplying the mean years of schooling for each country in 2005 circa and 2019 circa by the average harmonized learning outcomes (HLO) for primary and secondary scores divided by 625 for the closest year, following the methodology developed for the World Bank Human Capital Index. The average number of years of schooling is based on the latest country/year available either in UNESCO or PWT. HLOs are based on the Harmonized Learning Outcomes database accessed in October 2022.
Source: PWT, UNESCO, HLO.

Increased investments in education have been accompanied by an expansion in the labor supply driven by both demographics in most low- and middle-income countries and increases in labor force participation. The total global population grew from 1.7 billion in 1960 to 5 billion in 2021 (WDI). The largest share (85 percent) of the working-age population is concentrated in LICs and MICs and is expected

[10] The probability of individuals with five years of schooling being able to read a full sentence decreased about 10 percentage points for women and six percentage points for men.

to further increase to 89 percent by 2100 (UN population data). Participation rates improve with educational attainment, especially as countries get richer (JOIN database).

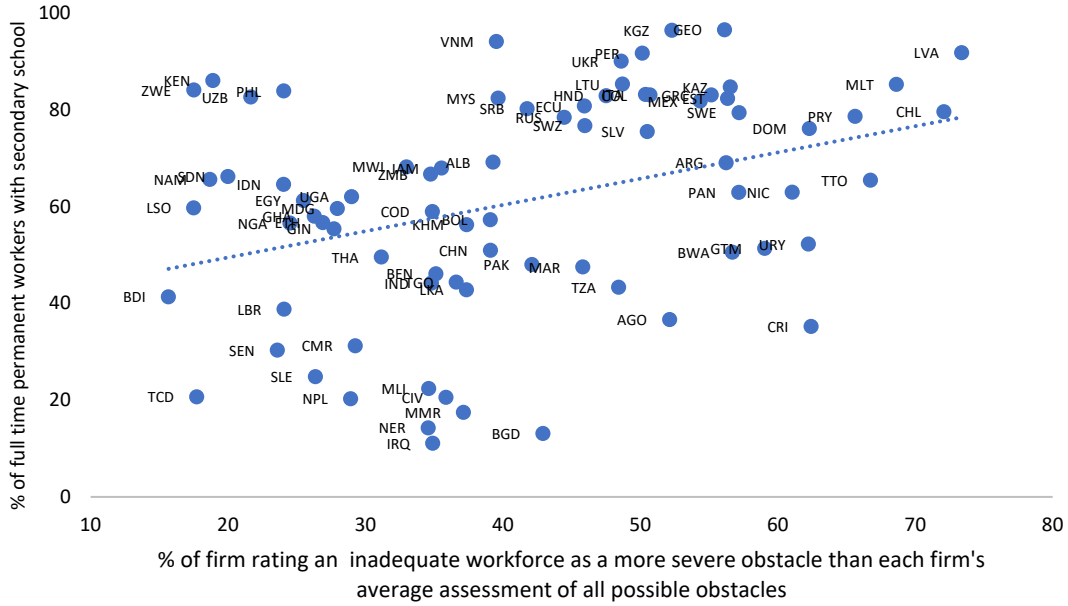
Despite increases in the educational level of the workforce and in labor supply, returns to education are high and continue increasing for the more educated, signaling the importance of skills for labor markets. Private returns to one additional year of schooling among wage workers are, on average, 10 percent globally (Montenegro and Patrinos 2021). Even when accounting for all workers, our estimates show that average returns to education are still high at 9.3 percent.[11] Private returns to schooling are higher for LICs than HICs. While overall returns to education have been steady over the past 20 years globally, returns to tertiary education have been increasing while returns to primary and secondary education have been decreasing over time, on average.

Returns to skills go beyond returns to education and what is learned at school. More precise metrics of cognitive and socioemotional skills would allow for better estimates of returns to the broader set of skills that are acquired since childhood. For example, literacy, numeracy, and problem-solving skills, as measured in the PIAAC assessment, yield higher returns on earnings than years of education alone in 22 OECD countries (Hanushek and Woessmann 2015). Similarly, returns to ICT skills based on PIAAC are large: a one standard deviation increase in ICT skills is associated with a 24 percent increase in earnings (Falck et al. 2016) . Skills measured by reading proficiency and complexity of on-the-job computer tasks based on World Bank STEP surveys in eight developing countries yield positive pay off in the labor market controlling for years of schooling, especially for cognitive skills (Valerio et al. 2016).

As countries become wealthier, firms are increasingly likely to report that a lack of skilled workers is a major barrier to their growth, which aligns with the high returns to skills observed in labor markets. Evidence from the World Bank Enterprise Surveys shows that, on average, 18 percent of firms in HICs consider an inadequately educated workforce to be the biggest obstacle to doing business compared to 2 percent in LICs. Firms rate inadequate skills as a severe obstacle even in countries with a relatively high share of workers with secondary education (Figure 2.8), highlighting quality gaps. Firms rate inadequate skills as less of an obstacle only when more of the workforce has tertiary education. At all levels of development, skills shortages are perceived as more binding among growing, innovative, and exporting firms (Figure 2.9).

[11] Estimates based on standard Mincerian regressions. Returns that are not statistically significant are set to zeros (Honorati, Kupets, and Santos forthcoming).

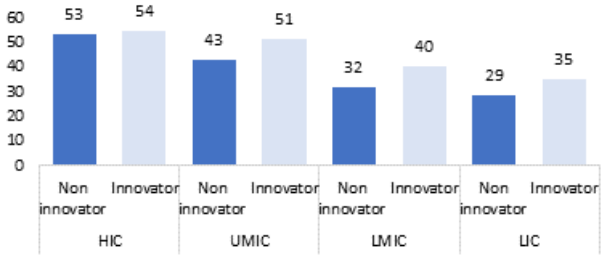
Figure 2.8: Skills are perceived as being an obstacle even in countries with a relatively high share of workers with secondary education.



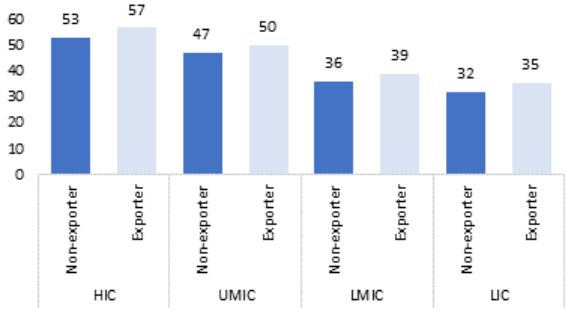
Note: Only the latest survey in each country. The surveys include 78 countries from 2010 to 2019. The percentage of workers with secondary school only refers to the manufacturing sector. The surveys include subjective assessments of the degree to which each element of the business environment is an obstacle to the firm's operations. The surveys include only formal firms, with 5 or more employees, in all manufacturing and selected services sectors.
Source: WB Enterprise Surveys (WBES).

Figure 2.9: Lack of adequate skills appears to be particularly problematic for innovative firms and for exporters.

A. Innovative firms



B. Exporting firms



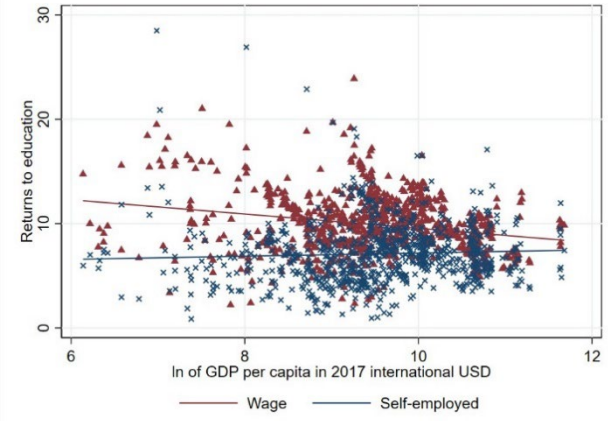
Note: A firm is an innovator if the firm introduced a new product/service or and a process innovation in the survey period. A firm is an exporter if at least 10 percent of its annual sales is derived from direct exports. Only the latest survey in each country. The surveys include 107 countries from 2006 to 2019.
Source: WB Enterprise Surveys (WBES).

However, linking workers with organizations increases their returns to education and makes human capital more productive. Our estimates show that there are significant differential returns to schooling

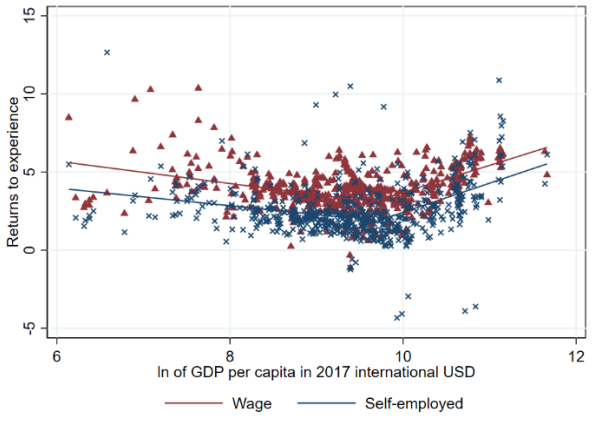
by employment status—wage jobs yield higher earnings on average than self-employment(Figure 2.10) and that women consistently have higher returns.[12] The lower returns to schooling for self-employed workers could reflect differences in the demand for skills in the formal and informal sectors, occupational or firm-type segmentation, or unobserved differences in individuals, for example around the quality of education.[13] Results are consistent with existing evidence in developing and high income countries.[14]

Figure 2.10: Returns to schooling and to experience for wage workers and self-employed people.

A. Returns to schooling



B. Returns to experience.



Note: Returns to schooling estimates are based on 805 household surveys for 118 countries between 1990 and 2020 harmonized in World Bank Global Labor Database (GLD), International Income and Distribution Database (I2D2) and the Global Monitoring Database (GMD). Returns to experience estimates are based on 585 household surveys harmonized in GLD, I2D2 and GMD for 105 countries in the same period. If the p-value is greater than 10 percent estimates are not included (Honorati, Kupets, and Santos, forthcoming). The lines represent the fitted values of linear regressions for HICs and LICs/LMICs/UMICs, respectively.
Source: Authors, based on harmonized household surveys in the GLD, I2D2 and GMD.

Skills acquired at work are also important and have significant returns, particularly among wage workers. We estimate that one additional year of work experience, which captures on-the-job skills acquisition, provides a return of 3.6 percent, on average, among wage workers and 1.6 percent among the self-employed (Honorati, Kupets, and Santos, forthcoming). Firms and organizations often invest in

[12] We report estimated returns to schooling for both wage workers and self-employed people aged 15 and older (excluding employers) based on a standard Mincerian OLS regression model controlling for gender, urban, experience (calculated as an individual's age minus years of education minus six), and experience squared. The dependent variable is logarithm of hourly earnings with trimmed values at the top and bottom 1 percent. OLS estimates are robust to adding sector of employment and to Heckman two-stage procedure to correct for selection into the labor force. Coefficients are set to zero if the p-value is greater than 10 percent (Honorati, Kupets, and Santos, forthcoming).

[13] Uncompetitive markets, returns to education should be the same for wage and self-employed workers. However, different rates of return may be explained by market and institutional failures that do not allow markets to equalize (for example, regulatory barriers that limit the flow of workers across firms).

[14] In Ghana, Tanzania, Ethiopia, Uganda, Peru, and Pakistan, using models both with and without corrections for sample selection (Rankin et al 2010, Sandefur et al. 2006, Kavuma et al. 2015, Laszlo 2005, Kingdon and Söderbom 2007). Returns to education do not differ for self-employed people and wage workers in rural Malaysia (Idrus and Cameron 2000). In HICs with relatively high self-employment rates (Spain and Portugal), wage workers perceive greater returns to education than do self-employed people, with and without controlling for selection bias (Garcia-Mainar and Montuenga-Gomez 2005]. Estimated rate of returns for non-farm self-employed people in India is very sensitive to the choice of different types of selection models (Bairagya 2020).

skills development, augment their value through skills specialization, agglomeration, and complementarities (Neffke 2019, Khan 2019, Woolley et al. 2010). In particular, returns to experience are higher in larger firms and more productive firms (Berlingieri, Calligaris, and Criscuolo 2018). Consistent with this, skills acquired at work have the highest returns in HICs, which are characterized by larger shares of jobs in organized sectors. The experience-wage profiles are on average twice as steep in rich countries as in poor countries. This means that workers in higher income countries accumulate twice as much skills at work much more than workers in developing countries, possibly because of skills externalities and greater opportunities to learn on the job and participate in skills training. Overall, work experience explains a third of the gap in wages between developed and developing countries (Lagakos et al. 2018, Jedwab et al. 2023).

A prima facie, globally and on average, labor supply and labor demand developments have moved in tandem. The world has seen in recent decades an increase in the size of the workforce and a significant improvement in its educational attainment. The fact that returns to education are high, on average, and are particularly high for the better educated, suggests that global labor demand has kept pace with these developments. However, as we discuss in the rest of the paper, this is not enough to understand whether skills are a constraint to structural transformation or not, nor whether the process of skills accumulation and utilization is efficient. In fact, as we show in the rest of the paper, this balance between labor supply and demand is often absent in ways that can hinder structural transformation and be inefficient.

3. Balancing skills supply and demand in episodes of successful and static transformation

The balance between productive physical and human capital accumulation determines the efficiency of skills investments in developing countries. This section reviews the dynamics of education in the workforce, returns to education,[15] and skills utilization to assess to what extent human capital accumulation and use are balanced with labor demand. When improvements in human capital are not met by labor demand, returns to education are usually declining. Declining returns are not necessarily a problem if returns are high. In economies where returns to education are unusually high and the unemployment of relatively skilled workers is low, the lack of skills is likely binding the transformation to a more organized economy[16]. In this paper, we rely on a classification of successful and static episodes of

[15] In this section, we report estimated returns to education for both wage workers and self-employed people aged 15 and older (excluding employers) based on a standard Mincerian regression model controlling for gender, urban, experience (calculated as an individual's age minus years of education minus six), and experience squared. The dependent variable is logarithm of hourly earnings with trimmed values at the top and bottom 1 percent. We estimate both the returns to one extra year of schooling and returns to primary school completed, secondary school completed, and tertiary education (some and completed) relative to less than primary-completed education. We checked the robustness of estimates by adding sector of employment and estimating the Heckman two-stage procedure to correct for selection into the labor force (Honorati, Kupets, and Santos, forthcoming).

[16] Low and declining returns to education may reflect low demand for skilled labor but also skills mismatches and a distorted relationship between wages and productivity. High private returns to education may reflect scarcity of skills supply compared to

structural transformation based on countries' progress over the last thirty years along four dimensions of structural transformation (sectoral, spatial, organizational, and occupational), progress in economic growth, and poverty reduction.[17] The analysis in this section identifies patterns of human capital accumulation and utilization that appear generalizable to successful and static episodes of transformation, by country income group. Selected country cases are presented to illustrate the conditions under which human capital can either support or be a constraint to successful structural transformation.

3.1 Skills in successful periods of transformation

No country has successfully transformed without substantially investing in skills. Successful episodes of structural transformation have always been accompanied by improvements in the educational attainment of the workforce. As discussed in Section II, educational attainment and the gross enrollment ratios (GER) have increased over time in all countries. However, at all levels of development, successful transformers start and end the transformation period with higher educational attainment levels and lower shares of the working-age population with no education than countries in static periods of transformation. In these countries, the average years of schooling was higher at the start of their transformation period[18] (5.5) than at the onset of static periods of transformation (2.5).[19] The gross enrollment rates in secondary education were also higher (57 percent, on average) at the onset of successful episodes than at the onset of static periods (42 percent). Tertiary GERs were significantly higher at the onset of success episodes compared to static episodes (19 percent vs. 8 percent, on average) and remained higher—reaching 45 percent on average—by the end of the transformation period compared to 20 percent, on average, at the end of static episodes.

Low-income countries that are successful transformers had increased the stock of workers with primary education at early stages of economic development, while transformation among successful middle-income countries was accompanied by higher secondary education completion rates While the share of people with post-secondary education tripled in LICs and doubled in MICs regardless of the transformation path, successful transformers achieve higher increases in primary education completion

demand, potential constraints to labor mobility (for people to move where jobs are and for sectoral mobility), and improved firm productivity and organization.

[17]Successful transformation is defined as a continual process along at least three of the four dimensions of structural transformation (sectoral, spatial, organizational, and occupational), progress in economic growth, and poverty reduction. While a country can have multiple episodes in its history, the episodes we focus on are dictated by the data availability since 1990. Thirty-five countries and periods could be consistently classified. Successful episodes include Armenia (1999-2017), Belarus (1998-2017), Burkina Faso (1994-2014), Chile (1992-2017), China (1993-2017) Costa Rica (1991-2017), India (1993-2017), Indonesia (1993-2017), Malaysia (1992-2015), Mali (1994-2009), Morocco (1998-2013), Panama (1991-2017), Rwanda (2000-2016), Thailand (1992-2017), Turkey (1994-2017), and Vietnam (1992-2016). Static episodes include Burundi (1992-2013), Central African Republic (1992-2013), Colombia (1992-2017), Côte d'Ivoire (1992-2015), Egypt (1995-2017), Guatemala (1998-2014), Guinea Bissau (1993-2010), Honduras (1991-2017), Kenya (1992-2015), Madagascar (1993-2012), Malawi (1997-2016), Mexico (1992-2016), Nigeria (1992-2015), Paraguay (1995-2017), South Africa (1993-2014), Swaziland (2000-2016), and Zambia (1991-2015).

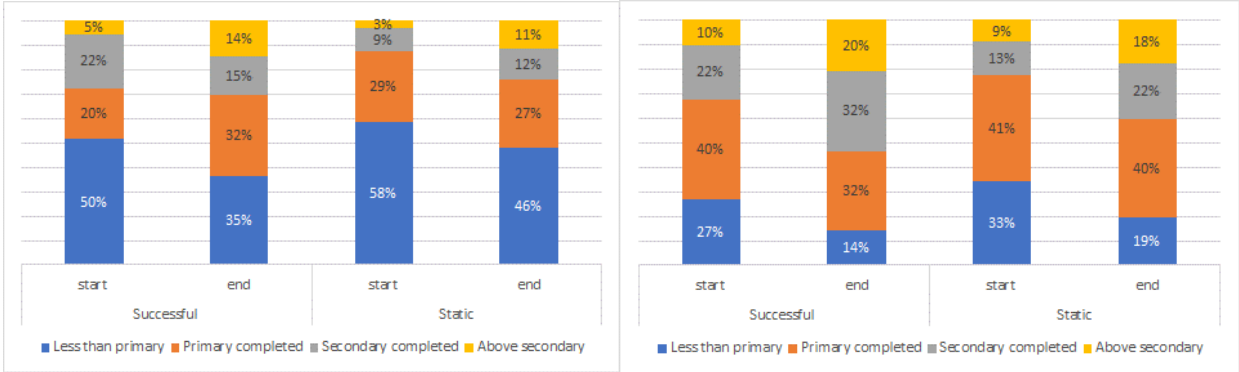
[18] The relative year refers to the number of years from the start year of the successful and static periods.

19 It is important to note, of course, that we do not observe the full history of countries and, hence, the ”onset” or the ”end” of a given period can be affected by the data available. That said, because years of schooling in the workforce change slowly, the differences observed here are likely to be present even in somewhat longer periods around the episodes considered here.

rates at early stages of transformation and in secondary education completion rates when they are in the middle stages of transformation (mostly in LMICs) than countries that are stuck in their transformation (Figure 3.1).

Figure 3.1: Successful transformers move up a "skills ladder" as they develop.

A. Classified as LICs at the start of the period B. Classified as MICs at the start of the period.



Note: Shares of working-age population (age 15 and older) by highest educational attainment at the start and end of the transformation periods. Transformation period runs between 1996 and 2017, on average, across countries. Successful and static transformation periods are defined in footnote 23.
Source: JOIN database.

High returns to education in most transforming countries, particularly at the tertiary level, together with indicators of improved educational attainment and tight labor markets suggest that, in those countries, human capital investments have most likely been absorbed in the labor market. For example, in Vietnam, high returns to tertiary-educated workers between 2002 and 2010 led to increases in tertiary enrollment rates during the following years and tight labor markets (McGuinness et al. 2021). Only 2 percent of people had some post-secondary education between 1997 and 2002; responding to increasing returns, the share increased rapidly in the following years to 7 percent in 2011 and then to 11 percent in 2017. High labor force participation LFP (at around 87 percent), high employment to population ratio (85 percent), and low unemployment rates (2 percent) for those with post-secondary and tertiary education remained stable between 2002 and 2010 (Vietnam labor force surveys) (Figure A.1). Thailand also displayed high and increasing returns to secondary- and tertiary-educated workers in the first part of its successful transformation period, between 1994 and 2009 (returns for secondary-educated workers increased to 15 percent in 2000 and then started decreasing, while returns to tertiary-educated workers kept increasing to 22 percent in 2009 and then started declining). This reflected the scarcity of these workers. In 1994, only 10 percent of the population above 25 years of age workforce was tertiary-educated, and another 4 percent had secondary education. High returns, together with increasing employment since 1998 and almost no unemployment (compared to declining employment rates for primary-educated workers), point to the increased demand and match for secondary and tertiary-educated workers at the cost of workers with less than primary-completed education[20]. By the end of the

[20] The employment rate of 25+ people with less than primary education declined from 80 percent to 54 percent during the transformation period (JOIN database).

transformation period in 2017, the share of Thai workers with completed secondary education was 18 percent and those with tertiary education, 19 percent (JOIN).

High returns to education during successful periods of transformation may also coexist with labor market slack. In India, returns to tertiary education remained high at 20 percent between 1993 and 2011 and then decreased. The high returns translated into increases in tertiary enrollment rates and an increase in the share of people aged 25 and older with at least post-secondary education from 4 percent to 10 percent in the same period (JOIN). However, the unemployment rate among the tertiary-educated increased from 10 percent to 16 percent, and their labor force participation and employment rate dropped from 73 percent to 61 percent and 66 percent to 51 percent, respectively, during the successful period of transformation (1993-2017) (Figure A.2). These trends together suggest that, after a certain point, education may not have been a binding constraint to better jobs and that possible barriers to labor participation and job creation may have prevented skills investments to realize their potential. In Indonesia, returns to education were increasing for all individuals with primary and higher levels of education until 2001 and then decreased as the stock of people with secondary and tertiary education improved from 14 percent and 2 percent in 1994 to 29 percent and 10 percent in 2017, respectively (JOIN database). The increased supply of skilled workers was not immediately absorbed in the labor market as indicated by high unemployment rates for workers with secondary education, which increased from 14 percent to 19 percent, and for tertiary-educated people. which remained at 10 percent between 1994 and 2006. However, after 2006, the unemployment rate improved, and employment rates increased from 50 percent to 64 percent for workers with secondary education and from 74 percent to 80 percent for those with tertiary education (JOIN database).

In countries where returns are high or increasing and labor demand remains strong, there continues to be a rationale for further investments in human capital, but investments in skills can also sometimes outpace labor demand. Vietnam's experience after 2010 is a cautionary tale of what can happen if labor demand does not keep up with increases in labor supply and skills investments. The expansion of tertiary education in Vietnam between 2006 and 2013 was met with a significant decline in returns to tertiary education after 2010 (McGuinness 2021). The continual increase in the supply of educated workers after 2010, which was no longer matched by the demand for this group, led to a rise in the unemployment rate of university graduates, which increased from 6 percent in 2010 to 18 percent in 2016.

In other cases, high and increasing returns have not been accompanied by significant increases in the supply of educated workers, suggesting possible skills underinvestment. For example, despite high returns to tertiary education (16 percent) in 1998 at the onset of Morocco's successful period of transformation (1998 to 2013), the share of people with post-secondary and tertiary education increased only from 6 percent to 9 percent throughout the period. High returns to both secondary (20 percent) and tertiary (29 percent) education in Rwanda at the beginning to the transformation period in 2000 led to only a 7-percentage point increase in the share of people age 25 and older with secondary education completed (from 11 percent to 18 percent) in the transformation period (2000 to 2016) and for tertiary education from 1 percent to 4 percent.

It is important to note, however, that not all successful periods of transformation are accompanied by high or increasing returns to education. For example, Turkey experienced decreasing returns to schooling from 12 percent to 8 percent between 2002 and 2017 and decreasing returns for primary, secondary and tertiary-educated people compared to those with no schooling. The share of people aged 25 and older with tertiary education increased from 6 percent to 16 percent between 2000 and 2017 and secondary-educated people from 29 percent to 42 percent, however, the unemployment rates for those with post-secondary education remained high at 11 percent, higher than the unemployment rate of less-educated people (8 percent) throughout the period (Figure A.3). Decreasing returns and a slacking labor market suggest issues of low labor market relevance of workforce skills or low demand for higher skills. Burkina Faso also experienced decreasing returns to one extra year of schooling from 16 percent to 7 percent during the successful transformation period between 1994 and 2009, mostly driven by decreasing returns to primary-educated workers compared to no schooling, while keeping high returns to secondary- and tertiary-educated workers. At the beginning of the successful period, 80 percent of the workforce aged 25 and older did not have any education completed, 17 percent had primary school completed, 2 percent had secondary education completed, and 0.7 percent had some tertiary education. Responding to high returns, the education composition of the workforce shifted during the following 15 years to larger shares of workers with secondary-completed education.[21] The labor market absorbed the increased population of secondary-educated people as reflected in constant unemployment rates throughout the period for secondary- and tertiary-educated workers (7 percent and 4 percent, respectively), displacing primary-educated workers, whose unemployment rate doubled from 7 percent to 13 percent during the same period. The decreasing returns to one extra year of schooling in Burkina Faso pointed to a shift in demand from lower-educated workers to secondary-educated workers.

In sum, the primary set of skills associated with successful transformations varies depending on the stage of development and market conditions, with more advanced skills needed for innovation and technology adoption as countries develop. For countries at low levels of economic development, which tend to be at early stages of structural transformation, skills that are typically obtained at the secondary education level (including vocational) seem to be more critical than higher levels of education to advance the structural transformation. But this doesn't mean that other skills are not important given skills complementarities. In more advanced economies, which are also typically ahead in the process of structural transformation, higher-level skills, usually acquired in tertiary education, could be most critical to further gains in jobs and their quality. Based on US historical data, inventors are those with at least a college education and higher parental income; the probability of becoming innovators is higher among those with PhDs in Denmark as well (Akgik 2020). There is also evidence that the engineers' density in 1900 led to faster technology adoption and structural transformation in the US, and that large differences in engineers densities across Latin American countries with similar income in 1900 diverged their growth trajectories over the next century (Maloney and Caicedo 2017).

[21] By 2009, the latest survey year available, the share of people age 25 and older with no schooling decreased to 73 percent, the share of workers with primary education completed as the highest attainment increased to 22 percent, the share of those who completed lower-secondary education as the highest attainment increased to 3.7 percent while the share of people age 25 with some upper-secondary education and above remained stable at less than 1 percent (JOIN).

3.2 Skills in static periods of transformation

Static periods of transformation coexist with both increasing and decreasing returns to education. At a low level of development, high returns in static periods may reflect either a low stock of skilled workers compared to demand, inadequate skills and low quality of education, or constraints to labor force participation or labor mobility. On the other hand, low returns during static periods may reflect low labor demand for skilled labor driven either by slow capital deepening or poor organization and declining firm productivity, a distorted relationship between wage and productivity, regulatory constraints, and skills mismatches with respect to skills demand. In this case, it is unlikely that the lack of skills is a binding constraint to better jobs. We discuss these cases in turn.

When returns to schooling are high, the relative scarcity of human capital could in itself be a constraint to structural transformation. This could particularly be the case in some LICs where the stock of educated workers is very small to start with. For example, in Zambia, returns on all levels of education remained high throughout the static period of transformation (1991-2015); education levels improved between 1998 and 2014, with the share of people with more than secondary education growing from 8 percent to 17 percent. Educational attainment in Malawi has not changed much between 1997 and 2016 despite the increasing returns to schooling from 9 percent to 16 percent between 2010 and 2016; the share of primary-educated individuals aged 25 and older remained at 60 percent; secondary-educated, at 15 percent; and tertiary-educated, at 13 percent[22].

A similar situation may play out in some resource-rich countries where limited investments in education and skills could be limiting economic transformation. Mineral wealth—from minerals or hydrocarbons such as natural gas and especially oil—has stimulated high economic growth in many SSA countries, though it has been less effective in facilitating a successful jobs-rich structural transformation. SSA countries rich in natural resources have spent less on education and health relative to peer countries in the same income group, and their spending is generally less effective, as they have poor human capital outcomes, which in turn may have been a constraint to successful transformation (de la Brière et al. 2017).

At the same time, in several countries that experienced periods of slow transformation—especially middle-income countries—returns to education are decreasing, pointing to either labor demand constraints or education quality issues. In Mexico, Colombia, and South Africa, many investments in education were not met with an adequate increase in labor demand; the decreasing returns to education in those contexts suggest an "overinvestment" in some segments of the education system. For example, in Mexico, returns to one extra year of schooling have decreased during the static transformation period from 12 percent in 1992 to 7 percent in 2019. **T**his has been driven by decreases in the rates of returns for primary- and secondary-completed education since 1994, reflecting the larger stock of secondary-

[22] Similarly, Cote d'Ivoire displays returns slightly above average at around 12 percent, with small improvements in the education composition of the workforce over time—in 2008, 52 percent of individuals had less than primary education and 35 percent had primary education completed (JOIN). Honduras has also experienced high returns to education throughout the transformation period (1991-2017), with some decreases but fluctuating between 10 percent and 13 percent. However, there have been limited increases in educational attainment given the high returns—those with primary education continue to represent the largest share (46 percent), with 36 percent reaching secondary educational attainment, and only 12 percent tertiary education (JOIN).

educated workers and their increasing unemployment rates.[23] In Colombia, returns have been gradually decreasing in the second part of the static period, from 10.5 percent in 2008 to 8.5 percent in 2019. At the same time, Colombia has experienced a large increase in educational attainment at all levels[24]and high (though decreasing) unemployment rates (Figure A.4). Taken together, these factors point to limited productive job creation and an oversupply of high-skilled workers after 2008 compared to demand. South Africa reflects a similar pattern, with very high returns reaching 17 percent in 2013 and dropping afterward. These declining returns may reflect either low quality of skills or distortions in labor and product markets such as tight labor regulations, misallocation of resources toward less-productive firms, barriers to mobility, and barriers to growth by new firms.

In contrast, investments in tertiary education appear to have been too little in other countries—given the high returns—to facilitate structural transformation. In Mexico, returns to tertiary education, for example, are very high; they were above 17 percent beginning in 1992 and reached 21 percent by 2012 (Montenegro and Patrinos 2021), pointing to possible underinvestment in tertiary education, as attainment was still relatively low at 15 percent in 2016 (WDI). The limited growth of higher education may have hindered progress in the occupational transformation; while the share of wage employment increased from 55 percent to 68 percent, the wage jobs skill composition remained stable—the share of high-skilled wage employment has been steady at around 20 percent, the share of mid-skilled wage employment increased only by 2 percentage points to 52 percent, and the share of low-skilled wage jobs slightly decreased to 30 percent (ILOSTAT). Similarly, in South Africa, there have been only minor increases in the share of tertiary-educated people, despite returns to tertiary education being high. Educational attainment for this group continued to be low at 8 percent at the end of the period in 2017.

Overall, a poorly skilled workforce may in some instances be a binding constraint in static periods of transformation, but it can also just be one factor among many, risking overinvestments. In economies where returns to education are unusually high, unemployment of relatively skilled workers is low, and firms go to unusual lengths to train workers or import skills from abroad, the lack of relevant skills is likely binding on the transformation to a more organized economy. Especially in LICs with a limited stock and low quality of foundational skills, skills shortages may bind or will bind at some point. In economies where returns to education are low and decreasing, unemployment of relatively skilled workers is high, and educated workers tend to leave the country for better jobs, education and skills may not be the most binding constraint. While a poorly skilled workforce can be a constraint to structural transformation, the stage of the transformation and market conditions should shape the mix and type of skills investments both in the short- and long-term.

[23] In fact, educational attainment has almost doubled at the primary and secondary education levels (81 percent for primary, 61 percent for lower secondary, and 24 percent for upper secondary) between 1990 and 2017, while the unemployment rate of secondary educated people doubled from 3 percent in 1998 to 6 percent in 2014 (JOIN database).

[24] From 1993 to 2018, the share of individuals with at least primary education increased from 60 percent to 81 percent, the share of those with secondary education increased from 41 percent to 58 percent, and the share of those with tertiary education increased from 28 percent to 53 percent (WDI).

4. What holds back the efficient accumulation and utilization of skills in the transformation process?

Countries with episodes of successful transformation match the demand for labor with their human capital not only by investing in quality education, but also by efficiently leveraging these skills in the labor market and further developing skills at work. In Section III, we discussed cases such as Vietnam and Thailand where the structural transformation was accompanied by an expansion in the tertiary-educated workforce that benefitted from high or rising returns to education and overall improved labor market prospects. Box 4.1 discusses the experience of Vietnam in more detail. This efficiency, however, is not the norm. Table 4.1 categorizes selected periods of structural transformation according to how efficient human capital appears to have been produced and used.

Box 4.1: Case study–Vietnam: Investment in higher education during a successful structural transformation episode (1992-2016)

Since the 1990s, Vietnam has experienced significant growth that almost tripled its per capita income between 1990 and 2016. In this period, the country experienced the fastest growth, between 1990 and 2007, with an average annual GDP growth rate of 7.8 percent. The structural transformation achieved between 1992 and 2016 has been substantial. The poverty rate (measured at the international poverty line of US$2.15 per day) plummeted from 45 percent in 1992 to 1.3 percent in 2016 (WDI). The sectoral transformation, which has been one of the predominant growth drivers, has led to a massive decline in the share of agricultural employment (from 74 percent in 1992 to 41 percent in 2016), wage employment rose from 13 percent to 34 percent, and high-skilled employment doubled to 9 percent during this period (ILOSTAT).

Education has been causally identified as a significant contributor to the transformation of Vietnam, with higher educational attainment creating opportunities for individuals to move into more skills-intensive sectors (Vu-Thanh and Vu 2022). The percentage of workers with only primary education or no education has dropped significantly, with nearly half of workers, particularly in professional and technical fields, holding secondary or higher degrees (Behr, Demombynes and Eckardt, 2016).

This contribution of education to Vietnam's transformation is echoed in the evolution of returns to education in the country. From 2002 to 2010, returns to higher education increased more than for other levels of education and for both men and women, suggesting relative excess demand for these workers. However, from 2010 to 2012, returns for workers with education below the secondary level rose, leading to a decline in wage premia of workers with upper-secondary or higher education relative to those with lower qualifications. This also came accompanied by a slower growth in the supply of better-educated workers. This reversal can be attributed to several factors, including possibly the higher demand for unskilled workers from the offshoring/shifting of production into countries like Vietnam and the elimination of excess demand for high-skilled workers as the supply has grown (McGuinness et al. 2021).

Table 4.1: Skills and structural transformation: typology of cases

Skills investment relative to demand	**Speed of structural transformation**	
	Successful periods	*Static periods*
Right investment (For any skill type: high returns, high school enrollment, high employment rate)	Vietnam (1992 -2010) Thailand (1992-2017) Chile (1992-2017) Costa Rica (1991-2017) Panama (1991-2017)	[by definition, no examples]
Overinvestment (For any skill type: low/ declining returns, high school enrollment, high unemployment)	Burkina Faso (1994-2014) India (1993-2017) China (1993-2017) Indonesia (1993-2017) Armenia (1999-2017) Turkey (1994-2017)	Honduras (1991-2017) Egypt (1995-2017) Paraguay (1995-2017) Colombia (1992-2017) Mexico (1992-2016) South Africa (1993-2014
Underinvestment (For any skill type: high/increasing returns, relatively low school enrollment, high employment rate)	Rwanda (2000-2016) Morocco (1998 -2013)	Zambia (1991-2015) Malawi (1997-2016) Madagascar (1993-2012) Sri Lanka (1995-2016)
Cross-cutting inefficiencies		
Underutilization (For any level of skills investment: low labor force participation, under-employment and high part-time work)		
Skills mismatches (For any level of skills investment: skills shortages and excess due to human capital misallocation across firms, field of study and space)		

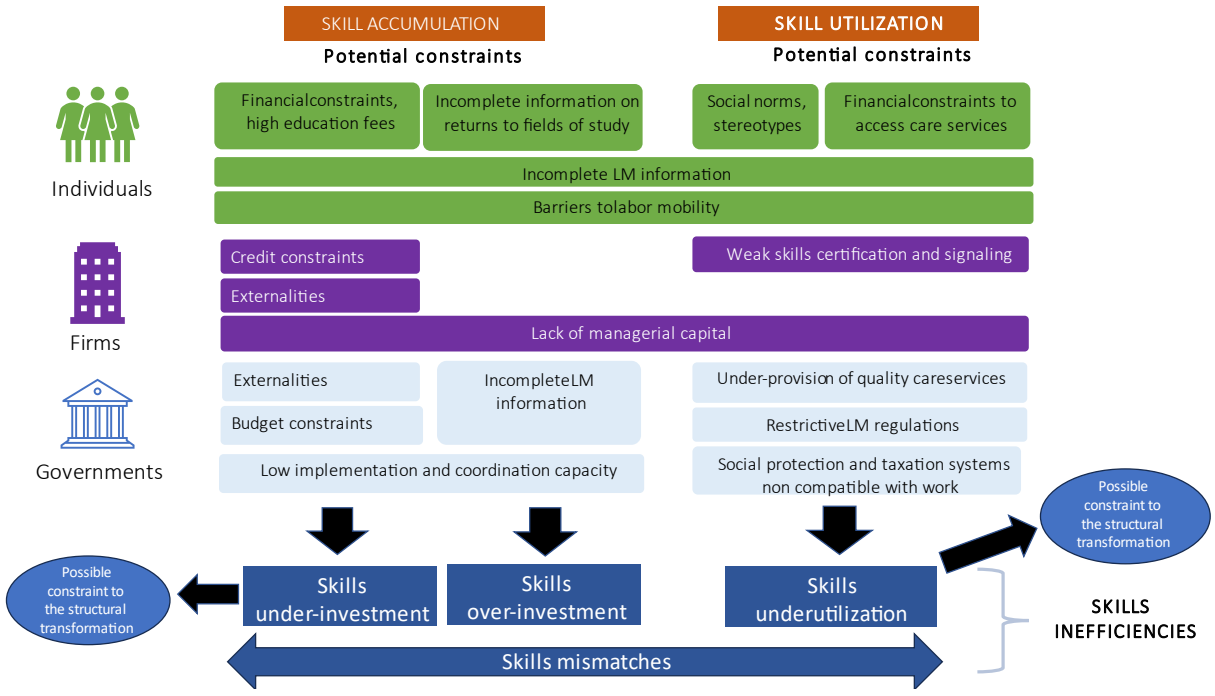
Note: Color code indicates the per capita GDP level at the beginning of the successful and static transformation periods based on Penn World Tables: blue (low income), orange (medium income), and green (higher income). Successful periods are defined as those when countries have grown, reduced poverty, and progressed more rapidly along the sectoral, spatial, organizational and occupational dimensions of the structural transformation than the average for their country income grouping. Static periods are defined as those when countries have grown, reduced poverty, and progressed more slowly along the dimensions than the average for their country income group (see footnote 30 for the list of countries and periods).
Source: Authors.

There are four types of inefficiencies that can arise in the accumulation and utilization of skills. First, there can be an *overinvestment* in skills when labor demand for at least some skills is insufficient compared to the skills available in the workforce. This is more likely to be the case for more advanced skills since, as discussed below, a good base of foundational cognitive and socio-emotional skills is likely to be necessary for a transformation process to even start. Second, there can be an *underinvestment* in skills when the demand for skills exceeds the skills available in the labor market (either in quantity or in terms of quality or relevance). Third, there are inefficiencies that arise from the *underutilization* of human capital that often affect population sub-groups and reflect supply or demand-side barriers that keep people out of work or productive work, even when the skills investments have been appropriate given skills demand. Fourth, there are cross-cutting inefficiencies that arise from *skills mismatches* associated with misallocations of human capital across firms, fields of study or space. While the first two sources of

inefficiencies are distinct from each other, the latter two are "cross-cutting", in the sense that they can co-exist with cases of both skills' overinvestment and underinvestment.

These four types of inefficiencies reflect several market and policy failures and can limit a country's prospects for transformation and the potential for creating more and better jobs. In this section, we highlight the market, institutional, and policy failures and barriers that can explain such inefficiencies across individuals, firms, and governments (Figure 4.1). The significance of each of these factors likely differs across countries and even across time within countries and, therefore, in-depth country-specific analysis is needed in each case to identify adequate policies.

Figure 4.1: Potential constraints leading to inefficiencies in skills accumulation and utilization.



Source: Authors.

4.1 Skills overinvestment

Overinvestment in skills relative to demand, as in Indonesia in the period considered in this paper, leads to low or declining returns to skills, that could be accompanied by unemployment and involuntary informality for the relevant segment of the labor market.

Overinvestments in skills can result from information asymmetries as job seekers and employers lack access to accurate and timely information about each other. In contexts where most job transitions happen within the informal sector, these information gaps can be significant, especially when skills themselves are obtained in the non-formal or informal education and training system (Nakata et al. 2021).

In cases when the transformation is slow, overall depressed labor demand can hold back (quality) job creation and structural transformation and people can end up overinvesting in skills given labor market conditions. We discuss information asymmetries in more detail in the skills mismatches section below as information failures can help explain all four types of inefficiencies covered in this paper.

Even when the transformation is rapid, there can still be overinvestment as many skills investments have a long vesting period during which there can be labor demand shifts (including, swift ones, for example, in the case of a large shock). This time inconsistency can render adequate skills investments at a given point in time inadequate later in the labor market. This appears to be the case in several MICs, for example, where investments in education have expanded significantly in recent decades. Part of the story is likely related to high volatility in economic activity, an uneven pace in the transformation process, and the dual nature of labor markets in those contexts (see Box 4.2 for the case of Colombia).

Box 4.2: Case study–Colombia: Unbalanced growth during static structural transformation (1992-2017)

Colombia experienced some growth and economic transformation between 1992 and 2017, but this progress was uneven. The early 1990s saw a significant increase in GDP growth, averaging around 4 percent. However, growth slowed down until a recovery that began in 2004, followed by a second slowdown between 2014 and 2017. This economic volatility impacted job creation, particularly in terms of quality jobs (WDI; World Bank 2015a; Carranza et al. 2021). Despite these trends, poverty fell from 17 to 4.3 percent between 1996 and 2017 (measured at the international poverty line of US$2.15 per day, WDI). However, the country saw little sectoral transformation in this period, with almost no change in agricultural employment, a minor increase from 16 percent to 19 percent in high-skilled employment, and limited progress in the creation of wage employment (ILOSTAT).

In this context, and with school enrollment and educational attainment increasing across the board, returns to schooling declined and unemployment increased. The supply of skilled workers, for example, grew by 1.7 million between 2009 and 2014 (although quality remained low, OECD 2019a), and the unemployment rate for high-skilled workers reached 12 percent in 2017. At the same time, skills were consistently cited as a major constraint to firm performance, suggesting potential skills mismatches in addition to overinvestments (World Bank, 2015a; Carranza et al., 2021; Tenjo et al., 2017).

Colombia provides a cautionary example of imbalances between supply and demand, with a mismatch between the supply of skilled labor and the demand for it. Despite an increase in the number of educated individuals, there has been a decline in the valuation of their skills and a rise in unemployment among this group. This suggests that the economy has not evolved quickly enough to utilize the growing pool of skilled workers, particularly in the 2000s. Several factors contribute to these imbalances. The business environment in Colombia is challenging, with established firms dominating the market, low survival rates for new firms, and increasing labor costs due to a rising minimum wage and high payroll taxes. The economy's heavy reliance on the service sector for job creation also indicates a lack of diversification across industries (Kugler and Kugler, 2009; Herrera-Idarraga et al. 2012; Carranza et al. 2021).

Skills overinvestments can also occur when people are making these investments in response to returns in markets other than the labor market. This has been documented in several countries in the case of women and the marriage market, for example. In Egypt, the estimated return to a bride's compulsory education is about 100 percent for bride price, about 14 percent for a husband's wages at the time of

marriage, and about 16 percent for husband's permanent income, returns that are much higher than the returns to education that Egyptian women experience in the labor market (Deng et al. 2023).

4.2 Skills underinvestment

Skills underinvestment can be a constraint to accelerating the structural transformation. In dynamic economies that are transforming, high or rising returns to skills are a likely symptom of underinvestment. Vietnam in the early 1990s is a case where the supply of skilled labor was a binding constraint and an example of how the policy response—the expansion of universities—unlocked a significant part of the country's transformation (Vu-Thanh and Vu 2022). More broadly, this can also be the case in MICs that are seeking to transition to high-income status. As firms strive to become more productive, enter new markets, and innovate, they increasingly demand more advanced skills, including technical, higher-order cognitive, and socioemotional skills (Bouazza et al. 2015; Khan, 2011). Consistent with this change in skills needs, skills tend to be a more severe constraint to growth among innovative than non-innovative firms, and the constraint becomes more severe as countries grow richer (see Section II).

There can also be underinvestment in skills during static periods of economic transformation. For example, in several LICs education levels are so low that they are likely to hinder any form of transformation (Basu and Guariglia 2008). In these cases, returns may be high, but they could also be low if the economy is trapped in a low-skills-low transformation equilibrium. In this situation, skills limit the transformation but, at the same time, the lack of transformation itself generates few incentives to invest in skills. Box 4.3 describes the case of skills underinvestment in Zambia.

Box 4.3: Case study—Zambia: Foundational skills to ignite transformation (1991-2015).

Zambia faced a prolonged economic downturn from 1973 to 1998, largely due to the collapse of copper prices. However, between 1999 and 2014, Zambia's economy grew rapidly, at a rate of 6.6 percent per year, on average (World Bank 2015b; WDI). Despite the progress made in terms of growth, the poverty rate increased between 1996 and 2015, as the country continued to face challenges in transforming its economy. The slow transformation stemmed from both inadequate skills and sluggish job creation (Merotto 2017). Most employment was still in agriculture (60 percent) in 2015, and wage employment had increased slightly to 22 percent. Few jobs were high-skilled, accounting for only 8 percent of the total in 2015 (ILO, World Bank).

While education has expanded, most of the progress has been at the primary level, with enrollment rates reaching 100 percent in 2004. Conversely, enrollment rates in secondary education have worsened, and tertiary education remains limited, with only 4 percent of the population enrolled in 2015 (UNESCO UIS-WDI; World Bank 2018b, Merotto 2017). Not surprisingly, returns are very high for tertiary-educated workers.

The low stock of educated Zambians is exacerbated by the low quality of education. Only 5 percent of 15-year-olds achieved a minimum proficiency level in reading and 2.3 percent in math in the PISA-D test in 2017 (OECD and Zambia Ministry of General Education, 2017). This lack of skills development is accompanied by low productivity growth, particularly in agriculture, which has also hampered the move of workers outside of the sector, creating a possible vicious cycle (Merotto 2017).

In the context of rapidly changing labor market needs, the continual updating of skills becomes more relevant and, as a result, underinvestment in specific types of skills becomes more likely. Three

considerations are particularly relevant. First, strong foundational cognitive and socio-emotional skills are increasingly important, as they are the basis for life-long learning and are also more transferrable across jobs (World Bank 2016; World Bank 2018a; Arias et al. 2019; Deming 2022; Deming 2017; Dalvit et al. 2023). In a world of rapid technological change, these foundational skills remain a lasting imperative. They are generally built from an early age and during basic education, continuing to be strengthened throughout life, including through work experience (OECD 2019b). Second, technical and advanced skills continue to be relevant, especially given the need to innovate and develop new technologies to facilitate technological change and the green transition, possibly exacerbating existing inequalities[25] (Box 4.4). Third, given the speed of change, new skills need to be added to foundational and technological skills, and skills accumulated need to be deepened throughout life. As a result, appropriate workforce reskilling and upskilling and broader employment policies are also necessary to ensure that more workers have the skills needed to both support those transformations and make them more inclusive.

Even stepwise changes can happen fast—consider digital technologies. Up to 2023, much of the literature and policy discussion had been concerned with digital technologies—together with other factors—hollowing out the middle class by substituting workers in routine tasks that could be essentially coded in a program. The consensus in the literature was that high-skilled, intensive "non-routine" work would be spared from potential displacement and stood to benefit from technological change through higher productivity (Autor and Salomons 2018; World Bank 2016a; World Bank 2019). These concerns are, however, being rapidly upended with the rapid take-off of artificial intelligence (Albanesi et al. 2023). Now, many of the tasks deemed to be non-routine are becoming routine and, with that, the range of tasks where technology can replace humans is expanding, with potentially significant—if still unknown—consequences (Acemoglu et al. 2022).

Box 4.4: Emerging area of skills underinvestment: Measuring green skills.

A better understanding of "green jobs", the required associated skills, and the skills gaps in the workforce is needed to inform skills policies that promote the greening of the economy and job transitions. A key challenge is to define and measure green jobs and the required skills. There is no standard definition of green jobs. Several definitions of green jobs are used: for example, at the aggregate level green jobs are defined based on the level of carbon emissions of their industry while at the firm/worker level based on how environmentally friendly production, output, technologies, management practices, workers' tasks and skills are.

Each concept and definition leads to different measurement approaches and data requirements. Some approaches are preferable than others depending on the policy question to be addressedTo inform skills policies, in particular, suitable approaches are based on the prevalence of green tasks and green skills based on a defined dictionary. For higher income countries, the United States' O*Net Green Economy Program provides a task-based definition of green occupations (and therefore the associated skills required) while the European Classification of Occupations, Skills and Competences (ESCO) provides a skills-based taxonomy of green and non-green skills based on the definitions in European Centre for the

[25] At least thus far, both technological change and the green transition are skills-biased in the sense that rewards go disproportionately to high-skilled workers (Autor 2010, Acemoglu and Restrepo 2017, 2020; Vona et al. 2018).

Development of Vocational Training (Cedefop) and a training dataset composed of text of green and nongreen activities.

Evidence from the US and Europe shows that green jobs—defined based on the United States' O*Net Green Economy Program (GEP)—require higher-order skills compared to non-green jobs and are better paid (Vona et al. 2018). In Poland, green jobs (defined based on O*Net GEP) require greater skills in numeracy, literacy, and problem-solving as measured in PIAAC and yield higher returns to skills than brown jobs (Sanchez-Reaza et al. 2023).

However, evidence on the skills needed to transition workers into greener jobs in developing countries is scant. In Europe and Central Asia, 13 percent of jobs on average are expected to undergo significant changes in their task content due to the greening of the economy, about 6 percent in Serbia, 5 percent in Turkey and about 2 percent in the Kyrgyz Republic (Mayer Gukovas et al. 2024) while 23 percent in Mexico (Gonzales Rubio et al 2023) based on the O*Net GEP with the assumption of the reliability of the O*Net GEP in developing countries. Alternatively, Granata and Posadas (2024) propose a methodology to identify green jobs and associated skills based on country-specific green dictionaries—either words, roots, or expressions—and text analysis. In Indonesia, the incidence of green jobs using this methodology is estimated to be between 8 and 29 percent depending on how strict of a definition is used, while in South Africa it is between 5.5 and 32 percent (Mosomi and Cunningham 2024). Applying a skills-based approach based on the ESCO taxonomy, around 78 percent, 88 percent, and 84 percent of non-agricultural workers in Egypt, India, and Kenya work in occupations that utilize at least some green skills. Green skills are also often associated with higher levels of education: in Brazil and the Philippines more than 50 percent of green jobs require a bachelor's degree based on online job postings. However, green skills are demanded also in jobs requiring lower education: 24 percent of green jobs postings require only lower secondary education in Kenya, 11 percent in Egypt and 7 percent in India (Sabarwal et al. 2024 forthcoming).

Skills underinvestment results from underlying market failures and barriers that inhibit the necessary quality investments and the ability of students, education institutions, and governments to see and respond to labor market signals and adjust the skills mix to evolving labor market needs.

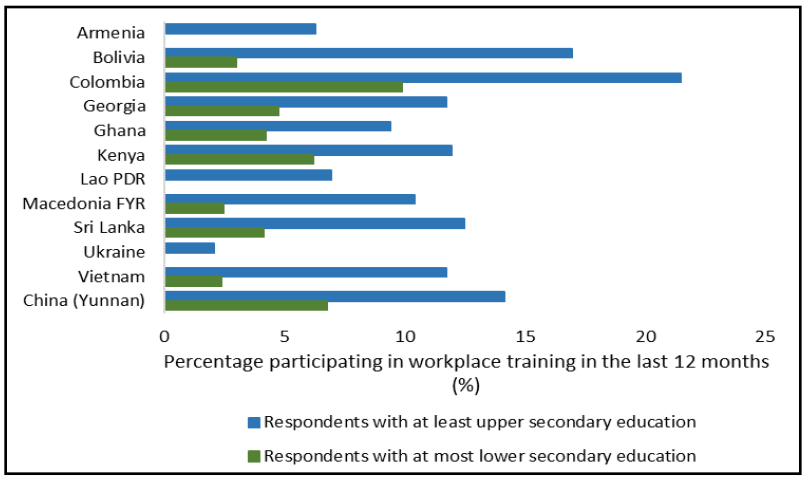
Credit and information constraints to access early and basic education are more severe among the most vulnerable, and a lack of adequate infrastructure can also impede school enrollment. In nearly every country, parents' wealth and educational attainment determine their children's education (World Bank 2018a). There are also important differences across learners' gender, disability status, ethnicity, or location. In addition to direct and indirect costs, parental decisions to invest in education depend on the distance to schools (especially for girls) and the perceived benefits of education, which depend on their perceptions about education quality, potential returns to education, and their children's learning ability (World Bank 2018a). Inadequate infrastructure is an issue but addressing credit and information constraints, particularly among the most vulnerable, is also necessary to address underinvestment in basic skills (Devercelli and Beaton-Day 2020). In the case of secondary education, high opportunity costs to studying or, for girls, teenage marriage or pregnancy, also hinder enrollment and completion (Arias et al. 2019).

Overall, however, the quality of basic education remains the main concern across countries, with many young people leaving the formal school system without adequate foundational skills. Estimates suggest that in low and middle-income countries, the rate of learning poverty—the percentage of students who cannot read and understand a simple text by age 10—stands at 70 percent today, up from 57 percent in 2019 because of learning losses associated with the COVID-19 pandemic (World Bank et al. 2022). Improving the quality of teaching in schools requires addressing financial and institutional constraints to strengthen the quality of teacher education and effectively support teachers in the classroom, in addition to improving the overall incentives for relevant actors (World Bank 2018, Arias et al. 2019 and World Bank et al. 2022).

Similarly, there are multiple challenges affecting the performance of formal technical and vocational education and training (TVET) systems in low- and middle-income countries. With its unique focus on workforce development, TVET has the potential to contribute to improving employment and productivity, but too often fails to do so. While (formal secondary) TVET has been shown to improve employment or earnings for at least some types of graduates in countries such as Brazil, Kenya, Mongolia, and Nepal, in other contexts, such as in El Salvador, Namibia and Turkey, the impacts have been zero. These outcomes reflect primarily information and credit constraints and weaknesses in earlier levels of education. TVET programs face multiple challenges in effectively delivering both technological skills and (remedial) foundational knowledge. Insufficient emphasis on work-based learning, along with inadequately trained and supported teachers, outdated infrastructure, and limited consideration of labor market needs contribute to issues of quality and relevance and impede a greater contribution of TVET systems to employability (World Bank, UNESCO, and ILO 2023).

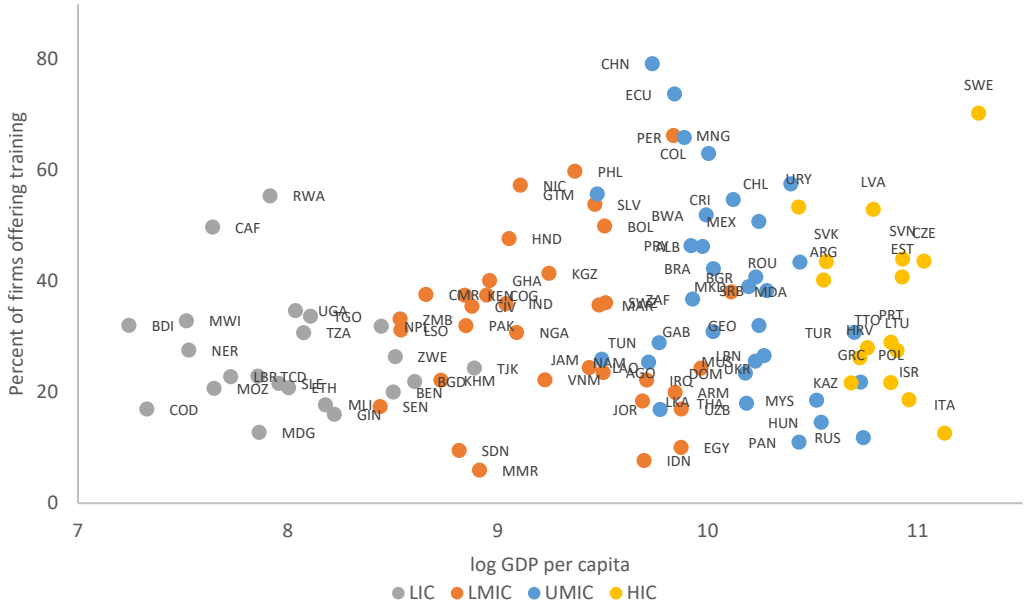
As most people spend more time outside the formal education system than inside it, lifelong learning is critical, although relatively uncommon. In low and middle-income countries where data is available, the share of urban adults who report participating in non-formal workplace training in the previous 12 months is very low, particularly for less-educated workers (Figure 4.2). In the EU, the share of people age 25 to 64 who had participated in education or training in the last four weeks was also low at 11 percent in 2021 (Eurostat). Only about one of four formal firms invests in the upskilling and reskilling of their workforce in LICs, compared to about one third in LMICs, 38 percent in UMICs, and 36 percent in HICs (Figure 4.3). Medium and large firms invest in skills development more than small firms do, and training investments are more common among exporters (Figure 4.4).

Figure 4.2: Participation in workplace training is low in most countries, particularly for less educated workers



Notes: Data from STEP Skills Measurement Program. Respondents were asked, "In the past 12 months, have you participated in any training courses, such as work-related training or private skills training, that lasted at least 5 days/30 hours (not part of the formal educational system)?"
Source: World Bank 2018a.

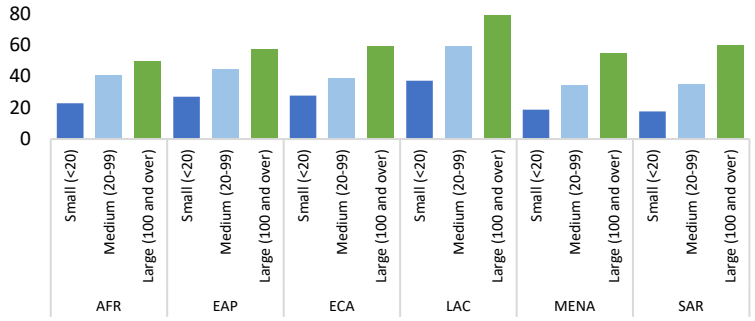
Figure 4.3: Only one of three firms invest in the training of its workforce in middle-income countries



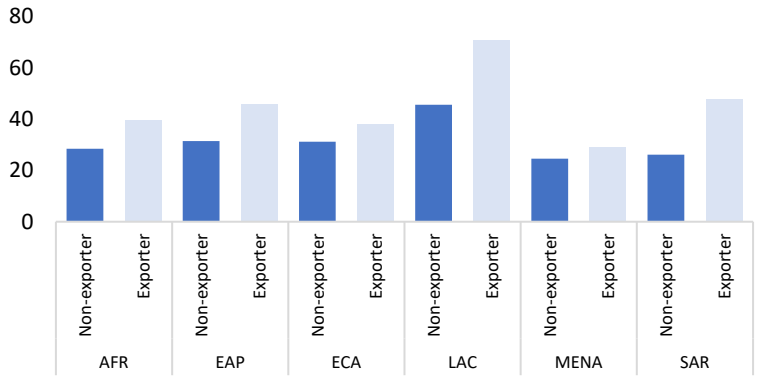
Note: Only the latest survey in each country. The figure includes 105 countries from 2006 to 2019. Penn World Tables for GDP data. WBES include only formal firms, with 5 or more employees, in all manufacturing and selected services sectors.
Source: WBES.

Figure 4.4: Few firms invest in upskilling their workforce, especially smaller firms

A. Share of firms investing in skills training , by size and region



B. Share of firms investing in skills training , by exporting status and region



Note: Data comes from the latest survey in each country. Averages across 109 countries from 2006 to 2019.
Source: WBES.

The magnitude of the needs and returns to quality investments suggests there can be an underinvestment. The types of investments in this category can take very different forms—such as managerial skills training, other entrepreneurship skills training, adult literacy, technical and socio-emotional skills training through ALMPs, and on-the-job training—and be directed at youth, mature workers, or older workers, experienced or less experienced workers, and low-skilled or high-skilled individuals. Across the board, the evidence points to cases of high returns mixed with cases of low or no returns, suggesting potential underinvestment but also difficulties in responding to exact needs (Blundell et al. 1999; Ashenfelter 1978; Kuckulenz and Zwick 2003; Card et al. 2010; Kluve et al. 2019; Alzúa et al. Lopez 2016; Cho and Honorati 2014; Johansson and Santos 2023). As an example, a study using detailed microdata for Portuguese firms found that the internal rate of return to firms from providing training was between 17 percent and 24 percent, but despite these high rates of return, average firms in the sample dedicated less than 1 percent of total work hours to training (Almeida and Carneiro 2009).

This underinvestment by workers, firms, and governments in life-long learning reflects not only policy failures but also market and institutional constraints and barriers related to weak foundational skills, credit constraints, externalities, and information asymmetries. Cognitive, technical, and socioemotional skills are complementary and build on each other (Psacharopoulos 1994, Laajaj and Macours 2017, and

Montalvao et al. 2017). Therefore, a lack of foundational skills makes it less profitable and less likely to continue building skills later in life. Credit constraints also play a role, with evidence pointing to the impact of programs that alleviate this constraint, increasing uptake and completion of training by individuals (Kugler et al. 2022; Hirshleifer et al. 2016) and the offering training opportunities by and in firms including through apprenticeships (Crepon and Premand 2019, McKenzie 2020). Because of externalities, as workers can move across firms, employers are also more likely to train in firm-specific skills to the detriment of other relevant skills (Almeida et al. 2012). As with other inefficiencies, information asymmetries can also lead to underinvestment.

Finally, across education levels and types of skills investments, there are additional coordination failures and externalities that further hinder skills investments and can lead to underinvestment. Managing education and skills development systems is very complex, with the government, private sector, individuals, families, and communities playing critical roles. This complexity, not surprisingly, often leads to significant coordination failures (World Bank 2018a; World Bank, UNESCO, and ILO 2023). In addition, skills investments can have significant externalities related to skills complementarities within and across firms and the co-location of workers, which distort skills investment decision making. The evidence on human capital externalities is mixed (Deming 2022), with some studies finding little or no evidence and others find large agglomeration effects of working in certain geographic areas or firms with higher levels of human capital (Gennaioli et al. 2013, Ciccone and Peri 2006, Moretti 2004, Acemoglu and Angrist 2000).

4.3 Skills Underutilization

Even when there is adequate skills investment by individuals, governments, and the private sector, human capital may be a constraint to structural transformation when it is underutilized in the labor market. Skills are underutilized when people face barriers or disincentives to work and barriers to more productive jobs due to both market and policy failures. Box 4.5 discusses skills investments and labor market utilization in the case of Turkey where, despite a rapid transformation, high returns to education, and increased educational attainment, a high share of women remain out of the workforce. This is a clear case of skills underutilization.

Box 4.5: Case study–Turkey: Human capital underutilization amid successful structural transformation (1994-2017)

Turkey's economic growth has been volatile over the years, including in the period 1994-2017. The 1990s saw an average growth of 2.4 percent, followed by a boom, with average growth rates of around 7 percent between 2002 and 2013, and then a deceleration until 2017 (WDI). Despite fluctuations in growth, Turkey's economy successfully transformed during this period. This economic transformation resulted in increased job creation across sectors, particularly in services. During this period, as a share of total employment, agricultural employment halved to 20 percent and wage employment increased to 67 percent. High-skilled employment also grew from 8 percent to 11 percent of total employment (ILOSTAT). The reallocation of labor to more productive sectors explain much of the expansion in GDP per capita between 1995 and 2011 (World Bank 2014a; Atiyas and Bakıs 2015).

The structural transformation was accompanied by an increasingly better-educated workforce. Education outcomes improved from 1994 to 2017, with primary enrollment rising from 80 to 90 percent between 2005 and 2018, lower secondary rising from 15 to 61 percent and upper secondary from 21

to 39 percent (UNESCO UIS-WDI). The number of universities also increased significantly (Polat 2017), leading tertiary attainment to double between 2000 and 2017 (OECD 2022). Despite these gains, women's LFP remained low at 37% in 2018 (ILOSTAT), and the rate of university graduates not in employment or education (NEET) was at 34% in 2017 (Acar and Del Carpio 2019). This underutilization co-existed with unemployment. For example, there was a notable increase in unemployment among high-skilled workers from 4.7% in 2001 to 10% in 2017, despite high returns on education (Montenegro and Patrinos, 2021; OECD Stat).

The underutilization of skills and labor in Turkey and the deceleration in transformation in the last years of the period can be explained by a combination of labor supply and demand constraints. On the supply side, there seems to be a mismatch between the skills of the workforce and those demanded by employers (Acar and Del Carpio 2019). Institutional and cultural factors further limit the participation of women. On the demand side, there is a limited demand for high-skilled workers because most Turkish firms are micro-firms operating in low-value-added sectors. Strict regulations, together with a rising minimum wage, also appear to have limited job creation during the focus period (Erdogan and Del Carpio 2019; Elgazzar et al. 2021; World Bank 2016b).

Women and other groups including youth, older workers, migrants, people with disabilities, and minorities often face critical barriers to productive employment that not only harm them but also the overall allocation of human capital and, therefore, the transformation. This systematic exclusion, especially of women, is likely to become more binding to the process of structural transformation as countries reach middle-income status and some of the earlier gains in terms of basic skills investments, transition out of agriculture, and organizational transformation have occurred (Gottlieb et al. 2024); at higher levels of income, productivity gains depend increasingly on the talents of the labor force, innovation and allocative efficiency (Restuccia and Rogerson 2017; Hsieh and Klenow 2016; Aghion and Bircan 2017). Since expected labor market returns partly determine skills investments in the first place (Gassier et al. 2022; Hicks et al. 2011; Jensen 2012), there is a vicious cycle where little utilization leads to lower skills investments, potentially putting further brakes on the transformation process.

Broadly, failures and barriers associated with information frictions, lack of access to networks and assets or work experience, social norms, missing markets, and disincentives to work associated with a country's regulations or the tax and benefit systems help explain underutilization of human capital in the labor market. In addition to these barriers, migrants, people with disabilities, and minorities face other, very case-specific constraints—ranging from discrimination to lack of physical accessibility in the workplace, lack of work permits, skills recognition systems and language skills in destination countries.

First, information frictions in the labor market pose significant challenges, limiting the efficient allocation of labor and exacerbating inequalities. On the one hand, for example, first-time entrants in the labor market often lack information about job opportunities, skills requirements, and labor market dynamics, impeding effective job matching. More than 50 low- and middle-income countries worldwide lack employment services with a central vacancy database or labor market information system, and more than 60 provide no counseling or vocational guidance to job seekers.[26] On the other hand, employers also lack critical information about the productivity of workers, especially youth or new labor market entrants,

[26] World Bank Employing Workers Database 2020.

partly because of the lack of certifications and credible signaling devices, not only for cognitive and technical skills but also for socio-emotional skills (Bassi and Nansamba 2022; Carranza et al. 2022; Abebe et al. 2021; Alfonsi et al. 2020). Issues of skills recognition and signaling have also been highlighted as barriers for the effective utilization of the human capital of migrants (World Bank 2012).

Second, the lack of access to networks, role models, assets, and work experience are an additional barrier to productive employment, including in self-employment, particularly for women and youth. A study in Ethiopia finds that the strongest predictor of a young woman's decision to enroll in male-dominated technical and vocational courses is her existing relationships with people who work in the associated trade (Alibhai et al. 2015). Similarly, in the Republic of Congo, the impacts of providing information on trade returns were three times larger among women who had a male role model, even though the information did not impact their expectations of earnings in male-dominated trades (Gassier et al. 2022). Beyond role models and networks, youth in particular face a "catch-22"—their lack of experience and assets limits their ability to enter the labor market productively and to accumulate these assets that they need in the first place (Bandiera et al. 2022a).

Third, missing markets, particularly in child and elderly care, combined with restricting social norms and stereotypes, also limit the supply of workers, especially women, older workers, and vulnerable groups. The availability of care services matters for labor market participation, especially for women. Globally, an estimated 606 million working-age women consider themselves unavailable for employment or are not seeking a job because of unpaid care work, compared to only 41 million men (ILO 2018a). Overcoming barriers to the expansion of quality care services, including such factors as location, hours, costs, and societal norms related to outsourcing child or elderly care is crucial (Halim et al. 2023). Caregiving also affects more than young women's labor force participation. Studies from Brazil, Mexico, and Thailand show that grandmothers' care obligations negatively affect both their participation and number of hours worked (Johansson and Santos 2023). Since families are often formed relatively early in life, many grandmothers in LICs and MICs often have significant potential working years ahead when they leave the workforce, reduce hours, or move to less-demanding activities (Johansson and Santos 2023). Social norms can also act as a significant barrier to women's employment. Evidence from India and Saudi Arabia, for example, shows that addressing the misconceptions of men and families about the acceptability of women's paid work can facilitate women's job search and employment outside the home. Nonetheless, these norms can often be "sticky" and challenging to overcome (Halim et al. 2023). Moreover, prevailing social norms and stereotypes are not exclusive to women but can also impact older workers or other vulnerable groups (Johansson and Santos 2023, Jin and Baumgartner 2019).

Finally, tax and benefits systems—together with labor market regulations —can also hinder incentives to work and affect the type of work that people do. Studies have found that high marginal tax rates can create disincentives to work additional hours, work formally, or enter the labor market (Packard et al. 2019; Pages 2017; and OECD 2011). Across countries, there is a wide variation in financial disincentives to enter formal employment. In Latin America, for example, formalization tax rates range from 8.5 percent in Venezuela to 65 percent in Colombia (Deza et al. 2020). Disincentives are often larger for second earners in a household, most often women. Potential disincentives stem from a range of policies including the choice of family-based taxation rather than individual-based one or the use of dependent spouse tax

credits and allowances (Thomas and O'Reilly 2016). In addition, the design of social protection benefit systems can also influence labor supply decisions. For example, the level and eligibility rules of unemployment and social assistance benefits may discourage beneficiaries from taking up formal jobs (Immervoll and Knotz 2018).[27] Mandatory retirement ages or legal impediments to partial retirement may outright prohibit or make it less attractive for workers to continue working (Johansson and Santos 2023).

In sum, getting skills investments right to support structural transformation depends not only on quality education and training but also on ensuring that they are in balance with labor demand and investments in complementary factors of production so that those skills can be put to work productively. But many countries fail to achieve the right balance, leading to cases of skills overinvestment or underinvestment, underutilization in the labor market, and misallocations across fields of study and space that hinder the shift to more productive economic activities. Several market and institutional failures and other barriers lie behind these misallocations and addressing them will help support the transformation efficiently.

4.4 Skills mismatches arising from misallocations across fields of study and space.

There are skills mismatches everywhere, in cases where there is an overall overinvestment in skills and where there is underinvestment. Even in Vietnam between 1992 and 2016 when the economy successfully transformed, there is evidence of this misallocation. These skills mismatches are driven by human capital misallocations, across firms, fields of study, and space. Saliola et al. 2024 indirectly discusses issues that pertain to the misallocation of workers across firms; in this section, thus, we focus on the latter two sources of inefficiencies.

First, there is often misallocation across fields of study, with many students going into general or technical areas for which there is little labor demand. This is likely to also reflect itself in occupational misallocation later in the labor market. For example, regarding the decision to pursue a technical or a general education, on average, returns to technical education tend to be lower over time than returns to general education, even though they can be higher immediately after graduation. Students of lower socio-economic status are also systematically more likely in most countries with data to go into TVET than into general education (Arias et al. 2019, World Bank et al. 2023, Dalvit et al. 2023).

There is also misallocation within technical or general fields of study. In Chile and Colombia, for example, the variation in program-level returns across fields in short-cycle tertiary education, ranges from −30 percent to 180 percent (Ferreyra et al. 2021). In Ghana and Kenya, in all fields of study in TVET or higher education, a high share of graduates with negative returns co-exists with high shares of graduates with positive returns (vis-à-vis those of a typical worker who only completes secondary education). Tellingly, similar cases exist even in HICs (The Economist 2023).

[27] There is little to support the concerns that the generosity of social assistance creates significant labor market disincentives in low- and middle income countries (Banerjee et al. 2017 and Bastagli et al. 2016). Gradually phasing out social assistance benefits for formal low wage earners, setting time limits of benefit receipt duration, reducing the marginal tax rate on earnings, and facilitating the reapplication process of "graduated" families are design features that could limit the potential disincentives to work among social assistance beneficiaries (Immervoll et al. 2015).

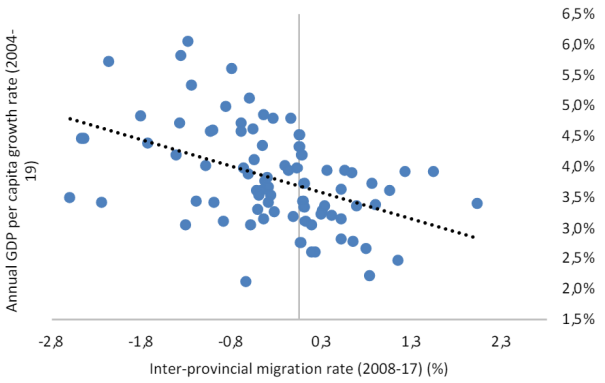
But why would people study something that is effectively making them poorer or at least means that they are leaving money on the table? Information failures partly explain this inefficiency since quality information on labor market returns for different jobs or occupations is notoriously difficult to find, if it exists at all. In Kenya, for example, young women had incomplete information about the relative returns to vocational training in female- and male-dominated trades, where the latter generate significantly higher earnings (Hjort et al. 2010). In addition, mobility constraints may also limit the ability of students to move to institutions that can provide quality, relevant education and training; this may be particularly important outside capital cities (World Bank et al. 2023). Similarly, in the case of women, psychosocial factors regarding gender norms about what women can and should do can also play a role (Campos et al. 2018). Finally, weak foundational skills can also help explain the sorting of students across education tracks and fields of study (Arias et al. 2019; World Bank, UNESCO, and ILO 2023, Dalvit et al. 2023).

In addition to misallocations across fields of study, low labor mobility also limits the efficient utilization and accumulation of human capital. The efficient reallocation of resources, on which structural transformation depends, hinges on the flexibility of firms and the mobility of workers. The vast differences across countries in returns to human capital make a clear case for international migration as a mechanism for improving efficiency.[28] Less often discussed, however, is the role of internal labor mobility. This is surprising given the significant and persistent geographic differences that can exist within countries in labor market performance and returns to education and skills. In China, for example, the "hukou" system, which imposes constraints to mobility by limiting the ability of farmers to trade land they are given to cultivate and by making social benefits conditional on holding a local hukou, reduces mobility and leads to overemployment in agriculture (Ngai et al. 2019). In Uzbekistan, the restrictive *propiska* registration system led to one of the lowest internal migration rates in the world, limiting workers to move where better jobs opportunity are (Seitz 2020). Turkey, in contrast, illustrates how the improvement in the internal labor mobility rates is associated with internal economic convergence (Baez Ramirez et al. 2023) and convergence in returns to education across provinces. Returns to education for paid employees declined in all regions between 2005 and 2019, especially in regions with higher returns in 2005(Figure 4.5). The overall low rates of internal mobility in many countries around the world (Bell et al. 2015) suggest ample room for improving efficiency through mobility.

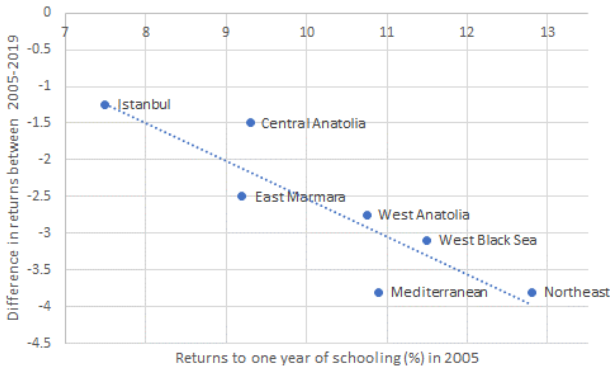
[28] It is important to note that the gains in migration that occur to individuals largely reflect returns to their human capital and not only returns to TFP or institutions in the receiving country (Hendricks and Schoellman 2018).

Figure 4.5: People in Turkey are moving closer to economic opportunities in support of economic convergence and transformation,

A. Internal migration



B. Change in returns to education 2005-2019



Source: Baez Ramirez et al. 2023, based on Turkey's Address-Based Population Registration System (left panel). Returns to one year of schooling on hourly wages based on harmonized LFSs in GLD in 7 regions between 2005 and 2019 (right panel**.**

Constraints to internal labor mobility can arise from failures in various markets and institutional and policy-driven distortions. Many people prefer not to move, even in the presence of large earnings differentials and despite facing no constraints. But often the willingness to move is higher than actual migration, suggesting constraints (Arias et al. 2014; Baez et al. 2023; Jensen and Miller 2017). Constraints to labor mobility within countries can be associated with underdeveloped housing and credit markets, information asymmetries, poor connectivity and basic services in lagging regions, poor foundational and transferable skills, social norms, the lack of portability of social benefits and administrative processes, and regional and other policies—such as agricultural subsidies—that inadvertently keep people in place (OECD 2018, Nayyar and Kim 2018, Arias et al. 2014; Koettl et al. 2014).

5. Efficient skills investments for structural transformation: A differentiated policy agenda

How can countries rethink their skills investment strategies considering constraints and varying labor market needs along the structural transformation? This section answers this question at two distinct but complementary levels. First, at the macro level, we discuss how trade-offs and strategic priorities differ depending on the progress countries have made along the structural transformation and the nature of skills misallocations that exist. Second, at the micro level, we discuss cross-cutting policy priorities that can lessen trade-offs in skills investments and help address the underlying market failures and barriers that lead to the skills misallocations identified in Section IV. Taken together, the aim is to provide strategic guidance on how skills investments can move more in tandem with complementary investments in capital and other factors of production to ensure an efficient use of skills that support the transformation and creation of more and better jobs.

A guiding principle for the public policy agenda is to ensure the economic inclusion and social protection of those who are most vulnerable in the structural transformation process. As with other transitions, economic transformations create winners and losers. The losers are usually the poorest, rural, and most marginalized families, less-educated and less-productive workers. Beyond addressing market and policy failures leading to skills misallocations, the role of public policy is to ensure that skills policies include the most vulnerable to promote their economic well-being and are complementary to effective social protection policies that safeguard against key risks and redistribute toward those in need.

5.1 Differentiated strategic priorities by patterns of structural transformation.

Strategic priorities for investing in skills depend on structural transformation dynamics and whether skills investments have outpaced skills demand and investments in complementary factors of production. This characterization is, of course, a simplification of complex policy choices and contexts, but the overall principles can help guide countries at the strategic level to identify potential red flags and gaps in their skills investments. Priorities are naturally further mediated by the actual stage of a country's structural transformation and additional characteristics such as demographics. With this in mind, and following the analysis and framework presented in Sections III and IV, we distinguish four groups of countries (Table 4.1).

Countries with signs of skills overinvestment, at least in some types of skills, but have been transforming rapidly:

These countries have been successful in creating more productive jobs and transforming, but there are mismatches and indications that the labor market has some slack, with returns—at least for some skills—low or falling and/or employment indicators that are not improving. Thus, a logical place to start is to facilitate transitions of workers to more productive firms, jobs, and locations through intermediation and job matching services and by removing barriers to labor and occupational mobility, ultimately improving reallocation and productivity growth (Engbom 2022; Arias et al. 2014). At the same time, the growing stock of human capital and the enabling environment for job creation point to opportunities for productive entrepreneurship, accompanied by relevant skills investments, which can help leverage existing human capital and continue to support the transformation (ILO 2010; Farole et al. 2017; Lazear 2004). Finally, in these contexts, it is important to be cautious about further rapid expansions of labor supply, and more focus is instead needed on improving the quality and relevance of education and training for current students and workers who are likely to see payoffs to these investments in a dynamic economy (World Bank 2018a; World Bank, UNESCO, and ILO 2023; Ferreyra et al. 2017).

Countries with signs of skills overinvestment but that have stagnated in their transformation:

In this context, labor demand is likely to be the most binding constraint to job creation and economic transformation. Thus, the main priority is to make the necessary reforms and capital investments to speed up skills demand . At the same time, supporting entrepreneurship in carefully targeted sectors—including through investments in relevant skills—can help spur labor demand and provide opportunities for the productive use of existing human capital (McKenzie et al. 2021; Malchow-Møller et al. 2011). Promoting

safe and productive international migration[29] that matches the skills needs of destination countries would be part of the employment strategy in such contexts, alleviating the pressure on domestic labor markets (World Bank 2024). In cases where, despite high returns, there is underutilization, opportunities exist to productively address supply-side constraints to labor force participation and engagement in productive employment, particularly among women, youth, older workers, and other vulnerable groups (ILO et al. 2022; Halim et al. 2023; ILO and OECD 2018; OECD 2019a).

Countries with signs of skills underinvestment despite transforming rapidly:

The clear priority in these countries is to address the underlying market and institutional failures and barriers leading to underinvestment of skills (at different levels) despite potential payoffs in the labor market (World Bank 2018a). In this way, skills investments can be ramped up to reap the benefits of the ongoing transformation while planting the seeds for its continuation. Since these economies are undergoing a rapid transformation, it is important to rely on a mix of policies including both short- and longer-term solutions. If, for example, there is a lower supply of specialized technical skills, investments in TVET and tertiary education may be combined with on-the-job training and programs, such as short-cycle tertiary, stackable degrees, and ALMPs, which can rapidly respond to the currently unmet labor market needs (World Bank, UNESCO, and ILO 2023; Ferreyra et al. 2021). In aging countries and contexts with shrinking labor supply due to different reasons, labor market programs to facilitate the integration of labor migrants and refugees with human capital in need would also be a policy priority.. Establishing bilateral labor agreements and developing global skills partnerships are examples of actions in this direction (World Bank 2024).

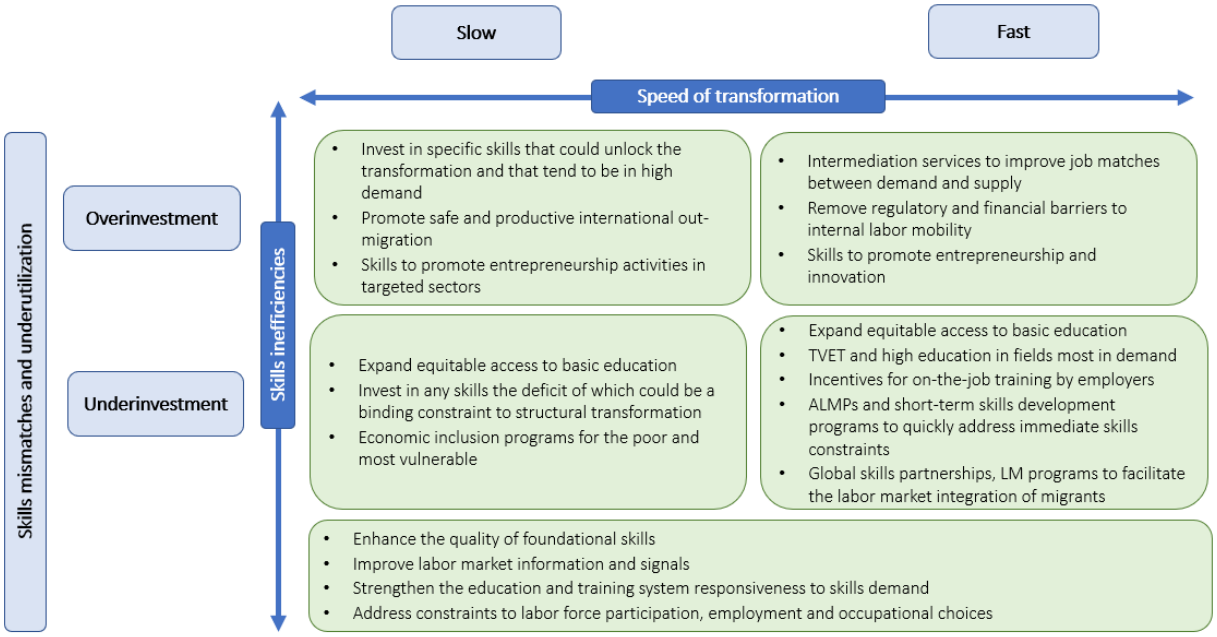
Countries with signs of skills underinvestment and stagnating in their transformation:

In these contexts, it is possible that the lack of skills in itself is a barrier to the transformation. In LICS, it is likely that levels of education and skills are so low that they are a barrier to any type of transformation. Here, it is important to make no-regret investments in basic education that have a long vesting period and can build the pipeline to ensure a basis for transformation (World Bank 2018a; Arias et al. 2019). In addition, well-targeted skills investments in growing sectors where that can help unlock the transformation can be prioritized. In the case of MICs that seek to move to higher-income status, there is a marked shift in skills needs as firms must transition from merely adopting existing technologies to increasing innovation and more efficiently allocating resources to continue advancing (World Bank forthcoming). As discussed in Section IV, this also implies a mix of different skills, with more advanced skills becoming more important as countries develop. While these specific and deliberate skills investments are made, countries in this category need to prioritize structural reforms for transformation and, particularly in early stages of transformation, capital investments. Finally, given the lack of dynamism, it is critical to expand economic inclusion programs—which often include skills investment for both self-

[29] In practice, this would mean to 1) encourage the utilization of formal channels to send remittances and reduce their costs; 2) strengthen links with the diaspora to facilitate knowledge exchanges and investment, and encourage their return, when feasible; 3) ensure that the rights of migrants are always protected, both during their journeys and while abroad; 4) mitigate potential brain drain effects by considering different types of education financing policies.

employment and wage employment—and social safety nets to support the most vulnerable while reforms and investments to generate labor demand bear fruit (Andrews et al. 2021).

Table 5.1: Differentiated strategies for skills investments in the context of structural transformation



Source: Authors.

Across these groups, other country characteristics will also be important to consider for fine-tuning skills investment priorities. For example, different demographic profiles give rise to distinct policy obstacles, even within countries in the group above (Deming et al. 2022; World Bank 2012). Countries grappling with swift population aging must prioritize policies that encourage extended work in older age and boost female LFP. However, countries with youthful populations should prioritize initiatives focusing on initial training and facilitating a smooth transition from school to employment. Likewise, certain countries may need specialized policies to address the labor market integration of migrants.

5.2 Strategic trade-offs

When establishing strategic priorities, there are two trade-offs that policymakers across all countries will need to grapple with in the context of structural transformation.[30] The elements in each of these trade-offs need to be weighed differently depending on the pattern of the transformation.

The first trade-off is between investing in skills that maximize growth and aggregate productivity—and arguably, transformation—and those that prioritize inclusion. An example is the trade-off between investing in frontier sectors that require advanced skills among relatively few workers and investing in basic levels of skills, including technological skills, for a large part of the population that may be in low-productivity work with few chances of moving up the jobs ladder. For countries that are not transforming,

[30] For a similar discussion on trade-offs in the context of Africa's skills investments, see Arias et al. 2019.

skills investments alone may not lead to more growth and transformation, but particularly in LICs in this situation, investing in basic skills for increasing productivity of the most vulnerable may remain critical, even if they do not maximize aggregate productivity.

The second trade-off emerges when deciding how much to invest in skills that are relevant for today's labor market versus those that are likely to be more relevant for the future. This trade-off is particularly salient for technological skills, which tend to be more job-, firm-, or sector-specific (World Bank forthcoming, Almeida et al. 2012) and thus are more subject to change. Uncertainty about future skills demand makes this trade-off even more complex. While there is some evidence pointing at higher order skills becoming more relevant, there is no common definition of what these skills are or how to measure and develop them (Deming 2022). Which future skills needs will be required given the pace of technological change or changes to the global economic model associated with the green transition remains unknown, but skills that are transferable across industries and higher-order skills are more likely to remain relevant in the future and allow workers to adapt to changes in skills demand. Investments in the skills of the future are likely to play a more significant role in countries that are more advanced in the transformation, experience faster change in skills demand, and have a larger share of employment in occupations that are more skills intensive.

5.3 Three interrelated policy priorities

An important principle underpinning strategic choices in skills investments is that countries should aim for a diverse portfolio of cognitive, socio-emotional, and technological skills in their populations that are developed through a combination of different forms and levels of education and training. Given different stages of economic development and patterns of comparative advantage among countries, different types of skills play different roles in the transformation. The evidence presented throughout this paper suggests that, as countries advance in their structural transformation, the relevant skills mix is heavier on more advanced skills and may require more frequent updating as countries are closer to the innovation frontier. However, this does not mean that investing in higher education, for example, is not necessary in countries at lower stages of development and transformation. Skills are complementary within individuals, firms, sectors, and at the national level. It is, however, a question of degree, given the need for balance with investments in complementary factors of production and labor market needs to ensure that skills investments pay off for individuals and society.

Getting this balance right requires policy action to address failures, remove barriers, and support inclusion. While labor demand can often be the most significant barrier to generating jobs at rising levels of productivity, we have shown that labor and skills supply can also play a catalytic role, unlocking transformation. At any rate, more productive firms need better-skilled workers. But getting the balance right with labor demand calls for:

- **Broad-based investments in quality foundational skills** needed for increasing productivity even in basic activities, which are fungible and the basis for learning other skills. Prioritizing these skills will also help level the playing field as inequality of opportunities in education and the labor market often stem from inequities in access to learning foundational skills.

- **Improving labor market information** to remove barriers to human capital utilization and accumulation. Information on returns, employment indicators, and feedback from the private sector—to inform the skills investments of governments in a timely manner while addressing additional constraints that hinder relevant actors in the education and labor market to respond efficiently to the signals; and
- **Making education and training systems more responsive to skills demand** by ensuring that mechanisms and incentives are in place for making the first two policy shifts. The fact that many skills investments have a long vesting period further complicates matters.

These three interrelated supply-side priorities are largely no-regret investments that can support the process of structural transformation across the board and ameliorate the trade-offs inherent in skills investments. Implementing them will naturally take different forms across countries and time since the underlying specific constraints and conditions vary.[31]

A relentless focus on quality foundational skills

Building quality foundational cognitive and socio-emotional skills begins early and requires strong basic education systems and targeted interventions among adults to remediate gaps (World Bank 2018a). Investments start by promoting equality of opportunities and school readiness, including through investments in maternal health, child nutrition, and early child stimulation during the first 1,000 days and the early years of life (Bendini and Devercelli 2022; Arias et al. 2019). Building foundational skills also requires improving access to basic education and closing large and persisting learning gaps. Recent evidence from educational initiatives in low and middle-income countries strongly indicates that improving teaching through improved pedagogy—and increasingly aided by technology—is the most effective approach to enhance learning outcomes (Evans and Popova 2016, Muralidharan et al. 2019). Overall, making systems more resilient will be critical to maintain gains and limit setbacks as the vast learning losses that took place during the recent pandemic clearly demonstrate (Schady et al. 2023). Finally, given the significant gaps in foundational skills among current workers and even among those who attend school, deliberate and evidence-based second-chance, adult literacy, and ALMPs should also be considered (World Bank 2019; Puerto et al. 2022; Arias et al. 2019).

Improving labor market information and signals

Balancing investments in skills with labor demand requires understanding what is needed in the labor market and addressing the limitations that individuals, firms, and governments have when responding to these labor market signals. In Section IV, we discussed the possible market and institutional failures and barriers that underpin the inefficient allocation of human capital. There is a growing body of evidence on how public policy can help address these shortcomings at different levels of the formal and informal education and training system.

First, there is a need to invest heavily in education and labor market information systems. Information constraints play a significant role across different forms of skills misallocation, making it clear that

[31] A detailed treatment of relevant policies and programs in these areas is beyond the scope of this discussion paper. Instead, we describe the broad directions of reforms as suggested by international evidence and experience and point the reader to recent and more comprehensive sources for more specific guidance.

significant investments are needed—in partnership with employers and education and training institutions—to strengthen education and labor market information systems so that quality information is available in a timely and accessible manner to all relevant stakeholders (World Bank et al. 2023). This is an area where technology has significantly lowered the cost of putting these systems in place and can be particularly helpful in increasing the reach and dynamism of these systems.

Second, it is important to address the credit and financial constraints that affect individuals, firms, and governments when investing in skills. The evidence discussed in Section IV shows that credit constraints can hinder relevant skills investments and that the use of different mechanisms, such as subsidies or credit, can help address these constraints. In many contexts, education and training systems in general may be underfunded, particularly as we ask for more development of these systems. But, of course, there is also room for a more efficient use of resources, including by better linking financing to results and inclusion (Arias et al. 2019; World Bank 2018a).

Third, particularly to address the underutilization of human capital and foster labor reallocation, it is critical to address constraints associated with social norms and essential missing markets. In recent years, there has been an increasing body of evidence on what can work for shifting social norms in ways that support labor market inclusion, particularly of women (Halim et al. 2023; Croke et al. 2022; Sahay 2023), but also of minorities (Zimmermann et al. 2008), people with disabilities, and older workers (Johansson and Santos 2023). Functioning child and elderly care markets (Halim, O'Sullivan, and Sahay 2023) and markets for housing and social services (Arias et al. 2014; Baez Ramirez et al. 2023) appear to be particularly relevant.

Making education and training systems more responsive to skills demand

Rapid changes in skills demand—from shocks such as a global financial crisis or pandemic and from megatrends—call for more adaptive and responsive education and training systems. Providing skills relevant to labor market needs is not easy to do, even in countries more advanced in the structural transformation, as the evidence of mismatches and returns shows. The task is made even more difficult when labor markets change rapidly, both in terms of the skills demanded and the way of working, in response to either a shock or to structural transitions in the labor market. Megatrends associated with globalization, demographics, technological change, and the green transition suggest we are at a moment in history of rapid change and, thus, making education and training systems more agile should be a priority, especially in countries at the technological frontier or highly integrated in the world economy.

In addition to information and credit constraints, coordination and externalities-related failures affect the responsiveness of education and training systems. Bringing employers more clearly to the center of skills provision is key, particularly for skills development beyond basic education. A combination of reforms in institutional arrangements (for example, through skills councils or private sector-led training funds), ALMPs, and better alignment of financing with results is promising (World Bank et al. 2023). In addition, making systems more responsive also calls for making education and training provision more flexible, including through the diversification of instruments used. Recent reviews on TVET (World Bank, UNESCO, and ILO 2023), short-cycle tertiary (Ferreyra et al. 2021), and active labor market programs (OECD 2021), for example, discuss insights for improving the design and implementation of these

programs based on fresh experiences and rigorous evidence. They point to potential innovations associated with the use of technology or micro-credentials, for example, that can reduce the adjustment costs.

In short, while a poorly skilled workforce can be a constraint to structural transformation, the stage of the transformation itself should shape the quantity and type of skills investments that are made so that human capital is balanced with complementary factors of production and technology, and the benefits of better jobs are widely shared. To achieve this, the policy agenda is focused on addressing the market and institutional failures and barriers that lead to inefficient investments—overinvestment, underinvestment, and other misallocations.

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Annex 1. Trends in education, returns to education and labor market indicators: country cases

Figure A.1: Vietnam

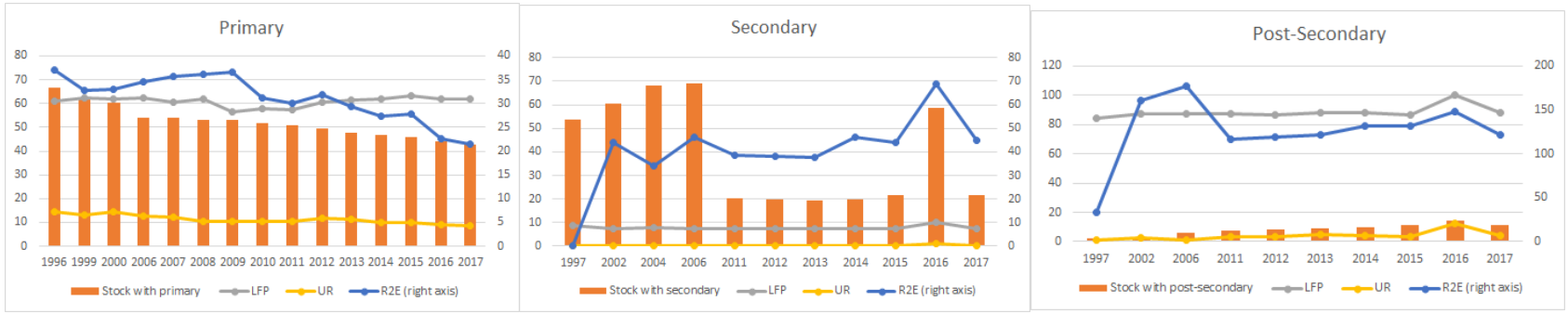


Figure A.2: India

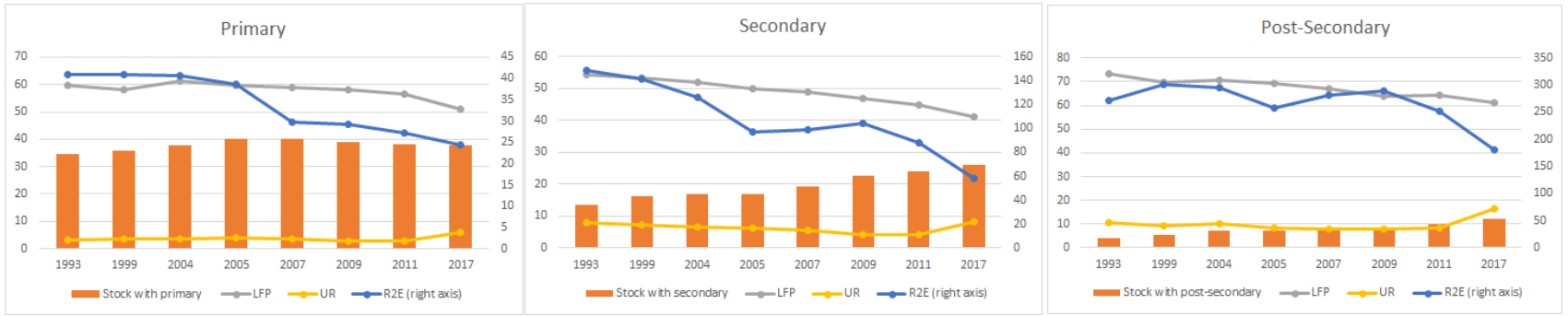


Figure A.3: Turkey

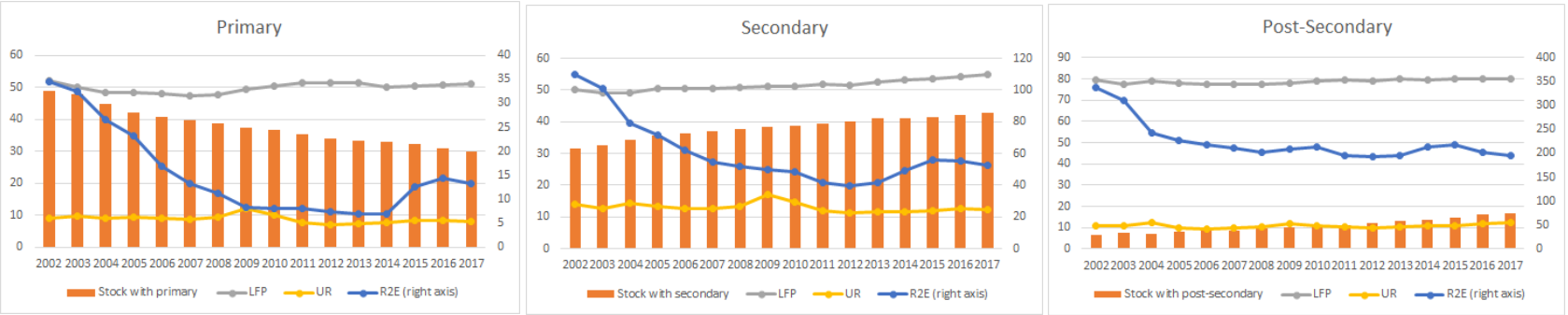
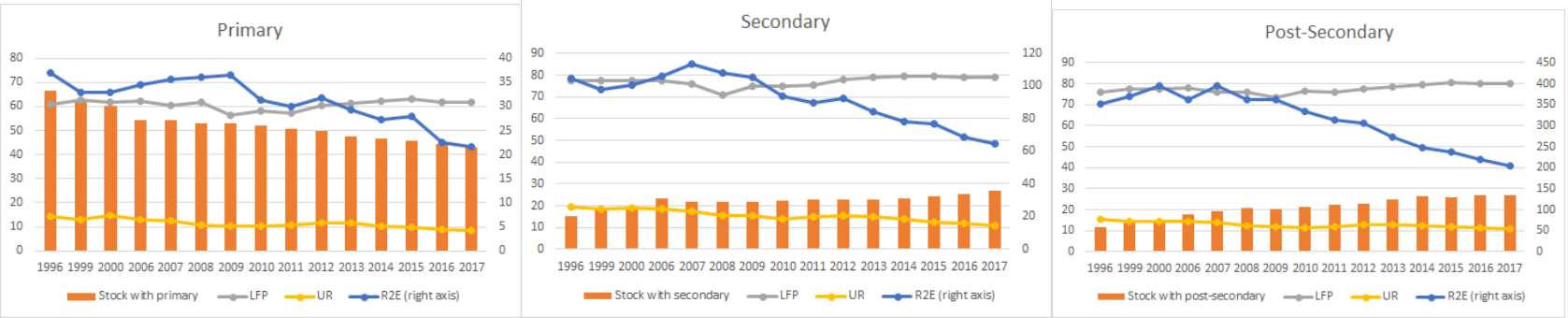


Figure A.4: Colombia



Source: GLD and Vietnam LFS. UR stands for unemployment rate; R2E stands for returns to education. Reported returns are the percentage increases in hourly earnings of workers with primary-completed, secondary-completed, and above secondary education as the highest attainment compared to no education (omitted category). The reported returns to education are based on the estimated coefficients of educational attainment dummies on log hourly wages (for wage workers only) controlling for urban, gender, age, and age squar

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ABSTRACT

The paper reviews the dynamics of human capital – mostly skills –accumulation and utilization during successful and static episodes of structural transformation in a sample of more than 90 countries over the last thirty years to identify cases when improvements in human capital are not met by skills demand - signaling an unbalance between investment in skills and other factors of production. A framework is proposed to differentiate inefficient skills investments by cases of over- and under-investment relative to skills demand, cases of skills underutilization, even at the right level of investment, and cases of skills mismatches due human capital's misallocation across geographical areas and field of study. Based on country case studies, the paper examines the different forms of inefficient human capital accumulation and utilization and the potential market and policy failures that lead to such inefficiencies across individuals, firms, and governments. The framework is used to differentiate policy priorities depending on the constraints to efficient human capital accumulation and utilization and the stage of the structural transformation.

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