



Executive **SUMMARY**

Investing in skills pays off: the economic and social cost of low-skilled adults in the EU



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European economies have recovered to varying degrees from the economic and financial crisis of 2008 but the effects on labour market dynamics in many EU Member States have proved profound and lasting. Persistent lack of employment opportunities, especially among the young and low-skilled, may lead to serious long-term consequences. Growing social exclusion, disengagement from the labour market and underuse of human resources can lead to permanently lower potential growth. More generally, improving and maintaining high-level skills and workforce competences is essential to ensure that Europe remains competitive and innovative against increasing global competition, fast-changing labour market needs and demographic challenges.

Policy-makers have long recognised the importance of skilled human capital for economic and social development and there is broad consensus on the vulnerability of the low-skilled. However, the low-skilled are now clearly at the top of the European policy agenda: the *New skills agenda for Europe* includes a specific action (*Upskilling pathways: new opportunities for adults*) aimed at supporting Member States in ensuring that every European acquires a minimum level of skills necessary to realise talent and potential fully.

Cedefop's *Investing in skills pays off: the economic and social cost of low-skilled adults in the EU* seeks to provide comprehensive and robust evidence on low-skilled adults in the EU, their volume and characteristics, and their economic and social costs. Fully appreciating the benefits of updating the skills of individuals through adult and lifelong learning is essential support to the rationale for public intervention in this area and to designing and implementing effective policies tailored to this particular group.

LOW SKILLS: CONCEPTUAL AND MEASUREMENT CHALLENGE

Analysis of low-skilled status in the labour market to date has been primarily conducted using the level of educational attainment of the population ⁽¹⁾. However, this definition is widely recognised as oversimplifying the concept of being low-skilled, as it does not take into account different types of skills, abilities and factors which can result in low-skilled status:

- (a) long-term unemployment and/or disengagement from the labour market;
- (b) skill obsolescence due to ageing, technological change, changes in production processes and/or work organisation;
- (c) gaps between individual job skills and changing skills demands of the labour market;
- (d) socioeconomic factors such as migrant background and gender.

A narrow conceptualisation of being low-skilled also fails to capture the role of skills and competences gained outside formal education environments, such as those acquired through training, informal learning and work experience.

Low-skilled status must, therefore, be conceptualised as a multidimensional and dynamic phenomenon which goes beyond educational attainment and considers both its determinants and effects. It should also include a wider typology of people with low skills, such as those with obsolete skills and mismatched workers.

UNDERSTANDING LOW SKILLS AND EU TRENDS

Educational attainment has increased substantially in recent decades, especially among younger generations. In 2015, low-qualified adults in the EU decreased to 23.5% and Cedefop forecasts this will fall substantially to 14.7% by 2025. When it comes to the labour force, low-qualified adults are expected to

fall by 33% between 2015 and 2025, despite a total adult labour force basically stable over the same period (0.8%).

Despite this long-term trend, in 2015 one in four European adults aged 25 to 64 (about 64 million adults) still held only low qualifications. PIAAC data also shows that the share of the adult population with low cognitive skills in literacy and numeracy is 18% and 20% respectively ⁽²⁾, with low achievement in these areas more prevalent among those with low qualifications than those with medium or high qualifications. However, data also show that educational attainment does not fully explain adults' skills. On average, 33% of individuals ⁽³⁾ without upper secondary education are low-skilled in literacy and 38% in numeracy. Even among those with higher educational attainment, 5% are low-skilled in literacy and 6% in numeracy.

There is widespread agreement in literature on the positive effect of education on labour market outcomes. People with at least upper secondary education are generally more likely to participate in the labour force, less likely to be unemployed, and more likely to receive higher earnings compared to those with only lower educational attainment.

In 2015, only 63.6% of adults with low qualifications actively participated in the labour market, compared to 79.9% with a medium educational level and 88.8% of those with tertiary education. Eurostat data suggest that low-educated adults are more likely to be discouraged ⁽⁴⁾ on the labour market than their more educated peers, resulting in disengagement and social exclusion.

Besides enhancing labour market participation, education also seems to provide a shield from unemployment. Rates are substantially higher among those with lower educational attainment in all the EU-28: on average, 16.3% among those holding low qualifications are unemployed compared to 5.2%

⁽¹⁾ Low-skilled are typically defined as individuals whose schooling is below any level of secondary education corresponding to levels 0-2 and 3c-short of the ISCED classification.

⁽²⁾ PIAAC covers 17 Member States: Belgium (the Flemish Community), Czech Republic, Denmark, Germany, Estonia, Ireland, Spain, France, Italy, Cyprus, Netherlands, Austria, Poland, Slovakia, Finland, Sweden and the UK (Cyprus not available for our analysis).

⁽³⁾ People aged 16 to 64.

⁽⁴⁾ Discouraged workers are those who desire to work but who are not in the labour force, believing that there is no work available for various reasons OECD: *Employment database*: <http://www.oecd.org/els/emp/onlineoecdemploymentdatabase.htm>

of those holding higher tertiary qualifications.

The recent economic crisis exacerbated the already vulnerable labour market position of workers with low qualifications. Between 2007 and 2015 the employment rate of adults with low qualifications decreased in the EU-28 from 57.1% to 53.2%, compared to a decline of only 1.1 percentage points for highly educated individuals (from 85.2% to 84.1%). While unemployment rates increased across all education levels during the crisis, the economic downturn has negatively affected especially those with low qualifications whose unemployment rate increased on average from 9.2% in 2007 to 16.3% in 2015.

Once in employment, low-skilled adults are also more likely to be employed in low-skilled occupations. PIAAC data shows that among workers employed in low-skilled occupations, 35% possess low skills in literacy and 40% in numeracy. Low proficiency in literacy and numeracy is also high in semi-skilled manual occupations, particularly in Italy, Spain and France where more than 30% of workers have low scores on cognitive skills. Analysis of EUSILC 2011 data suggests that adults with a low level of education are more likely to get trapped in low-skilled occupations: adults with low qualifications generally have a higher probability of remaining in low-skilled jobs at any age and job mobility tends to decrease with age.

Low-skilled workers and those employed in low-skilled occupations also tend to experience more precarious employment than their higher skilled peers. They are more likely to be self-employed than those with medium or high levels of education and are also more likely to be employed under a temporary contract. Workers in low-skilled jobs usually experience poorer working conditions⁽⁵⁾ compared to people in intermediate and highly skilled ones. They are reportedly less satisfied with their pay and career prospects, receive fewer benefits from extra payments, fringe benefits and performance-related schemes, and are also more likely to be employed in dangerous occupations and report higher accident rates.

Although the low-skilled are most in need of education, training and upskilling, empirical evidence tells us they are less likely to participate in learning activities. Both the adult education survey and PIAAC provide evidence on the unequal participation in learning activities and reveal strong disparities in the participation rates of different categories of adults in lifelong learning.

Trends in low skills among adults vary substantially across Member States. This is why consensus has emerged in literature on the importance of institutional settings and policies in explaining differences across countries. Two sets of policy approaches are consistently found in the empirical literature aimed at exploring ways to improve the labour market conditions of the low-skilled:

- (a) remedial measures targeted at the current stock of low-skilled adults;
- (b) preventive measures targeted at young school dropouts, NEETs and disadvantaged groups.

A cluster analysis allowed grouping of European countries according to the policy approach addressing low-skilled/qualified adults. Five country clusters were identified:

- (a) remedial policy approach: countries with high labour market policies (LMP) expenditure, particularly in training, direct job creation and income support. This cluster is also characterised by high levels of product and labour market regulation. Work-life balance policies are also substantial and increasing;
- (b) liberal policy approach: countries with the lowest of market regulation, and a high adult participation in lifelong learning. Despite growth in recent years, LMP expenditure remains low except for direct job creation;
- (c) preventive policy approach: countries with high support for education and work-life balance, and expenditure on LMP also above the EU average. Market regulation indicators are in line with the EU average, while the degree of union coverage and density is the highest in Europe;
- (d) regulatory policy approach and less intensive investment in education and training: countries with the highest levels of market and employment regulation. Expenditure on LMP and on education and training are lower than the EU average (particularly for training), as are adult participation in lifelong learning and work-life balance policies;
- (e) mixed policy approach: countries with the lowest level of expenditure on ALMP, education, formal childcare and income support. Levels of market and employment regulation are in line with the European average, while union coverage and

⁽⁵⁾ Fifth European working conditions survey (EWCS) 2010: <http://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/fifth-european-working-conditions-survey-2010>

density are the lowest in Europe.

The cluster analysis suggests that the preventive-policy approach helps not only preventing a high share of low-skilled adults, but also supporting labour market participation and living conditions of low-skilled adults. Countries in the mixed-policy and regulatory-policy clusters display similar negative patterns in the labour market and living conditions of the low-skilled adult population, although the incidence of the low-skilled population across these clusters is very different: in both groups skills gaps in employment rates are high, employment rates for low-qualified adults are the lowest, and low-skilled adults are at a high (and increasing) risk of poverty. Cluster analysis also suggests that high levels of LMP expenditure observed in the remedial policy approach cluster may counteract the negative effects of being low-skilled. Countries in the liberal-policy cluster, with their high level of adult participation in lifelong learning but lower than EU average LMP expenditure, generally display low rates of adults with low qualifications, but substantial share of adults who are low-skilled in numeracy.

EU LOW-SKILLED ADULTS: CHARACTERISTICS, DETERMINANTS AND RISKS

While future trends in low skills suggest that shares of low-skilled adults will continue to decrease, current trends also indicate how low-skilled people are particularly disadvantaged and vulnerable on

the labour market. Effective policy interventions tackling low skills require a clear understanding of who are the low-skilled and what are the risk factors of becoming low-skilled.

CHARACTERISTICS OF LOW SKILLS

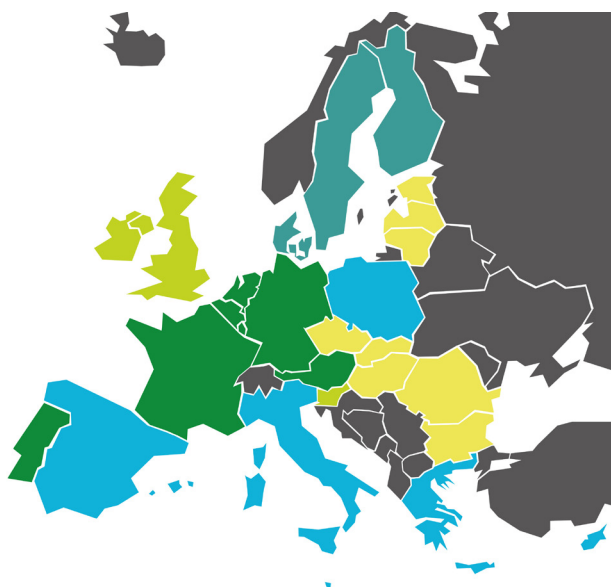
Findings from a pooled regression analysis of PIAAC data suggest low levels of cognitive skills are associated with lower levels of educational attainment, lack of work experience and spells of unemployment and inactivity.

Low cognitive skills are also associated with disadvantaged background, particularly migrant background, although the strength of the association varies widely across and within countries, between different age groups. The educational level of parents is also associated with cognitive skills proficiency (intergenerational persistence).

DETERMINANTS OF LOW SKILLS

Results from a variance decomposition analysis suggest that most of the observed difference in cognitive skills is explained by the level of formal education attained and frequency of use of information processing skills in everyday life (reading, writing, and numeracy). Personal characteristics (gender, age, migrant status and language spoken) and, especially, family background (migrant status, parental education level) are also responsible for a large portion of this difference. To a lesser extent, variance in cognitive skills is also explained by labour market attachment and having participated in training.

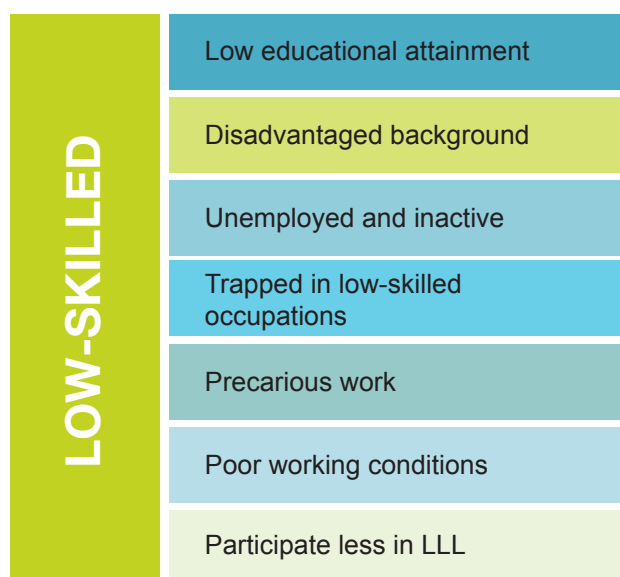
Figure 1. European countries by cluster



- Remedial policy approach (BE, DE, FR, LU, AT, NL, PT)
- Liberal policy approach (IE, SI, UK)
- Preventive policy approach (DK, FI, SE)
- Regulatory policy approach and less intensive investment in education and training (EL, ES, IT, CY, MT, PL)
- Mixed policy approach (BG, CZ, EE, LV, LT, HU, RO, SK)

Source: Cedefop, based on Eurostat (labour market policy database; education and training statistics; income and living conditions statistics); OECD (product market regulation database; employment protection legislation; social expenditure database; tax database); and ICTWSS (version 4.0).

Figure 2. **Characteristics, determinants and risk of being low-skilled**



Source: Cedefop.

Along with these personal and human capital variables, job characteristics may play a role in determining low cognitive skills among employed adults. Results from an OLS regression on employed adults, confirm a strong relationship between level of cognitive skills and type of occupation. The positive relationship between work experience and the level of proficiency in numeracy skills is also true for employed adults⁽⁶⁾. The effect of work experience on cognitive skills is more pronounced for older workers, probably because of a self-selection effect.

RISKS OF BEING LOW-SKILLED

A probit regression analysis⁽⁷⁾ on numeracy⁽⁸⁾ skills shows results consistent with the analysis of the characteristics and determinants of low skills. The probability of being low-skilled is strongly related to level of education attained and parental background. Having a migrant background seems to play an important role in determining the probability of having low proficiency in cognitive skills.

A strong relationship also exists between work experience and the probability of being low-skilled in numeracy: this is higher among individuals who never worked and among individuals experiencing unemployment or inactivity spells.

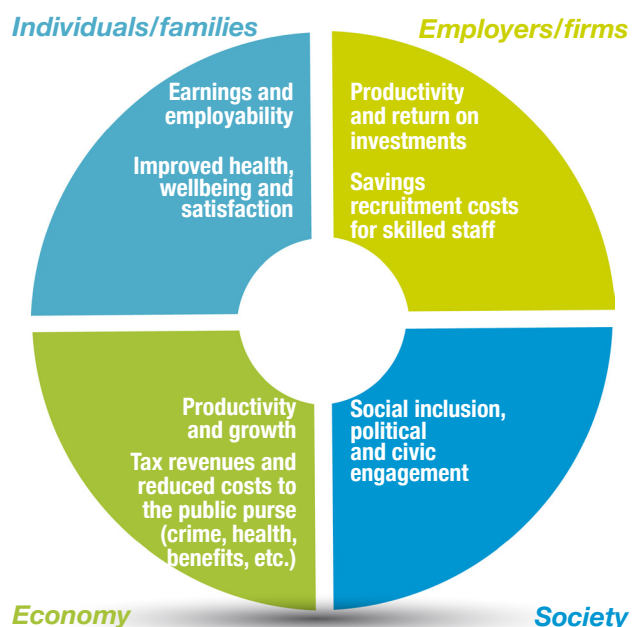
CONSEQUENCES OF BEING LOW-SKILLED

The idea that education and higher skills levels

are associated with a wider range of benefits for individuals (and their families), employers, society, and the economy as a whole, is largely agreed in the literature. Alongside increased employability and higher earnings for individuals, as well as higher productivity and economic growth for the economy as a whole, a more recent strand of analysis focuses on the social and non-market benefits of education and skills: improved health, social and civic engagement, and lower involvement in criminal activities.

Figure 3 shows the different dimensions impacted by higher levels of skills. While, at individual level, education can define major labour market outcomes, it also contributes to improving individual satisfaction, wellbeing and health status. Higher skills are also positively related to lower involvement in criminal activities and may promote trust, civic engagement, active citizenship and social inclusion. Investment in human capital also affects what could be called Schumpeterian growth: investment in education leads to a more skilled and competent population, which is able to generate and adopt new ideas that stimulate innovation and technological progress.

Figure 3. **Benefits of higher levels of skills**



Source: Cedefop.

⁽⁶⁾ Similar results are found for literacy.

⁽⁷⁾ Analysis uses average adjusted predictions and adjusted predictions at representative values.

⁽⁸⁾ This part of the analysis concentrates and presents results on numeracy skills, since literacy and numeracy proficiency scores are highly correlated (coefficient is 0.86) and produce similar results.

All these benefits are interlinked and spill into all four dimensions. For example, higher employability and higher returns also lead to higher revenues for governments in increased returns from taxes, as well as reduced spending on benefits, such as income support. Education is not only associated with private benefits, but also with large gains to economies and societies.

COSTS AND BENEFITS OF LOW-SKILLED ADULTS

The ultimate aim of this study is to estimate the individual and social value in monetary terms of a faster increase in the level of skills in Member States, compared to the current trend. It uses empirical data for all EU-28 Member States and – where data are not available – builds on findings from literature research on the impact of skills on main socio-economic variables. Applying robust methodological approaches, estimates are provided on both microeconomic approaches (costs and benefits for individual agents such as families, firms and the public sector), and macroeconomic approaches, considering the implications for the economy as a whole. Both approaches offer advantages and limitations.

Following standard principles, microeconomic analysis assumes that wages correspond to marginal productivity and so include returns on education/training. It implies that non-individual costs and benefits, such as externalities and spillover effects, are not captured by aggregation of microeconomic outcomes of education/training without further assumptions. At the same time, the implicit

assumption of constant returns on skills is unrealistic as it does not take into account deadweight losses, substitution and displacement effects.

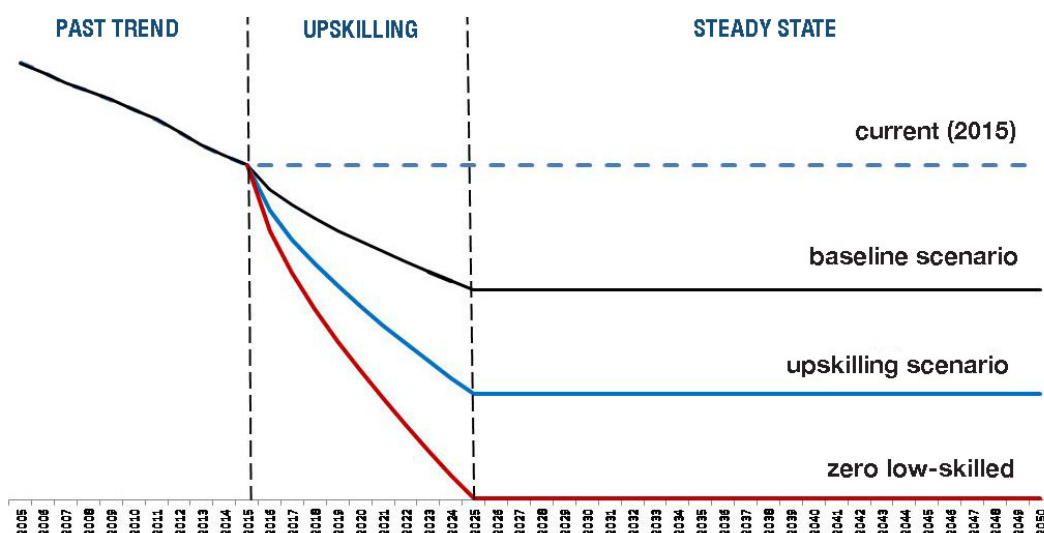
However, macroeconomic approaches also suffer from limitations, initially because of the lack of consideration of non-market values and distributional effects which estimates based on national accounts cannot include. Further, data available for the estimate in this exercise, which includes an unprecedented period of economic downturn, reduces the ability of the models to evaluate fully the role of spill-overs and externalities arising from public investments in human capital.

Box 1. Scenarios used to derive the net benefit from upskilling

A baseline scenario (business as usual), which assumes that population 15 to 54 observed in 2015 would age to the key adults cohorts in 2025 (25 to 64 year-olds) and would be affected by the past trend of decreasing levels of low skills, gradually reaching a proportion of low-skilled adults of 14.7% by 2025. This target was chosen in line with Cedefop’s forecast scenarios.

An upskilling scenario, which assumes a further decreasing trend in the proportion of low-skilled adults to reach 7.4% by 2025 (about half of the baseline target). A further assumption is that the increased reduction is higher for younger people and gradually lower for older cohorts. This scenario is challenging as it assumes that is possible to double the current trend in

Figure 4. Scenarios used to derive the net benefit from upskilling



Source: Cedefop.

the reduction in the proportion of low-skilled population, but not impossible when considering that a share of low-skilled around 10% is already a reality in several Member States.

A high hypothetical zero low-skilled scenario, which assumes that, by 2025, the proportion of low-skilled in the adult population would completely disappear. This scenario is largely unrealistic because of the extensive (and difficult to sustain) investment in adult learning facilities and policies it would require. However, it was included because it represents an interesting reference point for the analysis.

Microeconomic approach: aggregated economic net benefit of reducing the share of low-skilled adults by 2025

The first step in the microeconomic approach is to provide a series of estimates of costs and benefits of reducing the share of low-skilled/qualified to the individual agents:

- individuals/families (individual wage return, cost of upskilling, higher probability to be employed, improved health, reduced crime tendency);
- employers/firms (productivity gains and higher returns on investment, saving of downtime due to lack of skilled staff, and saving of recruitment costs);
- public sector/tax revenue (higher activity rate and lower unemployment, reduction of unemployment and out-of-work social benefits, reduction of ALMP public expenditure, public costs of upskilling, effects on tax revenues, healthcare spending, legal and social assistance systems).

Aggregation of individual agent costs and benefits resulting from upskilling the low-skilled population of different ages is presented in Table 1. The main components of costs and benefits are considered comparing the 'upskilling' and the 'zero low-skilled' scenarios against the baseline, assuming that the lower share of low-skilled/qualified adults can be achieved within a 10-year span (2015-25).

Results from the microeconomic analysis show substantial gross earnings increases, including tax revenues, as well as substantial positive effects for individuals in terms of health and crime benefits. The estimate of the aggregated economic net benefit of reducing the size of the low-skilled adult population account for a total present value over the 10 years of EUR 2 013 billion (yearly average value of about EUR 200 billion) in the 'upskilling' scenario, and of

EUR 3 529 billion in the 'zero low-skilled' scenario (yearly average value of about EUR 350 billion).

Table 1. Aggregated costs and benefits for individual agents: scenarios 2015-25, million EUR

	Main components	Upskilling scenario (7.4%)	Zero low-skilled scenario (0%)
(+)	Aggregate net income	903 618	1 614 877
(-)	Opportunity costs (foregone earnings)	287 936	453 946
Net benefit (~GVA)		615 682	615
(+)	Surplus/compensation	523 330	986 792
Net benefit including surplus		1 139 012	2 147 724
(-)	Net public spending	156 267	345 010
(+)	Health and crime economic benefits	1 030 044	1 725 841
Total net benefit (+/-)		2 012 789	3 528 554

NB: All figures are expressed in net present value. Aggregate GVA is computed as the difference between aggregate income increase and the opportunity costs (foregone earnings).

Aggregated gross earnings: returns of acquiring ISCED 3 as opposed to ISCED 0-2 qualifications, including higher earnings and employment rate (microeconomic estimates applied to evaluate gains in lifetime income resulting from upskilling of low-skilled adults).

Opportunity cost of education/training investment: cumulative foregone earnings for the education/training spell required to acquire ISCED3 qualification (based on empirically observed duration of acquiring ISCED3 qualifications in EU-28).

Surplus/compensation ratio: value-added created during the production process which remunerates capital and employers' work more generally (based on Eurostat data on GDP income components).

Health and crime benefits: benefits for individuals of better quality of health and crime reduction effects of education (estimates based on: QALY differentials between low-skilled/qualified adults and those with upper secondary education; evidence from literature as for crime-related benefits).

Aggregated public spending/savings: effects on public budget (further to tax revenues due to higher earnings and employment) related to education/training public spending and out-of-work benefits savings.

Source: Cedefop's estimations, based on EU-SILC.

Macroeconomic approach: long-term impact on the steady-state growth of GDP in 2025-50

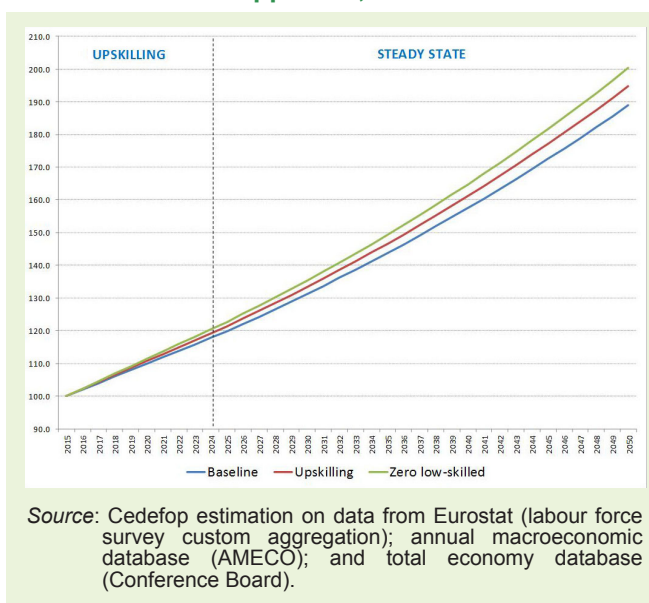
To estimate the possible long-term impact of reducing the share of low-skilled adults, a valuation exercise was conducted using a macroeconomic approach. This provides alternative estimates of the costs of low skills to the European economy, making use of skill levels and macroeconomic output measures rather than aggregating individual returns.

The impact of skills can be best estimated by quantifying the output growth foregone due to low skills, in models which explain GDP growth per capita based on factors of production and further variables relevant to macroeconomic output (savings, depreciation of capital, population growth and labour market participation). While cross-country comparisons have the advantage of capturing externalities otherwise omitted in the micro approach, GDP per capita cannot represent the full value of skills for society, as this includes additional aspects such as unpriced values, externalities, distributional considerations and other important determinants of social well-being.

The model's empirical specification combines Eurostat data on the qualifications of the population aged 25 to 65 years with further macroeconomic aggregates from the AMECO database and the total economy database of the Conference Board for all 28 EU Member States.

Results from the panel data regression show that a 10 percentage point reduction in the long-term proportion of low-skilled adults (with ISCED 0-2 qualification) would increase long-term GDP per capita growth rate by 0.1 percentage point. We apply our scenarios (Box 1), assumed as the long-term proportion of low-skilled adults in steady-state that is no longer changing as of 2025, and the impact of the steady state growth rate of the GDP per capita is based on the model ⁽⁹⁾.

Figure 5. GDP growth under different scenarios, macroeconomic approach, 2025- 50



Applying the steady-state growth rate to the 2015 GDP per capita, we obtain the expected GDP per capita in 2025 in both 'upskilling' and 'zero low-skilled' scenarios. In the upskilling scenario, after 25 years the GDP per capita would be EUR 52 909, compared to EUR 52 007 for the baseline. With an expected population in the EU-28 increasing by about 15 million by 2050, the long-term annual GDP for the EU-28 would be about EUR 480 billion larger in the upskilling scenario than in the baseline. Following the same approach, in the hypothetical 'zero low-skilled' scenario the long-term annual GDP differential would be about EUR 965 billion in 2050.

In the 25 years taken as reference period (2025-50) the increase in annual GDP due to the reduction in the share of low-skilled adults set in the 'upskilling' and the 'zero low-skilled' scenarios would be over EUR 200 billion and EUR 410 billion respectively. ■



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⁽⁹⁾ In both scenarios it is assumed that the reduction in the proportion of low-skilled adults translates into a similar increase in proportion of adults with ISCED 3-4 (no impact on ISCED 5-6).