

# Skill mismatch and overeducation in transition economies

## Substantial skill shortages coexist with overeducation, affecting both young and old workers

Keywords: overeducation, skills development, transition countries

### ELEVATOR PITCH

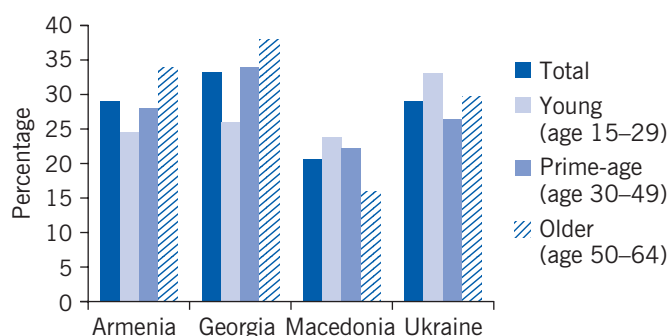
Large imbalances between the supply and demand for skills in transition economies are driven by rapid economic restructuring, misalignment of the education system with labor market needs, and underdeveloped adult education and training systems. The costs of mismatches can be large and long-lasting for workers, firms, and economies, with long periods of overeducation implying a loss of human capital for individuals and ineffective use of resources for the economy. To make informed decisions, policymakers need to understand how different types of workers and firms are affected by overeducation and skill shortages.

### KEY FINDINGS

#### Pros

- + High educational attainment of the population is an attractive feature for foreign investment and innovation.
- + Some degree of skill mismatch is inevitable in an era of rapid technological change and globalization.
- + Overeducated workers may represent an opportunity for productivity gains for firms and regions.
- + Overeducation is not a concern if it is a short-term mismatch that affects mainly young people.
- + Successful skill development calls for cooperation of education systems, labor market institutions, employers, and individuals.

The percentage of overeducated workers (self-reported) in urban areas varies by age



Source: [1].

#### Cons

- High levels of formal education do not necessarily translate into high levels of up-to-date productive skills.
- The inadequacy of workers' skills affects firm performance, technological investments, and competitiveness.
- Long periods of overeducation imply a loss of human capital for individuals and ineffective use of resources for the economy.
- Older workers risk being trapped in jobs with low educational requirements because of skill obsolescence.
- Improving career guidance and the quality and relevance of formal education is necessary but not sufficient for reducing skill mismatches.

### AUTHOR'S MAIN MESSAGE

Policymakers should be concerned not only with increasing the stock of human capital, but also with enhancing its quality and allocating it efficiently. Innovative firms need assistance in matching job-seekers with employment opportunities, while other firms need help in adopting new technologies, creating skilled jobs, and investing in worker training. Improving overall workforce quality could attract advanced technologies and stimulate local labor markets. It is also crucial to equip older displaced workers with up-to-date skills through adult training so that they are able to stay in productive employment longer.

## MOTIVATION

In transition economies, the proportion of the adult population educated to the secondary level or higher (the stock of human capital) is on par with that in mature market economies [2]. Policymakers often use educational attainment data as one of their country's key competitive advantages for attracting foreign investment and innovation. However, these quantitative indicators should be treated with caution in transition economies, where they can be a poor proxy for the true stock of human capital. High levels of formal education do not necessarily translate into high levels of up-to-date productive skills. Rapidly expanding higher education systems often fail to equip young people with adequate skills because of the low quality and relevance of education programs. Lifelong learning opportunities that could counteract the obsolescence of diplomas obtained under central planning and develop skill proficiency among adult workers are scarce. As a result, substantial skill shortages coexist with overeducation and structural unemployment, which affect both young and old workers. This paper summarizes the evidence of skill mismatches in transition economies, drawing on recent studies based on surveys of firms and households.

## DISCUSSION OF PROS AND CONS

### Skill mismatch in market economies: A blessing or a curse?

Some degree of skill mismatch is inevitable, and sometimes even positive, in a market economy [3]. Skill demand shifts in response to new technologies, sectoral shifts, globalization, and demographic change (mainly aging populations and rising international migration), and the skill supply adjusts to these shifts with a lag. There can be also a lag in adjustment of the skill demand to a growing pool of highly educated workers. Theory and empirical evidence on overeducation in developed countries suggest that mismatch is a temporary phenomenon affecting predominantly young people entering the labor market [4]. Some studies argue that overeducated workers may represent an opportunity for firms, regions, and countries, as these workers are still more productive at the aggregate level than their less educated counterparts [5].

Recent evidence suggests that the association between mismatch and labor productivity depends on the type of mismatch—skill mismatch, qualification (education) mismatch, or both. A key finding is that having workers who are both overeducated and over-skilled is positively associated with firm productivity but negatively correlated with allocative efficiency (when economy-wide resources are used to maximum benefit), which might have negative implications for the economy-wide labor productivity [6].

#### Types of mismatch

*Qualification (vertical education–job) mismatch* arises when workers' educational attainment is higher than required by their job (workers are overeducated) or lower than required (workers are undereducated).

*Field of study (horizontal education–job) mismatch* arises when workers are employed in a different field from the one in which they specialized. Workers who are not employed in an occupation that is considered a good match for their field are classified as mismatched.

*Skill mismatch* arises when workers' skill level is higher than that required by their job (over-skilled) or lower than required (under-skilled).

Source: OECD. *OECD Employment Outlook 2014*. Paris: OECD Publishing, 2014.

## Skill mismatch and overeducation in transition economies

In addition to facing global shifts in skill demand, transition economies have experienced large structural transformations and concurrent labor reallocation. At the same time, the supply of skilled labor has been changing, reflecting reforms in national education and training systems, demographic changes, and increased labor mobility. For all these reasons, skill mismatches can play out differently in transition economies than in mature market economies—for example, with respect to which groups of workers are affected and the persistence of mismatches.

### *The employers' perspective on skill mismatch*

According to surveys of firms conducted before the Great Recession of 2008/2009, employers regarded an inadequately educated workforce as a binding constraint to business growth [7]. The latest round of the Business Environment and Enterprise Performance Survey conducted in 2013/2014 finds a decline in the number of transition economies in which employers identified workforce skills as among the top three obstacles, from 11 of 29 countries in the 2008/2009 round to five countries (the Baltic countries, Belarus, and Moldova) [8]. But this drop is due less to an improvement in education and training than to the impacts of the global financial crisis, which affected the availability of skilled workers and made other obstacles relatively more important.

Recent ad hoc skills surveys of firms in Armenia, Georgia, Macedonia, and Ukraine conducted as part of the World Bank's Skills toward Employment and Productivity project in 2013–2015 support this argument. An overwhelming majority of surveyed firms reported that high taxes and social security contributions as well as poor business conditions in general posed much greater constraints to firms' growth than the availability of labor and skills, including workers' experience, general education of workers, technical and vocational education and training of workers, and high job turnover [9].

Despite being a less binding constraint on doing business in general, skill shortages, especially among managers, professionals, and technicians, have harmful effects on firm performance that differ by type of firm and sector. For example, the proportion of firms reporting problems in hiring due to inadequate skills among job candidates is usually higher for innovative firms than for more traditional firms, firms with international business contacts than for those without an international network, and firms with foreign ownership than for domestic firms. Innovative and dynamic firms exposed to international competition are more seriously affected by skill gaps than other firms because they tend to require modern, higher-order skills. At the same time, they are more likely to provide training to their workers, especially to managers and professionals [9].

Ukrainian firms participating in the Skills Toward Employment and Productivity employer survey in 2014 were also asked about the impact of existing skill gaps on their business. Nearly one in three surveyed firms in the information and technology sector reported that skill gaps reduce their efficiency, service quality, ability to retain and grow their client base, and innovation opportunities. Food producers also often reported losing clients and markets, efficiency, and innovation opportunities because of skill shortages. Perceived harmful effects of a lack of workers with the right skills were lower for renewable energy firms and agricultural growers, but the share of affected firms is still over 10%. Thus, the inadequacy of workers' skills seriously affects firm performance, technological investments, and the overall competitiveness of transition economies.

### ***Workers' perspective on skill mismatch and overeducation***

Qualification mismatch is by far the most intensely studied type of mismatch, especially in transition economies. Although analyses of skill mismatch are even more relevant from a policy perspective, such studies are much less common, mainly because direct information on workers' skills and the skill requirements of their jobs is less easily available than data on educational attainment.

### ***Overeducation in advanced transition economies: Estonia, Poland, and other new EU members***

Empirical evidence on overeducation or other type of skill mismatch in the new EU member states is scarce. A study of the incidence of overeducation and its impact on wages in post-communist Estonia reaches some interesting conclusions [10]. First, the incidence of overeducation increases with age among women and is significantly higher among older men (50 years and older) than among younger men (16–29 years), with no statistically significant difference for prime-age workers (30–49 years). Second, wage losses due to overeducation (about 24%) appear to be much higher than in the EU15 countries where similar studies were done. Moreover, the wage penalty associated with overeducation increases with age and is unlikely to be driven by unobserved worker characteristics. These findings are consistent with expectations for a rapidly changing transition economy where a large number of workers educated in a centrally planned economy suffered a depreciation of skills.

One of the most influential studies of overeducation in transition economies explored changes in the persistence of overeducation in Poland over 20 years of its post-communist transition, and whether overeducation can be regarded as a stepping stone to more adequate jobs or as a trap for affected workers [11]. It found high persistence of overeducation: over half the people working in jobs below their level of education remained in that situation five years later, and about 10% were persistently overeducated. Moreover, younger workers who entered the labor market in the late 1990s or early 2000s were much more likely to experience persistent overeducation than their older counterparts. Thus, jobs with low educational requirements appear to be traps for educated young workers. The Polish labor market was unable to accommodate the rapidly growing numbers of college-educated workers, in part because of the low quality and irrelevance of education in some colleges. The study concludes that popular policies regarding public investment in tertiary education might need reconsideration, given that jobs with low educational requirements appear to be traps for educated young workers.

Several cross-country studies also deal with education–job mismatch and its impact on productivity. One study, based on European Labor Force survey data for 2005–2011, examined the incidence of vertical and horizontal mismatch in 30 European countries including ten transition economies that joined the EU [12]. It also explored the relationship between different measures of mismatch and per capita output. The study found a higher incidence of undereducation than of overeducation for most countries and years, contrary to other studies for developed and transition economies [1], [3], [4]. This difference is probably attributable to the statistical approach used to measure the incidence of overeducation and undereducation, which has many disadvantages. Estimates of the incidence of horizontal mismatch in Central and Eastern European countries in 2011 vary from 18% in Slovakia to more than 37% in Latvia. Preliminary analysis of the factors affecting real per capita output growth reveals a negative effect of vertical mismatch on long-run growth, with statistically significant effects in the Czech Republic, Estonia, and Romania [12]. These findings suggest a need to reconsider the design of public funding of education in order to adjust the supply of skilled labor to its demand.

Another study examined the relationship between the share of college graduates at the district level and the share working in occupations not requiring a college education in the Czech Republic, Hungary, and Slovakia [13]. It found empirical support for the hypothesis that a large supply of skilled labor shifts the skill bias of the local economy and decreases the fraction of college graduates who are working in occupations not requiring a college education. Increasing the educational attainment of the local population might be used as a tool to attract advanced technologies and stimulate development of local labor markets.

### ***Overeducation in late-reforming transition economies: Armenia, Georgia, Macedonia, and Ukraine***

A recent comparative study based on data from the Skills Toward Employment and Productivity household surveys in Armenia, Georgia, Macedonia, and Ukraine in 2012/2013 used a self-assessment approach to measure vertical education–job mismatch [1]. The study applied the same methodology to measure the incidence of education–job mismatch in OECD countries using the Programme for the International Assessment of Adult Competencies survey.

#### **Self-assessment approach to measuring vertical education–job mismatch**

A self-assessment approach is based on respondents' self-reports about the required education level at their current job or about how well their education or skills are used.

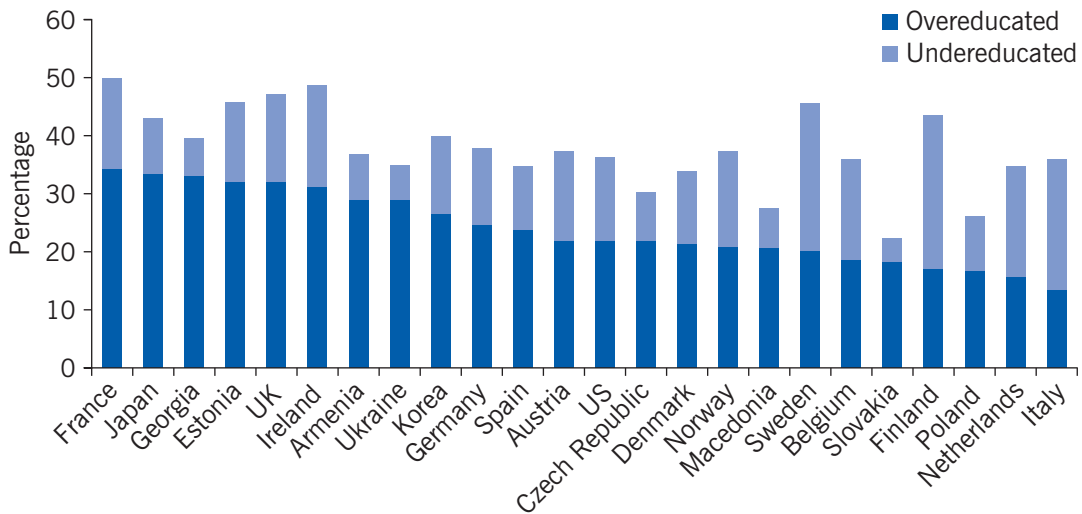
Information about required education for late-reforming transition economies comes in response to the question in the World Bank's Skills Toward Employment and Productivity household surveys: "What minimum level of formal education do you think would be required before someone would be able to carry out this work?" The related question in the Programme for the International Assessment of Adult Competencies survey asked of respondents in OECD countries is: "If applying today, what would be the usual qualifications, if any, that someone would need to get this type of job?" If a worker's highest educational attainment is the same as that required by a given job, the respondent is classified as well-matched. If the educational attainment is higher or lower than that required by a job, the respondent is classified as overeducated or undereducated.

*Source:* Kupets, O. *Education in Transition and Job Mismatch: Evidence from the Skills Survey in Non-EU Transition Economies*. Kyoto Institute of Economic Research Discussion Paper No. 915, 2015.

While the study found a high incidence of overeducation in late-reforming transition economies, the incidence was generally on par with that in many mature market and transition economies (Figure 1). The percentage of workers whose highest level of education is higher than the level of education they deemed necessary to carry out/get their job varied from about 13% in Italy to more than 33% in France, Georgia, and Japan. However, all four late-reforming transition economies have considerably lower incidences of undereducation than mature market economies. These results need to be interpreted with caution because they compare urban population in the four late-reforming transition economies with the entire population in most OECD countries or to subregional populations (in Belgium and the UK) [1]. Moreover, many workers who are classified as formally over- or undereducated are adequately matched to their jobs in terms of productive skills [3].

As expected, overeducation in transition economies affects a large share of older workers, from 16% in Macedonia to about 38% in Georgia (Figure 2). The relationship between age and overeducation observed in Armenia, Georgia, and Ukraine is in contrast to empirical evidence in mature market economies (and to the predictions of labor market theories) showing that

Figure 1. While overeducation rates are similar in late-reforming transition economies and mature market economies, undereducation is lower in the transition economies



Note: Data show percentage of workers who self-report being overeducated or undereducated.

Source: Kupets, O. *Education in Transition and Job Mismatch: Evidence from the Skills Survey in Non-EU Transition Economies*. Kyoto Institute of Economic Research Discussion Paper No. 915, 2015 [1].

older workers are less likely to be overeducated because they have more experience, better relevant skill sets, and more opportunities for upward mobility [3], [4]. This finding suggests that rapid structural changes in transition economies made obsolete many of the diplomas and qualifications acquired by workers under communist economic and political systems, explaining the mismatch between formal education and workers’ skills, on the one hand, and job requirements on the other.

An education-specific analysis of overeducation reveals that these transition-related changes have had the largest impact on workers with tertiary short-cycle education, which was classified as secondary specialized education under the Soviet system. The proportion of overeducated workers in this group varies from 40% in Ukraine to 66% in Georgia (see Figure 2). The high rates of overeducation in this group occurred mainly because the number of jobs that are supposed to require this level of education declined considerably during the mass restructuring of the transition economies toward trade and other less knowledge-intensive services [1]. In a keen competition for a limited number of white-collar jobs, holders of college diplomas in obsolete fields of study and with irrelevant skills have been crowded out by their better educated peers (those with university diplomas).

Perceived overeducation is a more serious problem in sectors with more unskilled jobs and less sophisticated hiring practices: trade, accommodation, and food service activities compared with other economic sectors (see Figure 2); self-employment compared with wage work; informal work compared with formal employment; private-sector jobs compared with public-sector jobs; and small firms compared with larger ones [1], [9].

A preliminary analysis of the composition of overeducated and well-matched employees by field of study shows that workers in Armenia and Macedonia with a degree in engineering, manufacturing, or construction account for a significantly larger share of overeducated workers than do their well-matched counterparts. During economic restructuring, as jobs

Figure 2. Incidence of overeducation and undereducation in late-reforming transition economies (self-reported) (%)

Characteristic	Armenia (2013)		Georgia (2013)		Macedonia (2013)		Ukraine (2012)	
	Over-education	Under-education	Over-education	Under-education	Over-education	Under-education	Over-education	Under-education
Young workers (age 15–29)	25	10	26	12	24	7	33	7
Prime-age workers (age 30–49)	28	7	34	4	22	5	26	5
Older workers (age 50–64)	34	6	38	5	16	8	30	4
Lower secondary education or less	0	41	0	42	0	25	0	32
Upper secondary education	26	15	22	17	20	6	19	10
College degree (tertiary short-cycle education)	56	7	66	8	55	21	40	6
University degree (tertiary long-cycle education)	25	0	30	0	22	0	32	0
Wage and salaried workers	27	7	29	7	19	6	27	6
Others, mainly self-employed workers	42	8	55	3	29	10	46	4
Industry and construction	36	6	41	2	24	6	30	5
Trade, accommodation, and food service activities	44	10	57	6	28	6	34	2
Transport, communication, individual services	30	11	42	8	24	5	32	10
Financial, real estate, renting, and business activities	25	5	20	8	13	5	12	13
Public services	20	7	18	7	9	9	25	4

Source: Kupets, O. *Education in Transition and Job Mismatch: Evidence from the Skills Survey in Non-EU Transition Economies*. Kyoto Institute of Economic Research Discussion Paper No. 915, 2015 [1].

shifted from industry to services, many displaced workers with industry-related degrees were forced to accept lower-level jobs in other sectors that did not require specific training and skills or for which retraining did not take a lot of time and effort. In Georgia, workers with a degree or certificate in services and office work are overrepresented among overeducated workers compared with well-matched employees. Overeducation of workers with a formal education

in the services sector can be attributed to distortions in the modern education system in Georgia rather than to job reallocation during transition [1].

Finally, a study based on the Skills Toward Employment and Productivity household surveys of urban workers reveals a large proportion of overeducated workers who have been in their current jobs for more than five years: from 37% in Armenia to more than 53% in Macedonia [1]. Long periods of overeducation imply a loss of human capital as the skills and competencies acquired through formal education become obsolete. As a result, large numbers of formally educated workers, both young and old, risk getting trapped in their current jobs with little chance of moving to better matched jobs due to state dependence and low access to training opportunities.

## LIMITATIONS AND GAPS

Data limitations and measurement issues complicate the empirical analysis of skill mismatch and overeducation in transition economies. An important limitation is that comparable data are available for only a few countries. For example, World Bank Skills Toward Employment and Productivity surveys are conducted only in selected transition and developing economies, while the EU Labour Force Surveys do not cover transition economies that are not EU members. In addition, studies measure education–job mismatches differently depending on the data available. The different approaches have advantages and limitations, and none has proved to yield more reliable and conceptually more correct estimates than the others [4].

The employer and household Skills Toward Employment and Productivity surveys, while providing crucial information on skills and labor market outcomes for policymakers, have limitations for empirical testing of hypotheses. For employer surveys, these limitations include small samples covering only selected economic sectors, differences in the time of the survey and in how typical workers with skill gaps are selected in Armenia and Georgia compared with Macedonia and Ukraine, and pre-defined lists of skill sets that do not elicit much-needed information about job-specific technical skills within occupation and sector [9]. The main limitation of household Skills Toward Employment and Productivity surveys is that respondents are limited to urban working-age populations, a group that is usually less vulnerable to education–job mismatch than rural populations. In addition, survey samples are somewhat biased and smaller than the all-national Labor Force Surveys. Finally, the surveys include no questions on the relevance of workers' skills; therefore, only a measure of education–job mismatch (overeducation and undereducation) can be constructed based on the household survey data.

Although the household Skills Toward Employment and Productivity surveys collect information on field of study, no work has yet been done on horizontal mismatch or its interaction with vertical mismatch. That is because there are many missing values for the horizontal mismatch variable for the late-reforming transition economies in the standard tables of correspondence between workers' qualifications (specializations) and the requirements of particular occupations. More time is needed to adapt the standard tables to the transition economies, taking into account additional information about the economic sector and workers' educational attainment. Similarly, the household surveys collect information on the earnings of urban workers, but the analysis of possible wage penalties associated with being overeducated is complicated by the low reliability of the surveys' income data (because of high non-response rates to income questions, widespread wage arrears, underdeclared labor income, and irregular work patterns). Another important unanswered question concerns the



relationship between the share of mismatched workers in a particular firm and productivity within the firm.

## SUMMARY AND POLICY ADVICE

In transition economies, substantial skill shortages coexist with widespread and persistent overeducation of workers. Along with many other challenges facing transition economies, skill mismatches threaten their international competitiveness and slow their transition to higher value-added activities and sustainable development. To end the large and persistent costs of skill mismatch and promote a virtuous circle of skills development, policymakers need to coordinate their strategies for education and skills development and involve all stakeholders in identifying solutions.

Employers and some policymakers often blame national education and training system for attracting too many students to some fields and for the low quality of the education and training provided. The solution often proposed to skill mismatch is to improve career guidance, along with the quality and relevance of formal education. However, recent studies of skill supply and demand in transition economies suggest some other contributors to skill mismatches: firms that do not adopt new technologies, do not train their workers, and do not cooperate with the education and training system; workers who make the wrong career choices and do not adapt to changing demands for skills through upskilling and continuous training; and institutions that do not provide relevant labor market information, adult training, and other support to jobseekers and that do not encourage job creation and on-the-job training [7], [9].

Policies targeted to specific groups of workers and firms can be more effective than broader measures. Innovative and more dynamic firms tend to require higher-order modern skills and are therefore more seriously affected by skill gaps than other firms. These firms need assistance in matching job-seekers with employment opportunities. At the same time, more extensive long-term policy measures are required to encourage many other firms to adopt new technologies and practices that can make more effective use of a country's skills endowment. Improving the quality of the workforce could attract advanced technologies and stimulate local labor markets. To meet the challenge of aging populations in many transition economies, it is crucial to equip older displaced workers with up-to-date skills through adult training so that they are able to stay in productive employment longer.

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## Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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