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## 2.2. How has improvement in workers' educational attainment impacted educational mismatches?

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### 1. Motivation

A structural feature of the Portuguese workforce has been a low level of education by European standards. Over the last decades, however, there has been a considerable increase in workers' educational attainment. At the same time, occupations requiring more qualifications have gained importance, as economies modernize and the weight of technology intensive industries grows. Such developments have impacted on educational mismatches, that is, the lack or excess of education relatively to that required for workers to adequately perform their jobs. These phenomena are known, respectively, as undereducation and overeducation.

Educational mismatches entail costs for the economies. Overeducation prevents workers' qualifications to be fully put to use, while undereducated workers are likely to have a deficit of skills impacting negatively on their productivity. Furthermore, educational mismatches may indirectly impact firm productivity through their effects on wages and, more generally, job satisfaction.

This Section, based on Pimenta and Pereira (2019), deals with educational mismatches in Portugal over the last two decades. A first issue considered is the impact on undereducation of the catching up of the portuguese workforce to higher education levels. There has been a consistent reduction in undereducation, in line with the replacement of generations in the labour market. Higher undereducation in Portugal vis-à-vis European Union countries is currently mostly a problem of older employees. Additionally, the growing number of highly educated workers coming to the labour market, particularly college graduates, has given rise to overeducation only to a very limited extent. In particular, the figures for Portugal stand below those for the majority of the European countries.

## 2. Data and computation of educational mismatches

The evolution of educational mismatches is assessed on the basis of two micro datasets: *Quadros de Pessoal*, for Portugal, and the Survey on Income and Living Conditions (EU-SILC), for the European Union countries. The two key variables are employees' occupations and educational attainment. The evaluation of educational mismatches relies on the definition of a required education level for each occupation. In general, measured mismatches depend heavily on such a definition, while there is no single best methodology for determining the required education level. The results presented in this Section are based on a standard correspondence between the International Standard Classification of Occupations (ISCO-08) and the International Standard Classification of Education (ISCED-97), developed by the International Labour Organization (ILO, 2012). Pimenta and Pereira (2019) use a 6-occupation-breakdown, corresponding to a slightly aggregated version of eight ISCO-08 major groups: Unskilled workers, Skilled manual workers, Services and Sales workers, Administrative staff, Technicians and Professionals.

## 3. Evolution of educational mismatches in the portuguese labour market

Figure 13 presents the evolution of overall educational mismatches and Figure 14 shows the breakdown by occupations and potential experience cohorts. The approximation of portuguese workforce education to European standards implied a consistent reduction of undereducation over time, from around two thirds of the employees in

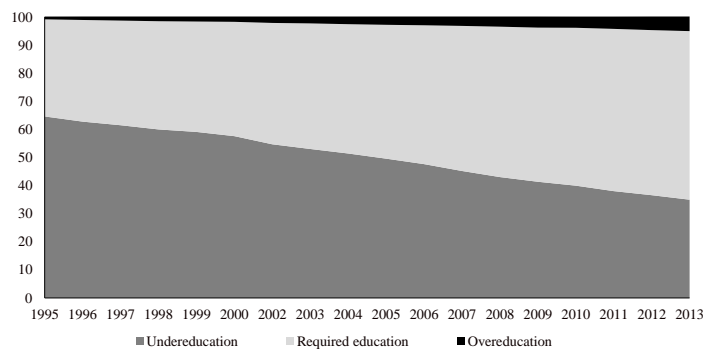
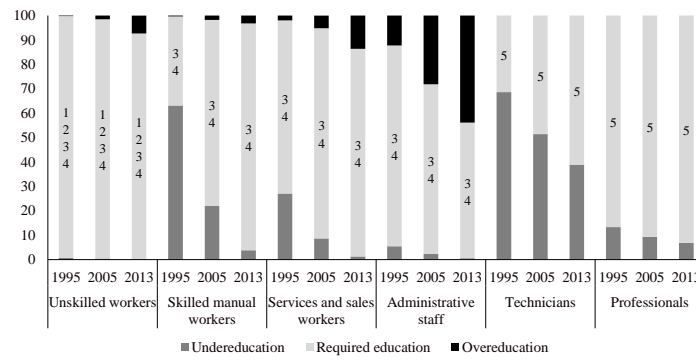
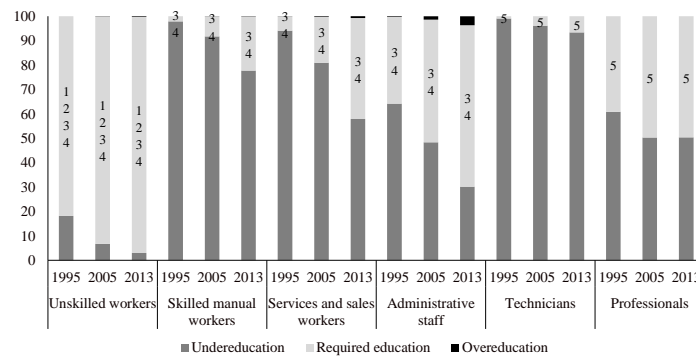


Figure 13: Evolution of overall educational mismatches according to ISCO-ISCED indicator (in percentage).

Source: Authors' calculations based on *Quadros de Pessoal* (1995-2013).



(a) Cohort 0-10 years of experience



(b) Cohort over 30 years of experience

Figure 14: Evolution of educational mismatches by occupation and experience cohorts using ISCO-ISCED indicator (in percentage).

Note: Numbers on the bars refer to the education required for each occupation in each year: 0=None, 1=1st cycle of primary education, 2=2nd cycle of primary education, 3=3rd cycle of primary education, 4=Upper secondary and Post-secondary education and 5=Tertiary education.

Source: Authors' calculations based on *Quadros de Pessoal* (1995-2013).

1995 to approximately one third in 2013 (Figure 13). This trend is common to all four potential experience cohorts, although the level of undereducation varies substantially across such cohorts (Figure 14). It stood at around 80% for the cohort of employees with more than 30 years of experience, in the mid-90s, remaining at 60% at the end of the sample. In contrast, in the lowest experience cohort, undereducation came down from approximately 33% at the beginning of the sample to 7% at the end of it. The decreasing profile of undereducation over time within potential experience cohorts reflects the gradual replacement in the labour market of older generations by newer, more educated ones. Overeducation remains a rather unimportant phenomenon throughout, rising from negligible values at the beginning of the sample to around 5% at the end of it (Figure 13). Overeducation is higher for employees with up to 10 years of experience, increasing

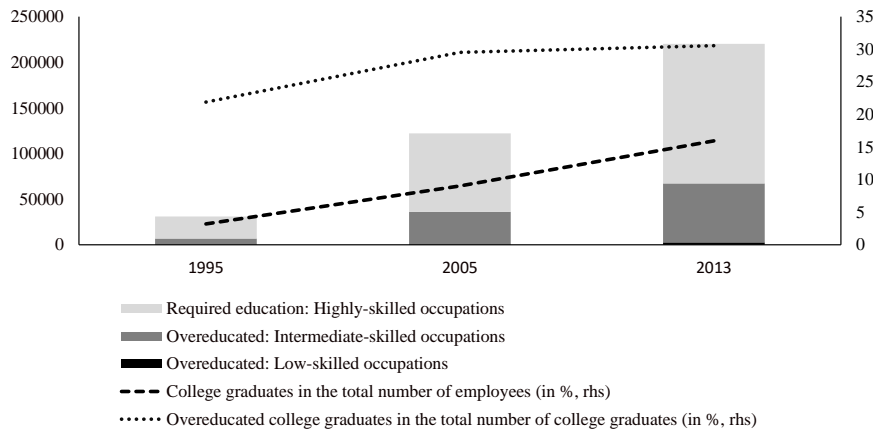


Figure 15: Occupations and educational mismatches of college graduates according to ISCO-ISCED indicator.

Notes: Low-skilled occupations include Unskilled workers; Intermediate-skilled occupations include Skilled manual workers, Services and Sales workers and Administrative staff; Highly-skilled occupations include Technicians and Professionals. According to ISCO-ISCED correspondence, overeducated college graduates are those in low- and intermediate-skilled occupations.

Source: Authors' calculations based on *Quadros de Pessoal* (1995-2013).

from 4% in 1995 to 12% in 2013. For more experienced cohorts, the proportion of overeducated employees is still negligible at the end of the sample (Figure 14).

### 3.1. Overeducated college graduates

The increase in the proportion of college graduates in the Portuguese labour force has been a prominent development in the last two decades. Figure 15 shows that the proportion of college graduates in the total number of employees increased from about 3% to 16% between 1995 and 2013. These employees have been mainly hired by the service sector, whose weight in employment of college graduates has gone up, matching a decrease in the weight of manufacturing.

The share of overeducated college graduates in the total number of college graduates has gone up in the first decade of the sample (from 20% to 30%) and then approximately stabilized. Despite the increase in overeducation, the bulk of the incoming college graduates coming to the Portuguese labour market were able to find highly-skilled occupations, in which the economy should profit most from their qualifications.

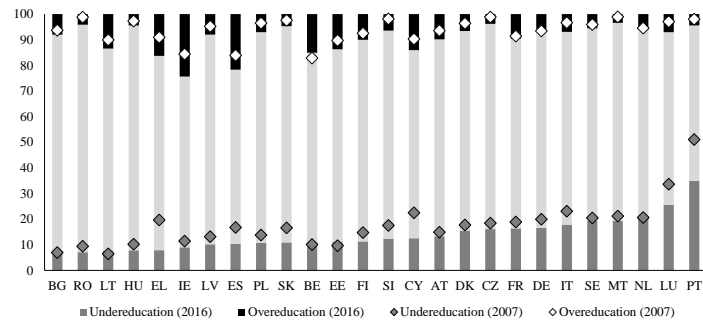


Figure 16: Evolution of educational mismatches by European Union country between 2007 and 2016 using ISCO-ISCED indicator (in percentage).

Notes: All results were weighted with sample weights, which allow an extrapolation to the entire population. The 26 countries represented are: Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI) and Sweden (SE).

Source: Authors' calculations based on EU-SILC.

### 3.2. Educational mismatches: Portugal vis-à-vis the European Union

Figure 16 presents an international comparison of educational mismatches for 2007 and 2016. Portugal is the country with the highest incidence of undereducation in both years, despite the reduction from 2007 to 2016. This disadvantage of Portugal vis-à-vis the European Union mainly reflects the low levels of education of more experienced employees in intermediate-skilled occupations. However, the aforementioned approximation of the level of education of the Portuguese workforce to international standards has contributed to mitigate such a disadvantage.

It is worth noting that the Portuguese workers employed in low-skilled occupations also had lower levels of education than their European peers, but this does not show up as undereducation because the ISCO-ISCED methodology considers as required education a very broad scope of attainment levels (as we can see in Figure 14). Moreover, some undereducation remains in highly-skilled occupations (specially for Technicians), but this is common to other European countries.

As regards overeducation, Portugal has an incidence below the European Union average and this holds throughout experience cohorts.

#### 4. Final remarks

There has been a steady decline in the proportion of undereducated employees in the Portuguese labour market as younger and more educated generations replace the older ones. In turn, overeducation in Portugal has slightly increased but remains low, even in more recent years. An important caveat for the methodologies used is that required education is evaluated solely on the basis of formal education, while other skills coming from broad-based knowledge, on-the-job training and experience might be equally important for workers to adequately perform their jobs. Additionally, one is only looking at on-the-job mismatches and does not observe the workers who could not find a job (and perhaps were unemployed or emigrated), something that may have been particularly important around 2013, coinciding with the economic downturn.

#### References

- ILO (2012). "International Standard Classification of Occupations: Structure, group definitions and correspondence tables." *International Labour Organization*.
- Pimenta, Ana Catarina and Manuel Coutinho Pereira (2019). "Aggregate educational mismatches in the Portuguese labour market." *Banco de Portugal Economic Studies*, 5(1), 41–66.