Paper prepared for the CEDEFOP/IZA Workshop on Skills and Skill Mismatch
(29-30 October 2015, Thessaloniki, Greece)

Regional upgrading or regional downgrading?
Over-education and underemployment in Greece's lagging-behind regions

Vassilis Monastiriotis
European Institute, London School of Economics
Address: Houghton Street, WC2A 2AE, London, United Kingdom
Contact: email: v.monastiriotis@lse.ac.uk; tel.: +44 (0)20 79556937

Keywords: over-education, supply-side policies, regional disparities, lagging-behind regions

Introduction

Regional disparities in most national settings prove rather persistent and difficult to address, despite policy efforts aiming at upgrading the physical and human / educational infrastructure of lagging regions to instigate regional convergence. The emphasis on supply-side measures (including measures aiming at increasing labour mobility and upgrading the skills content of the local labour force) is supported by what is today a significant body of research focusing on skills shortages and mismatch as key elements hampering not only productivity and growth but also labour market success at the individual level and social inclusion for society at large (Manacorda and Petrongolo, 1999; Blazquez and Marcel, 2008; Nickson et al, 2012; Cappelli, 2015; McGowan et al, 2015). As is discussed in this literature, skill shortages and mismatch are often seen as manifestations of *supply-side* problems in the economy (including in the sense of slow responsiveness to rapidly changing demand for skills, e.g., due to technical change – Machin, 1996; Gregg and Manning,

1997; Haskel and Martin, 2001; Cappelli, 2015). It is thus thought that addressing these (e.g., through vocational education and training or through incentivising job-search and labour mobility – for shortages and mismatch, respectively) can contribute significantly to improving economic outcomes at both the micro (individual) and macro levels, thus resulting in higher levels of employment, wage growth / progression, productivity and, ultimately, output growth.

Despite this, in many of the lagging regions labour market conditions suggest that problems of skill shortages and educational gaps are rather limited; while, instead, such supply-side problems are often more pressing in the most dynamic regions. This is a rather problematic observation, as it suggests that aiming at upgrading the physical and human / educational infrastructure of lagging regions may not be a sufficient – or even a necessary – condition for addressing persistent regional economic disparities and thus for supporting economic development at the local (and national) level. Indeed, despite this emphasis on skill shortages and, more generally, the under-supply of appropriate skills as barriers to economic development, it appears that problems of development, at least at the sub-national level, are often linked to the incidence of over-education, i.e., of the tendency of individuals to be located in jobs with lower educational requirements (and/or skill content) than this that they possess (Green and Owen, 2003). In the academic sphere, attention to the issue of over-education has its roots to the old literature of 'bumping down' (Reder, 1955; Metcalf, 1975; Borghans and de Grip, 2000; Lene, 2011) and has more recently obtained a new impetus through studies examining more contemporary, but related, notions such as job competition and employer sorting (Muysken and Weel, 1999; Ordine and Rose, 2011; Croce and Ghignoni, 2012). Although parts of this discussion connect directly to questions of skill mismatch, i.e., with the incidence of over-education co-existing with that of under-education and unemployment / employability problems (Battu and Sloane, 2000; McGuinness, 2006; Leuven and Oosterbeek, 2011) and thus problems of supply and labour market frictions (in the sense of weak matching, job-search and job-mobility), the issue of over-education is largely perceived as a demand-side problem reflecting weaknesses in the availability (supply) of skilled *jobs* than of a sufficiently and appropriately educated (skilled) workforce. The general implication emerging from this is that skills in themselves are not necessarily a driver of economic success at the individual level or, inversely, that they are not necessarily a constraint to economic success at the meso- and macro-levels (i.e., for businesses and for the economy as a whole).

This paper examines the extent of over-education, and its spatial variation, across the Greek regions as a means for measuring the degree to which problems of economic performance in the lagging regions of the country may be linked to skill shortages – and, in this sense, perceived supply-side problems having to do with the under-supply of skills (as measured by educational qualifications). Interestingly, although measured levels of over-education – across a variety of candidate measures – appear to be rather disparate across space, no particular spatial pattern is found (either in terms of spatial heterogeneity or in terms of spatial association). Instead, the incidence of over-education is found to be rather systematically associated to three key parameters: urban agglomeration (metropolitan areas), a history of depressed demand (in the form of past unemployment), and, inversely, regional incomes – especially so in times of heightened economic slack. This suggests that the distribution of 'excess' skills across space (and thus also the distribution of skill shortages) is linked more to differences in demand-side conditions (unemployment, regional incomes) and perhaps to wider issues of economic structure. It follows that over-education, at least in the Greek case, is more an issue of quality in the supply of jobs than of the composition of the supply of skills (in the sense of mismatch). In policy terms the implication is that measures aiming at the upgrading of lagging regions should rely more on the labour-demand side and in particular on incentives and strategies to diversify and modernise the economic base of these regions. But as such processes of diversification have a long-run horizon, it is perhaps possible that, paradoxically, a regional upgrading strategy may also involve elements of "educational down-grading", as a means for improving the matching between the local skills supply and the skill-mix of local labour demand.

The measurement of over-education

As noted already, it is generally believed that investment in education and skills upgrading are significant components in a strategy for regional (and national) economic development. In particular economic contexts, however, such as that of Greece but also perhaps more generally that of the less developed economies of the European periphery (e.g., parts of Central Eastern Europe and the Balkans), this assertion seems somewhat less unproblematic. Like the former communist states in Europe, Greece has a rather high stock of educated workers, as is manifested both by absolute measures (e.g., average years of schooling or percentage of tertiary-education degree-holders) and by evidence on the size of returns to education and the intensity of employment sorting on the basis of education. Indeed, returns to

education in Greece appear to be significantly lower than in other countries (Lopez-Bazo et al, 2015; Christopoulou and Monastiriotis, 2015), while also low are the employment probabilities associated to additional years of schooling (Monastiriotis and Martelli, 2014). This suggests that education, at least in its formal sense, is not in short supply – or, not too intensively sought after – in the country.

Anecdotally, it appears that an inverse problem, of over-education, is quite prevalent: a sizeable part of the workforce is "matched" to jobs with significantly lower educational requirements relative to the educational qualifications possessed by those workers. Of course, establishing this beyond the anecdotal level is anything but straightforward. Indeed, the literature on over-education addresses to great extent the conceptual and empirical challenges with regard to measuring over-education and, importantly, establishing a link between education and marketable skills or, in other words, between over-education and over-skilling (Green and McIntosh, 2007; Robst, 2008; Chevalier and Lindley, 2009).

Generally, there are two approaches to measuring over-education in the literature (McGuinnes, 2006). One concerns subjective measures, whereby individuals are asked to assess their status (overeducated or not) either in general or in relation to (what they perceive to be) the minimum educational/skill requirements of their job. The other concerns so-called 'objective' measures, which rely on statistical or expert information to derive a set of minimum educational requirements (per job or, more typically, per detailed occupational group). Expert information (the so-called 'job analysts approach') is sometimes organised into classification systems – for example, the USA Directory of Occupational Titles – but the relevance and usefulness of these across contexts (countries) and over time is, by nature, limited. Alternatively, and more easily in practical terms, the statistical approach (known as the 'objective mean approach') relies on actual case-specific data (e.g., from workforce surveys) from which it derives a within-sample estimation of the 'average' level of schooling in each occupation and thus of occupation-specific measures of the incidence of over-education (share of employees with above-average schooling).

In our analysis we follow the statistical approach to measuring over-education, given the lack of any alternative information, either 'subjective' (i.e., employee surveys directly asking questions on over-education) or 'objective' (i.e., an existing educational-requirements classification for Greece). Specifically, we use individual-level data from the Greek Labour Force Survey (for the period 2008-2013), relying in

particular on the schooling and education information for all people in dependent employment (salary-earners). However, we deviate somewhat from the traditional 'objective mean' approach, as described below. This is because – given the lack of any prior studies on the topic for Greece – we want to get a fuller and more diverse picture about the incidence of over-education ion the country. Thus, we use four alternative 'objective' thresholds for the measurement of over-education: (a) the actual years of schooling corresponding to the value of one standard deviation above the mean of the distribution of schooling in the sample; (b) the actual years of schooling corresponding to 115% of the years of schooling for the median worker (in terms of education) in the sample; (c) the actual years of schooling corresponding to the first quantile (25%) of the distribution of years-of-schooling in the sample; and (d) the level of educational qualification (level of degree; not measured in years) corresponding to the mode of the distribution of educational degrees in the sample. For each of these measures, individuals with above-threshold values obtained the value of one and are thus classified as 'over-educated'.

To derive sufficient detail for our analysis, the groups that we look at are not defined simply in terms of occupations but, instead, are based on combinations of sectors and occupations (sector-occupation groups, using 2-digit sectoral and occupational classifications). This accounts for the fact that educational requirements for any given occupation are not constant across industries, i.e., it allows for example for 'Science and engineering professionals' to face different educational requirements in Manufacturing than in Construction / Civil Engineering. Given our interest in the geographical picture and in particular in the distribution of over-education across space – as well as in its association with some key regional characteristics such as regional incomes and unemployment – we aggregated this data not at the occupation level but rather at the level of regions, using the 15-region classification provided by the Greek Statistical Authorities (13 NUTS-2 regions plus separate information for the two main metropolitan areas of Athens, the Greek capital, and Thessaloniki). Specifically, we expressed the sum of over-educated workers in the region as a share of the total number of employees there, thus deriving a region-specific percentage measure of over-education for each of our sample years. Note that this method produces an aggregate (region/year-specific) measure of over-education which uses different thresholds for employees in different sectors and occupations but uniformly across regions, i.e., it is defined at the national level for any given sector-occupation group.

Last, we developed this measurement further, in two ways. First, we calculated our four 'over-education' measures (as described above) for three separate reference groups: (a) the full sample (all employees in salaried employment), (b) a restricted sample of young workers (salaried employees aged 16-24), and (c) a restricted sample of 'new hires' (salaried employees with a maximum of 59 months of tenure in their current job). Second, we also produced a measure of 'educational sorting', separate to our measurement of over-education. This is calculated, again at the regional level, as the ratio of the average years of schooling of all dependent (salaried) employees in a region over the average years of schooling of all those who were currently unemployed (out of work but available and actively seeking work) in the region. Geared with this information we proceeded to our empirical analysis, which is presented in section 4, after some further considerations that are presented in the next section.

Considerations for the analysis

The analysis in this paper has a dual purpose: on the one hand, to provide for the first time for an economy such as Greece a detailed picture of the extent and geographical distribution of over-education in the country; on the other hand, to provide some evidence about the possible link between over-education (and, by the same token, under-education / skill shortages) and key regional characteristics. Specifically, the questions we ask are as follows.

a. What is the picture of over-education in Greece and how does it vary across groups, across measures, across space and over time?
b. How does over-education correlate with the levels of development (regional incomes) and local demand pressures (regional unemployment)?

Given the availability of information for years both prior to and during the Greek crisis, these questions obtain also an important dimension in relation to wider concerns about how sudden slumps / deep recessions may affect the utilisation of and demand for skilled labour, both in general and in relation to less skilled/educated labour (in job-competition / labour substitution terms). By looking at these questions, a number of other important issues are put aside for further research. These include practical/empirical questions such as the key *individual determinants* of over-education (i.e., who are the over-educated) and the *key effects* of over-education at the individual level (e.g., how over-education affects individuals' wages / how it is rewarded); but also wider questions about the functioning of the Greek labour market, and in particular about processes of wage determination with regard to

equilibrium (e.g., human capital), disequilibrium (e.g., job competition) and institutional (e.g., job assignment) explanations.

Despite this, our analysis here allows us to move beyond pure description (as depicted in points (a) and (b) above) and instead draw some inferences, or at least make some tentative assertions, about key functional characteristics of the Greek labour market and of the regional economies of the country more broadly. To demonstrate this, consider the following. Starting from a spatial equilibrium, regional differences in over-education should reflect (permanent) differences in amenities or sector-occupation structures, i.e., be a result of differences across workers with different educational qualifications in their preferences for specific amenities or be simply a compositional issue, whereby over-education is higher in regions that specialise in sectors/occupations with higher rates of over-education. However, in cases with weak regional equilibration mechanisms, such as that of Greece (Monastiriotis and Martelli, 2014), regional differences in the extent of over-education will *necessarily* reflect additionally differences in pressures of demand and job quality across space. Not only that, but the particular associations that over-education may reveal across space with other regional characteristics (even at the descriptive level) will inform us about the labour market processes characterising the regional economies in the country. In particular:

- If over-education is found to be *higher* in high-unemployment regions, then its incidence would be consistent with one or both of the 'employment sorting' (i.e., selectivity by firms) and 'bumping down' (i.e., relationally, between competing employees) hypotheses, and should thus be taken to reflect a higher or lower intensity of (labour) demand problems in these regions.
- If over-education is found to be *lower* in high-unemployment regions, then its incidence would rather be more reflective of some sort of supply-side problems in these economy, in the sense that it would indicate an inclination of unemployed people to 'wait' (wait unemployment) and/or a quality level of labour supply (in terms of skills) which may be below admissible levels of employability.

Similarly,

- If over-education is found to be higher in *high-income* regions, this could be taken as an indication that agglomeration forces (e.g., Marshallian labour market pooling) operate well in the more advanced geographical areas, while the less advanced areas (low-income regions) are characterise by skill shortages / under-supply).

- If, in turn, over-education is found to be higher in *low-income* regions, then this would be rather indicative of *job-quality* (and thus demand-side) problems in the less advanced areas, combined with a more effective (job-)matching in the more advanced areas.

Although the evidence provided from the empirical analysis of this paper does not allow for a definitive identification of any of the above processes, as mentioned already it may well be providing information that will be *indicative* of these processes. On the whole, the evidence could provide a first indication as to whether problems of regional development and convergence are of a demand or supply nature (i.e., related to weak job quality versus low quality of the supplied skills). The same applies to the case of conclusions that can be drawn in relation to the effects of the crisis. For example, one could reasonably anticipate that in times of crisis over-education will increase due to sorting / bumping down and reduced 'pickiness' (wait unemployment): in those cases, the education levels of the unemployed will also decline relative to those of the employees (those in salaried employment). Our descriptive investigation allows us to examine directly whether these expectations are consistent with the data.

Empirical results

As indicted above, a first step into our analysis is the examination of the extent of over-education. We present a picture of this, at the national level (average across regions) across our four measures of over-education and for different reference groups as well as for the two years before and at the peak of the crisis 2008 and 2013, respectively), in the two panels of Table 1.

As can be seen – and as should be expected, given the differences in definitions – there is significant variation in the revealed extent of over-education across measures. Even by the most conservative measures, however, at least one in ten employees appear to work on jobs with educational requirements well below their qualifications. Importantly, and counter to our expectations, the intensity of over-education has not increased with the crisis. Although this may seem counter-intuitive, it should be noted that this may simply be an artefact of our 'objective' measurement of over-education: if read in this prism, the result simply shows that average / median educational qualification levels increased everywhere for those staying in employment and thus the share of those with above-threshold qualifications fell.

Table 1. Levels of over-education in Greece

Measure 2008	All employees	New hires (<5 years)	Young workers
Average (mean plus one s.d.)	13.0%	12.3%	10.6%
Median (15% above the median)	20.9%	18.5%	15.2%
Quantile (above 25% of distribution)	49.9%	49.3%	41.6%
Mode (those above the mode degree)	16.7%	15.8%	15.9%

Measure 2013	All employees	New hires (<5 years)	Young workers
Average (mean plus one s.d.)	11.9%	10.2%	8.3%
Median (15% above the median)	19.2%	21.1%	18.4%
Quantile (above 25% of distribution)	43.2%	43.9%	38.2%
Mode (those above the mode degree)	17.6%	16.0%	17.0%

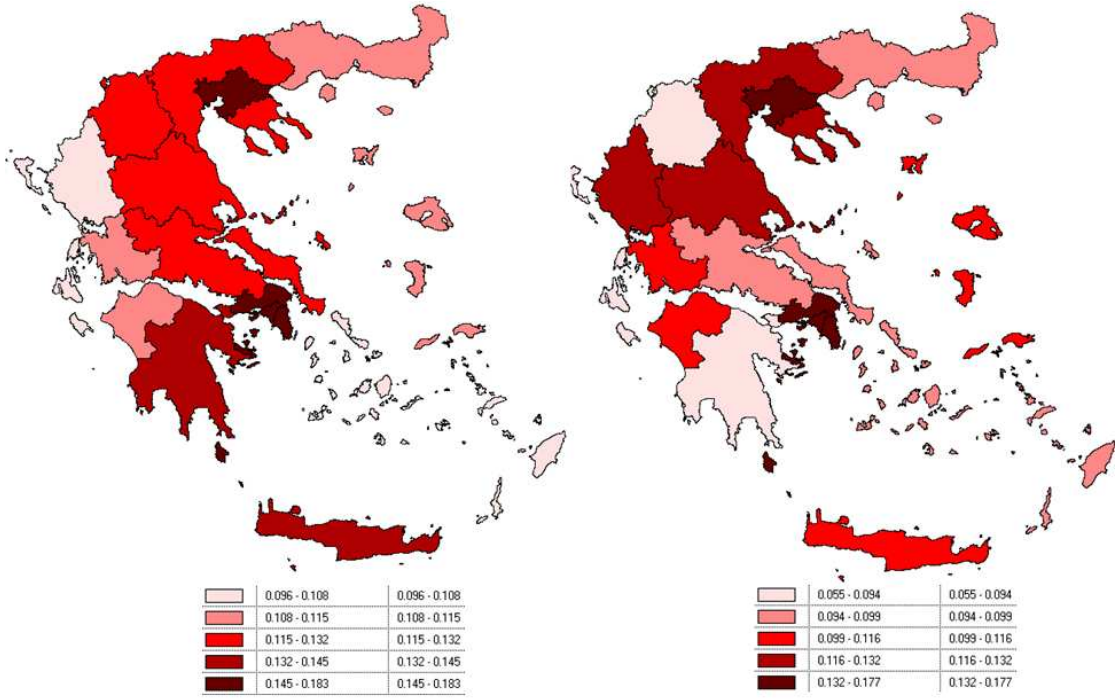
Source: author's elaboration of Greek LFS data

It is also important to note the relatively small differences in measured over-education observed for difference reference groups. Intuitively, one would expect that over-education would appear higher when measured across the full population, as older workers in any given occupation will naturally have less education (and perhaps compensate for this through their work experience), artificially lowering the over-education threshold and thus raising the share of workers that appear over-educated. In this sense, narrowing the sample to only new-hires or to only young workers should lead to lower values for the over-education measures. Although this is indeed the case in our data, the differences in most cases are rather small and, importantly, they are not significantly different between the pre-crisis and crisis periods.

In contrast, differences between the pre-crisis and crisis periods are more evident in the geography of over-education (across regions). As is shown in Figure 1, the share of over-educated workers in 2008 was highest in the two metropolitan regions of Athens and Thessoliniki and in a north-south axis running across these. By 2013 this geography had changed significantly: while the two metropolitan areas remained the

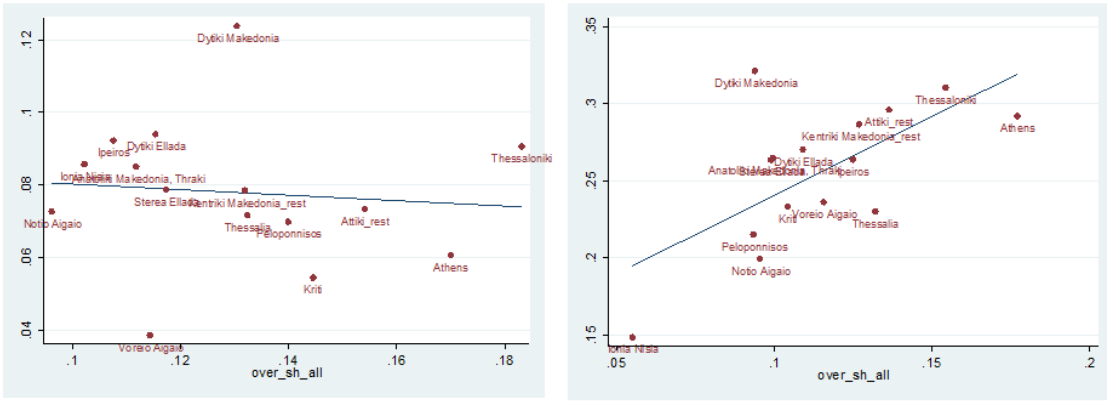
ones with the highest share of over-education, other regions emerged, both in the eastern and the western parts of the country, where over-education became more prevalent.

Figure 1. The geography of over-education in Greece



Note: Share 'over-educated' (> +1sd of mean), all employees, 2008 and 2013.
Source: author's elaboration of Greek LFS data.

Figure 2. Over-education and unemployment



2008 **2013**

Note: Share 'over-educated' (> +1sd of mean), all employees, 2008 and 2013.
Source: author's elaboration of Greek LFS data.

These spatial variations, and their changes between periods, leads us to the next issue, concerning the relationship between over-education and regional economic performance indicators / regional characteristics. Figure 2 presents the correlation between over-education and unemployment separately for the two periods. It is interesting to note that in the pre-crisis period this appears to have been mildly negative. In line with our earlier discussion, this would seem to be consistent with a view indicating problems of 'wait' unemployment and employability / labour quality problems – although only to a limited extent, given the weak significance of this relationship in 2008. By 2013, however, this relationship is strongly reversed: over-education is now clearly higher in high-unemployment regions, i.e., in the regions that were affected most by the crisis. Following our earlier discussion, this appears as clear evidence that the crisis represented a shift from (minor) supply-side problems to significant demand-side constraints: with erupting unemployment, over-education intensified, indicating increased employment sorting and more intense job competition (bumping down).

Conclusions

This draft is incomplete, as the research that it reports on is still work in progress. A more diverse set of results and a fuller analysis, including spatio-statistical (examining how systematically the incidence of over-education is distributed across space) and econometric (concerning the analysis of the link between over-education, the composition of personal characteristics in each region and various regional/area characteristics, such as unemployment) investigations, will be available in the full draft of the paper. At this stage, however, some preliminary conclusions can be drawn. Our analysis (also from results not reported here) suggests that regional differences in the extent/prevalence of over-education are only weakly 'structured' across space. There is weak spatial dependence both before and after the crisis, even though patterns of dependence appear to shift for some measures between the two periods. Also, there appears to be rather little of a relationship between over-education and the location/type of regions (North, Rural, Island). The only – but very strong – exception to this has to do with the 'Metropolitan' status, which intuitively would seem to proxy for agglomeration influences. For metropolitan regions, over-education is well above the national average and has, if anything, intensified with the crisis. Besides these geographical patterns, over-education appears to be on the whole: positively associated with levels of human capital; negatively associated with

regional incomes (outside the metro-areas); and positively associated with unemployment (but only in the crisis). These findings point largely towards explanations of regional backwardness that have to do more with problems of labour demand, and in particular job-quality, which may be creating conditions of job competition (and thus occupational downgrading) especially in recessionary periods. This in turn suggests that addressing problems of (regional) economic development and backwardness – at least in the particular context of Greece – requires a different strategy than a predominant focus on education and skills upgrading for the existing labour force. Perhaps one ingredient of this strategy may have to do with improving labour mobility, both across space (regions) and more generally. But another important ingredient will undoubtedly entail concerted efforts to uplift the quality of jobs that are on offer in the lagging-behind regions.

References

Battu, Harminder, and Peter Sloane. "Overeducation and crowding out in Britain." The overeducated worker (2000): 157-174.

Blázquez, Maite, and Marcel Jansen. "Search, mismatch and unemployment."European Economic Review 52.3 (2008): 498-526.

Borghans, Lex, and Andries de Grip. "The overeducated worker?: the economics of skill utilization." (2000).

Cappelli, Peter H. "Skill Gaps, Skill Shortages, and Skill Mismatches Evidence and Arguments for the United States." ILR Review (2015): 0019793914564961.

Green, Anne, and David Owen. "Skill shortages: local perspectives from England." Regional Studies 37.2 (2003): 123-134.

Gregg, Paul, and Alan Manning. "Skill-biassed change, unemployment and wage inequality." European Economic Review 41.6 (1997): 1173-1200.

Haskel, Jonathan, and Christopher Martin. "Technology, wages, and skill shortages: evidence from UK micro data." Oxford Economic Papers 53.4 (2001): 642-658.

Léné, Alexandre. "Occupational downgrading and bumping down: The combined effects of education and experience." Labour Economics 18.2 (2011): 257-269.

Leuven, Edwin, and Hessel Oosterbeek. "Overeducation and mismatch in the labor market." Handbook of the Economics of Education 4 (2011): 283-326.

Machin, Stephen. "Changes in the relative demand for skills." Acquiring skills: Market failures, their symptoms and policy responses (1996): 127-146.

Manacorda, Marco, and Barbara Petrongolo. "Skill Mismatch and Unemployment in OECD Countries Marco Manacorda." Economica 66.262 (1999): 181-207.

McGowan, Muge Adalet, and Dan Andrews. Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data. No. 1209. OECD Publishing, 2015.

McGuinness, Seamus. "Overeducation in the labour market." Journal of economic surveys 20.3 (2006): 387-418.

Metcalf, David. "Urban unemployment in England." The Economic Journal(1975): 578-589.

Nickson, D., Warhurst, C., Commander, J., Hurrell, S. A., & Cullen, A. M. (2012). Soft skills and employability: Evidence from UK retail. Economic and Industrial Democracy, 33(1), 65-84.

Reder M. (1955), The theory of occupational wage differentials, American Economic Review, 44.