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Is Mass Higher Education Working? An Update and a Reflection on the Sustainability of Higher Education Expansion in Portugal

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**Is Mass Higher Education Working? An Update and a Reflection on the Sustainability of
Higher Education Expansion in Portugal**

by

Hugo Figueiredo[♦], Pedro Teixeira^{*}, Jill Rubery[^]

Abstract

The appeal of HE expansion has been particularly significant in the case of Portugal, whose levels of qualification of the labour force have been historically low. Over the last two decades the country has experienced a massive expansion of its higher education system and the numbers of students enrolled and rates of enrolment have multiplied more than four times. This paper focuses on the sustainability of this trend of higher education (HE) expansion in Portugal and attempts to update and rebalance a debate that is too often carried out exclusively from a supply-side perspective. The paper develops an empirical framework which incorporates the diversity of jobs currently carried out by university graduates and their changing skill requirements but that also provides a useful benchmark to refer to growing expectations mismatches among graduates. Using a new typology of graduate-level jobs and staff logs data collected annually by the Portuguese Government for private sector employees, the paper analyses the increasing dispersion of graduates' relative earnings and relates this trend to the increasing diversification of their jobs. The paper also tests more directly the impact of over-education (relative to the graduate jobs' current skill requirements) and finds that the relative penalty associated with this condition has increased during the 1995-2005 period. The paper then questions the extent to which Portugal can continue to be portrayed as a straightforward success story regarding the massification of HE and considers the implications regarding political and social support for continuing expansion in the system.

Keywords: human capital; higher education massification; demand for graduates; over-education; inequality

1. Introduction

In recent years the expansion of higher education (HE) has become a staple of most political agendas. This has been presented as a strategy that is not only virtuous from an economic point of view, but also with clear social benefits regarding equality of opportunities and social mobility. The EU's Lisbon Strategy has stressed the need to invest in the massive qualification of the workforce in order to improve Europe's competitiveness position and to promote social inclusion. Moreover this policy agenda has had particular appeal in those countries such as Portugal where governments could present this expansion as a way of catching-up other countries' levels of qualification and

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productivity¹. The qualification level of the labour force has been historically low in Portugal, especially compared with its European counterparts. Hence, over the last two decades there has been a massive expansion of its higher education system, with both numbers of students enrolled and rates of enrolment by age cohort more than quadrupling since the mid-eighties and the share of young individuals currently *participating* in HE being now already very close to the current government's target of 50%. Thus the Portuguese HE has moved from being a system directed to an elite of young individuals towards one directed to a very significant share of the country's young population. It is in this sense that the term 'mass higher education' is used here (see Elias and Purcell 2004 for the case of the UK). However, it should be noted that the share of young people with a degree still remains relatively low, due to the expansion being recent and to a high drop-out rate among enrolled students.

This paper provides a fresh look at the relative success of this agenda of mass higher education in Portugal by monitoring, in particular, how the value that employers attach to university-level degrees has changed since the mid-1990s. The relative value of a degree is measured here mainly in terms of the earnings premiums that employers are prepared to offer graduates over less qualified individuals. The results point to increasingly dispersed returns for the highly-skilled during this period, and this diversification is linked to the increasing diversification of jobs held by graduates and the associated rise in over-education. The argument is made that the concentrated HE massification in Portugal has been based predominantly on supply-side policies to the neglect of an understanding of the dynamics of change in both the job structure and graduates' position within the job structure. Limited evidence is found to support the notion, implicit in human capital theory, that all jobs can adjust to utilise available skills. These results call into question the sustainability of the current expansion without further change to the job structure due to the risk of increasing "expectations mismatches" among young university graduates and prospective students.

The paper is structured as follows. Section 2 reviews recent empirical international evidence on rising wage inequality and over-education among graduates. Section 3 reviews the evolution of the Portuguese higher education system and previous studies about the relative benefits enjoyed by graduates over the last two decades. Section 4 describes the dataset used in our study and outlines our main empirical findings regarding the recent evolution of graduates' relative earnings and the increasing dispersion of their wage premiums. In the attempt to make sense of these trends, section 5 starts by considering degree characteristics and the nature of HE expansion as possible causes. Sections 6 to 8, in turn, rebalance the debate and consider instead the transformation of graduates' job structure and the increasing incidence and impact of over-education. Section 9 concludes and discusses the implications of our findings.

2. Why return (once again) to the debate on over-education?

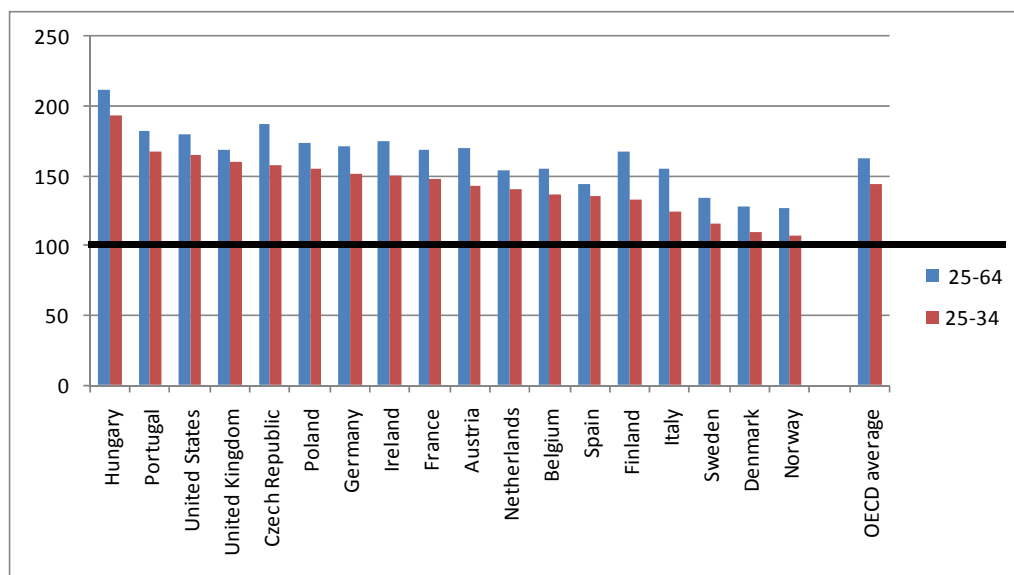
The debate on the benefits or otherwise of the expansion of higher education has tended to go in cycles. The unreserved optimism of the 1960's that education would at a stroke solve problems of both growth and inequality quickly gave way to alarmist predictions of massive waste of resources by creating an army of "over-educated" individuals². However, the most pessimistic scenario never fully materialised: the meta-studies that have attempted to cut through the huge diversity of results

¹ In most European economies, this has become an integral part of a much wider political framework which now finds further strength in the Bologna Process of HE harmonisation across Europe. This political drive ultimately rests on the belief that HE expansion is a necessary pre-condition to unleash the much higher productive potential of new information and communication technologies and of the systemic changes associated with their implementation at work. Furthermore, a highly-qualified workforce is seen as capable to transform a society into a 'magnet economy' capable of attracting the resources of modern and high-skilled industries and multinationals (Brown and Lauder 2006)

² For the original contribution on this, see Freeman (1976).

produced by this literature³ do not find evidence that ‘over education’ has risen in considerable magnitude over the last three decades (Groot and Maassen van den Brink 2000; Rubb 2003; McGuinness 2006)⁴. Furthermore, Schomburg and Teichler (Schomburg and Teichler 2006; Teichler 2007a; Teichler 2007b), based on an exhaustive study of the employment situation of European university graduates four years after graduation, did not find evidence of a significant deterioration in their relative situation vis-à-vis less qualified individuals at least up to the turn of the century. Most existing problems were argued to be *transitional* in nature with most graduates employed in sectors closely connected with their degrees, in jobs offering significant autonomy and where their degrees had relevance in meeting the skill requirements of their jobs. Only around 12% considered that their job did not correspond to their level of educational attainment with fewer still remaining in relatively low-level occupations (clerks, low-level sales jobs, manual jobs) and reporting actual mismatches between their skill levels and the jobs’ skill requirements⁵. Moreover at least until recently, graduates wage premiums have generally remained considerably high. A recent OECD (2009) *Education at a Glance* report, for example, provides evidence that, up to 2007, tertiary type-A and post-graduates’ total monthly earnings were, in the large majority of European economies, at least 1,5 times higher than those who completed upper secondary and post-secondary non-tertiary education (see figure 1)⁶.

Figure 1. Total Monthly Earnings Premiums of University Graduates in 2007



Source. Education at a Glance 2009: OECD indicators

Notes. Includes Tertiary Type-A and B degrees; upper secondary and post-secondary non-tertiary education = 100 .

³ These studies have had to address major methodological difficulties in measuring over-education and tracking its progress overtime. According to Verhaest and Omev (2006), the large variability of estimates produced by the wide range of methods employed constitute the main weakness of this literature and the reason why it is viewed sceptically by a large number of mainstream academics. Green and Zhu (2010) single out the conceptual ambiguity and the lack of consistent time-series and longitudinal data as major problems.

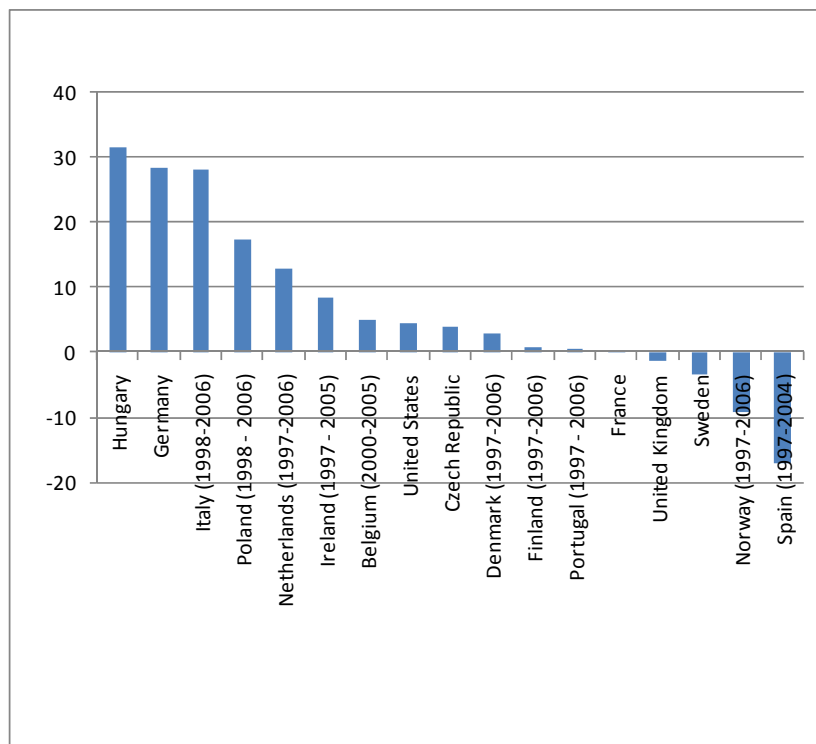
⁴ Most of these works assume, however, a universalistic view of over-education and do not explicitly attempt to compare the determinants of different levels of over-education across different countries or make separation between “genuine” or “apparent” over-education (see, for example, Chevalier 2003)

⁵ The exception in this study appeared to be those with degrees in Humanities and Social Sciences. Schomburg (2007), in fact, argues that the field of study appears to have a decisive impact on European graduates’ objective conditions of work.

⁶ The exceptions being Spain, Sweden, Norway and Denmark where graduates, in any case, still earned a significant premium over less qualified individuals.

Furthermore, in the majority of countries these relative premiums either increased since the turn of the century (as in Hungary, Germany or Italy) or remained fairly constant at high levels as in the case of Portugal but also the UK and the US, for example (see figure 2)⁷. The returns were found to vary by age cohort- a point to which we return below- but younger tertiary graduates' relative earnings also remained high in the great majority of European economies.

Figure 2. Trends in relative earnings in the OECD: 25-64 (1997-2007)



Source. Education at a Glance 2009: OECD indicators

This evidence of sustained relatively high graduate wage premiums has contributed to a new consensus that as *individual* or *private* rates of return of investing in the completion of a degree have remained exceptionally high, that the returns of public investments in HE also remain high. However there are a number of trends in the data that might suggest that again this is too optimistic an interpretation. First of all, the 1980's and early 1990's generalised trend of simultaneous increases in the supply of university-educated workers and in their relative earnings, as documented for example by Peracchi et al. (2006), appears to have reached a plateau at the very least. Machin (2008), for example, confirms that the recent slow-down of graduates' wage differentials is widespread and constitutes a new stylised fact for research on wage inequality⁸. For the UK, Green and Zhu (2010) cite a number of recent studies to point out that graduates' wage premiums appear to have started modestly declining since 2002. Crucially, this trend appears to be more pronounced for younger age cohorts and may have started earlier. Walker and Zhu (2008), for example, show that, despite stable average GWPs in the 1996 to 2003 period, these have fallen among younger graduate cohorts and particularly those that graduated after the massive expansion in the UK HE

⁷ The main exceptions to this pattern, in turn, are Norway and Spain where graduates have seen their relative earnings fall.

⁸ The two other new stylized facts mentioned by the author are the increase in within-group (education, age and gender) inequality and the existence of divergent trends at the top and the bottom of wage distribution, a topic we fully cover below.

system. Chevalier, Harmon et al. (2004) also find evidence of significant decreases in the magnitude of younger cohorts' earnings premiums already in the 1990's. The possibility that older and more experienced graduates may be largely immune from the impact of shifts in supply therefore needs to be recognised in any analysis of the impact of HE expansion. Goldin and Katz (2007), argue that contrary to earlier periods (Katz and Murphy (1992), the increase in US graduates relative earnings since the 1990's has been more the product of a sluggish supply of university graduates rather than the continuation of sharp increases in demand. Autor, Katz et al. (2008) refer to this apparent slow-down in demand for graduate skills as 'puzzling' particularly with the internet revolution, for example, being a phenomenon of the 1990s.

Once the analysis moves away from the *average graduate* in employment –and instead distinguishes by age cohorts and by occupational segments- a more differentiated picture emerges. As the share of graduates has increased, their employment landscape has become increasingly diversified with an ever increasing share of graduates being employed in associate- or middle-level occupations. For the US, Lemieux (2008) has shown that while within-group inequality remained largely stable within other educational groups it rose considerably among HE graduates since the 1990's. These recent increases in wage inequality have been concentrated at the upper-part of wage distribution with much steeper relative gains for individuals above the 80th percentile. Likewise Green and Zhu (2010) show that, in the UK, the returns to tertiary education grew slightly at the top end of graduates' wage distribution in the 1994-2006 period while they fell considerably at the bottom. More importantly, the authors argue that stable relative earnings for the average or median graduate may be compatible with declining returns for those failing to secure higher-level jobs.

This means that it is ever more necessary to have a differentiated analysis of the fortunes of graduates instead of a focus on that of the average or representative graduate. This approach should not lead back to the rather blind pessimism of the past but instead should allow for a differentiated analysis not only of types of graduates but also of the occupational segments in which they are employed. This differentiated analysis must allow for change within jobs as well as changes in the occupational structure. Thus, a large number of jobs, including intermediate-level occupations in particular, may over time have been transformed to the extent that they now require graduate-level skills. For example, Elias and Purcell (2004), argue that in the UK occupational restructuring and the consequent development of new graduate-level managerial and technical specialisms has largely held the relative status of young university graduates constant and served to limit the extent of skills under-utilisation even at a time of strong expansion in HE supply⁹. Thus, graduates may be able to substitute for less educated individuals and even be paid more for this work simply because these jobs may have indeed become more complex (Spitz-Oener 2006). It is therefore vital not to 'freeze in time' the notion of what a graduate job is – or to associate it exclusively with either managerial or professional occupations – as such an approach will over-estimate the extent of over-education. However not all of the integration of graduates is due to jobs becoming more complex; instead they may act as substitutes for less educated workers because they are seen, for example, as being more flexible *and therefore still* relatively cheap (Brown and Lauder 2006) or because they have having better 'generic' skills (communication, sociability, self-management or basic computing skills)(Dickerson and Green 2004). This process of integration is similar to that of the second half of the 20th century where high-school educated workers, instead of graduates now, were forced to occupy lower-level positions as the result of the increasing massification of HE (Goldin and Katz 2007). It is therefore important still to differentiate between types of jobs undertaken by graduates. Much of the intrinsic value of tertiary level education arises out of the opportunity to develop further skills at work which build on the further learning potential conferred by a degree and which

⁹ An alternative interpretation of course is that, as the massification of HE increases, the main and inevitable function of an increasing number of institutions may turn out to be precisely that of preparing students for these intermediate-level occupations with the adjustment being done through changes in the degrees' curricula and organisation rather than through such changes in the demand for graduate skills.

provide protection against substitution by cheaper workers. However not all jobs offer these opportunities or offer them only to a limited degree. Those unable to secure a job with such opportunities for skill development are also at greater risk of substitution by ‘cheaper’ workers and thereby more exposed to the compression of their relative wages. Walker and Zhu show for example that the earnings’ premiums of younger cohorts did *not* decrease if they secured a graduate-level job (meaning either a managerial or a professional job), while they fell for those failing to find such jobs.

A significant share of tertiary educated individuals now either occupy intermediate-skilled positions – that require new but still relatively narrow skills profiles when compared with ‘true’ graduate or knowledge jobs - or dead-end jobs and their ability to transform these jobs may be limited. The job itself may then provide a significant cap to the relative benefits graduates can extract from obtaining a degree. A possible result is an increase in the share of those who Brown and Lauder (2006) call ‘knowledge workers without power’, who work in jobs in which cost considerations are significantly more important or for which they are over-qualified. They also earn, of course, much less than true knowledge workers with the result being a much higher level of inequality among graduates¹⁰.

Our research framework should therefore be sensitive to this tension within jobs between the transformation of skill demand promoted by the increasing availability of highly qualified individuals and the existence of limits to further skill accumulation. Equally useful could be to progress beyond the simplistic and static difference between graduate and non-graduate jobs and incorporate a richer framework capable of distinguishing between jobs where the upgrade in skill demand has been either significant or limited. This stands as a guiding principle of the research method used in this paper.

This argument does not preclude the notion that the increasing diversity of graduates’ educational characteristics may also be playing a role in the increasing dispersion of graduates’ relative earnings. For the US, Lemieux (2006) argues that the continuing rise in the returns to post-graduate degrees explains a significant part of recent changes in inequality in the US.¹¹ There is indeed evidence that the earnings gap between postgraduates and undergraduates has increased more than between these latter group and high-school graduates (Goldin and Katz 2007) and that the returns to post-graduate degrees continued to rise rapidly and at similar rates relative to the 1980’s (Autor, Katz et al. 2008; Lemieux 2008). In turn, regarding the UK, O’Leary and Sloane (2005) show that there is a significant spread in the premiums over different fields of study and argue that the decrease in female graduates’ *average* earnings can be explained by their disproportionate concentration in particular subjects. These results are confirmed by a new study by Walker and Zhu (2010). Schomburg (2007) also argues that the field of study is an important determinant of young graduates’ relative fortunes across Europe. Within our framework educational characteristics may not have a direct effect on wage inequality but an indirect effect through the job assignment process. Clearly, however, this perspective is an alternative to the idea that the increasing dispersion of graduates’ earnings follows simply from the also increasing dispersion of unobserved ability among tertiary students. It is worth noting here that the increasing dispersion is mostly felt at the top of graduates’ wage distribution (Atkinson 2007; Machin 2008; Green and Zhu 2010) whereas it could be expected to be found more at the lower end if the main factor was the widening dispersion of abilities with the increase in shares of the cohort entering higher education.

¹⁰ Brown and Lauder argue, in addition, that a number of these jobs can be increasingly off-shored, further undermining, therefore, the relative position of such graduate segments.

¹¹ For the case of the UK instead, Mcintosh (2006) shows that additional returns to ‘higher degrees’ have also increased very slightly from 1996 to 2002. O’Leary and Sloane (2005) also show that the returns to a post-graduate degree (particularly a PhD) were significantly higher than that of a degree.

3. Previous evidence: is mass higher education in Portugal a success story?

The issue of educational qualifications has been a theme of significant political and academic interest in Portugal for a long time. This has been particularly stimulated by the fact that the country has historically presented some of the lowest levels of qualifications when compared to most European countries. Hence, this created an embedded belief that this lag in educational achievement explained an important part of the country's economic backwardness and that individual and social economic advancement would be significantly boosted by a serious progress in educational qualifications. For instance, only by the mid-twentieth century did the majority of the adult population attained basic literacy levels and by the end of the last century almost 10% of the population was still illiterate. These results did not compare favourably even with the other southern European countries that have also lagged vis-à-vis a much earlier literate Northern and Central Europe. The inheritance of this slow development in educational qualifications endured in the working population, since nowadays around two-thirds of the working population has either basic educational levels or less. Thus, the massive expansion that took place over the last decades in the educational system has introduced a major break in the previous patterns and enlarged access significantly.

Table 1. Educational Qualifications of Portuguese Labour Force (%)

	1981	1991	2008
Illiterate	26,4	15,3	4,2
Basic literacy	1,1	0,8	--
1st Cycle Basic	47,6	43,8	28,2
2nd Cycle Basic	9,0	12,7	20,4
3rd Cycle Basic	8,3b	10,9a	21,4
Secondary	4,9b	8,7a	14,7
Tertiary	2,8b	6,3a	11,0

a – enrolment and graduation; b – completed;

Source. Barreto (1996) e INE (2008)

The changes were particularly significant at the higher education level. Until the mid-eighties, the Portuguese higher education sector remained very small and elitist (Teixeira, Rosa et al. 2006). Until the beginning of the 1970s there were only 4 Universities (all of them public), but during that decade a process of expansion was initiated with the purpose of widening access to higher education. After the Democratic Revolution of 1974 several other public universities and polytechnic institutes were created with the aim to expand and diversify the higher education system. The polytechnic subsystem was intended to have a strong applied and technical emphasis and marked vocational orientation adapted to regional needs. By the eighties the social and political pressures for expansion became very strong and the system has expanded massively since then,

both in number of institutions and in students enrolled. The late 1980s saw the rise of private higher education which benefited from the difficulty of the public sector to absorb a rapidly growing demand (and also from facilitating policies of the Minister of Education at that time (1987-91) who not only approved a large number of new private institutions but also decided to lower the access requirements to higher education which created favourable market conditions for the private sector). Thus, during the last decades of the twentieth century the Portuguese higher education system multiplied its size several times.

Table 2. Growth of enrolments, total and by sub-sector

	1971		1981		1991		2001		2008	
	No.	%	No.	%	No.	%	No	%	No.	%
Public Universities	43,191	87,3	64,659	76,8	103,999	47,0	176.303	44,5	169.449	43,6
Public Polytechnics	2,981	6,0	12,195	14,5	31,351	28,7	108.486	27,3	105.872	27,9
Private institutions	3,289	6,7	7,319	8,7	51,430	24,3	111.812	28,2	91.408	28,5
Total	49,461	100,0	84,173	100,0	186,780	100,0	396.601	100,0	366.729	100,0

Source. Barreto (1996); Simão et al (2002); OCES

In recent years the demand has stabilized due to demographic changes. At present, the Portuguese public higher education system comprises 13 public universities, an Open University (Universidade Aberta) and a university institute (ISCTE), 15 public polytechnics and 32 polytechnic schools. In the private sector there are 7 universities (including a Catholic University), 4 polytechnic institutes and 72 schools of university and polytechnic education. As table 2 indicates, there were profound transformations of the system over the last decades. The system approximately doubled its size each decade, moving steadily away from its original elitist character. If until the early 1980s, public universities overwhelmingly dominated the higher education system, a decade later the non-university public sector was already absorbing a significant proportion of enrolments and, nowadays, the vocational public sector enrolls more than a quarter of the total system. On the other hand, the expansion was also significantly fuelled by the private sector, representing about 1/3 of enrolments, though this sector has declined over the last decade. Portugal has nowadays a rate of gross enrolment similar to its European counterparts and a very diverse sector.

This massive expansion of the higher education system has been supported by very high expectations regarding the private (and public benefits) associated with a higher education degree. During most of the 1980s and 1990s the reality seems to have lived up to the expectations, and in some cases even surpassed it. Despite the massive expansion of the higher education system, the private return to education has been persistently reported as very profitable at around 10%. A synthesis of various studies covering the last 20 years (see table 3) indicates that these results are robust and that the average return was not significantly affected. The private returns to education have grown in the late eighties and early nineties, which helps to explain the buoyant demand, especially for higher education, at that time. These results tend to be explained by the expansion in the demand for more skilled labour due to the very good performance of the country during that period, following the country entry in the EU in 1986. This brought not only a large inflow of EU structural funds, but also stimulated a major growth in FDI during the following 10-15 years.

Table 3. Private Rates of Return to Education in Portugal

STUDY	PERIOD	ESTIMATION METHOD	RATES OF RETURN
Kiker and Santos (1991)	1985	OLS	9.4-10.4%
(Vieira 1999)	1986/1992	OLS e IV	7.5-8.2% (OLS)
Martins and Pereira (2004)	1995	OLS e Quantile R	OLS - 12.6% QR - 6.7-15.6%
(Machado and Mata 2001)	1982/1994	OLS e Quantile R	OLS - 1.3-9.2% / 0.4-11.3 QR - 0.5-10.1% / 0.3-13.8%
(Hartog, Pereira et al. 2001)	1982/1986/1992	OLS e Quantile R	OLS - 5.3% / 5.5% / 6.4% QR - 3.1-6.6% / 3.4-7.0% / 3.6-8.0%

The high expectations regarding education were also clearly associated with advantages regarding employability. The low levels of the qualifications of the Portuguese labour force and its particularly small share of university graduates have historically granted significant economic and social benefits to the latter. Like in many elite higher education systems, having a university degree was associated with stable and well-paid employment in relative terms. This also fuelled strong social demand for an expanding higher education system. However, the public opinion regarded with concern the pace of expansion of the system, especially from the 1980s onwards. Many expressed the view that this would soon create a significant problem of graduate unemployment. This was based on the widely held assumption among many non-economists that the number of jobs for university graduates is limited over time and that an expansion will create an increase in graduate unemployment. Additionally, many expressed concerns about rising over-education (though not always phrased in that way) and of a subsequent repositioning across the labour force, with new graduates replacing workers with lower occupations in jobs not traditionally occupied by the former.

The evolution of the unemployment rate by levels of qualification indicates that until the beginning of the twentieth-first century these fears were largely exaggerated. The unemployment rate among university graduates increased from around 1% in 1981 to 4% in 1991, though remained around that level throughout most of the 1990s. Thus, although there was an increase, unemployment among university graduates remained very low and its evolution did not mirror the expansion of the higher education system. In fact, after an initial period in which the demand for skilled labour struggled to keep pace with a massive outpouring of graduates, the evolution in the nineties suggested that although the number of graduates continued to rise at a fast pace, the rate of unemployment among graduates stabilized. Moreover, other studies have indicated that a lot of this unemployment was due to frictional issues in the labour market.¹² Hence, even those graduates that were affected by unemployment were likely to find a new job faster than other workers with lower qualifications.

¹² Underneath this rate of unemployment for graduates seems to be the coexistence of high rates of job creation and job destruction and, therefore, a high job turnover among university graduates (Cardoso e Ferreira, 2002).

Regarding the fears of rising over-education, during the period 1986-1999 the evidence has also contradicted the pessimistic expectations. Contrary to the expectation that the employability of graduates was based on the occupation on non-graduate jobs, since Portugal joined the EU in 1986, graduates have moved to better paid jobs and that the probability of occupying jobs normally taken by individuals with lower qualifications has declined¹³ (Cardoso 2007). This adjustment was also caused by an upskilling of certain occupations who started to require higher qualifications and to provide higher salaries. The analysis of the incidence of over and under education for the 1980s and 1990s also seems to confirm this picture. Despite the apparent rigidity of the Portuguese labour market, which was likely to increase the magnitude of those two phenomenon, by hindering the capacity of firms to adjust their workforce to its changing needs, the evidence available for the 1990s indicated that the large majority of workers presented qualifications close to the average of workers employed on those occupations (Kiker, Santos et al. 1997). There was also a decline in the incidence of under-education and a slight increase in over-education, which is consistent with the fast and massive improvement in the qualifications of the labour force. Moreover, subsequent work argued that many of these unbalances are frequently of a short-term nature (Oliveira, Santos et al. 2000). An important share of cases of over-education correspond to an entry strategy by many younger workers of compensating their lack of experience with higher than average qualifications, and an important share of under-education corresponds to older workers that tend to compensate their lower formal qualifications with greater on-the-job experience. Thus, it is not unlikely that those younger workers may be able to move to better jobs once they suppress their experience handicap. The existence of both unbalances cannot be dissociated either from the major structural adjustments faced by the Portuguese economy over the last 25 years, after joining the EU.

However, this kind of success story has started to become more complicated in recent years. One of the signs that the situation could be less straightforward was shown by the fact that several recent studies indicated that, underneath the high average private return to education, there was a large variability in those returns. The magnitude of this variation was not uniform across studies, though they tended to indicate that it had increased, at least slightly, from the 1980s to the 1990s. Accordingly, the private return to an additional year of education was reported from as high as 15% to below 1%. The increase in variability seems to have been more influenced by an increase in the upper bound, than to a decline in the lower bound, which is consistent with the aforementioned slight increase in the average return. This variability is even more significant when we compare the results obtained for Portugal with other European countries. In a study published a few years ago, Martins and Pereira (2004) compared the return to an additional year of education for Portugal with an average of 17 European countries (EU-15 plus Norway and Switzerland), whose main results are reported in table 3. Their results confirm that Portugal had one of the highest returns to education, but also one of the most variable.

The rising dispersion in the private return to education is very significant as well because Portugal has one of the most unequal countries within the EU regarding the distribution of earnings. In fact, the evidence available indicates that although inequality may have decreased in the 1980s, it has clearly increased over the 1990s, especially during the first half of the decade, having stabilized afterwards for lower levels of income but increased for higher incomes (Rodrigues 2007). Whereas there was no long run trend in the bottom decile of the earnings distribution during the period 1980-2000, in the upper part of the distribution there was a clear trend of what has been called the fanning-out of the earnings distribution (Atkinson 2008). All the top measures (upper quartile, upper decile and upper decile) have increase relatively to the median income and, even more significantly, the increases were greater the higher the measure we were considering.

This evolution in earnings, combined with the previous data about dispersion of returns to education, suggests that the rising inequality is mostly associated with a growing dispersion in higher incomes

¹³ Cardoso, however, considers non-graduate jobs only as those that fail to pay premiums above 10%, a point to which we return below.

and workers with higher levels of schooling. The data indicate that the earnings' advantage of more educated workers has resisted and was even strengthened over the 1990s. This is even more significant since this was the period of fastest expansion in higher education's enrolments. Several studies have indicated that the level of education has been the major explanatory variable regarding levels of inequality and poverty for the period 1989-2000 and that this greater inequality was enhanced by the growing inequality in return to education (Hartog, Pereira et al. 2001). This is not surprising in periods of expansion of education, because the benefits of more education tend to enlarge the possibilities and incomes of those that manage to reach the higher levels of education.

Table 4. Earnings by highest level of Education attained in Portugal (1989-2000)

LEVEL OF SCHOOLING	AVERAGE EARNINGS			DEVIATION VIS-A-VIS AVERAGE EARNINGS		
	1989	1995	2000	1989	1995	2000
None completed	4.169	4.324	4.933	62,1	55,0	55,2
Basic Education	6.561	6.988	7.939	97,8	88,9	88,8
Secondary Education	10.462	11.782	12.182	155,9	149,9	136,3
Tertiary Education	14.202	18.754	21.340	211,7	238,6	238,8
Total	6.709	7.860	8.937	100,0	100,0	100,0

Source. Rodrigues (2007)

The analysis of evolution of wage's dispersion also indicates a trend of steep increase in the degree of dispersion for the period 1985-2005 (see Cardoso, 2009). This evolution is nevertheless composed of two contrasting trends. On the one hand, there is a reduction of wage inequality when comparing the median wage and the lowest deciles. On the other hand, there is a growing inequality when comparing the median wage with the highest deciles. This evolution of wage inequality reflects to a large extent the evolution of the wage premium for university graduates over this period. Three possible explanations have normally been advanced for changes in wages' structures: technological progress and the bias towards more skilled workers, which could have led to greater differentiation (or even segmentation) in the labour market; Increasing competition in international markets and greater economic interdependence associated with growing economic globalization, creating a large pressure on less skilled workers, especially in those sectors facing greater international competition; and decline in unionization and de-regulation of the labour market, which has diminished the protection to certain groups of workers. Preliminary results indicate that the first hypothesis seems to be the strongest explanatory factor, especially since there are indications of increasing wage inequality between firms within industry. Nonetheless, they also underline a pattern of change and increasing inequality that may be extremely relevant for the analysis of transition of higher education graduates to the labour market.

Overall, recent studies have produced a more nuanced view about the so-called success story and pointed out latent problems in the articulation between the educational system and labour market, especially at the higher level. This is very important to follow since in recent years public perceptions about the private benefits of a higher education have shown a declining confidence in

the economic value of a degree. These concerns have become even more significant over the last decade, and especially in the aftermath of the 2008 financial and economic crisis. The Portuguese economy has had a mediocre performance since 2001, which has reflected in a growing difficulty to create jobs and a rapidly growing unemployment rate. The current situation has affected a rising share of graduates, suggesting that their once rather protected position is being eroded. It is also important to assess the recent evolution of the average return and the dispersion among those returns and to what extent there is a growing inequality among the fate of higher education graduates.

Table 5. Rate of Unemployment by Level of Education (2003-2010)

Level of qualification	Basic or less	Secondary	Higher Education	Total
2003	6.2	6.9	6.0	6.3
2005	7.8	8.0	6.3	7.6
2007	8.0	6.2	7.5	8.0
2009	10.1	9.6	6.4	9.5
2010	11.6	11.3	7.1	10.8

Source. INE – National Statistics Office

4. Data and Recent Trends

This paper uses the Portuguese Government’s Quadros de Pessoal (QP) dataset to monitor the evolution of young graduates’ relative earnings in recent years (1995 to 2005). This is an exceptionally comprehensive and high-quality dataset which aggregates staff logs collected annually and compulsorily by the Portuguese Ministry of Employment and Social Security (MTSS) with the purpose of monitoring the implementation of employment legislation. The dataset covers practically the whole universe of business firms with at least one wage-earning employees excluding, however, the public administration and domestic services sectors¹⁴. Employers (self-employed with wage-earning employees) as well as non-wage earning family workers were excluded¹⁵. Calculations, unless otherwise noted, refer to normal hourly earnings which include regular or basic monthly wage, seniority-indexed components of pay and other regular pay components¹⁶. Additionally, following Cardoso (2007), we excluded individuals with hourly earnings higher than 10 times that of the 99th percentile in each year and those with hourly earnings below the adjusted minimum wage¹⁷.

¹⁴ We also exclude the agricultural, fishing and mining sectors (Code A, NACE Rev 1.1) due to the lack of wage earners in these sectors. The residuals cases of domestic services employees and those working in extra-territorial bodies were also deleted (sectors 95 and 99, Nace Rev 1.1)..

¹⁵ Individuals without information regarding their occupational category (ISCO-88 3-digit) or their highest level of education were also excluded. The same happened with individuals without a working schedule (a status which is controlled by a specific variable in the dataset) or with missing wage data.

¹⁶ We exclude overtime hours as to focus on *permanent* changes both in the composition of employment and individuals’ wages and avoid measuring specific shifts associated with the reference week in which the data is collected. Results are however broadly similar if one considers overtime.

¹⁷ Finally, each individual in the dataset may have more than one data entry provided that he or she works in more than one firm (e.g.: an accountant working short hours in a number of firms). These cases are a minority in the dataset with regularly more than 92% of all available cases in each year corresponding to individuals with one job. We keep these

Our calculations usually refer to individuals aged between 26 and 36 unless otherwise noted. We take into account the fact that, as noted earlier, the massification of the Portuguese HE system has only started recently and that, therefore, older graduates may be ‘protected’ from HE expansion due to ‘first-mover’ advantages and higher on-the-job experience.¹⁸ If the average young graduate is still certainly young, the inclusion of older university graduates in our calculations has the potential of blurring the relative situation of those who have just recently completed a degree. Furthermore, the focus on the 26 to 36 age segment aims to move the analysis beyond graduates’ transition into their *first* job and to control for atypical employment episodes during the completion of their degrees¹⁹. Regarding the actual monitoring of trends, and similarly to Cardoso (2007) we first calculate graduates’ wage premiums (GWP) as the estimated coefficient ρ in the following OLS framework:

$$(4.1.) \ln |W(u, x, C)| = \alpha_0 + \rho u + \beta_0 x + \beta_1 x^2 + \sum_{j=2}^t \beta_j C + \varepsilon,$$

, where $W(u, x, C)$ measures regular hourly earnings, u is a dummy on the completion of either upper secondary or tertiary education, x refers to potential work experience (age – schooling years – 6) and C is a vector of further controls for individual or job characteristics with a separable effect on wages, namely part-time status. C includes, however, a very narrow set of control variables since we assume that the effect of other possible determinants of earnings is not fully separable from that of education. There is indeed a risk of emptying out the overall premium attributed to the completion of a tertiary degree by fitting an over-complex set of control variables²⁰.

Following Peracchi, Hanushek et al. (2006), we argue that this GWP concept differs from Mincer’s (1974) internal rate of return (IRR) to education since it does not necessarily refer to the *causal*, stationary and *fully separable* and predictable effect of university education on individuals’ earnings. GWP is used here instead as a *descriptive* measure of graduates’ relative benefits over otherwise similar and experienced individuals and can be seen as the *average price* attributed to tertiary education at a particular point in time.

To our knowledge, no studies have yet updated Cardoso’s (2007) calculations for the 1986-1999 period. In order to enhance comparability, we initially considered only either high-school or university graduates with up to ten years of potential experience but then performed separate calculations by gender and age-groups.

The resulting message (see figure 3) is that the downward trend apparently initiated in 1995 (according to Cardoso calculations) has continued in more recent years and that it has been especially pronounced in the case of men. In 1995, young male university graduates’ hourly wages were, on average and holding other predictors constant, almost 73% higher than those earned by high-school graduates. By 2005, however that premium had decreased by around 11 percentage points. Among women, this decrease was substantially lower (4 percentage points from a premium slightly above 65% in 1995). If the relative earnings premium of both male and female graduates

cases, however, because our interest is on the *job*’s relative quality and we do not wish to exclude workers in multi-employer arrangements. In any case, the number of available cases in each year should not then be taken as indicative of the number of cases in the whole universe of private-sector wage-earning employees.

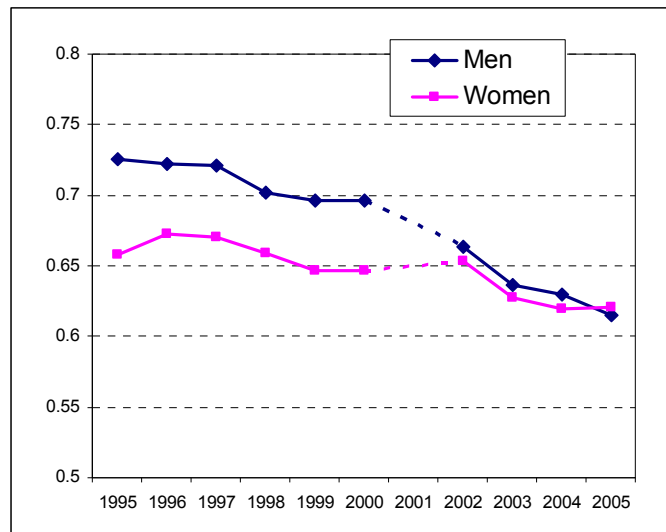
¹⁸ We do in fact show later in the paper that GPWs trends are significantly different across different age cohorts.

¹⁹ According to recent OECD (2007) data, the typical graduation age in Portugal – prior to the reorganisation of degrees promoted by the Bologna process – was around 21 for tertiary type-B degrees and between 22 and 26 for type-A degrees.

²⁰ We assume that the effect of other possible determinants of earnings is not fully separable from that of education. If the completion of a degree allows university graduates to access better quality jobs, for example, and that further learning opportunities within these jobs impact graduates’ future productivity, what remains as the independent effect of university education can be considerably abstract. By including sector or occupation dummies, for example, we would only capture their *independent* and *average* effect for *both* high-school and university graduates.

had then converged as a result of these trends, it is also the case that these continue to be high by European standards.

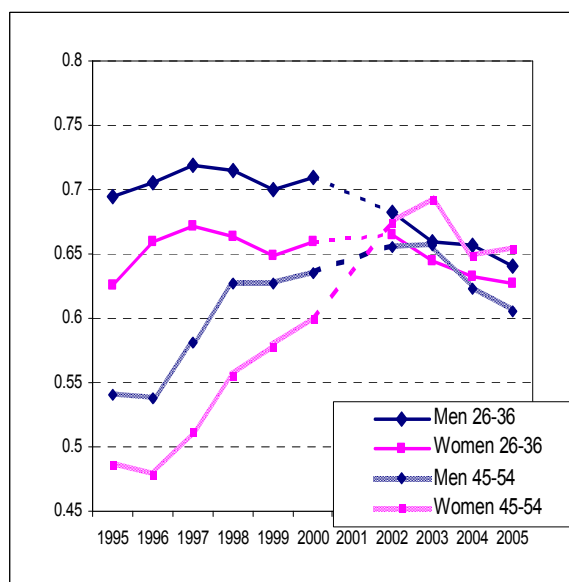
Figure 3. Young University Graduates’ Wage Premium in Portugal, 1995 - 2005 (individuals with up to ten years of potential experience)



Source. QP dataset (1995 – 2005)

Notes. Following the method used by Cardoso (2007), wage premiums are measured by the value of the coefficient of a university dummy on a log-hourly earnings regression framework which also includes controls for “potential experience” (quadratic) and part-time employment status. “Potential experience” is defined by deducting the number of schooling years plus 6 (the age at which pupils enter primary education) from the age of each individual. Only individuals with up to ten years of potential experience are considered here and hourly earnings refer to “regular” earnings (i.e.: excluding overtime). Calculations using total hourly earnings provide very similar results. No data are available for 2001. The 2001 entry is calculated by simply considering the average of the 2000 and 2002 values.

Figure 4. University Graduates’ Wage Premium by Age Cohorts, 1995 – 2005



Source. QP dataset (1995 – 2005)

Notes. Calculations are done separately for these two age cohorts instead.

The calculations for the two separate age cohorts (figure 4) show however that the decrease in GWP among the young is somewhat less pronounced, even if it is visible that young graduates' wage premiums peaked around 1997 and have decreased since then, especially again in the case of men. Since these calculations consider slightly older graduates than previously²¹, a significant part of the reported decrease in GWPs may be due to increasing difficulties in graduates' transition into employment. Our results do confirm, however, that older graduate cohorts appear to have been largely immune from the impact of HE expansion with their average premiums still increasing throughout most of the period and at least up to 2003. This may suggest either that older and younger graduates may be imperfect substitutes or indeed that younger graduates may have been substituting older and less qualified workers in intermediate-skilled jobs, a hypothesis which we do not fully pursue here.

There is however one important methodological critique to these calculations that follows from the arguments raised in the previous two sections. Instead of focusing on the average graduate worker, we ought to pay particular attention to the dispersion of HE wage premiums across the wage distribution since there is increasing evidence that the impact of HE massification may have not been uniform among graduates. In addition to OLS estimates, we then use a quantile regression (QR) framework (Koenker and Bassett 1978; Buchinsky 1994) to test for the possibility of increasing heterogeneity among graduates' wage premiums (GWP)²²:

$$(4.2) \ln |W_p(u, x, C)| = \alpha_{0p} + \rho_p u + \beta_{0p} X + \beta_{1p} X^2 + \sum_{j=2}^t \beta_{jp} C + \varepsilon_p,$$

, where, in addition to the subscripts identified above, p corresponds to the p th percentile of the distribution of university and high school graduates' earnings.

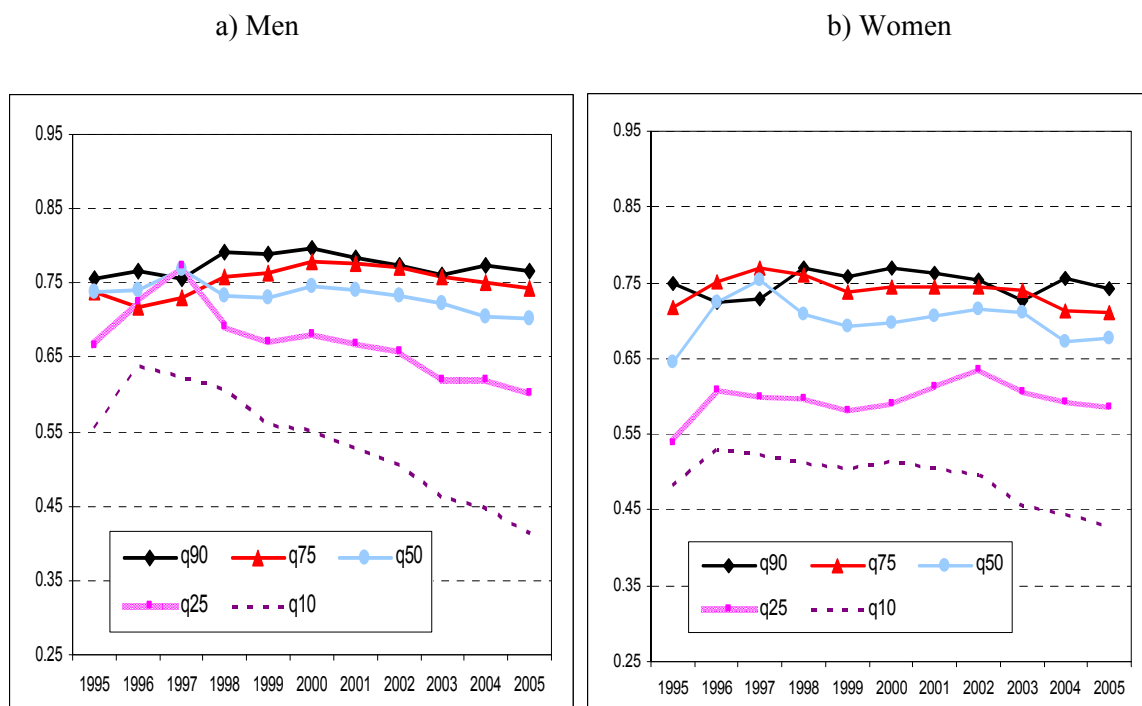
An important part of the argument that demand for higher education skills grew at an extraordinary pace in Portugal up to the mid-1990's was the idea that rising GWPs applied across the whole spectrum of jobs held by graduates (see again, for example, Cardoso 2007). Figure 5 presents conditional wage premiums for the 90th, 75th, 50th, 25th and 10th percentiles from 1995 to 2005 and shows that the shape of the distribution of graduates' relative premiums became more complex during this more recent period. The graph presents two types of information. First, and regarding each year's spread of GWPS, the graph confirms that the lowest paid graduates are significantly penalized in Portugal as there is a considerable dispersion of returns particularly below the median. Second, it also demonstrates that the *least successful* graduates witnessed their relative situation deteriorating considerably across this period, once again particularly in the case of men for whom returns were much less dispersed at the beginning of the period²³. This decrease in the relative value of a degree has also been felt exclusively below the median.

²¹ "Individuals with up to ten years of potential experience" refers to individuals aged up to 32 years old in the case of those who have completed tertiary education and aged up to 28 years old in the case of those who have completed secondary education. Because high-school graduates enter the labour market much sooner than university graduates, we compared two very different age groups in the calculations made above.

²² While OLS estimates the earnings premium at the mean of the distribution, QR estimates it for individuals located at different quantiles of the wage distribution and does so by re-weighting all the available data. Estimate for the 10% decile, for example, assigns half the weight of errors to cases within the lowest 10% of wages and half the weight to the other 90%. The method then requires a sufficient number of highly and low educated individuals both at the top and bottom of the distribution. This is unlikely to be a limitation here since we only consider individuals with at least upper secondary education and since we use a very large and highly representative dataset.

²³ In 1995 and in the case of men, there were no statistical significant differences for GWPs above the median (50th, 75th and 90th percentiles) despite the very high number of cases included in the QP dataset and the very low standard errors and narrow confidence intervals involved in these calculations.

Figure 5. Young Graduates Wage Premiums: Conditional Quantile Regression Estimates, 1995-2005



Source. QP Dataset (1995 – 2005)

Notes. Only individuals aged between 26 and 36 years of age are considered.

Relative premiums at the upper quantiles, on the other hand, remained high. Thus, in 2005, while male graduates at the top of the wage distribution were paid close to 76% more per hour than otherwise similar but less qualified individuals, the corresponding figure at the bottom of the wage distribution was 41%. Relative trends among women, however, were more stable even if GWPs decreased also for young graduate women at the bottom of the wage distribution (10th percentile). Again, there is some degree of convergence here since differences were already higher for women in the beginning of the period. It is possible that this is linked with the earlier and more significant expansion of tertiary education among women but it can also be made compatible with a much sharper impact of occupational restructuring among men, a point to which we return below. Finally, the hourly wage increase associated with one additional year of work experience (for both levels of education considered) also rises considerably as one progresses towards the top of the wage hierarchy and, presumably, towards better jobs. This suggests that differences in the overall benefits of a degree over time can be even larger for the most successful graduates considering that jobs at the top should be disproportionately filled by young university graduates.

From a policy point of view it is crucial to understand why the least successful graduates saw their relative position deteriorating. As the HE system expands and involves new segments of the young population (from less affluent socio-economic backgrounds and that enrol in new types of degrees or institutions) their fate should be of particular concern to politicians because there is the potential of rising expectation mismatches and therefore a greater threat to further HE expansion.

5. Starting Making Sense of Growing Inequality among Graduates: Unregulated HE Expansion

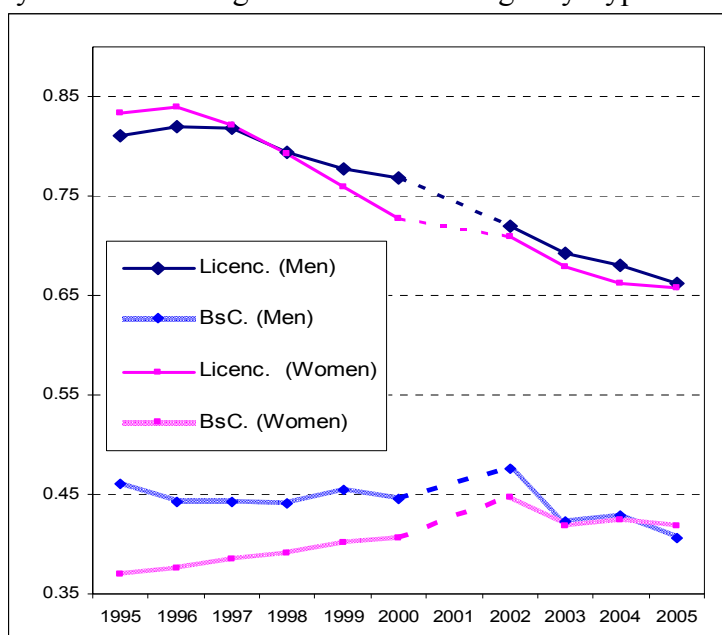
Most mainstream studies interpret different GWPs across the wage distribution as indicative of different complementarities between tertiary education and innate ability. The fact that, as documented earlier, Portuguese graduates *improved* their relative position during the early periods

of HE expansion has also traditionally been interpreted as supporting the idea (implicit in human capital theory) that *all* jobs can be transformed to reflect individuals innate or acquired level of skills.

In this sense, the dispersion of GWPs could simply reflect the wider range of innate ability levels of the young individuals who now reach HE or, alternatively, differences in educational characteristics, namely the adequacy of curriculums to labour market needs or the overall quality of degrees and institutions.

Regarding degree characteristics, the QP dataset has information only about the degrees' field of studies (ISCED-97 classification) as well as its type and length (bacharelato vs. licenciatura). Regarding the latter, Figure 6 presents GWPs calculated using separate dummies for these two different types of degree in a regression framework similar to (4.1)²⁴. The much sharper decrease in the relative value of *Licenciatura* degrees which is visible in the graph mirrors the strong increase in the supply of graduates with this type of degrees. There has been, in fact, a strong shift in the relative importance of this type of degrees over this period with the share of *Bacharelato* holders falling to around 23% in 2005 compared with 31% in 1995 according to QP data. Their relative earnings have, however, decreased much more slowly in the case of men and have even increased significantly for women. Female *Licenciatura* holders, in turn, experienced a decrease comparable to men. We have then witnessed a clear convergence between the price attributed to academic and more vocational-oriented degrees at least up to 2002. In any case, GWPs for the academically-oriented degrees remained, however, much higher, which can still justify students' continuing preference for this type of degrees. The potential for the build-up of expectations mismatches is again, however, considerable here since the decrease in the value of these degrees has been much sharper than the trend documented above.

Figure 6. Young University Graduates' Wage Premium in Portugal by Type of Degree, 1995 – 2005



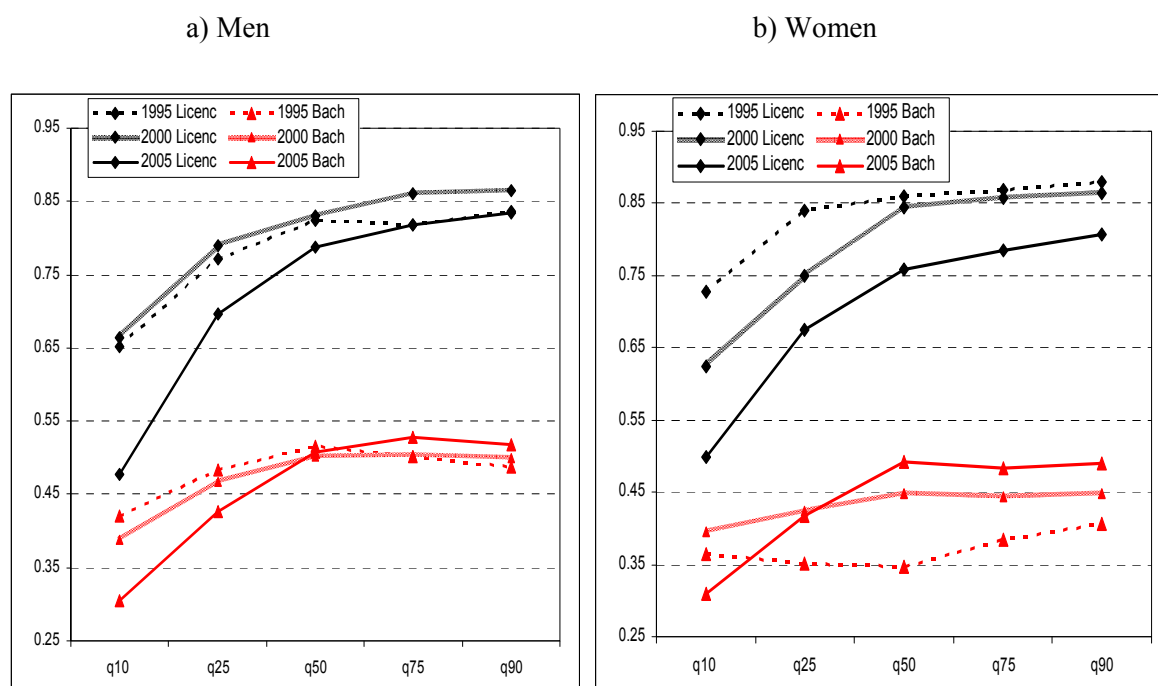
Source: QP dataset (1995 – 2005)

Notes: Calculations are done using a similar framework. The university education dummy in this model is, however, split into two further dummies depending on the type of degree obtained by each individual. Only individuals with up to ten years of experience are considered here.

²⁴ Only individuals with up to ten years of experience are considered here.

Figure 7 also shows quantile regression estimates for both these types of degrees in three specific years (1995, 2000 and 2005). The slash in the GWPs of *Licenciatura* holders applied mainly to those below the median. There were, however, finer dynamics at play. The most successful male graduates largely kept their relative position unchanged and *Bacharelato* holders actually experienced significant increases of GWPS. Women with a *Bacharelato* degree, however, saw the prices attributed to their degrees actually increasing significantly in all quantiles except at the very bottom of the wage distribution. By 2005, the most successful *Bacharelato* holders were thus actually able to extract higher relative premiums based on their education than were the least successful holders of *Licenciatura* degrees in their respective jobs with the point being that the financial motivation that may have lead many students to embark in longer and more academically oriented degrees has been heavily slashed for the lowest paid. Inequality among graduates has therefore increased significantly. This runs against the evidence of wage compression presented by Budria and Pereira (2005) for the 1993 to 2000 period. That trend was puzzling in a context of HE expansion since it was incompatible with an increase in over-education. That is no longer the case here however. The authors' disregard for cohort differences may however explain this apparent contradiction.

Figure 7. Young Graduates Wage Premiums by Type of Degree: Quantile Regressions, 1995, 2000 and 2005



Source. QP Dataset (1995 – 2005)

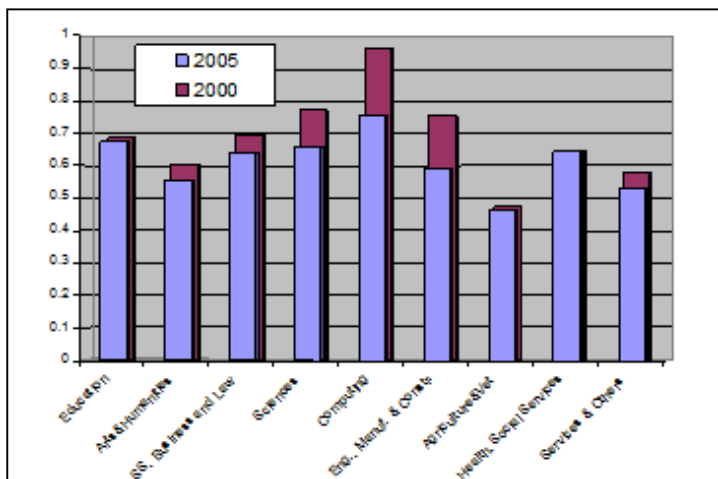
Notes. Only individuals aged between 26 and 36 years of age are considered.

The consensus that demand for graduate-level skills was growing at an extraordinary pace during earlier periods of HE expansion helped mute voices warning that the unregulated growth of the HE system could lead to rising over-education. The evidence presented above, however, calls for further caution. On the one hand, the increasing supply of academic-oriented degrees dissociated of labour market needs may partly explain the trends described above. On the other hand, it is somewhat simplistic to associate it with the increasing dispersion of innate ability levels or, for example, graduates' socio-economic origins if we take into account that the premiums of vocational oriented degrees offered by polytechnic institutions – which traditionally granted HE access to the least privileged parts of society – stabilised or even increased. The unregulated and excessive

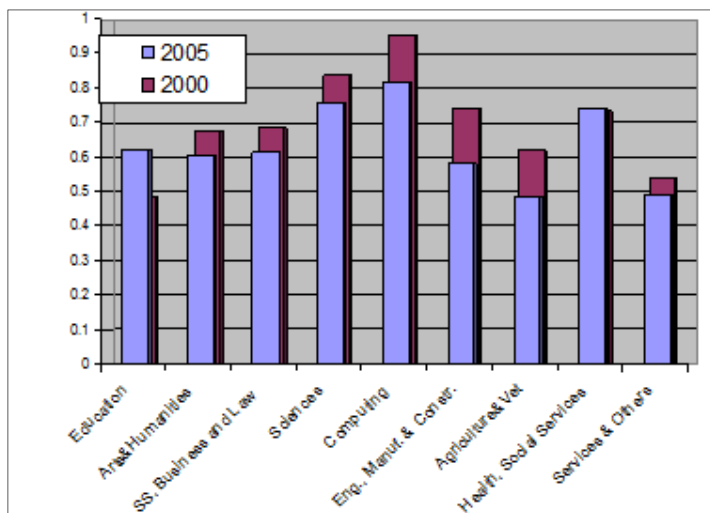
growth of HE courses with little relevance to employers is also a recurrent explanation of difficulties in the transition to the labour market and of rising wage inequality among graduates. Figure 8 shows GWPs by field of education for both 2000 and 2005²⁵. It is the case that degrees in computing, sciences or health-related subjects still granted in 2005 higher premiums than other subjects. This gives ground to the idea that the growth of vacancies in particular areas may explain part of the decreasing value attributed to HE over this period. The clear distinction in GWPs by fields of study has however faded since 2000.

Figure 8. University Graduates' Wage Premiums by Field of Education, 2000 vs. 2005

a) Men



b) Women



Source. QP dataset (1995 – 2005)

Notes. Calculations are done using a framework similar to equation (A.4) – see Appendix A. The university education dummy is split into a number of dummies depending on the field of education in which the degree is obtained. Only individuals with up to ten years of experience are considered here.

²⁵ Since the QP classification scheme of tertiary degrees has changed in 2000, earlier series are not directly comparable with these later results. GWPs are calculated using separate dummies for different fields of study in a regression framework similar to (4.1).

Male graduates in areas such as computing, engineering, manufacturing and construction and sciences, in particular, experienced a net relative decrease in their premiums compared to other fields of education. The fact that most degrees were not immune to decreasing earnings' premiums should warn us against simply attributing the shifts in the overall trend of rising GWPS to the re-composition of HE supply.

6. Rebalancing the Debate: Job Structure Effects

Since GWPs kept increasing during earlier periods of HE expansion, academic studies have rarely looked at job structure effects and assumed that the Portuguese productive structure showed sufficient dynamism to absorb new graduate generations. We now argue that in order to make sense of the increasing heterogeneity of HE premiums we should look at the wider array of jobs that graduates now perform and their relative success in job assignment processes. Lower GWPs for the least successful graduates may in this sense be explained by a lack of enough graduate-level jobs (Budría and Pereira 2005).

Even if Portuguese graduates are now facing access to an increasingly segmented labour market we should also keep in mind that jobs that traditionally were non-graduate jobs may have been restructured and may *now* require graduate-level qualifications. We should then take into account this tension between changes in the structure of employment and occupational restructuring in ways that the traditional definitions of graduate jobs of the widely available ISCO-88 occupational classification (ILO 1990) cannot. Inspired by the work of Elias and Purcell (2004), we distinguish between *graduate-jobs*, *new graduate jobs* and *non-graduate jobs* by considering intergenerational shifts in skill intensity. All detailed 3-digit ISCO occupations were, therefore, initially grouped according to the procedures described in table 6²⁶:

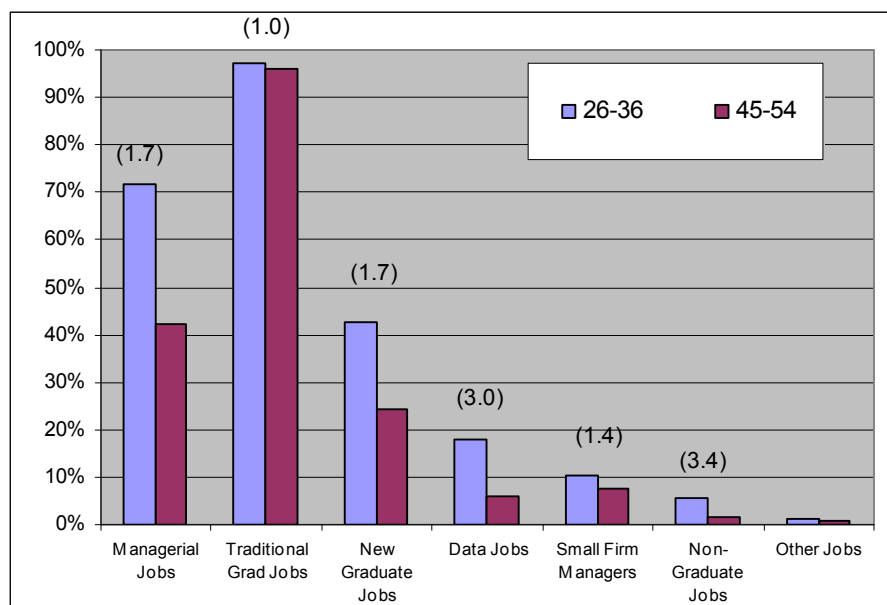
Table 6. Skill Intensity Thresholds used in the Construction of the GRADJOBS Typology

Occupational Group	Older Age Group 45-54	Younger Age Group
		26 – 36
Graduate Jobs	>=50% of Highly Skilled	>=50% of Highly Skilled
New Graduate Jobs		>= 25% of Highly Skilled and at least 10 percentage points higher than older group (and none of the above)
Non Graduate Jobs		<25% (and none of the above)

²⁶ This distinction captures the almost totality of jobs in the Portuguese economy. According to 2006 EU LFS data, less than 0,5% of all jobs held by graduates are left out of these three categories. We use different thresholds relative to Elias and Purcell (2004) as the overall share of university graduates in Portugal continues to be much lower than in the UK.

New graduate jobs should account for the type of new specialisms described by Elias and Purcell (2004) which now require a much broader set of skills than in the past. Following Lavoie, Roy et al.'s (2003) we also make a distinction, however, between 'data' occupations and other new graduate jobs. Rather than making use of analytical or inter-personal skills to generate new knowledge, data jobs should mainly consist of processing large quantities of symbolic information. Graduates in these jobs may then be more easily substituted than complemented by new ICTs. Even if graduates may still be more productive than older, less qualified individuals (and therefore more attractive to employers), ICTs may still strengthen the degree of employers' control in these jobs potentially limiting graduates' ability to transform these jobs as to reflect their true level of skills. Similarly, we isolate "managerial jobs" from other graduate-level jobs. Managerial jobs in firms with less than ten employees, however, are unlikely to correspond to top career jobs in the same way as those in larger firms and they constitute a separate category in our study²⁷. Table 7 lists all the 3-digit occupations included in each category of the resulting GRADJOBS typology. Figure 9 summarises the degree of intergenerational change in skill intensity in each one of these categories of jobs.

Figure 9. Intergenerational Change in Skill Intensity in PT by Type of Job, 2006



Source. EU LFS 2006

Note. Skill Intensity is calculated as the share of individuals with completed university education in the total workforce of a particular group of jobs and in the particular age segment being analysed. Figures within brackets refer to the ratio between the figures for both age groups.

The typology's main advantage is the ability to move beyond the idea that any job with a (statistically) significant earnings premium is necessarily a graduate job, as assumed for example by Cardoso (2007). In our view, that approach limits our ability to inform an efficient public planning of skill provision strategies in face of future workforce skill needs. At the same time, the typology allows us to partly control for differences between apparent and genuine over-education with the latter being more likely, namely, in data and non-graduate jobs.

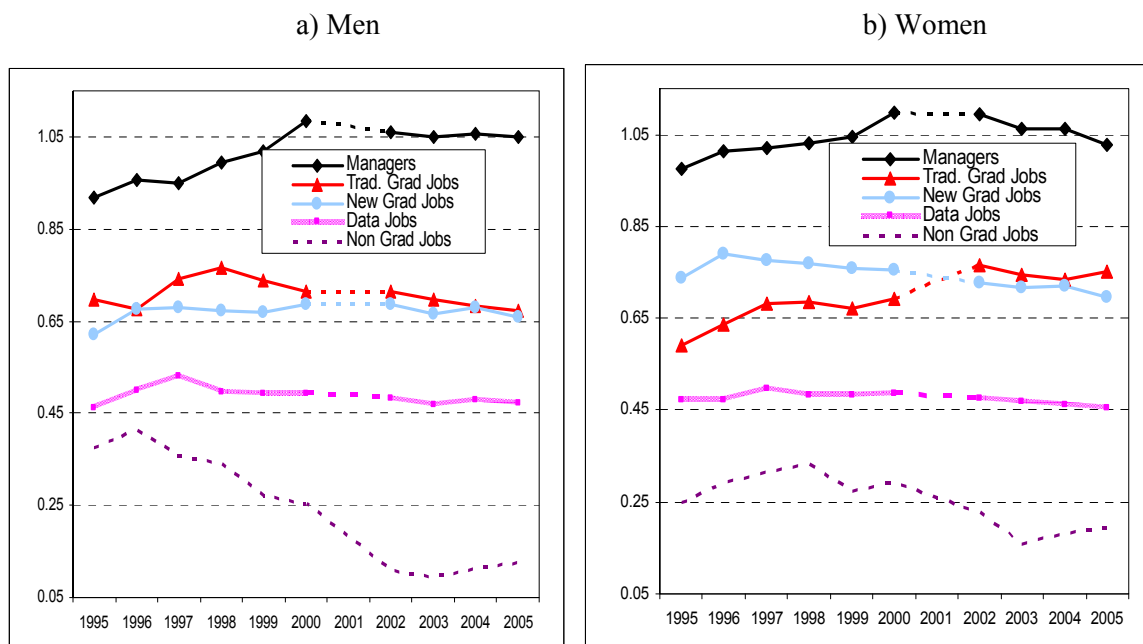
²⁷ Also because university graduates are almost totally absent from ISCO 6-9 occupations, these were isolated into a residual category.

Table 7. Description of the GRADJOBS Typology (ISCO-88 3-digit Jobs)

Management Workers	114	Senior officials of special-interest organisations
	121	Directors and chief executives
	122	Production and operations managers
	123	Other specialist managers
Traditional Graduate Jobs	111	Legislators and senior government officials
	211	Physicists, chemists and related professionals
	212	Mathematicians, statisticians and related professionals
	214	Architects, engineers and related professionals
	221	Life science professionals
	222	Health professionals (except nursing)
	223	Nursing and midwifery professionals
	323	Nursing and midwifery associate professionals
	231	College, university and higher education teaching professionals
	232	Secondary education teaching professionals
	233	Primary and pre-primary education teaching professionals
	235	Other teaching professionals
	242	Legal professionals
	244	Social science and related professionals
247	Public service administrative professionals	
331	Primary education teaching associate professionals	
332	Pre-primary education teaching associate professionals	
New Graduate Jobs	311	Physical and engineering science technicians
	313	Optical and electronic equipment operators
	315	Safety and quality inspectors
	321	Life science technicians and related associate professional
	322	Health associate professionals (except nursing)
	213	Computing professionals
	312	Computer associate professionals
	234	Special education teaching professionals
	241	Business professionals
	245	Writers and creative or performing artists
	333	Special education teaching associate professionals
	341	Finance and sales associate professionals
	345	Police inspectors and detectives
Data Jobs	243	Archivists, librarians and related information professionals
	342	Business services agents and trade brokers
	343	Administrative associate professionals
	344	Customs, tax and related government associate professionals
	411	Secretaries and keyboard-operating clerks
	412	Numerical clerks
	413	Material-recording and transport clerks
	414	Library, mail and related clerks
	419	Other office clerks
	421	Cashiers, tellers and related clerks
422	Client information clerks	
Small Firm Managers	131	Managers of small enterprises
Non Graduate Jobs	334	Other teaching associate professionals
	347	Artistic, entertainment and sports associate professionals
	511	Travel attendants and related workers
	512	Housekeeping and restaurant services workers
	513	Personal care and related workers
	514	Other personal services workers
	516	Protective services workers
	521	Fashion and other models
522	Shop, stall and market salespersons and demonstrators	
Other Jobs	611-615	Skilled agricultural and fishery workers
	711-714	Extraction and building trades workers
	721-724	Metal, machinery and related trades workers
	731-734	Precision, handicraft, craft printing and related trades workers
	741-744	Other craft and related trades workers
	811-817	Stationary plant and related operators
	821-829	Machine operators and assemblers
	831-834	Drivers and mobile plant operators
	911 - 916	Sales and services elementary occupations
	931-933	Labourers in mining, construction, manufacturing and transport

Figure 10 shows separate GWPs estimates for these different job types.²⁸ In fact, only graduates in *non-graduate jobs* saw the value of their degree decreasing considerably since 1995. On the contrary, graduates in *managerial jobs* and indeed female graduates in *traditional graduate jobs* saw their relative premiums *increasing* significantly. In other words, conditional on getting a graduate-level job (including new graduate jobs), the actual value of a university degree did not decrease substantially during this period. At the same time, there are clear differences in the level of GWPs across jobs and graduates in both data and non-graduate jobs were able to extract much lower relative gains from HE.

Figure 10. Young Graduates Wage Premiums by Type of Job, 1995-2005



Source. QP Dataset (1995-2005)

Notes. See Appendix A and equation (A.4). The university education dummy is split into five further dummies depending on the type of job obtained by each individual. Only individuals aged between 26 and 36 were considered

The obvious question is why, therefore, are those in higher-level jobs apparently sheltered from the effect of HE expansion? The apparent stability or even rise of GWPs within jobs and the sharp differences between them is, in our view, compatible with elements of assignment (Sattinger 1993) and job queue theories (Thurow 1976) and the idea that graduates' productivity is fundamentally shaped at work by building on the further learning potential of HE competences rather than on their direct effect²⁹. In this case, an insufficiently elastic demand structure could explain the decrease in the value of HE particularly in the case of those that end up at the bottom of such job queues.

Experienced individuals in jobs which provide significant opportunities for further skill development may not be easily substituted by 'cheaper' workers without significant investment on the part of employers. Besides, the non-linear effect of technological transformation on skills

²⁸ Again we split the original university dummy in the original OLS regression into different dummies for each of these job types. Similarly experienced high-school workers act again as the reference category.

²⁹ In any case, supply-side determinants can still be significantly correlated with earnings or job quality measures. It is the assignment of graduates to particular types of jobs that works as their main determinant rather than the *direct* effect of such supply-side characteristics. Sattinger's (1993) calls the later argument a 'fallacy of composition'.

demand could be behind a growing job polarisation (Autor, Katz et al. 2006) also among graduates. New technologies may indeed increase the productivity of ‘true’ knowledge workers and complement their already high-levels of specialised skills at work. Similarly, however, they may help the substitution of relatively-skilled positions by jobs which employers control to a greater extent (Brown and Lauder 2006). This is not incompatible with rising skill intensity or indeed the actual restructuring of most jobs’ skill requirements. Also graduates may be preferred to less qualified individuals in *all* types of jobs simply because they can be more flexible *and* still relatively cheap (Brown and Lauder 2006) or because they may have better ‘generic’ skills (communication, sociability, self-management or basic computing skills). We argue nevertheless that lower quality jobs still provide a significant cap to graduates’ relative earnings particularly as graduates may be more easily substituted. Those who Brown and Lauder (2006) call ‘knowledge workers without power’³⁰ should then be particularly exposed to the effects of the increasing supply of HE qualifications.

7. Employment Composition Effects

The fact that GWPs have remained fairly stable in most job indicates, therefore, that, most of them may have been transformed to a sufficient extent as to keep graduates’ relative position unchanged *within job groups*. In fact, non-graduate jobs constitute the only exception to this trend yet they still accounted for a very small percentage of graduates’ employment in 2005 – 4% in the QP dataset. At the same time, the stable differences in GWPs *across* jobs raise the possibility that graduates’ falling average wage premium may simply be explained by the compositional effects associated with their increasing prevalence particularly in data jobs. In fact, while in 1995 close to 56% of young university graduates were employed in either managerial or traditional graduate jobs, the respective figure for 2005 was only 41%. New graduate jobs and data jobs, in turn, already accounted for, respectively, 27% and 25% of all young graduate jobs (with their joint share in 1995 being 41%)³¹.

In order to assess the relative importance of compositional effects we decompose each year’s total graduates’ wage gap (GWGAP) into a *composition* and a *returns* effect (Oaxaca 1973; Cotton 1988; Neumark 1988; Oaxaca and Ransom 1994). GWGAP is here defined as the absolute difference between the log hourly earnings of university and high-school graduates. These, in turn, can be separately expressed as:

$$(7.1) \ln |W(X_{uni})| = \alpha_{uni} + \sum_{j=0}^n \beta_{uni j} X_{uni j} + \epsilon_{uni} ,$$

$$(7.2) \ln |W(X_{hs})| = \alpha_{hs} + \sum_{j=0}^n \beta_{hs j} X_{hs j} + \epsilon_{hs} ,$$

, where X is the vector of observable determinants of earnings, namely tenure, additional experience, employment status, sector, job type defined according to the GRADJOBS typology, work place, ownership, structure of firm and firm size. Assuming that b^* is the vector of *non-discriminating* coefficients, calculations were made as follows:

$$(7.3) \ln |\overline{W(X_{uni})}| - \ln |\overline{W(X_{hs})}| = b^* (\overline{X_{uni}} - \overline{X_{hs}}) + \overline{X_{uni}} (\widehat{b_{uni}} - b^*) + \overline{X_{hs}} (b^* - \widehat{b_{hs}})$$

³⁰ These authors argue, in addition, that this type of positions can be increasingly off-shored, further undermining, therefore, the relative position of such graduate segments.

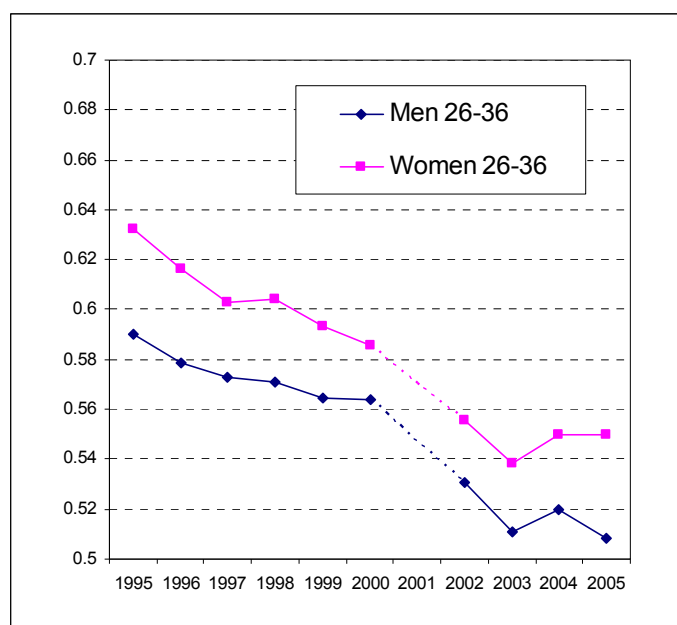
³¹ Since the QP dataset does not include the public administration sector – traditionally an important graduate employer – this figure does under-estimate the share of graduates in those jobs traditionally considered as graduate jobs. In fact, according to separate calculations based on the EU LFS dataset, 58% of young HE graduates in Portugal were still employed in either managerial or traditional graduate jobs in 2006.

, where a bar above W or X refers to sample means and b to the vector of estimated coefficients for the various determinants of earnings. We use the reference (non-discriminating) wage structure proposed by Neumark (1988) who estimates the relevant set of coefficients using a pooled sample of both groups³².

The *returns effect* – accounted by the last two terms on the right of the above equation – can then be seen as *graduates' total relative premium within apparently similar jobs*. As explained above, jobs are here defined much more specifically than previously. This then gives the total difference in premiums assuming a fixed level of these earnings' determinants. Composition effects, in turn, can be used to understand whether graduates' relative earnings trends simply reflect the changing composition of graduates' employment according to the characteristics we use to define jobs. It is associated with the difference in the determinants' means for the two educational groups (university and high-school graduates) at fixed returns.

Figure 11 first depicts the GWGAP trend for the period covered in this paper. Because, as we have argued, experience effects may actually serve to increase graduates' total earnings premiums it is useful to consider this alternative measure which does not control for such effects. It allows us, therefore, to have an idea of the *total premium* attributed to graduates rather than focusing on the effect of education per se. The downward trend of graduates' relative earnings is indeed clearly more pronounced if we consider this alternative measure.

Figure 11. Log Hourly Earnings Gap between Young University and High-School Graduates (GWGAP), 1995 - 2005



Source. QP 1995 – 2005

Notes. This measure refers to the absolute difference between the mean log hourly earnings of university graduates aged 26-36 and the respective measure for similarly aged individuals with completed secondary education.

Table 8 then shows the results of this decomposition exercise for three specific years (1995, 2000 and 2005). Clearly the different occupational distribution of university and secondary education graduates stands as the most important factor conditioning both each year's total gap as well as the decrease in graduates' relative earnings across this period. The different distribution of university

³² Alternatively, either the university graduates' or the high-school graduates' wage structures could have been taken as the reference (non-discriminating) wage structure.

and high-school graduates along the GRADJOBS typology could in fact explain still more than 55% of the total earnings gap in 2005. Less important but still relevant compositional differences are found regarding the combined effects of experience and tenure which contribute negatively to the earnings gap - as expected – and factors such as firm size and sector which contribute positively to the gap. The magnitudes of these contributions are nevertheless much smaller when compared with the effect of occupational effects.

Table 8. Decomposition of GWGAP among Young University Graduates 1995, 2000, 2005 (Oaxaca/Neumark Method)

a) Men

Wage Determinants	1995			2000			2005		
	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects
	Composition Effects	Returns Effects		Composition Effects	Returns Effects		Composition Effects	Returns Effects	
Tenure and Additional Experience	-0.039	0.020	-6.5%	-0.042	-0.030	-7.4%	-0.036	-0.005	-7.0%
Part-Time	0.006	-0.012	1.0%	0.006	0.001	1.1%	0.006	-0.013	1.2%
Work Location (Lisbon=1)	0.016	0.010	2.7%	0.014	0.039	2.5%	0.005	0.025	1.1%
Firm Size (ref. 100-499)	0.028	-0.023	4.6%	0.028	-0.019	5.0%	0.017	-0.037	3.4%
Ownership Structure	0.003	0.001	0.4%	0.001	-0.002	0.3%	0.002	0.007	0.4%
Sector (Ref.: Trad Manufacturing)	-0.001	0.040	-0.1%	0.019	0.029	3.3%	0.018	-0.013	3.5%
Occupation (Ref. Traditional Grad Job)	0.401	-0.136	67.4%	0.339	-0.147	59.8%	0.300	-0.126	58.8%
Intercept		0.280			0.330			0.360	
Total	0.414	0.181	69.6%	0.365	0.201	64.5%	0.313	0.198	61.3%

b) Women

Wage Determinants	1995			2000			2005		
	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects	Contribution to GWGAP		% of GWGAP Accounted by Composition Effects
	Composition Effects	Returns Effects		Composition Effects	Returns Effects		Composition Effects	Returns Effects	
Tenure and Additional Experience	-0.005	-0.090	-0.8%	-0.008	-0.064	-1.3%	-0.007	-0.046	-1.3%
Part-Time	0.045	0.025	7.1%	0.022	0.014	3.8%	0.020	0.004	3.7%
Work Location (Lisbon=1)	0.012	-0.010	1.9%	0.010	0.005	1.7%	0.005	0.004	0.9%
Firm Size (ref. 100-499)	0.044	-0.071	6.9%	0.035	-0.044	6.0%	0.022	-0.033	4.0%
Ownership Structure	0.002	0.002	0.3%	0.001	0.001	0.2%	0.010	0.009	1.9%
Sector (Ref.: Trad Manufacturing)	0.004	-0.073	0.7%	0.023	-0.043	3.9%	0.014	-0.030	2.6%
Occupation (Ref. Traditional Grad Job)	0.347	-0.148	54.9%	0.325	-0.188	55.4%	0.307	-0.355	55.9%
Intercept		0.548			0.497			0.625	
Total	0.449	0.183	71.0%	0.408	0.178	69.7%	0.372	0.177	67.7%

Source. QP dataset (1995 – 2005)

Notes. Following Neumark (1998), I take the pooled sample of university and high-school graduates as the ‘non-discriminatory’ earnings structure. Calculations consider only individuals aged between 26 and 36 years of age.

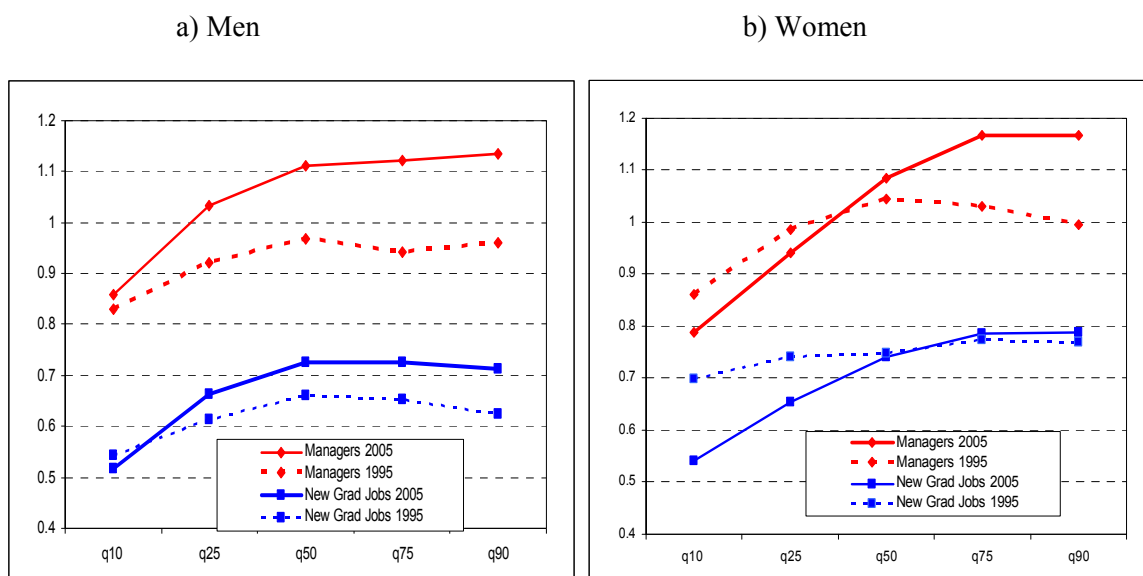
Regarding the evolution over time of these effects, it is clear that as graduates occupy new types of jobs, total ‘composition effects’ tend to decrease and this was the main drive behind falling relative earnings for this period. This decrease was especially strong in the case of men again because there was in 1995 a considerably more unequal distribution of jobs between young university and high-

school graduates. The massification of HE supply had the effect of, in short, making the average male graduate fall from a much better job than the average female graduate. For men, in turn, total return effects actually contributed to an *increase* in the total earnings gap, which indicates that, despite the increase in the numbers of available highly educated workers, firms were still willing to attribute a greater premium to graduate education in 2005 *within jobs*. Also women saw their total ‘return effects’ largely stabilising throughout this period.

Finally, occupational differences in 2005 explained significantly more of the overall earnings gap of female graduates. Conversely, within apparently similar jobs, women are still paid less for their degrees than men with this effect actually increasing overtime. Finally, our results also show that a large part of the decrease in absolute compositional effects is associated with the increasing prevalence of graduates in data jobs. On the other hand, the increasing displacement of high-school graduates towards non-graduate jobs had the opposite effect, increasing the earnings gap between university and secondary education graduates, particularly in the case of women.

Finally and even if clearly beyond the scope of this paper, the work organisation and HRM practices behind the increase in inequality within jobs and mainly managers’ relative earnings during this period deserve, in our view, further research attention. As an illustration of more developed calculations performed elsewhere (Figueiredo 2009), figure 12 shows QR estimates for two types of jobs - managerial and new graduate jobs – where growing inequality was more apparent. It is visible that, among men in particular, those at the very top of the wage distribution saw their relative situation improving considerably. This type of evidence is consistent therefore with the argument of rising inequality at the top or the fanning-out (Atkinson 2008) of earnings distribution and may also apply to graduates.

Figure 12. Graduates Wage Premiums for Managers and New Graduate Jobs: Quantile Regressions, 1995 and 2005



Source. QP Dataset (1995, 2005)

Notes. The results were obtained by calculating conditional QR estimates of a framework similar to that of figure 8 only individuals aged between 26 and 36 years of age are considered.

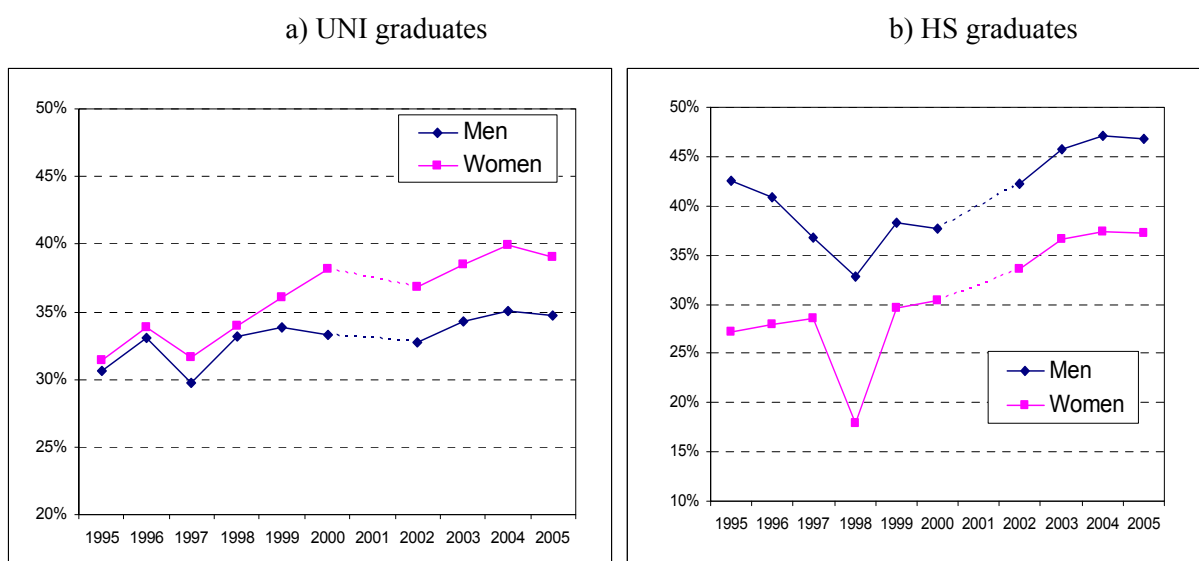
8. The over-education effect

In previous research, over-education has been usually seen as temporary and cohabiting with the modernisation of the Portuguese productive structure (Oliveira, Santos et al. 2000). In our view, it is easier to adhere to this idea when focusing on the long-run and particularly when earlier empirical

evidence supported the view that demand for tertiary skills was able to keep up or even outperform supply. We argue, however, that it loses relevance as the success story of HE expansion in Portugal loses momentum and in view of the *increase* in the relative penalty of over-education among young Portuguese graduates which we document below.

Following the increasing diversity of jobs held by university graduates, the share of the over-educated has indeed increased considerably both among university and high-school graduates (figure 13). In 2005, close to 40% and 35% of male and female graduates were ‘over-educated’ according to the definition we use here. Following Oliveira, Santos et al. (2000) and Sloane (2004), we define the level of *required* education within a particular ISCO-88 3-digit occupation as the mode of the educational attainment of all workers in that occupation³³. We do not make a distinction between formal and genuine over-education which is a potential limitation since we may then under-estimate the transformation of some jobs’ skill requirements particularly if these changes are very recent³⁴.

Figure 13. Share of ‘Over-Educated’ Young University and High-School Graduates (26-36), 1995 – 2005



Source. QP dataset (1995 – 2005)

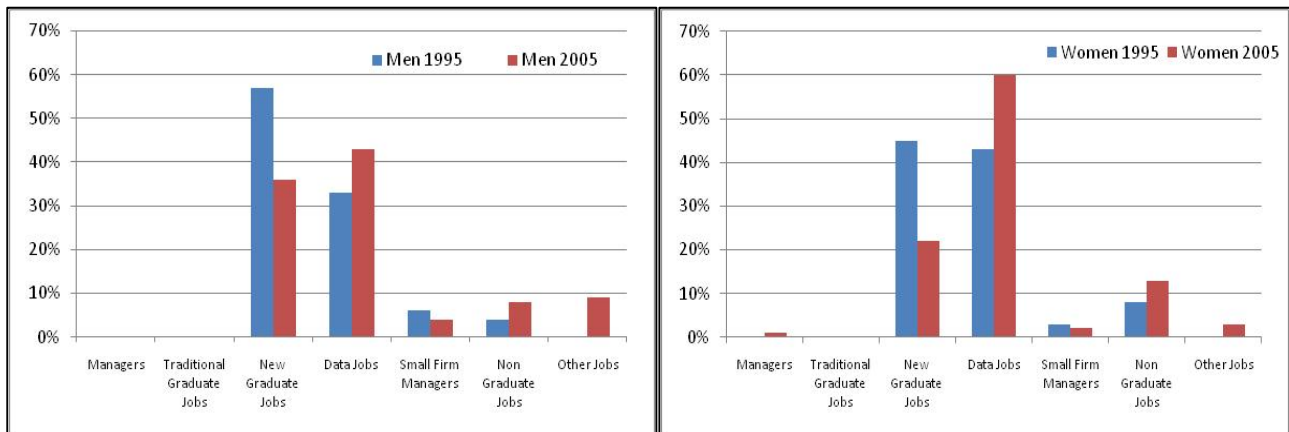
Notes. ‘Over-educated’ are defined as individuals who have more years of education than the mode of their respective 3-digit occupation, considering all individuals in the sample. However, graduates with a Licenciatura-type of degree (16 years of education) in jobs with a mode of 14 (Bacharelato) are not considered over-educated. Where the occupation had more than one mode, a relatively conservative approach was used with the highest level of education being considered as the most frequent level of educational attainment. For more details about this definition of over-education please refer to Appendix F.

³³ This is one of many possible measurement methods. The authors argue, however, that the use of the mode instead of one other measure of central location has the advantage of being less susceptible to outliers and being therefore more representative of the skill intensity associated with that particular occupation. It should be pointed out that this specification does not correspond to the commonly applied ORU specification (Hartog 2000) which itself constitutes an alternative to the Mincer (1973) specification in that it also considers demand side effects through the introduction of a measure of required schooling. In the ORU specification, however, it is usually still assumed that the impact of one additional year of required or over-education is similar for individuals across all educational levels. This is clearly not the case in our calculations.

³⁴ Changes in firms’ recruitment practices may apply only to recently employed workers with its effect being then spread only slowly across different generations of workers. The distinction between apparent or genuine over-education has indeed become rather important in raising the validity of recent research on over-education (see, for example, Chevalier 2003). A similar and common distinction made is that of formal over-qualification and skill underutilisation which were shown to significantly diverge (see, for example, Green and McIntosh 2007).

In any case, during the period covered in our study, over-education became increasingly synonymous with being employed either in data or non-graduate jobs, particularly among women. Our calculations (figure 14) show that, in 2005, close to 64% of men and 78% of the over-educated women were in these types of jobs. In 1995, the respective figures were 43% and 55%. New graduate jobs continued therefore to absorb young graduates in increasing numbers and, by 2005, tertiary education had become the prevalent level of educational attainment in a number of these jobs³⁵. On the other hand, the also rising over-education among high-school graduates is compatible with their increasing displacement from data jobs or other intermediate-skilled jobs which are now being increasingly filled by degree holders.

Figure 14. Distribution of ‘Over-Educated’ Graduates by Type of Job, 1995 - 2005



Source. QP dataset (1995 – 2005)

Notes. see figure 12

In order to monitor the impact of over-education on the increasing dispersion of GWPs (which works as another proxy for job structure effects), we again substitute the original university dummy in our original OLS regression framework (4.1) by a vector of dummies for graduates in *adequate* jobs, *over-educated* graduates and *under-educated* graduate³⁶. We measure, therefore, the relative wage premium of each of these categories relative to the average worker with completed secondary education. Figure 15 presents the results of these calculations.

This rise in over-education per se is not necessarily a surprise or problematic from a policy point of view. It can underestimate changes in jobs' skill requirements over time due to a lag between the start of changes in firms' recruitment practices and the recruitment of a sufficient number of individuals with the 'correct' level of schooling (Oliveira, Santos et al. 2000). Crucially, however, if over-education was simply a transitional phenomenon typical of periods of modernisation, we would expect the apparently over-educated to continue to enjoy stable or even rising premiums. In other words, if jobs could be fully transformed as to reflect the intrinsic productivity levels of highly qualified individuals, the occupational redistribution of graduate jobs should not necessarily have any impact regarding decreasing GWPs. This does not seem to be the case, however, according to the results shown above.

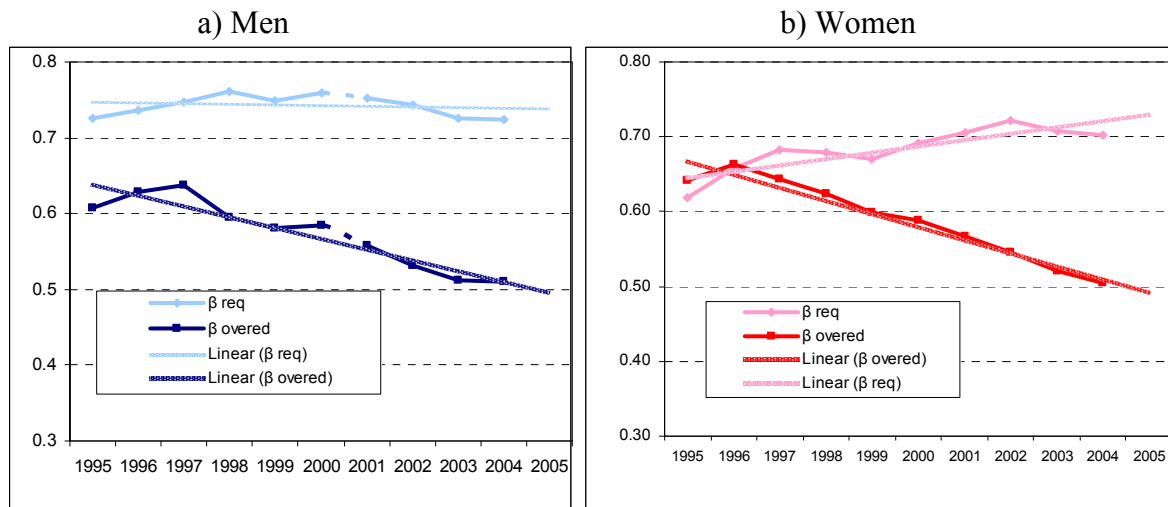
Figure 15 shows that, beyond any compositional effects, the decrease in GWPs within jobs has happened *solely* for the over-educated. Female young graduates in adequate jobs, for example, actually continued to experience increasing GWPs. The relative penalty of being over-educated has then appeared to increase significantly. In 1995, for example, the average over-educated graduate

³⁵ This provides further validity to the GRADJOBS typology we use in the paper.

³⁶ Under-qualified graduates refer to those with vocational oriented degrees (and 14 schooling years overall) in jobs where the educational mode is 16 schooling years.

was paid more than 60% more than an average high-school worker with a similar level of experience while that value was close to 50% in 2005.

Figure 15. Graduates Wage Premiums by Overeducated Status , 1995-2005



Source. QP Dataset (1995-2005)

Notes. The university education dummy is split into two further dummies depending on whether or not the graduate is over-educated according to the definition in figure 6.13. Only individuals aged between 26 and 36 years of age are included.

Graduates in jobs with higher skill intensity levels, in turn, were paid around 70% more than that same reference high-school graduate worker. Again here, there is an important shift in the story of wage inequality among graduates since the period up to 2000 was characterised by growing GWPs for both over-educated and adequately educated graduates (Hartog et al. 2001).

9. Conclusions: is mass higher education in Portugal such a success story after all?

Over the last decades we have observed a continuous trend of expansion higher education worldwide, which was largely supported by high individual and social expectations about the labour market benefits associated with advanced training and higher education qualification. The unprecedented speed and scale of higher education's expansion has consistently raised concerns about the impact that that expansion could have on the aforementioned benefits. In Europe, where mass higher education developed later, these concerns gained momentum in the late twentieth century (Schomburg and Teichler, 2006). In this paper we have analysed the impact of the massification of higher education In Portugal, which is a particularly interesting case. Although the development of mass higher education was one of the latest and most concentrated in time in Europe, prior studies have persistently indicated that Portugal had high labour market benefits for higher education graduates, both on employability and long-term returns. These benefits fuelled persistent high demand. Nevertheless, these recent studies have shown that underneath those high average benefits, there was significant and growing variability in graduates' earnings premiums, suggesting that the transition to labour market was becoming increasingly differentiated.

Using a large official dataset that covers a large majority of employees, we have analysed the evolution of GWP for the period 1995-2005. We observe that although there is still a large premium for graduates, there was a visible decline in line with the continuing massification of higher education. We have also found, however, that most of the decline affected graduates with earnings below the median and that the return for higher incomes remained largely unaffected. We have also found that most of the erosion referred to university degree holders (the largest group among higher education graduates), with a fanning-out of the distribution also below the median. Their relative earnings have become closer to the higher earnings of those obtaining a vocational degree.

Differently from other studies, we have looked at changes in the composition of employment structure and the way this may have affected GWPs. Using a typology of graduate jobs, we have found that the decline affected essentially those graduates that occupied what we consider to be non-graduate jobs. The results also indicate that those graduates who occupied what we consider to be graduate jobs have not seen an erosion of their GWPs. Thus, supply and demand forces operate seems to be clearly more favourable to some graduates than to others and that there are signs of a possible increasing stratification among higher education graduates (though the deterioration still affects a small share of graduates). Overall, we observe that the employment dimension seems extremely relevant in explaining falling GWPs particularly because stable earnings premiums *within* most graduate jobs co-existed with the significant re-composition of graduates' employment with a much larger share now found, for example, in data-processing jobs. Graduates in jobs for which they were (formally) over-qualified, in particular, appear to have taken most of the blow.

Despite an overall positive correlation between education and employment and education and long-term earnings, our results highlight an increasing variability of scenarios faced by higher education graduates. This then complicates considerably the largely successful story of HE expansion in Portugal with an increasing paradox arising. On the one hand, fuelled by past perceptions but also by the continuing advantages of some graduate segments, Portuguese students are perhaps among those who still expect more from a degree. Most jobs, in addition, appear to have continued to be transformed to an extent as to maintain graduates' relative position relatively intact provided graduates are able to access them in the first place. Furthermore, graduates increasingly substitute less qualified individuals in intermediate-skilled positions, fuelling therefore further interest in attending HE education. On the other hand, due to HE expansion being very recent in Portugal, there is little tolerance for the sudden shift in some graduates' fate that we documented here. Differences in the overall quality of different graduate job categories have indeed remained largely intact or even increased effectively making graduates' position highly dependent on the type of job which they are assigned to. The sole re-composition of graduates' employment during this period contributed significantly therefore to worsen the situation of many who now seem to be facing increasing difficulties visible through lower returns to their degrees and an occupational path that reduces their present income and possibly their longer term prospects.

With rates of enrolment moving beyond 50% in many European countries, part of the debate should then move beyond attaining a degree to the type and quality of the degrees offered by the HEIs and those demanded by the labour market. Further studies of the competences-mix required by the type of jobs that now make for the majority of graduates' employment are clearly needed as are further reflections on the desired role that universities should assume when training and educating such future workers. This has become even more relevant since the development of mass higher education diminished the informational value of a university degree and many employers started to develop other criteria to distinguish among a widening pool of candidates. On the other hand, we have shown elsewhere (Figueiredo 2009) that there is a higher degree of mismatch between the pace of HE expansion in late-massification countries such as Portugal but namely in Spain and Italy and these economies' inertia in creating high-quality, graduate-level jobs. Young graduates' in these countries are more likely to end up in jobs for which they may be over-educated or in lower quality jobs which can be significantly at odds with their initial expectations.

Our results then converge with recent studies in presenting a more nuanced view about the complex links between higher education and the labour market within a context of mass higher education and an increasing differentiation of graduates' prospects. Thus, although the massification has created good opportunities in Portugal for many younger generations, especially in contrast with previous generations (to whom access to higher education was a possibility for only a small elite), the continuing expansion seems to be creating new inequalities among graduates that mitigates the high expectations many of them had regarding higher education.

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