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The dynamics of job creation and destruction for University graduates: why a rising unemployment rate can be misleading

The dynamics of job creation and destruction for University graduates: why a rising unemployment rate can be misleading [*]

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Abstract

A large matched employer-employee dataset on the Portuguese economy is used to analyze gross job creation and job destruction for university graduates, compared to other groups of workers. Standard measures of gross job flows are computed, and variance decomposition is used to check whether idiosyncratic shocks or aggregate and sectoral shocks can account for the time variation in gross job flows, for schooling groups separately. Results indicate that the market for university graduates has expanded much more than that for undergraduates, and that idiosyncratic shocks are more relevant driving job flows for university graduates than for non-graduates. No support is therefore found for the pessimistic view that states that the expansion of higher education may have gone too far.

KEYWORDS: gross job flows; aggregate, sectoral, idiosyncratic shocks
JEL: J21, J60, J63

1 Introduction

Higher education has been expanding in most countries, with enrollment rates and the number of students rising sharply. This trend was particularly pronounced during the first half of the 1990s. For example, between 1990 and 1996 total enrollment in tertiary education more than doubled in Poland and Portugal, having increased by over 80 percent in the UK and Hungary (OECD 1999). Several reasons have combined for this outcome. Changes in the funding system of higher education, steered to rely increasingly on market mechanisms, have led institutions into intense competition to attract students. Rising private returns to higher education, pointed out in studies of wage dispersion for several countries, may have played a role motivating the continuation of studies beyond high school. Also, the widespread perception of the impact of higher education on development has pushed some countries, in particular developing ones, into expanding their higher education systems.

However, as higher education degrees became more widespread and less exclusive, fears started spreading as to the capacity of the labour market to absorb the newly-graduates. Throughout, employers have been claiming that the higher education system is not providing the necessary skills and it is often advocated that the external efficiency of universities should be evaluated, monitoring the jobs and earnings of graduates. Most often, the unemployment rate has been implicitly set as the criterion to assess employment prospects for graduate workers. As the unemployment rate for this group of workers increased in several countries, the high expectations of the 80s gave place to concern in the 90s. An extreme view seems to be popular nowadays, stating that the expansion of higher education may have gone too far and that investment in a higher education degree has become too risky, possibly not worthwhile, as employers are no longer keen on recruiting newly graduate workers (Teichler (1999) provides a clear analysis of these trends).

Such statements are usually not backed up by empirical analysis of sound data, and in this paper we argue that a more balanced view is called for. Relying on

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systematic information on job creation and job destruction for higher education graduates compared to other groups of workers, we find that the unemployment rate can provide a misleading idea of the dynamics in labour demand and of the employment prospects for university graduates. What has indeed been the pace of job creation and job destruction for university graduates hiding behind their unemployment rate? Which have been the most dynamic sectors? What is the role of aggregate and sectoral shocks, as opposed to idiosyncratic shocks, driving gross job flows for university graduates?

The study uses a very rich longitudinal data set matching workers and employers in the Portuguese economy, with information on over two million workers and approximately 200 thousand firms each year.

Section 2 describes the evolution of employment prospects for university graduates when compared to other groups of workers in Portugal, as traditionally captured by their unemployment rates and by the job offers advertised nationally over two decades. Section 3 describes the data set and concepts used. In section 4, the results on job creation and job destruction are presented. Section 5 checks the role of aggregate and sectoral shocks versus firm-level shocks driving gross job flows, and concluding comments are presented in the last section.

2   Higher education and the labour market in Portugal

The schooling achievement of the working population is remarkably low in Portugal when compared to its OECD partners. Indeed, only 11% of the labour force holds a tertiary education diploma, the lowest value reported by the OECD (2002); on the other hand, 45% of the Canadian labour force holds one such degree (42% in Ireland and 36% in Japan).

Nevertheless, the possibility of integrating university graduates into the labour market started to be an issue of concern in Portugal in the early 90s and the claim that employers were no longer interested in hiring university graduates, in particular young ones, and were demanding instead experienced workers, was widely believed upon. Such claim was backed up by the evolution of the unemployment

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rate by schooling levels and by the requirements advertised in job openings.

A certain convergence of unemployment rates across schooling levels can be identified in figure 1. Whereas the unemployment rate of university graduates increased from around 1% in 1981 to 3% two decades later, for lower schooling levels it showed signs of declining. This convergence of unemployment rates by schooling level led to the idea that a university diploma was no longer a safe passport out of unemployment and raised doubts about the capacity of the labour market to absorb the newly-graduates. Slack labour demand for university graduates was often identified as the source of the problem.

—————————figure 1 about here—————————

Analysis of the requirements imposed by job offers would apparently lend support to this claim. Between 1989 and 1995, the share of job announcements requiring a university diploma declined sharply, from around 50% to 5%. On the other hand, the share of ads requiring previous labour market experience remained high, though declining from 50% to 20%. By mid 90s, a higher education diploma was back in high demand, and the number of employers advertising jobs for graduates was close to the number of those requiring previous experience. However, the trend in late 90s was not enough to overcome the concerns that meanwhile had grown, especially as the graduates unemployment rate failed to decline.

—————————figure 2 about here—————————

Relevant questions are therefore: To what extent did the economy indeed reduce its pace of job creation for graduate workers? Which were the most and the least dynamic sectors? To what extent does the evolution of the unemployment rate provide relevant clues for a decision on whether to invest in university education?

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3   Data set and concepts used

Data set

This study relies on *Quadros de Pessoal*, a longitudinal data set matching workers and their employers in the Portuguese private sector, from 1985 to 1999. The data are gathered annually by the Ministry of Employment, based on an inquiry that every establishment with wage-earners is legally obliged to fill in. Reported data cover all the personnel working for the establishment in a reference week (in March until 1993, and in October from 1994 onwards). Public administration and domestic service are not covered, and the coverage of agriculture is low given its low share of wage-earners. For manufacturing and the services, given the mandatory nature of the survey, the population of firms with wage-earners is in fact covered. Reported data include the firm's location, industry, employment, sales, ownership, legal setting, and the worker's gender, age, skill, occupation, schooling, admission date, earnings, and duration of work. Jobs filled by full-time wage earners were considered in the analysis.

The Ministry assigns a unique identification number to each company when it first reports to the database, and it is thus possible to track firms. Extensive control procedures are implemented to guarantee that a firm is not assigned a different number later on. Such procedures are based in particular on the location of the firm and its official identification codes.

In 1990 no worker data were reported and therefore it is not possible to compute the flows for the periods 1989-90 and 1990-91. Since the date of inquiry changed from March to October in 1994, a wider time frame is covered that year, rendering the flows not comparable to the other years, and therefore that period will not be used in the computations. Tables 3 and 4 in appendix describe the sample sizes and the structure of employment by industry, respectively.

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Job creation and job destruction

Aggregate employment figures provide no information concerning the expansion or contraction of employment taking place at the firm level. The study of gross job flows at the firm level has therefore deserved increasing attention in the literature, as it provides a more accurate picture of the dynamics in the labour market (see for example Davis *et al* (1996) or Garibaldi and Mauro (2000) for a highlight of its advantages).

The methodology and the concepts used follow Davis *et al* (1996). Gross job creation and destruction are computed at the firm level as the change in employment from period $t-1$ to period t.

$$\Delta X_{f,t} = X_{f,t} - X_{f,t-1}$$

where X stands for the employment level, f refers to the firm and t to the moment in time (year). If employment increases, job creation is said to have taken place, while job destruction occurs when employment in the firm decreases.

Aggregating from the firm to the level of the sector or the industry s, gross job creation (*pos*) equals the sum of employment changes over all firms that expanded its employment or were set up during the period, and similarly, job destruction (*neg*) is the sum of employment changes over all firms that contracted or shut down.

$$pos_{s,t} = \sum_{+} \Delta X_{f,t} \qquad and \qquad neg_{s,t} = \sum_{-} |\Delta X_{f,t}|$$

Net job creation (*net*) is the difference between gross job creation and gross job destruction and gross job reallocation is the sum of job creation and job destruction over a certain period for sector s:

$$net_{s,t} = pos_{s,t} - neg_{s,t}$$

$$sum_{s,t} = pos_{s,t} + neg_{s,t}$$

Job reallocation is the maximum amount of worker reallocation required to accommodate the change in employment opportunities across firms. Note that, if no

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worker switched from a contracting to an expanding company, then the amount of worker reallocation would correspond to the job reallocation, as *pos* workers would move from out of employment into employment, while *neg* workers would move in the opposite direction. This measure therefore provides an indication of the overall degree of rotation in the labour force resulting from changing job opportunities across firms.

However, certain workers may be counted twice in the gross reallocation measure, if they switch from a contracting to an expanding company. The measure of minimum worker reallocation (m) aims precisely at eliminating the problem of double counting involved in summing gross job creation and gross job destruction. It is computed as the larger of gross job creation and gross job destruction:

$$m_{s,t} = max(pos_{s,t} \, , \, neg_{s,t})$$

It reports the minimum worker reallocation required to account for the changes in job opportunities across firms.

Finally, excess job reallocation (exc) is computed as the difference between gross reallocation and the absolute value of net employment change.

$$exc_{s,t} = sum_{s,t} - |pos_{s,t} - neg_{s,t}|$$

It evaluates the amount of job reallocation that took place beyond what would be strictly necessary to accommodate the net job change. This is considered the best indicator of simultaneous job creation and job destruction, capturing the heterogeneity among firms – whereas some are expanding, others are contracting.

Job flows can be expressed as rates, dividing through by a measure of firm size, z, which is the average employment in periods t and $t-1$.

$$Z_{f,t} = \frac{X_{f,t} + X_{f,t-1}}{2}$$

The rate of employment growth in the firm is thus computed as:

$$g_{f,t} = \frac{\Delta X_{f,t}}{Z_{f,t}}$$

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The use of this size measure is preferred over the traditional size measure (employment in the base period), because the rate of employment change now ranges over a bounded and symmetrical interval, -2 to $+2$.[1]

4 Coexistence of high rates of job creation and job destruction

High rates of job creation coexisted with high rates of job destruction for university graduates, with a net positive impact on overall employment. Indeed, out of 100 jobs existing in the economy performed by university graduates, 23 new ones were created on average each year between 1986 and 1999, whereas 15 were destroyed (table 1). These values suggest that a high job rotation prevails for university graduates in the Portuguese economy, strictly due to heterogeneity in the firms' recruitment behavior. According to Caballero and Hammour (1996), a positive correlation between job creation and destruction would be indicative of a market operating efficiently, with matches being destroyed to yield better matches. Several authors have reported the coexistence of high rates of job creation and job destruction for different countries (see for example Davis and Haltiwanger (1992) for the USA, Baldwin *et al* (1998) for Canada and the USA, Blanchflower and Burgess (1996) and Konings (1995) for the UK, Tsou *et al* (2002) for Taiwan, or Vainiomaki and Laaksonen (1999) for Finland).

High job creation and simultaneous job destruction is also a characteristic of the labour market for workers with lower levels of schooling, but the rates are lower. Out of 100 existing jobs performed by undergraduates, 13 were created and 12 were destroyed on average each year during the period under analysis.

—————————————table 1 about here—————————————

The trends in net job creation rates for graduate workers and for those not holding a university diploma diverged after 1988 (figure 3), as the variable tended

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[1]It is therefore possible to compute the measure for new firms and for those going out of business (achieving the values $+2$ and -2, respectively). Values between -1 and 1 correspond approximately to the traditional percent increase in employment.

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to move in the same direction, but at different paces, for the two groups of workers. Net job creation for workers not holding a university diploma follows more closely the business cycle. During the second half of the 80s, the Portuguese economy has grown sharply and employment expanded at a fast pace, with the rate of net job creation being similar for the two groups of workers. By the end of the 1980s, however, net job creation for workers holding a university diploma was already taking place at a faster pace than for workers with lower schooling levels. The contrast became more pronounced in the 90s, when employment opportunities for graduates were expanding faster than for non-graduates. In 1993, negative rates of job creation for undergraduates contrasted with a positive 4% net job creation for graduates. Since 1993, employment for undergraduates has grown very modestly, whereas for university graduates it has been expanding strongly, reaching 13% a year in 1997 and 1998.

—————————————figure 3 about here—————————————

Concerns about the employment prospects for university graduates therefore begun spreading in Portugal precisely when their employment opportunities were expanding the most and in sharpest contrast with the employment prospects for undergraduates. Thus, the rising unemployment rate did not result from a slack labour demand by employers no longer trusting the higher education system and the skills it provides. Instead, demand kept expanding. The employment prospects of university graduates should be compared to those of undergraduates in the same period, and not to those of graduates who left the educational system a decade before.

Figure 4 presents other measures of rotation of job opportunities among companies (gross job reallocation and excess job reallocation). It reveals that the pace of change in the labour market for university graduates is faster than for other workers. In fact, approximately 40% of the existing jobs for higher education graduates are either created or destroyed each year, whereas for undergraduates that value is around 20-25%. The reallocation beyond what would be strictly necessary to ac-

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commodate the net employment change (excess job reallocation) reveals a similar pattern. Such turbulence results from the contrasting behaviour of the different companies, which is more pronounced for jobs held by university graduates than for the rest of the labour force. For undergraduates, the economy is closer to a situation where all the companies either contract or expand their employment level.[2]

—————————————figure 4 about here—————————————

Figure 5 reports, for each industry, the average yearly rate of job creation and job destruction for university graduates and workers holding lower schooling levels. In each of those graphs, industries located on the diagonal did not change their overall employment level for that category of workers, since the rate of job creation was offset by an equal rate of job destruction. Industries located above the diagonal were net job creators and, symmetrically, industries below the diagonal were net job destructors. Industries closer to the origin present lower rates of job reallocation, as both job creation and job destruction were low. The farther away from the origin, the higher the rate of gross job reallocation in the industry.

—————————————figure 5 about here—————————————

Employment expansion for university graduates took place across industries, with the exception of base metals, where employment declined. The services have shown the largest expansion of graduate jobs. Note however that, whereas in banking and insurance the expansion of employment took place with low reallocation of jobs across firms, in the remaining services high job creation coexisted with high job destruction. The most stable industries, apart from banking and insurance, were electricity, gas and water, chemicals and transportation and communications.

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[2]Part of the detected homogeneity in firm behaviour when it comes to job changes for the undergraduates may result from the fact that we are dealing with a broader group of workers, and therefore mechanisms of compensation within the firm may operate. Note the example of a firm that may contract its employment level for workers holding 4 years of education, while expanding it for workers with 9 years of education. In such a case, overall employment for undergraduates could remain stable, and neither job creation nor destruction would be captured.

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The contrast with workers holding lower schooling levels stands out. Note first of all the higher concentration of industries close to the diagonal, indicating low rates of net job creation for undergraduate workers. In electricity, gas, water, base metals, and chemicals, job destruction has surpassed job creation. On the contrary, in services to companies and other services, job creation took place at a fast pace, just like for graduate workers. Job reallocation was considerably lower for workers with lower levels of schooling, indicating that net job expansion or contraction resulted from a more uniform trend across firms than it has been the case for university graduates.

5 Decomposition of employment changes into idiosyncratic, sectoral and aggregate shocks

This section analyses the time variation in job creation and job destruction. It checks the role of idiosyncratic shocks against sectoral and aggregate shocks as forces driving job flows, using variance decomposition analysis. Following Davis and Haltiwanger (1992), the firm growth rate of employment is decomposed into a firm-specific part, a sector-specific part and an aggregate part, by estimating:

$$g_{ft} = \widetilde{g}_{ft} + g_{st} + g_t, \tag{1}$$

where g_{ft} is the firm employment growth rate between years $t-1$ and t, $\widetilde{g}_{ft}$ is the residual or idiosyncratic component of firm-level employment growth, g_{st} is the sector-time specific component and g_t is the aggregate-time component. The job creation associated with idiosyncratic shocks is then computed as:

$$\widetilde{POS}_t = \sum_{\widetilde{g}_{ft}>0} \widetilde{g}_{ft}\frac{z_{ft}}{z_t} \tag{2}$$

where z_{ft} stands for the firm size and z_t for overall employment in the economy, both defined, as previously described, as the average of the current and previous periods. The following identity holds:

$$POS_t = \widetilde{POS}_t + (POS_t - \widetilde{POS}_t) \tag{3}$$

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and therefore

$$Var(POS_t) = var(\widetilde{POS}_t) + Var(POS_t - \widetilde{POS}_t) + 2Cov(\widetilde{POS}_t, (POS_t - \widetilde{POS}_t)).$$

(4)

The first term on the right-hand side is the effect of idiosyncratic shocks on job creation, the second term gives the impact of sectoral and aggregate shocks, whereas the third term provides the interaction between those two types of shocks, revealing whether the two effects reinforced each other or operated in different directions. Dividing each of these terms by the left-hand side, yields their relative importance in accounting for time variation in job creation. Similar computations were made for job destruction and job reallocation, with equation 2 adapted to become:

$$\widetilde{NEG}_t = \sum_{\widetilde{g}_{ft} < 0} |\widetilde{g}_{ft}| \frac{z_{ft}}{z_t}$$

(5)

$$\widetilde{SUM}_t = \sum |\widetilde{g}_{ft}| \frac{z_{ft}}{z_t}$$

(6)

——————————table 2 about here——————————

From table 2 it is noticeable, first of all, that aggregate and sectoral shocks are the main force driving changes over time in job flows. Using the same methodology on different samples, Davis and Haltiwanger (1990, 1992) found slightly higher contributions of the idiosyncratic component to job creation and destruction in the USA; Gautier and Broersma (2001) found much higher contributions in The Netherlands; in the UK, the contribution reported by Konings (1995) for job creation is higher than in Portugal, whereas that for job destruction is similar to the Portuguese. A regulated labour market and stiff employment protection legislation could in Portugal leave little scope for firms to adjust their employment level when faced with firm-specific shocks. It has been documented that higher employment protection has an impact, not just on job destruction flows, but as well on job creation (see Blanchard and Portugal (2001); similarly, Broersma (1996) found that regulations leading to wage restrain or the generosity of the social security

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system had an impact on flows in the labour market. It should however be noted that idiosyncratic shocks reinforce in Portugal the impact of sectoral and aggregate shocks, for most of the cells reported in table 2. Job destruction increases during recessions and this effect is amplified by firm-level effects; similarly, job creation increases during expansions, an effect reinforced by firm-level shocks.

The relevance of aggregate and sectoral shocks may also have resulted from the pace of change taking place in the economy. During the period under analysis, the Portuguese economy underwent structural adaptation, partly driven by the accession to the European Union that had taken place in 1986. The growth in GDP per capita (see table 5 in appendix) illustrates the speed of change, as it increased from 40 percent to 50 percent of the USA level between 1985 and 2000. The composition of employment changed, with the relevance of manufacturing declining (specially in the case of textiles, clothing, and heavy manufacturing), in favour of the services (table 4 in appendix). Under this framework, demand for a qualified labour force increased, reflected in rising wage premia (Cardoso, 1999). Though demand for workers holding a university degree kept expanding, in certain scientific areas it did not match the rise in supply resulting from the expansion of higher education. Table 6 in appendix reports by age group the share of population attaining tertiary education. Whereas just 3 percent of the cohort aged 55-64 in 2001 held a university diploma, 11 percent of the cohort aged 25-34 held one. The latter cohort of university graduates entered the labour market during the 1990s, bringing about the sharpest increase in schooling achievement ever registered in the country's labour market.

Table 2 indicates moreover that the impact of the different shocks is similar for university graduates and non-graduates, when considering just continuing firms. However, when progressing to analyse all firms in the economy, different patterns can be detected for university graduates and non-graduates. The different action taking place in terms of job creation or job destruction for university graduates and non-graduates results from the behaviour of new firms and those going out of business. Idiosyncratic shocks play a larger role for university graduates than

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non-graduates.

Results highlight a much more flexible and flowing labour market for higher education graduates than for non-graduates, and a more relevant impact of idiosyncratic shocks driving job flows for the most schooled labour force.

6   Conclusion

Analysis of gross job creation and destruction at the firm level provides systematic information on job dynamics that cannot be captured by the evolution of aggregate employment or unemployment rates.

It is interesting to note that the rising unemployment rate for university graduates and its decline for undergraduates over the 80s and 90s provide a misleading idea of the dynamics of job creation in the Portuguese economy, as net job creation rates point precisely in the opposite direction —net job creation took place at a much faster pace for higher education graduates than for the rest of the labour force. The rise in the unemployment rate for graduate workers did not result from declining demand for that group of workers, and support is thus not found for the simplistic view that seems to be widespread nowadays, according to which employers would no longer be willing to recruit university graduates, given the inability of the system to provide workers with adequate skills.

The labour market for graduate workers is more flexible and flowing than that for workers with lower schooling levels. On average, one in four graduate workers will have to switch employer or employment status each year, just to respond to the reallocation of job opportunities across firms. That ratio is one in seven for the undergraduate labour force. Irrespective of the type of contract the worker holds, individuals holding a higher education diploma are asked to switch jobs more frequently, simply as a result of the reshuffling of employment opportunities across firms, and will thus have to adapt more frequently to changing work environment.

Using variance decomposition to check whether idiosyncratic or sectoral and aggregate shocks drive the time variation in job flows further highlights that the graduate labour market is more volatile. The impact of idiosyncratic shocks is more

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relevant driving job flows for higher education graduates than for non-graduates. The contrasts between the two labour markets results mostly from the behaviour of new firms and those going out of business, most likely because continuing firms are subject to employment protection legislation that is applied irrespective of the worker schooling level.

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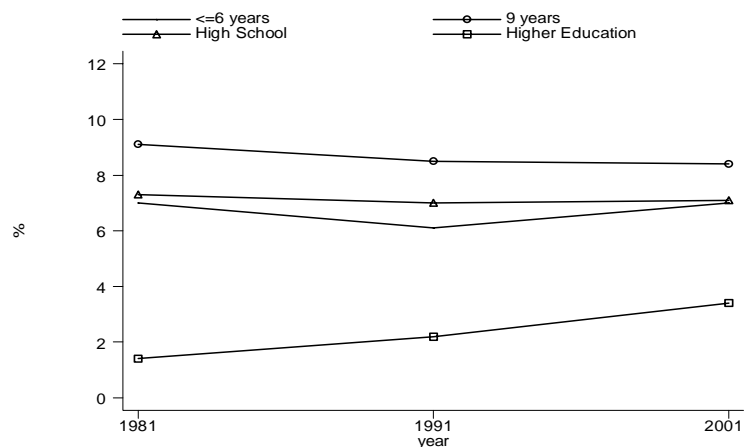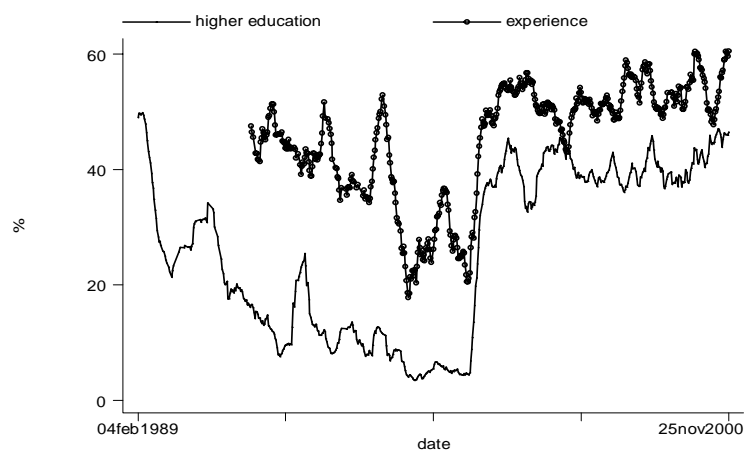Figure 1: UNEMPLOYMENT RATE BY SCHOOLING LEVEL. Sources: Portugal, INE (1981, 1991, 2001).

Figure 2: REQUIREMENTS IMPOSED BY JOB OFFERS ADVERTISED AT THE NATIONAL LEVEL, 1989-2000. Source: Newspaper *Expresso*. Notes: This newspaper is the major means for advertising job offers at the national level for qualified workers. The graph reports moving averages, with a smoothing window of 13 weeks (approximately one trimester).

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year	higher education graduates		schooling below higher education	
	creation	destruction	creation	destruction
1986	0.207	0.148	0.129	0.075
1987	0.204	0.159	0.132	0.084
1988	0.223	0.175	0.134	0.100
1989	0.279	0.190	0.149	0.102
1992	0.229	0.148	0.127	0.112
1993	0.218	0.182	0.113	0.138
1995	0.223	0.137	0.124	0.111
1996	0.238	0.123	0.121	0.116
1997	0.263	0.131	0.140	0.107
1998	0.271	0.137	0.131	0.128
1999	0.182	0.140	0.100	0.142
mean	0.231	0.152	0.127	0.110

Table 1: RATES OF GROSS JOB CREATION AND DESTRUCTION BY SCHOOLING LEVEL, 1986-1999. Source: Computations based on Portugal, MTS (1985-1999).
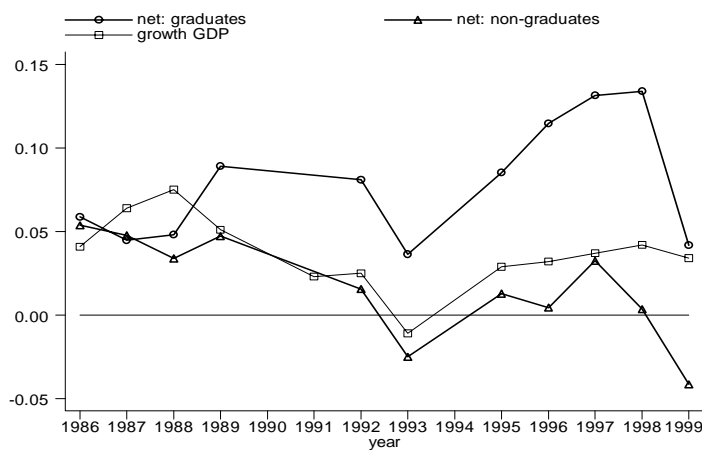

Figure 3: RATE OF NET JOB CREATION BY SCHOOLING LEVEL, 1986-1999. Sources: Computations based on Portugal, MTS (1985-1999).

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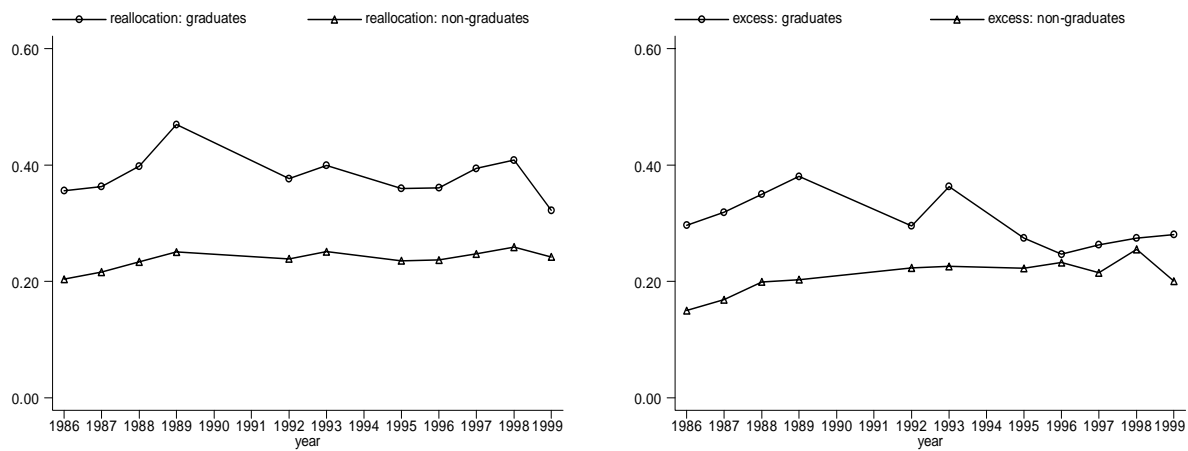
Figure 4: RATE OF GROSS JOB REALLOCATION AND EXCESS JOB REALLOCATION BY SCHOOLING LEVEL, 1986-1999. Sources: Computations based on Portugal, MTS (1985-1999).
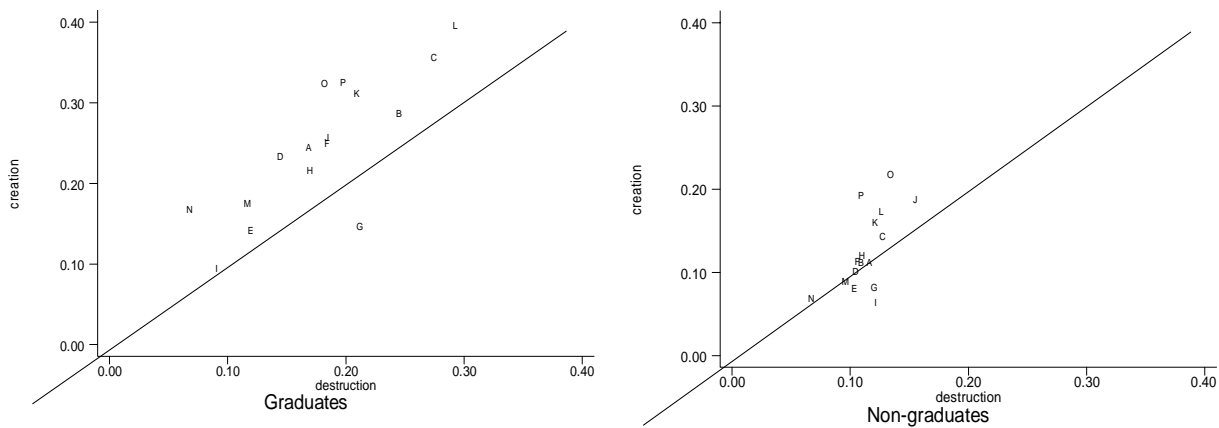
Figure 5: GROSS JOB FLOWS BY INDUSTRY AND SCHOOLING LEVEL, 1986-1999. Sources: Computations based on Portugal, MTS (1985-1999). Codes: A: Food, beverages, tobacco; B: Textiles, clothing, leather; C: Wood, cork; D: Paper; E: Chemicals; F: Non-metallic mineral prod; G: Base metals; H: Metal prod; I: Elect., gas, water; J: Building; K: Trade; L: Restaur., hotels; M: Transport, communic; N: Banking, insurance; O: Serv. to companies; P: Social, cultural and personal serv.

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	Continuing firms		All firms	
	uni grads	non-grads	uni grads	non-grads
Job creation				
idiosyncratic component	0.01	0.03	0.13	0.08
sector and aggregate component	0.89	0.81	0.75	1.19
interaction	0.10	0.16	0.12	-0.27
Job destruction				
idiosyncratic component	0.01	0.02	0.25	0.03
sector and aggregate component	1.05	0.91	0.65	0.79
interaction	-0.06	0.07	0.10	0.17
Job reallocation				
idiosyncratic component	0.02	0.07	0.32	0.21
sector and aggregate component	0.81	0.65	0.47	0.57
interaction	0.17	0.27	0.21	0.22

Table 2: RELATIVE IMPACT OF IDIOSYNCRATIC SHOCKS AND SECTORAL PLUS AGGREGATE SHOCKS ON GROSS JOB FLOWS. Source: Computations based on Portugal, MTS (1985-1999). Note: *All firms* includes new and exiting firms; continuing firms are the ones remaining in business between two periods.

year	firms	workers
1985	82 957	1 431 112
1986	87 339	1 436 487
1987	91 777	1 484 690
1988	100 543	1 500 771
1989	112 841	1 613 063
1991	123 534	1 675 050
1992	132 398	1 704 686
1993	137 963	1 670 933
1995	160 065	1 721 608
1996	163 875	1 712 677
1997	180 040	1 823 672
1998	186 555	1 854 468
1999	202 522	1 959 354

Table 3: SIZE OF SAMPLE UNDER ANALYSIS. Source: Computations based on Portugal, MTS (1985-1999).

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	1985	1991	1995	1999
food, beverages, tobacco	5.5	4.5	4.5	3.8
textiles, clothing, leather	16.6	18.1	15.1	12.4
wood, cork	3.9	3.6	4.1	3.7
paper	2.7	2.4	2.2	2.0
chemicals	4.4	3.1	2.5	2.1
non-metalic mineral prod	3.6	3.3	3.1	2.8
base metals	1.4	0.9	0.5	0.5
metal prod	10.5	9.3	9.0	8.6
elect., gas, water	1.6	1.3	1.0	0.8
building	8.4	9.2	9.4	10.1
trade	15.9	16.7	19.9	20.4
rest., hotels	4.5	5.2	6.2	6.4
transp, communic	9.3	7.8	6.9	6.7
banking, insurance	4.6	4.7	4.8	4.2
social, cultural and personal serv.	7.3	9.9	10.9	15.3

Table 4: STRUCTURE OF EMPLOYMENT BY INDUSTRY (MANUFACTURING AND SERVICES), POR-TUGAL. Source: Computations based on Portugal, MTS (1985-1999).

	GDP per capita					GDP per person employed				
year	1981	1985	1990	1995	2000	1981	1985	1990	1995	2000
thousand 1995 USD	9.3	9.5	12.7	13.8	16.4	23.8	23.6	28.2	30.4	33.6
as % of USA		40			50		45			50

Table 5: GDP PER CAPITA AND PER PERSON EMPLOYED, PORTUGAL. Source: OECD, 2002a.

age	25-34	35-44	45-54	55-64
Portugal	11	7	5	3
OECD mean	18	16	14	10

Table 6: PERCENTAGE OF THE POPULATION THAT HAS ATTAINED TERTIARY EDUCATION, BY AGE GROUP, 2001. Source: OECD, 2002.

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