Working Paper 99-80
Economics Series 29
November 1999

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YOUTH LABOUR MARKETS IN SPAIN: EDUCATION, TRAINING AND CROWDING-OUT

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Abstract

The stylised facts describing the evolution of youth labour markets in Spain can be characterised as a "high-skill, bad-job trap" where higher educated workers end up in semi or unskilled entry jobs while crowding out lower educated workers from that type of job. A simple matching model with multiple contracting regimes is used to explain how a less tigher skilled labour market can be lead to crowding-out of lower educated worker and less on-the-job-training.

Keywords: unemployment, education, training, matching.
JEL Codes: J21, J23.

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Forthcoming in *European Economic Review.* We are grateful to C. Pissarides and E. Wasmer, participants at the EEA'99 invited session on *Training and Labour Markets: Incentives and Outcomes*, and an anonymous referee for useful comments. For financial support, Dolado thanks CICYT for grant no. SEC96-0738

1 Introduction

Spanish unemployment, besides being very high and persistent, is very unevenly distributed: female and youth unemployment rates have been about 10 and 20 percentage points higher, respectively, than the average unemployment rate, close to 20% since the mid-1980s. This fact constitutes a puzzle considering that in the last fifteen years there has been a very rapid educational upgrading which has mostly affected precisely females and young workers.

The educational drive in Spain has taken place at a time when skill biased technological progress and increased global competition were leading to a change in the industrial structure and a fall in the demand of lower educated workers. However, in an earlier paper (Dolado, Felgueroso, and Jimeno, 1999) we have argued that both forces, on their own, cannot explain the various stylized facts which have been observed in Spain. Indeed, in addition to the explanations just mentioned above, we argued that there is the less familiar explanation of "crowding out" of workers with lower education by those with a higher education. In some European countries, some studies (see Muysken and Ter Weel, 1998 and the references therein) are rediscovering the old concept of overeducation to explain unemployment differentials by educational levels.

Traditionally, job competition and crowding-out models stem from the existence of training ladders and a given amount of jobs with fixed characteristics (see Thurow, 1975) or from situations when firms find costly to adjust wages and thus react by increasing hiring standards instead (see Okun, 1981). An alternative explanation for "crowding out" could be given by standard search theory (see Van Ours and Ridder, 1995). When it takes time for workers and vacancies to find each other, a possible strategy for higher educated workers is to accept a temporary unskilled job and to continue searching for a skilled job paying a higher wage.

Five stylized facts which characterize the performance of Spanish youth labour market over the last two decades are:

1. The rise of unemployment rates has been primarily concentrated on lower educated workers but it has also taken place for higher educated ones.

2. The effects of educational attaintments on the employment rate are not particularly large. For instance, it is only after 30 years of age that workers with a university degree have lower unemployment rates than workers with high school or with a college diploma.

3. There is a dramatic downgrading in the entry-jobs market which affects mainly to workers aged between 16 and 27 years of age and all educational attaintments. This downgrading seems to have harmed the employability of workers with low levels of educational attaintments.

4. There is a deceleration in the returns to schooling (see e.g. Alba, 1993). Relative wages for educated workers have, if anything, become stagnant over the last decade.

5. The amount of on-the-job training provided by firms to lower educated workers is seemingly rather low. Thus, these workers hold entry jobs which provide many less opportunities of promotion in the future than they used to do in the past..

We address the issue of whether a matching model, as in Mortensen and Pissarides (1994) and Pissarides (1994), can account for these facts. In our model there are two types of jobs (skilled and unskilled) and two types of workers (higher and lower educated). We assume that hires take place in a non-segmented labour market where higher educated workers can perform unskilled jobs but less educated workers cannot perform skilled jobs.

In Dolado et al. (1999) we use this model to explain issues 1 to 4 listed above. We found that the model was able to explain these four stylized facts when combined with increases in the separation rate, in non-working benefits and in union power.[1] In this paper, we concentrate on the fifth fact, namely that regarding the consequences of crowding out on training. We argue that the increase in the relative supply of educated workers has harmed the on-the-job training prospects for less educated workers.

The structure of the rest of the paper is the following. Section 2 documents the stylized facts motivating the paper, Section 3 presents the theoretical framework, and Section 4 contains some final remarks.

2 Facts

2.1 Educational attainments by age and gender

Starting in the 1960s from one of the lowest stocks of human capital in the OECD (8% of the population aged 10-14 and 40% of those above 65 were illiterate), Spain has experienced a remarkable improvement in the relative supply of educated workers. An important characteristic of this process is that the emphasis has been towards higher educational levels (essentially university/tertiary degrees) and that it has been reinforced to a large extent, by a steady rise in the female demand for formal education.

These features are illustrated in the three panels of Table 1. In panel a) there is a comparison of educational attaintments of population aged 25-64 in Spain and the OECD, as of 1995. While Spain has one of the largest share of population with at most upper secondary education, the youngest cohorts (25-34 years of age) is between twice and four times more educated than older cohorts. Panel b) shows how this higher education is mostly concentrated on female workers, opposite to what happens in the OECD. Finally, panel c) shows unemployment

[1] Both conditions are not at odds with the recent evolution of the Spanish labour market. The liberalizarion of fixed-term jobs in 1984 has produced a drastic increase in the workers turnover rate and, hence, a rise in the separation rate (see Bentolila and Dolado, 1994). Likewise, it is likely that despite the declining density of the Spanish unions, their coverage has increased over the last two decades. Finally, the coverage and generosity of unemployment benefits also increased throughout the 1980s.

rates by age and educational attaintments. It can be observed that the negative relationship between education and unemployment in the OECD is less pronounced in Spain. Notwithstanding, the evolution of unemployment between 1977 and 1998 is more unfavorable for workers with lower secondary education -a rise from 2% (3%) to 17% (32%) for 25-39 aged male (female) workers, than for those with a university degree -a rise from 2% (3%) to 13% (21%) for the same age cohort.

TABLE 1 ABOUT HERE

2.2 Entry jobs

Over the last two decades, there is a tendency towards the less skilled jobs being occupied by the more educated workers. We illustrate this phenomenon by making use of the occupational structure of the so-called "entry-jobs" into the labour market, namely the type of jobs that youth workers take after completing a given educational level. For that purpose, four age groups and four educational levels have been chosen, in such a way that it allows to analyze the kind of job that young workers were occupying up to four years since they finished their studies. Hence, the 16-20 cohort corresponds to compulsory lower education, 18-22 to upper secondary education, 21-25 to college diploma and 23-27 to university degree. As regards occupations, we consider Professionals/technicals (P1); Teaching Professionals and Employees in Public Administration (P2); Clericals and Administratives (P3); Manual Crafts and Operators (P4), and Sales Elementary and Hotel & Restaurant Occupations, Unskilled Services and labourers (P5). The five occupations have been ranked in decreasing order of skill requirements for the job. The inclusion of P2 is justified since accession to Public Administration, through several types of competitions, has been a traditional "entry job" for Spanish youth workers, either with a high or an intermediate level of education.

For the three main occupational groups described above, and for age cohorts and educational attainments, Figure 1 plot the proportion of the corresponding occupation in male employment (dotted lines) and the proportion of male wage earners with a given age and educational attainment which work in a certain occupation (the solid lines). The lesson to be drawn from this Figures is that the more educated workers seem to be increasingly filling the more skilled jobs (P1) and the semi-skilled ones (P3). This process is taking place at the expense of a drastic reduction in P2, possibly due to the ageing of the Public Administration employees and/or the lack of hirings of young workers. At the same time the less educated workers have been crowded out from their traditional "entry-jobs", namely semi-skilled jobs (P3) towards those jobs that hardly offer any training and require no educational qualifications (P5).[2]

FIGURE 1 ABOUT HERE

[2] Similar findings also applied to female workers (see Dolado et al., 1999).

2.3 Overeducation and training

One possibility could be that the IT revolution has changed so much the education requirements of the occupations we have considered, so that overeducation and crowding-out of low educated workers is only apparent. We look at workers' perception of educational requirents for a given occupation First, panel a) of Table 2 shows the proportion of workers under 30 years of age who declare to be overqualified in their current jobs. When we distinguish by educational attaintment and occupation, the proportion of workers in P3 with tertiary/university education who declare to be overqualified is close to 75 per cent, while most workers with lower educational attaintments declare to be underqualified. Indeed, the pattern of responses for P3 is different from those pertaining to the remaining occupations where under and overqualification hold for P1 and P2 and for P4 and P5, respectively. This seems to indicate that higher educated workers do have enough human capital to hold P3 jobs, whereas less educated workers do not and thus specific training is needed. Without past observations on workers' perceptions of jobs' educational requirements, we cannot be sure about recent trends in overeducation stemming from the IT revolution. However, it seems clear that a significant proportion of higher educated workers in semi-skilled jobs declared to be overqualifed for those jobs.

TABLE 2 ABOUT HERE

As regards training, a few words about how it is provided in Spain are in order. In general, there are school-based and workplace-based systems, the latter either based on firm skill formation or on government-led programs (see OECD, 1998). The Spanish system is mainly school-based and relies on employer subsidies or tax relief conditional on work-place training through special training/apprenticeship systems aimed at youth. However, apprenticeship employment contracts only accounted for 12 per cent of youth employment in 1995 given the high incidence of fixed-term employment contracts which do not involve any explicit training altogether (see Bentolila and Dolado, 1994). Moreover, despite generous incentives to convert fixed-term into permanent contracts, only 12 per cent of training contracts and 28 per cent of apprenticeship contracts were so converted in 1997. Panel b) of Table 2 gives the proportion of workers whose training has been provided and paid by the firm, broken down by the worker's educational attaintment and occupation, as reported by the HPS. It is noteworthy that this fraction in P3 is highest for workers with upper-secondary education and lowest for workers with tertiary/university education. Indeed, though not reported here for the sake of brevity, we find, using individual data from the HPS, that the probability that a higher educated worker occupies a job in P3 increases with the regional unemployment rates of educated worker and the minimum wages set for those occupations at the provincial/sectoral collective wage bargaining agreement (see Dolado et al., 1997).

3 A matching model

To account for overeducation, training and crowding-out, we consider a simple matching model with two types of workers -educated and non-educated, two types of jobs -skilled and unskilled, and on-the-job search for educated workers employed in unskilled jobs.[3] There is a continuum of firms. Unskilled jobs do not require any schooling but skilled jobs can only be filled by educated workers, who also can take unskilled jobs. The supply of non-educated and educated workers is exogenously given and equal to L_1 and L_2, respectively ($\kappa = \frac{L_2}{L_1}$ is the ratio of educated to non-educated workers).[4] Training in the firm is required for non-educated workers and is not a substitute for schooling. Firms post vacancies for unskilled and skilled jobs. Educated workers will accept offers for unskilled jobs if they do not have offers for skilled jobs and the value from being employed in a unskilled jobs is larger than the valued of being unemployed. Firms will hire educated workers for unskilled jobs as this implies saving of the training costs required for non-educated workers. Firms do not discriminate against educated workers occupying unskilled jobs (there is no a bad signal in an educated worker to take unskilled jobs) and, in equilibrium, will be indifferent between hiring any type of worker for unskilled jobs.

3.1 Matching

Hires are given by matching functions which take the number of searchers and job vacancies as arguments. Educated workers search for skilled jobs and fill them according to the matching function $H_2 = m(u_2 L_2 + e_1^2 L_2, v_2 L_2)$, where H_2 is the number of hires of educated workers for skilled jobs, u_2 is the unemployment rate of educated workers, e_1^2 is the proportion of educated workers employed in unskilled jobs who are also assumed to be searching for skilled jobs, v_2 is the vacancy rate of skilled jobs (measured with respect to L_2), and m is a constant-returns-to-scale (CRS) matching function with $m_1, m_2 > 0$.[5] Unemployed educated workers also match with unskilled job vacancies. Given the matching function for skilled jobs, the number of hires of educated workers for unskilled jobs is $H_1^2 = m(u_2 L_2, v_1 L_1 + v_2 L_2) - \frac{u_2}{u_2 + e_1^2} m(u_2 L_2 + e_1^2 L_2, v_2 L_2)$, where v_1 is the vacancy rate of unskilled jobs (measured with respect to L_1). Finally for non-educated workers, the number of hires is $H_1 = m(u_1 L_1 + u_2 L_2, v_1 L_1) - H_1^2 - \frac{u_2}{u_2 + e_1^2} H_2 = m(u_1 L_1 + u_2 L_2, v_1 L_1) - m(u_2 L_2, v_1 L_1 + v_2 L_2)$, being u_1 the unemployment rate of non-educated workers.

[3] It departs from other models in the search literature with heterogeneous workers (for instance, Brunello 1996, Saint-Paul 1996, Acemoglu 1997, Mortensen and Pissarides 1998) by assuming that the markets are non-segmented by skills, so that educated workers can be employed in unskilled jobs. Gautier (1999) uses a similar model to discuss under which conditions low skilled workers are harmed by competition from skilled workers. We were not aware of his work when developing the model in this paper.

[4] Given the very rapid increase in subsidies for tertiary education which took place in Spain since the early 1980s, this seems an acceptable assumption.

[5] We are assuming on-the-job search of educated workers in unskilled jobs at the same efficiency as of the search of unemployed educated workers.

Given the matching process, the probabilities of filling vacancies are given by:

- For a skilled jobs: $q_2 = \frac{H_2}{v_2 L_2}$, which under the CRS assumption can be written as $q_2 = m(\theta_2)$, with $\theta_2 = \frac{v_2}{u_2 + e_1^2}$.
- For unskilled jobs: $q_1 = \frac{H_1 + H_1^2}{v_1 L_1}$, which under the same assumption is equal to $q_1 = m(\theta_1) - \frac{\kappa u_2}{v_1}\theta_2 q_2$, with $\theta_1 = \frac{v_1}{u_1 + \kappa u_2}$.

As for workers, the rates at which they receive job offers are

- Skilled job offers for educated workers (either unemployed or employed in unskilled jobs), $\tau_2 = \theta_2 q_2$.
- Unskilled job offers for educated workers, $\tau_1^2 = \theta_{12} m(\theta_{12}) - \theta_2 q_2$, with $\theta_{12} = \frac{v_1 + \kappa v_2}{\kappa u_2}$.
- Unskilled job offers for non-educated workers, $\tau_1 = \frac{u_1 + \kappa u_2}{u_1}\theta_1 m(\theta_1) - \frac{\kappa u_2}{u_1}\theta_{12} m(\theta_{12})$.

Thus, as the skilled jobs market gets tighter (θ_2 increases), the proportion of educated workers moving to unskilled jobs decreases, and the proportion of non-educated workers finding unskilled jobs increases.

3.2 Steady State Equilibrium

In the steady state equilibrium,the flow out of unemployment and the flow into unemployment are equal for both types of workers and the flow of educated workers into unskilled employment must be equal to the flow of educated workers out of unskilled employment toward unemployment or to skilled employment. Thus,we have: $s_1 N_1^E = \tau_1 N_1^U$, $s_2 N_2^E = \left(\theta_2 q_2 + \tau_1^2\right) N_2^U$, and $\left(s_1 + \theta_2 q_2\right) N_2^{E1} = \tau_1^2 N_2^U$ where $N_i^E (N_i^U)$ is the number of employed (unemployed) workers of type i $(i = 1, 2)$, s_i is the separation rate for jobs of type i, and N_2^{E1} is the number of educated workers in unskilled jobs. Hence, the steady state unemployment rate for each non-educated workers is

$$u_1 = \frac{s_1}{s_1 + \tau_1} \tag{1}$$

the steady state unemployment rate of educated workers is

$$u_2 = \frac{s_2}{s_2 + \theta_{12} m\left(\theta_{12}\right)} \tag{2}$$

and the proportion of educated workers in unskilled jobs is

$$e_1^2 = \frac{s_2}{s_1 + \theta_2 q\left(\theta_2\right)} - \frac{s_2 + \theta_2 q(\theta_2)}{s_1 + \theta_2 q\left(\theta_2\right)} u_2 \tag{3}$$

3.3 The supply of vacancies

For the determination of the supply of vacancies, we follow Pissarides (1990). Let V_i be the returns to opening a job position of type i ($i = 1, 2$), J_i the asset value of a job of type i filled by a worker of type i, and J_1^2 the value of a unskilled job filled by an educated worker. Assuming that $J_1 = J_1^2$ we have that[6]

$$rV_1 = -\gamma_1 + q_1(J_1 - V_1) \tag{4}$$

while for skilled jobs

$$rV_2 = -\gamma_2 + q_2(J_2 - V_2) \tag{5}$$

The asset values of a filled job, in turn, are given by

$$rJ_1 = y_1 - w_1 - t + s_1(V_1 - J_1)$$

$$rJ_2 = y_2 - w_2 + s_2(V_2 - J_2)$$

where r is the rate of interest, γ_i is the cost of keeping a job vacancy of type i unfilled, y_i is the output produced by a worker of type i in a job of the same type, w_i is the wage paid to workers of type i, and t is the training cost for unskilled workers; while for unskilled jobs filled by educated workers[7]

$$rJ_1^2 = y_1 - w_1 + (s_1 + \theta_2 q_2)(V_1 - J_1^2)$$

In equilibrium all profits opportunities from offering new jobs are exploited so that $V_1 = V_2 = 0$, and, hence,

$$J_1 = \frac{y_1 - w_1 - t}{r + s_1}, J_2 = \frac{y_1 - w_2}{r + s_2}, J_1^2 = \frac{y_1 - w_1}{r + s_1 + \theta_2 q_2} \tag{6}$$

As for wages, we assume that for educated workers they are equal to a proportion β of the total surplus generated by the match, unless outside options of the firm and of the worker are binding (see Acemoglu, 1995) and that these options are not binding, while for non-educated workers we will assume that the outside option of the workers is binding, being z the reservation wage of non-educated workers. Thus,

$$w_1 = z, w_2 = \beta y_2 \tag{7}$$

From equations (4), (5), and (6), after substituting for wages, we get the conditions which represent the supply of vacancies

$$(1 - \beta) y_2 q_2 = \gamma_2 (r + s_2) \tag{8}$$

[6] This assumption is consistent with the matching process specified above and, moreover, guarantees an interior solution for u_1 and u_2.

[7] Notice that the quit rate is the same one that we have assumed for the rest of job matches, s_1, plus the probability of receiving a skilled job offer for the educated worker employed in unskilled jobs, which is equal to $\theta_2 q_2$.

$$(y_1 - z)q_1 = \gamma_1(r + s_1 + \theta_2 q_2) \tag{9}$$

and for the training costs which make firms indifferent between hiring educated or non-educated workers for unskilled jobs:

$$t = \frac{\theta_2 q_2}{r + s_1 + \theta_2 q_2}(y_1 - z) \tag{10}$$

Thus, as the skilled job market is less tighter and the separation rate in the unskilled job market increases, the training costs which makes firm indifferent between training non-educated workers and hiring educated ones, falls, which means that less firms are eager to supply on-the-job training.[8]

3.4 Simulations

Given a plausible functional form for the matching function, the model is too complex to be solved analytically. Thus, we proceed as follows. We assume a Cobb-Douglas matching function with constant returns to scale, which seems to fits well the evidence on labour market flows (see Blanchard and Diamond, 1989):

$$q_1 = m(\theta_1) = \theta_1^{-\alpha}, m(\theta_{12}) = \theta_{12}^{-\alpha}, q_2 = m(\theta_2) = \theta_2^{-\alpha}$$

where $\alpha > 0$ is the elasticity of hires with respect to job searchers. Given the exogenous variables ($\alpha, r, s_1, s_2, \beta, z, \kappa, y_1, y_2, \gamma_1$ and γ_2), equation (8) determines θ_2 and then, equation (9) determine q_1, while equation (10) determines t..Given q_1 and θ_2, equations (1), (2), and (3), together with the definition of q_1, determine $u_1, u_2, v_1, v_2, e_1^2$.

We illustrate the implications of the model by means of numerical simulations (Table 3). The parameter values that we used correspond, with some variations, to those used by Mortensen and Pissarides (1998) in their calibration of unemployment in a representative "European economy". In particular, we increase the replacement rate, z, to be .5, and decrease the separation rate to be .3 and .1 for unskilled and skilled jobs, respectively. Moreover, y_2 is assumed to be the double of y_1, and κ is taken to be 1, namely that 50 per cent of the labour force is educated. It should be noticed that we do not try to calibrate the model to yield "realistic" values for the endogenous variables (the model is too simple for that task). We rather aim at evaluating the qualitative implications of the model. The first column of Table 3 gives the results for this baseline case: the unemployment rates of non-educated and educated workers are 28.1% and 2.5%, respectively, while 7.3% of educated workers are employed in unskilled jobs, and the training cost threshold is about .21. In the second column of the Table it can be observed that an increase in the relative supply of educated workers, increases both unemployment rates, decreases the proportion

[8] Under the assumption that the training costs is distributed uniformly between 0 and 1 (the value which we will assume for y_1, for normalization), t can be interpreted as the proportion of firms training non-educated workers.

of educated workers employed in unskilled jobs but does not affect the training cost threshold. Finally, the third column shows that as separation rates of both types of jobs increase and the bargaining power of educated and the reservation wage of lower educated workers workers rise, then the unemployment rates of both types of workers increase, the proportion of educated workers employed in unskilled jobs also rises and there are less firms willing to supply on-the-job training, in agreement with the stylized facts discussed above.

TABLE 3 ABOUT HERE

4 Concluding Remarks

The causes of unemployment of less educated workers has relevant welfare and policy implications. From a welfare viewpoint, overeducation and crowding-out of less educated workers can never be a first best solution since potential productivity is not used. In this case, it can be argued that policy-makers should stimulate job creation at the top segment of the labour market. However, if any of the other more traditional explanations also count, then policy-markers could better directly focus at the bottom segment of the labour market, for example by introducing subsidies for low-wage jobs. Finally, a conventional wisdom is that when there is crowding-out, there is no need for extra education of low skilled workers since those workers would occupy unskilled jobs, anyway. Thus, according to the above analysis, an increase in the educational attaintment of the labour force does not always solve the unemployment problem unless other labour market rigidities are reduced.

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Table 1. Education and unemployment in Spain

Panel a). Educational attaintment by age group

	25-64 years		25-34/35-44 years		25-34/45-54 years		25-34/55-64	
	US	U	US	U	US	U	US	U
Spain	28	16	1.5	1.5	2.6	2.5	4.7	4.5
OECD	60	22	1.1	1.0	1.3	1.3	1.7	1.9

Panel b). Educational attaintment of school leavers among population aged 16-29

	Males		Females	
	LS	U	LS	U
Spain	44	25	23	39
OECD	36	23	31	26

Panel c). Unemployment rates (%) by age and educational attaintment

	20-24 years of age			25-29 years of age			29-64 years of age		
	LS	US	U	LS	US	U	LS	US	U
Spain	37.4	41.0	53.1	32.3	27.0	33.2	20.6	18.5	13.5
OECD	21.9	15.5	15.3	16.9	9.8	8.5	10.1	7.0	4.0

Notes: LS: Lower Secondary or less. US: _Upper Secondary. U: University. Column 1 of panel a) gives the proportion (in %) of population 25-64 years of age who have completed at least upper secondary or university education. The remaining columns give the ratios between this proportion for different age cohorts (Source: OECD, 1997). Panel b) gives the proportion (in %) of the population of school leavers with lower secondary education or less and university education (Source: OECD, 1998). Panel c): Source, OECD (1997).

Table 2. Overeducation and Training in Spain

Ed. Att./Occup.	P1		P2		P3		P4&P5	
	O	U	O	U	O	U	O	U
a) Workers' perception of over and underqualification (%)								
Lower Education	33.3	66.7	16.7	44.4	12.5	66.7	34.2	31.6
Secondary Education	23.1	46.2	41.2	23.5	17.6	49.0	55.0	23.3
Vocational Training	15.6	71.9	27.0	40.5	15.0	68.3	53.0	33.9
Tert./Univ. Education	23.5	69.1	25.3	60.0	74.5	21.3	80.0	10.0
b) Workers receiving on-the-job training (%)								
Lower Education	0		40		33.3		13	
Secondary Education	33.3		33.3		47.6		9.1	
Vocational Training	68.6		28.6		33.3		27	
Tert./Univ. Education	50.0		25		22.2		11.1	

Note: O: overqualified, U: underqualified. Source: EUROSTAT Household Panel Survey.

Table 3. Numerical Simulations

Parameter values: $y_1 = 1, y_2 = 2, \gamma_1 = .25, \gamma_2 = 2, \alpha = .5, r = .03$.

	$s_1 = .27, s_2 = .18, \beta = .85, z = .7$		$s_1 = .3, s_2 = .2, \beta = .9, z = .8$
	$\kappa = 0.1$	$\kappa = 1$	$\kappa = 1$
$u_1(\%)$	19.8	28.7	32.6
$u_2(\%)$	1.1	6.0	8.0
$u(\%)$	18.1	17.3	20.3
$e_1^2(\%)$	17.3	12.8	20.2
$t(\%)$	21.1	21.1	11.4

Figure 1: Figure 1: Entry jobs by age and education, men (1977-1998)