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INTEGRATION VS. POLARISATION: A SHARING MODEL
APPROACH TO THE LABOUR MARKET EFFECTS OF A
PROCESS OF EDUCATIONAL EXPANSION.

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Abstract

The rapid transition from an elite to a mass higher education (HE) system in Spain influenced both labor market status of existing graduates and the opportunities of employment for new graduates entering the labor force. Past and present trends in the labor-market status of higher education graduates (HEG) are analyzed in terms of a) changes in the occupational distribution of graduates; and b) changes in the conditions faced by younger graduates entering the market. Results show a more polarized job-holding structure than in the past, with gender, age group and length of HE program completed being relevant factors in the assignment of HEG to jobs and positions. The creation of typical graduate positions has been too slow compared with the growing numbers of college graduates, so the chances for younger HEG have worsened in general.

Higher Education is in the grip of a strong feeling of loss of social exclusiveness. Academic careers lose their glamour in terms of social status, income, superior knowledge and professional self-control. Students often have to attain higher educational levels than their parents just to achieve a similar social position (Teichler, 2001).

1.- INTRODUCTION

The central fact of Spanish higher education (HE) in recent decades was the expansion of the system, with no parallel in other European countries. The expansion has been a demand-driven process explained by demographic changes, general increases in families' income, and a growing ratio of students completing secondary education (Mora, 1996). Central and, especially, regional governments have implemented de facto policies to meet the growing demand for HE, allocating increasing volumes of both financial and human resources to the system. The number of universities, the number of courses, and the number of places offered increased noticeably (Mora and Vidal, 2000). Easy-access policies, low tuition fees, and increased funds for student aid programs also made possible the extension of HE to more inclusive social groups (González and Dávila, 1998). As a result, participation in HE rose from an elite of 0,3 million students in the middle 1970's to a mass of 1,6 million by the end of the 1990's.

Although graduation rates are rather low in Spain compared to other developed countries, and students take much longer to finish their courses than is formally required, the expansion of HE resulted in increasing numbers of university graduates joining the labor force. The number of higher education graduates (HEG) working or looking for a job increased sharply, from some 0,6 million in the late 1970's to about 2,4 million in the late 1990's. This rapid growth happened during a period of deep transformations affecting Spain's political, social and economic system. The most outstanding changes were the consolidation of democratic institutions, the shift towards an urban, service-based economy, and the entrance to the more competitive framework of the European Union.

So far, research on the labor-market effects of the educational expansion in Spain has been focused on the monetary value of schooling. The evidence suggests that average rates of return to HE have not decreased, but rather increased, in spite of the growing supply of graduates during the last decades (Vila and Mora, 1998). However, the combination of demographic, economic and educational changes may have had other labor-market impacts than the effect on average returns.

In the research debate about the effects of a rapid educational expansion on the job-holding structure for HEG, two main approaches are found: the integration approach, and the polarization approach (Teichler and Kehm, 1995). Both of them consider that the education system must be responsive to the needs of the employment system, providing the supply of educated workers that would match the demand for educated labor. However, their predictions about changes in the labor market during a period of educational expansion are rather different, though partially compatible. The integration approach predicts that the demand for HEG would shift upwards as a result of higher requirements of qualifications by the production system. The idea is that existing jobs become in general more complex, and that new job-opportunities requiring highly educated workers would appear in developing fields. The polarization view, on the other hand, predicts that increases in the supply of HEG would result in a more polarized labor market structure, as more and more graduates compete for a relatively small number of job-opportunities requiring workers with HE credentials.

This paper intends to analyze the output of the expansion process in terms of changes in the occupational status of HEG and in the conditions for the transition from college into the employment system. Section two describes some major changes in the Spanish labor market over the last two decades, paying special attention to the job-holding structure of HEG. Section three develops an accounting model, within a human capital / job-competition framework, to represent the evolution of the job-holding structure of graduates. Statistical tests for both the integration and the polarization hypothesis are deduced from the model, and results are collected in section four. Section five presents some concluding remarks regarding the recent evolution of the labor market for HEG in Spain.

2.- MAJOR CHANGES IN THE LABOUR MARKET IN SPAIN (1977 - 1997)

In market oriented economies, the patterns of the match between education and employment emerge from the interaction between labor supply and labor demand. Since both the demand for, and the supply of workers with diverse levels and types of education evolve over time, observed changes in job-holding structures by level of education would provide evidence to analyze whether and how educational and economic trends have been reflected by the market.

The evolution of the labor market in Spain, between 1977 and 1997, has been summarized in Table 1 using official data from the National Bureau of Statistics. The aggregate expansion of labor supply was wide, since the total number of people working or looking for a job rose by 3.1 million during the period. Two elements account for the aggregate expansion of labor supply. First, the baby-boom came in Spain about ten years later than in other European countries and, consequently, the labor force grew rapidly during the 1980's and the 1990's. Second, labor force participation rates in Spain rose up to European standards as the nation's economic system developed.

TABLE 1

CHANGES IN LABOR MARKET MATCH BETWEEN EDUCATION AND EMPLOYMENT (SPAIN 1977-1997)
(Thousand workers)

	PRIMARY OR LESS	LOWER SECONDARY	UPPER SECONDARY	HIGHER EDUCATION	ALL LEVELS
LABOR FORCE	-4451,7	3994,6	1842,7	1723,4	3109,0
UNEMPLOYED	596,0	980,0	373,2	212,5	2161,8
EMPLOYED	-5047,8	3014,6	1469,5	1510,9	947,2
SELF EMPLOYED	-1073,8	699,7	281,3	211,7	118,9
MANAGERIAL JOBS	-15,5	14,7	37,2	68,6	105,0
TECHNICAL JOBS	25,9	109,7	155,2	867,5	1158,2
CLERICAL JOBS	-518,1	283,5	480,2	291,5	537,0
OTHER SERVICE JOBS	-264,1	637,7	205,4	36,7	615,7
BLUE COLLAR JOBS	-3202,3	1269,4	310,3	35,0	-1587,6

Source: Labor Force Survey (EPA) 1977, 1997.

On the other hand, new entrants to the labor force during the period were much better educated than retiring workers as a result of the increase in post-compulsory schooling completion. Consequently, the educational composition of the labor force shifted as well. The number of potential workers with a post-compulsory education credential grew by 3.6 million people, and the number of HEG increased by 1.7 million. Contrarily, the number of workers in the labor force with only primary education or less declined by 4.5 million. Nonetheless, according to Mora (1996), the educational expansion is reaching a peak in Spain, and the educational attainment of the labor force is expected to stabilize in the next few years.

The aggregate demand for labor rose too, but its evolution was rather different from that of the supply. The total number of jobs in the economy increased by only 0.9 million over the period, so the ratio potential workers to jobs grew sharply. This fact, combined with a very regulated pay structure, resulted in increasing unemployment, since in Spain firms traditionally adjusted employment instead of wages. As a matter of fact, the number of unemployed workers rose by 2.1 million over the 1977-1997 period.

Simultaneously, there was a structural shift away from the agriculture and manufacturing sectors as key economic activities to services sectors, so the composition of the pool of jobs in the economy changed markedly too. The number of manual jobs declined by 1.6 million over the period, whereas new positions appeared, mainly in technical (1.2 million) and clerical occupations (1.1 million).

The evolution of the labor market described above influenced notably the job-holding structure of HEG. As shown in table 2, the total number of working HEG grew by 1500 thousand during the period, whereas the number of unemployed graduates grew by only 200 thousand. Moreover, employment of graduates increased within almost all occupations in absolute terms, the category of middle-level civil servant being the only exception.

TABLE 2

CHANGES IN JOB-HOLDING STRUCTURE OF HIGHER EDUCATION GRADUATES (SPAIN 1977-1997)
(Thousand workers)

	HIGHER EDUC. SHORT CYCLE				HIGHER EDUC. LONG CYCLE				ALL HIGHER EDUC. GRADUATES
	Women		Men		Women		Men		
	< 30 yr	> 30 yr	< 30 yr	>30 yr	< 30 yr	> 30 yr	< 30 yr	> 30 yr	
Labor Force	143,3	372,4	57,4	259,0	118,1	347,8	62,9	362,6	1723,4
Unemployed	36,4	38,4	18,9	15,5	24,3	42,0	14,3	22,7	212,5
Employed	106,9	334,0	38,5	243,5	93,8	305,8	48,6	339,8	1510,9
Entrepreneurs	1,4	5,3	1,6	13,4	0,6	3,9	0,6	9,4	36,2
Self-employed professionals	2,0	7,3	2,7	28,1	13,6	32,8	2,3	49,3	138,0
Other self-employed	2,3	8,2	2,3	12,1	1,5	3,2	3,4	4,4	37,5
Managers public sector	0,0	1,8	0,1	6,8	0,0	4,2	0,0	10,2	23,1
Managers private sector	0,5	1,9	-1,1	12,8	2,1	4,3	1,5	23,6	45,5
Technicians public sector	18,4	190,3	-3,8	64,1	8,4	136,8	2,4	118,2	534,7
Technicians private sector	23,0	49,5	15,8	52,3	30,0	56,3	21,6	84,3	332,7
Civil servants middle-level	0,0	0,7	-2,0	-11,0	0,1	4,6	-0,5	-7,3	-15,4
Clerical jobs public sector	6,5	28,5	4,4	20,9	5,7	31,1	1,4	17,4	115,9
Clerical jobs private sector	43,4	29,1	11,1	16,8	24,6	21,9	10,2	18,5	175,6
Other service sector workers	7,5	10,4	4,6	12,9	4,7	4,9	3,0	4,0	52,1
Foremen	0,0	0,0	0,6	3,1	0,0	0,1	0,1	2,2	6,1
Skilled Workers	1,4	1,2	0,9	6,4	0,2	1,1	1,0	3,5	15,9
Non skilled workers	0,5	0,0	0,6	3,8	0,2	0,1	1,0	0,4	6,6
Others	0,0	-0,2	0,6	1,1	1,9	0,6	0,7	1,8	6,4

Source: Own estimates from Labor Force Survey (EPA) 1977, 1997.

Compared to 1977, in 1997 there were 870 thousand more HEG working in technical occupations, 138 thousand more working as independent professionals, and about 60 thousand more working in managerial occupations. Regarding technical jobs, HEG held on almost all vacancies or new positions in the public sector, and about one half of them in the private sector. A similar pattern, although with lower figures, is found for new managerial jobs/vacancies. Thus, the public sector has been the main employer of graduates in typical high-qualification jobs, that is, in jobs that traditionally require highly educated workers. Nonetheless, there are 290 thousand more graduates working in clerical occupations, where jobs do not require in general a higher education credential. As a matter of fact, university graduates held on more than one half of vacancies or new clerical jobs created during the period. Besides, 27 thousand more working HEG are found in manual occupations, where the reduction in the total number of jobs during the period was severe. So, the labor market was able to absorb large numbers of HEG, and many of them found jobs in occupations where positions are generally associated to high status and earnings. Nonetheless, the number of HEG working in jobs that do not require in general highly educated workers grew during the period too.

3.- A MODEL FOR THE LABOUR MARKET MATCH BETWEEN EDUCATION AND EMPLOYMENT

According to standard economic theory, the labor market matches labor demand with labor supply through wage competition. Nonetheless, job competition has been proposed as an alternative mechanism to explain the allocation of workers with different education levels to jobs, especially in situation where wages are rigid and unemployment is persistent (Thurow and Lucas, 1972). Within a job-competition framework, the demand for labor is determined by jobs requiring workers with diverse qualifications in terms of skills, talents, training, and education. The qualification required for a given position depends on job-characteristics such as the complexity of the tasks and the level of responsibility associated to the job. On the other hand, the supply of labor is represented by current labor force. The educational attainment of potential workers, combined with other personal characteristics, shape the qualifications they bring into the market. Assuming that the market assigns workers to jobs by matching the required qualifications, the interaction between labor demand and labor supply may be expressed through a sharing model, since the cross-structure of any pair of economic aggregates can be captured in a model of that class (Fontela and Pulido, 1993).

Let $(m \times n)$ matrix Z_t represent the job-holding structure in absolute terms. Jobs of m different types are performed by workers with n different qualifications (which would include education, gender, age group, and so on), at time t . Let denote by Z_t^* the augmented $((m+1) \times n)$ matrix which includes an extra row of unemployed workers. From Z_t , a matrix of employment shares by qualification group across occupations, A_t , may be calculated. Matrix A_t represents the relative demand by occupations for workers from different groups. Accordingly, a $((m+1) \times n)$ matrix, B_t , may be calculated from Z_t^* , expressing the employment situation (i.e., working in one of m occupations, and being unemployed) of workers from different qualification groups. Matrix B_t represents, in relative terms, the assignment of the supply of workers, classified by qualification, to different occupations and to unemployment. It is worth noting that matrices A_t and B_t estimate, respectively, the distribution of workers'

qualification conditional to occupation, and the distribution of employment situation conditional to worker's qualification.

Using matrices A_t and B_t , the labor market structure at time t may be represented through the following demand and supply system:

$$x'_t = y'_t A_t + u'_t \quad (1)$$

$$y^*_t = B_t x_t \quad (2)$$

where x'_t is a vector of potential workers by qualification group ($1 \times n$), y'_t is a vector of jobs by type of occupation ($1 \times m$), u'_t is a vector of unemployed workers by qualification group ($1 \times n$), and $y^*_t = [y'_t \mid \sum_i (u_i)_t]'$ is a vector of potential workers by employment situation ($(m+1) \times 1$).

The changes in the coefficients of matrix A_t between two time periods suggest which groups of workers have experienced significant increases (decreases) in relative demand by the employment system, after controlling for the occupational change. If the proportion of jobs performed by workers from a given qualification group tend to increase (decrease) across occupations over time, the demand for labor with the corresponding qualification has necessarily shifted upwards (downwards), irrespective of changes in the composition of the pool of jobs. Similarly, changes in the coefficients of matrix B_t may suggest to which occupations has been preferentially assigned the supply of educated workers during the period. If the proportion of workers assigned to a given occupation tends to increase (decrease) across qualification groups, job-opportunities within that occupation have become more (less) frequent than in the past, irrespective of educational changes.

4.- LABOUR MARKET INTEGRATION AND POLARISATION FOR HIGHER EDUCATION GRADUATES

The evolution of the Spanish labor market, described in section two in aggregate terms, may have had significant effects both on the qualifications required to be

employed in different types of jobs (Burke and Rumberger, 1987), and on the distribution of job-opportunities among educated workers (Matzner and Wagner, 1990). These effects may be addressed empirically in terms of structural stability of the coefficients defined in section three: coefficients of recruitment for diverse types of workers, A_t , and coefficients of workers' assignment to diverse occupations and to unemployment, B_t .

Table 3 shows the results of a Mean Differences T-test, a Wilcoxon Matched-Pair test, and Fisher's Exact test, for structural change over the differences in the recruitment coefficients corresponding to different demographic groups of HEG across occupations.

TABLE 3

STRUCTURAL CHANGE IN RELATIVE DEMAND COEFFICIENTS FOR HIGHER EDUCATION GRADUATES (SPAIN 1977-1997)
(Ostblom's, Wilcoxon's, and Fisher's tests statistics and p-values)

	ALL HIGHER ED. GRADUATES	HIGHER EDUC. SHORT CYCLE				HIGHER EDUC. LONG CYCLE			
		Women		Men		Women		Men	
		< 30 yr	> 30 yr	< 30 yr	>30 yr	< 30 yr	> 30 yr	< 30 yr	> 30 yr
MEAN DIFFERENCES PARAMETRIC TEST									
T stat.	2,658	1,125	1,897	-1,540	-0,159	1,833	5,032	0,750	-1,323
P-value	0,009	0,140	0,039	0,927	0,562	0,044	0,000	0,233	0,896
WILCOXON'S MATCHED-PAIR TEST									
Z stat.	2,783	0,738	0,795	-1,817	-0,795	0,568	3,351	0,170	-1,250
P-value	0,003	0,230	0,213	0,965	0,787	0,285	0,000	0,432	0,894
FISHER'S EXACT TEST									
H* stat.	2,840	-0,258	1,291	-0,258	-0,775	0,775	3,873	0,258	-1,291
P-value	0,002	0,602	0,098	0,602	0,781	0,219	0,000	0,398	0,902

Source: Own estimates from Labor Force Survey (EPA) 1977, 1997.

During the 1977-1997 period, the requirement for workers with a HE degree clearly grew in Spain, reflecting the increasing importance of HE as a tool in becoming employed. All three testing procedures show significant increases in the recruitment coefficients across occupations for the general sample of HEG. The expansion of the labor market demand for workers with HE credentials was based on two main factors. First, the rapid growth of the service sector, which has generated new positions in executive, managerial, technical, and related support occupations. Second, the expansion of the public sector, including local governments and local administrations, which fostered the recruitment of HEG during the 1980's and early 1990's.

However, the significance of changes in the demand for HEG depended crucially on the type of courses completed, and on the age-gender group. In general, changes in the demand for graduates were more significant for adult workers than for younger workers. The changes in the coefficients of demand were noticeably greater for women than for men as a consequence of increased women's participation both in HE and in employment during the period. At 5% level, all three testing procedures show significant increases only in the demand for adult women with long-cycle credentials. Besides, the t-test also shows significant increases for young woman with long-cycle credentials, and for adult women with short-cycle credentials. To the contrary, none of the tests considered find significant increases in relative demand for male graduates, irrespective of age and length of the courses.

In brief, structural change in relative demand for HEG shows that the market provided much better chances of employment for educated workers in 1997 compared to 1977. In particular, relative demand for HEG clearly improved after monitoring for changes in the composition of jobs. Accordingly, chances of employment must have worsened for those with poor educational attainment. The outcome also suggests that labor market integration was more significant for educated women than for educated men. Additionally, integration was less significant for younger workers than for older workers, suggesting that the transition from education to employment was far more difficult in the late 1990's than twenty years before.

On the other hand, conditions and standards of life for new entrants to the labor market depended crucially on the distribution of new job-opportunities among educational and demographic groups. Consequently, changes in assignment coefficients would suggest the opportunities offered to those entering the labor market in 1997 compared to those who entered in 1977. The results of testing for structural change over the changes in assignment coefficients to diverse occupations, across educational and demographic groups, are shown in Table 4.

At 5% level, all tests showed significant increases in the assignment of graduates to occupations which do not require in general HE credentials: clerical and other service

occupations, manual jobs, and non-professional self-employment. In contrast, no significant increases were found in the assignment of HEG to professional, managerial, and technical occupations, which are traditionally considered typical occupations for HEG. It is clear that new job-opportunities for HEG increased in relative terms only in occupations that concentrate high proportions of low-status jobs which do not require a HE credential. Only the parametric test, which is more sensitive to the size of the changes than the other tests, showed a significant increase in relative assignment of graduates to one high-qualification occupation: managers in the public sector.

TABLE 4
STRUCTURAL CHANGE IN ASSIGNMENT COEFFICIENTS FOR HIGHER EDUCATION GRADUATES
(Ostblom's, Wilcoxon's, and Fisher's tests statistics)

OCCUPATION	MEAN DIFFERENCES t-TEST		WILCOXON PAIR TEST		FISHER EXACT TEST	
	T-stat	P-value	Z-stat	P-value	H*-stat	P-value
Entrepreneur	-0,337	0,627	-1,225	0,890	-0,707	0,760
Self-employed	0,069	0,473	0,816	0,207	0,000	0,500
Other self-	2,895	0,012	6,940	0,000	2,121	0,017
Managers public	2,372	0,025	0,837	0,201	0,707	0,240
Managers private	-0,721	0,753	-1,225	0,890	0,000	0,500
Technicians public	-3,250	0,993	-7,348	1,000	-2,828	0,998
Technicians private	-0,930	0,808	-2,041	0,979	0,000	0,500
Civil servants middle-	-3,359	0,994	-7,348	1,000	-2,828	0,998
Clerical jobs public	4,261	0,002	7,393	0,000	2,828	0,002
Clerical jobs private	2,731	0,015	4,082	0,000	2,121	0,017
Other service sector	4,907	0,001	7,393	0,000	2,828	0,002
Forem	1,006	0,174	-0,217	0,586	0,000	0,500
Skilled	2,940	0,011	5,339	0,000	2,121	0,017
Non skilled	2,636	0,017	7,348	0,000	2,121	0,017
Others	-1,262	0,876	-3,266	0,999	-0,707	0,760

Source: Own estimates from Labor Force Survey (EPA)

Thus, the pattern of structural change in assignment of HEG to jobs over the period of educational expansion indicates a remarkable polarization of the labor market in terms of job-opportunities for graduates. The assignment of graduates to high and middle-qualification jobs declined in relative terms, whereas relatively more graduates held on lower-status jobs. This suggests that new job-opportunities for graduates tended to concentrate at the lower end of the job-ladder, and that substantial bumping, as defined in Fields (1974), may have occurred during the period, since new entrants to the labor force were much better educated than retiring workers. However, the employment of graduates in jobs previously performed by

workers with lower educational attainment does not necessarily imply generalized underemployment of educated workers. The complexity of tasks and the level of responsibility associated to jobs of a given type would may have shifted upwards over time, as it is suggested by the process of general development of the Spanish economy.

5.- CONCLUDING REMARKS

Between 1977 and 1997, a period of profound changes in the economic structure and in the educational attainment of the workforce, the Spanish labor market for HEG experienced some structural change from both the demand and the supply perspectives. By analyzing the differences in the job-holding structure by educational and demographic group, the evidence indicates: a) increased participation of women, both in the labor force and in employment; b) increased relative demand for women with HE across occupations, but not for male workers in the same conditions; c) lower proportion of middle-level job-opportunities; d) selective new high-level positions; e) more job-opportunities at the bottom of the job ladder, and f) higher unemployment affecting especially young graduates and female graduates.

The outcomes suggest that the educational expansion and the changes in the economic structure have had two major effects on the labor market for HEG over the last two decades.

First, the labor market integration of increasing numbers of graduates has been intense. The absolute demand for workers with a college degree has clearly expanded. The employment system has been able to absorb large numbers of HEG, especially women. At the same time, labor market integration of younger workers has been slower than the integration of adult workers, providing evidence for longer periods of job-search after graduation than in the past. Accordingly, there is evidence of a general upgrading shift on the need of qualifications to become employed, though only workers with very specific personal characteristics and/or

curricula are relatively more demanded by the production system than in the past. Although employment of HEG has grown sharply in absolute terms, the increase in labor demand has been slower than the expansion of the supply, resulting in higher unemployment rates.

Second, the labor market for HEG shows a more polarized distribution of jobs than in the past, with relatively more low-level jobs, moderate creation of new high-level jobs, and with fewer middle-qualification positions remaining. Since cohorts entering the labor market were more numerous and better educated than retiring cohorts, employment chances for younger HEG are in general much worse than twenty years before. Nonetheless, labor-market conditions are in general better for HEG than for workers with low educational attainment, because only the former still have some chance of holding on a high-status position.

Summarizing, the changes in the job-holding structure of graduates during the 1977-1997 period evidence that the educational expansion in Spain has reduced the gender gap both in labor force and employment participation. HE continued to be the best investment for young people, and women, in obtaining status equity through better jobs and positions. The influence of the public sector as an equal opportunity employer has been a major factor in the labor market integration of the expansion of qualifications, because it has been the main recruiter of HEG over the last two decades. However, the deepening polarization of job-opportunities, along with rising unemployment rates, indicates an increasing risk of general polarization of society in terms of earnings and living conditions of HEG. The current situation will influence the educational choices of younger cohorts in the future, and induce new changes in the conditions required to become employed, as well as changes in the expectations of income and social status for new entrants to the labor market.

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