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Talent allocation in the school-to-job transition

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Talent allocation in the school-to-job transition

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Abstract

This paper raises the problem of the optimal allocation of talent in a gendered perspective. It analyses the transition from education to labor market in Italy, and the way in which gender differences emerge early in the labor market career. Our data establish higher grades for females in both male and female type of courses on the one hand, and lower employment rate, lower entry wages, and under-representation in apical positions for women three years after graduation on the other. We explain female educational over-performance by means of signaling theory and under-utilization of female manpower by means of tournaments theory.

Keywords: Analysis of Education, Human Capital, Economics-of-Gender (J240, I210, J160)

Introduction

Individuals are not born equal: *People who possess* unusual innate ability in some *field of activity* and those who are endowed with greater intelligence or cognitive ability are potentially more productive than others. Each individual enters professional life with a set of randomly assigned but not directly observable talents, represented as the individual's potential maximum level of skill in each activity.

The allocation of talent in a society is an important determinant of output and growth. The social value of identifying the talent of individuals derives from their imperfect substitutability, and from the fact that an unsuitable match between individuals and the roles assigned to them by the social division of labor reduces the level of output below that potentially achievable by the economic system.

The focus here is on the discovery process of talent. We assume the hypothesis of the equal distribution of talent between men and women as a group: if men and women had equal outside opportunities, and their distribution across professions and hierarchical levels of economic activities were unaffected by social stereotypes, they would be equally distributed across occupations.

Outside opportunities and gender stereotypes are closely linked to the roles of men and women in relation to family responsibilities. They originate both in the educational system and in the labor market, and they segregate men and women into fixed roles and behaviors that may be in contrast with their individual talents (in the educational system women are segregated into “female courses”; in the labor market women are segregated into “female jobs”).

Occupational segregation by sex is extensive in each and every country, and the fact that women are critically under-represented in high rank positions indicates that society is failing to use and develop the talent of its people to the full. The data show that in spite of the overall progress of women in education and despite their entry into the labor market in increasingly large numbers, marked horizontal and vertical segregation still persists, and women remain clustered in a narrow range of jobs at the bottom of occupational ladders (Anker 1998).

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Analyzing the data on the school performance and school-to-work transitions of young Italians provided by the Italian National Statistical Office[1] we establish higher grades for females in both male and female type of courses on the one hand, and lower employment rate, lower entry wages, and under-representation in entrepreneurial and managerial positions for women three years after graduation on the other.

Unless we believe that men are innately inferior to women in intelligence, male educational under-performance must be explained; unless we believe that women are innately inferior to men in intelligence, female manpower under-utilization only comes at a cost to society as a whole.

The aggregate market failure is the sub-optimal match between skills and jobs. The supply of talent, as observed in the labor force, is scarce even when it is not so in the population. This is a waste of talent and of the investment which has been made in women's education. Fully utilizing women's potential requires a commitment to overcome the persistent educational and occupational segregation.

Theoretical framework: Labor market characterization and talent definition

Modern labor markets are characterized by heterogeneity on both demand and supply side. On the demand side heterogeneity is a consequence of job-specific differences in technology; on the supply side, heterogeneity results from individual-specific differences in ability to perform the tasks. The heterogeneity of agents enables the advantages of specialization to be reaped, but it raises an allocation problem: the identification of the specific talent of agents and the consequent *assortative matching* of workers to suitable jobs[2].

Nature endows different individuals with different talents: Some people possess an innate ability for particular activities, like singing opera or playing football: Murphy, Shleifer, and Vishny call this innate ability "*natural talent*" (1991, p. 504). This natural talent gives those who possess it a comparative advantage in performing specific tasks, and this comparative advantage makes the correct matching of individuals with jobs important for allocative efficiency[3].

Some individuals possess a higher level of intelligence or innate cognitive ability: This talent gives those who possess it a competitive advantage in whatever they have to do. Murphy, Shleifer, and Vishny (1991) call this intellectual ability "*general talent*". Mainstream economic literature on the assignment of heterogeneous agents to different hierarchical levels emphasizes the role of talent as the main determinant of rank: Rosen's (1982) proof ensures the greater managerial talent commands greater resources[4].

Since information is never symmetric and complete in modern labor markets, the problem of the optimal allocation of talent assumes particular importance under the hypothesis of *symmetric ignorance*; under this assumption neither individual agents (both employers and employees) nor society possess information about individual talent (Rosen, 1986; Lazear, 1998).

Talent status is defined by a high level of individual performance compared with the level of performance of the rest of the population. Individual performance depends on ability (both innate and acquired by

[1] - The Survey on Labor Market Transitions of University Graduates carried out in 2001 is the result of interviewing Italians who graduated from university in 1998 three years after graduation. The retrospective information gather allows to analyze both the academic performances (final degree grades) and the first entry into the labor market.

[2] - Oi (1990) masterly summarizes the hypothesis of the heterogeneity of agents: "A competitive labor market is characterized by the presence of heterogeneous agents. Individuals with *different* abilities and preferences search for suitable *jobs* described by composite bundles of wages, working conditions, promotion opportunities, and 'whether or not his associates will be such as he cares to have'. Employers also care about whom they employ, for if they did not, they would not spend so much to recruit new hires or to screen incumbents for promotions. The employment relations that we observe in the labor market exhibit differences in pay, job tenure, and effort intensity. They are determined in competitive labor markets where non-identical individuals try to maximize utility and heterogeneous firms organize production in different ways to maximize profits" (p. S147).

[3] - Stiglitz aptly summarizes the advantages of correctly matching workers with jobs: "It is widely recognized that individuals differ in the comparative skills with which they can perform different tasks (jobs) and the ease with which they learn different skills. If the typist has a comparative advantage in plumbing and the plumber a comparative advantage in typing, we can have both more typing and more plumbing if they 'switch' jobs" (1975, p. 288).

[4] - In Rosen's (1982) model higher-ability agents are placed in higher levels of the hierarchy; *the basic reason* for this is the downward externality that more able agents generate for the productivity of agents in lower levels, for example through more efficient information processing or supervision on tasks.

means of human capital investments), but it also depends on effort and random factors, and one is unable to say whether a good performance reflects ability, effort or luck by simply observing the outcome (Arrow 1986; Milgrom and Roberts, 1992).

In this context, how can individuals compare abilities of which they themselves may be unaware since talent is neither observable nor measurable as input, but only apparent in output[5]? The problem is identifying the talent of individuals and labeling agents. The process of identification is called selection or sorting[6]. All agents except the worst have an economic incentive to have their talent identified, because they can thus acquire the reward yielded by improving the match between worker and job. This higher wage is the private return on *selection* (MacDonald, 1980).

The school to job transition relates two social institutions *that sort individuals* according to their talent: school and firm. We shall now briefly examine these two selection mechanisms – non-compulsory schooling and careers in hierarchical organizations – in order to assess their efficacy as talent revealing instruments.

The *talent-revealing role of education*

In modern economies the non-compulsory system of education can be analyzed from two points of view: one can either investigate its productive function, which consists in augmenting the skills of agents with effects described by the theory of human capital; or one can investigate its allocative function, which consists in identifying the capacities of agents, the effects of which are instead described by information theory.

In human capital models of education (Becker 1964) the individual demand for schooling *is explained by the private* rate of return to an investment, that summarizes the costs and benefits of the educational choice. The costs incurred by the individual are his/her foregone earnings while studying, plus any expenses the individual is subject to during schooling. Since education is mostly provided free by the state, in practice the only cost in a private rate of return calculation is the foregone earnings. The private benefits amount to what a more educated individual earns, above a control group of individuals with less education (Psacharopoulos, 1994).

The informative role of education, as opposed to its role in increasing productivity, has been studied in particular by Arrow (1973b) and Spence (1973). In these models, education not only increases productivity but it also provides an instrument through which individuals with different amounts of talent can be identified. More specifically, non-compulsory schooling serves as an (imperfect) measure of innate ability rather than as evidence of acquired skills.

In order to highlight the difference between the productive and informative role of schooling, we may compare two individuals, one with high innate ability and the other with low innate ability. Although they acquire the same human capital – that is, although they complete the same number of courses taking the same time and at the same university – they perform the same job with different levels of efficiency. The more able individual achieves greater productivity and receives more pay than the less able one[7]. In a separating equilibrium (i.e., a signaling equilibrium which allows employers to distinguish high from low

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[5] - Innate ability is typically "an unmeasured and unmeasurable variable … Attempts have been made … but unfortunately these ability measures are wrong in principle. Typically, they are measures of intelligence; but *ability* in the relevant sense means the ability to produce goods, and there is simply no empirical reason to expect more than a mild correlation between productive ability and intelligence as measured on tests" (Arrow 1973, p. 134). Also Rosen (1981, p. 848) points out that a cardinal measure of talent must be based on measurement of the result. At most, according to this latter view, the distribution of talent could be defined by the distribution of output or income.

[6] - Weiss (1995) *uses the term* "sorting" to refer to both signaling and screening of workers: Both signaling and screening serve to sort workers according to their unobserved abilities. They differ according to who takes the initiative: if the agent – that is, the party who possesses the private information – uses signals to transmit his/her characteristics to the employer before the contract is drawn up, this is *signaling*; if instead it is the employer who seeks to discriminate among heterogeneous agents by offering a range of alternative contractual conditions, this is *screening*.

[7] - In sorting models firms do not directly observe individual talent; rather, firms use educational performances to draw inferences about unobserved abilities. The underlying hypothesis is that abilities that are correlated with schooling positively affect productivity on all jobs.

ability individuals) the benefit from signaling a high ability (i.e., the increase in future wages) is greater than the cost of the education for the high ability individuals.

The presence of a direct link between talent and wages creates an incentive for more able individuals to invest more in schooling, given that the greater ability enables them to receive extra pay and to obtain a degree in a shorter time, or with less effort[8]. One may therefore conclude that more talented individuals invest in human capital more than less talented ones, but this efficiency property depends crucially on two factors: (i) the capacity of the educational system to correlate scholastic success with certain productivity-increasing abilities; (ii) the capacity of the hierarchical structure to allocate more talented individuals to *more paid jobs*.

As regards the former factor, it is difficult to assess whether schooling is an institution able to reveal talent or not, because the effects of education which augment skills and those which select ability are not empirically distinguishable[9]. These effects may converge, but only if school performance and work performance coincide, i. e. if grades in a university and income in the market-place measure the same individual qualities. To explore these issues, the efficiency of the mechanisms that match workers to jobs in hierarchical organizations will be examined in the following section

The *talent-revealing role of tournaments*

One of the selection mechanisms most widely used in modern economies is the *tournament*. A tournament is a mechanism that orders the competitors on the basis of rules established so that a non-divisible prize can be assigned in optimal manner. It regards competition among agents as an efficient means with which to match individuals with jobs, and it applies to career paths in hierarchical organizations (Lazear and Rosen, 1981).

The tournament rules state the prize for the winner and the procedures for assessing and classifying the competitors. The indivisible prize of the tournament is assigning the winner to a particular level in the hierarchy and awarding the remuneration that corresponds to it. This remuneration depends neither on the individual performance nor on the opportunity cost of the employee who performs it, and is the same for all those who operate at the same level[10].

Every job in an organization requires a certain performance – the result of which cannot be verified – that depends on the agent's innate ability and acquired skills, on his/her effort, and on chance. The hierarchical order of jobs acts as an incentive for a level of effort that is rewarded not by current remuneration but by remuneration in the future. The wages received by workers depend only on the jobs to which they are assigned, and those of them who work harder in the hope of gaining promotion are not paid to any greater extent. The expected return on their effort resides in the fact that, by signaling their ability through their good present performance, and it being in the firm's interest to match more capable workers with better paid jobs, they increase their likelihood of winning the tournament prize – that is, of gaining promotion.

Using the terminology of O'Keeffe, Viscusi and Zeckhauser (1984) tournaments are either symmetric or asymmetric. Symmetric tournaments occur when agents are homogeneous and are treated equally by the rules of the competition. Asymmetric tournaments may be *uneven* or *unfair*: they are *uneven* when agents

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[8] - Admittedly, greater innate ability may also increase the opportunity cost of the investment, should the more able individuals earn higher wages than the less able ones if they left school. But, under the hypothesis of symmetric ignorance, employers, who are unaware of these individuals' productivity and know only that they do not possess a degree, offer equal wages for all diploma-holders, which makes the opportunity cost identical for individuals with differing levels of talent.

[9] - "Given the data limitations, it would be naive to believe that any one study could produce definitive answers" (Riley 1979, p. S229). "Schooling contains an important informational aspect, but attempts to separate the allocative and productivity-augmenting effects through examination of the earnings/schooling relationship are unlikely to be successful" (MacDonald 1980, p. 594).

[10] - Here, a job has no technological attributes but serves solely to denote a given wage level or profile. The holder of the job is entitled to a specified compensation scheme (Lazear 1992, p. 21). One individual is more suited than another to occupy a given hierarchical position if the total profits earned by the firm that promotes him/her are greater than those it would earn if it instead promoted his/her rival.

have different cost-of-effort functions (heterogeneous contestants); they are *unfair* when agents are identical, but the rules of the competition favor one of them.

The result of the competition in symmetric tournaments depends on two variables: ability (both innate and acquired) and effort. Ability remaining equal, the individual making the most effort will win. Effort remaining equal, the most talented individual will win. By means of symmetric tournaments the talent can be allocated in the optimal manner within different hierarchical levels. On the contrary, asymmetric tournaments (both *uneven* and *unfair*) fail in their allocative function and preclude efficiency attainment; *in these cases* the talent cannot be allocated in the optimal manner by means of tournaments[11].

Empirical results

Nowadays female graduates exceed the number of male graduates: as shown in table 1, women possess 52% of university degrees. While young women are now exceeding the qualification levels attained by men, the belief that women and men are suited for different activities and professions is still common, and women's choices of non-technical subjects is shown in table 1: females are under-represented in engineering (21%) and over-represented in teaching (89%).

Women's choices of non-technical subjects may explain some occupational segregation (tab. 2): females are under-represented in engineering, gas and water production (20%) and over-represented in education and training (76%). Educational segregation is positively associated with occupational segregation by gender: females with a female type of education find jobs in the female type of occupations; males with a male type of education find jobs in the male type of occupations (tab. 3).

It is apparent that occupational segregation reflects, at least in part, the way in which the different kinds of courses taken by male and female students channel them into gender-typed occupations; however, marked gender differences persist among those who have taken similar courses too: women and men with the same kinds of qualifications enter quite different occupations.

Furthermore our data show that there are important differences between the academic outcomes of male and female students: female students outperform male students in academic achievement, but male graduates outperform female graduates in labor market outcomes. We find higher grades for females in both male and female type of courses on the one hand, and lower employment rate, lower entry wages, and under-representation in entrepreneurial and managerial positions for women three years after graduation on the other hand (tabs. 6-7-8).

Discussion

These results rise two related questions: Since innate ability is equally distributed between men and women as a group, why do male and female students not have similar educational outcomes (degrees and scores)? Why do male and female students with similar degrees and scores not have similar occupational outcomes (labor status and wages)?

The first question addresses the following problem: What is about female students which increases their chances of success at degree-level (female score on average is nearly 3 points higher)? There are no obvious differences between male and female students that might explain the gender difference in academic performance: the number of students who graduate in excess of the legal duration of the course is much the same, and they have similar working activities while studying (tabs. 4-5).

Our analysis suggests that the greater academic success for female students can be explained as the product of differences in the level of effort put into the competition for grades. Individual performance - both in school and in job - depends on talent and on effort. Talent and effort remaining equal, the outcome of the educational competition will be the same for males and females. Since talent is by hypothesis equally distributed between men and women as a group, the better performance of women must depend on their bigger effort.

[11] - "The real problem of tournaments with heterogeneous contestants arise if the contestants' types cannot be identified. Since tournaments which are mixed ex post do not induce optimal effort … the outcome is not efficient" (McLaughlin 1988, p. 248).

Female students work harder than male students; women invest more time and effort in academic assignments because they have lower costs of time and effort than men have. The opportunity-cost of time and effort is lower for female students because on the one hand the gender wage gap between diploma-holders reduces the foregone earnings for women while studying, and on the other hand their time and effort cannot be otherwise devoted to care work because family responsibilities arise later in their life cycle. After family formation, on the contrary, the effort of women is divided between two equally demanding activities – care work and work for the market – while the effort of men is divided between leisure activities and work for the market.[12].

Spence's original model states that talented individuals acquire higher educational levels, than less talented individuals, signalling their higher ability and obtaining better jobs. To the extent that signaling theory is applicable, female students have an extra-payoff to excelling: by outperforming men in terms of the grades awarded, female students signal their ability to employers, and try to overcome the harm of the statistical discrimination[13].

The literature on survey reports of discrimination finds a greater tendency for younger women to feel harmed by discrimination than older women, maybe because young women are more likely to be "pioneers" in their field of activity, that is, to be among the first to enter male-dominated occupations (Antecol and Kuhn 2000).

By attaining high grades, female students benefit from the opportunity to distinguish and to label themselves; the possibility of independently signaling their talent may prevent employers from turning to other more subjective strategies for identifying high ability individuals like as statistical discrimination. Employers have a strong interest in identifying an individual's relative ranking in the overall pool from which they select applicants, and *by means of student grades* they infer a desirable attribute that cannot be otherwise verified (innate ability).

In conclusion, the answer to the first question raised by our data is as follows: the average man in higher education performs less well than the average woman because female students have career aspirations; since usually they are not yet caring for the children while studying, they can put all their effort into academic assignments and use their talent effectively; by outperforming men in terms of the grades awarded, they signal their ability to employers and gain the benefit to overcome statistical discrimination.

Let us now consider the second question raised in our results: why are women critically under-represented in high ranking positions, though female students are outperforming males in their academic work, and though the tournament theory emphasizes the role of talent as the main determinant of rank?

The gender literature establishes (The segregation literature establishes) that family formation is the biggest obstacle to women's career: since women have family responsibilities when they have to compete against men in labor market tournaments, the traditional division of roles by gender only permits women to occupy positions with lesser responsibility and lower wages.

Occupational segregation matters for the efficient allocation of talent: the limited availability of suitable jobs across the full range of occupations mean that many women may be unable to find employment in which their talents are properly utilized.

Female students have career aspirations, but they have family aspirations too: by forgoing a career they gain the benefit to conciliate working life and family life. As an example, the concentration of women in part-time work arise primarily from pressure to combine work with home responsibilities.

The segregation of males and females into different occupations may be the result of optimizing behavior: if females have better opportunities than males outside the labor market at certain stages of their life

[12] - We maintain Becker's (1985) hypothesis that domestic activities like childcare are much more effort-intensive than leisure activities, and that they may be just as effort-intensive as market ones.

[13] - Statistical discrimination (Arrow 1972, 1973a) occurs when employers make hiring and promoting decisions based not on an individual's personal characteristics, but on the statistical characteristics of the individual's gender. Employers avoid women because they are much more likely than men to quit due to their child bearing and rearing responsibilities. Although not all women have children or quit, employers make their hiring decisions on the basis of higher statistical probability for women to quit. This is why women do not get desirable jobs.

cycle, then the higher reservation wage leads, on average, to lower participation in labor market tournaments.

Women achieve equilibrium by forgoing a career. Their effort is allocated to its more productive use, and by hypothesis they are unaware of their misallocated talent. Society, by contrast, is not in the optimal situation, because the talent of women cannot be revealed if they do not take part in tournaments, which are the social mechanisms by which talent is revealed in a context of symmetric ignorance.

Conclusions

The gender differences that emerge from our analysis of the school-to-job transition are closely conditioned by the unequal allocation between the sexes of responsibility for domestic and care work. These differences are the outcome of an inefficient social division of labor that hampers the optimum allocation of the individual talent of agents.

Individual talent gives those who possess it a competitive advantage in both educational and occupational performance; this advantage enables them to beat their adversaries in the competition to take a degree, to obtain marks, to get a job, to gain promotion, in short, to win a tournament.

Tournaments may be either symmetric or asymmetric; asymmetric tournaments may be both *uneven* and *unfair*. Neither educational nor occupational tournaments are symmetric (i.e. agents have the same cost of effort and are treated equally by the rules of the competition). Educational tournaments are uneven: male and female students are treated equally by the rules of the competition for grades, but the cost of effort is lower for females due to the gender wage gap (employers offer lower wages for females diploma-holders). In educational tournaments, ability remaining equal, female students make greater effort and win the competition for grades.

Occupational tournaments are uneven too, but the cost of effort is now greater for women due to the gender division of labor and family responsibilities; talent remaining equal, male workers make greater effort and win the market competition gaining hierarchical promotions. Due to statistical discrimination, occupational tournaments may be unfair too: talent remaining equal, the rules of the competition favor male workers.

By means of symmetric tournaments the talent can be allocated in the optimal manner within different hierarchical levels; on the contrary, asymmetric tournaments (both *uneven* and *unfair*) fail in their allocative function. Social policies address these asymmetries. To remedy unfair tournaments society has enacted equal opportunity laws: they prevent employers from favoring one group of agents. To remedy uneven tournaments society has enacted affirmative action programs: they induce unfair tournaments by using unfair rules to compensate higher cost of effort of disadvantaged groups[14].

These policies are of considerable empirical importance both in Europe, where the Luxembourg Jobs Summit (1997) identified a gender gap of 25 million jobs – 25 million fewer women than men employed – as one of the main problems, and in Italy, where the presence of 8,000,000 housewives pushes its female activity rate to the bottom of the EU Member States. European Union policies to promote female participation in the labor market constitute one of the four *'pillars'* on which the European strategy to support employment is based, and they operate on two fronts: on the one hand they encourage an equal *sharing* of family responsibilities between men and women; on the other, they seek institutional solutions which aid the *reconciliation* of work and family life.

[14] - "Equal opportunity laws force tournament administrators to run symmetric tournaments, while affirmative action programs define unfair, uneven tournaments with the rules favoring cost disadvantaged groups" (Schotter and Weigelt 1992, p. 512).

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Table 1 - Educational segregation according to degrees (absolute value and degree of feminization)

GROUP OF DEGREE	M	F	MF	F/MF%
Engineering group	1436	387	1823	21.2
Medical group	143	90	233	38.6
Agrarian group	275	192	467	41.1
Architectural group	375	346	721	48.0
Economics and statistics group	1201	1114	2315	48.1
Scientific group	394	375	769	48.8
Sum of male type of degrees (1)	**3824**	**2504**	**6328**	**39.6**
Chemical and pharmaceutical group	344	381	725	52.6
Law group	463	552	1015	54.4
Sociopolitical group	473	589	1062	55.5
Geology and -biology group	275	361	636	56.8
Psychology group	206	370	576	64.2
Literary group	328	774	1102	70.2
Linguistic studies group	112	639	751	85.1
Teacher training group	52	434	486	89.3
Sum of female type of degrees (1)	**2253**	**4100**	**6353**	**64.5**
Total graduates	**6077**	**6604**	**12681**	**52.1**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

(1) - Here “male” type of degree is defined as those courses where the proportion of men is greater than the proportion in total graduates, and “female” type of degree is defined as those courses where the proportion of women is greater than the proportion in total graduates.

Table 2 - Occupational segregation according to production sectors (absolute value and degree of feminization).

SECTORS	M	F	MF	F/MF%
Production and distribution of power, gas and water	36	9	45	20.0
Production of electric optical and electronic equipment,	101	47	148	31.8
Mechanical and means of transport industry	367	173	540	32.0
Agriculture, hunting and fishing	128	68	196	34.7
Building	160	87	247	35.2
Computer science and connected activities	524	324	848	38.2
Chemical and oil sector	230	160	390	41.0
Production of Metals	41	29	70	41.4
Other industries	362	260	622	41.8
Paper, print and editing industries	23	17	40	42.5
Credit and insurance	538	405	943	43.0
Professional consultants	989	945	1934	48.9
Food and tobacco industry	69	73	142	51.4
Sum of male sectors (2)	**3568**	**2597**	**6165**	**42.1**
Civil service and defense	422	461	883	52.2
Other services	566	634	1200	52.8
Transport, travels and telecommunications	225	262	487	53.8
Textile industry, clothing and leather manufacturing	59	70	129	54.3
Trade, hotels and public houses	363	533	896	59.5
Health and social assistance	408	642	1050	61.1
Cultural, sports and recreation sectors	90	215	305	70.5
Education and training	376	1190	1566	76.0
Sum of female sectors (2)	**2509**	**4007**	**6516**	**61.5**
Total sectors	**6077**	**6604**	**12681**	**52.1**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

(2) - Here “male” occupations are defined as those where the proportion of men is greater than the proportion in total employment, and “female” occupations are defined as those where the proportion of women is greater than the proportion in total employment.

Table 3 - Educational and occupational segregation (absolute value and % row).

MALE	"male" occupations	"female" occupations	**TOTAL**
"male" type of degree	**2590**	**1234**	**3824**
"female" type of degree	**978**	**1275**	**2253**
Total	**3568**	**2509**	**6077**
FEMALE	"male" occupations	"female" occupations	**TOTAL**
"male" type of degree	**1388**	**1116**	**2504**
"female" type of degree	**1206**	**2894**	**4100**
Total	**2594**	**4010**	**6604**
MALE % row	"male" occupations	"female" occupations	**TOTAL**
"male" type of degree	**67.7**	**32.3**	**100**
"female" type of degree	**43.4**	**56.6**	**100**
Total	**58.7**	**41.3**	**100**
FEMALE % row	"male" occupations	"female" occupations	**TOTAL**
"male" type of degree	**55.4**	**44.6**	**100**
"female" type of degree	**29.4**	**70.6**	**100**
Total	**39.3**	**60.7**	**100**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

Table 4 - Educational segregation according to degree groups and average graduation results

	graduated "on course"*			average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	79	33	**112**	103.92	106.07	**104.55**
Medical group	58	41	**99**	107.59	108.83	**108.10**
Agrarian group	31	40	**71**	107.39	107.98	**107.72**
Architectural group	10	20	**30**	106.31	107.97	**107.42**
Economics and statistics group	48	71	**119**	103.88	104.97	**104.53**
Scientific group	17	32	**49**	106.24	107.25	**106.90**
Sum of male type of degrees	**243**	**237**	**480**	**105.49**	**106.86**	**106.17**
Chemical and pharmaceutical group	38	56	**94**	107.3	108.16	**107.70**
Law group	16	23	**39**	104.06	105.83	**105.10**
Sociopolitical group	58	67	**125**	103.00	106.33	**104.78**
Geology and -biology group	38	65	**103**	106.55	108.34	**107.68**
Psychology group	33	96	**129**	106.36	107.22	**107.00**
Literary group	19	36	**55**	109.11	108.58	**108.76**
Linguistic studies group	3	16	**19**	108.67	107.81	**107.95**
Teacher training group	6	42	**48**	108.50	109.12	**109.04**
Sum of female type of degrees	**211**	**401**	**612**	**105.81**	**107.65**	**107.00**
Total	**454**	**638**	**1.092**	**105.61**	**107.36**	**106.63**
	graduated "off course"**			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	1.357	354	**1711**	100.60	103.11	**101.12**
Medical group	85	49	**134**	102.68	104.20	**103.24**
Agrarian group	244	152	**396**	102.34	104.48	**103.16**
Architectural group	365	326	**691**	103.07	105.10	**103.98**
Economics and statistics group	1153	1043	**2196**	99.77	102.51	**101.07**
Scientific group	377	343	**720**	102.19	102.17	**102.18**
Sum of male type of degrees	**3.581**	**2.267**	**5848**	**100.92**	**103.09**	**101.76**
Chemical and pharmaceutical group	306	325	**631**	101.34	102.83	**102.11**
Law group	447	529	**976**	98.89	100.78	**99.92**
Sociopolitical group	415	522	**937**	100.10	103.31	**101.89**
Geology and -biology group	237	296	**533**	103.18	104.99	**104.19**
Psychology group	173	274	**447**	103.40	104.34	**103.98**
Literary group	309	738	**1047**	107.82	107.88	**107.87**
Linguistic studies group	109	623	**732**	106.19	105.95	**105.99**
Teacher training group	46	392	**438**	107.91	107.06	**107.15**
Sum of female type of degrees	**2.042**	**3.699**	**5741**	**102.33**	**104.87**	**103.97**
Total	**5.623**	**5.966**	**11.589**	**101.43**	**104.19**	**102.85**
	Total graduated			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	1.436	387	1.823	100.78	103.36	**101.33**
Medical group	143	90	233	104.67	106.31	**105.30**
Agrarian group	275	192	467	102.91	105.21	**103.85**
Architectural group	375	346	721	103.16	105.18	**104.13**
Economics and statistics group	1.201	1.114	2.315	99.93	102.66	**101.25**
Scientific group	394	375	769	102.36	102.60	**102.48**
Sum of male type of degrees	**3.824**	**2.504**	**6.328**	**101.21**	**103.43**	**102.09**
Chemical and pharmaceutical group	344	381	725	101.97	103.62	**102.83**
Law group	463	552	1.015	99.07	100.99	**100.12**
Sociopolitical group	473	589	1.062	100.46	103.66	**102.23**
Geology and -biology group	275	361	636	103.65	105.60	**104.75**
Psychology group	206	370	576	103.88	105.09	**104.65**
Literary group	328	774	1.102	107.90	107.92	**107.91**
Linguistic studies group	112	639	751	106.26	106.00	**106.04**
Teacher training group	52	434	486	107.98	107.26	**107.34**
Sum of female type of degrees	**2.253**	**4.100**	**6.353**	**102.65**	**105.15**	**104.26**
Total	**6.077**	**6.604**	**12.681**	**101.74**	**104.50**	**103.18**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

* Graduated "on course" are students fulfilling their statutory examination requirements on the legal duration of the course.

** Graduated "off course" are students fulfilling their statutory examination requirements in excess of the legal duration of the course.

Table 5 - Educational segregation according to degree groups and average graduation results (performing occasional working activity, working on a permanent job, or do not working while studying)

	performing occasional working activity			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	685	167	**852**	100.35	103.30	**100.93**
Medical group	43	28	**71**	103.26	106.29	**104.45**
Agrarian group	162	95	**257**	103.00	104.55	**103.57**
Architectural group	203	182	**385**	103.84	105.20	**104.48**
Economics and statistics group	609	552	**1161**	100.09	102.21	**101.10**
Scientific group	184	152	**336**	102.76	102.25	**102.53**
Sum of male type of degrees	**1.886**	**1.176**	**3062**	**101.17**	**103.12**	**101.92**
Chemical and pharmaceutical group	164	142	**306**	102.03	103.54	**102.73**
Law group	203	251	**454**	98.29	101.33	**99.97**
Sociopolitical group	195	323	**518**	100.97	103.69	**102.66**
Geology and -biology group	162	184	**346**	103.34	104.92	**104.18**
Psychology group	107	209	**316**	103.54	105.26	**104.68**
Literary group	162	371	**533**	107.81	107.87	**107.85**
Linguistic studies group	58	388	**446**	106.21	106.19	**106.19**
Teacher training group	16	184	**200**	107.94	107.06	**107.14**
Sum of female type of degrees	**1.067**	**2.052**	**3119**	**102.67**	**105.19**	**104.33**
Total	**2.953**	**3.228**	**6.181**	**101.71**	**104.44**	**103.13**
	working on a permanent job			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	143	21	**164**	98.68	101.33	99.02
Medical group	15	6	**21**	101.07	103.17	101.67
Agrarian group	36	22	**58**	100.86	104.77	102.34
Architectural group	78	44	**122**	101.66	102.71	102.04
Economics and statistics group	184	138	**322**	97.57	102.23	99.56
Scientific group	49	26	**75**	99.69	101.50	100.32
Sum of male type of degrees	**505**	**257**	**762**	**99.06**	**102.40**	**100.19**
Chemical and pharmaceutical group	34	21	**55**	97.59	98.57	97.96
Law group	89	72	**161**	97.51	99.02	98.18
Sociopolitical group	190	128	**318**	99.67	103.44	101.19
Geology and -biology group	28	28	**56**	102.07	104.82	103.45
Psychology group	50	71	**121**	104.40	103.56	103.91
Literary group	86	150	**236**	107.68	107.54	107.59
Linguistic studies group	26	101	**127**	105.35	104.95	105.03
Teacher training group	31	160	**191**	107.94	107.38	107.47
Sum of female type of degrees	**534**	**731**	**1265**	**101.79**	**104.84**	**103.55**
Total	**1.039**	**988**	**2.027**	**100.46**	**104.21**	**102.29**
	not working while studying			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	608	199	**807**	101.77	103.62	102.22
Medical group	85	56	**141**	106.02	106.66	106.28
Agrarian group	77	75	**152**	103.68	106.17	104.91
Architectural group	94	120	**214**	102.92	106.05	104.67
Economics and statistics group	408	424	**832**	100.76	103.40	102.10
Scientific group	161	197	**358**	102.72	103.30	102.89
Sum of male type of degrees	**1.433**	**1.071**	**2504**	**102.02**	**104.08**	**102.88**
Chemical and pharmaceutical group	146	218	**364**	102.92	104.15	103.66
Law group	171	229	**400**	100.82	101.24	101.06
Sociopolitical group	88	138	**226**	101.02	103.78	102.71
Geology and -biology group	85	149	**234**	104.75	106.57	105.91
Psychology group	49	90	**139**	104.08	105.89	105.25
Literary group	80	253	**333**	108.30	108.21	108.23
Linguistic studies group	28	150	**178**	107.21	106.21	106.37
Teacher training group	5	90	**95**	108.00	107.47	107.49
Sum of female type of degrees	**652**	**1.317**	**1969**	**103.32**	**105.24**	**104.61**
Total	**2.085**	**2.388**	**4.473**	**102.43**	**104.70**	**103.64**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

Table 6 - Educational segregation according to degree groups and average graduation results (working/not working on a permanent basis three years after graduation)

	M	F	MF	M	F	MF
GROUP OF DEGREE	Not working on a permanent basis*			Average graduation results		
Engineering group	225	73	**298**	101.29	102.96	**101.70**
Medical group	31	26	**57**	104.52	105.42	**104.93**
Agrarian group	81	71	**152**	103.36	105.92	**104.55**
Architectural group	66	105	**171**	103.57	105.26	**104.61**
Economics and statistics group	227	244	**471**	100.68	102.40	**101.57**
Scientific group	84	111	**195**	102.18	101.91	**102.03**
Sum of male type of degrees	**714**	**630**	**1344**	**101.79**	**103.38**	**102.05**
Chemical and pharmaceutical group	73	94	**167**	104.33	105.28	**104.86**
Law group	92	170	**262**	100.54	101.35	**101.06**
Sociopolitical group	94	190	**284**	102.09	104.17	**103.48**
Geology and -biology group	87	174	**261**	104.00	106.02	**105.34**
Psychology group	85	168	**253**	103.35	105.38	**104.70**
Literary group	117	347	**464**	108.17	107.96	**108.02**
Linguistic studies group	42	224	**266**	106.45	106.02	**106.09**
Teacher training group	7	139	**146**	107.86	106.46	**106.53**
Sum of female type of degrees	**597**	**1506**	**2103**	**104.15**	**105.63**	**105.21**
Total	**1311**	**2136**	**3447**	**102.86**	**104.96**	**104.16**
GROUP OF DEGREE	Working on a permanent basis **			Average graduation results		
Engineering group	1.211	314	**1.525**	100.69	103.45	**101.26**
Medical group	112	64	**176**	104.71	106.67	**105.43**
Agrarian group	194	121	**315**	102.72	104.79	**103.52**
Architectural group	309	241	**550**	103.07	105.14	**103.98**
Economics and statistics group	974	870	**1.844**	99.76	102.74	**101.16**
Scientific group	310	264	**574**	102.41	102.90	**102.64**
Sum of male type of degrees	**3.110**	**1.874**	**4.984**	**101.08**	**103.46**	**101.97**
Chemical and pharmaceutical group	271	287	**558**	101.33	103.07	**102.23**
Law group	371	382	**753**	98.71	100.83	**99.79**
Sociopolitical group	379	399	**778**	100.06	103.41	**101.78**
Geology and -biology group	188	187	**375**	103.48	105.02	**104.34**
Psychology group	121	202	**323**	104.25	104.85	**104,62**
Literary group	211	427	**638**	107.74	107.88	**107.83**
Linguistic studies group	70	415	**485**	106.14	105.99	**106.01**
Teacher training group	45	295	**340**	108.00	107.64	**107.69**
Sum of female type of degrees	**1.656**	**2.594**	**4.250**	**102.11**	**104.85**	**103.79**
Total	**4.766**	**4.468**	**9.234**	**101.44**	**104.27**	**102.81**
GROUP OF DEGREE	Working on a permanent basis /Total graduated %			Average graduation results		
Engineering group	84.3	81.1	**83.7**	100.69	103.45	**101.26**
Medical group	78.3	71.1	**75.5**	104.71	106.67	**105.43**
Agrarian group	70.5	63.0	**67.5**	102.72	104.79	**103.52**
Architectural group	82.4	69.7	**76.3**	103.07	105.14	**103.98**
Economics and statistics group	81.1	78.1	**79.7**	99.76	102.74	**101.16**
Scientific group	78.7	70.4	**74.6**	102.41	102.90	**102.64**
Sum of male type of degrees	**81.3**	**74.8**	**78.8**	**101.08**	**103.46**	**101.97**
Chemical and pharmaceutical group	78.8	75.3	**77.0**	101.33	103.07	**102.23**
Law group	80.1	69.2	**74.2**	98.71	100.83	**99.79**
Sociopolitical group	80.1	67.7	**73.3**	100.06	103.41	**101.78**
Geology and -biology group	68.4	51.8	**59.0**	103.48	105.02	**104.34**
Psychology group	58.7	54.6	**56.1**	104.25	104.85	**104.62**
Literary group	64.3	55.2	**57.9**	107.74	107.88	**107.83**
Linguistic studies group	62.5	64.9	**64.6**	106.14	105.99	**106.01**
Teacher training group	86.5	68.0	**70.0**	108.00	107.64	**107.69**
Sum of female type of degrees	**73.5**	**63.3**	**66.9**	**102.11**	**104.85**	**103.79**
Total	**78.4**	**67.7**	**72.8**	**101.44**	**104.27**	**102.81**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

* Includes those out of work, those employed with occasional working activity and those employed with a short term contract.

** Includes all those employed with a long term contract

Tab. 7 - Educational segregation according to degree groups and average graduation results (graduated employed as entrepreneurs, liberal professionals and managers three years after graduation)

	A-entrepreneurs, liberal professionals and managers			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	201	48	249	100.40	103.33	100.96
Medical group	99	53	152	104.87	106.62	105.48
Agrarian group	100	50	150	102.16	104.36	102.89
Architectural group	199	128	327	102.89	105.75	104.02
Economics and statistics group	145	65	210	97.37	103.05	99.13
Scientific group	22	9	31	101.82	101.78	101.81
Sum of male type of degrees	**766**	**353**	**1119**	**101.32**	**104.76**	**102.41**
Chemical and pharmaceutical group	27	18	45	95.81	101.34	98.02
Law group	157	92	249	98.54	100.78	99.38
Sociopolitical group	71	31	102	99.78	103.58	100.93
Geology and -biology group	50	30	80	103.14	105.67	104.09
Psychology group	49	60	109	104.79	105.08	104.95
Literary group	43	31	74	108.05	107.81	107.94
Linguistic studies group	14	29	43	107.07	103.69	104.79
Teacher training group	7	18	25	109.00	108.11	108.36
Sum of female type of degrees	**418**	**309**	**727**	**101.29**	**103.81**	**102.37**
Total	**1184**	**662**	**1846**	**101.32**	**104.31**	**102.39**
	B-Total of employed graduates			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	1.436	386	**1822**	100.78	103.34	101.32
Medical group	143	88	**231**	104.67	106.36	105.32
Agrarian group	274	191	**465**	102.88	105.18	103.83
Architectural group	374	345	**719**	103.14	105.16	104.11
Economics and statistics group	1197	1107	**2304**	99.92	102.66	101.24
Scientific group	393	372	**765**	102.37	102.66	102.51
Sum of male type of degrees	**3.817**	**2.489**	**6306**	**101.20**	**103.44**	**102.08**
Chemical and pharmaceutical group	344	381	**725**	101.97	103.62	102.83
Law group	460	549	**1009**	99.10	100.96	100.11
Sociopolitical group	471	586	**1057**	100.46	103.65	102.23
Geology and -biology group	275	357	**632**	103.65	105.58	104.74
Psychology group	204	366	**570**	103.91	105.16	104.71
Literary group	324	767	**1091**	107.89	107.91	107.90
Linguistic studies group	112	636	**748**	106.26	106.02	106.06
Teacher training group	52	432	**484**	107.98	107.27	107.34
Sum of female type of degrees	**2.242**	**4.074**	**6316**	**102.66**	**105.15**	**104.26**
Total	**6.059**	**6.563**	**12.622**	**101.74**	**104.50**	**103.17**
	A/B %			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	14.00	12.44	13.67	100.40	103.33	100.96
Medical group	69.23	60.23	65.80	104.87	106.62	105.48
Agrarian group	36.50	26.18	32.26	102.16	104.36	102.89
Architectural group	53.21	37.10	45.48	102.89	105.75	104.02
Economics and statistics group	12.11	5.87	9.11	97.37	103.05	99.13
Scientific group	5.60	2.42	4.05	101.82	101.78	101.81
Sum of male type of degrees	**20.07**	**14.18**	**17.75**	**101.32**	**104.76**	**102.41**
Chemical and pharmaceutical group	7.85	4.72	6.21	95.81	101.34	98.02
Law group	34.13	16.76	24.68	98.54	100.78	99.38
Sociopolitical group	15.07	5.29	9.65	99.78	103.58	100.93
Geology and -biology group	18.18	8.40	12.66	103.14	105.67	104.09
Psychology group	24.02	16.39	19.12	104.79	105.08	104.95
Literary group	13.27	4.04	6.78	108.05	107.81	107.94
Linguistic studies group	12.50	4.56	5.75	107.07	103.69	104.79
Teacher training group	13.46	4.17	5.17	109.00	108.11	108.36
Sum of female type of degrees	**18.64**	**7.58**	**11.51**	**101.29**	**103.81**	**102.37**
Total	**19.54**	**10.09**	**14.63**	**101.32**	**104.31**	**102.39**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001

Table 8 – People employed with an income above 1500Euros over the total of people employed according to degree groups and average graduation results

	Income>1500euros/Employed%			Average graduation results		
GROUP OF DEGREE	M	F	MF	M	F	MF
Engineering group	28.5	19.4	26.6	100.52	102.61	100.85
Medical group	53.1	37.5	47.2	104.53	106.12	105.01
Agrarian group	19.0	10.5	15.5	102.77	103.70	103.03
Architectural group	21.9	10.7	16.6	103.44	105.36	104.04
Economics and statistics group	23.1	10.4	17.0	100.83	103.84	101.72
Scientific group	22.6	8.1	15.6	102.85	103.23	102.95
Sum of male type of degrees	**25.8**	**12.5**	**20.5**	**101.49**	**103.90**	**102.07**
Chemical and pharmaceutical group	18.6	7.3	12.7	99.45	103.79	100.77
Law group	13.7	5.6	9.3	99.68	101.71	100.35
Sociopolitical group	28.0	9.4	17.7	100.45	104.91	101.76
Geology and -biology group	13.5	3.4	7,8	104.19	108.00	105.12
Psychology group	14.7	6.0	9.1	104.97	104.59	104.81
Literary group	11.1	3.7	5.9	108.42	107.86	108.17
Linguistic studies group	8.0	5.5	5.9	106.00	106.00	106.00
Teacher training group	13.5	1.9	3.1	108.29	104.88	106.47
Sum of female type of degrees	**16.9**	**5.4**	**9.5**	**101.91**	**105.00**	**103.04**
Total	**22.5**	**8.1**	**15.0**	**101.61**	**104.36**	**102.38**

Source: our calculations on Istat data. Survey on Labor Market Transitions of University Graduates, 1998 and 2001