

Professional Benchmarking of Degrees at the University of Padua

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Abstract

The transition from the university to the working world has grown in importance over the past few years. However, mere inclusion in the labour market is not sufficient to understand the practical value of a title of study on the employment market, since the rapidity of employment must be combined with the graduate's level of satisfaction with the quality of the employment found. Studying the professions performed by graduates from different courses and educational background is therefore crucial to describe the transition to the working world. By June 2000, the University of Padua has activated a research concerning its graduates. The survey, of a longitudinal (perspective) type, consists in observing, for a total of seven occasions during a three-year period, a sample of around 2700 graduates of given graduating sessions of 2000 and 2001. The data regarding the first contingent of graduates, interviewed six months and one year after graduation, are used to benchmark the 13 faculties on the basis of the access to work, but also with respect to objective and subjective characteristics of the jobs, as the income, sector of activity, size of the enterprise etc. on the one side, and different aspects of satisfaction about job and the usefulness of the university career for it on the other side.

1 From University to work

The transition from the university to work has grown in importance in Italy over the past few years, both at an institutional level and at a scientific one, by way of surveys carried out both by ISTAT and by autonomous structures fostered by various universities (e.g. Biggeri et al., 2001; Dolton et al., 1993; Tronti and Mariani, 1994).

Gori and Vittadini (1999) call the effects of University teaching on student learning compared to the reality of the vocational world the 'external effectiveness' of learning. ISTAT, as well, performs a retrospective study every three years on a large group of those who have graduated three years before (ISTAT, 1987, 1990, 1994, 1996, 1999). This survey does not achieve, nor can it achieve, the detail of surveys performed at the level of the individual university; however, it is carried out considering tens of thousands of cases, and allows us to compare categories of

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graduates from different universities. Analysis using a multilevel model (Biggeri et al., 2001) shows territorial differences in relation to the rapidity of employment.

However, mere inclusion in the employment market is not sufficient to understand the practical value of a title of study on the employment market, since the rapidity of employment must be combined with the graduate's level of satisfaction with the quality of the employment found, especially in a labour market offering nearly full employment as in the North-East area of Italy. Studying the professions performed is therefore crucial to deciding both national educational policies and, above all, those concerning the autonomy of universities.

The importance of assessing the employment of professional skills rather than the generic state of occupation is documented in numerous empirical studies, including a nationally prominent one, the 'Excelsior' informative system, regarding the professional demands of firms, which has now reached its fourth edition (www.excelsiorunioncamere.it) in 2001. On the local level we find such examples as the professional register achieved by the University of Padua (Fabbris, 2001).

Moreover, the Italian University system is currently facing a transformation that should be profitably managed taking into account the demands both of the labour market and of the experience of the most direct witnesses of the present situation.

This study attempts to analyse experiences of employment seeking and of professional activity among graduates from the University of Padua with the aim at identifying traits that qualify the graduate's professional career in relation to his/her course of studies or the faculty attended.

For each faculty, indications concerning job opportunities, professional careers, the use of skills in the performance of work activities by own graduates allow the determination of the practical value of titles of study and the professional skills in the local employment markets, and help building a bridge between university and work.

2 Methodology of the research

By June 2000, the University of Padua had activated a research concerning its graduates, involving in this enterprise, as well, the university faculties, with the aim of obtaining analytical estimates even at the level of faculties and, in some case, of courses. The survey, of a longitudinal (perspective) type, consists in observing, for a total of seven occasions during a three-year period, a sample of around 2700 graduates of 5 given graduating sessions of 2000 and 2001. The six-month intervals have been chosen as a compromise between the need for timeliness and precision in surveying all the occurring changes in the graduates' careers, and the attempt to keep the respondent's burden acceptable; in fact, we aim at monitoring each change in the different working experiences, even those that result to be minor ones and are likely to be forgotten in a short time; on the other side, too frequent interviews could cause an increase in refusals, especially for those respondents who did not change their situation and are asked a number of times about the same (perhaps negative) situation. Moreover, these interviews turn to be particularly important in the first period after graduation, when the graduates move from a job to a new one, in order

to understand what the job market offers, what are their vocations, and to look for a stable and satisfying employment.

The graduates were asked questions by the student secretarial offices by way of a self-administered questionnaire at the moment when they requested admission to the final graduating examination, and then every six months by way of computer-assisted telephone interviews (CATI). The telephone contacts amounted to a total of six during a three-year period, for each student in the sample group. The questionnaire for gathering data on first contact (time 0) contains short requests for information concerning the formative curriculum being carried out, any work activity done while studying, and short-term vocational expectations. Instead, questionnaires for longitudinal surveying, from time 1 (six months after graduation) to time 6 (three years after graduation) aim at gaining testimony on the ways in which the graduate has acted in order to find a job, the problems he or she has encountered, success in the search for employment and, for those who are working, the activities actually performed, the skills utilised, perception of the efficacy of education acquired at university; finally, suggestions are requested for orienting the learning structure in relation to professions (Fabbris et al., 2001).

Many different topics are treated: this gives the opportunity to study different aspects, e.g. education after graduation, entrance in the job market (research, refusals,...), unemployment, professional patterns and careers, job quality and satisfaction, and to benchmark the faculties with respect to (some of) these aspects. In spite of the length and the detail of this questionnaire, the respondents have shown good reactions and, in many cases, a sincere interest in the topics, the interview and its results.

At this step only the first two waves for the first contingent of 793 graduates were available, that is, the interviews conducted six months and one year after graduation.

3 A general picture

First of all, we need a general picture of the situation of young graduates six months after graduation: how many of them already have a job, how many are still looking for one, how many decide to go on studying. Of course, this may depend on what they were doing before graduation (only studied, or already started working), even if among people who worked before graduation there are some who already were regularly and stably employed, and some who had temporary and unstable part-time jobs just in order to maintain themselves during the university years. Table 1 shows the rates of respondents involved in the different activities, by gender and situation before graduation.

The percentage of recently graduated people who work six months after graduation strongly depends on what they were doing before, and ranges from more than 80% of people who already used to work, to about one half of the ones who did not. As a mirror image, unemployed are more than twice among people who did not work before graduation than among people who already did. This indicates that working before graduation makes it easier to work afterwards, that is, the most difficult step is to enter the job market; after this entrance, it becomes much easier to maintain

Table 1: Distribution of activities six months after graduation by gender and situation before graduation.

	<i>Activity six months after graduation</i>			
	Employed	Student	Unemployed	Other
Males	61.8%	15.6%	10.9%	11.7%
Females	63.2%	24.9%	9.1%	2.3%
Worked before graduation	81.7%	10.8%	4.6%	2.9%
Did not work before graduation	51.6%	27.0%	12.8%	8.6%
Total	62.6%	21.1%	9.8%	6.5%

Table 2: Masses, coordinates, relative contributions (squared angle cosines) and contributions by the points to the principal axes.

Name	Mass	Coordinates		Relative contributions		Contributions to inertia	
		k=1	k=2	k=1	k=2	k=1	k=2
Employed	209	-0.544	0.300	498	152	139	48
Unemployed	33	1.047	-0.273	119	8	81	6
Student	70	0.573	-1.355	87	487	52	327
Other	22	1.820	1.883	230	246	162	196
Worked	122	-1.003	0.349	580	70	276	38
Didn't work	211	0.579	-0.201	580	70	160	22
Female	195	-0.351	-0.550	174	427	54	151
Male	138	0.496	0.776	174	427	77	212
<i>Supplementary points</i>							
Agriculture		0.227	0.377	1	4		
Economics		0.297	-0.312	2	3		
Education		-0.796	-0.074	31	0.3		
Engineering		0.345	0.689	33	132		
Law		0.501	-0.552	18	22		
Literature		-0.232	-0.071	6	1		
Medicine		-0.760	0.086	69	1		
Pharmacy		-0.117	-0.407	1	7		
Politics		0.091	0.174	1	4		
Psychology		-0.098	-0.865	2	116		
Sciences		0.253	-0.035	7	0.1		
Statistics		-0.010	0.259	0.0	2		
Veterinary		0.388	-0.251	2	1		

the employment or to move from a job to a new one. The graduates who decide to continue with studies are about 20% of the total, but they are mainly concentrated among females and people who did not work before graduation. This is a consequence of two different factors: on the one side different long-term choices suggest people who want to go on studying to forget about work and be as fast as possible in taking a degree. On the other side, the 13 considered faculties do not have the same characteristics in terms of post-graduation studies required in order to find a job, and the gender composition of the faculties that require additional study and/or training is often unbalanced in favour of females. Finally, the proportion of males who are not studying, nor employed or unemployed is significantly larger than the analogue for females, since this response category includes the compulsory military service, that many young men start after completing their formation.

In order to understand what is the benchmarking of the faculties with respect to these first considered variables, we perform a multivariate correspondence analysis on the variables reported in Table 1; the faculties are represented as supplementary points (Figure 1). Numerical results are shown in Table 2. All quantities of a relative nature are multiplied by 1000 and rounded to integers, to eliminate decimal points and thus facilitate printing and examinations.

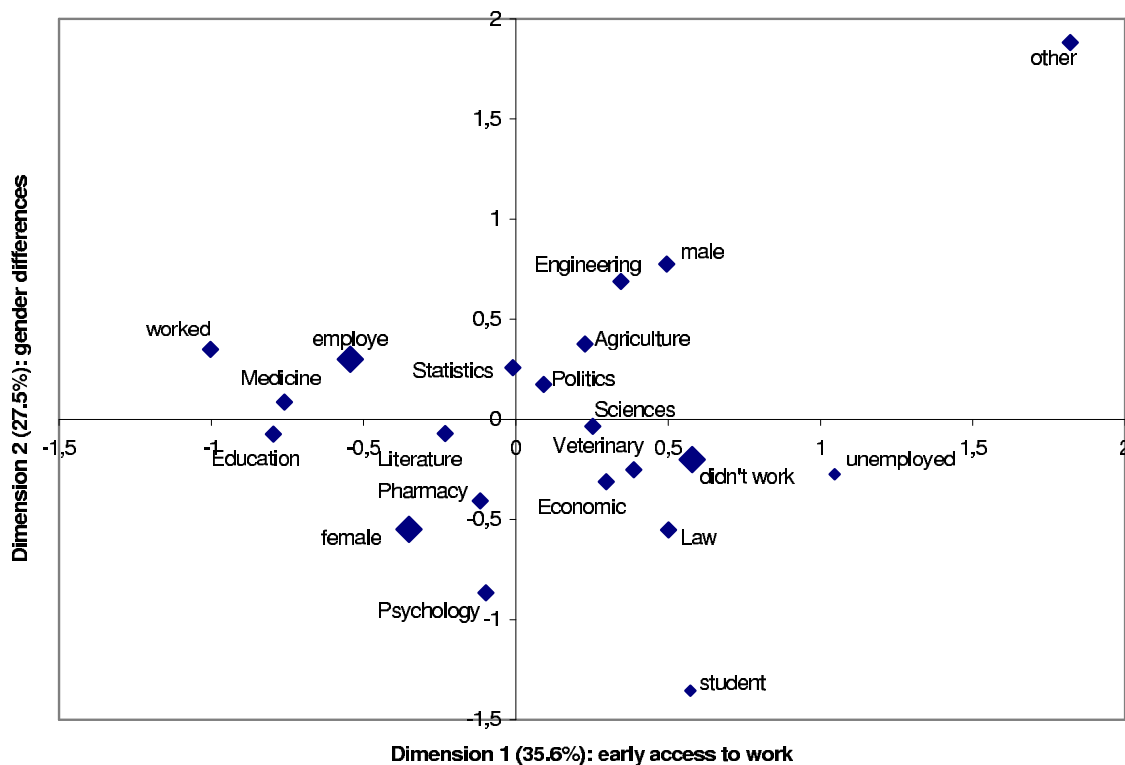


Figure 1: Correspondence analysis of the data about gender, working situation before graduation and working situation six months after graduation, with faculties displayed as supplementary points.

From the figure we get a graphical idea of what has already been pointed out by the analysis of Table 1, but we can also read a characterisation of the faculties

according to the considered variables.

The first dimension, which explains 35.6% of Greenacre adjusted inertia (Greenacre, 1993), is related to access to work. People who already worked before, and especially those who studied Education or Medicine whose majority starts working before graduation, tend to continue working after graduation². The ones who did not work before delay the entrance in the job market for different reasons: some, mainly females, and especially from the faculties of Psychology, Law and Economics, go on studying, others wait because of the military service (as seen, these are males, in particular from Engineering and Agricultural Sciences), while some are simply looking for a job.

The second dimension, explaining the 27.5% of adjusted inertia, describes gender differences: Psychology, Education and Pharmacy are mainly female faculties, while Engineering and Agricultural Sciences are principally chosen by males. Girls tend to study after graduation more frequently than males, but this depends also on the fact they graduate in faculties, like Psychology or Law, where at least one year (or more) of specialisation is needed. Finally, we see also from this figure that many males have to spend the first year after graduation for the military service, and this moves the 'male' Engineering and Agriculture faculties to the right of the graphic.

Entering the job market is an important step, but it is not the only aspect that characterises and differentiates the faculties with respect to the work opportunities they offer to their graduates, especially in areas, like the North-East of Italy where Padua is located, where the labour situation is close to full employment (Fabbris *et al.*, 2002). Young graduates usually have expectations about their ideal job that come from the amount of time they spent in studying, and from their perception of the professional skills acquired in their formation; for this reason, finding a job is not necessarily enough compared to their expectations of a 'good job'.

Then, it is important to define what makes a job 'a good job'. The most direct measure is the impression of the graduates themselves: the questionnaire contains a question about how satisfied the graduates feel about their job on a 10-point scale.

Table 3 reports the data about entrance in the job market and satisfaction six months after graduation at an aggregate level, that is, for each faculty, the percentage of graduates who work and the average level of satisfaction³.

As already pointed out, we see that the employment rate is higher for people who worked before graduation; this trend is the same in each faculty, but it is especially true for the faculties whose graduates have a difficult, or delayed, access to work: among graduates of Law and Psychology who worked before graduation, the employed six months after graduation are three times their colleagues who did not work before.

The average satisfaction does not show such a general pattern: for most of faculties, the average satisfaction is higher for people who started to work after graduation, probably because they were able to look for a job in agreement with

²Notice that, here and in the following, the data for the graduates in Medicine have not been treated since for them a specialisation is required before they can really start working. The data about the faculty of Medicine refer instead to the short degree for qualified nurses and physiotherapists, which is held in the same faculty.

³Data on the subgroups for the faculty of Veterinary are missing due to the small size.

Table 3: Percentage of graduates who work six months after graduation and their average satisfaction about their job, by faculty and situation before graduation.

Faculty	% employed			Average satisfaction		
	worked	did not work	total	worked	did not work	total
Agriculture	66.7	56.5	60.0	6.5	7.2	7.0
Economics	66.7	43.8	48.8	7.5	7.9	7.8
Education	94.3	56.3	82.4	7.2	6.8	7.1
Engineering	90.9	71.7	76.1	7.8	7.6	7.7
Law	53.9	17.7	25.0	8.0	7.8	7.9
Literature	73.8	50.0	61.6	7.1	7.6	7.3
Medicine	100.0	90.3	95.9	8.0	7.4	6.8
Pharmacy	86.7	44.8	59.1	7.5	7.9	7.7
Politics	87.5	44.7	61.3	6.3	7.7	6.9
Psychology	64.7	20.0	38.1	7.4	6.2	7.0
Sciences	71.4	46.9	53.5	6.1	7.2	6.8
Statistics	78.6	71.4	73.8	6.6	7.5	7.2
Veterinary	—	—	39.8	—	—	6.9
Total	81.7	51.6	62.6	7.3	7.5	7.4

their expectations. There are many exceptions: graduates in Medicine, Engineering, Law, Psychology and Education have less satisfactory jobs when they start working after graduation.

Data in Table 3 can be represented in a bi-dimensional graphic on the basis of their deviations from the general (inter-faculties) mean. The picture is shown in Figure 2, and gives an idea of the position of the different faculties with respect to the considered variables.

Here we can point out 4 different groups of graduates: the ones with a degree in Engineering and Medicine have an easy and satisfying access to work while, on the other side, graduates from Psychology, Sciences, Agricultural Sciences, Political Sciences and Literature have a delayed entrance in the job market, and the job they can find is not in agreement with their expectations. Between these two extremes, we find the graduates in Economics, Pharmacy and Law, who delay their entrance in the job market (perhaps also because some of them go on studying), but the ones who work feel satisfied about their job, and graduates in Education and Statistics, who have an easy access to work but do not like the job they find.

This is true for the mean values of each faculty, but often the two sub-populations of people who worked and did not work before graduation show strong differences. For example, statisticians who start working after graduation have both an easy access to work and a satisfactory job, and the same is true for graduates in Pharmacy and in Psychology who already worked before graduation, while graduates in Literature and in Political Science are satisfied about job if they start working after graduation, but in this case they have a difficult access to work.

Till now we have considered satisfaction about job as a variable that differentiates

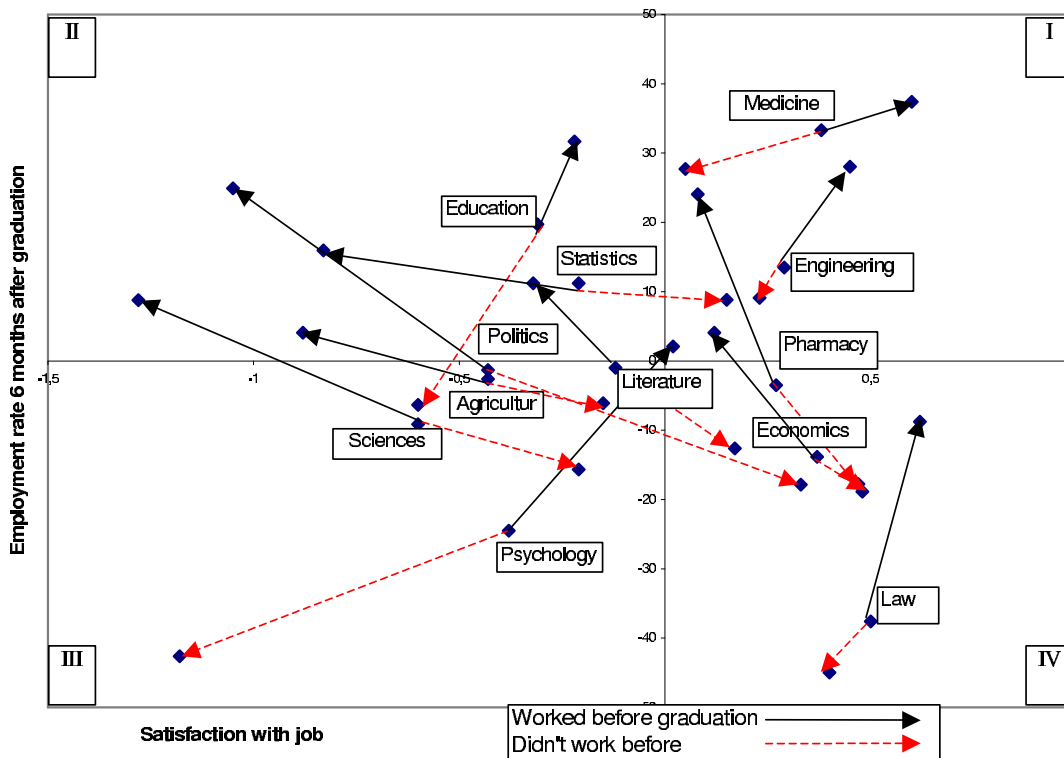


Figure 2: Bi-dimensional representation of the faculties according to the percentage of people entering the job market and the mean satisfaction.

graduates of different faculties, but satisfaction is a composite concept, and results from the sum of different aspects.

The aspect whose meaning is the most direct and easy to interpret is income, also because it usually comes together with other, less measurable, characteristics of a job. The first income has a particular meaning: on the one side, it is particularly rewarding as a symbol of financial independence from the original family, but on the other side many graduates perceive the first job as a temporary accommodation, and they may accept jobs with low income (or not income at all) because it enriches their experience and professionalism in order to find a good job afterwards.

Another important aspect is the consistency between the educational pattern and the job; this consistency is a value especially for people who have just completed their formation and do not have many criteria to evaluate a job, apart from the ideal job they conceived during their studies, and because of them. Table 4 reports, for each faculty, the percentage of graduates who consider their job consistent with their studies, and the median income⁴.

Jobs of people who start working after graduation are usually more consistent with the educational pattern than the ones of people who already worked, likely because after graduation people can look for some categories of job they can not access before graduation, while people who already worked in general do not change

⁴Again, data on the subgroups for the faculty of Veterinary are missing due to the small size.

Table 4: Percentage of graduates with a consistent job six months after graduation and median income by faculty and situation before graduation.

Faculty	% consistent jobs			Income in thousands ITL		
	worked	did not work	total	worked	did not work	total
Agriculture	75.0	69.2	71.4	1500	1950	1575
Economics	83.3	92.9	90.0	1850	1850	1850
Education	81.8	66.7	78.6	1708	1600	1650
Engineering	72.4	89.5	84.8	1790	1933	1918
Law	85.7	88.9	87.5	875	1725	1100
Literature	41.9	59.1	49.1	1675	1675	1675
Medicine	95.2	89.3	92.9	2038	1950	2019
Pharmacy	92.3	100.0	96.2	1933	1963	1943
Politics	38.1	52.9	44.7	1967	1650	1750
Psychology	36.4	40.0	37.5	1150	1000	1000
Sciences	42.4	72.3	61.6	1350	1600	1550
Statistics	36.4	70.0	58.1	1780	1850	1800
Veterinary	—	—	62.1	—	—	2050
Total	64.7	77.9	71.6	1767	1791	1775

their job in a short time after graduation. The only exceptions are for graduates in Medicine and Education, but this is due to the fact these graduates often start their stable work before obtaining their degree, and people who do not do the same are probably less interested in that job, or not very clever.

In this table we also see that the higher incomes correspond, in general, to graduates who did not work before graduation; this is probably due to the fact that people who start working after graduation obtain an income that is consistent with their educational level, while people who already worked do not receive an immediate adjustment of their income as soon as they graduate (and often, at least for some jobs, they do not receive an adjustment at all...). Again, there is an exception for graduates in Medicine and Education, but the reason could be the same as for the job consistency. Other exceptions regard graduates in Literature and Political Science; here the reason is slightly different, since these faculties have the highest rates of working student, and among them we can find a significant number of people with a stable (and good) job in the Public Administration, who decide to take a 'laurea' degree in order to improve their position.

Also for consistency and income, it is possible to benchmark all the faculties by representing in a bi-dimensional plot the differences of their aggregate indices from the general mean. The plot is given in Figure 3.

The better positioned faculties are the ones in the I quadrant of the picture, that is, Medicine, Pharmacy, Engineering and Economics, with both a median income and an average level of consistency between job and studies higher than the general mean.

On the other extreme, we find graduates who are likely to be disappointed both

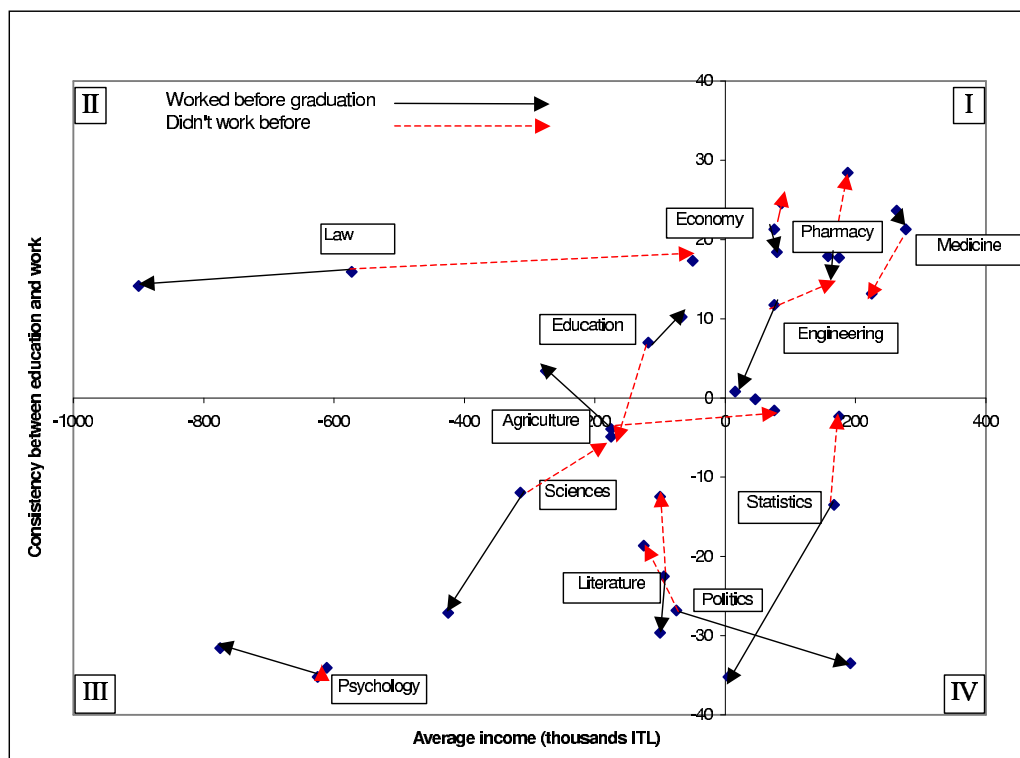


Figure 3: Bi-dimensional representation of the faculties according to the average income and the percentage of people with a consistent job.

by the economic aspect of their job, and by its consistency with what they studied. These are graduates in Psychology, Sciences and Literature, together with graduates in Political Sciences at their first employment.

Between these extremes, we see on the one side graduates in Law, with consistent jobs that are very badly paid (these are probably people in their training period at a lawyer's study), and on the other side statisticians, who are paid better than the average, but are not requested to make a 'statistical' job.

Across these rough groups, there are graduates in faculties where the situation strongly depends on their working condition before graduation. For the faculty of Agricultural Sciences, jobs are averagely consistent, but the income is quite high for people who started working only after graduation, and low for people who already worked. The opposite happens for Political Scientists: in general they have inconsistent job, but these are well paid for people who already worked during the university, and low for the others. Finally, graduates in Education have in general low incomes (teaching in the primary school, that is their main occupation, is not particularly rewarding), but their jobs are more consistent if they already worked before graduation.

In general, but it is not strictly a rule, we can observe that the more 'technical' faculties, where it is pretty clear, also for the students, what kind of job is to be considered consistent with the studies, bring to a more consistent work than faculties where it does not exist a 'typical' occupation.

4 From six months to one year

After this 'static' benchmarking of the faculties according to some general characteristics of the graduates and their working position six months after graduation, we include in the analysis the situation of the same contingent of 793 graduates at the second interview, that is, one year after graduation.

We will consider both the 'objective' characteristics of a job, such as the type of contract, the place where graduates work, the economic sector, etc., and the 'subjective' ones, like satisfaction, use of tools acquired during studies, need for further education, etc.

The data are analysed by correspondence analysis (see, e.g., Greenacre, 1984): in each analysis, a group of variables is chosen to describe the axes, and the data collected in the two time points are used to find a primary correspondence analysis solution, which acts as a reference frame where the faculties are projected as supplementary points. In order to graphically represent the change over time of the benchmarked faculties, their position on the axes is represented separately for the two time points, while the axes are described by the values observed in both the interviews.

Table 5: Principal inertias, adjusted inertias, percentages of inertia and cumulative percentages of inertia for the correspondence analysis on the set of objective characteristics of the job.

Principal inertia	Adjusted inertia	Percentage of inertia	Cumulative percentage
0.26746	0.02113	40.82	40.82
0.24225	0.01345	25.98	66.80
0.20320	0.00496	9.58	76.37
0.19801	0.00414	8.00	84.37
0.18780	0.00275	5.31	89.68
0.17830	0.00171	3.30	92.99
0.17257	0.00120	2.32	95.31
0.16812	0.00087	1.68	96.99
0.16620	0.00074	1.43	98.42
0.15810	0.00032	0.61	99.03
0.15515	0.00021	0.40	99.43
0.15325	0.00015	0.28	99.71
0.15143	0.00010	0.19	99.91
0.14836	0.00004	0.08	99.99
0.14519	0.00001	0.01	100.00
Total	0.05176	100.00	

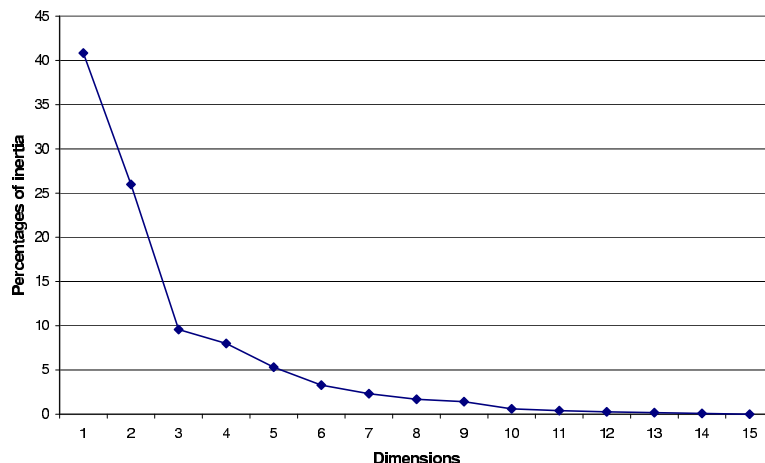


Figure 4: Percentages of adjusted inertia using the method proposed by Benzécri (1979), for the correspondence analysis on the set of objective characteristics of the job.

4.1 Objective characteristics

The first group of considered variables regards objective characteristics of the job. These are: the type of contract and the type of position (no contract, atypical, self-employed, training worker, temporary worker, stable worker, training clerk, temporary clerk, stable clerk, training manager, temporary manager, stable manager), the size of the enterprise in terms of staff (small size for up to 19 employees, medium size for 20-100 employees, and big size for more than 100 employees), the sector of activity where they work (public, private, no profit, school, or 'apasm', that is a state-controlled or a municipal firm), the place where the enterprise is located (same town where the respondent lives, different town in the same province, different province in the same region, different region in Italy, abroad, or the job involves travelling in different places), and the income (very low income up to 1.5 millions ITL, low income from 1.5 to 1.8 millions ITL, medium income from 1.8 to 2.1 million ITL, high income from 2.1 to 2.5 millions ITL, and very high income more than 2.5 millions ITL). Moreover, we include gender and working situation across the two time points ('lost job' if the respondent worked at time 1 and did not work at time 2; 'found job' if the respondent worked at time 2 but did not work at time 1; and 'always work' if the respondent worked both at time 1 and 2).

Multiple correspondence analysis of these data is performed by applying the procedure CORRESP of the software SAS (Sas Institute Inc., 1994, 2000). Table 5 reports principal inertias, adjusted inertias using the method proposed by Benzécri (1979) and described by Greenacre (1984), percentages of inertia and cumulative percentages of inertia. Percentages of inertia, plotted in Figure 4, indicate the presence of two relevant dimensions, that are displayed in the two-dimensional map in Figure 5. The numerical results of this analysis are shown in Table 6. In order to eliminate decimal points and thus facilitate printing and examinations, all quantities of a relative nature are multiplied by 1000 and rounded to integers.

Along the first dimension 40.8% of Benzécri adjusted inertia is represented, while

Table 6: Masses, coordinates, relative contributions (squared angle cosines) and contributions by the points to the principal axes, for the correspondence analysis on the set of objective characteristics of the job.

Name	Mass	Coordinates		Relative contributions		Contributions to inertia	
		k=1	k=2	k=1	k=2	k=1	k=2
No contract	9	-0.423	-1.336	12	116	6	64
Atypical	33	-0.913	-0.024	247	0.2	102	0.1
Self-employed	11	-0.374	-1.148	12	112	6	61
Training worker	2	-0.639	0.244	5	1	2	0.4
Temporary worker	2	-0.619	0.979	6	14	3	8
Stable worker	3	-0.241	1.157	1	24	1	14
Training clerk	13	0.937	-0.371	88	14	43	7
Temporary clerk	34	0.090	0.572	3	103	1	46
Stable clerk	32	0.721	0.189	152	10	63	5
Training manager	0.2	-0.220	-0.817	0.1	1	0.0	1
Temporary manager	1	0.236	0.643	0.4	3	0.2	2
Stable manager	3	1.306	-0.725	33	10	18	6
Small enterprise	62	-0.423	-0.449	135	152	41	51
Medium enterprise	36	0.245	0.235	21	19	8	8
Big enterprise	32	0.984	0.162	274	8	114	3
NR size	14	-1.032	1.034	111	111	54	60
Private	93	0.151	-0.411	43	316	8	65
Public	35	-0.159	0.929	8	282	3	125
School	3	-0.233	1.682	1	65	1	37
Apsm	2	1.097	1.794	20	52	10	30
No profit	9	-1.120	-0.430	86	13	43	7
Same town	44	-0.356	-0.117	56	6	21	3
Change town	69	-0.098	0.125	9	15	3	4
Change province	19	0.418	0.214	26	7	12	4
Change region	10	1.321	-0.338	129	8	64	5
Abroad	2	0.563	-1.747	4	35	2	20
Travel	1	1.292	-3.004	5	29	3	17
No income	1	-1.825	0.837	21	5	11	3
Very low income	24	-1.164	-0.009	277	0.0	123	0.0
Low income	30	0.021	-0.039	0.1	0.4	0.0	0.2
Medium income	34	0.471	0.805	68	199	28	90
High income	12	1.044	0.484	101	22	49	12
Very high income	10	0.967	-0.808	67	47	34	26
NR income	34	-0.301	-0.703	28	153	11	69
Female	87	-0.272	0.327	115	167	24	38
Male	56	0.425	-0.510	115	167	38	60
Lost job	14	-0.935	0.032	96	0.1	46	0.1
Found job	28	0.128	-0.575	4	82	2	39
Always worked	100	0.096	0.158	22	59	4	10

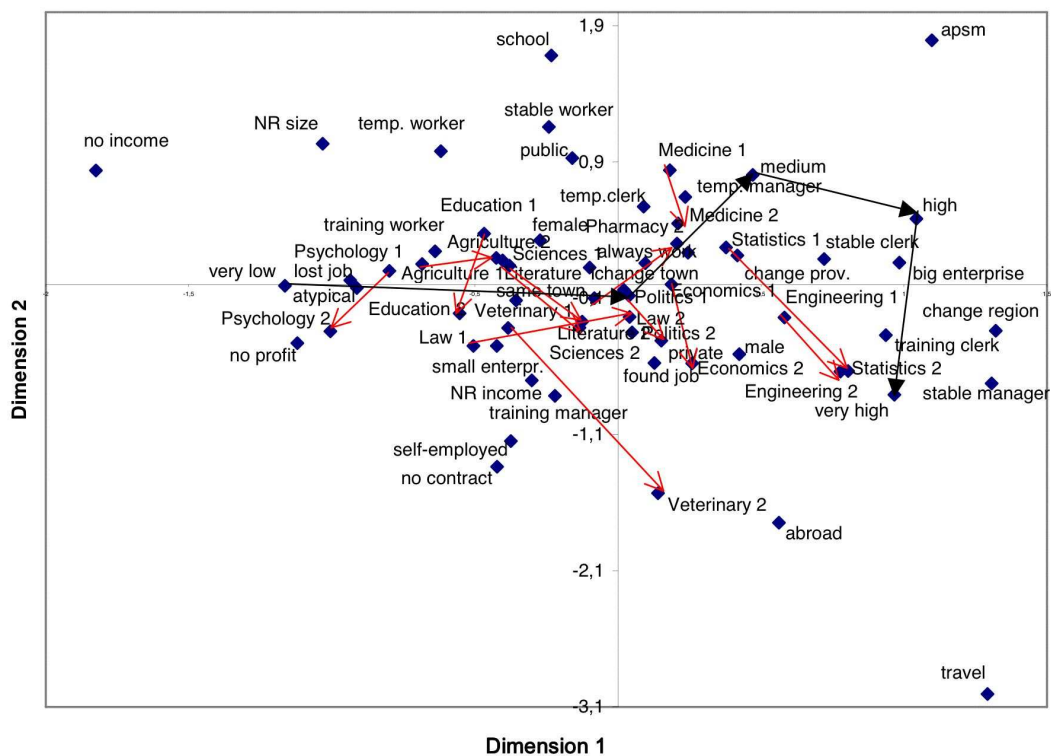


Figure 5: Correspondence analysis of the data on type of contract and position, size of the enterprise, sector of activity, place where the enterprise is located, income, gender and working situation across the two time points.

the adjusted inertia along the second axis is 26.0%. The interpretation of the axes can be obtained by reading the contributions of the points to inertia, reported in Table 6.

The first dimension is mainly determined, on the one extreme by atypical contracts (a particular form of contracts that does not give many guarantees to the employee) and very low incomes, and on the other extreme by people who work in big size enterprises and in a region different from where they live, and by stable clerks (i.e. clerks with a contract *sine die*). In few words, this dimension describes the stability of a job, both in terms of income and of type of contract: we find, at one extreme, people with very low income or no income at all (even if they are very few and they do not really contribute to the axis, there are people who work for free), with atypical contracts, and people who had a job at time 1 and do not work anymore at time 2; on the other extreme there are higher incomes and stable, high level positions, together with people who work in another region from where they live (in fact, it is likely that people are willing to move only for a good, stable employment).

The second dimension is determined by jobs in the public sector, associated with

Table 7: Coordinates and relative contributions (squared angle cosines) of the supplementary points for the correspondence analysis on the set of objective characteristics of the job.

Name	Coordinates		Relative contributions	
	k=1	k=2	k=1	k=2
Agriculture 1	-0.684	0.152	16	1
Agriculture 2	-0.425	0.196	2	1
Economics 1	0.187	0.003	1	0.0
Economics 2	0.260	-0.577	1	5
Education 1	-0.467	0.374	15	10
Education 2	-0.553	-0.211	8	1
Engineering 1	0.582	-0.242	59	10
Engineering 2	0.778	-0.638	28	19
Law 1	-0.506	-0.450	5	4
Law 2	0.041	-0.237	0.0	1
Literature 1	-0.379	0.139	11	2
Literature 2	-0.125	-0.273	1	3
Medicine 1	0.181	0.840	4	78
Medicine 2	0.210	0.448	1	4
Pharmacy 1	-0.082	-0.101	0.3	0.4
Pharmacy 2	0.206	0.302	1	1
Politics 1	0.039	-0.082	0.1	0.3
Politics 2	0.049	-0.350	0.1	3
Psychology 1	-0.799	0.102	19	0.3
Psychology 2	-1.006	-0.342	13	2
Sciences 1	-0.403	0.178	13	2
Sciences 2	-0.134	-0.316	1	5
Statistics 1	0.378	0.273	7	3
Statistics 2	0.804	-0.635	8	5
Veterinary 1	-0.384	-0.319	1	1
Veterinary 2	0.140	-1.530	27	27

medium incomes, versus self-employment and jobs in the private sector. This can be read, to some extent, as a propensity to risk in looking for a job: on the one side public employment (public administration, school, and state-controlled firms), mainly chosen by females, which guarantees a smaller risk and a medium income; on the other side, people more willing to risk with self-employment, private sector, small size enterprises, jobs without contracts, and also people who go abroad to work (but the mass of this point is very low).

Males and females are characterised with respect to both the dimensions, also because of the faculties where they prevail: females are more oriented to the public employment, but they tend to get less stable jobs, while males are more willing to

risk and to move, and they usually obtain better jobs, with higher income and more stability.

Table 8: Principal inertias, adjusted inertias, percentages of inertia and cumulative percentages of inertia for the correspondence analysis on the set of subjective characteristics of the job.

Principal inertia	Adjusted inertia	Percentage of inertia	Cumulative percentage
0.26234	0.02464	94.44	94.44
0.14972	0.00080	3.06	97.50
0.14296	0.00042	1.61	99.11
0.13814	0.00023	0.86	99.98
0.12717	0.00001	0.02	100.00
0.12545	0.00000	0.00	100.00
Total	0.02609	100.00	

Faculties in the two time points are displayed in Figure 5 as supplementary points, and the numerical results are shown in Table 7. The quality of these representations is not very high, but it gives some interesting indications: graduates in Engineering and Statistics have the jobs with the highest incomes and stability, while graduates in Psychology tend to have lower incomes and atypical contracts. From time 1 to time 2 all the graduates move to more stable and 'rich' employments, with the exceptions of graduates in Psychology and Education, which show an opposite trend.

4.2 Subjective characteristics

The second group of variables that have been considered regards subjective characteristics of the jobs: satisfaction about job, use of competences acquired at the university, gaps in education (i.e., competences the graduates miss in their job), consistency between education and work, and use of *forma mentis*; moreover, we consider again the income, since it is often an index of several, sometimes unobserved, aspects of a job, together with gender and working situation in the two occasions.

Again, we perform multiple correspondence analysis of these data; Table 8 reports principal inertias, Benzécri adjusted inertias (Benzécri, 1979), percentages of inertia and cumulative percentages of inertia. The decomposition of inertia points out the existence of only one principal axis. However, the points are represented in the two-dimensional display of Figure 6. The numerical results of the analysis are shown in Table 9⁵.

The first two dimensions explain 97.5% of Benzécri adjusted inertia, which is almost completely represented along the first axis. This axis, as we understand

⁵Again, in order to eliminate decimal points and facilitate printing and examinations, all quantities of a relative nature are multiplied by 1000 and rounded to integers.

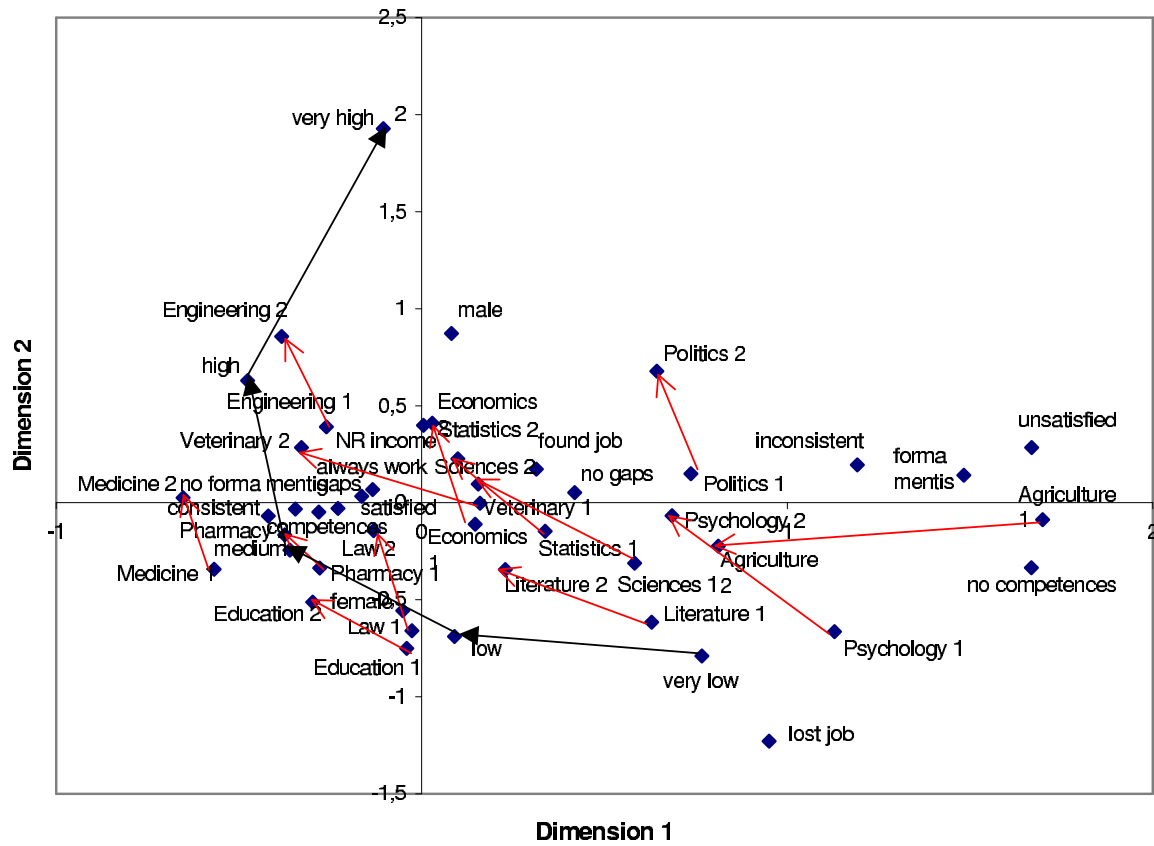


Figure 6: Correspondence analysis of the data on satisfaction about job, use of competences, gaps in education, consistency, use of *forma mentis*, income, gender and working situation in the two occasions.

by analysing the contributions by the points to principal inertia, is determined by the contrast between unsatisfying and inconsistent jobs on the one extreme, and satisfying jobs that are in line with the educational pattern on the other extreme. The use of *forma mentis* strongly contributes to the principal inertia, but it is associated with unsatisfactory and inconsistent job; probably this means that *forma mentis* is something graduates feel useful for their job only when they cannot use specialist abilities or anything else of what they learnt during their studies.

The second dimension, even if very weak, has a clear meaning, since it distinguishes between males, associated with higher incomes, and females, associates with lower incomes, as seen in the previous section. It is also evident that consistent and satisfactory jobs in general correspond also to higher incomes.

To complete the analysis, faculties in the two time points are represented as supplementary points; the numerical results are reported in Table 10.

Also in this case, the quality of the representation is not very good, but the indications are easily interpretable. Graduates of technical faculties, first of all Medicine, Engineering and Pharmacy, report higher levels of consistency between studies and work, they earn higher incomes, they do not use *forma mentis*, but they use competences they learnt at the university, and sometimes they miss some

Table 9: Masses, coordinates, relative contributions (squared angle cosines) and contributions by the points to the principal axes for the correspondence analysis on the set of subjective characteristics of the job.

Name	Mass	Coordinates		Relative contributions		Contributions to inertia	
		k=1	k=2	k=1	k=2	k=1	k=2
Satisfied	114	-0.164	0.033	274	11	12	1
Unsatisfied	11	1.668	-0.334	274	11	119	8
Competences	107	-0.282	-0.048	470	14	32	2
No competences	18	1.669	0.285	470	14	192	10
Gaps	81	-0.229	-0.029	96	2	16	0.4
No gaps	44	0.418	0.052	96	2	30	1
Consistent	92	-0.420	-0.069	500	13	62	3
Inconsistent	33	1.192	0.195	500	13	176	8
Forma mentis	24	1.483	0.142	513	5	198	3
No forma mentis	101	-0.346	-0.033	513	5	46	1
Very low income	21	0.766	-0.790	117	124	46	86
Low income	22	0.090	-0.689	2	103	1	71
Medium income	29	-0.361	-0.244	39	18	14	12
High income	14	-0.477	0.630	28	49	12	37
Very high income	9	-0.105	1.927	1	302	0.4	233
NR income	30	0.005	0.398	0.0	50	0.0	32
Female	76	-0.052	-0.557	4	486	1	158
Male	49	0.081	0.872	4	486	1	248
Lost job	8	0.950	-1.229	62	103	28	81
Found job	18	0.313	0.174	17	5	7	4
Always worked	99	-0.135	0.067	68	17	7	3

knowledge that was not taught during the courses.

On the other extreme, graduates of less technical, or less required, faculties, especially from Psychology, Agricultural Sciences and Political Sciences, feel unsatisfied about their jobs, where they do not use specific competences, since their job is usually inconsistent with what they studied. They only use *forma mentis*, and they do not feel any gap in their education. Moreover, in general they have lower incomes, and less stable jobs ('lost job', that is people who worked at time 1 but not at time 2, lies clearly on this side of the display). Some faculties, like Statistics and Economics, look like a link between the highly specialised degrees and the more generalist and liberal ones.

If we observe the positions of the supplementary points at the two time points, we see that the differences among graduates from different faculties are quite large six months after graduation, but are reduced at the second interview, one year after graduation. In fact, the trend for each faculty is towards more consistent and satisfying job, and higher incomes; the enhancements are particularly large for

faculties in worse positions.

Table 10: Coordinates and relative contributions (squared angle cosines) of the supplementary points for the correspondence analysis on the set of subjective characteristics of the job.

Name	Coordinates		Relative contributions	
	k=1	k=2	k=1	k=2
Agriculture 1	1.698	-0.088	15	0.0
Agriculture 2	0.811	-0.223	5	0.4
Economics 1	0.146	-0.111	0.4	0.2
Economics 2	0.029	0.409	0.0	4
Education 1	-0.041	-0.751	0.1	24
Education 2	-0.298	-0.512	5	14
Engineering 1	-0.261	0.392	8	18
Engineering 2	-0.384	0.857	18	91
Law 1	-0.027	-0.660	0.0	8
Law 2	-0.132	-0.144	1	1
Literature 1	0.629	-0.616	20	19
Literature 2	0.229	-0.344	3	6
Medicine 1	-0.568	-0.343	24	9
Medicine 2	-0.653	0.026	31	0.0
Pharmacy 1	-0.279	-0.337	2	3
Pharmacy 2	-0.375	-0.166	5	1
Politics 1	0.737	0.150	19	1
Politics 2	0.643	0.677	17	19
Psychology 1	1.129	-0.665	22	8
Psychology 2	0.684	-0.067	9	0.1
Sciences 1	0.582	-0.312	18	5
Sciences 2	0.155	0.096	1	1
Statistics 1	0.337	-0.147	4	1
Statistics 2	0.099	0.227	0.4	2
Veterinary 1	0.160	-0.002	0.2	0.0
Veterinary 2	-0.329	-0.284	1	1

5 Considerations and further development

The value of a University degree for the labour and professional markets depends on the amount of chances given to a graduate in his/her quick finding a satisfactory job, and on the value added by his/her competences for professional improvement. In general, we found high ratings both for access to work and for the perceived quality of the jobs.

Benchmarking of faculties depends on the parameters on which we base the analysis, but it has shown some regularities. Apart from special cases mainly due to the Italian law, which requires further formation after graduation for some professions, graduates from technical and/or specialist faculties tend to enter the labour market more easily than graduates from liberal arts and generalist faculties and, also after the first job is found, we observe a differential between these types of faculties in terms of income, satisfaction, and consistency.

Females are generally employed in less stable (and worse paid) positions than their male colleagues, but this is likely to be an effect of the differential prevalence of males and females in some faculties: in fact, females prevail in many liberal faculties, while males are the majority in some technical ones.

The key for success in finding a satisfactory job seems to be a well-balanced compromise between stability and risk: graduates who 'dare' to move to other towns, other regions, or even abroad, and the ones who enter upon a new activity can have more success than the ones who look for the 'classical' public employment, but the danger is to risk too much, and to move from a short-term job to another.

What is encouraging is that, one year after graduation, things go better for almost everybody: graduates from each faculty slowly converge to more satisfying and more rewarding jobs. It is not completely clear, in fact, to what extent they really find better jobs, and to what extent they remodel their professional expectation on the basis of their actual experience, but it is important to see that, also for those graduates who experience a frustrating access to work, disappointment is not a permanent condition.

At least, this is what emerges from data collected six months and one year after graduation. What happens afterwards will be clear only after the analysis of the data from further interviews and further contingents of graduates. More time points will make it possible to better describe the professional patterns of graduates from different faculties, while more contingents of graduates will give more stability to the estimates and will permit the analysis of the data at a more detailed level (e.g., not only the faculties, but also the courses).

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