

## **Occupational outcomes of graduates: The role played by the field of study**

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### **Abstract**

With the expansion of upper secondary and tertiary education occurred since the second half of the twentieth century, the selectivity of higher education has diminished, and having a tertiary degree may no longer be sufficient to ensure access to the best occupational positions. Even more, in the last two decades, youth working conditions have worsened, and early occupational careers of recent graduates have experienced an increasing “flexibilization” made up by unemployment spells and temporary employment contracts.

Nevertheless, graduates’ occupation downward trend has occurred to a different extent across disciplinary areas, penalizing graduates from the humanities and social sciences and guaranteeing better rewarded occupations for graduates in the ‘hard’ sciences.

The aim of this work is to advance our understanding on graduates’ occupational returns according to their field of study in Italy. For our purposes, a rich and detailed longitudinal dataset will be constructed integrating two administrative data sources relating to the academic and occupational outcomes of University of Florence’s graduates, respectively. Analysing data through event-history models, with our study we intend to shed light on graduates’ occupational returns in terms of waiting times before having a stable position in the labour market, field-of-study mismatch and qualification mismatch.

**Keywords:** Fields of study; field-of-study mismatch; qualification mismatch; graduates; labour market; event-history analysis; Italy

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## Introduction

Human and cultural capital, including education and qualifications, can be considered a relevant resource to create innovation and development. From this perspective, graduates' careers represent an important issue for both professional organizations and labour market stakeholders, and Universities themselves. Monitoring activity of student career paths allows high-level educational institutions to evaluate the quality and effectiveness of training courses provided.

In the twenty-first century, the Italian university system has experienced relevant changes. After a sharp increase of the number of graduates in the second half of the twentieth century, the number of enrolments started to decline in 2008 with the beginning of the economic crisis. The decline continued till 2012, when the number of graduates began to increase again, especially in northern and central Italian regions.

The expansion of upper secondary and tertiary education reduced the selectivity of higher education and increased the heterogeneity of graduates; thus, having a tertiary (university) degree may no longer be sufficient to ensure access to the best occupational positions (Breen & Goldthorpe, 1997). Even more, the growth in the number of graduates was not followed by an upgrading of the occupational structure (Barone, 2012). In the last two decades, youth working conditions have worsened, with an increased 'flexibilization' of the youth labour market (Barbieri & Scherer, 2009). Early occupational careers of recent graduates have become more difficult: increasingly, graduates face with temporary employment contracts at the early stages of their occupational careers, which may have long-term negative consequences for employment prospects too (Barbieri & Scherer, 2009).

The deterioration of employment conditions has caused a stronger competition among graduates entering the labour market, where employee selection processes started requiring a number of additional criteria. These go beyond the standard job-related qualifications and more often focus on the type of institution attended at secondary or tertiary level (Macmillan, Tyler, & Vignoles, 2015). Nevertheless, graduates' occupation downward trend occurred to a different extent across disciplinary areas, in particular penalizing graduates from the humanities and social sciences (Argentin & Triventi, 2011; Ballarino & Bratti, 2009). These results are consistent with the international literature, which reports how graduates from different field of study (FoS) have heterogeneous occupational returns (Gerber & Cheung, 2008), both in the US (Daymont & Andrisani, 1984) and in Europe (Chevalier, 2011; Reimer, Noelke, & Kucel, 2008; van de Werfhorst, 2004). In Italy, Ballarino and Bratti (2009) showed that in 1995-2004 graduates in the 'hard' sciences obtained better rewarded occupations in terms of earnings and occupational status and were less likely to be unemployed or overeducated compared to graduates in the 'soft' social sciences and humanities. Ballarino and Bratti's analyses caught one of the major steps in labour market deregulation resulting from the 1997 'Treu Law' (L.196/1997). However, their analysis only partially explored the "Biagi Law" (L.30/2003) effects, which gave further impulse to the spread of 'flexible' and atypical forms of employment (Barbieri & Scherer, 2009; Bernardi & Nazio, 2005). In light of this, there is a lack of Italian studies investigating the impact of the 2008 economic crisis on graduates' occupational outcomes and their association with different FoS.

The aim of this work is to advance our understanding on graduates' occupational returns in term of field of study in Italy. Italy is an interesting case study because of its sharp spread of flexible and temporary contractual forms over the last decades, which has been one of the fastest in Europe. The sudden increase in flexibility of the youth labour market combined with the increase of the number of graduates may have led to a more competitive labour market compared to other European

countries. Moreover, graduates' entry into the labour market, especially those belonging to the "soft" social sciences and humanities, might be affected by the most adverse labour market outcomes, i.e. higher rates of temporary job contracts, overqualification or field-of-study mismatch<sup>1</sup>.

In light of this, this study aims at answering the following three research questions: *Does the transition into a permanent job contract after graduation differ according to the field of study? Do graduates, trained in a particular field, work in that field or is there a field-of-study mismatch? Are graduates' professional qualifications appropriate in relation to their educational attainment or is there a qualification mismatch?*

For answering to our research questions, we will construct an original dataset of Master's graduates from University of Florence, following the work made by Alleva et al. (Alleva, 2015; Lucisano, Magni, De Luca, Renda, & Zanazzi, 2016), which integrated the Sapienza graduates' archive with the Mandatory Communications of the Ministry of Labour for an assessment of all contracts signed by all graduates in 2008-2013 from degree attainment up until 31 December 2014.

Occupational outcomes of university students once they graduate represent a crucial issue for both the individual and the societal level, especially in a country like Italy that boasts one of the highest percentages of NEET (not in employment, education or training), and that poses serious difficulties to youth for finding a stable and qualified job position in the labour market (De Rose & Strozza, 2015; Eurofound, 2012; Livi Bacci, 1999). With our study, we intend to shed light on graduates' occupational returns in terms of waiting times before having a stable position in the labour market, professional qualifications and consistency between type of occupation and human capital acquired by field of study.

## **Data and Methods**

Our work intends to integrate two data sources relating to the academic and occupational outcomes of Master's graduates from University of Florence. The first one is an administrative database of University of Florence's students. We focus on Master graduates in all the schools in the years 2013-2015. The database provides information on students' academic career, from enrolment to graduation, including transfers within University of Florence and several information on student's high school career. The second one is a database of Mandatory Notices of the Ministry of Labour regarding graduates from the University of Florence during the same period, which contain information related to all job contracts signed by graduates (except self-employment spells) years after graduation. Through this record linkage of two data sources, we will obtain a very rich and detailed longitudinal dataset including relevant information on graduates' academic history and career history.

We are aware that we are concentrating on one university only, which could not be representative of graduates' population at the national level, despite the fact that University of Florence is the seventh university in Italy as number of graduates with more than 8,000 graduates in the last three years. Nevertheless, compared to other data sources – such as Almalaurea data or the University Graduates Survey conducted by Istat (Almalaurea, 2019; Istat, 2016) - using the administrative database of the University of Florence's students and the Mandatory Notices of the Ministry of Labour will allow us

<sup>1</sup> Overqualification arises when workers have an educational attainment that is higher than that required by their job. Field-of-study mismatch arises when workers are employed in a different field from what they have specialised in (Montt, 2015; OECD, 2017).

to have all detailed information on occupational career instead of information only for a few fixed points in time after graduation. With its limits, thanks to our longitudinal, micro-level dataset our study will constitute a more ambitious attempt to shed light on graduates' employment dynamics in Italy.

Once this data source will be created, we will analyse graduates' dataset through event-history analysis, given the very rich detail on graduates' employment spells. For answering to the first research question, we will analyse the transition to a first job with a permanent contract, where the key explanatory variable will be the FoS, divided into 7 categories: Humanities, Law, Social Sciences, Economics/Statistics, Technical, Sciences and Medicine (Triventi, Vergolini, & Zanini, 2017). To answer the second research question, we will implement a competing-risk event-history model for the transition to a first permanent job with field-of-study mismatch or not. In this case, the two competing events are a job with field-of-study mismatch or a job without field-of-study mismatch. Finally, in order to meet the third research question, we will implement a competing-risk event-history model for the transition to a first permanent job with qualification mismatch, where the three competing events are a right-qualified job, an underqualified job or an overqualified job.

## Descriptive results

Table 1 shows the number of Master's graduates from University of Florence in the years 2013-2015, by gender and FoS. During the three-year period, the number of graduates has a fluctuating trend, with a slight increase by 1% in 2014 and a decrease of 2.6% in 2015. Instead, in line with the general tendency in the country, the number of female graduates is always higher than the males and accounts for 62-64% of all graduates. Finally, the number of graduates by FoS greatly differs by gender: whilst the highest gap in favour of men is in the Technical field, the highest gap in favour of women is in the Social Science field.

**Table 1: Master's graduates from University of Florence by FoS and gender. 2013-2015.**

a) Year 2013

	Males		Females		Total	
	abs.v.	%	abs.v.	%	abs.v.	%
Humanities	119	10.3	299	14.5	418	13.0
Social sciences	156	13.5	667	32.3	823	25.5
Law	125	10.8	264	12.8	389	12.1
Economics and statistics	111	9.6	144	7.0	255	7.9
Technical	247	21.3	74	3.6	321	10.0
Science	266	23.0	381	18.5	647	20.1
Medicine	134	11.6	235	11.4	369	11.5
<b>Total</b>	<b>1,158</b>	<b>100.0</b>	<b>2,064</b>	<b>100.0</b>	<b>3,222</b>	<b>100.0</b>

b) Year 2014

	Males		Females		Total	
	abs.v.	%	abs.v.	%	abs.v.	%
Humanities	97	7.9	280	13.8	377	11.6
Social sciences	133	10.8	596	29.4	729	22.4

Law	148	12.0	299	14.8	447	13.7
Economics and statistics	146	11.9	174	8.6	320	9.8
Technical	283	23.0	76	3.8	359	11.0
Science	303	24.7	395	19.5	698	21.5
Medicine	119	9.7	204	10.1	323	9.9
<b>Total</b>	<b>1,229</b>	<b>100.0</b>	<b>2,024</b>	<b>100.0</b>	<b>3,253</b>	<b>100.0</b>

c) Year 2015

	Males		Females		Total	
	abs.v.	%	abs.v.	%	abs.v.	%
Humanities	86	7.7	264	13.1	350	11.2
Social sciences	140	12.5	596	29.6	736	23.5
Law	130	11.6	236	11.7	366	11.7
Economics and statistics	127	11.3	132	6.5	259	8.3
Technical	212	18.9	66	3.3	278	8.9
Science	301	26.9	457	22.7	758	24.2
Medicine	125	11.2	265	13.1	390	12.4
<b>Total</b>	<b>1,121</b>	<b>100.0</b>	<b>2,016</b>	<b>100.0</b>	<b>3,137</b>	<b>100.0</b>

Trying to catch a snapshot of occupational outcomes of Master's graduates from University of Florence, Table 2 shows the percentage of graduates who worked one year after graduation. For the three cohorts of graduates, less than half of them worked after one year, and the percentage of those working monotonically decreases over the period, passing from 45.4% to 41.3%. Looking at the differences by FoS, the highest percentage of working graduates is in the Technical field, whilst the lowest in the Law field. Considering also how many working graduates had a permanent job contract, over the three years the trend is steadily increasing, from 19.5% to 24.2% who had a permanent job contract among those working one year after graduation. In this respect, the highest percentage of working graduates with a permanent contract is among the Medicine field, even if this percentage highly fluctuates from a minimum of 34.1% to a maximum of 48.6% over the considered period. On the other hand, the lowest percentage of permanent employees is among graduates in Law (where self-employment is widespread).

**Table 2: Master's graduates from University of Florence in 2013-2015 who worked one year after graduation by FoS.**

	2013		2014		2015	
	<i>% working</i>	<i>whose with a permanent contract</i>	<i>% working</i>	<i>whose with a permanent contract</i>	<i>% working</i>	<i>whose with a permanent contract</i>
Humanities	41.4	16.2	36.1	17.6	46.3	29.0
Social sciences	53.3	20.3	52.7	22.1	47.3	25.0
Law	18.5	16.7	16.8	14.7	16.7	13.1
Economics and statistics	44.3	20.4	46.3	18.9	45.2	28.2
Technical	67.0	16.7	57.4	20.9	56.8	28.5
Science	41.1	10.2	37.2	9.6	35.5	11.9
Medicine	50.1	38.4	44.6	48.6	46.7	34.1

<b>Total</b>	<b>45.4</b>	<b>19.5</b>	<b>41.6</b>	<b>21.1</b>	<b>41.3</b>	<b>24.2</b>
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To sum up, the entry into the labour market among graduates seems to differ across disciplinary areas, with the Technical field showing the most prominent employment rates one year after graduation; but surprisingly, graduates in this field do not seem to have the same occupational advantages in terms of job contract, with the highest rates of permanent job contract pertaining to graduates in Medicine. Next steps of our work will proceed implementing the three models for answering the three research questions, while testing possible interaction effects between key covariates and the time. Using event-history models and time-varying information on graduates' employment and educational careers, we will try to answer our research questions about the association between occupational returns and FoS in terms of job contract, field-of-study mismatch, and qualification mismatch.

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