UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M.FANNO"

CORSO DI LAUREA MAGISTRALE IN

ECONOMICS AND FINANCE

TESI DI LAUREA

STUDENT ENTREPRENEURSHIP: THE CASE OF THE UNIVERSITY OF PADOVA

RELATORE:

CH.MA PROF.SSA SILVIA RITA SEDITA

LAUREANDO: ALEX LUCAS LENTI

MATRICOLA N. 1103658

ANNO ACCADEMICO 2015 – 2016

Il candidato dichiara che il presente lavoro è originale e non è già stato sottoposto, in tutto o in parte, per il conseguimento di un titolo accademico in altre Università italiane o straniere.
Il candidato dichiara altresì che tutti i materiali utilizzati durante la preparazione dell'elaborato sono stati indicati nel testo e nella sezione "Riferimenti bibliografici" e che le eventuali citazioni testuali sono individuabili attraverso l'esplicito richiamo alla pubblicazione originale.

Firma dello studente

_____

Contents

INTRODUCTION

Entrepreneurship is the engine of economic growth (Carreea and Thurik, 2012; Wennekers and Thurik, 1999). It makes economies more competitive and contributes to the creation of new jobs and to the development of new skills. Considering the current economic evolution, the development of new creative ideas and projects assumes an increasingly important value given their ability to generate new wealth and in some cases intellectual property (e.g. patents, copyrights, trademarks, registered designs) that contribute to support the progress of a country. Entrepreneurship is defined as one of the most important activities of modern economic life and has the potential to improve economic opportunities for all (Hart et al., 2015). In the more advanced economies, growth is driven by innovation and that results in new products and services able to stimulate the competition and the efficiency of the economic system and so the consumer welfare. Considering instead the less advanced countries, growth is more affected by readjustment of the industrial structure (Ferrante and Supino, 2016). For both cases however, the entrepreneurial activity is the foundation for the value creation process.

Landström, Harirchi and Åström (2011) reported an in-depth analysis about the core knowledge of entrepreneurship research considering the role and the different schools of thought around the phenomenon. From the individual level, the psychological endowments and skills play a crucial role and are the spark that triggers the creation mechanism. In order to not extinguish immediately the entrepreneurial flame, the individuals obviously need an enabling environment and specific support from the institution. The consequence of the business creation have an important effect on local and global economy both directly and indirectly. From a more concrete point of view, new companies enhance rivalry. About this topic, there might be several points of view in favour or against a greater competition especially in the case of early stage start-ups. However, competition empower people (and firms) to learn from both their own and other's successes and disappointments. In this way, individuals and enterprises expand their skillset through this selecting and learning process. They are then able to restart the business generation process and go ahead with the entrepreneurial action making an intermittent chain of linkages. The performances of companies that are able to establish themselves are also improved given the initial selection and individuals boost their self-confidence and welfare. We can then assume that economic growth derives from an increase in efficiency for what concerns the firm management, the economic health of individuals connected to the business and their motivation; in addition, from a more general point of view, the society as a whole will take advantage from

an increase in innovation supply. As Porter (1990) says, “the entrepreneurship is at the heart of national advantage” but above all entrepreneurs solve problems both at micro and at global level.

Over the past 30 years, universities have been encouraged to foster entrepreneurial activities through different mechanisms, from professionalized technology transfer offices to dedicated policies supporting academic spin-offs (Grimaldi et al., 2011). Some empirical analysis made on specific group of student demonstrate the possibility to foster economic development by stimulating student entrepreneurship through specialized course curricula including at least one course in the areas of Economics and Management (Colombo et al. 2015).

The thesis is structured as follows. The first chapter is an overview of the study on entrepreneurship (Landström, Harirchi and Åström, 2011), which also considers the role of the manager in the entrepreneurial process related to the “liability of newness” (Penrose, 2002), the ecosystem in which new business could be generated (Ranga and Etzkowitz, 2013) and the interventions of the institutions in order to support the business creation (European Commission, 2013). The second chapter focuses on the student entrepreneurship analysing the role of universities and the network offered (Petretto, 2008), the stimuli and competences of the young entrepreneurs (Fini et al. 2016) and finally offering an overview of the analysis performed in previous studies, in order to determine factors that affect student entrepreneurship (Colombo et al. 2015) and their ability to manage a new business (Åstebro et al. 2012). The third chapter analyses the case of the University of Padova using data available from the university dataset and data merged by Infocamere with the Italian Business register selecting all the students labelled as managers and/or entrepreneurs graduated between 2000 and 2010. After a data revision, the topics covered include all the descriptive statistics such as students and companies characteristics, time of creation, sectors and university courses breakdown, company dimension and status, geographic distribution and consistency between university courses and company sectors. Finally, the fourth chapter offers an original econometric approach applied to two samples of individuals and companies. The models applied consider 64,299 students graduated at the University of Padova between 2002 and 2010 and 1,728 linked companies. Specifically, we elaborated two Probit regressions models in order to estimate the probability of being an entrepreneur or a manager and to create a successful company according to some characteristics of the student and the business.

CHAPTER 1: BACKGROUND

1.1 Core knowledge of entrepreneurship research

The concept of entrepreneurship started to gain importance from the middle ages when markets moved their firth step to the modern evolution. From that point, authors and researches began to put more effort and attention to the phenomenon and to implement theories and guidelines useful to understand all aspects of the business creation. Landström, Harirchi and Åström (2011) made an extensive research work analysing and ranking all the sources and the authors that contributed to the study of entrepreneurship. Cantillon could be considered the first coiner of a more precise definition of entrepreneurship. In 1755 in fact, the author with his research "Essai sur la Nature du Commerce en Général" translated later in "Essay on the Nature of Commerce in General" (Cantillon, 1931) analysed the relation between the landowners, entrepreneurs and hirelings offering an in-deep analysis of the market based on the individual property. At the end of the mercantilism phase, the founder of the classical approach Adam Smith in his work "An Inquiry into the Nature and Causes of the Wealth of Nations" (1776) defines the entrepreneur as a passive entity and the concept of business creation was outclassed by the concept of capitalism. At the beginning of the twentieth century, the interest in the discipline resumed its diffusion. Schumpeter in fact, presented in 1934 a new idea of economic growth based essentially on innovation and newness defining the entrepreneur as the induvial able to create new products, production methods and management process able to change the market equilibrium. Few years later, in the 1940s the entrepreneurship started to be treated and analysed as an empirical phenomenon involving mathematical models based essentially on the Schumpeterian approach. However, the discipline never attracted a large number of supporters and authors until the beginning of the period of the spread of the concept so-called "creative destruction" characterised by a strong technological development. Politicians such as Ronald Reagan and Margaret Thatcher increased the debate concerning the role assumed by large companies and especially the entrepreneurial process that led to the economic efficiency of the small businesses. In this way, the 1980s became a turning point for the entrepreneurship research since the industrial dynamics became an extreme important topic in the modern society. Fields such as the psychological attitude of the individuals and direct consequences of the business creation started to attract the attention of researchers. The report of Birch (1979) about the importance of job creation by the small firms in US had an important impact on the community and increased the attention of the institutions about the incorporation of small or

early stage entities into the analysis of economic growth. The 1990s were characterised by a strong increase in education programs focused on entrepreneurship and by a growing attention of media about the topic. An impressive amount of scientific journals and models started to circulate within academic environments and society generating a general ambition to understand the phenomenon in all its aspects. The research however was characterised by a strong fragmentation and heterogeneity becoming a "mosaic of issues to be explored" as defined by Zahra in (2005). Only at the beginning of the new millennium, the entrepreneurship research reached the maturation in term of methodological process and guidelines. The delimitation of the research field assumed a central role and divided the researchers in three different schools of thought (Shane and Venkataraman, 2000):

- **Domain approach**: defines a set of empirical evidence about entrepreneurship not imputable to other field of research;
- **Integrative approach**: a more open point of view characterised by the attribution of a wider application of theories to entrepreneurship;
- **Multiple research approach**: considers the entrepreneurship as a not comprehensive theory and sustains the need to create more communities and teams specialised on a single entrepreneurial aspects such as venture capital, growth and start-ups;

The social sciences also returned under the attention of researchers. Several models in fact, consider the characteristic of the individual as an important factor in determining the future behaviour and decision-making process of an entrepreneur. Landström, Harirchi and Åström (2011) identified two groups of scholars, one more focused on studies related to management ("entrepreneurship researchers") and the other that includes different disciplines ("disciplinary researchers"). The authors also defined the top 20 knowledge producers in entrepreneurship research (Table 1) according to the 135 works present in the database analysed that consider the J-Index[1]. The ranking is dominated by USA scholars and is hard to identify a university or cultural centre for entrepreneurship in terms of research. According to the results obtained analysing the J-index and comparing them with the total number of citation taking into account the field[2], Schumpeter, Knight, McClelland, Barney, Porter, Storey and Saxenian are classified as "entrepreneurship researchers" while the rest as "disciplinary researchers".

[1] Definition taken from the work of Landström, Harirchi and Åström (2011): "J-index = (A*100)/E where A = actual citations E = maximum citations E is calculated by adding the number of all handbook chapters published at least one year after the publication date of the specific work. For example, to calculate the J-index for Shane and Venkataraman (2000), the actual citation is 17, and as this work could have been cited in all chapters of all handbooks published after 2001, the J-index for the article becomes (17*100)/19+11+27+27 = 22.97."

[2] This relation consider the Social Sciences Citation Index (SSCI) of Web of Science

Table 1 Top-20 scholars

Rank	Total J-index	Author	Year(s)	Country	Affiliation(s)
1	47.02	Joseph Schumpeter	1934, 1942	Austria/ USA	Harvard University
2	29.59	Howard Aldrich	1979, 1986, 1990, 1993, 1994, 1999	USA	Cornell University, USA University of North Carolina
3	29.52	William Gartner	1985, 1988, 1990, 1992, 1995	USA	University of Virginia Georgetown University University of Southern California San Francisco State University
4	29.30	Israel Kirzner	1973, 1979, 1997	USA	New York University
5	27.71	Scott Shane	2000, 2000	USA	MIT University of Maryland,
6	21.91	Sankaran Venkataraman	1997, 2000	USA	Rensselaer Polytechnic Institute University of Virginia
7	17.14	William Baumol	1968, 1990, 1993	USA	New York University
8	16.59	David Audretsch	1988, 1990, 1995, 1996	Germany/ USA	Wissenschaftszentrum Berlin fur Sozialforschung
9	15.68	Frank Knight	1921	USA	University of Chicago
10	14.62	David Birch	1979, 1987	USA	MIT
11	12.16	Amarnath Bhidé	2000	USA	Harvard Business School
12	11.90	David Blanchflower	1998, 2000, 2001	USA	Dartmouth College
13	11.89	David McClelland	1961	USA	Harvard University
14	11.63	David Storey	1994	UK	Warwick Business School
15	11.38	Mark Casson	1982	UK	University of Reading
16	11.10	Jay Barney	1991, 1997	USA	Texas A&M University Ohio State University
17	10.97	Michael Porter	1980, 1990	USA	Harvard Business School
18	10.94	Josh Lerner	1999, 1999	USA	Harvard Business School
19	10.90	David Evans	1989, 1989, 1990	USA	NERA: National Economic Research Associates, Inc.
20	10.85	AnnaLee Saxenian	1994	USA	University of California

Source: Landström et al. (2011)

Considering the specific works made by all the authors[3] and their J-index is possible to identify the top-ranked works in term of citations showed in Table 2. Landström, Harirchi and Åström (2011) divided the Top-20 core works in thematic groups based on the field and the content. Thirteen out of twenty top ranked works are theoretical foundation works about the functions (Schumpeter, 1934; Kirzner, 1973; Knight, 1921; Casson, 1982; Shane and Venkataraman, 2000) and the characteristics (McClelland, 1962) of entrepreneurs in the creation of new products and

[3] 135 works present in the database analysed by Landström, Harirchi and Åström (2011)

new markets and the development of entrepreneurship (Stinchcombe, 1965; Penrose, 2002; Nelson and Winter, 1982; Aldrich, 1999).

Table 2 Top-10 Core works

Rank	Year	Author(s)	Title	Type	J-index
1	1934	Schumpeter, J.	*Theory of Economic Development*, Cambridge, MA: Harvard University Press.	Book	33.51
2	2000	Shane, S. and Venkataraman, S.	'The Promise of Entrepreneurship as a Field of Research', *Academy of Management Review*	Article	22.97
3	2000	Shane, S.	'Prior Knowledge and the Discovery of Entrepreneurial Opportunities', *Organization Science*	Article	16.22
4	1921	Knight, F.	*Risk, Uncertainty and Profit*, Chicago, IL: University of Chicago Press.	Book	15.68
5	1942	Schumpeter, J.	*Capitalism, Socialism and Democracy*, New York: Harper and Brothers.	Book	13.51
6	1988	Gartner, W.	'Who is an entrepreneur? Is the wrong question', *American Journal of Small Business*	Article	12.85
7	2000	Bhidé A.	*The Origin and Evolution of New Businesses*, New York: Oxford University Press.	Book	12.16
8	1973	Kirzner, I.	*Competition and Entrepreneurship*, Chicago, IL: University of Chicago.	Book	11.89
9	1961	McClelland, D.	*The Achieving Society*, Princeton, NJ: Van Nostrand.	Book	11.89
10	1994	Storey, D.	*Understanding the Small Business Sector*, London: Routledge.	Book	11.63

Source: Landström et al. (2011)

The main schools of entrepreneurial and economics identified within the core works are:

- **Schumpeterian**: the school defines the entrepreneurs as prime movers in the financial and economic framework that drives the market far from an existing harmony. The concept of "creative destruction" is the core of capitalism and under an entrepreneurial point of view becomes an evolutionary process that puts big corporation in a positive advantage respect to small firms given the economies of scale. "The Theory of Economic Development" (Schumpeter, 1934) is the top ranked work present in the analysis.

- **Kirznerian**: the school defines the entrepreneurs as the individual able to identify profit opportunities and take advantage of the situations ("entrepreneurial alertness"). This idea needs the presence of asymmetry of information in the market in order to create possible advantage for the more proactive individuals. The most important exponent of this theory is Kirzner and its book "Competition and Entrepreneurship" (1973) is ranked 8th in the analysis.
- **Knightian**: the school defines the entrepreneurs as a risk-taker and considers the uncertainty a fundamental aspect for the value creation since if the return is predictable for all the individuals, there will be no profit opportunities. The author who gave the name to this school of thought is Knight and with his thesis "Risk, Uncertainty and Profit (1921) is classified 4th in the analysis.
- **Integrative approach**: the school follows an upstream approach in term of relation between different theories. One of the exponents is Casson that includes economic modelling and synthetises the relation between the neo-classic economics and the more direct market making process. Casson was influenced by the ideas of Schumpeter and Knight and focuses on the concept of the ability of synthesis of information of the entrepreneur. The elaboration of all the external inputs is the process needed for the market making process since in this way the entrepreneurs can catch and recognise new business opportunities. The author with his book "The entrepreneur: an economic theory" (Casson, 1982) is ranked 12th in the analysis.

In the 1960s the focus moved to the characteristics of the entrepreneur as an individual. A testimony of this fact is the high rank (9th) of the book "The achieving society" (McClelland, 1962). The author demonstrated how entrepreneurs have a positive effect on economic development and on the society transforming the need for achievement in economic growth. In addition, entrepreneurs are characterised by self-confidence, problem-solving skills and other personal qualities that occupied a crucial role in entrepreneurship research for the future two decades even if the individual characteristics (mainly given by disciplines such as psychology and sociology) are still criticized because considered as an end in themselves.

Other studies analysed the difference between the concept of entrepreneur and the entrepreneurship (Siropolis, 1982; Demattè, 1991) getting closer to the definition of the role. The term entrepreneur has been associated with a person able to exercise all the executive functions essential to manage an economic activity. The term entrepreneurship however, it has been also associated with different roles played by the individual entrepreneur that require planning, innovative and investment capacity. Siropolis (1982) defines as entrepreneurs who

launch new ventures and is able to organize, operate and assume risk connected to the business creation. The same author besides defines the entrepreneurship as the capacity to create and develop innovation, investment, expansion in new markets, products and new techniques. As observed by Demattè (1991), the term entrepreneur is commonly used to indicate a specific figure that guides the company being also the owner and instead the concept of entrepreneurship has a broader meaning since it indicates the exercise of a role that does not necessarily require the provision of capital. The entrepreneurship so is identified as the ability, aptitude and disposition to play an entrepreneurial role and is reconnected to the personality, the experience and intuition of one or more natural persons forming the entrepreneurial organ. As a result, the entrepreneur can be defined as the entity that performs at least one business function, whether it is taking the risk, the coordination production factors, decision-making, etc., while the concept of entrepreneurship refers to all the business functions and to the ability to judge. Both the dimension anyway represent the manifestation of the attitudes and the personal skills of the individuals as the ability of understanding complex issues that occur sometimes in difficult situations or the value generation through innovation.

The researchers Wennekers and Thurik in their analysis (1999) grouped several functions and definition of entrepreneurs used in other research (Hébert and Link, 1989) identifying 13 distinct roles some of which connected with the schools of economics identified by Landström, Harirchi and Åström (2011):

1. The individual that accepts the hazard and the risk related with instability and the uncertainty (Knightian school);
2. The provider of capital (Knightian school);
3. A trend-setter and an innovator (Schumpeterian school);
4. A leader;
5. An individual able to manage an industrial firm;
6. An administrator or a director;
7. A coordinator and organizer of economic assets;
8. The owner of an activity (Knightian school);
9. An employer;
10. A contractor;
11. An individual able to get advantage of the situation (Kirznerian school);
12. An allocator of assets;
13. The individual that creates a new business.

The list comprehends all the notion discussed by the major exponents of the entrepreneurship research and identifies the framework and the definitions used in this work to identify the figure of the entrepreneur.

1.2 Entrepreneurial process and the role of the management

As reported by Landström, Harirchi and Åström (2011), scholars in different disciplines elaborated different models about evolutionary theories that explain the economic change and creation of a business. In line with Schumpeter, the two researchers Nelson and Winter (1982) developed a model that explain the process of change of industries over time at a micro level. Further studies made by Aldrich (1999) applied these theories to a macro level introducing the concept of environment adaptation and the connection with the ability to change with future performance. The so-called "evolutionary approach" explained by the author, consists in processes concerning variation, selection, retention and struggle that a new firm must apply in order to allow the evolution. In addition, Aldrich empathises the importance of networks and relationships that help to provide the resources both abstract and concrete useful to compete in the market with other entities. In line with the idea of the "evolutionism", Stinchcombe (1965) analysed the social structure and the organisation of already established and new firm finding important difference in terms of needs. The author identified four condition that affect the probability of survival related to the construct of "liability of newness":

1. Individuals engaged in new business face issues and challenges without any experience;
2. The organisational structure is not present and individual do not have standardised and tested roles, processes and routines;
3. Lack of legitimation and sometimes trust within new employees;
4. Lack of solid external network.

Penrose (2002) with her resource-based view offers an internal approach that focus on the aspects that could influence the evolution of a new enterprise. According to this theory, a company improves its competitive advantage by developing and maintaining the control on all the resources available and developing its strategic capabilities. Penrose defined as resources also the administrative board and the ability of the components in term of managerial and entrepreneurial capabilities aimed to the growth of the firm. The exploitation of the potential of the firm therefore, depends on the ability to combine entrepreneurial resources with managerial assessment in order to produce a value added. According to this theory, the future growth is

the result of the accumulation of past growth also understood as an increase in experience. In addition, the issues related to the "liability of newness" could be overcome with an external help. Each great company in fact, started from an idea and a dream of an entrepreneur, then it grew up inspired by the vision, passion and behaviour of the entrepreneur until which the employer has decided to take a step back and appoint the management of the company a professional manager, better prepared, with lots of experience in management and many behind courses. In other words, the manager is a complementary figure that supports the entrepreneurial activity in most of the cases high specialised in a specific field. Managers however, even if have motivations in common with the owners, tend to implement rational and logical choices rather than follow their own feelings. In order to analyse this aspect of entrepreneurship and management motivations, the company Amway (2015) created a survey in collaboration with Gfk (Gesellschaft für Konsumforschung, a society for consumer research) and the Technical University, analysing a sample of 50,000 people surveyed in 44 countries worldwide between May and August of 2015. The results show that the motivations that drive the business creation by order of importance are the independence from an employer, the self-realization and finally the gain perspective. Other studies (Segal et al. 2005) showed how the self-employment intention could be predicted considering the tolerance for risk, the self-efficacy and the perceived net desirability (calculated as difference between the desirability of self-employment compared to the desirability of working with others). An interesting fact is that all the motivation could also be applied to a managerial goal since a managerial position could led to an increase in salary, satisfaction in seeing realized personal goals and in a certain sense also the need of more independence. Also almost all the definition and roles listed by Wennekers and Thurik (1999) can be applied also to managers. In particular, definition related to the ability to organize and manage individual and assets are shared with both the categories, instead definitions concern about the risk assumption and the provision of capital are specific for entrepreneurs.

1.3 Entrepreneurship ecosystem

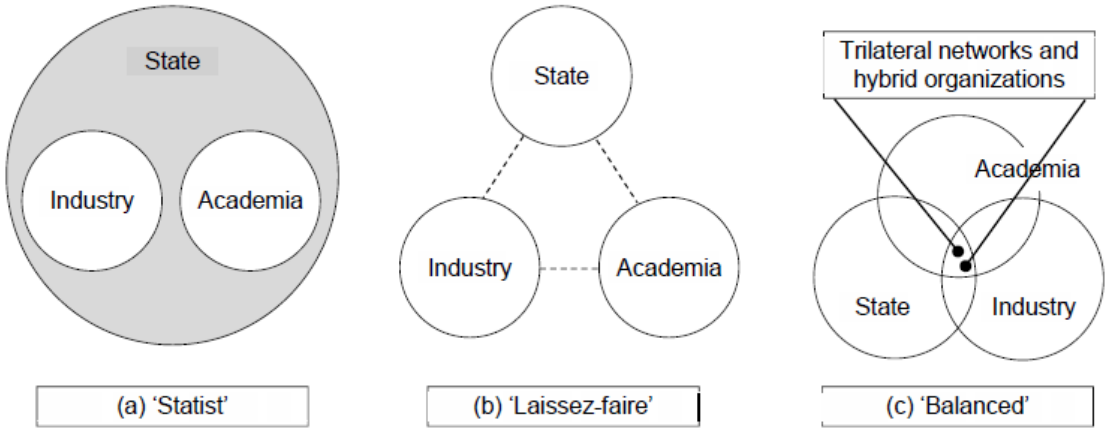
The growth of initiatives aimed to encourage and facilitate the emergence and development of new business, constitutes a common trend in many industrialized countries. These actions demonstrates the need of a great effort by the institutions, local administrations and universities in order to facilitate the creation of new enterprises and their subsequent survival (Gibson and Smilor, 1991). More in particular, the institutional players should create or improve new or existent instruments able to valorise new entrepreneurial processes and help the entrepreneur

during the initial phases of the business creation. In the USA for example, the Universities assumed a dynamic role in term of valorisation of the entrepreneurship. In particular, a great effort has been made to ensure the internalisation of the research result inside the companies, the strategic management of the intellectual property, the incentives for new initiatives creation (Spin Off) and the creation of incubators, accelerators and science parks. In Italy a similar path is developing slowly despite the common perception of a gap between University and early stage entrepreneurs world.

The so-called “Triple Helix” system (Ranga and Etzkowitz, 2013) represent the interaction between university, industry and government and argues that the innovation flows mainly from the interaction of these different actors. The authors defined the university ‘”Third Mission” as the contribution of the institution in regional development and government policies aimed to strengthen university–industry links and contribute to the development of territories and businesses, in addition to the competent mission to train students and to produce a competitive research. In Europe the institutional affirmation of the "Third Mission" can be traced back to the year 2001, thanks to the communication of the EU (European Commission, 2001) about the innovation in a knowledge-based economy. The EU document, addressed to the Council and the European Parliament, stipulated that in addition to the role traditionally played by them in education and research. Universities should start a third mission promoting the diffusion of knowledge and technology, especially in local business environment.

Figure 1 represents the “Triple Helix” system configuration proposed by Ranga and Etzkowitz, (2013). The statist configuration is characterised by a government leader that imposes rules to industries and universities and so limits the capacity of innovation and transformation. Some examples are economies like China, Russia, Latin America and some Eastern European Countries. The second configuration instead as the name suggest (Laissez-faire) is characterised by less state intervention and considers the industry as the primary force and the other two spheres as an auxiliary support. This system is typical of economies like the USA and some Western European Countries where universities provide essentially the human capital and the government act as a regulator. The third case (Balanced) offers the most favourable environment for innovation given the presence of interaction between the entities. In this case, the universities act together with industries and government forming joint initiatives.

Figure 1 The Triple Helix configurations



Source: Ranga and Etzkowitz (2013)

The Italian setting is a Laissez-faire oriented but still not mature as the USA especially in term of entrepreneurial stimulus and support. Italian graduates' challenges in getting to the work do not exclusively rely on upon components identified with the supply side (for example the nature and level of education and the deviation between graduates' abilities and those required by the market). Actually, a vast part of the Italian financial framework is still not prepared for the previously mentioned capitalisation due to the lack of innovative specialization, measurements and internationalization of its organizations. This circumstance is not reasonable for the Italian economy. The nation's business segment needs a redesign, and new organizations set up by graduates may give a valuable commitment to it. Some econometric studies highlighted also that education and university structure have a positive impact on business execution (Parker, 2009) and therefore having a bigger share of graduate business visionaries may trigger an idealistic circle and cultivate the capitalisation of exceedingly talented human capital. Recovering the model proposed by Ranga and Etzkowitz (2013) universities and cultural environments however are not the alone in the entrepreneurship ecosystem. New ventures and projects could also be encouraged in other vehicles or centre of innovation such as private investors and industrial districts. The university incubators tend to prefer innovation rather that profitability and supports early stage business ideas supplying knowledge, networks and related resources. Initiatives created within industrial districts instead, are more focused on a value creation path sometimes based from pre-existing business or models. Private investors such as Venture Capitalist are in a middle way since act for profit but required high levels of innovation and competitive advantage. Institutions allocate and manage resources in favour of entrepreneurship across all the actors present in the environment through targeted action plans.

1.4 Entrepreneurship 2020

Several obstacles discourage Europeans from choosing self-employment, in particular the fear of failure and the risk of receiving an irregular income. The survey Flash Eurobarometer "Entrepreneurship in the EU and beyond", report that in 2009 approximately 45% of Europeans wanted to start their own business. In the last three years, this number has been reduced by almost 20%, as a result of the current economic situation and the deterioration of the business prospects. The European Commission (2003B) defines entrepreneurship as "*the mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management, within a new or an existing organisation*". After a consultation addressed to EU SMEs, the General Directorate for Internal Market, Industry, Entrepreneurship and SMEs presented in 2013 an action plan to the commission (European Commission, 2013). The aim was to intervene and create an favourable environment for new businesses, including support entrepreneurs among young people, women, old people, immigrants and unemployed. The entrepreneurship education should act as a stimulus for the innovative business creation. Such training in higher education would be able to stimulate the creation of high growth and high-tech enterprises thanks to the support offered to business ecosystems, partnerships and industrial alliances approaching the ideal "Balanced" system seen before with Etzkowitz. The action plan "Entrepreneurship 2020" identifies six key lines (European Commission, 2013):

- **Access to finance**: the Commission proposes to strengthen the existing financial instruments with the aim to create a European microfinance market, simplify the tax system to enable SMEs to obtain financing through private direct investment and to introduce and improve new alternative forms of financing, such as crowdfunding;
- **Support at key stages of the life cycle of the enterprise**: the governments should devote more resources to help new businesses especially to overcome the first period of life. Some support measures could be for example the training of managers and entrepreneurs and creation of networks that links peers, suppliers and potential customers;
- **Development of new business opportunities in the digital age**: given the rapid growth of SMEs that adopt information and communication technologies, will be increased the support for start-ups operating in the sector;
- **Facilitate M&A operations and the transfer of businesses**: each year about 450,000 companies with 2 million employees are transferred within Europe, with an estimated

loss of about 150,000 businesses and 600,000 jobs. The Commission therefore proposes the expansion of markets for the companies and the reduction of obstacles to cross-border transfers;

- **Accord a second chance to honest entrepreneurs after bankruptcy**: about 96% of the bankruptcies are due to late payments or to other practical problems. The Commission therefore proposes to change the liquidation procedure applying a new approach that will help companies overcome financial difficulties in some specific cases;
- **Administrative simplification**: the Commission will continue its commitment to reduce regulatory burden.

The Commission also intends to promote entrepreneurship among specific population groups:

- **Women**: women account for only 34.4% of self-employed workers in Europe and for that reason should be encouraged and need more support in order to stimulate the culture of women's entrepreneurship;
- **Old people**: the retired entrepreneurs have valuable know-how that should be transferred to future generations in order to assist them in starting a business;
- **Migrants**: self-employment could be a valuable opportunity for migrant given the difficulties that often face in the labour market and also could help the social inclusion;
- **Unemployed**: the support programs for business creation intended unemployed should include training, counselling and mentoring services.

From 2013, the Commission has proceeded with the implementation of the action plan, working closely with Member States, business organizations and stakeholders. The implementation of the plan and its key actions will be implemented by the Commission through the mechanism of governance of industrial policy and competitiveness. The plan aroused various reactions from different associations. The Association of European Chambers of Commerce and Industry Eurochambres, as reported in its press release (Eurochambres, 2013), is agree with the adoption of the Action Plan and fully supports the pursuit of its primary objective of stimulate the entrepreneurial spirit of young Europeans. Eurochambres stresses the importance of specific measures in term of education and in particular, the recommendation to ensure that entrepreneurship is included in the curriculum of primary, secondary and tertiary education. However, the association regrets that the plan of action is not limited to the first chapter on entrepreneurship education, but goes beyond, addressing a wide range of issues relating to the general economic environment. According to Eurochambres, the Commission would risk to

compromise the implementation of measures to stimulate entrepreneurship and thus dilute the overall impact. The Confederation of European Business (BusinessEurope, 2013) considers the action plan as an important first step and asks to pay close attention to its implementation at European and national level. Also the European Association of Craft, Small and Medium-Sized Enterprises (Ueapme, 2013) supports the recommendation to continue the modernization of the labour market as well as the increased attention given to the transfer of businesses and entrepreneurship education. The association however pointed out the lack of references for important role played by intermediary organizations in advising SMEs and recommended the full involvement of these entities. All the opinions and recommendations from the SMEs association still confirm the ideal situation of a Balanced system.

CHAPTER 2: STUDENT ENTREPRENEURSHIP

2.1 The role of universities

At the international level for several years, the universities assumed a proactive role in the field of entrepreneurship promotion. The fruitful collaboration between universities and entrepreneurs enhances the benefits of the technology created within the academic institutions and allows the proliferation of new businesses that can evolve newborn companies and generate employment opportunities. For example, in USA, the Stanford University is considered the engine of the birth and development of the California high-tech economy more than any other institution. Teachers and students at Stanford University indeed have founded more than 2,400 companies including Cisco Systems, Hewlett Packard and Google as reported in the university press. Another example is the MIT (Massachusettes Institute of Technology) which creates more than 150 new companies each year since 1990. According to the data of 1997, the university realized approximately 4,000 companies spin off that occupy more than one million people and generate an annual turnover of about 232 billion dollars (Stefensen et al. 2000). Italian universities, that are engaged in the exploitation of research both in terms of quantity and quality, acquired recently specific offices for technology transfer by engaging directly in the training of potential entrepreneurs and working towards the creation of structures to support new businesses and creation of spin-off companies. This last category and incubated companies usually are mutually connected by relations of complementarity and subsidiarity and operate in various forms of affiliation and cooperation in order to strengthen the ability to compete. For example the Science Park of the San Raffaele Hospital in Milan hosts inside a research centre of the pharmaceutical company Schering-Plough and the University of Trento houses a new research centre of Microsoft since 2004. Moreover, in recent years, there has been a growing commitment in both teaching and researching about the formation of students through university courses, forums and conferences dealing with entrepreneurial stimulus. In particular, Universities increased the number of courses and credits in entrepreneurship and economics field[4] that allow the creation of a major pool of potential entrepreneurs as well as a high level of human capital. Universities therefore, are possible engines of economic development for the country and entrepreneurship diffusion sources in the reference areas focusing on the quality of teaching and dialoguing with institutions (Petretto, 2008). These institutions give a strong

[4] Data from University of Padova database (DTB_St, 2000-2010)

contribution to the development of new companies contributing and supporting the introduction of innovations and new technologies of products increasing also the differentiation.

The relationship between universities and businesses is a classic theme of analysis in economic theory. Public institutions, such as universities and research centres are positive externalities for the business system and stimulate the innovation and the creation and competitiveness. Inefficient institutions, however, could be expensive, obstacle for the business creation, delay development and limit competitive abilities. With the term “social capital” formulated for the first time by Jacobs J. in 1961, we define the sum of current and potential resources resulting from a network of relationships owned by several entrepreneurs (Naphiet and Ghoshal, 1998). The two authors divided all the characteristics in three different categories:

- **Structural dimension**: all the interactions and social relationships that provide access to information more easily by reducing the amount of time and investment required;
- **Cognitive dimension**: represented by the set of resources that allow to share languages, codes, rules and regulations influencing the conditions of economic relations between the various parties;
- **Relational dimension**: all the personal relationships allow the trust increase and that can develop knowledge, information and facilitate access to other forms of available resources within the network.

2.2 The university network

The analysis, definition and measures browsed in the first chapter highlighted the importance of new business in term of social and economic development of a country or the system as a whole. Entrepreneurship and new ideas indeed stimulate the growth, the creation of employment opportunities and starts a virtuous cycle of technological and organizational knowledge accumulation. Several authors defined the development of creative ideas and projects as "creative economy" and "experience economy" (Bonaccorsi and Granelli, 2005) assuming an increasingly important economic value. These terms refer to a specific branch of the economy that includes some areas (usually high-tech) able to generate new wealth and intellectual properties (patents, copyrights, trademarks and registered designs) that support the development of some traditional economic sectors. This is even more valid for a country like Italy, which has an industrial structure characterized by traditional products highly exposed to competition of other e more industrialised economies. The previous part also highlighted some

of the issues that a start-up could face at the beginning of its life and the need of management and entrepreneurs able to minimise all the financial and economic risk that manifest in this phase.

Nascent entrepreneurs could use their network, their interactions and their social relationships to influence and shape their cognitive capital (structural dimension), to develop trust and confidence to get support from various actors (relational dimension) and to share values and goals during the entire entrepreneurial process (cognitive dimension). According to this perspective (Naphiet and Ghoshal, 1998), the social capital is configured as a network ties (set of relations and relationships) that allows access to resources and is a critical element for the development of new entrepreneurship and for the economic growth of a given local context. Every business initiative is influenced by social relations and by the environment in which it operates. The institutions (including universities) create the contextual conditions and the relative endowment of social capital within which the business processes are manifested. In other words, universities can affect the entrepreneurial behaviour in terms of the legitimacy of the activities, exploitable opportunities, networks and resources. However, what are the links between social capital and propensity to become an entrepreneur? Abel et al. (2001) tried to answer this question proposing several network able to stimulate the creation of new entrepreneurs:

- **Legitimation Networks**: relationships between individuals that give legitimacy to the action becoming an entrepreneur.
- **Opportunities Networks:** relationships between individuals that offer entry opportunities in a sector through the creation of new businesses.
- **Resources Networks:** relationships between individuals in a position to provide better access to material resources and appropriate human capital.

Universities are able to activate strong networks that can allow a potential entrepreneur get the access to a system of relationships and contacts. An example are the awards for the best business ideas promoted regularly by the institutions both in Italian and American universities, or the presence of conventions related to entrepreneur and with all the other opportunities that allow the sharing of ideas, experiences and projects. Universities also may offer the opportunity to get in touch with people who may be complementary for an entrepreneurial action reducing costs and saving time during the entire start-up process. An example is the possible complementarity between an engineer and a corporate consultant in the choice of the possible markets for technological application result of scientific research or the opportunity to make

contact with subjects, such as venture capitalists and business angels to help finance a business idea. Universities also provide access to information and material/immaterial resources such as business incubators, academic spin-off processes, science parks, technology districts and access to services established by the office for technology transfer institutions. These three forms of networks, therefore, could be used in order to obtain resources, capital, technology, skills and expertise otherwise hardly available. The accessibility to these networks can therefore be positively related with the creation of new businesses and their ability to achieve good performance in the first few years of life. In addition, they legitimize, encourage and stimulate new entrepreneurship processes and allow access to opportunities, resources and crucial information useful to be successful in a new company.

2.3 Legitimation networks

As also observed by Vallini and Simoni (2006), some specific initiatives and activities promoted within the university system can enable a network of relationships that can stimulate the entrepreneurial vocation (wish of entrepreneurship). Together with the possession of specific business skills, these activities could turn an "Unmotivated Entrepreneur" in a "Entrepreneur with success potential". The activation of these networks can derive from different sources as the presence within the universities of centres for entrepreneurship and the presence of extracurricular activities such as associations and clubs of students and alumni (with particular reference to those engaged in the development and implementation of managerial and entrepreneurial activities) as well as sports and events. In major American universities, the Entrepreneurial Centers promote training activities about management, organization, research and entrepreneurship. These constitute the hub for the entrepreneurial activities and represent the epicentre of all the activities promoted by the universities in the field of entrepreneurship. The common objectives to all Entrepreneurial Center are the offer of educational and training programs with regard to the entire lifecycle of business and the creation of a community linkages among academics, students and the business world. All the ongoing activities ensuring the inclusion of the potential entrepreneur into a global network and a system of alliances, made up of relationships, contacts and exchange of ideas. Finally, the close collaboration with groups such as Entrepreneurial Clubs and the promotion of events (such as meetings with venture capitalists and business angels, brainstorming for the formation of new business ideas, training activities and practices for the realization of business plan) promotes the proliferation of business ventures. Students themselves can indeed be inserted into a real community that keeps

them in touch and relates them to the teachers and to the business world by ensuring that necessary link between people, ideas and resources necessary for starting any business process.

Regarding extracurricular activities, the strengths of such associations and groups are the interdisciplinary nature of the environment, the cultural richness resulting from a vibrant intellectual community, the sharing of ethics, rules, ideologies, coexistence and social relations. Many USA colleges also have their internal organizations and associations focused on the entrepreneurship field (or Entrepreneurial Clubs). These associations arise as organizations interested in the promotion of interdisciplinary cultural activities on specific aspects of entrepreneurship able to encourage the exchange of ideas and intellectual maturation thus complementing university education. Among the all activities proposed there are for example cycles of conferences and meetings with teachers, professionals and cultural figures as well as a number of other events that allow students to interact with the business world. In synthesis, the Entrepreneurial Clubs create an entrepreneurship culture, motivate, empower and encourage the entrepreneurial activities, facilitate the design and implementation ideas, guarantee the acquisition of skills and expertise and could be a source of contact with investors.

2.4 Opportunity networks

As in the case of the legitimation networks, also the opportunity networks may influence the different stages of a process of new business creation and in particular the pre-startup activities, the operational set-up and concept and implementation of the initial evaluation after launch. The Education and Training Programs are activated and promoted by major USA universities with the main objective to stimulate, facilitate and encourage the formation of business skills. As defined by Hynes (1996) the entrepreneurial education is the process or series of activities that enable an entity to assimilate and develop knowledge, skills and competences and can help define, evaluate and solve specific business problems. The author also defines the entrepreneurial training activities as all the activities planned and organized with the aim to modify and / or develop knowledge, skills and abilities (already acquired) through work experiences, special projects and job performance. The difference between the two sources of education are summarised in the Table 3 below where are reported the different content (content of activity) the different teaching methods (method used), specific objectives (objectives) and the expected results (outcomes of process).

Table 3 Comparison between Education and Training Programs

COMPARISON FACTOR	EDUCATION	TRAINING
Content of activity	Specific curricula Academic courses Academic programs	Knowledge, skills, compe- tences e attitudes relevant tc a specific entrepreneurial activity
Method used	Lessons, Lectures e guided reading Debate e forum	Demonstrations, Practices Work experiences
Objectives	Objectives are in general terms	Can be specified clearly
Time scale	Specified period	Short term
Nature of learning process	Structurated or mechanistic	Structurated or mechanistic
Focus on activity	On structured development of individual to specified outcomes	On knowledge skills, ability e job performance
Outcomes of process	External specified outcomes	Skilled performance of tasks which make up an en- trepreneurial activity
Process of evaluation	Evaluation in term of pass/fail levels	Evaluation against specific job performance steards

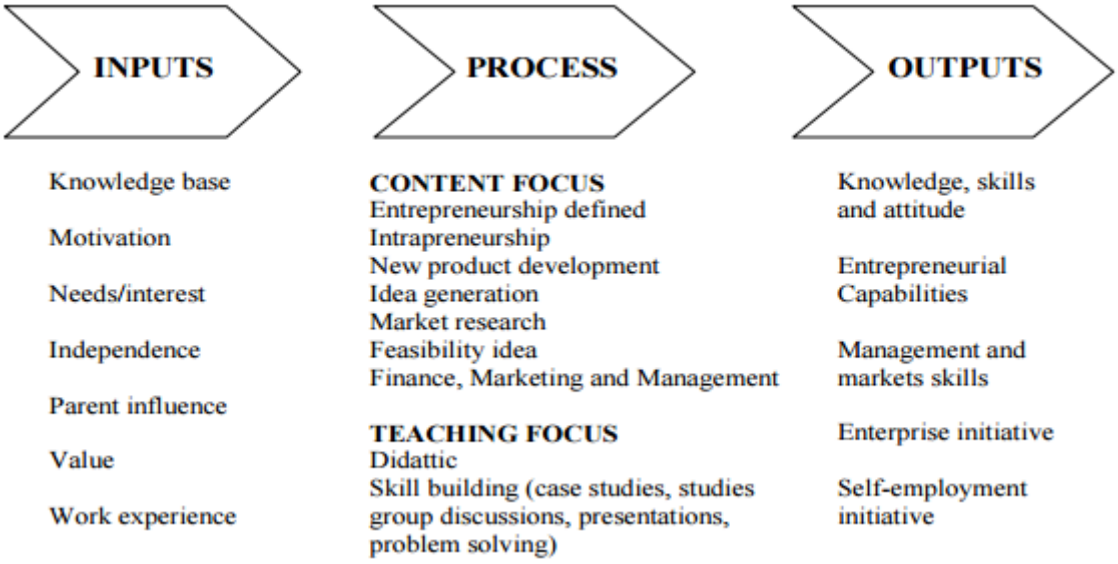
Source: Hynes (1996)

The provision of training is no longer limited to general courses in management but provides specific academic curricula and specific projects in addition to traditional university courses both for American and Italian Universities. An Italian example is the establishment in 2003 of a training program for potential entrepreneurs promoted by mutual agreement between the Department of Management and the Tuscany Region (Vallini and Simoni, 2006). Frank (2005) in a research conducted by the Centre for Education in the Built Environment (CEBE) identifies the four "pillars" on which should be structured training programs for prospective entrepreneurs:

1. **Learning to know** (conceptual, theoretical, how to learn)
2. **Learning to do** (practical, applied knowledge and skills)
3. **Learning to be** (how to be an entrepreneur with success potential)
4. **Learning to live together** (as a business culture)

America can be considered the pioneer country in this area by offering, as early as the 60s, a series of different and specific curricula and specific business training activities for students. The situation in Italy is actually evolving. In the process model proposed by Hynes (1996) concerning the entrepreneurship education, the inputs are represented by the content of the training programs (ranging from teaching basic skills to specific work experiences) and the outputs are characterized by the results in terms of skills, attitudes, motivations and competences acquired by potential entrepreneurs as summarised in the Figure below.

Figure 2 Entrepreneurship Inputs, Process and Outputs



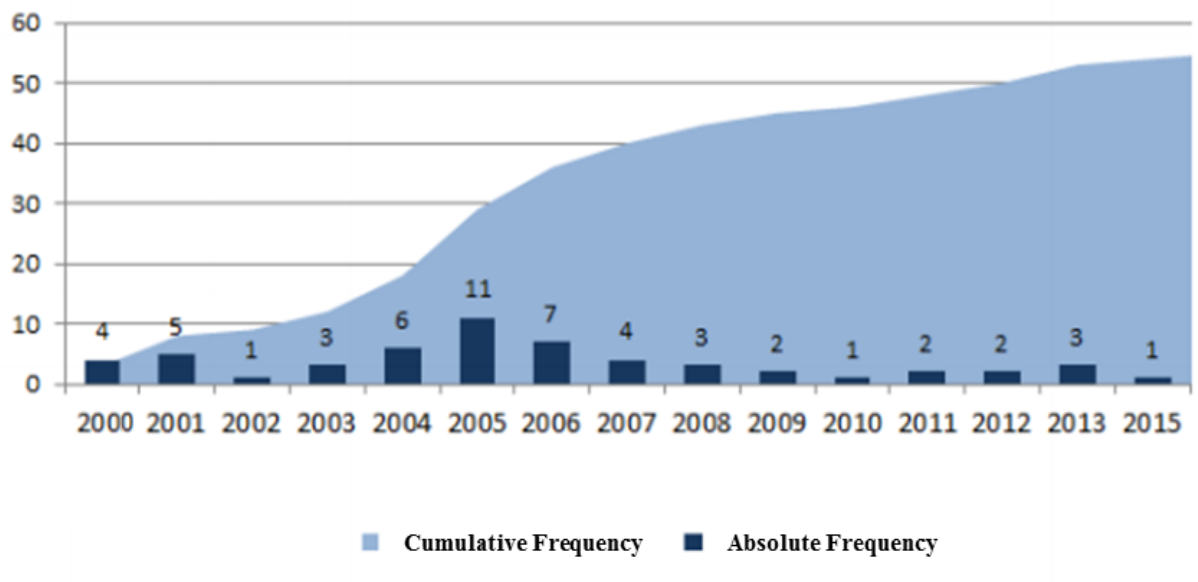
Source: Hynes (1996)

In conclusion, Petretto (2008) outlined in four points the opportunities in terms of exploitable reports by potential entrepreneurs arising from participation in education and training programs:

1. Acquisition of skills and capabilities;
2. Influence on the perception of the entrepreneur desirability;
3. Influence on the feasibility (perceived feasibility perception);
4. Influence on the desire to launch a new business initiative.

Another source of opportunity networks is related to the possibility offered by specific academic structures to realize and consequently commercialize the results of research conducted by students, professors and researchers within universities. The technology transfer offices (*Uffici di Trasferimento Tecnologico* or UTT**)** are active structures present in universities and research institutes that aim to raise results from an economic standpoint of scientific and technological research achieved in its membership organizations. Graph 1 shows how most of the Italian universities are actually equipped with an UTT (Ramaciotti and Daniele, 2016). The high concentration around 2005, is probably due to the entry of Decree 593/00 and Legislative Decree no. 30/2005 as well as by the Ministerial Decree of 5 August 2004 n. Article 262. 12 respectively, which confirmed the possibility of acquiring government funding for spin-off activation, the rules in the field of protection of intellectual property and the possibility of obtaining co-financing for state universities who wanted to create or support among its UTT.

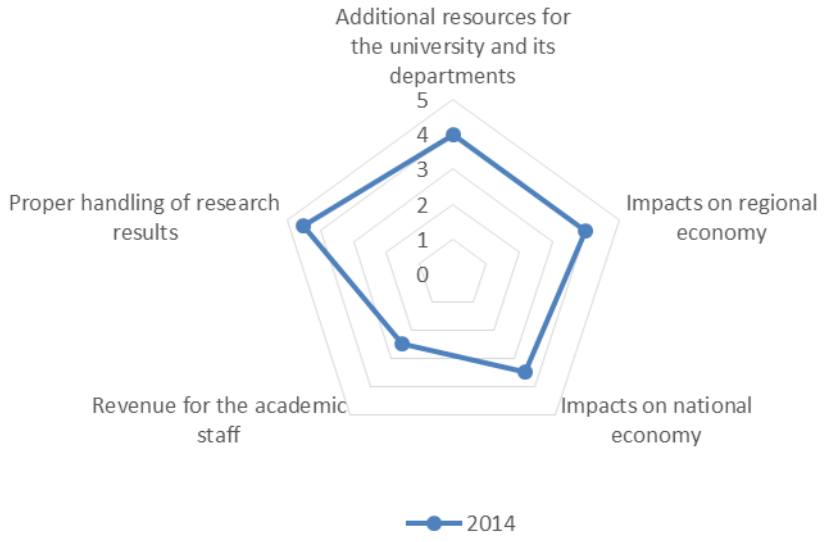
Graph 1 Number of UTT in Italy across years



Source: Ramaciotti and Daniele (2016)

The main objectives of an UTT (Graph 2) are (sorted by relevance) the proper handling of research results, the creation of additional resources for the university and its departments, the ability to generate impacts on the regional and national economy and finally the possibility to originate revenue for the academic staff.

Graph 2 UTT purposes



Source: Ramazzotti and Daniele (2016)

With regard to the various functions performed by the UTT in 2014 emerges very clearly the substantial increase of the support to the creation of spin-off companies followed closely by VAT management, the administration existing licensing activities, the diffusion or request of information and the management of seed capital funds, science parks and incubators. From the

new entrepreneurs' point of view, the technology transfer offices facilitate and encourage entrepreneurial activities through the management of technical services and professional development (facilitating the pre start-up activities and operational set-up). In addition, they promote and support the patenting and licensing activities initiated within universities increasing, the ability to commercially exploit such rights (facilitating and influencing the pre start-up and set-up). Finally, UTT promote and facilitate the launch of new business creation processes through the support activities for the creation of spin-off firms and through the management of science parks (facilitating the final two stages of the process).

2.5 Resource networks

The activation of the resource networks allows the entrepreneur to have access to information and resources, tangible and intangible, usable and exploitable during the entire process of new business creation such as spin offs, incubators and investors networks. These networks have a strong influence on factors such as the entrepreneur's motivation and the development the business idea. In fact, a potential entrepreneur will feel more empowered and motivated to start a new entrepreneurial initiative knowing they can exploit and take advantage of some of the above mentioned structures.

The term spin-off indicates companies born within initiative of other businesses or other types of organizations such as universities and research centres. The start-up in other words, used the resources (funding, technology, human resources, reports, etc.) provided by another entity. Academic spin-off, therefore, act as foster technology transfer processes helping to bridge the gap between the university research and interest of companies or when it is possible an industrial application of the results.

Business incubators do not refer to a single structure, but instead to different categories of operators sharing the purpose of facilitating and encouraging the start-up development. The National Business Incubators Associations (InBIA) defines these programs as entities that supply tailored resources to young firms with the aim to create jobs, enhance a community's entrepreneurial climate, retain businesses in a community, build or accelerate growth in a local industry and diversify local economies[5]. The amount of incubators increased dramatically during the last decades as reported by the National Business Incubators Associations.

[5] www.inbia.org/resources/business-incubation-faq

Considering the USA situation, in 1980 the programs were only 12 in whole country while in 2016 they exceeded the thousand. Around the world InBIA estimates that there are approximately 7,000 programs[6]. The Italian incubator system is divided into three sub-categories (Ciappei et al. 2006):

1) **Science and technology parks** (Science Park)

2) **Business Innovation Centre** (BIC)

3) **University incubators**

The themes that characterize the role of the Science and Technology Parks are the transfer of knowledge and technology, the management of knowledge and information and the creation and subsequent launch of spinoff business. In addition, the science park pursue the wider strategic objective of achieving growth in the economic and productive system of a specific local context. This is accomplished through initiatives and interventions organised in order to enhance research and services targeted to the development and diffusion of technological innovation, even operating within alliances and national and international partnership.

Incubators linked to the BIC system aim to promote the economic development of a region by supporting the creation of innovative new businesses and/or supporting existing enterprises. The UE established BIC in 1984 with the aim to combine the local operational dimension with a supranational coordination. The Business Innovation Centre are important vehicles for new entrepreneurship due to their ability to understand local needs and create solution also applicable to higher spheres.

The university incubators are structures situated within universities promoted by local authorities and financial structures and supported by different actors both public and private. As for the other categories, their priority is the provision of services and infrastructure created to facilitate and stimulate new business initiatives. The university incubators offer financial, business, legal and commercial support to start-ups helping them to survive and grow during the first period. The provision of such services to new entrepreneurs reduce the high costs related to the phase of the set-up and minimise the initial investments for the acquisition of resources which are provided by these structures at a lower cost compared to that found on the market. Incubators also allow entrepreneurs to deal with financial difficulties that characterize the start and the subsequent development of a new company by obtaining funds from Venture Capital or Business Angels or through soft loans and non-repayable funds. In conclusion,

[6] www.inbia.org 2016 estimates

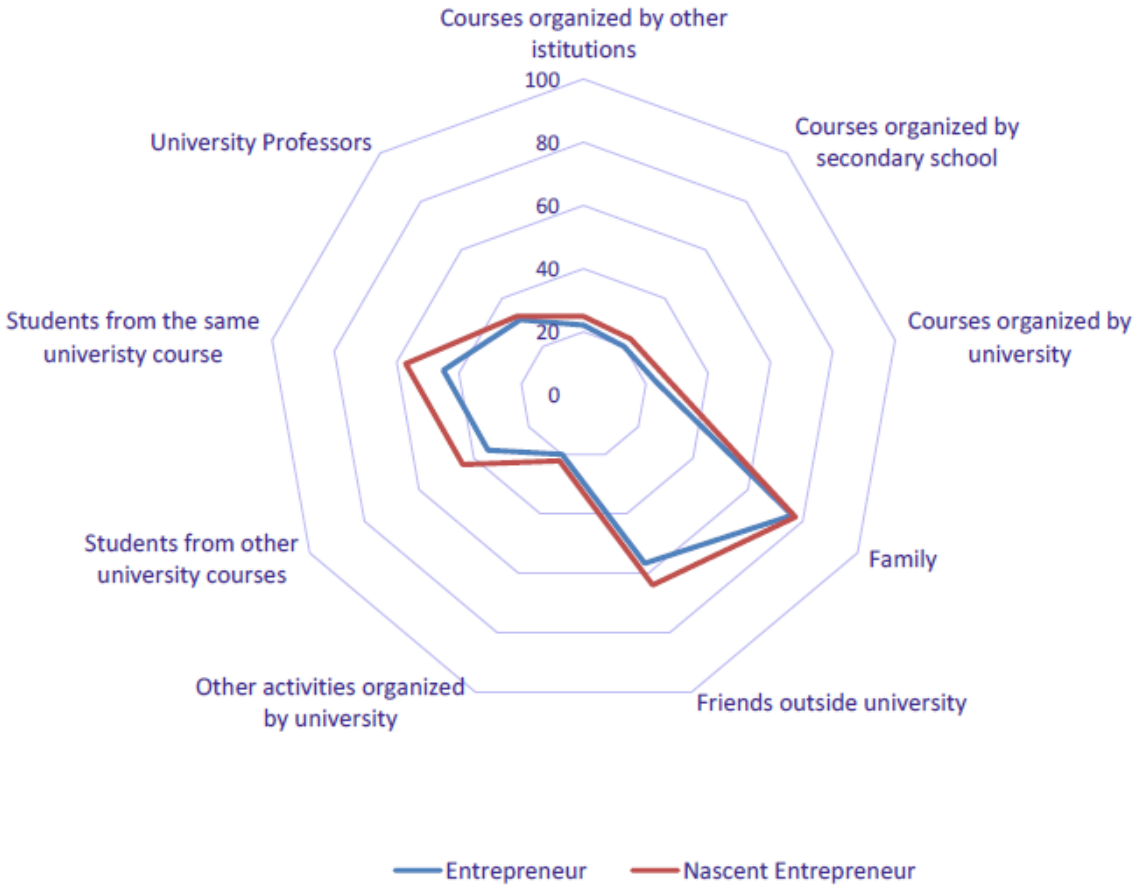
incubators activities are a further element reflecting the increasing commitment of the university to a more direct involvement in support the commercialization of research results and more generally of the scientific and technological knowledge.

2.6 Stimuli and competences

The birth of new firms and their performance are affected, at least in the short term, by the presence of individuals characterized by specific features not only necessary to recognize the opportunities but also to enhance them. Not all the individuals came out from an educational process with all the skills and characteristics needed to create a business or more in general to face successfully the challenges that will face on a workplace. The student entrepreneurship could play a fundamental role in term of adding value to an educational experience and prepare future managers, entrepreneurs or skilled workers through the creation of an experiential background not always present in an academic path. By definition entrepreneurship is risky and requires confidence, conviction, creative thinking, collaboration and the collision of ideas, all characterises that can be applied in any professional environment. The creativity so is an asset and together with interpersonal and organisational skills must be grown and stimulated especially in the years when individuals are particularly receptive. Creativity and business creation also takes courage and must be supported both directly eliminating obstacles and indirectly supplying all the knowledge necessary in order to be self-confident at the moment when it is necessary to take a crucial decision and act. The student entrepreneurship also can be an alternative employment option especially in countries with high unemployment rate like Italy. This trend is strengthening more and more in recent years especially among young people like university graduates. At the same time a lot of literature and researches are developing about student entrepreneurship, in particular in Italy the data provided by Almalaurea allow to continue mapping this phenomenon. Fini and the other researchers (Fini et al. 2016) provide in-depth analysis comparing groups of entrepreneurs across different dimensions. The database analysed by the authors consider 61,115 student from 64 Italian universities and their companies or activities for the second half of 2014. The result obtained will be compared in the following chapters in order to have an optimal landmark to analyse the Padua environment respect to the national one. The data released by Almalaurea however are more complete in term of information about the preferences and behaviour of the students. The study depends on a particular survey, the " Student Entrepreneurship Survey" which was made as another module incorporated into the yearly overview of Italian universities graduates associated with

AlmaLaurea. The sample are divided in three categories of entrepreneurs (entrepreneurs, nascent entrepreneurs and non-entrepreneurs) depending on the actual situation of the individual if it already founded a company, if it is engaged in some entrepreneurial activity of if is unrelated to any type of entrepreneurial activity. In the survey, there are a lot of question regarding the perceptions, the obstacle and the support that entrepreneurs and nascent entrepreneurs feel about the Italian and university environment. Graph 3 and 4 respectively report the entrepreneurial stimuli and competences.

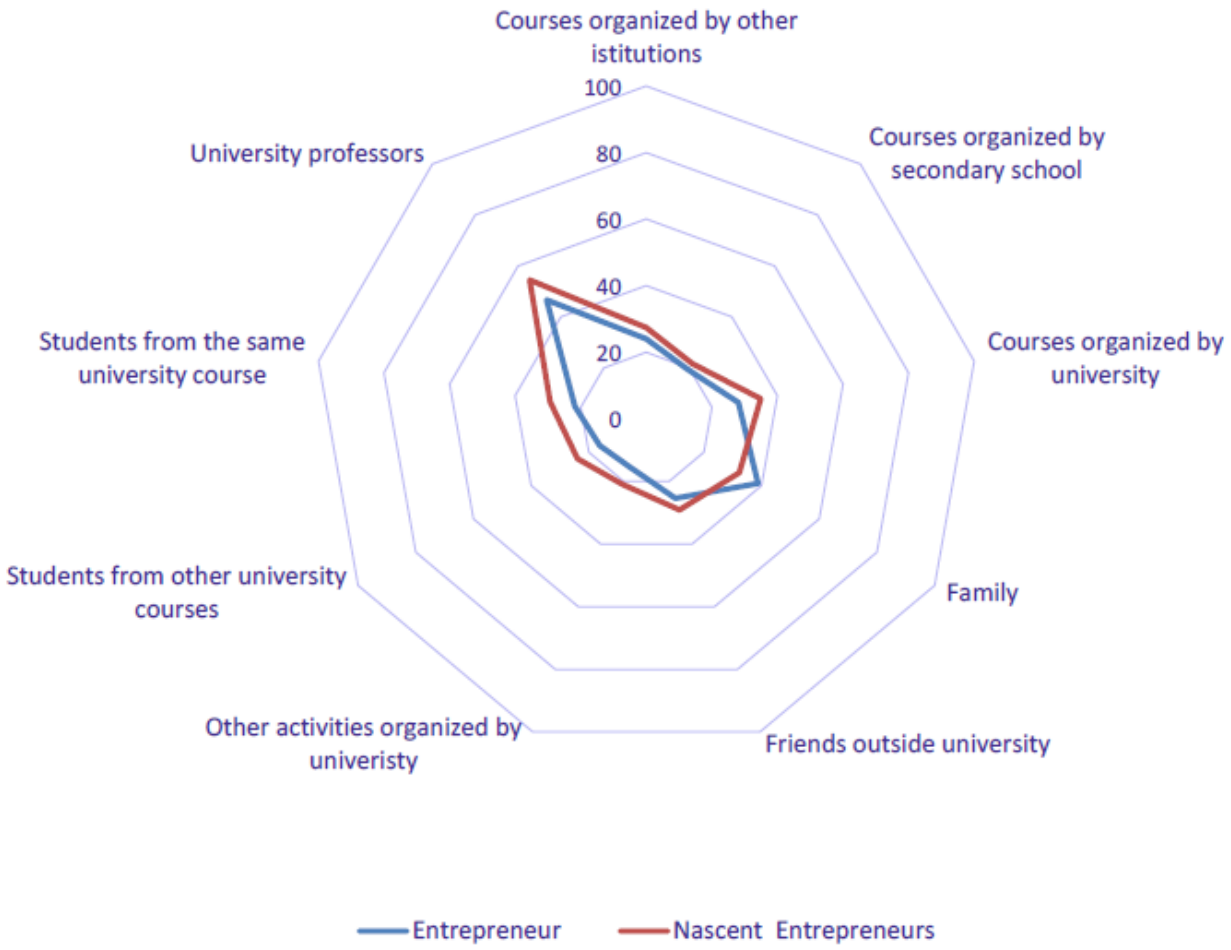
Graph 3 Entrepreneurial stimuli



Source: Fini et al. (2016)

Considering what affected more the decision of becoming an entrepreneur, the data shows that the main motivations or stimuli came from family, friends outside university and then university colleagues. There are not particularly differences between the two categories of entrepreneurs and nascent entrepreneurs for both the stimuli and competences. The external factors that affect the entrepreneurial activity are related especially with the networks and the individuals more close to the subjects such parents and friends while the university activity and courses still have a marginal role.

Graph 4 Entrepreneurial competences



Source: Fini et al. (2016)

The source of competence acquired by the student entrepreneurs are especially the university professors and the family, the last one have higher influence on actual entrepreneurs. The university courses and the peers seem to play a secondary role considering the skill acquisition. Looking at these results the motivation that leads to the creation of a new business came from outside university but the competence needed in order to manage the entrepreneurial activity depends both directly and indirectly on the university.

Table 4 shows the obstacles that could affect a business creation by degree of importance. Bureaucratic and administrative difficulties are considered the most significant obstacles in term of new venture creation followed by difficulties in finding financial support and partners and lack of market information. All of these obstacles in a certain sense however are just personal limits except for the tax and contributions. Individuals and in particular students could learn how to overcame problems if stimulated in the right way.

Table 4 Barriers to business creation

	Entrepreneurs (n=1,664)		Nascent Entrepreneurs (n=2,232)	
Variable	Mean	SD	Mean	SD
Bureaucratic and administrative difficulties	5.3	1.9	5.5	1.6
Difficulties in finding financial support	4.9	1.9	5.5	1.7
Difficulties in finding partners	3.8	2.2	4.2	2.0
High tax and contributions	5.6	1.7	5.6	1.6
Lack of adequate managerial skills	3.8	1.8	3.9	1.8
Lack of adequate technical skills	3.6	1.8	3.8	1.8
Lack of market information	4.2	1.9	4.3	1.8

Source: Fini et al. (2016)

Student entrepreneurship indeed could be considered as a different type of internship given all the challenges present on the development path. Companies are changing and becoming more innovative and for this reason need dynamic individuals able to adapt in each situation. When a person is at university, it is in a unique position that no one else is in because in most of the cases people do not have mortgages, full time jobs and family responsibilities. Starting a business during universities could change completely the future of a student both in case of success or failure. Even in the second case indeed the individual gained entrepreneurial mentality, creative and innovative way of acting, leadership and accountability for own actions all characteristics valued in the workplace.

2.7 Past studies

As previously seen there are several studies that monitor the Italian entrepreneurial activity (Cammelli & Ferrante, 2014 ; Fini et al. 2016) but student entrepreneurship is actually an under-investigated phenomenon. An optimal starting point for the analysis however, is the research and the model applied by Colombo et al. (2015) in order to understand the relation between the academic curriculum and the decision to became an entrepreneur for technology based university student of Politecnico di Milano. The result showed that specialisation and participation to management and economic courses have a positive effect on business creation in term of probability to become and entrepreneur. The dataset analysed by Colombo et al. includes 43,398 alumni enrolled in any course at Politecnico di Milano and graduated between 2000 and 2009 (one year less rather than the dataset available for Padua). In addition, the companies linked to the former students are selected including those created between the year

of enrolment and the 5th year after the graduation. About 3,427 companies were founded by 2,984 student in Italy with a total turnover of 1,951 mil € and 5,194 employers. The method applied for the matching between companies and student follows the same process applied in the analysis made on Padua. The Probit model applied by Colombo et al. considers a sample of 13,940 alumni at their last experience at university and 434 start-ups created by these individuals. Specifically, the author estimated the following three Probit regressions:

Table 5 Probit Models: Probability to become an entrepreneur

	Model 1		Model 2		Model 3	
Constant	-2.129 (0.617)	**	-2.407 (0.623)	***	-1.619 (0.840)	†
Course_Specialization	-		0.342 (0.164)	*	-2.901 (2.356)	
Course_Specialization×Degree_Score	-		-		0.031 (0.023)	
DEconomics	-		0.165 (0.046)	***	0.163 (0.046)	***
Degree_Score	0.004 (0.003)		0.004 (0.003)		-0.003 (0.006)	
DPrior_Shareholder	0.882 (0.072)	***	0.878 (0.073)	***	0.879 (0.073)	***
DWoman	-0.356 (0.054)	***	-0.371 (0.055)	***	-0.372 (0.055)	***
Enrolment_Age	-0.001 (0.018)		0.000 (0.018)		0.000 (0.018)	
DBachelor_Outside	-0.234 (0.100)	*	-0.243 (0.100)	**	-0.249 (0.100)	*
DFailing_Student	-0.008 (0.047)		0.001 (0.048)		0.003 (0.048)	
DBorn_Abroad	-0.535 (0.151)	***	-0.538 (0.152)	***	-0.527 (0.152)	**
Distance_from_Milan	0.034 (0.008)	***	0.032 (0.008)	***	0.031 (0.008)	***
DInd_Inf_Engineering	-0.147 (0.049)	**	-0.157 (0.050)	**	-0.155 (0.050)	**
No. observations	13,940		13,940		13,940	
McFadden's Adjusted R^2	0.057		0.061		0.061	
Percentage correctly classified	96.98%		96.98%		96.98%	

Legend: † p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

Source: Colombo et al. (2015)

The dependent variable for all the models is a dummy variable that assumes value 1 if the student founded a company between the year of enrolment and the 5th year after the graduation. The variable DEconomics assumes value 1 if the alumnus attended any courses associated to the areas of Management Engineering, Economics and Management. This indicator have a positive effect on the probability of being an entrepreneur in Model 2 and 3 of Table 5 (statistically significant at 1% in both cases). The authors emphasize the need to stimulate student entrepreneurship developing specialised courses and increasing the number of credits in economics and management also in other university areas.

Another important factor linked to the entrepreneurship is also the ability to manage the new-born firm or in other words the ability of the entrepreneurs. Åstebro et al. (2012) analysed the consistency between an academic course and the economic sector of activity in term of better performance. The dataset used is the U.S. Scientists and Engineers Statistical Data System

(SESTAT) for the years between 1995, 1997, 1999, 2003 and 2006. The companies analysed are the firms created by students during the academic years or until three years after the graduation. The authors applied an OLS with robust standard errors clustered at the individual level using as dependent variable the annualized earnings of individual i at date t. and estimated the following three regressions showed in the table below:

Table 6 OLS: Factors that affect earnings for recent graduates

	Log earnings at *t*		
	Column 1	Column 2	Column 3
Entrepreneur	−0.074*** (0.027)	−0.091*** (0.035)	−0.021 (0.037)
Age	0.015*** (0.001)	0.012*** (0.001)	0.013*** (0.001)
Male	0.192*** (0.007)	0.060*** (0.007)	0.059*** (0.007)
White	−0.009 (0.008)	0.002 (0.007)	0.003 (0.007)
Married	0.130*** (0.008)	0.094*** (0.007)	0.098*** (0.006)
Naturalized citizen	0.115*** (0.019)	−0.008 (0.016)	−0.011 (0.016)
Green card	0.100*** (0.020)	−0.030* (0.017)	−0.024 (0.015)
Temporary resident	0.215*** (0.016)	−0.004 (0.013)	−0.005 (0.013)
Year 1997	0.064*** (0.008)	0.067*** (0.007)	0.068*** (0.007)
Year 1999	0.146*** (0.008)	0.139*** (0.007)	0.141*** (0.007)
Year 2003	0.197*** (0.011)	0.150*** (0.009)	0.151*** (0.009)
Year 2006	0.174*** (0.009)	0.115 (0.008)	0.118*** (0.008)
Job closely related to degree		0.080*** (0.007)	0.106*** (0.009)
Job closely related to degree × entrepreneur		0.078* (0.045)	−0.069 (0.053)
NRC rating			0.028*** (0.003)
NRC rating × entrepreneur			−0.049* (0.025)
NRC rating × job closely related to degree			−0.017*** (0.004)
NRC rating × job closely related to degree × entrepreneur			0.101*** (0.031)
Constant	9.493*** (0.019)	10.617*** (0.091)	10.657*** (0.104)
Other controls	No	Yes	Yes
Number of observations	47,945	47,705	47,622
Adjusted *R*-squared	0.126	0.383	0.387

Source: Åstebro et al. (2012)

A better economic education (NCR rating of US universities) and the consistency between university courses and sector (Job closely related to degree) increase the earnings for entrepreneurs still active in their business one year later after the company foundation (Column 3, variable NCR rating x job closely related to degree x entrepreneur in Table 6). Entrepreneurs earn 10.6% (exp(0.101)-1) more respect to their peers for each extra point in NCR and if there is consistency between university and sectors of activity. The higher benefits could derive from an efficient organisation of the activity and so the individual skills. Åstebro et al. also observed that the overall survival rates are higher for start-ups related to degree of the founder.

CHAPTER 3: THE CASE OF THE UNIVERSITY OF PADOVA

3.1 Padua's environment

In Italy, the innovative activity was negatively affected by the modest capacity of public policies to create a dynamic environment for innovation (World Bank, 2016). The allocation of resources to the most innovative companies is impeded by an institutional context that obstacles the business creation process due to a regulation sometimes too restrictive. At the end of March 2016, 5,439 innovative start-ups entered in a special section of the Business Register, an increase of 296 units (+ 5.8%) compared to the end of December (Unioncamere Veneto, 2016). Start-ups represent 0.4 percent of the nearly half million Italian companies, in particular Veneto is fourth in the absolute number of innovative start-ups as reported in Table below.

Table 7 Innovative start-ups in Italy data at first half 2016

Region	Inn. Start-ups	Inn. Start-ups (%)	Rank (Italy)
Emilia Romagna	625	11.50%	2
Veneto	**404**	**7.40%**	**4**
Piemonte	365	6.70%	5
Italia	5439	100%	

Source: Italian Chamber of Commerce

The region Veneto is one of the engines that drive the Italian economy. According to the annual report concerning the economic situation of Veneto in 2015, the sector with the higher rate of workers is manufacturing followed by retail and accommodations/restorations structures (Unioncamere Veneto, 2016).

The University of Padova operates in a favourable environment for entrepreneurship considering the Italian situation as a whole. Considering broaden horizons, however, the situation is far behind respect to countries as USA, UK and France in terms of attractiveness and support for business creation. Padua is classified second according to Censis Italian ranking 2016-2017 for public universities as showed in Table 8[7].

[7] The ranking consider only universities with over 40,000 students enrolled for the year 2016-2017 and takes into account the level of services, facilities, internationalization and communication.

Table 8 Ranking for public universities 2016-2017

University	Score
Bologna	94.00
Padua	**88.80**
Florence	88.00
Pisa	85.80
Rome Sapienza	85.20
Palermo	84.60
Turin	83.00
Milan	80.20
Bari	79.80
Naples Fed.II	75.80
Catania	73.00

Source: Censis

The University of Padova has an average of approximately 10,800[8] students that complete the academic path each year from year 2000 in the one of courses offered. Also according to the annual report made by the NdV (Nucleo di Valutazione) of Padua (University of Padova, 2015), the high numbero of students that found a job after the first and the third year after graduation, places Padua in the higher part of the ranking among universities in the comparison group. The University is organised in 32 departments and offers a wide range of managerial and economic courses not only in the economics department but also in other field such as pharma, engineering and agronomy. According to the analysis made by Censis in 2016, the economic branch of the University of Padova is classified third preceded only by Ferrara and Venice with regard to public universities.

A good indicator of the entrepreneurial appeal is given by the total amount of spin offs activated. The University of Padova launched 58 spin offs in which it holds an average of 5% stake since 1981[9] and is classified second on the national ranking as reported in Table 9.

[8] DTB_St Average calculated using the total amount of student graduated each year at the University of Padova from 2000 to 2010.
[9] Data from Spin Offs Italia http://www.spinoffricerca.it/

Table 9 Ranking of entities considering the spin off activation from 1981 to 2016

Entity	Spin Offs
Politecnico di Torino	85
Università degli studi di Padova	**58**
CNR (Consiglio nazionale delle ricerche)	57
Università degli studi di Firenze	53
Università di Genova	48
Scuola Superiore Sant'Anna	48
Università degli studi di Pisa	44
Università Politecnica delle Marche	43
Università degli studi di Udine	39
Università di Perugia	39
Università degli studi di Bologna	39
Università degli studi di Roma Tor Vergata	39
Università del Salento	37
Politecnico di Milano	36
Università degli studi di Cagliari	33
Università degli studi di Torino	33
Università della Calabria	31
Università di Modena e Reggio Emilia	29
Università degli studi di Siena	26
Università degli studi di Ferrara	25
Politecnico di Bari	25
Università degli studi di Milano	25
Università degli studi di Pavia	24
Università degli studi di Trieste	22
Università degli studi di Bari	22
FBK (Fondazione Bruno Kessler)	21
Università degli studi di Parma	21
Università di Roma "La Sapienza"	20
Università degli studi del Piemonte Orientale A. Avogadro	19
Università degli studi di Milano Bicocca	19
Università di Camerino	18
Università degli studi di Palermo	17
Università di Verona	16
Other	262
Total	**1373**

Source: Spin Off Italia

According to the annual report made by the NdV of Padua (University of Padova, 2015), in 2014 the University provided approximately € 20.5M to various initiatives (€ 1.5m less respect 2013):

- Junior and Senior Research Grant Projects (€ 7M for two years);
- Institutional Research Projects (€ 5M);
- University Research Projects (€ 4.5 M);
- Young Scholars Projects (€ 2 M);
- University Strategic Projects (€ 1 M);
- Scientific equipment (€ 1 M).

In 2014 also the University registered an impressive record of 13 (in addition to 14 national patents or extensions) new patents compared to the Italian national average of 4.9 applications per university obtained in 2013.

Within the province of Padua, there are some entities as incubators and science parks described previously, that support the business creation process:

- **M31 Italy**: since 2007, the incubator creates new enterprises and support growth in international markets combining incubation services and venture capital.
- **StartCube**: the university incubator of Padua offers functional services and modular equipped offices, which are rented, to stakeholders at a reasonable price.
- **PST Galileo**: the mission of the science park is to support the competitiveness of enterprises through innovation. PST Galileo deals with transfer of technology, industrial design and new materials.
- **SCENT - School of Entrepreneurship**: the mission of the school is to set up a scholastic reference point for research on business enterprise, instruction projects and learning sharing on entrepreneurial aptitude. The School is active in research, learning and information sharing.
- **Fablab**: It is a workshop open to the public equipped with digital fabrication machines. It is a place where individuals and businesses have access to equipment, processes and people can transform ideas into prototypes and products.

Other entities are present in the region Veneto that are linked with the University of Padova and other universities. The most important are:

- **Fondazione la fornace dell'innovazione (Asolo – TV)**: it believes in change as a development opportunity and in design and creativity as competitive factors.
- **H-Farm (Roncade – TV)**: the incubator was founded in 2005 with the aim to help young entrepreneurs in launching innovative initiatives and support the transformation of the Italian companies in the digital perspective.

- **Incubatore di Venezia (Venice)**: it operates in the following asset classes: information, communication, arts and entertainment.
- **Vega In Cube and Vegapark (Venice)**: is a science park and an incubator that host start-ups, spin-offs and companies recently formed that deal with ICT, nanotech and green economy.
- **Star Parco Scientifico di Verona (Sommacampagna - VR)**: it was created to encourage the diffusion of innovation in the area, acting as a link between local businesses, the research community and funding sources.

In order to create a more efficient networks and to increase cooperation in investment in R&D and innovation transfer in support of small and medium-sized enterprises, in Veneto were introduced and enhanced the regional innovative networks (reti innovative regionali - RIR). These aggregations are designed to connect SME to the world of innovation and research, starting from common needs (Unioncamere Veneto, 2016). A RIR aggregates companies, public and private entities, universities and research centres and creates partnerships aimed to conceive products, processes, methods, tools or services completely new, redesigned or improved. The areas of activity includes aerospace, automotive, biomedical, nanotechnology, industrial automation, food, and energy and are consistent with the regional policy of smart specialization but also open to the multi-sectoral nature.

3.2 Data

The initial dataset included 119,347 students graduated at the University of Padova between 2000 and 2010. The information collected concern personal data, university courses, final grade, credits and other characteristic about the individual or the academic years collected with two surveys made at the time of enrolment and graduation. The source InfoCamere S.c.p.A. matched the student from Padua with the companies present on the Italian Business register where the alumni have been listed as shareholders or with a managerial role. The process creates interaction between students and companies and widens the search field. After an elaboration and other subsequent additions we obtained two databases. The first dataset (hereafter database "DTB_St") includes all the graduate students in Padua between 2000 and 2010 with related personal and academic data. The second (hereafter database "DTB_Co") is the result of the merge between the Italian Business register and the University of Padova databases. The main difference between the two sources is the subject of the analysis since in the DTB_St consider as individuals the alumni and DTB_Co the companies. All the variables present in the first

database are included in the second and the characteristic about the position of the student (manager, entrepreneurs or other roles) is reported in the first sample.

Database DTB_Co includes 20,338 companies founded by university students graduated between 2000 and 2010. The matching does not takes into account if the company is a branch or a headquarters and creates duplicates or observations with no data. The issue was solved using the "drop duplicates observation" function on STATA fixing the tax code of the student, the Italian Business register code of the company and giving priority to headquarters rather than branches. The function checked for each student and for each company the presence of duplicates and in case of more companies (headquarter and branches) considered only the headquarter. In this way from an initial sample of 20,338 companies, we obtained a sample of 14,671 detections. Tables below shows all the restriction applied to the database DTB_Co in order to reach the 6,450 observation used for the research.

Table 10 Data selection

DTB_Co	
Universe	20,338
Drop duplicates with STATA	(5,667)
	14,671
Role selection	(7,983)
Individuals - Natural Person	(30)
Consortia	(13)
Entrepreneur before 18 (yeras olds)	(195)
Sample (N. Companies)	6,450

Source: DTB_Co, Authors' elaboration

Table 11 Managers and Entrepreneurs breakdown

DTB_Co		
Companies with a Manager	4195	65%
Companies with an Entrepreneur	2255	35%
Sample (N. Companies)	6450	100%

Source: DTB_Co, Authors' elaboration

The parameters used for the data selection concern the corporate structure of the company created or the role of the former student inside the business. We defined instead as "Entrepreneurs" all the students labelled as owners with 18 or more years at the time of company establishment. All the analysis includes only entrepreneurs who have founded a company after the legal age in order to try to avoid firm inheritors or acquirers of already based businesses and to have higher probability to analyse the original founders. About 195 observation were dropped due to this restriction. The analysis does not consider the natural person and consortia as a company forms useful to investigate the entrepreneurial impulses of a student. We eliminate consortia due to their nature of "over entrepreneurial" intended as a combination of companies without the ownership. The table in Appendix C at the end of the work shows all the roles taken into account for the analysis. Each company must have at least one student from Padua covering one or more position listed. All the roles are characterized by the presence of responsibility and decision-making power.

The process used to identify the entrepreneurs is different for each category of companies and takes into account information not available for all the enterprises present in the sample. In case of corporations and partnerships, such characteristic is applied if the student is classified as partner or labeled as an owner. The qualification of entrepreneur is also assigned to the holders ("Titolare") in case of individual enterprises and for the rest of the company forms only if the student is reported as an owner. After the selection process, the remaining students were labelled as managers following the roles of table above if not classified as entrepreneurs.

No restrictions have been applied to the database DTB_St since includes all the students graduated in Padua. The database DTB_St contains only information about the student and the university but no information about the company related or the student role. Through the intersection of tax codes, the characteristic of entrepreneurs/manager was reported from DTB_Co to DTB_St in order to analyse it from a student point of view.

Table 12 Data selection

DTB_St	
Universe	119,347
No restrictions	
N. Students	119,347

Source: DTB_St, Authors' elaboration

Table 13 Managers and Entrepreneurs breakdown

DTB_St		
Managers	2049	2%
Entrepreneurs	4104	3%
Other	113194	95%
N. Students	119347	100%

Source: DTB_St, Authors' elaboration

Comparing Table 11 with Table 13 the number of companies with an Entrepreneur/Manager in DTB_Co (4,195 and 2,255) differs from the number of Managers/Entrepreneurs of DTB_St (4,104 and 2,049) since an individual could have created or have a role in more than one company. During the analysis will always be indicated if the data must be interpreted from the student point of view and so to DTB_St or from companies' point of view using DTB_Co.

The analysis and the model applied present some limitations mainly due to the nature of the data available that will be also explained during the process. The following table reports all the issue and the solution used in the work. In addition to the problem listed, there is also the absence of information concerning the character, psychological traits and information about the family that are not available in the database of the university.

Table 14 Limits of the analysis

Limitations/Problem	Solution/Limit applied
There is no possibility to identify the original founder of the company looking at the data.	The individuals labelled as entrepreneurs with 18 or more years at the time of company establishment were dropped from the sample.
There is no difference between entrepreneurs with managerial responsibility (active) and only suppliers of capital.	There are few cases in which a second role is indicated due to a lack in the data. All the entrepreneurs were treated as active entrepreneurs based on the definition of the role analysed also in the chapter before.

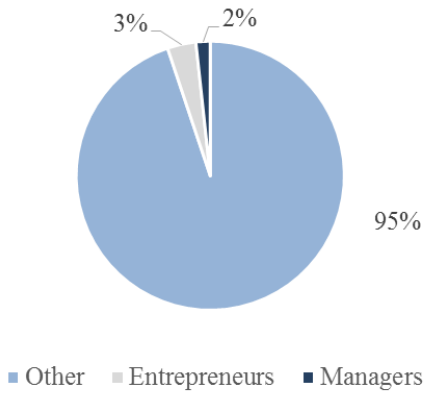
There are no information about the time at which a manager or an entrepreneur entered in the company	The analysis does not consider the time variable in such cases.
The data about the students are available from 2000 to 2010 while data about companies until 2015.	The analysis does not consider the time variable for what concern companies (further information about will be discussed in the next section)

Source: DTB_St,and DTB_Co Authors' elaboration

3.3 Student characteristics

The universe of 119,384 students of DTB_St includes 3% of entrepreneurs, 1% of managers and 95% of individuals with different occupations as shown in the following Graph. We defined as "manager" the student that has a role with a managerial responsibility as CEO, area manager or responsible[10] and as "Entrepreneurs" all the students labelled as owners with 18 or more years at the time of company establishment as mentioned before.

Graph 5 Tot students graduated at the University of Padua between 2000 and 2010

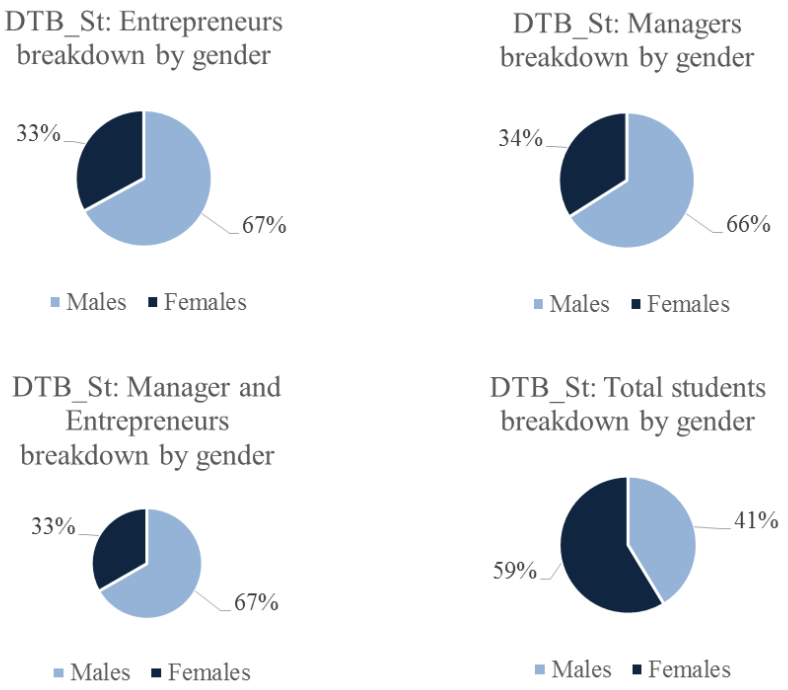


Source: DTB_St Authors' elaboration

The sample of 6,153 students identified as managers or entrepreneurs (approximately 5% of the total amount) includes 67% males and 33% females. Considering the universe of 119,384 students the males are 41% and females 59% as shown in the graphs below.

[10] The full list of role considered for the definition is available in the Appendix C.

Graph 6 Breakdown by gender and individual type



Source: DTB_St Authors' elaboration

The characteristic of entrepreneurs and manager seems to be more common for males despite the total amount of females exceeds half of the sample (59%). About this topic, the action plan "Entrepreneurship 2020" (European Commission, 2013) highlighted issues related to the creation of a new business for women rather than men, primarily with regard to access to finance, training, networks and the reconciliation between the company and the family. In 2009, the Commission launched the European Network of Female Entrepreneurship Ambassadors that provides support and role models addressed to potential entrepreneurs. In addition, in 2012 the Commission presented a proposal to improve the gender balance on the boards of listed companies. Even if an individual requires different skills and abilities than entrepreneurial to be part of the board, a greater number of women in senior management could serve as a role model for other women in general and stimulate the resourcefulness.

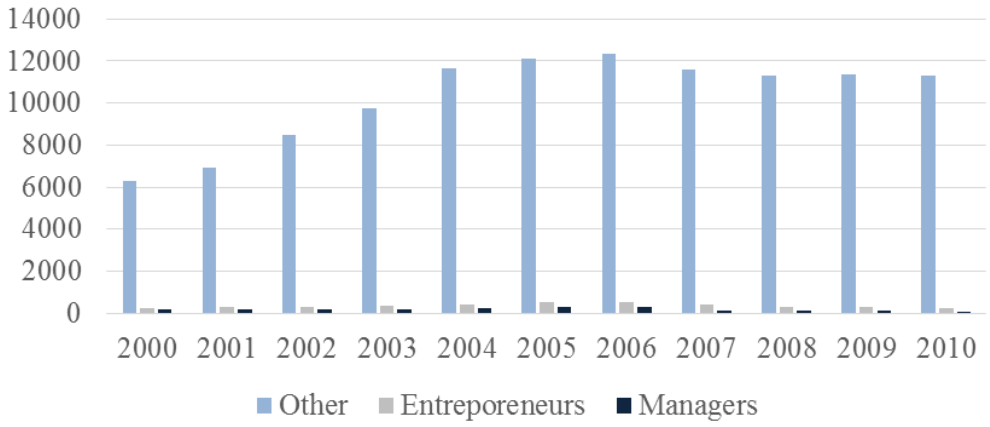
Matching the characteristic of entrepreneur/manager with the year of graduation is possible observe the trend of total amount of the individual across years. Graph 8 illustrate how the total amount of entrepreneurs and managers increased from 2000 to 2006 and then seems to be falling after year 2006.

Graph 7 Managers and Entrepreneurs breakdown by year of graduation

Source: DTB_St Authors' elaboration

The causes of this result could be a lack in the data or some other reason related to the business cycle or external factors since the year of the decrease includes also the period pre and post crisis of 2008. A first hypothesis could be an effect of a reduction in the total amount of student graduated in Padua. Comparing the result with Graph 8 (the light blue columns represent the total amount of graduates students for each year), the number of students is constant so the sharp decrease of entrepreneurs and managers is not the consequence of a drop in enrolment at university.

Graph 8 Total graduated students breakdown by year of graduation

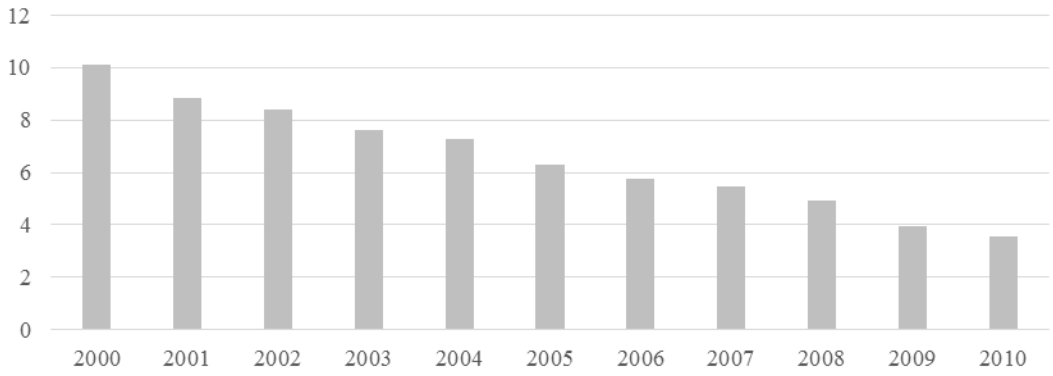


Source: DTB_St Authors' elaboration

The more plausible hypothesis connects the decline to an absence of data caused by the availability of company information until 2015 and instead an availability of student information until 2010 in terms of time necessary for the creation of the enterprise. Graphs 9 and 10 shows respectively the average of years between graduation and company creation and the average age of students at the moment of company creation across years of graduation. The

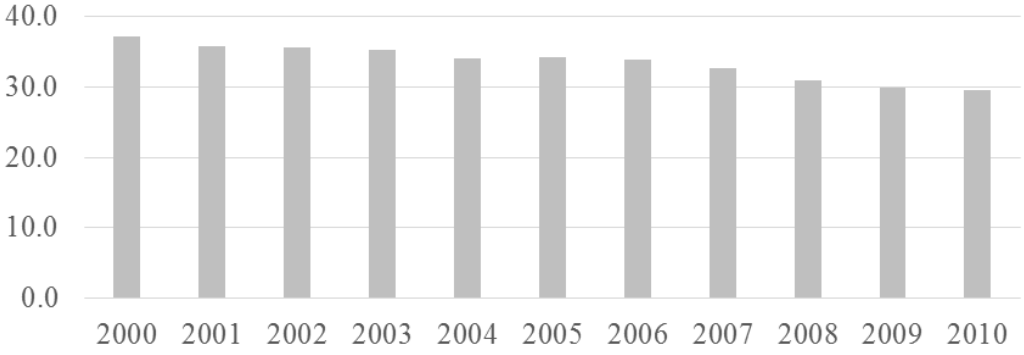
analysis consider only post-university companies in order to avoid negative years calculating the difference between the year of company foundation and graduation.

Graph 9 Average of years between graduation and company creation by year of graduation



Source: DTB_Co Authors' elaboration

Graph 10 Average age for company creation by year of graduation

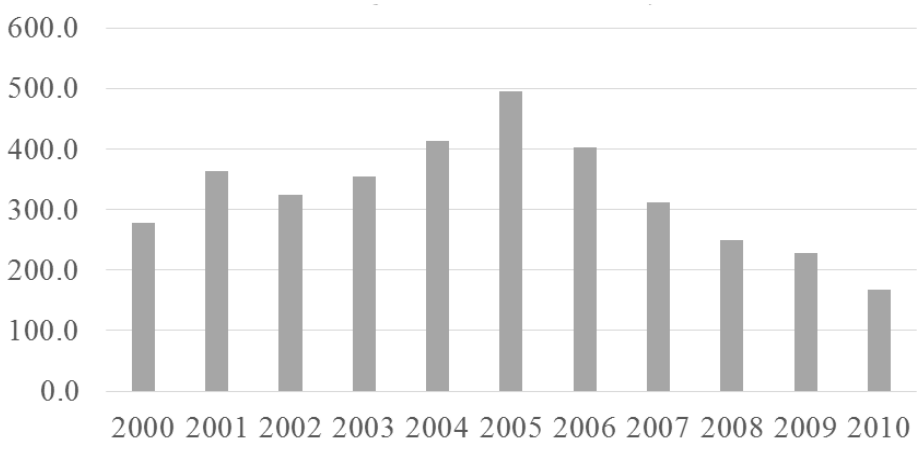


Source: DTB_Co Authors' elaboration

The decreasing functions of both graphs is at the same time a sign and a consequence of the apparent reduction of entrepreneurs and manager after 2006 of Graph 7. The graphs present also a lack of data and cannot be interpreted as a reduction of company creation time across years of graduation. The time between graduation and company creation could reach 10 year and then decrease until 3 years as shown in Graph 9. Students also tend to create companies at 33-34[11] years and to get the diploma at 26-27[12], at about 7-8 years of distance on average. The difference is the amount of companies on which the average is applied that causes an apparent reduction. Graph 12 indicates the trend of company creation by year of graduation and is the final evidence of the lack in the data.

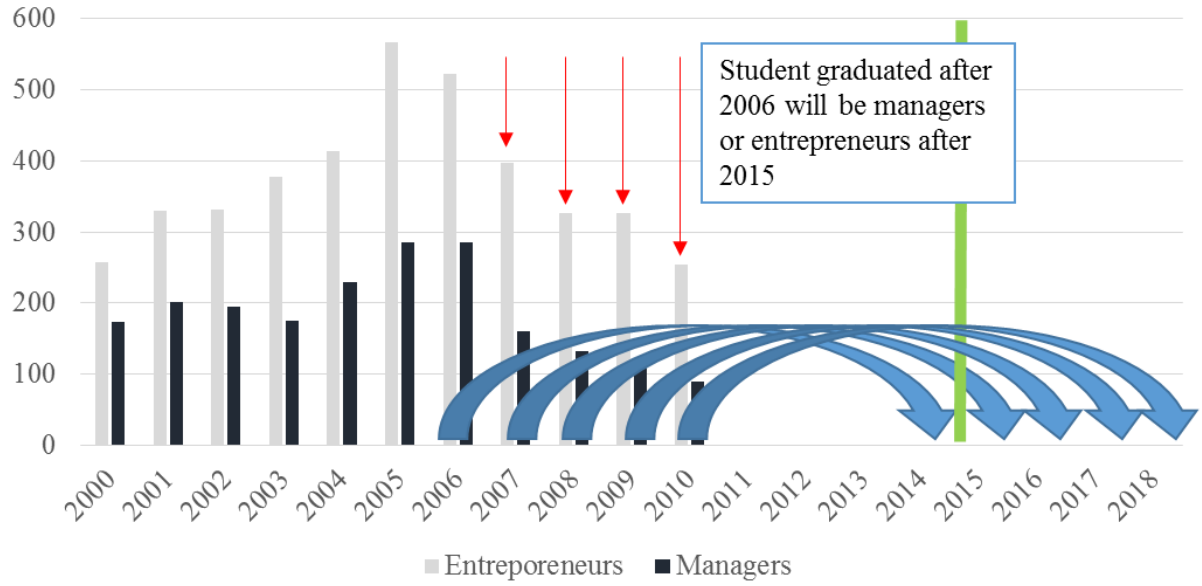
[11] DTB_St: average of the total universe of 119,384 students
[12] DTB_St: average of the total universe of 119,384 students

Graph 11 N. of companies founded by year of graduation of the entrepreneur



Source: DTB_St Authors' elaboration

Graph 12 Managers and Entrepreneurs breakdown by year of graduation



Source: DTB_St Authors' elaboration

The decreasing trend showed in Graph 12 is the result of the unavailability of data after 2015 since on average a student graduated in 2007 could create a company after 2015 (+ 8 years). The same reasoning applies with 2008, 2009 and 2010 so in order to analyse the trend until 2010 we should have data after 2015 and anyhow the students graduated in 2010 are currently in a phase of potential company creation. In order to run a temporal analysis should be fixed the expected time of company creation (as in this case 10 year after the graduation). A similar analysis is not valid for managers since in the database DTB_Co there are no information about the entry time in the company. The structure of the data and the absence of information about companies after the 2015 led to the decision of studying the entrepreneurial and the managerial

attitudes without considering the time factor or the trend across years. This restriction is applied only on analysis that consider the dataset DTB_Co.

3.4 Credits and courses

The database DTB_St includes 119,347 students divided in 234 specific university courses. In order to simplify the analysis and the interpretation of the data the courses were clustered in 13 macro categories listed in the table below[13]. The course category with more entrepreneurs and managers is Engineering that includes 19.7% of all the entrepreneurs (respect to the total number of entrepreneurs) and 28.6% of all the managers (respect to the total number of managers). The ranking of the tables below however, does not consider the total amount student enrolled in each course but it is a good indicator to identify the major source of entrepreneurs and managers. Table 15 shows the student breakdown by course category and individual type and it is ordered by the total amount of graduated students in each category graduated from 2000 to 2010 (last column of the table).

Table 15 Managers & Entrepreneurs breakdown by course category

Course Category	Other	Entrepreneurs	Managers	Tot
INGEGNERIA	20915	808	585	22308
PSICOLOGIA	18930	406	218	19554
MEDICINA E CHIRURGIA	14991	480	320	15791
LETTERE E FILOSOFIA	11854	352	144	12350
SCIENZE POLITICHE	10059	547	236	10842
SCIENZE MATEMATICHE FISICHE E NATURALI	9558	300	111	9969
SCIENZE DELLA FORMAZIONE	8377	158	68	8603
GIURISPRUDENZA	5301	116	38	5455
AGRARIA	3784	427	120	4331
ECONOMIA	3092	123	82	3297
FARMACIA	2985	214	74	3273
SCIENZE STATISTICHE	2369	105	28	2502
MEDICINA VETERINARIA	979	68	25	1072
Tot	**113194**	**4104**	**2049**	**119347**

Source: DTB_St Authors' elaboration

[13] All the clusters applied for each university course (170 courses) are listed in Appendix A.

Table 16 represent instead the ranking of university course category by percentage of entrepreneurs on total graduated students in each course category. In contrast to the previous tables, Engineering has dropped in ranking and the course category that present the higher percentage of manager and entrepreneurs is Agronomy ("Agraria").

Table 16 Managers & Entrepreneurs breakdown by course category (%)

Course Category	Other	Entrepreneurs	Managers	Tot
AGRARIA	87.4%	9.9%	2.8%	4331
FARMACIA	91.2%	6.5%	2.3%	3273
MEDICINA VETERINARIA	91.3%	6.3%	2.3%	1072
SCIENZE POLITICHE	92.8%	5.0%	2.2%	10842
SCIENZE STATISTICHE	94.7%	4.2%	1.1%	2502
ECONOMIA	93.8%	3.7%	2.5%	3297
INGEGNERIA	93.8%	3.6%	2.6%	22308
MEDICINA E CHIRURGIA	94.9%	3.0%	2.0%	15791
SCIENZE MATEMATICHE FISICHE E NATURALI	95.9%	3.0%	1.1%	9969
LETTERE E FILOSOFIA	96.0%	2.9%	1.2%	12350
GIURISPRUDENZA	97.2%	2.1%	0.7%	5455
PSICOLOGIA	96.8%	2.1%	1.1%	19554
SCIENZE DELLA FORMAZIONE	97.4%	1.8%	0.8%	8603
				119347

Source: DTB_St Authors' elaboration

Camelli and Ferrante (2014) obtained a similar result observing that the self-employment was more common for graduates in Agronomy or agriculture related courses[14]. Assuming that this specific academic career should lead to become an agricultural entrepreneur, this elevate number could be the consequence of in agronomy favourable treatment of this category rather than commercial entrepreneurs due to incentives and concessions (Italian Civil Code, Art. 2135). The commercial entrepreneur indeed must register the activity in the commercial register, keep the accounting records is subjected either to bankruptcy than to other insolvency proceedings according to the Italian Civil Code (Art. 2195). The Padua and Veneto contexts also are part of favourable area for agriculture and related activities in term of know-how and characteristics of the territory. According to the data provided by Unioncamere (2015) mentioned in the chapter before, approximately 4% of the total amount of workers in Veneto is engaged in activities related to agriculture, forestry or fishing. Those considerations however assumes the perfect connection and consistency between university course and the economic

[14] Based on the 2013 survey made on 450,000 graduates from 64 Italian universities.

sector of activity. Further analysis about the consistency will be discussed at the end of this chapter.

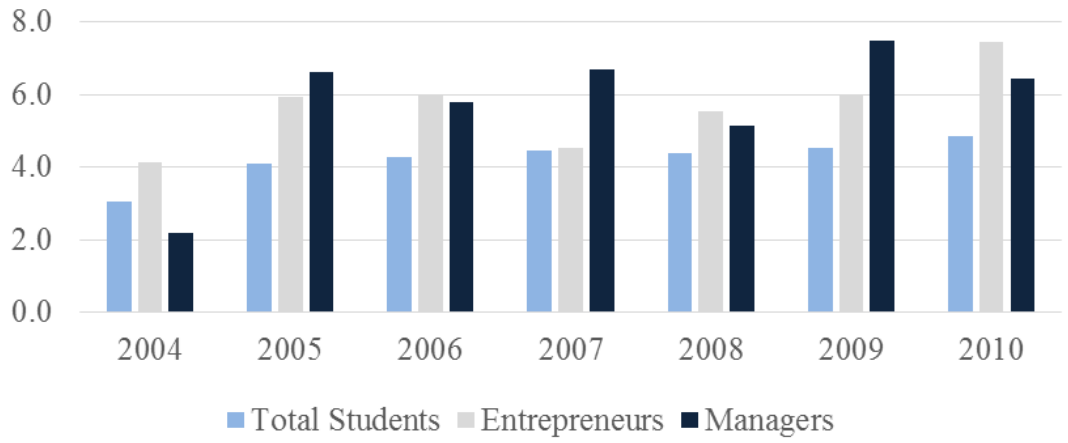
The database DTB_St includes information about credits in economic and managerial courses obtained by students at university. Table 17 and Graph 13 show the average of the sum of credits in economic courses for the student by year of graduation. The data are interpretable from year 2004 due a lack of data in credit registration.

Table 17 Average credit in economic courses per student by individual category (2004-2010)

	Total Students	Entrepreneurs	Managers
Average Credits	4.2	5.7	5.8

Source: DTB_St Authors' elaboration

Graph 13 Average credit in economic courses per student by year of graduation (Trend 2004-2010)



Source: DTB_St Authors' elaboration

According to the information available in the dataset DTB_St, the course selected to obtain the sum of credits in economics consider topics such as business administration, mathematical tools for economics and economic theory[15]. Among all the exams available there were not specific courses focused on entrepreneurship or start up management or any other reference to external activities concerning on the topic. Despite the majority of the teachings are not entrepreneurial stimuli, the economic background of a student could be useful for future developments of the business idea and so it indirectly influences the final output. According to the averages obtained in Table 17 Managers are the category with more credits followed by entrepreneurs and finally

[15] The full list of courses considered is available in Appendix B

by the other students even if the difference between the two groups is thin. The result respect the expectation of more economics skills of managers and entrepreneurs respect the rest of the sample but does not give any information about the effectiveness.

Table 18 and Graph 14 give an indicator of the quality of the student skills as the final grade obtained at the last experience at the University of Padova.

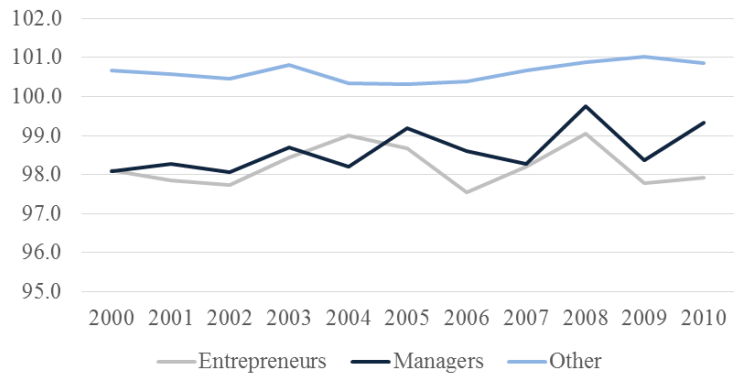
Table 18 Entrepreneurs & Managers final grade (average) by year of graduation

Year Graduation	Entrepreneurs	Managers
2000	98.1	98.1
2001	97.8	98.3
2002	97.7	98.1
2003	98.4	98.7
2004	99.0	98.2
2005	98.7	99.2
2006	97.5	98.6
2007	98.2	98.3
2008	99.0	99.8
2009	97.8	98.4
2010	97.9	99.3
Average	**98.2**	**98.6**

Source: DTB_St Authors' elaboration

Managers have a higher final grade than entrepreneurs do on average even if the difference is thin. The result confirm the expectation since a student "manager oriented" could be more inclined to take care of his academic career in a future prospective of competition with peers. An "entrepreneur oriented" student instead, could be distracted or taken from another kind of interest such a university start-up. These assumptions will be tested in the next chapter even if considering the total sample managers and entrepreneurs seem to follow a similar trend in term of final grade at university. A peculiar result instead is reported in Graph 14.

Graph 14 Entrepreneurs, Managers and other student final grade (average) by year of graduation



Source: DTB_St Authors' elaboration

Comparing the final grade of managers and entrepreneurs with the rest of the sample, emerge a significant difference between the different categories of individuals. The other students have an average grade of 100.6[16] so the entrepreneur and managers have a lower grade respect to the average. As the previous result, the significance of the gap will be tested in the regression chapter.

Table 19 Entrepreneurs final grade (average) breakdown respect to company foundation time

	CompPostUniv	CompDurUniv
Final Grade	97.65	96.35

Source: DTB_St Authors' elaboration

According to Table 19, the entrepreneurs that founded a company during the academic years have a lower final grade respect to the entrepreneurs that created a company after graduation. The time and the effort needed to create a business could affect the academic routine and results and so could be the cause of the gap between final grades of the two categories of individuals.

A second indicator of student skills is the experience abroad made during the university years. Table 20 show the total amount of student with an experience abroad and the part of entrepreneurs and managers for each year of graduation. The total amount of student with experience abroad is an increasing function from 2000 due to the development of international program within the university across years.

Table 20 Individuals with an experience abroad breakdown by year of graduation

Year Graduation	Total student with an experience abroad	Entrepreneurs	Managers
2000	527	16	17
2001	646	33	18
2002	665	25	14
2003	691	27	17
2004	782	21	13
2005	784	26	8
2006	752	(11)	(9)
2007	702	(14)	(8)
2008	693	(15)	(4)
2009	801	(13)	(5)
2010	853	(16)	(5)
Tot	**7896**	**217**	**118**

Source: DTB_St Authors' elaboration

[16] DTB_St sample average considering student not labelled as managers and entrepreneurs.

The data about managers and entrepreneurs after 2006 (the data showed in parentheses in the table above) are affected by the same problem previously seen concerning the lack of recent data about companies and so the characteristic of entrepreneur. In this case the numbers do not refer to averages so the total amount of entrepreneurs and managers affect the result and it does not make it interpretable numbers after 2006 unless considering the percentage of the total for each category. Entrepreneurs indeed on average are more likely to have an experience abroad (7.7% vs 6.2% over the total amount of entrepreneur and managers[17]) and that result seems to go against the expectations. In fact, access to leadership roles specially in big corporation and be successful as a manager is extremely hard without having behind at least one experience abroad. Considering also more entry level positions in such companies and comparing the open position requirement it easy to see a growing demand for graduates with an international curriculum. Entrepreneurs instead could also gain from an experience abroad such as the ability to internalize this feature in their projects. However, by definition entrepreneurs are characterised by a great initiative that may drove them to foreign countries respect to their colleagues.

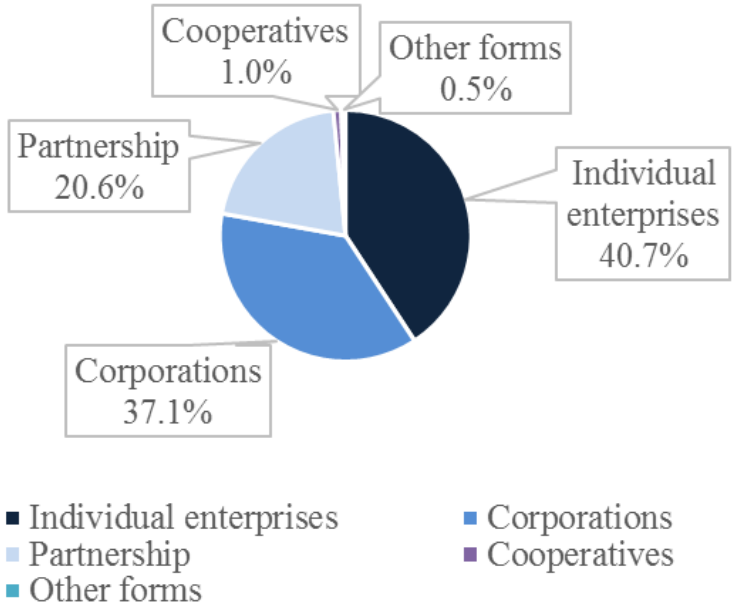
3.5 Companies form and time of creation

The sample of 6,450 companies (DTB_Co) in which a student from Padua is an Entrepreneur or a Manager includes mainly individual enterprises (40,7%) and Corporations (37,1%) as shown in the Graph below. The analysis does not consider the natural person and consortia as mentioned before in order to avoid VAT account of professionals even if in some occasions, these are grouped into corporation and is not possible an isolation.

Individual enterprises are the most common company form and that is due to the economic and bureaucratic barriers for companies foundation. Considering only the samples of 4,195 companies with an entrepreneur and 2,255 with a manager from Padua, the difference is relevant but at the same time predictable Graph 16 consider only the companies owned by a former student and respects the results obtained before and the expectation.

[17] DTB_St: The total amount of manager is 2,049 of which 6.2% had at least one experience abroad in the academic CV, while the 7.7% of entrepreneurs (4,104) register the same characteristic.

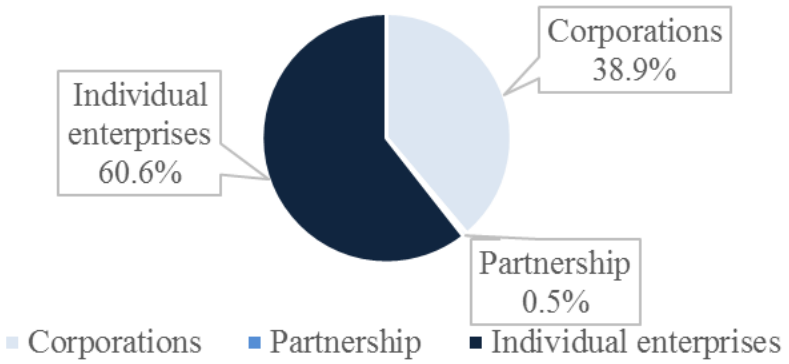
Graph 15 Company form breakdown



Source: DTB_Co Authors' elaboration

Entrepreneurs found mainly individual enterprises (60.6%) and corporations (38.9%), the only unusual consideration is the low number of partnerships probably due to a preference for corporate forms with perfect patrimonial autonomy or a single shareholder.

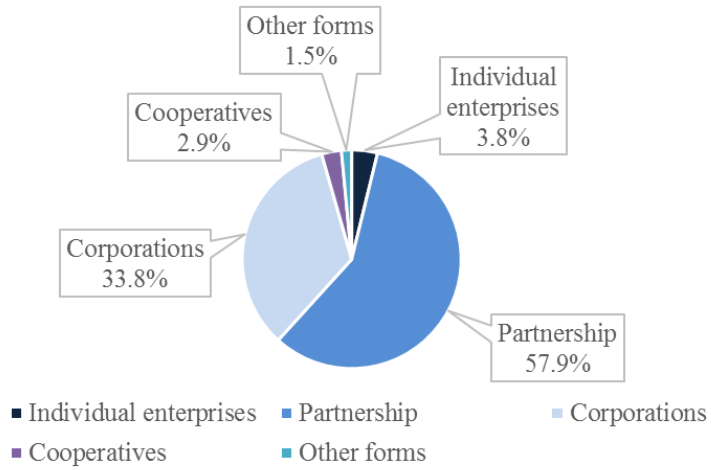
Graph 16 Entrepreneurs company form breakdown



Source: DTB_Co Authors' elaboration

The results are completely different considering only the manager as reported in Graph 17. Managers tend to have a role in partnerships rather than individual enterprises as entrepreneurs.

Graph 17Managers company form breakdown

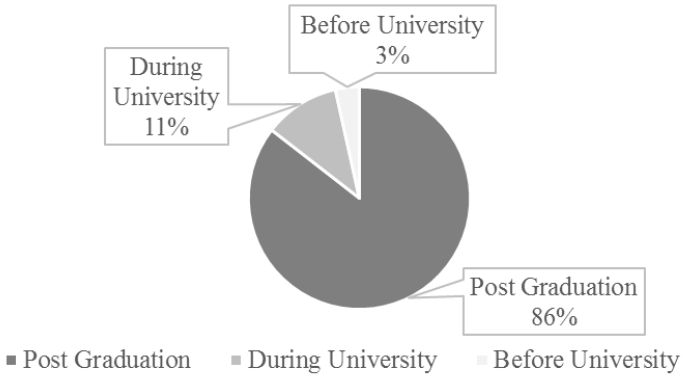


Source: DTB_Co Authors' elaboration

Corporations and Partnerships given the nature of the form and the organizational models tend to attract managers. Individual enterprises by definition are more entrepreneur oriented and rarely require managers. In addition, individual enterprises have less entry barriers in terms of bureaucracy and have lower cost for the foundation especially in case of a low initial turnover. The database DTB_Co does not include information about the entry time in the company, the only information available is the data of company creation and it is valid only for entrepreneurs. The data of creation is calculated using the year of registration in the business Register for enterprises born after 19/02/1996 and the year of registration in a former register (also known as "Registro delle Ditte") for those born before.

Graph 18 analyses the company creation timing respect to the university studies and phases.

Graph 18 Company creation time for entrepreneurs



Source: DTB_Co Authors' elaboration

The companies created before the university are 3%, during the university 11% and after the graduation 86% of the total companies created by Padua alumni. The category concerning the

company created before university refers to a particular set of companies founded before the last experience at the University of Padova such as a second graduation. Other cases included in this category are also entrepreneurs who undertook a master or postgraduate courses after the company creation. Unfortunately, the condition of the legal age for the entrepreneurs applied to the sample is not enough but it certainly increases the chances of isolating only the original founders.The data obtained by Fini et al. (2016) in the analysis made on 61,115 students from 64 Italian universities in 2014 reported a different results. According to the authors, 2.7% of the total sample are student entrepreneurs (student that creates a business before or during the university). Considering the data about Padua students and the percentage respect to the total, approximately 0.5%[18] of the students were engaged in some entrepreneurial activities before or during the studies. Comparing the university data of Padua from 2000 to 2010 and the national data of Fini et al. (2016) of 2014 the university has a lower percentage of student entrepreneurs respect to the national average. The data obtained using the dataset of Padua consider all the years between 2000 and 2010 despite the issue about the lack of recent information since the analysis focus only on entrepreneurship during academic years and so consider only business created before the survey compilation. Unfortunately, since the data for 2014 are not available for what concerns students from the University of Padova, a comparison for the same year with the results obtained by Fini et al. is not possible. The gap (-2.2%) is probably due to the changes due to the time and the evolution of the phenomena. Even considering the last year available (2010) the result is still low considering that only the 0.28%[19] of students graduated in 2010 founded a company during university.

3.6 Sectors

The classification used to identify the company sector follow the Ateco code categories from A to X. Table 21 shows the ranking of sectors for the companies owned by a former student while Table 22 lists the sectors of the companies with a manager. Considering the final occupation of managers and entrepreneurs, the sector with the higher number of companies is retail (G) and it confirms the average of the region. The manufacturing activities (C) instead dropped in ranking and are more common for managers rather than entrepreneurs.

[18] Percentage of student that creates a business before or during the university considering 119,347 observation of DTB_St (2000-2010).
[19] Percentage of student that creates a business before or during the university considering 11,632 observation of DTB_St (2010).

Table 21 Entrepreneurs breakdown by sector (Ateco)

Sector	Companies with an Entrepreneur
G Commercio all'ingrosso e al dettaglio	1289
M Attività professionali, scientifiche e tecniche	511
A Agricoltura, silvicoltura pesca	415
J Servizi di informazione e comunicazione	280
K Attività finanziarie e assicurative	268
C Attività manifatturiere	255
N Noleggio, agenzie di viaggio	199
L Attivita immobiliari	181
X Imprese non classificate	156
F Costruzioni	152
I Attività dei servizi alloggio e ristorazione	120
Q Sanita e assistenza sociale	108
S Altre attività di servizi	86
P Istruzione	69
R Attività artistiche, sportive, di intrattenimento	62
H Trasporto e magazzinaggio	24
D Fornitura di energia elettrica, gas e vapore	15
E Fornitura di acqua e reti fognarie	5
Tot Companies with an Entrepreneur	**4195**

Source: DTB_Co Authors' elaboration

Table 22 Managers breakdown by sector (Ateco)

Sector	Companies with a Manager
G Commercio all'ingrosso e al dettaglio	555
L Attivita immobiliari	238
F Costruzioni	227
C Attività manifatturiere	193
M Attività professionali, scientifiche e tecniche	179
A Agricoltura, silvicoltura pesca	160
I Attività dei servizi alloggio e ristorazione	115
X Imprese non classificate	106
N Noleggio, agenzie di viaggio	103
Q Sanita e assistenza sociale	100
J Servizi di informazione e comunicazione	94
D Fornitura di energia elettrica, gas e vapore	54
P Istruzione	32
S Altre attività di servizi	29
K Attività finanziarie e assicurative	22
H Trasporto e magazzinaggio	20
R Attività artistiche, sportive, di intrattenimento	19
E Fornitura di acqua e reti fognarie	8
B Estrazione di minerali da cave e miniere	1
Tot Companies with a Manager	**2255**

Source: DTB_Co Authors' elaboration

The results differs in part respect to the ones described in the chapter before. According to the annual report concerning the economic situation of Veneto in 2015 in fact, the sector with the higher rate of workers is manufacturing followed by retail and accommodations/restorations structures (Unioncamere Veneto, 2016).

3.7 Company dimension and status

The Small and medium-sized enterprises (SMEs) are defined in the EU recommendation 2003/361 at the article 2 of the Annex (European Commission, 2003A). The companies included in the database DTB_Co were classified as micro (Mi), small (Sm), medium (Ma) or macro (Ma) following the thresholds given by the recommendation showed in the following table.

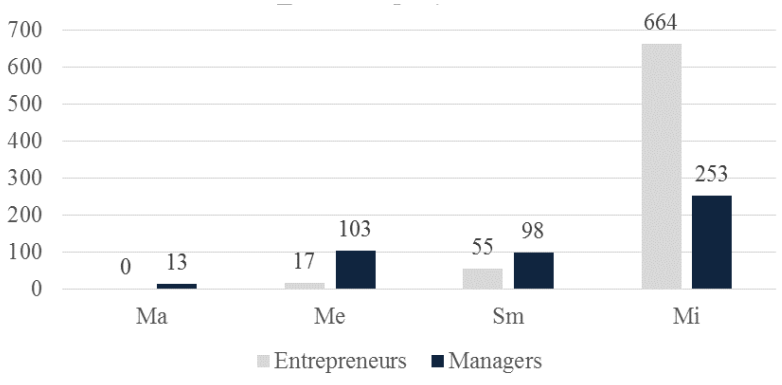
Table 23 Definition of SME

Company dimension	Employees	Annual turnover
Macro (Ma)	>250	>50M
Medium (Me)	≤250	≤50M
Small (Sm)	≤50	≤10M
Micro (Mi)	≤10	≤2M

Source: EU recommendation 2003/361 at the Article 2 of the Annex

Some companies were excluded due to a lack of data for what concern the turnover and employees, in particular almost all the companies related to managers miss data: 3,459 companies for entrepreneurs (out of a total of 4,195) and 1,788 (out of a total of 2,255). Graphs 20 represent the company dimension breakdown by each category of companies and individuals.

Graph 19 Company dimension breakdown by individual category



Source: DTB_Co Authors' elaboration

Entrepreneurs tend to create smaller enterprises rather than managers following the information available at 2014. The large lack of data anyway complicates the interpretation of the result and the classification will not be part of the regression. However, in order to control the model for the size of the companies, the regression considers the total amount of employees which it is the most comprehensive data.

Another important indicator essential for the analysis is the status of the companies in 2015. Table 24 shows the company status by each category of individuals in percentage terms respect to the total amount of companies related to managers and entrepreneurs.

Table 24 Company status in 2015 breakdown by individual category

Company Status	Managers	Entrepreneurs
Active	90.7%	94.4%
Inactive	6.5%	4.7%
In liquidation	1.3%	0.5%
In bankruptcy	1.3%	0.2%
Suspended	0.2%	0.2%
Tot	100.0%	100.0%

Source: DTB_Co Authors' elaboration

The companies in which a former student from the University of Padova is a manager are more stable than the ones founded by the category of entrepreneur. In 2015, 9.3% of the companies related to managers are not active versus 5.6% related to entrepreneurs[20]. The slight gap in favor of managers could be affected by the company dimension since, as showed in Graph 19, they are employed in larger companies probably less subjected to failure.

3.8 Geographic distribution

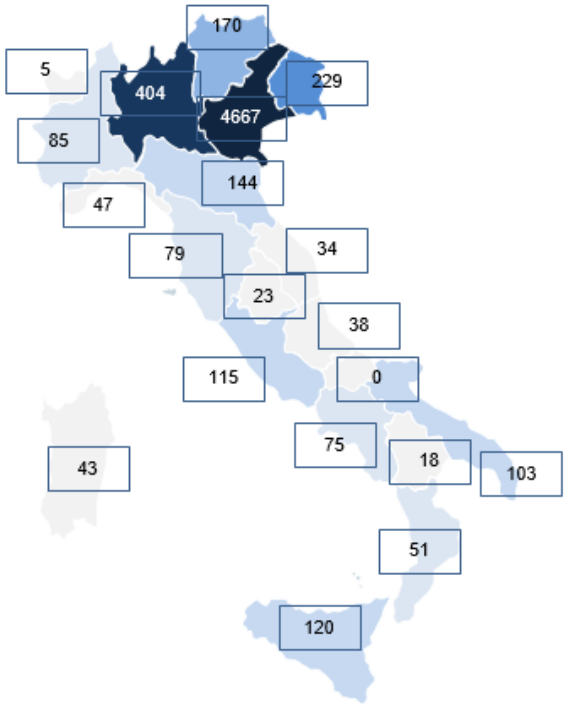
Approximately 81% of the 6,450 Italian companies[21] included in DTB_Co are located in the North-East, 8% in the North-West, 4% in the Center and 7% in the south and islands. Figure 3 illustrate the distribution of the companies across all the Italian regions identifying the destinations of manager and entrepreneurs. The analysis does not consider companies created outside the border even if created by a former student from Padua since the matching considers only the Italian companies found in the Italian Business Register. There are not significant

[20] Sum of the percentages of inactive, in liquidation, in bankruptcy and suspended companies for entrepreneurs and managers.
[21] Companies in which a student graduated between 2000 and 2010 is labelled as an owner or a manager.

differences between managers and entrepreneurs in term of Italian distribution of companies. Both the categories follow the result obtained in the following Figure and are distributed around the epicentre of Padua mostly in the North-East. For that reason specific chart has not been reported a for each category of individual.

Figure 3 Company geographical distribution (entrepreneurs and managers)

Region	N. Companies	
Veneto	4667	>500
Lombardia	404	<500
Friuli-Venezia Giulia	229	<400
Trentino-Alto Adige/Südtirol	170	<200
Emilia-Romagna	144	<150
Sicilia	120	
Lazio	115	
Puglia	103	
Piemonte	85	<100
Toscana	79	
Campania	75	
Calabria	51	
Liguria	47	<50
Sardegna	43	
Abruzzo	38	
Marche	34	
Umbria	23	
Basilicata	18	
Valle d'Aosta/Vallée d'Aoste	5	
Tot	**6450**	



Source: DTB_Co Authors' elaboration

The data available allow the comparison between the students and the company residence in order to investigate the attraction of the University of Padova and more in general of the region Veneto as a whole. Table 25 and Table 26 show respectively if a student creates or has a role in a company in the same region or in the same province where he lives.

Table 25 Comparison between company region and student native residence

Company region respect to student residence	Managers	Entrepreneurs
Different Region	10.6%	9.0%
Same Region	89.4%	91.0%
	100%	**100%**

Source: DTB_Co Authors' elaboration

In the 10.6% of the cases, a former student cover a managerial position in a company situated in a different region respect where he lives, while in rest of the cases (89.4%) remain in the same region. The percentage are also similar for entrepreneurs, in fact the 9% of the entrepreneurs found a company in the same native region and 91% in a different one. The portion of individual that choose to remain in the same geographical area is high for both the category of individuals. In order to obtain a more precise result should be taken into account the difference between border areas of the region or analyse also the effect considering the province as reported in the table below.

Table 26 Comparison between company province and student residence

Company province respect to student residence	Managers	Entrepreneurs
Different Province	23.5%	19.7%
Same Province	76.5%	80.3%
	100%	**100%**

Source: DTB_Co Authors' elaboration

Changing the approach and observing the effect from a province point of view obviously the percentage moved in favour of a change due to the area restriction while are still very high for the same zone conservation. The category of managers seems to be the more likely to move and it is reasonable since career advancement often require shifts. The entrepreneurs also change but for different reason such as economic advantage and strategic locations. Starting from the macro approach of the region the analyses was led to the specific attraction effect of the University of Padova and the region Veneto for each type of individual. Table 27 and Table 28 consider only the company owned by a former student from Padua and represent the attraction effect of the city and the region for the entrepreneurs.

Table 27Attraction effect of Veneto for entrepreneur

Student residence	Company founded in other region	Company founded in Veneto
Other regions	77.6%	2.8%
Veneto	22.4%	97.2%
	100%	**100%**

Source: DTB_Co Authors' elaboration

The 97.2% of the companies situated in Veneto were founded by a student from Veneto and only the 2.8% by external students. Considering instead the companies located outside the region taken into consideration, 22.4% were founded student that live in Veneto and 77.6% by others.

Table 28 Attraction effect of Padua for entrepreneur

Student residence	Company founded in other cities	Company founded in Padua
Other cities	92.7%	15.3%
Padua	7.3%	84.7%
	100%	**100%**

Source: DTB_Co Authors' elaboration

Applying the same reasoning reducing the analysis only on Padua, the 84.7% of the companies situated in Padua were founded by Paduans and 15.3% by other. Considering instead all the companies founded in different cities, the 7.3% were founded by Padua residents.

Very similar results were obtained analysing the managers as reported in the tables below.

Table 29Attraction effect of Veneto for managers

Student residence	Company founded in other region	Company founded in Veneto
Other regions	77.9%	2.7%
Veneto	22.1%	97.3%
	100%	**100%**

Source: DTB_Co Authors' elaboration

Table 30 Attraction effect of Padua for managers

Student residence	Company founded in other cities	Company founded in Padua
Other cities	91.7%	13.7%
Padua	8.3%	86.3%
	100%	**100%**

Source: DTB_Co Authors' elaboration

Considering the students that lives in other cities, the attraction effect of the University of Padova for both managers and entrepreneurs correspond to 14.8% of the total companies founded in Padua as showed in Table 31. The percentage correspond to 268 companies founded or in which they have a role in Padua by those category of individual over 1,813 companies in Padua present in database DTB_Co.

Table 31Attraction effect of Padua for managers and entrepreneurs

Student residence	Company founded in other cities	Company founded in Padua
Other cities	92.4%	14.8%
Padua	7.6%	85.2%
	100%	**100%**

Source: DTB_Co Authors' elaboration

3.9 Consistency between university courses and company sectors

The specific preferences of individuals are not observable given the data available for the analysis but having the information about the university course is possible to track or to estimate the future occupation of the individual in term of sector of activity. The goal is to determine the consistency of the course chosen at the university and the sector of activity in order to study the effect of the university on future employment and entrepreneurial decisions. Table 32 lists the entire sectors associated to a company present in the sample following the Ateco code and classification.

Table 32 Ateco sectors classification applied

	Sectors
A	Agricoltura, silvicoltura pesca
B	Estrazione di minerali da cave e miniere
C	Attività manifatturiere
D	Fornitura di energia elettrica, gas e vapore
E	Fornitura di acqua e reti fognarie
F	Costruzioni
G	Commercio all'ingrosso e al dettaglio
H	Trasporto e magazzinaggio
I	Attività dei servizi alloggio e ristorazione
J	Servizi di informazione e comunicazione
K	Attività finanziarie e assicurative
L	Attivita immobiliari
M	Attività professionali, scientifiche e tecniche
N	Noleggio e agenzie di viaggio
P	Istruzione
Q	Sanita e assistenza sociale
R	Attività artistiche, sportive, di intrattenimento
S	Altre attività di servizi
X	Imprese non classificate

Source: DTB_Co Authors' elaboration

One or more sectors have been associated to each course category analysing the area of pertinence and their subcategories. The association is specific for the analysis applied and considers marginal associations and secondary activities in order to make a wider analysis. The following table associates to each university category the letters related to the sector. Some particular cases regard Economics, Engineering and Natural science. The last two categories are associated to similar sectors given the similar professional areas. Economics instead should include all the sectors given the predisposition to the preparation of the student to managerial and entrepreneurial activity. The analysis do not take into account this factor given the presence of specific economic sectors as Finance and Insurances and to avoid outliers since the sample of analysis is composed by only entrepreneurs and managers.

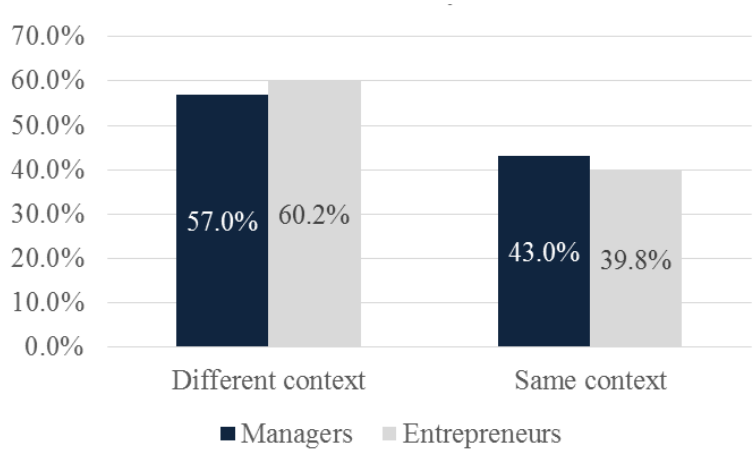
Table 33 Association between university course category and economic sectors

Course Category	Sectors associated
AGRARIA	A C I
ECONOMIA	G H M N
FARMACIA	C M Q
GIURISPRUDENZA	K L M S
INGEGNERIA	B C D E F G
LETTERE E FILOSOFIA	I J N R
MEDICINA E CHIRURGIA	M Q
MEDICINA VETERINARIA	M Q
PSICOLOGIA	J N P Q
SCIENZE DELLA FORMAZIONE	M N P Q S
SCIENZE MATEMATICHE FISICHE E NATURALI	B C D E F J
SCIENZE POLITICHE	K M N S
SCIENZE STATISTICHE	G H K M N R

Source: DTB_Co Authors' elaboration

The association furthermore does not consider 262 companies not classified (corresponding to the letter X in Table 32). Graph 20 reports the results obtained after the association and compares the percentages for each category of individual.

Graph 20 University and sector consistency for managers and entrepreneurs



Source: DTB_Co Authors' elaboration

About 57% of the companies related to a "student-manager" are linked with the academic course of the student while 43% belong to a different area or context. The companies founded by "student-entrepreneurs" are more related with the University course presenting a connection in 60.2% of the cases. The difference between managers and entrepreneurs is thin and the meaningfulness will be tested in the regression chapter. The analysis however, considers only macro categories of sector and it is only a starting point for future studies on the phenomenon,

as it does not consider in particular subsector or specific business activities. Taking into account this limitation and according to the result obtained analysing the case of the University of Padova, entrepreneurs seems to be more likely to change context of activity respect to managers. The result respects the expectation since entrepreneurs are less affected by the decisions of others subjects as employers or job entry requirements and so they are more free to operate in different areas.

CHAPTER 4: MODELS AND RESULTS

4.1 Models applied

From the total universe of 137 variables, we dropped 93 characteristics concerning not useful information for research purposes as badge number and personal contacts. In addition, we created 60 new variables to improve some existing information or to create new interaction. All the variables present in the database "Student" are included in the database "Companies" due to the matching principles but refer to different type of subject (companies for DTB_Co and students for DTB_St). Considering both the regression models applied, the analysis includes 65 variables and does not consider trend indicators concerning the total amount of entrepreneurs or manager for the reasons already discussed previously about the lack of data. The variables applied in the models are 54 of which 20 are repeated in both databases but with a different interpretation (Table 34).

Table 34 List of variables

Label	Name	Source	Type	Description
Entrepreneur	Entrepr	DTB_St	Dependent Variable	Dummy(0,1): Assumes value 1 if the student is an entrepreneur according to the definition applied
Manager	Manager	DTB_St	Dependent Variable	Dummy(0,1): Assumes value 1 if the student is has a managerial role according to the definition applied
Company Status	CompStatus	DTB_Co	Dependent Variable	Dummy(0,1): Assumes value 1 if the company is active in 2015 and 0 otherwise (inactive, in liquidation, in bankruptcy or suspended)
Male	Male	DTB_Co DTB_St	Independent variable	Dummy(0,1): Assumes value 1 if the entrepreneur related with the company is a male Dummy(0,1): Assumes value 1 if the student is a male
Years of study	YStudy	DTB_Co DTB_St	Independent variable	Difference between the year of graduation and the year of enrolment at the university of the entrepreneur related with the company Difference between the year of graduation and the year of enrolment at the university of the student
Graduation mark	GradMark	DTB_Co DTB_St	Independent variable	Final mark at university of the entrepreneur related with the company Final mark at university of the of the student
Experience abroad	ExpAbroad	DTB_Co DTB_St	Independent variable	Dummy(0,1): Assumes value 1 if the entrepreneur related to the company made an experience abroad during university Dummy(0,1): Assumes value 1 if the student made an experience abroad during university

Agraria (Agronomy)	AGR	DTB_Co & DTB_St	Independent variable	Set of Dummy(0,1) that assume value 1 if the student (in case of DTB_Co the entrepreneur related to the company) is enrolled in the specified course at university
Economia (Economics)	ECON			
Farmacia (Pharmacy)	PHARM			
Giurisprudenza (Law)	LAW			
Ingegneria (Engineering)	ENG			
Lettere e filosofia (Philosophy and Letters)	LIT			
Medicina e chirurgia (Medicine and Surgery)	MED_CH			
Medicina veterinaria (Veterinary medicine)	MED_VET			
Psicologia (Psychology)	PSYC			
Scienze della formazione (Education Sciences)	SC_FORM			
Scienze matematiche fisiche e naturali (Physical and Natural Sciences)	SC_MAT			
Scienze politiche (Political Science)	SC_POL			
Scienze statistiche (Statistical Sciences)	SC_STAT			
Company northeast of Italy	CoNW	DTB_Co	Independent variable	Dummy(0,1): Assumes value 1 if the company is located in the northwest of Italy
Company northwest of Italy	CoNE			Dummy(0,1): Assumes value 1 if the company is located in the northeast of Italy
Company centre of Italy	CoCentre			Dummy(0,1): Assumes value 1 if the company is located in the centre of Italy
Company south of Italy	CoSouth			Dummy(0,1): Assumes value 1 if the company is located in the south of Italy
Company islands	CoIslands			Dummy(0,1): Assumes value 1 if the company is located in Sicily or in Sardinia
Student northeast of Italy	StNW	DTB_St	Independent variable	Dummy(0,1): Assumes value 1 if the student lives in the northwest of Italy
Student northwest of Italy	StNE			Dummy(0,1): Assumes value 1 if the student lives in the northwest of Italy
Student centre of Italy	StCentre			Dummy(0,1): Assumes value 1 if the student lives in the centre of Italy
Student south of Italy	StSouth			Dummy(0,1): Assumes value 1 if the student lives in the south of Italy
Student islands	StIslands			Dummy(0,1): Assumes value 1 if the student lives in Sicily or in Sardinia
Student foreign	StForeign			Dummy(0,1): Assumes value 1 if the student lives in a foreign country

Same province	SameProv	DTB_Co	Independent variable	Dummy(0,1): Assumes value 1 if the company was founded in the same province of residence of the entrepreneur
University influence (consistency)	UnivInflue	DTB_Co	Independent variable	Dummy(0,1): Assumes value 1 if the sector of activity of the company and the university course made by the entrepreneur are connected following the consistency definition applied
Company created during university	CompDurUniv	DTB_Co	Independent variable	Dummy(0,1): Assumes value 1 if the company was born during university years of the entrepreneur
Age company	AgeComp	DTB_Co	Independent variable	Difference between 2015 and the year of foundation of the company
Total employees	TotEmpl	DTB_Co	Independent variable	Total number of employees of the company
A Agriculture, forestry and fishing	A	DTB_Co	Independent variable	Dummy(0,1): Assumes value 1 if the company operates in the agriculture, forestry and fishing sector
C Manufacturing	C			Dummy(0,1): Assumes value 1 if the company operates in the manufacturing sector
X Unclassified companies	X			Dummy(0,1): Assumes value 1 if the company operates in an unclassified sector
Services and other	SO			Dummy(0,1): Assumes value 1 if the company operates in all the other sectors
Credits in Ingegneria economica	NCrIngEco	DTB_St	Independent variable	Total credits in Ingegneria economica
Credits in Politica economica	NCrPolEcon			Total credits in Politica economica
Credits in Scienza delle finanze	NCrFinScien			Total credits in Scienza delle finanze
Credits in Storia del pensiero economico	NCrHistor			Total credits in Storia del pensiero economico
Credits in Econometria	NCrEcmetrx			Total credits in Econometria
Credits in Economia applicata	NCrAdvEcon			Total credits in Economia applicata
Credits in Economia aziendale	NCrAccount			Total credits in Economia aziendale
Credits in Economia e gestione delle imprese	NCrManag			Total credits in Economia e gestione delle imprese
Credits in Finanza aziendale	NCrBusinFin			Total credits in Finanza aziendale
Credits in Organizzazione aziendale	NCrCompMan			Total credits in Organizzazione aziendale
Credits in Economia degli intermediari finanziari	NCrIntermed			Total credits in Economia degli intermediari finanziari
Credits in Storia economica	NCrHistEcon			Total credits in Storia economica
Credits in Scienze merceologiche	NcrProdScien			Total credits in Scienze merceologiche
Total credits in economics exams	TotCredEcon	DTB_Co DTB_St	Independent variable	Sum of the credits in all the exam listed above

Source: DTB_Co and DTB_St Authors' elaboration

The dependent variables applied are:

- **Entrepreneur**: An individual is defined as an entrepreneur if is labelled as an owner in an Italian company and has 18 or more years at the time of company establishment. All the analysis include only entrepreneurs who have founded a company after the legal age in order to try to avoid firms inheritors or acquirers of already based businesses and to have higher probability to analyse the original founders. The process used to identify the entrepreneurs is different for each category of companies. In case of corporations and partnerships, such characteristic is applied if the student is classified as partner or labeled as an owner. The qualification of entrepreneur is also assigned to the holders ("Titolare") in case of individual enterprises and for the rest of the company forms only if the student is explicitly reported as an owner. In database DTB_Co (each observation is a company) the dummy assumes value 1 if among the owners of the company there is a student graduated between 2002 and 2010 at the University of Padova. In DTB_St (each observation is a student) instead the variable assumes value 1 if the student from Padua graduated between 2002 and 2010 is labelled as an owner in the Italian Business Register.
- **Manager**: An individual is defined as a manager if has a managerial role in an Italian company. The roles selected include different mansions characterized by the presence of responsibility and decision-making power[22]. In database DTB_Co (each observation is a company) the dummy assumes value 1 if among the managers of the company there is a student graduated between 2002 and 2010 at the University of Padova. In DTB_St (each observation is a student) instead the variable assumes value 1 if the student from Padua graduated between 2002 and 2010 cover a managerial role in a company present in the Italian Business Register.
- **Company Status**: Considering the lack of data concerning the turnover and other financial information, the status declared by the company at the end of the 2015 is the best performance indicator available. The dummy assumes value 1 if the company is active in 2015 and 0 if is inactive, in liquidation, in bankruptcy or suspended.

The independent variable applied are:

- **Gender**: The dummy variable "Male" indicates the gender of the individual. In DTB_St (each observation is a student) the variable assumes value 1 if the entrepreneur related

[22] The full list of roles used in order to define the category of manager is reported in the Annex C

with the company is a male. In database DTB_Co (each observation is a company) instead the variable assumes value 1 if the student is a male.

- **Years of study**: It represents the years spent at university. In DTB_Co (each observation is a company) is calculated as the difference between the year of graduation and the year of enrolment at the university of the entrepreneur related with the company. In DTB_St (each observation is a student) instead it is the difference between the year of graduation and the year of enrolment at the university of the student.
- **Graduation Mark**: The variable is a quality indicator of the academic performance of the student and correspond to the final grade obtained in the last experience made by the individual at the University of Padova (the range is between 70 and 110). In DTB_Co (each observation is a company) it is the graduation mark of the entrepreneur related with the company. In DTB_St (each observation is a student) instead it is graduation mark of the student.
- **Experience Abroad**: The dummy variable consider all the academic experiences made by the individual abroad. In DTB_Co (each observation is a company) assumes value 1 if the entrepreneur related to the company made an experience abroad during university. In DTB_St (each observation is a student) instead if assumes value 1 if the student made an experience abroad during university.
- **Course category**: Set of 13 dummy that assume value 1 if the student (in case of DTB_Co the entrepreneur related to the company) is enrolled in the specified course category at university. The course category Agraria (AGR), Economia (ECON), Farmacia (PHARM), Giurisprudenza (LAW), Ingegneria (ENG), Lettere e Filosofia (LIT), Medicina e Chirurgia (MED_CH), Medicina Veterinaria (MED_VET), Psicologia (PSYC), Scienze della Formazione (SC_FORM), Scienze Matematiche Fisiche e Naturali (SC_MAT), Scienze Politiche (SC_POL) and Scienze Statistiche (SC_STAT). Each course category is an agglomeration of specific courses listed in Appendix A.
- **Same Province**: Comparison between the geographic location of the company and the province residence of the student. The dummy assumes value 1 if the company was founded in the same province of residence of the entrepreneur.
- **University Influence**: Comparison between the university category and the company sector. According to the association sector-course category made specifically for this

analysis[23], the dummy assumes value 1 if the sector of activity of the company and the university course made by the entrepreneur are connected in term of future job applications and skills required (by the sector) and/or offered (by the university).

- **Company during university**: The variable identifies the companies founded by students in the period between the year of enrolment and the year of graduation. The dummy assumes value 1 if the company was born during university years of the entrepreneur.
- **Credits in economics exams**: Set of 13 variables that indicates the total amount of credits obtained in each area. The list of areas available is reported in the Appendix B, also the analysis consider a 14th variable (TotCredEcon) that is the sum of all the credits obtained by the individuals in the considered economics areas.

The controls variable used are:

- **Student and company geographic distribution**: Set of 11 dummy variables that indicate the geographic distribution of the companies and the students. In DTB_Co (each observation is a company) the dummies CoNE, CoNW, CoCentre, CoSouth, and CoIsland assumes value 1 if the company is located respectively in the northeast, northwest, centre, south of Italy or in one of the islands. In DTB_St (each observation is a student) instead the dummies StNE, StNW, StCentre, StSouth, StIsland and StForeign assumes value 1 if the student lives respectively in the northeast, northwest, centre, south of Italy, in one of the islands or in a foreign country. The geographic distribution helps to control for eventual geographical effects such as the economic trend of an Italian area.
- **Sectors**: Set of 4 dummy variables that indicates the sector in which the company operates according to the Ateco classification and the subsequent grouping. The variable A assumes value 1 if the company operates in the agriculture, forestry and fishing sector. Variable B assumes value 1 if the company operates in the manufacturing sector. Variable C assumes value 1 if the company operates in an unclassified sector and finally variable SO assumes value 1 if the company operates in all the other sectors. The cluster for activity helps to control for specific sector trend and phenomena.
- **Age company**: It is the only time variable considered in the analysis related to last year of observations (2015) and is calculated as the difference between 2015 and the year of foundation of the company. The data of creation is calculated using the year of

[23] The association consider the Ateco classification and the course category previously explained. The full list of sectors associated with each course cateroy is available in the Appendix D.

registration in the business Register for enterprises born after 19/02/1996 and the year of registration in a former register (also known as "Registro delle Ditte") for those born before. The variable helps to control effects deriving from the economic phases of the company such as the risk of failure in the first years of life.

- **Total employees**: It represents the size of a company and is calculated as the last available data about the total amount of employees declared. The variable helps to control for effects related to the size since the turnover was not available due to a lack of data.

The analysis specifically estimate the following Probit regressions models (both estimated with robust standard errors), one for each database:

A. $Y_i = cons + \beta Male_i + \beta Ystudy_i + \beta GradeMark_i + \beta ExpAbroad_i + \gamma Z_i + \gamma K_i + \gamma W_i + \varepsilon_i$

B. $CompStatus_j = cons + \beta Male_j + \beta Ystudy_j + \beta GradeMark_j + \beta ExpAbroad_j + \beta TotCredEcon_j + \beta SameProv_j + \beta UnivInflue_j + \beta CompDurUniv_j + \gamma Z_j + \gamma W_j + \gamma X_j + \varepsilon_j$

The first model proposed (A) is applied to the database DTB_St and presents two variants both considering the observations from 2002 and 2010. In one case, the dependent variable Y_i is the dummy variable Entrepr that assumes value 1 if the individual (student) i is labelled as an entrepreneur and 0 otherwise. As previously described, we defined as "Entrepreneurs" all the students labelled as owners with 18 or more years at the time of company establishment present in database DTB_St. In the other case Y_i is the dummy variable Manager and assumes value 1 if the individual (student) has a managerial role in the company. The independent variables applied in model A concerns some characteristics of the student: gender, year of study at university, graduation mark, experiences abroad, course attended at university (Z_i) and specific exams completed (K_i). The variables concerning the student's residence (W_i) are used as control variables. The model aims to understand the factors that could let to the business creation or to have a managerial role in a company. The following table shows all the variables used in model A and their basic statistics. The variables ECON and StNE were omitted in order to avoid the problem of multicollinearity. The correlation matrix is available in Appendix E.

Table 35Basic statistics

Model A (DTB_St)				
Variable	Mean	Std. Dev.	Min	Max
Entrepr	0.030827	0.17285	0	1
Manager	0.013704	0.116262	0	1
Male	0.402772	0.490459	0	1
YStudy	3.371976	1.346753	0	9
GradMark	101.2711	7.649381	70	110
ExpAbroad	0.056014	0.22995	0	1
AGR	0.041719	0.199948	0	1
ECON	0.029771	0.169955	0	1
PHARM	0.019174	0.137136	0	1
LAW	0.034121	0.181542	0	1
ENG	0.174257	0.379333	0	1
LIT	0.110536	0.313559	0	1
MED_CH	0.172159	0.377522	0	1
MED_VET	0.009198	0.095467	0	1
PSYC	0.158672	0.365373	0	1
SC_FORM	0.062074	0.241291	0	1
SC_MAT	0.084339	0.277898	0	1
SC_POL	0.083671	0.276896	0	1
SC_STAT	0.020308	0.141053	0	1
StNW	0.044563	0.206343	0	1
StNE	0.894187	0.3076	0	1
StCentre	0.01243	0.110797	0	1
StSouth	0.02556	0.157819	0	1
StIslands	0.015522	0.123619	0	1
StForeign	0.007738	0.087625	0	1
NCrIngEco	0.686757	3.094815	0	35
NCrPolEcon	0.718882	2.902001	0	40
NCrFinScien	0.33864	1.479927	0	16
NCrHistor	0.095278	0.620558	0	8
NCrEcmetrx	0.059681	0.699649	0	18
NCrAdvEcon	0.306843	1.662395	0	30
NCrAccount	1.155246	4.828904	0	51
NCrManag	1.036506	3.855616	0	38
NCrBusinFin	0.032039	0.420318	0	12
NCrCompMan	0.349617	1.430616	0	20
NCrIntermed	0.193633	1.091504	0	10
NCrHistEcon	0.210538	1.139247	0	16
NcrProdScien	0.00169	0.055325	0	1.9
TotCredEcon	5.185349	13.58907	0	102

Source: DTB_St Authors' elaboration

The second model (B) instead is applied to database DTB_Co and considers only the sub-sample of companies founded by entrepreneurs (1,728) graduated between 2002 and 2010 from

the University of Padova. Even in this case the founder must have the legal age at the company foundation time. The dependent variable in this case represent the status of the company in 2015 ($CompStatus_j$) that assumes value 1 if the company "j" is active in 2015. The independent variable applied in model B concern some characteristics of the entrepreneur associated with the company: gender, year of study at university, graduation mark, experiences abroad, course attended at university (Z_j), total credits obtained in economics field, consistency between university and sector of activity, time of company creation and geographical information. Furthermore, there are also some control variables that concern some characteristics of the company (X_j) such as the geographical location, sector of activity, age of the company and size indicators. The model aims to understand the factors that could led to the creation of a successful company and so a successful entrepreneur. The table below shows all the variables used in model B and their basic statistics.

Table 36 Basic statistics

Model B (DTB_Co)				
Variable	Mean	Std. Dev.	Min	Max
CompStatus	0.953107	0.211469	0	1
Male	0.671186	0.469915	0	1
YStudy	3.508475	1.617872	0	9
GradMark	98.02203	7.879252	74	110
ExpAbroad	0.027684	0.164111	0	1
TotCredEcon	8.839944	17.34845	0	94
AGR	0.076836	0.266407	0	1
ECON	0.040113	0.19628	0	1
PHARM	0.041808	0.200207	0	1
LAW	0.032768	0.17808	0	1
ENG	0.216949	0.412284	0	1
LIT	0.090961	0.287634	0	1
MED_CH	0.10113	0.301586	0	1
MED_VET	0.019774	0.139262	0	1
PSYC	0.112429	0.315983	0	1
SC_FORM	0.038983	0.193609	0	1
SC_MAT	0.066102	0.24853	0	1
SC_POL	0.137853	0.344843	0	1
SC_STAT	0.024294	0.154003	0	1
CoNE	0.740678	0.438387	0	1
CoNW	0.074011	0.261863	0	1
CoCentre	0.050848	0.219748	0	1
CoSouth	0.080791	0.272591	0	1
CoIslands	0.053672	0.225434	0	1
SameProv	0.820904	0.383541	0	1
UnivInflue	0.316949	0.465419	0	1
CompDurUniv	0.091525	0.288436	0	1
AgeComp	6.410169	6.857519	0	47
TotEmpl	1.833898	6.12537	0	135
A	0.071186	0.257209	0	1
C	0.050283	0.218589	0	1
X	0.081356	0.273458	0	1
S0	0.797175	0.402217	0	1

Source: DTB_Co Authors' elaboration

The variables ECON, CoNE and C were omitted in order to avoid the problem of multicollinearity. The correlation matrix is available in Appendix F.

4.2 Factors affecting entrepreneurship

Table 37 [24] reports the application of regression model A to a sample of the database DTB_St that considers only the 64,359 students graduated at the University of Padova between 2002 and 2010. The years 2000 and 2001 were dropped due to the absence of data concerning the credits obtained by the individuals. The depended variable is the dummy Entrepr and is explained by a set of independent (Male, YStudy, GradMark, ExpAbroad, dummies related to course category and credits obtained in economic areas) and control variables (student's residence). The following table shows two different regressions: Model A1 takes into account the sum of all the credits in economics (according to the list seen before) obtained by the student during the university and Model A2 instead consider each exam category. The variable ECON and StNE were omitted in order to avoid multicollinearity.

The variables Male, YStudy, Grad Mark and ExpAbroad are significant and have the same sign in both the models. According to the result, being a male has a positive effect on the probability of being an entrepreneur while additional years at university (each additional year decrease the probability), experiences abroad and a higher graduation mark a negative one.

The coefficient of the dummies related with the course category explains the probability of being an entrepreneur respect to ECON courses (Economics). Despite the high number of entrepreneurs present in Engineering courses (absolute number) and Agronomy (percentage over total students enrolled in the courses) seen in the chapter before, the course with the highest and significant coefficient is MED_VET while the lowest are LAW for Model A1 and SC_STAT for Model A2.

The total credits in economics have a positive coefficient in Model A1 even if small while analysing each component of the sum in Model A2, some exams categories contribute more to the probability of being an entrepreneur. In particular, an increase in credits obtained in NcrProdScien ("scienze merceologiche") and NCrManag ("economia aziendale") have a positive effect on the dependent variable.

[24] p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

Table 37 Probit: Factors affecting entrepreneurship

Probit		Model A1			Model A2		
Entrepr	Coef.	Robust Std. Err.		Coef.	Robust Std. Err.	
_cons	-0.75909	(0.18)	***	-0.83277	(0.21)	***
Male	0.463305	(0.02)	***	0.463843	(0.02)	***
YStudy	-0.04319	(0.01)	***	-0.04418	(0.01)	***
GradMark	-0.01541	(0.00)	***	-0.01559	(0.00)	***
ExpAbroad	-0.1362	(0.05)	***	-0.14077	(0.05)	***
AGR	0.758381	(0.09)	***	0.820203	(0.14)	***
ECON	(omitted)			(omitted)		
PHARM	0.726306	(0.11)	***	0.808747	(0.15)	***
LAW	0.163094	(0.10)		0.306443	(0.15)	**
ENG	0.029101	(0.09)		0.144748	(0.14)	
LIT	0.403623	(0.09)	***	0.484336	(0.14)	***
MED_CH	0.295991	(0.09)	***	0.377276	(0.14)	***
MED_VET	0.865248	(0.12)	***	0.94715	(0.16)	***
PSYC	0.109813	(0.09)		0.187194	(0.14)	
SC_FORM	0.153608	(0.10)		0.222827	(0.15)	
SC_MAT	0.218542	(0.09)	**	0.311524	(0.14)	**
SC_POL	0.391698	(0.08)	***	0.564432	(0.13)	***
SC_STAT	0.216877	(0.10)	**	0.293066	(0.16)	*
TotCredEcon	0.003731	(0.00)	***	-	-	
NCrIngEco	-	-		-0.00134	(0.00)	
NCrPolEcon	-	-		-0.00318	(0.00)	
NCrFinScien	-	-		-0.01894	(0.01)	*
NCrHistor	-	-		-0.02345	(0.02)	
NCrEcmetrx	-	-		-0.00332	(0.02)	
NCrAdvEcon	-	-		-0.00597	(0.01)	
NCrAccount	-	-		0.008488	(0.00)	*
NCrManag	-	-		0.013254	(0.00)	***
NCrBusinFin	-	-		-0.01305	(0.03)	
NCrCompMan	-	-		0.026895	(0.01)	***
NCrIntermed	-	-		-0.0053	(0.01)	
NCrHistEcon	-	-		-0.00843	(0.01)	
NcrProdScien	-	-		0.37313	(0.14)	***
StNW	(omitted)			(omitted)		
StNE	0.230384	(0.05)	***	0.232017	(0.05)	***
StCentre	0.648827	(0.07)	***	0.647114	(0.07)	***
StSouth	0.552411	(0.05)	***	0.553938	(0.05)	***
StIslands	0.663123	(0.06)	***	0.665544	(0.06)	***
StForeign	-0.26203	(0.14)	*	-0.24544	(0.14)	*
Number of obs		64359			64359	
Wald chi2(34)		1263.72			1311.78	
Pseudo R2		0.0792			0.0819	
Log pseudolikelihood		-8154.46			-8130.5	

Source: DTB_St Authors' elaboration (STATA)

4.3 Factors affecting managerial goals

Respect to the previous case, the depended variable is the dummy Manager and is explained by a set of independent (Male, YStudy, GradMark, ExpAbroad, dummies related to course category and credits obtained in economic areas) and control variables (student's residence). The table [25] shows two different regressions: Model A3 takes into account the sum of all the credits in economics (according to the list seen before) obtained by the student during the university and Model A4 instead consider each exam category. The variable ECON and StNE were omitted in order to avoid multicollinearity.

The results are similar to those obtained previously considering the entrepreneurs in fact the variables Male, YStudy, Grad Mark and ExpAbroad are significant and have the same sign in both the models. According to the result, being a male has a positive effect on the probability of being a manager while additional years at university (each additional year decrease the probability), experiences abroad and a higher graduation mark a negative one.

The coefficient of the dummies related with the course category explains the probability of being a manager respect to ECON courses (Economics). The variables with a significant coefficient decreased respect to the case seen before. However despite the high number of managers present in Engineering courses (absolute number) and Agronomy (percentage over total students enrolled in the courses) seen in the chapter before, the course with the highest and significant coefficient is MED_VET while the lowest are PSYC and SC_STAT that have a negative coefficient.

The total credits in economics have a positive coefficient in Model A3 even if small while analysing each component of the sum in Model A4, some exams categories contribute more to the probability of being a manager. In particular, an increase in credits obtained in NCrCompMa ("organizzazione aziendale") and NCrAdvEcon ("economia applicata") have a positive effect on the dependent variable.

[25] p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

Table 38 Probit: Factors affecting managerial goals

Probit		Model A3			Model A4	
Manager	Coef.	Robust Std. Err.		Coef.	Robust Std. Err.	
_cons	-1.67887	(0.23)	***	-1.7218	(0.26)	***
Male	0.387638	(0.03)	***	0.385486	(0.03)	***
YStudy	-0.05706	(0.01)	***	-0.05662	(0.01)	***
GradMark	-0.00689	(0.00)	***	-0.00659	(0.00)	***
ExpAbroad	-0.14518	(0.07)	**	-0.14131	(0.07)	**
AGR	0.214302	(0.12)	*	0.175954	(0.17)	
ECON	(omitted)			(omitted)		
PHARM	0.269795	(0.15)	*	0.276448	(0.19)	
LAW	-0.16068	(0.14)		-0.13269	(0.18)	
ENG	0.02145	(0.11)		0.031943	(0.16)	
LIT	0.004634	(0.12)		0.020302	(0.16)	
MED_CH	0.197648	(0.11)	*	0.192163	(0.16)	
MED_VET	0.382699	(0.16)	**	0.381345	(0.19)	**
PSYC	-0.30087	(0.12)	***	-0.28897	(0.17)	*
SC_FORM	-0.08807	(0.13)		-0.11152	(0.17)	
SC_MAT	-0.06765	(0.12)		-0.05837	(0.17)	
SC_POL	0.10905	(0.10)		0.186545	(0.16)	
SC_STAT	-0.30484	(0.14)	**	-0.22405	(0.21)	
TotCredEcon	0.005058	(0.00)	***	-	-	
NCrIngEco	-	-		0.005527	(0.00)	
NCrPolEcon	-	-		-0.00351	(0.01)	
NCrFinScien	-	-		-0.00547	(0.01)	
NCrHistor	-	-		-0.02616	(0.03)	
NCrEcmetrx	-	-		-0.04663	(0.03)	
NCrAdvEcon	-	-		0.027301	(0.01)	**
NCrAccount	-	-		0.007924	(0.01)	
NCrManag	-	-		0.003171	(0.01)	
NCrBusinFin	-	-		-0.0757	(0.05)	
NCrCompMan	-	-		0.038427	(0.01)	***
NCrIntermed	-	-		-0.00216	(0.02)	
NCrHistEcon	-	-		-0.01585	(0.02)	
NcrProdScien	-	-		0.002010	(0.02)	
StNW	(omitted)			(omitted)		
StNE	0.627846	(0.05)	***	0.623776	(0.05)	***
StCentre	0.862708	(0.07)	***	0.854285	(0.07)	***
StSouth	0.609032	(0.06)	***	0.603472	(0.06)	***
StIslands	0.518987	(0.08)	***	0.513753	(0.08)	***
StForeign	-0.64561	(0.32)	**	-0.63638	(0.32)	**
Number of obs		64359			64359	
Wald chi2(34)		610.03			634.19	
Pseudo R2		0.0871			0.0897	
Log pseudolikelihood		-4253.74			-4241.05	

Source: DTB_St Authors' elaboration (STATA)

4.4 Factors that characterize a successful company

The table[26] below reports the application of regression model B to a sample of the database DTB_Co that considers only the 1,735 companies created by students graduated at the University of Padova between 2002 and 2010. The years 2000 and 2001 were dropped due to the absence of data concerning the credits obtained by the individuals as in the previous analysis. The depended variable is the dummy CompStatus and is explained by a set of independent (Male, YStudy, GradMark, ExpAbroad, TotCredEcon, SameProv, UnivInflue, CompDurUniv and dummies related to course category) and control variables (company geographic location, AgeComp, Sectors and TotEmpl). Model B2 consider the sectors in addition to the variables included in Model B1. The variable ECON, C and CoNE were omitted in order to avoid multicollinearity.

The only two significant variables (except for the controls) in both models are TotCredEcon and UnivInflue. The amount of credits obtained in economics courses by an entrepreneur seems to have a negative effect on the probability that the company is active in 2015 but the coefficient is extremely low in absolute values.

In Model B1 the variable ExpAbroad has a p-value<0.05 and a negative coefficient and so could reduce the realisation of the dependent variable. The most interesting result concerns the variable UnivInflue and so the effect of a consistency between the company sector and the university made by the entrepreneur on the probability of being active in 2015. According to the results, if the sector of activity of the company and the university course made by the entrepreneur are connected in term of future job applications and skills required (by the sector) and/or offered (by the university) the probability of being active increases.

[26] p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

Table 39 Probit: Factors that characterize a successful company

Probit		Model B1			Model B2	
CompStatus	Coef.	Robust Std. Err.		Coef.	Robust Std. Err.	
_cons	1.780838	(0.96)	*	1.929639	(0.99)	*
Male	0.044668	(0.12)		0.044109	(0.12)	
YStudy	0.006909	(0.04)		0.006868	(0.04)	
GradMark	-0.0053	(0.01)		-0.00498	(0.01)	
ExpAbroad	-0.41837	(0.25)	*	-0.3985	(0.25)	
TotCredEcon	-0.00672	(0.00)	**	-0.00678	(0.00)	**
AGR	0.247669	(0.30)		0.316624	(0.31)	
ECON	(omitted)			(omitted)		
PHARM	0.19673	(0.33)		0.198663	(0.33)	
LAW	0.065761	(0.39)		0.085902	(0.39)	
ENG	0.307066	(0.26)		0.313182	(0.26)	
LIT	0.246319	(0.30)		0.249823	(0.30)	
MED_CH	0.200057	(0.27)		0.228199	(0.27)	
MED_VET	0.310078	(0.30)		0.331405	(0.30)	
PSYC	0.239956	(0.28)		0.247039	(0.28)	
SC_FORM	0.473272	(0.38)		0.477989	(0.38)	
SC_MAT	-0.04552	(0.29)		-0.03318	(0.29)	
SC_POL	0.233352	(0.28)		0.249325	(0.28)	
SC_STAT	0.309216	(0.42)		0.306825	(0.42)	
SameProv	-0.05944	(0.13)		-0.05285	(0.13)	
UnivInflue	0.589779	(0.15)	***	0.588111	(0.15)	***
CompDurUniv	0.422644	(0.30)		0.422813	(0.30)	
AgeComp	0.038934	(0.02)	**	0.040005	(0.02)	***
TotEmpl	-0.00312	(0.01)		-0.00375	(0.01)	
CoNE	(omitted)			(omitted)		
CoNW	0.056981	(0.22)		0.050959	(0.22)	
CoCentre	-0.47702	(0.22)	**	-0.48086	(0.21)	**
CoSouth	-0.38362	(0.19)	**	-0.39017	(0.19)	**
CoIslands	-0.34528	(0.23)		-0.33653	(0.23)	
A				-0.43309	(0.31)	
X				-0.08533	(0.31)	
SO				-0.20194	(0.26)	
Number of obs		1735			1735	
Wald chi2(34)		48.97			57.83	
Pseudo R2		0.0936			0.0971	
Log pseudolikelihood		-302.105			-300.949	

Source: DTB_Co Authors' elaboration (STATA)

CONCLUSIONS

With this report, we provided an in-depth analysis of entrepreneurship concerning the former students graduated at the University of Padova and their entrepreneurial activities. We focused on the population of students graduated from 2000 and 2010, comparing the characteristic of managers, entrepreneurs and other roles. We analysed their entrepreneurial activities and skills providing some robust evidence that could be useful for implementing effective actions to support entrepreneurship among university students. The matching of each student with the companies present in the Italian Business Register allowed a specific analysis of the characteristic that can led to the business creation and at the same time assess possible correlations between the university path, company status and so economic growth.

The econometric analysis partially confirmed the results obtained with the descriptive statistics. Comparing the models with the higher pseudoR2 (Model A2 and A4 in Table 37 and 38) concerning the factors that affect propensity to become entrepreneurs and managers, there are many similarities between the two categories of individuals. The variables Male, YStudy, Grad Mark and ExpAbroad are significant and have the same sign in both the models. The results obtained with the models confirm the preliminary analysis of the data about the gender and add extra information about factors related to university. The characteristic of entrepreneurs and manager seems to be more common for males despite the total amount of females exceeds half of the sample. About this topic, the action plan "Entrepreneurship 2020" (European Commission, 2013) highlighted issues related to the creation of a new business for women rather than men, primarily with regard to access to finance, training, networks and the reconciliation between the company and the family. In 2009, the Commission launched the European Network of Female Entrepreneurship Ambassadors that provides support and role models addressed to potential entrepreneurs. In addition, in 2012 the Commission presented a proposal to improve the gender balance on the boards of listed companies. Even if an individual requires different skills and abilities than entrepreneurial to be part of the board, a greater number of women in senior management could serve as a role model for other women in general and stimulate the resourcefulness.

A delay or an extension of time while studying at university has a negative effect on both roles and that result is linked to the business creation. The time between graduation and company creation in fact, could reach 10 years and students also tend to create companies when they are 33-34 years old and to get the diploma at 26-27, on average 7-8 years before. The reduction of

this period and the anticipation of the entrepreneurial activity would be a benefit to society as a whole. The higher is the age the greater is the experience but also the greater the risk concerning a future occupation in case of failure. Since business creation often involves resignation from previous employment, young people would be able to adapt better than someone who is older. In addition, when a person is at university or right after graduation, is in a flexible position having in most of the cases no mortgage, no full time job and no family responsibilities. University could help to reduce the time between graduation and company creation stimulating the creation of enterprises during years of study ensuring that this does not affect negatively academic performance. Entrepreneurs that founded a company during the academic years in fact, have a lower final grade compared to entrepreneurs that created a company after graduation (on average 96 vs 98 out of 110). The time and the effort needed to create a business could affect the academic routine and results and so could be the cause of the gap between final grades of the two categories of individuals. Some solutions could include offering extra credit to students that create a new business during academic years and/or preparing substitution programs to normal internship involving the formation of work teams with an idea of business (perhaps linking students from different university courses).

Managers are the category with more credits in economics followed by entrepreneurs and finally by the other students, furthermore they have a higher final grade rather than entrepreneurs do on average. The result confirm the expectation since a "manager oriented" student could be more inclined to take care of his academic career in a future prospective of competition with peers. An "entrepreneur oriented" student instead, could be distracted or taken from another kind of interest such a university start-up.

According to Models A2 and A4 (Table 37 and 38) the presence of courses specialised in company management (NCrManag), products science (NCrProdScien) and organisation (NCrCompMan) could be positive entrepreneurial stimuli. The last category also contributes positively to the probability of being a manager after graduation. The result confirm the output obtained by Colombo et al (2015) that studied the relation between the academic curriculum and the decision to became an entrepreneur for technology based university student of Politecnico di Milano. The result showed that specialisation and participation to management and economic courses have a positive effect on business creation in term of probability to become an entrepreneur. The authors emphasize the need to stimulate student entrepreneurship developing specialised courses and increasing the number of credits in economics and management also in other university areas.

The course category with more entrepreneurs and managers in absolute terms is Engineering (ENG) that includes 19.7% of all the entrepreneurs (respect to the total number of entrepreneurs) and 28.6% of all the managers (in respect to the total number of managers). This ranking however does not consider the total amount of student enrolled in each course and considering instead the percentage of manager and entrepreneurs respect to this info, the higher percentage is attributed to Agronomy (AGR). About 9.9% of the total number of student enrolled in the course from 2000 to 2010 is labelled as entrepreneurs while 2.8% have a managerial role in a company. Camelli and Ferrante (2014) obtained a similar result observing that the self-employment was more common for graduates in Agronomy or agriculture related courses. Assuming that this specific academic career should lead to become an agricultural entrepreneur, this elevate number could be the consequence of an agronomy favourable treatment of this category rather than commercial entrepreneurs due to incentives and concessions . According to Models A2 and A4 (Table 37 and 38) that analyse the probability of being an entrepreneur or a manager also on the basis of the course attended by individuals respect to ECON , the AGR superior position is reduced. The probability to become an entrepreneur is higher (compared to an individual that attended a course in economics) if the student is enrolled in MED_VET (veterinary), SC_POL (political science), PHARM (pharmaceutical science) and AGR (agronomy). Considering instead the probability to become a manager, MED_VET (veterinary) increases the chances while PSYC (psychology) reduces them. Echoing the result obtained earlier, we believe that increasing the economics knowledge of the students is not enough in order to stimulate entrepreneurial and managerial activities since student with an academic curriculum based on matters totally unrelated to the management (e.g. veterinary) have apparently more chances to cover one of the roles.

As well as increasing the total number of companies, it is also important that these companies are successful. About 57% of the companies related to a “student-manager” are linked to the academic course of the student while 43% belong to a different area or context. The companies founded by “student-entrepreneurs” are more related with the university course presenting a connection in 60.2% of the cases. The second model applied (Table 39) sustains that if the sector of activity of the company and the university course made by the entrepreneur are connected in term of future job applications and skills required (by the sector) and/or offered (by the university) the probability of being an active company in 2015 increases. If we indicate the company status in 2015 as an indicator of the entrepreneur's management skills, in order to stimulate the creation of successful companies it would be advisable to ensure a greater specialization for students (Colombo et el. 2012) that culminates in a creation of a company in

a related sphere. According to Åstebro et al. (2012), a better economic education and the consistency between university courses and sectors increase the earnings for entrepreneurs still active in their business one year later after the company foundation. Entrepreneurs earn more respect to their peers if there is consistency between university and sectors of activity. The higher benefits could derive from an efficient organisation of the activity and so the individual skills. The authors also observed that the overall survival rates are higher for start-ups related to degree of the founder.

The entrepreneurial activity is the foundation for the value creation process and must be encouraged in order to increase the amount and the quality of new companies. Some processes aimed at these objectives could concern the anticipation of the time of creation, the promotion of female entrepreneurship, the increase of the specialisation, networks and motivations of students and other related factors manageable by universities and institutions. In addition to this, the actual low cost of borrowing, the injection of liquidity by ECB (QE), the low cost of fuel and energies and some targeted institutional measures (Entrepreneurship 2020) should create an ideal environment for the creation of enterprise in the coming years.

The analysis and the model applied present some limitations mainly due to the nature of the data and the absence of information concerning the character, psychological traits and information about the family. Moreover, the study consider as entrepreneurs only individuals that founded a company after the legal age in order to try to avoid firms inheritors or acquirers of already based businesses and to have higher probability to analyse the original founders since this specific information is not available. The result must be considered as a single case outcome and could be compared and aggregated with future researches of other universities environments or additional information about Padua's ecosystem. In particular, the data and the results obtained will be matched with information resulting from a survey made on a sub-sample of entrepreneurs present in DTB_St. The aim is to study the factors that affect entrepreneurship adding information about the entrepreneurial motivations and other individual characteristic (e.g. if the company was inherited or not) and capabilities not available in the raw database.

The results therefore are only a starting point to better understand the phenomenon of the student entrepreneurship and many steps have to be taken for future researches, but citing Horace (Epist., I, 2, 40): "dimidium facti, here coepit, habet".

BIBLIOGRAPHY

Abell P., Crounchley R. and Millis C. (2001). "Social Capital and Entrepreneurship in Great Britain", in *Enterprise and innovation management studies*, 2.2, pp 119-144.

Amway (2015). "Defining the entrepreneurial spirit", AGER 2015, Global entrepreneurship report available at www.amwayentrepreneurshipreport.tum.de/index.php?id=5&L=1.

Åstebro T., Bazzaziana N. and Braguinsky S. (2012). "Startups by recent university graduates and their faculty: Implications for university entrepreneurship policy", *Research Policy*, 41.4, pp 663-677.

Aldrich H.E. (1999). "*Organizations evolving*", SAGE Publications, Trowbridge (UK), pp 19-33.

Birch D.L. (1979). "*The Job Generation Process*", MIT Program on Neighborhood and Regional Change, Cambridge (US), pp 12-20.

Bonaccorsi A. and Granelli A. (2005). "*L'intelligenza s'industria. Creatività e innovazione per un nuovo modello di sviluppo*", Collana Arel, Il Mulino, Bologna (IT), pp 17-35.

BusinessEurope (2013). "Europe must unleash the entrepreneurial potential of its citizens", Press release, available at https://www.businesseurope.eu/publications/europe-must-unleash-entrepreneurial-potential-its-citizens.

Camelli A. and Ferrante F. (2014). "Entrepreneurship and innovation: the role played by graduates", Almalaurea working papers, ISSN 2239-9453 no. 69.

Cantillon, R. (1931). "*Essay on the Nature of Commerce in General*", Transaction Publ. MacMillan, London (UK), pp 5-31.

Carreea M.A. and Thurik A.R (2012). "The Impact of Entrepreneurship on Economic Growth", in *Handbook of entrepreneurship research*, Springer (US), pp 437-471.

Casson M. (1982). "*The entrepreneur. An economic theory*", Barnes & Noble Books, Totowa, (NJ), pp 384-395.

Ciappei C., Schillaci S. and Tani S. (2006). "Gli incubatori di impresa: esperienze a confronto", Firenze University Press.

Colombo M. G., Piva E., Rossi-Lamastra C (2015). “Student entrepreneurs from technology-based universities: the impact of course curriculum on entrepreneurial entry”, Department of Management, Economics and Industrial Engineering, Politecnico di Milano, Anvur attachments, article 779.

Demattè C. (1991). “Riflessioni attorno al ruolo imprenditoriale”, in *Economia e Management*, Milano (IT), Vol 23, pp 5-7.

Etzkowitz H., and Leydesdorff L. (2000). “The Dynamics of Innovation: From National Systems and 'Mode 2' to a Triple Helix of University-Industry-Government Relations”, *Research Policy*, 29.2, pp 109-123.

Eurochambres (2013). “Entrepreneurship Action Plan: motivating potential new entrepreneurs the no. 1 priority”. Press Release, available at http://www.eurochambres.eu/objects/1/Files/PR-Entrepreneurship_Action_Plan.pdf.

European Commission (2001). “Opinion of the Committee of the Regions on the Communication from the Commission — Challenges for enterprise policy in the knowledge-driven economy”. *Official Journal of the European Communities*, 2001/C 22/04.

European Commission (2003A). “Concerning the definition of micro, small and medium-sized enterprises”, *Official Journal of the European Union*, EU recommendation 2003/361, article 2 of the Annex.

European Commission (2003B). “Green Paper on Entrepreneurship in Europe”, Commission Green Paper, Bruxelles (BE), 21.1.2003 COM (2003) 27 final, available at ec.europa.eu/invest-in-research/pdf/download_en/entrepreneurship_europe.pdf .

European Commission (2013). “Piano d'azione imprenditorialità 2020”, Comunicazione della commissione, Bruxelles (BE), 9.1.2013 COM(2012) 795 final, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0795:FIN:it:PDF.

Ferrante F. and Supino S. (2016). “Le misure di sostegno alla nuova imprenditorialità. Le buone pratiche su scala europea, con particolare riferimento all’educazione imprenditoriale”, Munich Personal RePEc Archive, Paper No. 68930.

Fini R., Meoli A., Sobrero M., Ghiselli S., Ferrante F. (2016). “Student Entrepreneurship: Demographics, Competences and Obstacles”, Technical Report - Almalaurea Consortium, available at https://ssrn.com/abstract=2740541.

Gibson D.V. and Smilor R.W. (1991). “The role of the research university in creating and sustaining the U.S. technopolis”, in *University spin-off companies: economic development, faculty entrepreneurs, and technology transfer*, Rowman & Littlefield, Savage (MD), 31-70, pp 31-70.

Grimaldi R., Kenney M., Siegel D.S. and Wright M. (2011). “30 years after Bayh–Dole: Reassessing academic entrepreneurship”, *Research Policy*, 40.8, pp 1045-1057.

Hart M., Levie J., Shasul M. K. (2015). “Closing the Generational Start-up Gap”, Strathprints Institutional Repository, available at http://strathprints.strath.ac.uk/41939/.

Hébert R. F. and Link A. N. (1989). “In Search of the Meaning of Entrepreneurship”, *Small Business Economics*, 1.1, pp 39-49.

Hynes B. (1996). "Entrepreneurship education and training – introducing entrepreneurship into non-business disciplines”, *Journal of European Industrial training*, 20.8, pp 10-17.

Kirzner I.M. (1973). “*Competition and Entrepreneurship*”, University of Chicago Press, Chicago (IL), pp 30-88.

Knight F.H. (1921). “*Risk, Uncertainty and Profit*”, University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, Chicago (IL), pp 3-10.

McClelland D.C. (1962). “*The Achieving Society*”, D. Van Nostrand Company, Inc. Princeton (NJ), pp 63-70.

Nelson R. and S. Winter (1982). “An Evolutionary Theory of Economic Change”, University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, available: https://ssrn.com/abstract=1496211.

Parker S. C. (2009). “The Economics of Entrepreneurship”. Cambridge University Press.

Petretto L. (2008). “Imprenditore ed Università nello start-up di impresa”. Firenze University Press.

Penrose E.T. (2002). “*The theory of the growth of the firm*”, Oxford University Press, Oxford (UK), pp 279-309.

Porter M. E. (1990). “*The Competitive Advantage of Nations*”, Harvard business review, Cambridge (MA), 68.2, pp 73-93.

Ramaciotti L., Daniele C. (2016). “Ricerca, valorizzazione dei risultati ed impatto”. XIII Rapporto Netval sullla Valorizzazione della Ricerca Pubblica Italiana, available at http://netval.it//static/media/uploads/files/Survey_2016_dati_2014.pdf.

Ranga, M. and Etzkowitz H. (2013). “Triple Helix Systems: An Analytical Framework for Innovation Policy and Practice in the Knowledge Society”, *Industry and Higher Education*, 27(4) pp 237-262.

Schumpeter J.A. (1934). “*The Theory of Economic Development*”, Harvard University Press, Cambridge (MA), pp 61-116.

Segal G., Borgia D. and Schoenfeld J. (2005). “The motivation to become an entrepreneur”. *International Journal of Entrepreneurial Behaviour & Research,* Vol. 11 No. 1, pp. 42-57.

Shane S.A. and Venkataraman S. (2000). “The promise of entrepreneurship as a field of research”, *Academy of Management Review*, 25.1, pp 21-26.

Siropolis N. (1982). “*Small Business management, a guide to entrepreneurship*”, Houghton Mifflin Company, Boston (MA), pp 8-15.

Smith A. (1776). “*An Inquiry into the Nature and Causes of the Wealth of Nations*”, Methuen and Co. London (UK), pp 147-195.

Stefensen M., Rogers E. and Speakman K. (2000). “Spin-offs from research centres at research university”. *Journal of Business of Economics*, 15.1, pp 93-111.

Stinchcombe A.L. (1965). “Organizations and social structure”, in *Advances in strategic management*, Toronto (CAD), 17, pp 229-259.

Vallini C. and Simoni C. (2006). “Higher Education and entrepreneurial vocation and capabilities: a University of Florence case”, Firenze University Press.

Wennekers A.R.M. and Thurik A.R. (1999). “Linking entrepreneurship and economic growth”, *Small business economics*, 13.1, pp 27-56.

Ueapme (2013). “Entrepreneurship 2020 Action Plan sets right priorities, say SMEs”. Press Statement for immediate release, available at http://www.ueapme.com/IMG/pdf/130109_pr_Entrepreneurship_2020_Action_Plan.pdf.

Unioncamere Veneto (2016). “La situazione economica del Veneto”, Rapporto annuale 2016, available at http://rapportoannuale.unioncamereveneto.it/.

University of Padova (2015). “Nucleo di Valutazione di Ateneo” rapporto annuale sull’ateneo 2014-2015, available at http://www.unipd.it/nucleo/rapporti-annuali.

Zahra S.A. (2005). “Entrepreneurship and Disciplinary Scholarship: Return to the Fountainhead”, in Alvarez S.A., Agarwal R. and Sorenson O, *Handbook of Entrepreneurship Research. Interdisciplinary Perspectives*, Springer (US), pp 253-68.

APPENDIX

APPENDIX A : Course category allocation

Course	Course Category
BIOTECNOLOGIE AGRARIE	AGRARIA
GESTIONE TECNICA E AMMINISTRATIVA IN AGRICOLTURA	AGRARIA
INDUSTRIE DEL LEGNO	AGRARIA
PRODUZIONI VEGETALI	AGRARIA
SCIENZE AGRARIE	AGRARIA
SCIENZE E TECNOLOGIE VITICOLE ED ENOLOGICHE	AGRARIA
SCIENZE FORESTALI	AGRARIA
SCIENZE FORESTALI E AMBIENTALI	AGRARIA
TECNOLOGIE ALIMENTARI	AGRARIA
TECNOLOGIE E INDUSTRIE DEL LEGNO	AGRARIA
TECNOLOGIE FORESTALI E AMBIENTALI	AGRARIA
TUTELA E MANUTENZIONE DEL TERRITORIO	AGRARIA
TUTELA E RIASSETTO DEL TERRITORIO	AGRARIA
PAESAGGIO, PARCHI E GIARDINI	AGRARIA
SCIENZE E TECNOLOGIE AGRARIE	AGRARIA
SCIENZE E TECNOLOGIE ALIMENTARI	AGRARIA
TECNICHE FORESTALI E TECNOLOGIE DEL LEGNO	AGRARIA
TECNICHE VIVAISTICHE	AGRARIA
ECONOMIA AZIENDALE	ECONOMIA
ECONOMIA E COMMERCIO	ECONOMIA
ECONOMIA E DIREZIONE AZIENDALE	ECONOMIA
CHIMICA E TECNOLOGIA FARMACEUTICHE	FARMACIA
FARMACIA	FARMACIA
INFORMAZIONE SCIENTIFICA SUL FARMACO	FARMACIA
GIURISPRUDENZA	GIURISPRUDENZA
SCIENZE GIURIDICHE	GIURISPRUDENZA
SERVIZI GIURIDICI	GIURISPRUDENZA
CONSULENTE DEL LAVORO	GIURISPRUDENZA
OPERATORE GIURIDICO D'IMPRESA	GIURISPRUDENZA
SCIENZE DELLE RELIGIONI	LETTERE E FILOSOFIA
VITICOLTURA, ENOLOGIA E MERCATI VITIVINICOLI	AGRARIA
BIOLOGIA MARINA	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOTECNOLOGIE SANITARIE	MEDICINA E CHIRURGIA
COMUNICAZIONE	PSICOLOGIA
COOPERAZIONE ALLO SVILUPPO	AGRARIA
LINGUE STRANIERE PER LA COMUNICAZIONE INTERNAZIONALE	LETTERE E FILOSOFIA
SCIENZE DELLA COMUNICAZIONE	PSICOLOGIA
SCIENZE E CULTURA DELLA GASTRONOMIA E DELLA RISTORAZIONE	AGRARIA
SCIENZE E TECNICHE DELL'ATTIVITA' MOTORIA PREVENTIVA E ADATTATA	SCIENZE DELLA FORMAZIONE
SCIENZE E TECNOLOGIE ANIMALI	MEDICINA VETERINARIA
SCIENZE E TECNOLOGIE PER L'AMBIENTE	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE MOTORIE	SCIENZE DELLA FORMAZIONE
ACQUACOLTURA	AGRARIA
DISCIPLINE DELLA MEDIAZIONE LINGUISTICA E CULTURALE	LETTERE E FILOSOFIA
TECNICHE ERBORISTICHE	FARMACIA
INGEGNERIA AEROSPAZIALE	INGEGNERIA
INGEGNERIA BIOMEDICA	INGEGNERIA
INGEGNERIA CHIMICA	INGEGNERIA
INGEGNERIA CIVILE	INGEGNERIA
INGEGNERIA CIVILE - SEZIONE EDILE	INGEGNERIA
INGEGNERIA CIVILE - SEZIONE IDRAULICA	INGEGNERIA
INGEGNERIA DEI MATERIALI	INGEGNERIA
INGEGNERIA DELL'AUTOMAZIONE	INGEGNERIA
INGEGNERIA DELLE TELECOMUNICAZIONI	INGEGNERIA

INGEGNERIA DELL'INFORMAZIONE	INGEGNERIA
INGEGNERIA EDILE	INGEGNERIA
INGEGNERIA ELETTRICA	INGEGNERIA
INGEGNERIA ELETTRONICA	INGEGNERIA
INGEGNERIA ELETTROTECNICA	INGEGNERIA
INGEGNERIA GESTIONALE	INGEGNERIA
INGEGNERIA INFORMATICA	INGEGNERIA
INGEGNERIA MECCANICA	INGEGNERIA
INGEGNERIA MECCATRONICA	INGEGNERIA
INGEGNERIA PER L'AMBIENTE E IL TERRITORIO	INGEGNERIA
INGEGNERIA CIVILE - SEZIONE TRASPORTI	INGEGNERIA
INGEGNERIA ENERGETICA	INGEGNERIA
INGEGNERIA INFORMATICA E AUTOMATICA	INGEGNERIA
ARCHEOLOGIA	LETTERE E FILOSOFIA
DISCIPLINE DELL'ARTE, DELLA MUSICA E DELLO SPETTACOLO	LETTERE E FILOSOFIA
GEOGRAFIA DEI PROCESSI TERRITORIALI	LETTERE E FILOSOFIA
LETTERE	LETTERE E FILOSOFIA
LINGUE E LETTERATURE STRANIERE	LETTERE E FILOSOFIA
LINGUE E LETTERATURE STRANIERE MODERNE	LETTERE E FILOSOFIA
PROGETTAZIONE E GESTIONE DEL TURISMO CULTURALE	LETTERE E FILOSOFIA
STORIA	LETTERE E FILOSOFIA
STORIA E TUTELA DEI BENI CULTURALI	LETTERE E FILOSOFIA
STORIA MODERNA E CONTEMPORANEA	LETTERE E FILOSOFIA
CULTURA E TECNOLOGIA DELLA MODA	LETTERE E FILOSOFIA
FILOSOFIA	LETTERE E FILOSOFIA
LINGUE, LETTERATURE E CULTURE MODERNE	LETTERE E FILOSOFIA
ASSISTENZA SANITARIA (ABILITANTE ALLA PROFESSIONE SANITARIA DI ASSISTENTE SANITARIO)	MEDICINA E CHIRURGIA
DIETISTICA (ABILITANTE ALLA PROFESSIONE SANITARIA DI DIETISTA)	MEDICINA E CHIRURGIA
FISIOTERAPIA (ABILITANTE ALLA PROFESSIONE SANITARIA DI FISIOTERAPISTA)	MEDICINA E CHIRURGIA
FISIOTERAPISTA	MEDICINA E CHIRURGIA
INFERMIERE	MEDICINA E CHIRURGIA
INFERMIERISTICA (ABILITANTE ALLA PROFESSIONE SANITARIA DI INFERMIERE)	MEDICINA E CHIRURGIA
MEDICINA E CHIRURGIA	MEDICINA E CHIRURGIA
ODONTOIATRIA E PROTESI DENTARIA	MEDICINA E CHIRURGIA
OSTETRICIA (ABILITANTE ALLA PROFESSIONE SANITARIA DI OSTETRICA/O)	MEDICINA E CHIRURGIA
TECNICHE AUDIOMETRICHE (ABILITANTE ALLA PROFESSIONE SANITARIA DI AUDIOMETRISTA)	MEDICINA E CHIRURGIA
TECNICHE DI LABORATORIO BIOMEDICO (ABILITANTE ALLA PROFESSIONE SANITARIA DI TECNICO DI LABORATORIO BIOMEDICO)	MEDICINA E CHIRURGIA
TECNICHE DI RADIOLOGIA MEDICA, PER IMMAGINI E RADIOTERAPIA (ABILITANTE ALLA PROFESSIONE SANITARIA DI TECNICO DI RADIOLOGIA MEDICA)	MEDICINA E CHIRURGIA
TECNICO SANITARIO DI LABORATORIO BIOMEDICO	MEDICINA E CHIRURGIA
TERAPIA DELLA NEURO E PSICOMOTRICITA' DELL'ETA' EVOLUTIVA (ABILITANTE ALLA PROFESSIONE SANITARIA DI TERAPISTA DELLA NEURO E PSICOMOTRICITA' DELL'ETA' EVOLUTIVA)	MEDICINA E CHIRURGIA
IGIENE DENTALE (ABILITANTE ALLA PROFESSIONE SANITARIA DI IGIENISTA DENTALE)	MEDICINA E CHIRURGIA
LOGOPEDIA (ABILITANTE ALLA PROFESSIONE SANITARIA DI LOGOPEDISTA)	MEDICINA E CHIRURGIA
ORTOTTICA ED ASSISTENZA OFTALMOLOGICA (ABILITANTE ALLA PROFESSIONE SANITARIA DI ORTOTTISTA ED ASSISTENTE DI OFTALMOLOGIA)	MEDICINA E CHIRURGIA
SCIENZE DELLE PROFESSIONI SANITARIE TECNICHE DIAGNOSTICHE	MEDICINA E CHIRURGIA
SCIENZE INFERMIERISTICHE ED OSTETRICHE	MEDICINA E CHIRURGIA
TECNICHE AUDIOPROTESICHE (ABILITANTE ALLA PROFESSIONE SANITARIA DI AUDIOPROTESISTA)	MEDICINA E CHIRURGIA
TECNICHE DELLA PREVENZIONE NELL'AMBIENTE E NEI LUOGHI DI LAVORO (ABILITANTE ALLA PROFESSIONE SANITARIA DI TECNICO DELLA PREVENZIONE NELL'AMBIENTE E NEI LUOGHI DI LAVORO)	MEDICINA E CHIRURGIA
TECNICO AUDIOPROTESISTA	MEDICINA E CHIRURGIA

TERAPIA OCCUPAZIONALE (ABILITANTE ALLA PROFESSIONE SANITARIA IN TERAPISTA OCCUPAZIONALE)	MEDICINA E CHIRURGIA
MEDICINA VETERINARIA	MEDICINA VETERINARIA
SICUREZZA IGIENICO-SANITARIA DEGLI ALIMENTI	MEDICINA VETERINARIA
PSICOLOGIA	PSICOLOGIA
PSICOLOGIA CLINICA	PSICOLOGIA
PSICOLOGIA CLINICO-DINAMICA	PSICOLOGIA
PSICOLOGIA DELLO SVILUPPO E DELL'INTERVENTO NELLA SCUOLA	PSICOLOGIA
SCIENZE PSICOLOGICHE COGNITIVE E PSICOBIOLOGICHE	PSICOLOGIA
SCIENZE PSICOLOGICHE DELLA PERSONALITA' E DELLE RELAZIONI INTERPERSONALI	PSICOLOGIA
SCIENZE PSICOLOGICHE SOCIALI E DEL LAVORO	PSICOLOGIA
DISCIPLINE DELLA RICERCA PSICOLOGICO - SOCIALE	PSICOLOGIA
PSICOLOGIA SOCIALE, DEL LAVORO E DELLA COMUNICAZIONE	PSICOLOGIA
PSICOLOGIA SPERIMENTALE E NEUROSCIENZE COGNITIVO-COMPORTAMENTALI	PSICOLOGIA
SCIENZE PSICOLOGICHE DELLO SVILUPPO E DELL'EDUCAZIONE	PSICOLOGIA
ASTRONOMIA	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOLOGIA	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOLOGIA EVOLUZIONISTICA	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOLOGIA MOLECOLARE	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOTECNOLOGIE	SCIENZE MATEMATICHE FISICHE E NATURALI
BIOTECNOLOGIE AGRO-INDUSTRIALI	SCIENZE MATEMATICHE FISICHE E NATURALI
CHIMICA	SCIENZE MATEMATICHE FISICHE E NATURALI
CHIMICA INDUSTRIALE	SCIENZE MATEMATICHE FISICHE E NATURALI
INFORMATICA	SCIENZE MATEMATICHE FISICHE E NATURALI
MATEMATICA	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZA DEI MATERIALI	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE BIOLOGICHE	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE E TECNOLOGIE PER I BENI CULTURALI	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE E TECNOLOGIE PER LA NATURA	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE GEOLOGICHE	SCIENZE MATEMATICHE FISICHE E NATURALI
SCIENZE NATURALI	SCIENZE MATEMATICHE FISICHE E NATURALI
FISICA	SCIENZE MATEMATICHE FISICHE E NATURALI
GEOLOGIA E GEOLOGIA TECNICA	SCIENZE MATEMATICHE FISICHE E NATURALI
OTTICA E OPTOMETRIA	SCIENZE MATEMATICHE FISICHE E NATURALI
EDUCATORE SOCIALE, CULTURALE E TERRITORIALE	SCIENZE DELLA FORMAZIONE
FORMATORE NELLE ORGANIZZAZIONI	SCIENZE DELLA FORMAZIONE
FORMATORE NELLE ORGANIZZAZIONI SOCIALI COMPLESSE	SCIENZE DELLA FORMAZIONE
MATERIE LETTERARIE	SCIENZE DELLA FORMAZIONE
PEDAGOGIA	SCIENZE DELLA FORMAZIONE
SCIENZE DELLA FORMAZIONE PRIMARIA	SCIENZE DELLA FORMAZIONE
SCIENZE DELL'EDUCAZIONE	SCIENZE DELLA FORMAZIONE
SCIENZE PER LA FORMAZIONE DELL'INFANZIA E DELLA PREADOLESCENZA	SCIENZE DELLA FORMAZIONE
SERVIZIO SOCIALE	SCIENZE DELLA FORMAZIONE
EDUCATORE PROFESSIONALE NELLE STRUTTURE SOCIALI, SANITARIE, CULTURALI E AMBIENTALI	SCIENZE DELLA FORMAZIONE

SCIENZE DELL'EDUCAZIONE E DELLA FORMAZIONE	SCIENZE DELLA FORMAZIONE
DIRITTO DELL'ECONOMIA	SCIENZE POLITICHE
ECONOMIA INTERNAZIONALE	SCIENZE POLITICHE
ECONOMIA TERRITORIALE E RETI D'IMPRESE	SCIENZE POLITICHE
GOVERNO DELLE AMMINISTRAZIONI	SCIENZE POLITICHE
ISTITUZIONI E POLITICHE DEI DIRITTI UMANI E DELLA PACE	SCIENZE POLITICHE
OPERATORE DELLA PUBBLICA AMMINISTRAZIONE	SCIENZE POLITICHE
POLITICA INTERNAZIONALE E DIPLOMAZIA	SCIENZE POLITICHE
SCIENZE POLITICHE	SCIENZE POLITICHE
SCIENZE POLITICHE E RELAZIONI INTERNAZIONALI	SCIENZE POLITICHE
SCIENZE SOCIOLOGICHE	SCIENZE POLITICHE
DIRITTO, ISTITUZIONI E POLITICHE DELL'INTEGRAZIONE EUROPEA	SCIENZE POLITICHE
POLITICA E INTEGRAZIONE EUROPEA	SCIENZE POLITICHE
POLITICHE DELL'UNIONE EUROPEA	SCIENZE POLITICHE
SCIENZE STATISTICHE E DEMOGRAFICHE	SCIENZE STATISTICHE
SCIENZE STATISTICHE, DEMOGRAFICHE E SOCIALI	SCIENZE STATISTICHE
STATISTICA (CORSO BIENNALE)	SCIENZE STATISTICHE
STATISTICA E GESTIONE DELLE IMPRESE	SCIENZE STATISTICHE
STATISTICA E INFORMATICA	SCIENZE STATISTICHE
STATISTICA E INFORMATICA PER LA GESTIONE DELLE IMPRESE	SCIENZE STATISTICHE
STATISTICA, ECONOMIA E FINANZA	SCIENZE STATISTICHE
STATISTICA, POPOLAZIONE E SOCIETA'	SCIENZE STATISTICHE
SCIENZE STATISTICHE ED ECONOMICHE	SCIENZE STATISTICHE
STATISTICA E INFORMATICA PER LE AMMINISTRAZIONI PUBBLICHE	SCIENZE STATISTICHE
STATISTICA E TECNOLOGIE INFORMATICHE	SCIENZE STATISTICHE

APPENDIX B: Credits in economics exams composition

Economics courses available	
NCrEcmetrx	Econometria
NCrAdvEcon	Economia applicata
NCrAccount	Economia aziendale
NCrIntermed	Economia degli intermediari finanziari
NCrManag	Economia e gestione delle imprese
NCrBusinFin	Finanza aziendale
NCrIngEco	Ingegneria economico
NCrCompMan	Organizzazione aziendale
NCrPolEcon	Politica economica
NCrFinScien	Scienza delle finanze
NcrProdScien	Scienze merceologiche
NCrHistor	Storia del pensiero economico
NCrHistEcon	Storia economica

APPENDIX C: Roles associated with the definition of Manager

Roles
Preposto
Preposto Alla Gestione Tecnica
Titolare Firmatario
Amministratore Unico
Socio Accomandatario
Socio Amministratore
Amministratore
Responsabile Tecnico
Socio Unico
Direttore Tecnico
Amministratore Delegato
Consigliere Delegato
Direttore Generale
Titolare
Legale Rappresentante
Socio Di Opera
Delegato Di Cui Art. 2 Legge 25/8/91 N.287
Direttore
Socio Lavorante
Procuratore Generale
Responsabile
Presidente Comitato Direttivo
Collaboratore Familiare
Delegato Di Cui All'Art. 2 Della Legge 287 D
Preposto Di Cui All'Art. 2 Legge Re. N. 37 D
Direttore Responsabile
Socio Accomandatario D'Opera

APPENDIX D: Course-Sector association

Sectors	
A	Agricoltura, silvicoltura pesca
B	Estrazione di minerali da cave e miniere
C	Attività manifatturiere
D	Fornitura di energia elettrica, gas e vapore
E	Fornitura di acqua e reti fognarie
F	Costruzioni
G	Commercio all'ingrosso e al dettaglio
H	Trasporto e magazzinaggio
I	Attività dei servizi alloggio e ristorazione
J	Servizi di informazione e comunicazione
K	Attività finanziarie e assicurative
L	Attivita immobiliari
M	Attività professionali, scientifiche e tecniche
N	Noleggio e agenzie di viaggio
P	Istruzione
Q	Sanita e assistenza sociale
R	Attività artistiche, sportive, di intrattenimento
S	Altre attività di servizi
X	Imprese non classificate

Course Category	Sectors associated
AGRARIA	A C I
ECONOMIA	G H M N
FARMACIA	C M Q
GIURISPRUDENZA	K L M S
INGEGNERIA	B C D E F G
LETTERE E FILOSOFIA	I J N R
MEDICINA E CHIRURGIA	M Q
MEDICINA VETERINARIA	M Q
PSICOLOGIA	J N P Q
SCIENZE DELLA FORMAZIONE	M N P Q S
SCIENZE MATEMATICHE FISICHE E NATURALI	B C D E F J
SCIENZE POLITICHE	K M N S
SCIENZE STATISTICHE	G H K M N R

APPENDIX E: DTB_St Correlation Matrix

0 p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

	Entrepr	Manager	Male	YStudy	GradMark	ExpAbroad	AGR
Entrepr	1						
	***						
Manager	-0.021	1					
	***	***					
Male	0.0942	0.0651	1				
	***	***	***				
YStudy	-0.0041	-0.0317	0.0279	1			
	0	***	***	***			
GradMark	-0.0481	-0.021	-0.1617	-0.3217	1		
	***	***	***	***	***		
ExpAbroad	-0.0122	-0.0101	0.0107	0.0239	0.0964	1	
	***	**	***	***	***	***	
AGR	0.072	0.0155	0.1186	0.0041	0.0262	0.0029	1
	***	***	***	0	***	0	***
ECON	-0.0059	0.0077	0.006	-0.021	-0.0785	0.0746	-0.0365
	0	*	0	***	***	***	***
PHARM	0.0177	0.0001	-0.0471	0.1815	-0.0043	0.0093	-0.0292
	***	0	***	***	0	**	***
LAW	-0.0093	-0.0126	-0.0236	0.0878	-0.0896	-0.0194	-0.0392
	**	***	***	***	***	***	***
ENG	-0.0139	0.0079	0.386	-0.0117	-0.1752	-0.025	-0.0959
	***	**	***	***	***	***	***
LIT	-0.0098	-0.0177	-0.1127	0.1395	0.1412	0.0893	-0.0736
	**	***	***	***	***	***	***
MED_CH	0.0156	0.0436	-0.1077	-0.2621	-0.0135	-0.057	-0.0952
	***	***	***	***	***	***	***
MED_VET	0.0271	0.0068	-0.0068	0.0939	-0.0067	0.0027	-0.0201
	***	*	*	***	*	0	***
PSYC	-0.0329	-0.0281	-0.197	-0.0484	0.1611	-0.0087	-0.0906
	***	***	***	***	***	**	***
SC_FORM	-0.0239	-0.0176	-0.1379	0.0793	-0.0098	-0.0411	-0.0537
	***	***	***	***	**	***	***
SC_MAT	-0.0072	-0.0108	0.0605	-0.0366	0.0171	0.0158	-0.0633
	*	***	***	***	***	***	***
SC_POL	0.0166	0.0069	-0.0017	0.0982	0.004	0.0008	-0.063
	***	*	0	***	0	0	***
SC_STAT	0.0068	-0.0075	0.0365	-0.0418	-0.067	0.0013	-0.03
	*	*	***	***	***	0	***
StNW	0.005	0.0393	-0.0535	-0.0506	0.0808	0.0198	-0.0134
	0	***	***	***	***	***	***

	Entrepr	Manager	Male	YStudy	GradMark	ExpAbroad	AGR
StNE	-0.0596***	-0.0742***	0.0461***	0.089***	-0.0701***	-0.012***	0.0273***
StCentre	0.0392***	0.0543***	-0.00320	-0.0511***	0.0347***	0.0087**	-0.0087**
StSouth	0.0469***	0.0419***	-0.0112***	-0.0426***	0.0161***	-0.00390	-0.0171***
StIslands	0.0496***	0.023***	-0.008**	-0.0377***	0.0104***	0.00110	-0.0073*
StForeign	-0.0065*	-0.0089**	-0.00060	0.00130	-0.0317***	-0.0099**	-0.0122***
NCrIngEco	-0.0060	0.0078**	0.1763***	0.0476***	-0.1626***	-0.0467***	-0.0463***
NCrPolEcon	0.0183***	0.00470	0.0219***	0.0822***	-0.0997***	0.0169***	-0.0258***
NCrFinScien	0.00290	0.0114***	0.0077*	0.0847***	-0.1623***	-0.0164***	-0.0475***
NCrHistor	-0.0010	-0.00430	-0.00560	0.0762***	0.00650	-0.0050	-0.031***
NCrEcmetrx	-0.00080	-0.0068*	0.0148***	0.00390	-0.0438***	-0.00280	-0.0178***
NCrAdvEcon	0.0107***	0.0155***	0.0324***	0.0208***	-0.1062***	-0.0215***	-0.0295***
NCrAccount	0.0186***	0.0214***	0.0105***	0.0392***	-0.1507***	0.0319***	-0.0368***
NCrManag	0.0252***	0.0069*	-0.00590	0.084***	-0.1164***	0.0177***	-0.0508***
NCrBusinFin	-0.00010	-0.00580	0.00320	0.0075*	-0.0456***	-0.0097**	-0.0159***
NCrCompMan	0.031***	0.0257***	0.0157***	0.0506***	-0.1192***	0.0136***	0.1461***
NCrIntermed	0.00110	0.00370	-0.00290	0.04***	-0.1071***	0.0376***	-0.037***
NCrHistEcon	0.01**	0.0148***	0.032***	0.0526***	-0.1233***	0.025***	-0.0294***
NcrProdScien	0.00630	-0.00360	-0.0158***	0.00070	0.0271***	0.00580	-0.00640
TotCredEcon	0.0221***	0.019***	0.0564***	0.0948***	-0.2103***	0.0108***	-0.0452***

	ECON	PHARM	LAW	ENG	LIT	MED_CH	MED_VET
ECON	1						
	***						
PHARM	-0.0245	1					
	***	***					
LAW	-0.0329	-0.0263	1				
	***	***	***				
ENG	-0.0805	-0.0642	-0.0863	1			
	***	***	***	***			
LIT	-0.0618	-0.0493	-0.0663	-0.1619	1		
	***	***	***	***	***		
MED_CH	-0.0799	-0.0638	-0.0857	-0.2095	-0.1608	1	
	***	***	***	***	***	***	
MED_VET	-0.0169	-0.0135	-0.0181	-0.0443	-0.034	-0.0439	1
	***	***	***	***	***	***	***
PSYC	-0.0761	-0.0607	-0.0816	-0.1995	-0.1531	-0.198	-0.0418
	***	***	***	***	***	***	***
SC_FORM	-0.0451	-0.036	-0.0484	-0.1182	-0.0907	-0.1173	-0.0248
	***	***	***	***	***	***	***
SC_MAT	-0.0532	-0.0424	-0.057	-0.1394	-0.107	-0.1384	-0.0292
	***	***	***	***	***	***	***
SC_POL	-0.0529	-0.0422	-0.0568	-0.1388	-0.1065	-0.1378	-0.0291
	***	***	***	***	***	***	***
SC_STAT	-0.0252	-0.0201	-0.0271	-0.0661	-0.0508	-0.0657	-0.0139
	***	***	***	***	***	***	***
StNW	-0.0334	-0.0088	-0.0352	-0.0833	0.007	-0.0155	-0.0121
	***	**	***	***	*	***	***
StNE	0.043	0.0105	0.0507	0.1181	0.0257	-0.0275	0.0204
	***	***	***	***	***	***	***
StCentre	-0.0172	-0.0106	-0.0188	-0.0434	-0.0243	0.0317	-0.0108
	***	***	***	***	***	***	***
StSouth	-0.011	-0.0004	-0.0191	-0.05	-0.0301	0.0292	-0.0104
	***	0	***	***	***	***	***
StIslands	-0.022	-0.0047	-0.0174	-0.0448	-0.0198	0.0323	-0.0055
	***	0	***	***	***	***	0
StForeign	0.0002	0.0045	-0.0127	-0.0102	0.0062	-0.005	-0.0029
	0	0	***	***	0	0	0
NCrIngEco	-0.0389	-0.031	-0.0417	0.4754	-0.0782	-0.1012	-0.0214
	***	***	***	***	***	***	***
NCrPolEcon	0.1584	-0.0346	-0.0086	-0.1117	-0.0838	-0.113	-0.0239
	***	***	**	***	***	***	***

	ECON	PHARM	LAW	ENG	LIT	MED_CH	MED_VET
NCrFinScien	0.4317***	-0.032***	0.2958***	-0.104***	-0.0807***	-0.1044***	-0.022***
NCrHistor	-0.0269***	-0.0215***	-0.0272***	-0.0705***	-0.0321***	-0.07***	-0.0148***
NCrEcmetrx	0.1036***	-0.0119***	-0.016***	-0.0392***	-0.0301***	-0.0389***	-0.0082**
NCrAdvEcon	-0.0323***	-0.0258***	-0.0345***	-0.0666***	-0.0648***	0.0301***	-0.0178***
NCrAccount	0.7093***	-0.0073*	-0.0224***	-0.1096***	-0.084***	-0.0926***	0.0194***
NCrManag	0.1944***	-0.0225***	-0.0464***	-0.1218***	0.0631***	-0.1162***	-0.0259***
NCrBusinFin	0.2359***	-0.0107***	-0.0133***	-0.0321***	-0.0269***	-0.0348***	-0.0073*
NCrCompMan	0.5378***	-0.029***	0.0262***	-0.1123***	-0.0473***	-0.0551***	-0.016***
NCrIntermed	0.6009***	-0.0248***	-0.0333***	-0.0815***	-0.0358***	-0.0809***	-0.0171***
NCrHistEcon	0.4689***	-0.025***	-0.00480***	-0.0788***	0.0168***	-0.0843***	-0.0178***
NcrProdScien	-0.00540	-0.00430	-0.00570	-0.014***	-0.0108***	0.067***	-0.00290
TotCredEcon	0.5308***	-0.0392***	-0.0073*	-0.0398***	-0.0747***	-0.1461***	-0.0209***

	PSYC	SC_FORM	SC_MAT	SC_POL	SC_STAT	StNW	StNE
PSYC	1						
SC_FORM	-0.1117***	1					
SC_MAT	-0.1318***	-0.0781***	1***				
SC_POL	-0.1312***	-0.0777***	-0.0917***	1***			
SC_STAT	-0.0625***	-0.037***	-0.0437***	-0.0435***	1***		
StNW	0.2065***	-0.0343***	-0.0176***	-0.0296***	-0.0119***	1***	
StNE	-0.2719***	0.0558***	0.0251***	0.0332***	0.013***	-0.6278***	1***
StCentre	0.1006***	-0.0178***	-0.0113***	-0.0197***	-0.0082**	-0.0242***	-0.3261***

	PSYC	SC_FORM	SC_MAT	SC_POL	SC_STAT	StNW	StNE
StSouth	0.1207***	-0.0274***	-0.0155***	-0.0155***	-0.0121***	-0.035***	-0.4708***
StIslands	0.0906***	-0.0208***	-0.0128***	-0.0134***	-0.0020	-0.0271***	-0.365***
StForeign	-0.00440	-0.0139***	0.0134***	0.0252***	0.0175***	-0.0191***	-0.2567***
NCrIngEco	-0.0964***	-0.0571***	-0.057***	-0.0669***	-0.0319***	-0.0417***	0.0619***
NCrPolEcon	-0.0156***	-0.0566***	-0.0731***	0.4415***	0.1103***	-0.0366***	0.0449***
NCrFinScien	-0.0994***	-0.0589***	-0.0694***	0.2422***	-0.0298***	-0.0449***	0.0562***
NCrHistor	-0.0667***	-0.0395***	-0.0466***	0.4813***	-0.0221***	-0.00280	0.0082**
NCrEcmetrx	-0.037***	-0.0219***	-0.0259***	-0.0258***	0.4497***	-0.0133***	0.00570
NCrAdvEcon	-0.0769***	-0.0475***	-0.0556***	0.2617***	0.2812***	-0.0334***	0.0337***
NCrAccount	-0.0801***	-0.0342***	-0.0716***	0.1172***	0.1265***	-0.0343***	0.0361***
NCrManag	0.0067*	-0.0641***	-0.0814***	0.236***	0.2245***	-0.0397***	0.0566***
NCrBusinFin	-0.0331***	-0.0196***	-0.0225***	-0.011***	0.195***	-0.0132***	0.0154***
NCrCompMan	-0.0443***	0.0528***	-0.0515***	-0.0686***	-0.0347***	-0.0191***	0.0236***
NCrIntermed	-0.0288***	-0.0456***	-0.0538***	0.0488***	0.0853***	-0.0311***	0.0401***
NCrHistEcon	-0.0778***	-0.0475***	-0.0507***	0.1646***	-0.021***	-0.0301***	0.0393***
NcrProdScien	-0.0133***	-0.0079**	-0.0093**	-0.0092**	-0.00440	-0.0040	0.0088**
TotCredEcon	-0.0916***	-0.0733***	-0.1097***	0.2768***	0.1857***	-0.058***	0.073***

	StCentre	StSouth	StIsla~s	StFore~n	NCrIng~o	NCrPol~n	NCrFin~n
StCentre	1						
	***						
StSouth	-0.0182	1					
	***	***					
StIslands	-0.0141	-0.0203	1				
	***	***	***				
StForeign	-0.0099	-0.0143	-0.0111	1			
	**	***	***	***			
NCrIngEco	-0.0207	-0.0262	-0.0241	-0.0116	1		
	***	***	***	***	***		
NCrPolEcon	-0.0216	-0.0214	-0.0197	0.0219	-0.0534	1	
	***	***	***	***	***	***	
NCrFinScien	-0.0229	-0.0187	-0.0226	0.0032	-0.0491	0.3166	1
	***	***	***	0	***	***	***
NCrHistor	-0.0091	-0.0071	-0.0063	0.011	-0.0339	0.2094	-0.0323
	**	*	0	***	***	***	***
NCrEcmetrx	-0.006	-0.0034	-0.0086	0.0368	-0.0189	0.2008	0.0746
	0	0	**	***	***	***	***
NCrAdvEcon	-0.0169	-0.0131	-0.0114	0.0215	-0.0299	0.3941	0.3743
	***	***	***	***	***	***	***
NCrAccount	-0.0104	-0.0075	-0.0169	0.0044	-0.0526	0.353	0.6043
	***	*	***	0	***	***	***
NCrManag	-0.0257	-0.0251	-0.0245	0.0069	-0.0561	0.627	0.2952
	***	***	***	*	***	***	***
NCrBusinFin	-0.0086	-0.0039	-0.0096	0.0085	-0.0114	0.1047	0.1609
	**	0	**	**	***	***	***
NCrCompMan	-0.0049	-0.0065	-0.0106	-0.0051	-0.0542	0.1449	0.3335
	0	*	***	0	***	***	***
NCrIntermed	-0.0146	-0.0158	-0.0199	0.0076	-0.0394	0.2413	0.4086
	***	***	***	*	***	***	***
NCrHistEcon	-0.0183	-0.0132	-0.0158	0.0019	-0.0304	0.3799	0.5573
	***	***	***	0	***	***	***
NcrProdScien	-0.0034	-0.0049	-0.0038	-0.0027	-0.0068	-0.0076	-0.007
	0	0	0	0	*	*	*
TotCredEcon	-0.0291	-0.0276	-0.0316	0.0114	0.1584	0.677	0.6316
	***	***	***	***	***	***	***

	NCrHis~r	NCrEcm~x	NCrAdv~n	NCrAcc~t	NCrManag	NCrBus~n	NCrCom~n
NCrHistor	1						
	***						
NCrEcmetrx	-0.0131	1					
	***	***					
NCrAdvEcon	-0.0283	0.3608	1				
	***	***	***				
NCrAccount	-0.033	0.1944	0.1966	1			
	***	***	***	***			
NCrManag	-0.0325	0.1306	0.3757	0.4468	1		
	***	***	***	***	***		
NCrBusinFin	-0.0093	0.3591	0.0588	0.2921	0.162	1	
	**	***	***	***	***	***	
NCrCompMan	-0.0371	0.046	-0.0431	0.6312	0.2939	0.1488	1
	***	***	***	***	***	***	***
NCrIntermed	-0.0265	0.3579	0.0745	0.6794	0.2945	0.3613	0.4556
	***	***	***	***	***	***	***
NCrHistEcon	0.006	0.0773	0.4127	0.6098	0.3861	0.1746	0.396
	0	***	***	***	***	***	***
NcrProdScien	-0.0047	-0.0026	-0.0056	-0.0073	-0.0082	-0.0023	0.016
	0	0	0	*	**	0	***
TotCredEcon	0.0482	0.299	0.472	0.825	0.7389	0.3025	0.5377
	***	***	***	***	***	***	***

	NCrInt~d	NCrHis~n	NcrPro~n	TotCre~n
NCrIntermed	1			
	***			
NCrHistEcon	0.4316	1		
	***	***		
NcrProdScien	-0.0054	-0.0056	1	
	0	0	***	
TotCredEcon	0.614	0.6815	-0.0051	1
	***	***	0	***

APPENDIX F: DTB_Co Correlation Matrix

0 p-value<0.1; * p-value<0.05; ** p-value<0.01; *** p-value<0.001

	CompStatus	Male	YStudy	GradMark	ExpAbr~d	TotCre~n	AGR
CompStatus	1						
	***						
Male	0.0325	1					
	0	***					
YStudy	0.0102	-0.0915	1				
	0	***	***				
GradMark	-0.013	-0.1767	-0.3289	1			
	0	***	***	***			
ExpAbroad	-0.0603	-0.0505	0.0428	0.0419	1		
	**	**	*	*	***		
TotCredEcon	-0.0421	0.0238	0.1027	-0.1733	0.0554	1	
	*	0	***	***	**	***	
AGR	0.0038	0.0078	0.0313	0.003	-0.0228	0.0224	1
	0	0	0	0	0	0	***
ECON	-0.0228	0.0205	-0.0251	0.0298	0.0182	0.0034	-0.059
	0	0	0	0	0	0	**
PHARM	-0.0071	0.032	0.0233	-0.0178	-0.0008	-0.0413	-0.0603
	0	0	0	0	0	*	**
LAW	-0.0042	0.0072	0.0069	-0.009	0.0076	0.0008	-0.0531
	0	0	0	0	0	0	**
ENG	0.013	0.027	-0.0155	0.0095	0.0532	-0.0274	-0.1519
	0	0	0	0	**	0	***
LIT	0.0051	-0.0295	0.0002	-0.041	-0.0294	-0.0132	-0.0913
	0	0	0	*	0	0	***
MED_CH	-0.0142	0.0034	0.0359	-0.0359	0.0119	0.0222	-0.0968
	0	0	0	0	0	0	***
MED_VET	0.0315	-0.0561	0.0607	0.0078	0.0255	0.0175	-0.041
	0	**	**	0	0	0	*
PSYC	0.0028	-0.025	-0.0654	0.0274	-0.0165	0.0123	-0.1027
	0	0	***	0	0	0	***
SC_FORM	0.0171	0.0043	-0.0164	0.0094	0.0194	0.0012	-0.0581
	0	0	0	0	0	0	**
SC_MAT	-0.0378	0.0168	0.0274	0.0198	-0.0172	0.0085	-0.0768
	0	0	0	0	0	0	***
SC_POL	0.0112	-0.0306	-0.0001	-0.0086	-0.0375	-0.0137	-0.1154
	0	0	0	0	0	0	***
SC_STAT	0.0003	0.0245	-0.0337	0.0242	-0.0043	0.0387	-0.0455
	0	0	0	0	0	0	*
CoNE	0.0517	-0.0903	0.3956	-0.069	0.0056	0.1317	0.0497
	**	***	***	***	0	***	**

	CompSt~s	Male	YStudy	GradMark	ExpAbr~d	TotCre~n	AGR
CoNW	0.0117	-0.0318	-0.1116	0.1304	0.0181	-0.0332	-0.0005
	0	0	***	***	0	0	0
CoCentre	-0.046	0.0361	-0.1745	0.014	0.008	-0.063	-0.0475
	*	0	***	0	0	***	**
CoSouth	-0.0421	0.106	-0.2329	-0.0135	-0.0248	-0.0782	-0.031
	*	***	***	0	0	***	0
CoIslands	-0.0183	0.0493	-0.188	-0.0147	-0.0096	-0.0615	-0.0122
	0	**	***	0	0	***	0
SameProv	0.0079	0.0589	-0.0117	-0.0148	0.007	-0.0256	-0.0368
	0	**	0	0	0	0	0
UnivInflue	0.0994	0.1098	0.147	-0.116	0.0035	0.1013	0.0041
	***	***	***	***	0	***	0
CompDurUniv	0.0519	0.0053	0.0722	-0.022	-0.0297	0.0234	0.0261
	**	0	***	0	0	0	0
AgeComp	0.083	0.158	-0.3484	0.0879	-0.088	-0.0945	-0.0049
	***	***	***	***	***	***	0
TotEmpl	-0.013	-0.03	-0.026	-0.0151	-0.0185	0.0567	-0.0102
	0	0	0	0	0	**	0
A	-0.0321	-0.0307	0.0216	0.0101	0.0202	0.0331	0.2419
	0	0	0	0	0	0	***
C	0.0144	-0.0426	0.0555	0.0108	0.0084	0.006	-0.0081
	0	*	**	0	0	0	0
X	-0.0024	0.0147	-0.0616	0.0097	0.0002	0.0151	-0.0083
	0	0	***	0	0	0	0
SO	0.0144	0.0328	-0.0021	-0.0189	-0.0177	-0.0347	-0.1446
	0	0	0	0	0	0	***

	ECON	PHARM	LAW	ENG	LIT	MED_CH	MED_VET
ECON	1						
	***						
PHARM	-0.0427	1					
	*	***					
LAW	-0.0376	-0.0384	1				
	0	0	***				
ENG	-0.1076	-0.1099	-0.0969	1			
	***	***	***	***			
LIT	-0.0647	-0.0661	-0.0582	-0.1665	1		
	***	***	**	***	***		
MED_CH	-0.0686	-0.0701	-0.0617	-0.1766	-0.1061	1	
	***	***	***	***	***	***	
MED_VET	-0.029	-0.0297	-0.0261	-0.0748	-0.0449	-0.0476	1
	0	0	0	***	*	**	***

	ECON	PHARM	LAW	ENG	LIT	MED_CH	MED_VET
PSYC	-0.0728***	-0.0743***	-0.0655***	-0.1873***	-0.1126***	-0.1194***	-0.0506**
SC_FORM	-0.0412*	-0.0421*	-0.03710	-0.106***	-0.0637***	-0.0676***	-0.02860
SC_MAT	-0.0544**	-0.0556**	-0.049**	-0.14***	-0.0842***	-0.0892***	-0.03780
SC_POL	-0.0817***	-0.0835***	-0.0736***	-0.2105***	-0.1265***	-0.1341***	-0.0568**
SC_STAT	-0.03230	-0.0330	-0.0290	-0.0831***	-0.0499**	-0.0529**	-0.02240
CoNE	-0.03010	-0.00520	-0.01420	0.00490	-0.01460	-0.00680	0.03770
CoNW	0.0412*	-0.01590	0.0692***	-0.0493**	-0.02190	0.01970	-0.00920
CoCentre	0.01820	0.01590	-0.01370	0.02170	0.043*	-0.00940	-0.03290
CoSouth	0.01340	-0.01010	-0.01960	-0.01020	0.02880	-0.01010	-0.02720
CoIslands	-0.02310	0.02540	-0.01570	0.03890	-0.0230	0.01160	0.00220
SameProv	0.00540	0.02390	-0.00510	0.0421*	0.02990	-0.00460	-0.02890
UnivInflue	0.0340	-0.0392*	0.0110	-0.0080	0.03370	0.02520	-0.00950
CompDurUniv	-0.03490	-0.00760	-0.00340	-0.02920	0.00860	0.01050	-0.01690
AgeComp	0.02890	0.0419*	-0.00960	0.00630	-0.0020	-0.03290	-0.02390
TotEmpl	-0.0250	-0.01740	-0.00540	-0.02850	0.00670	0.02380	-0.00410
A	-0.03420	-0.03590	0.02310	-0.0551**	-0.03410	0.00920	0.0869***
C	0.00570	-0.02220	-0.02780	0.0608**	0.01710	-0.0429*	-0.03270
X	0.0655***	0.01010	0.00330	-0.03630	0.00650	0.03730	-0.02740
SO	-0.02580	0.02810	-0.00190	0.02690	0.00810	-0.00790	-0.01920

	PSYC	SC_FORM	SC_MAT	SC_POL	SC_STAT	CoNE	CoNW	
PSYC	1							
	***							
SC_FORM	-0.0717	1						
	***	***						
SC_MAT	-0.0947	-0.0536	1					
	***	**	***					
SC_POL	-0.1423	-0.0805	-0.1064	1				
	***	***	***	***				
SC_STAT	-0.0562	-0.0318	-0.042	-0.0631	1			
	**	0	*	***	***			
CoNE	-0.0424	0.0059	0.0277	0.0122	-0.0239	1		
	*	0	0	0	0	***		
CoNW	0.0155	-0.0012	-0.0144	0.0122	-0.0026	-0.4778		1
	0	0	0	0	0	***	***	
CoCentre	-0.0417	0.0331	-0.0098	-0.003	0.0303	-0.3912		-0.0654
	*	0	0	0	0	***	***	
CoSouth	0.0586	-0.0276	0.0129	-0.0223	0.034	-0.501		-0.0838
	**	0	0	0	0	***	***	
CoIslands	0.0343	-0.0091	-0.0432	-0.008	-0.0213	-0.4025		-0.0673
	0	0	*	0	0	***	***	
SameProv	-0.0063	-0.0049	-0.0359	-0.0184	0.0163	0.0867		-0.1606
	0	0	0	0	0	***	***	
UnivInflue	0.0189	-0.018	-0.0053	-0.0223	-0.0523	0.2202		-0.0117
	0	0	0	0	**	***		0
CompDurUniv	-0.0013	-0.0032	-0.0371	0.0606	0.0008	0.0045		-0.0149
	0	0	0	**	0	0		0
AgeComp	-0.0114	0.005	-0.0169	0.0155	0.0109	-0.2715		0.0467
	0	0	0	0	0	***	**	
TotEmpl	0.0286	-0.0231	0.0124	0.0232	-0.0023	-0.0106		0.0316
	0	0	0	0	0	0		0
A	-0.0151	-0.0104	-0.0206	-0.0533	-0.0437	0.0335		-0.0111
	0	0	0	**	*	0		0
C	0.0081	0.0071	0.0012	-0.0245	0.0141	0.03		-0.0157
	0	0	0	0	0	0		0
X	0.0446	-0.0066	-0.0293	-0.0351	-0.0067	-0.0267		0.0185
	*	0	0	0	0	0		0
SO	-0.0251	0.0072	0.0324	0.0713	0.0248	-0.0195		0.0031
	0	0	0	***	0	0		0

	CoCentre	CoSouth	CoIsla~s	SameProv	UnivIn~e	CompDu~v	AgeComp
CoCentre	1						
	***						
CoSouth	-0.0686	1					
	***	***					
CoIslands	-0.0551	-0.0706	1				
	**	***	***				
SameProv	-0.0529	0.0141	0.0524	1			
	**	0	**	***			
UnivInflue	-0.1134	-0.1663	-0.103	-0.0428	1		
	***	***	***	*	***		
CompDurUniv	0.0068	0.0209	-0.0234	0.0358	-0.0099	1	
	0	0	0	0	0	***	
AgeComp	0.1118	0.1716	0.1572	0.1077	-0.1578	0.1754	1
	***	***	***	***	***	***	***
TotEmpl	-0.0164	-0.0038	0.0044	-0.0762	-0.0329	0.08	0.1113
	0	0	0	***	0	***	***
A	-0.0241	-0.0176	-0.0074	0.0605	-0.0091	0.0188	-0.0211
	0	0	0	**	0	0	0
C	0.0056	-0.0208	-0.0204	-0.0004	-0.0012	0.0077	-0.0104
	0	0	0	0	0	0	0
X	-0.003	0.0255	0.0025	0.042	0.0149	-0.0013	-0.0781
	0	0	0	*	0	0	***
SO	0.0144	0.0052	0.0141	-0.067	-0.0037	-0.0153	0.0722
	0	0	0	***	0	0	***

	TotEmpl	A	C	X	SO
TotEmpl	1				
	***				
A	0.0133	1			
	0	***			
C	0.0442	-0.0637	1		
	*	***	***		
X	0.0341	-0.0824	-0.0685	1	
	0	***	***	***	
SO	-0.0557	-0.5488	-0.4562	-0.59	1
	**	***	***	***	***

ACKNOWLEDGEMENTS

I am grateful to my supervisor, Professor Silvia Rita Sedita, whose expertise, understanding, generous guidance and support made it possible for me to work on a topic that was of great interest to me. It was a pleasure working with her.

I would like to express my gratitude to Dr. Roberta Apa for being so generous and giving me the right advice at the right time.

Thanks to my parents Karen and Roberto who never gave up in sustaining me and for respecting both my ambitions and passions allowing me to realize my own potential. I just want you to know that I am conscious of all the sacrifices you have made to get me here... Thank you so much.

Special thanks to all my friends in particular to my fellow adventures at university Umberto, Andrea and Filippo, my flatmates Francesco, Salvatore and Giacomo and my old good friends Alessandro and Cesare for their constant encouragement of never give up in pursuing my goals.

I also need to thank my start-up colleagues Enrico, Salvatore and Gianmaria, whose enthusiasm and capabilities made it possible to create YouGuide and to be on the right way to fulfil our dreams.

A very special acknowledgement goes to my girlfriend Giulia, who loved and supported me during the final intense months of my dissertation. Without you I would never be here where I am today. I love you and I will always be here for you.

In closing, I would like to dedicate this thesis in loving memory of my grandmother Miriam whose passing occurred during my graduate studies. I can only hope that I have and will continue to make her proud.