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Education, social capital and entrepreneurial selection in Italy[†]

Francesco Ferrante^{*} and Fabio Sabatini^{**}

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Abstract

There is wide consensus that entrepreneurial talent is the ability to discover and exploit market opportunities by taking the relevant risky decisions. Discovery and exploitation are separate but interlinked features of entrepreneurship requiring, in different proportions, the exploitation of innate and acquired skills. Institutions and technology, by determining the nature of the discovery and exploitation process and the need for such skills, play an essential role in shaping the nature of entrepreneurial talent and the specific role of education in entrepreneurial selection and performance. Empirical studies on entrepreneurship do not offer a neat picture of the actual contribution of education to entrepreneurial human capital or *entrepreneurial talent*. This unsatisfactory outcome is not surprising and is due to an inadequate assessment of the context-dependent factors shaping the latter. Building on these premises, the aim of our research work is to carry out a in depth analysis of the determinants of entrepreneurship in Italy, thus accounting for the role that variables like the educational qualification, the family background, and social capital play in determining the entrepreneurial selection.

This paper attempts to constitute a first step for the improvement of our understanding by means of a preliminary, exploratory, analysis on the Italian data and a series of probit analyses aimed at identifying the main determinants founding the entrepreneurial choice. Rough data are taken from an original dataset built by the authors partly drawing on the *Survey of Household Income and Wealth* (SHIW) carried out by the Bank of Italy. The latter has been integrated with a wide variety of environmental variables drawn from different data sources describing the social and institutional context of the entrepreneurial activity.

JEL Classification: I21, J23, J24, M13, Z13.

Keywords: Education, Work status, Employment, Self-employment, Entrepreneurship, Human capital, Social capital, Cognitive abilities.

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1. Introduction

There is wide consensus that entrepreneurial talent is the ability to discover and exploit market opportunities. The main factors affecting this ability are certain innate traits, such as creativity, imagination, alertness, and the skills acquired through formal education, on-the-job experience, and access to social capital. Discovery and successful exploitation are separate but interlinked features of entrepreneurship requiring, in different proportions, the exploitation of such innate and acquired skills.

Empirical studies on the role of education in entrepreneurial selection and performance do not offer a neat picture of the actual contribution of education to entrepreneurial human capital or *entrepreneurial talent*. This unsatisfactory outcome is not surprising and stems from an inadequate assessment of the context-dependent factors shaping the latter.

Building on Knight (1933) and Kirzner (1973), the function of entrepreneurial human capital is also to generate those cognitive abilities that are necessary to compress the uncertainty surrounding the discovery and exploitation of market opportunities. Indeed, it is uncertainty that gives room to entrepreneurs as resource allocation machines, empowered with a market equilibrating function: in deterministic contexts, there would be not need for entrepreneurship since prices would do a better job in driving the allocation process (Kirzner, 2002). Institutions and technology play an essential role in shaping the type of skills and cognitive abilities required to entrepreneurs, i.e. the nature of entrepreneurial talent, and the specific role of education in entrepreneurial selection and performance. As far as technology is concerned, this is not true only of entrepreneurial talent, but applies also to human capital in general as a source of growth (Vandenbussche, Aghion and Meghir, 2005).

On practical grounds, one should make a distinction between the entrepreneurial talent required to discover opportunities and talent that is needed to exploit the latter. It is reasonable to suppose that the availability of the former affects the rate of firms creation, whether that of the latter determines the average size of the surviving firms.

This distinction goes at the roots of the debate on what entrepreneurial talent is. One main feature of this debate is the unclear distinction between managerial and entrepreneurial functions. Indeed, among the various attempts to clarify this essential point, the view that entrepreneurs pursue *allocative* efficiency whereas managers, given resources and allocative targets, are responsible for *technical* efficiency seems the most appropriate, albeit it lacks a clear operative content: "Given an arrangement which calculations, experience or judgment indicate to constitute a reasonable approximation to the current optimum, it is a manager's task to see that this arrangement is in fact instituted to a reasonable degree of approximation.

The entrepreneur (whether or not he in fact doubles as a manager) has a different function. It is his job to locate new ideas and to put them into effect. He must lead, perhaps even inspire; he cannot allow things to get rut and for him today's practice is never good enough for tomorrow. In short, he is the *Schumpeterian* innovator and some more. He is the individual who exercises what in the business literature is called 'leadership'. And it is he who is virtually absent from the received theory of the firm" (Baumol, 1968, p. 65). We believe that in the past too much emphasis has been placed on the *creative* and *innate* abilities of entrepreneurs and too few on those acquired cognitive abilities that are needed to convert ideas in marketable products and successful firms and that are indeed, an important component of entrepreneurial talent. Indeed, the latter skills need to evolve with technological and institutional change.

For these reasons, in our view, questioning about the general characteristics of entrepreneurs is not legitimate unless one specifies the main features of the context under investigation. It goes without saying that from this follows that international comparisons of entrepreneurship are legitimate and useful to the extent that either they recognize the impact of such technological and institutional factors or that they aim to assess it. Henceforth, the self-employment rate cannot be considered a good proxy of entrepreneurship in the economy: for a given distribution of innate entrepreneurial talent, technological and institutional factors can determine very diverse occupational choices and selection processes into entrepreneurial activities. That is to say, countries displaying the same self-employment rates, might be endowed with very different amounts and quality of entrepreneurial skills devoted to innovation and business ventures "[...]holding that entrepreneurs are always with us and always play some substantial role.[....] How the entrepreneurs acts at a given time and place depends heavily on the rules of the game –the reward structure of the economy- that happen to prevail. Thus the central hypothesis here is that it is the set of rules and not the supply of entrepreneurs or the nature of their objectives that undergoes significant changes from one period to another and helps to dictate the ultimate effect on the economy via the allocation of entrepreneurial resources." (Baumol, 1990 p. 894)

Building on these premises and on some *a priori* about what makes entrepreneurial talent in Italy, the aim of our research work is to carry out a more in depth analysis of occupational choices and entrepreneurship in Italy, thus accounting for the role that variables like the educational qualification, the family background, the ability to acquire information from diverse sources, and a range of social and institutional factors play in determining the entrepreneurial selection.

This paper attempts to constitute a first step for the improvement of our understanding by means of a preliminary, exploratory, analysis on the Italian data and a probit analysis on the determinants of entrepreneurship. Rough data on human capital and entrepreneurship in Italy are drawn from the *Survey of Household Income and Wealth* (SHIW) carried out by the Bank of Italy¹. Data describing the social and institutional factors that may influence the entrepreneurial choice are taken from an original dataset built by the authors combining SHIW's microdata with a variety of different sources, including a set of multipurpose surveys carried out by the Italian National Bureau of Statistics (Istat), Istat's reports on social enterprises (Istat, 2006) and voluntary organizations in Italy (Istat, 2005), the ISL Data Bank set up set up by the Economics Department of the University of Parma, other surveys collecting useful socio-economic indicators (Lunaria, 2004 and 2006, Legambiente, 2005a and 2005b), and previous studies on the role of social and institutional factors in the economic performance in Italy (Sabatini, 2005, 2006a).

It is noteworthy that models selected in this paper are those with the best goodness of fit and related estimations are perfectly representative of the regularities emerging from data.

Indeed, our discussion aspires to offer more than just a descriptive picture, and provides some general insights on how one should model and analyse the role of education in entrepreneurial selection and performance in order to account for the context-dependent nature of entrepreneurial talent.

The paper is organized as follows. Section 2 deals with the roots of entrepreneurship and discusses the specific role of education in entrepreneurial human capital. Section 3 examines the main institutional and technological factors behind the connection between educational attainment and occupational choice. Section 4 describes the results of our empirical analysis of the connections between educational attainment and occupational choice in Italy, with a special emphasis on entrepreneurial selection. Finally, section 5 draws the main conclusions and suggestions for future research.

2. The roots of entrepreneurship

Occupational choices and the decision to become an entrepreneur are driven by intrinsic and extrinsic motivations which affect utilities contingent on occupational status. At the micro level, several models have described the individual choice to become an entrepreneur instead of being an employee by partitioning the workforce into two ideal categories, respectively shaped by entrepreneurs and wage-earners, or, in other terms, employers and employees. In his seminal paper, Lucas (1978) traces the roots of this division to the distribution of

individual characteristics: each member of the workforce is endowed with a specific entrepreneurial talent which varies across individuals. Kanbur (1979) stresses also the importance of risk aversion, while Kihlstrom and Laffont (1979) add to these factors also the possibility to gain access to the capital required to start the firm, although focusing on risk aversion as the main root of entrepreneurship.

This literature basically founds the “entrepreneurial choice” on the critical economic role of the entrepreneur as a risk-bearer. This view dates back to Cantillon (1755) who characterized the economy as consisting of two classes of inhabitants (aside from the Prince and Landowners): “hired people” on fixed wages, and “undertakers” who purchase inputs (including labor) at fixed prices without assurance of profits.

However, contemporary empirical literature has consistently proved that entrepreneurs’ risk profiles are quite indistinguishable from those of wage earners. When there are differences in risk propensity, they can be mostly attributed to the fact that entrepreneurs exhibit greater risk aversion than wage earners (Brockhaus, 1980, Masters and Meier, 1988; Sarasvathy, Simon and Lave, 1998; Miner and Raju, 2004). For example, Cramer, Hartog, Jonker, and van Praag (2002) compare individuals’ valuations for a lottery ticket and find that subjects who had ever been self-employed exhibited lower risk tolerance than wage earners even after controlling for wealth effects: the self-employed tend to have greater wealth and therefore bear less relative risk than wage earners. Empirical evidence on the characteristics of entrepreneurs in different countries (Blanchflower and Oswald, 1998; Cowling, 2000), suggests that country-specific factors shape the nature of entrepreneurial talent and the impact of education on entrepreneurial selection and performance. As far as the latter aspect is concerned, the most recent contribution offering support to the context-dependent nature of entrepreneurial talent is a meta-analysis by van Sluis, van Praag and Vijverberg (2004) showing that (a) entrepreneurial selection is not significantly affected by education, (b) performance i.e. returns to education for entrepreneurs vary a lot from country to country and (c) returns to education for entrepreneurs may be or may be not higher than returns to education for employees. Our empirical analysis offers a relevant proof that such hints are valid also within the Italian context, where the choice to become an entrepreneur proves to be negatively influenced by education.

The incentives of individuals to (i) acquire and (ii) allocate education among different occupations is affected by how firms technology shape demand for skills and by how institutions affect returns to education in different occupations. In particular, in those occupations requiring the type of education that is most profitable to entrepreneurs. Moreover,

institutions affect the source of uncertainty and the allocation of risks among different economic activities and, therefore, the risk premium on educational returns required in different occupations (Kanbur, 1978). For instance, an enforced entry regulation can reduce entry and income risk and, thereby, create rents for incumbents in some occupations (thereby, increasing returns to education); conversely, entry regulations that, owing to bribery, are not enforced, may simply affect the type of entrepreneurs selected, with no substantial effects on the rate of entry (Klapper, Leaven, and Rajan, 2004).

In this literature, the entrepreneurial talent has in most cases been modelled as depending from a generic “human capital variable” including very diverse concepts like previous working experience, the educational qualification, the family background, risk aversion and the extension of social networks involving individuals. Besides some notable exceptions, the multidimensional nature of human capital has been generally undervalued and the specific role of education underscored.

The point of departure of our research work is the acknowledgement of the multidimensionality of human capital, and the emerging need to carry out a more in depth analysis of the influence that institutions and technology exert on the choice to become an entrepreneur and on the economic performance of firms.

To this respect, the multidimensional nature of entrepreneurial human capital should be considered in connection with the different skills required, respectively, to discover opportunities and to set up a firm to exploit them in different technological and institutional environments. Needless to say, new ideas must be transformed in marketable goods to be successful, and the latter process will be more or less efficient depending on the entrepreneur’s skills in running the business and coordinating resources. Moreover, if we depart from a static view of the discovery process, cognitive abilities are also required to generate new opportunities for fuelling entrepreneurial discovery in the future. Dynamic learning, i.e. the capability of responding to change by forming new mental configurations (Loasby, 2006, p. 11) is a fundamental requisite for entrepreneurial/firm survival and growth. Cognitive abilities build upon innate personality traits and acquired skills which are based on codified knowledge, absorbed through education and training, and tacit knowledge, stemming from experience and access to social capital.

Leaving aside risk aversion, experience, education and the social capital main arguments in the function generating codified and tacit knowledge and, then, entrepreneurial human capital. Although it is not possible to give a precise shape to such a function, one should suppose that a minimum amount of each variable is required to generate a unit of entrepreneurial human

capital and that both such thresholds and the degree of substitutability among, respectively, experience, education and social capital depend on the characteristics of the decision making context.

3. Institutions, technology and entrepreneurial selection.

3.1. Social capital and entrepreneurship

Among the environmental and institutional factors of entrepreneurship, in this paper we explore the role of social capital in the Italian context. During last ten years, the concept of social capital has been invoked almost in every field of social science research, and has been used to explain an immense range of phenomena, from political participation to the institutional performance, from health to corruption, from the efficiency of public services to the economic success of countries. Such perspectives on social capital are markedly different in origins and fields of application, but they all agree on the ability of certain aspects of the social structure to generate positive externalities for members of a group, who gain a competitive advantage in pursuing their ends. Recently, social capital has become particularly popular in the literature on the determinants of entrepreneurship, with particular regard for the role of environmental variables like formal and informal networks in start-up processes. Following Putnam (1994), we can roughly define social capital as a multidimensional concept including features of social life-networks, norms, and trust, that enable participants to act together more effectively to pursue shared objectives (Putnam, 1994, 1). Putnam describes two main components of the concept: *bonding social capital* and *bridging social capital*. The former refers to the value assigned to social networks between homogeneous groups of people and the latter to that of social networks between socially heterogeneous groups. Typical examples are that criminal gangs create bonding social capital, while choirs and bowling clubs create bridging social capital. Bridging social capital is argued to have a host of other benefits for governments, individuals, and communities, thereby creating positive externalities for society and the economy as a whole. The distinction is useful in highlighting how social capital may not always be beneficial for the economic performance and development processes. Horizontal networks of individual citizens and groups that enhance community productivity and cohesion are generally considered as forms of positive social capital whereas self-serving exclusive gangs and hierarchical patronage systems that operate at cross purposes to societal interests can be thought of as negative social capital burdens on society. Recently, a third kind of social capital has become particularly popular in the debate: *linking social capital*. Such concept generally refers to the the capacity to leverage resources,

ideas and information from formal institutions beyond the community (Leonardi, 1995). Our analysis of the Italian labour market proves that such *linking social capital* may be particularly relevant in shaping workers' occupational choices. Coming back to the main focus of our paper, the social capital of entrepreneurs generally takes the form of relationships with other traders (i.e. *bridging social capital*), which help firms to economize on transaction costs, relationships with individuals who can help in time of financial difficulties, which insure traders against liquidity risk, and family relationships (i.e. *bonding social capital*), which may reduce efficiency (Fafchamps and Minten, 2002, Fafchamps, Gabre-Mahdin and Minten, 2005). On the other side, recent literature from the field of economic sociology has highlighted the role of social networks as a relevant resource for start-up. Yli-Renko, Autio and Tonnti (2002), sustain that encounters between the single entrepreneur, with whom the firm at this stage of growth is normally identified, and his network contacts are often the main strategic elements that are able to improve new venture development. In other words, start-up relations are a form of capital in that they provide the means for identifying opportunities or obtaining resources, and thus constitute potential sources of competitive advantage that may exert a positive influence on the choice to become an entrepreneur instead of being an employee or to undertake a career as a member of the arts or professions.

In sections 4.4 and 4.5, we test such hypotheses in the context of the Italian labour market through two probit analyses addressing the effect of *bonding*, *bridging* and *linking social capital* on the probability to become an entrepreneur.

3.2. Education, experience and entrepreneurship

Measures of educational attainment are invariably included in empirical studies on self-employment and entrepreneurship. Unfortunately, if one aspires to draw general conclusions that may fuel theoretical reasoning, the evidence about its effects on entrepreneurial selection and performance is not very comforting (van Sluis, van Praag and Vijverberg, 2004). Nevertheless, such a lack of systematic effects is, by itself, a useful information, suggesting that the relevance of education, as a component of entrepreneurial human capital, is context-dependent.

This amounts to say two reasonable things. First, that the extent to which education is needed for successful discovery and exploitation of market opportunities depends on the technological characteristics of the economic environment e.g. technological opportunities and the appropriability of innovations. Second, that returns to education in different occupations vary from country to country, depending on how institutional factors the

functioning of markets. Hence, the key to explain such observed international variation, is the analysis of how the latter factors affect the returns to education as entrepreneurs *vis a vis* the returns to education as non entrepreneurs.

Education and in general, codified knowledge, play several roles in enhancing entrepreneurial skills. Its main contribution is to foster those planning and coordination abilities i.e. managerial ability, which are needed in the exploitation stage of new market opportunities; by so doing, codified knowledge helps to compress uncertainty surrounding a given business venture. Moreover, the enhancement of managerial ability helps reducing the uncertainty about one's entrepreneurial talent (van Praag and Cramer, 2001).

The role of education as a source of codified knowledge for entrepreneurs is to be compared to the contribution of tacit knowledge generated through experience. The usual contention is that previous working experience is much more important, in determining entrepreneurial human capital, than education. Indeed, in the discovery stage, education may well be irrelevant or less important than experience. But, as far as the exploitation stage is concerned, the latter conclusion is not convincing, at least when business ventures are highly innovative and/or when they require setting up complex organizations, large financial investments and detailed business plans.

3.3. Codified and tacit knowledge as context-dependent sources of cognitive abilities

The connection between education and general cognitive abilities is a two-way street: codified knowledge acquired through education helps people to better understanding the general rules which govern the world they live in. Moreover, education enhances the ability to acquire and use codified information about specific aspects of working and non working life. Hence, appropriately explored data on educational attainment should reveal the cognitive abilities possessed by individuals.

Learning through experience is another means of acquisition of cognitive abilities. Through experience people learns how to associate behavioural responses to specific decision making contexts. For this reason, knowledge acquired through experience becomes obsolete at a faster rate than knowledge acquired through education. Of course, the rate of obsolescence depends on how volatile is the environment in which behavioural routines are generated through experience. On the other hand, general knowledge acquired through education must be adapted to the specific decision making context in order to be used, i.e. real life data must be transformed in "codified information" to be interpreted.

The above conjectures have clear implications for the level and type of education required to entrepreneurs in connection with the complexity of the competitive environment and the organization of the firm and provide an explanation of why analytical skills acquired through vocational curricula as well as tertiary education are positively associated with entrepreneurial performance (Van Praag and Cramer, 2001).

Entrepreneurial discovery and exploitation consists basically in finding either more efficient ways of satisfying given consumers' wants or new goods to satisfy latent consumers' needs. The opportunities of doing it are constrained by the scientific and technological base of the economy, from which entrepreneurs can draw new marketable ideas, and by the appropriability of the results of the innovation efforts. Of course, globalization has enlarged the potential sources of such advances beyond the national and regional frontiers, but the actual access to such common pool of knowledge is still limited by the local absorption capacity. Hence, at one hand, the nature of entrepreneurial talent is determined by the state of local technological knowledge.

The extent to which new ideas can be converted into marketable products and the cost of doing it are affected by how institutions constraints entrepreneurial behaviour and the life of the firm. The legal environment and extent of enforcement of regulation are the main institutional constraints to entrepreneurial activity. For instance, entry regulation determines the cost and feasibility of setting up a new firm (e.g. the administrative burden to start the business, the cost of compliance with health and safety regulation); the fiscal policy affects the net cost of running a business; intellectual property rights shape the appropriability of new ideas.

It goes without saying that the ability to adjust to the regulatory setting, thereby minimising its net burden on the firms, is not evenly distributed in the population and is a component of entrepreneurial talent. The skills required for adjusting to regulation are particularly valuable when lack of enforcement and bureaucratic discretion amplify the room for opportunistic behaviours. A discretionary application and enforcement of heavy regulations may create significant costs and profits differentials among firms and equally differentiated incentives to become entrepreneurs.

As far as the type of entrepreneurial knowledge is concerned, different technological and institutional environments require, respectively, codified and non codified knowledge in varying proportions. For instance, the need for codified knowledge as source of entrepreneurial talent is comparatively higher in technologically and organizationally complex environments, and in environments that change rapidly. The reason of this is that codified

knowledge is more general than non codified one, thus providing potential and actual entrepreneurs of more adaptable mental models and instruments to select and process those data required to take decisions. Moreover, the competences acquired through codified knowledge are essential when time is a very scarce resource and the environment is changing rapidly, so that information previously generated becomes quickly obsolescent. Conversely, non codified knowledge is more useful in slowly changing environments where developed behavioural routines need not to be frequently adapted and the skills to deal with uncertainty stem mainly from the ability to manage the social dimension of individual actions. In such a case, the privileged access to local knowledge, due to the specificity of experience and of social networks, can become a strong competitive advantage.

Leaving aside technology and institutions, the composition of entrepreneurial talent in terms of type of knowledge has important bearings for the expected size of the firm and the complexity of its organizations. Non codified knowledge is comparatively more important in the entrepreneurial discovery stage whereas codified knowledge is mostly required to develop the entrepreneurial project: hence, in a given economic domain, whereas lack of the former would hinder the discovery process, the rate of entrepreneurial experimentation and of new firms creation, lack of the latter would adversely affect the rate of growth of surviving firms and their average size.

3.4. Some stylized facts about Italy

The aim of this section is to sketch the main features of the Italian economy that may help to identify the type of entrepreneurial environment and the specific role of education and access to social capital as sources of talent.

There are a few interlinked features characterizing the Italian economy, regarding the self-employment rate, the size distribution of firms and their technological and international performance, whose relationship with entrepreneurial selection and performance needs to be closely investigated in the light of claimed context-dependent nature of entrepreneurial talent. Indeed, these elements together provide an overall consistent profile of a country lagging behind in terms of those entrepreneurial abilities required to compete in complex and turbulent environments. Within this picture, we have to distinguish the role of technological and institutional factors.

As far as technology is concerned, science and technology indicators suggest that the involvement and performance of the Italian firms and economy in R&D and science intensive sectors is quite weak (OECD, 2005). The shares of GDP devoted to R&D activities by the

private sector and the by the government places Italy are at the bottom of the list within the most advanced OECD countries.

As far as institutions are concerned, Italy is characterized by both high degrees of product and labour market regulation and a reduced extent of law enforcement which seem to explain why Italy has such a large shadow economy. Such strict regulations, lacking complete enforcement, do not seem to have affected adversely entry in entrepreneurial activity, but rather the type of entrepreneurs selected (Klapper, Leaven, and Rajan, 2004). We believe that the latter evidence may help explaining why Italy shows a so much higher business ownership rate than expected given its per capita GDP (Carree and Thurik, 2002).

Summing up, as far as entrepreneurship is concerned, the main stylized facts about the Italian economy we wish to stress here are:

- 1) the high rate of self-employment (27,5% in 2003), almost twice the EU15 average;
- 2) the small average firms' size: micro firms and small firms are over-represented in the Italian economy, *vis a vis* the European counterparts;
- 3) the Italian firms' specialisation in low and medium technology industries;
- 4) the low firms' degree of foreign involvement through direct investments (with respect to their export propensity).

Finally, when they entry, the market size of firms is not small: the trouble is that they remain small afterwards. Building on our premises, these stylized facts should be put in connection with a poor endowment of codified knowledge of Italian entrepreneurs and a corresponding weak role of education in entrepreneurial talent, selection and performance. So, we would expect that education plays a negative role or no role in the choice to become an entrepreneur in Italy and that other variables influencing access to non codified knowledge, such as social capital or the family background, exert a positive impact on it.

4. Educational attainment and occupational choice in Italy.

Since great part of the theoretical literature describes the individual choice to become an entrepreneur instead of being an employee by partitioning the workforce into the two ideal groups, respectively shaped by entrepreneurs and wage-earners, or, in other terms, employers and employees, the point of departure of our analysis of the Italian labour market is a quick glance at the main features characterizing such categories of workers. Drawing on data taken from the last four waves of the SHIW, this section begins with a descriptive analysis of some dynamic trends concerning the educational qualification attained by entrepreneurs and employees during the last decade. Thus, the “entrepreneurial choice” of Italian workers is

addressed by means of a simple probit analysis aiming to take into the appropriate account a wide range of factors potentially able to affect workers' careers. The rest of the section uses the empirical evidence emerging from the Italian labour market to show that the self-employment rate cannot be considered as a good proxy for measuring entrepreneurship. In Italy, self-employed workers are a broad category mostly shaped by members of the arts and professions and only residually including different kinds of entrepreneurs. Finally, the choice between the entrepreneurial activity and the "professional" career is analyzed through a further probit analysis performed on the narrower population of self-employed workers.

4.3 Employers or employees? A probit analysis

In this section, the choice to become an entrepreneur instead of being an employee is analyzed through a simple probit analysis. Firstly, we have enriched the SHIW dataset with new variables drawn from previous studies on the role of social and institutional factors in the economic performance in Italy (Arrighetti, Serravalli and Lasagni, 2001, Sabatini, 2005 and 2006) and from other Italian sources of socio-economic indicators (Istat, 2005, 2006, Legambiente, 2005a, 2005b, Lunaria, 2004, 2006). Secondly, we have tested the effect of different combinations of stimuli on the entrepreneurial choice within the context of a data mining process carried out by means of a series of probit models grounded on our theoretical hypotheses. Models selected in this paper are those with the best goodness of fit and related estimations are perfectly representative of the regularities emerging from data. However, it must be remembered that, as other unexamined models may fit the data as well or better, an accepted model is only a not-disconfirmed model.

The analysis takes into account only the two groups of entrepreneurs and employees, thereby neglecting the other careers shaping the broader category of self-employed workers. A comparison between entrepreneurs and members of the arts and professions is presented in sections 4.5 aiming to highlight the problems related to the use of self-employment rates as a tool for measuring entrepreneurship. Variables considered in the analysis are as follows:

- years of schooling, computed on the basis of Bank of Italy's data according to the classification presented in table 2, section 4.2. Following great part of the empirical literature in the field, this variable is considered as the basic proxy for the measurement of workers' human capital.
- The tendency to move financial investments or to buy and sell assets, here labelled as "arbitrage ability". This variable is a more specific measure of human capital, regarding workers' ability and willingness to access specific information about financial markets

trends. The basic idea is that workers dealing with problems related to resources' allocation like entrepreneurs should be particularly familiar with the discovery and exploitation of new gain opportunities, and may apply such abilities to their own portfolio management. This measure is computed on the basis of people's responses to the question: "How often do you move your financial investments or buy and sell?" asked within the last wave of the Bank of Italy's SHIW¹.

- Parental work status, as measured through people's responses to the question "Which was the employment status of your parents when they were your present age?". Responses have been recoded in order to assign a value equal to 1 when the head of household was an entrepreneur and equal to 0 if he was not. This variable aims to capture two possible factors of entrepreneurship we mentioned within the survey presented in sections 2 and 3: firstly, the entrepreneurial activity of parents may act as a source of tacit knowledge enriching worker's skills. Secondly, it could reduce workers' risk aversion, since the undertaking of an entrepreneurial career may be perceived as a less risky choice when parents are entrepreneurs.
- The earned income in 2004 (the year before the last wave of the SHIW), as represented by the variables YM and YLM respectively referring to entrepreneurs and employees.
- An environmental variable describing the diffusion of opportunistic behaviours in the region of residence of SHIW respondents. This indicator is taken from the ISL Data Bank set up by the Economics Department of the University of Parma to study the relationship between intermediate institutions and local development², and is computed as the first factor from a principal component analysis performed on a set of variables measuring the number of protests of bills and checks, and the number of crimes against property, public economy, industry and trade that have been denounced to public authorities for every 1.000 people living in the same region. Our hypothesis is that lower levels of trustworthiness – connected to higher levels of opportunism - may discourage the entrepreneurial choice thereby drawing workers to become employees rather than employers.
- An indicator of "linking social capital", here defined as all the interpersonal relationships that, through the building of linkages connecting single agents with those in the institutions, might be used to the pursuit of particular objectives, like gaining resources or

¹ Possible responses are "at least once a week", "about once a month", "about once every 3 months", "about once every 6 months", "about once a year", "less often", "when the securities mature", and "never".

² See Arrighetti, Seravalli and Lasagni (2001) for further details.

power, e.g. finding a job or obtaining a license. Once again, this measure is drawn from the SHIW which asks respondents whether they have ever asked relatives or friends and acquaintances to help them or a member of their household in finding work or dealing with government red tape.

- A dimensional index of per capita income at the regional level, used as an indicator of the level of wealth characterizing workers' environment. The index is computed as:

$$index = \frac{effective\ value - minimum\ value}{target\ value - minimum\ value}$$

by the Italian association Lunaria (2004) in the context of a campaign assessing national budget law's contents, promoted by 35 NGOs. The minimum value is 5.000€ and the target value = 40.000€. The index for the region i can thus be expressed as follows:

$$Income_i = \frac{\log(effective\ value) - \log(5.000)}{\log(40.000) - \log(5.000)}$$

Let x_1 be the years of schooling, x_2 the tendency to move financial investments or to buy and sell, x_3 parental work status, x_4 and x_5 the earned income in 2004 of employers and employees, x_6 the diffusion of opportunistic behaviours, x_7 linking social capital, and x_8 per capita income. The dependent variable Y is the probability to become an entrepreneur. It assumes a value equal to 1 if the worker is an entrepreneur and to zero in all the other cases. The probit model can be expressed as follows:

$$P(Y = 1 | X = x) = \Phi(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8) \quad (1)$$

Parameters estimates are reported in table 3.

Table 3. Parameters estimates and Pearson goodness of fit chi-square for model (1)

Variable	Regression coefficient	Coeff. / St. error
Years of schooling	-,09446	-2,68176
Arbitrage ability	,13425	2,79492
Parental work status	1,11634	1,93502
Regional per capita income	-1,89883	-2,65183
Opportunism	-,36859	-1,70904
Linking social capital	,42541	1,82702
Earned income in 2004 (ent.)	-,00001	-1,94598
Earned income in 2004 (emp.)	,00003	2,16792
Intercept	-1,96872	-4,33195

Pearson Goodness-of-Fit Chi Square = 89,246; DF = 140; P = 1,000

Three main facts emerge from the analysis. Firstly, the only one factor positively affecting the entrepreneurial choice is the parental work status: people whose parents are (or have been) entrepreneurs are more likely to become entrepreneurs too. A positive influence, even if weaker and less significant, is exerted also by the ability to establish fruitful relationships with the institutions as a mean to gain advantages and resources. Secondly, there is a negative and significant relationship between the entrepreneurial choice and the level of “environmental wealth”. People living in richer regions are less likely to chose to become entrepreneurs, and prefer to undertake other less risky careers. Thirdly, and most important, education – as measured by years of schooling - proves to be highly significant but with a small negative sign, thereby confirming the idea, already pointed out in sections 4.1 and 4.2, that in Italy education cannot yet be considered as a determinant of entrepreneurship. This finding is coherent with Sluis, van Praag and Vijverberg’s (2004) results.

4.4 The role of social capital

This section carries out a more in-depth analysis of the role of social capital. Following the distinction between *bonding*, *bridging* and *linking social capital* introduced in section 2.1, we perform a new probit analysis addressing the effect of such features of the social environment on the entrepreneurial choice.

In respect to the previous model, the diffusion of opportunism and the regional level of per capita income have thus been replaced by two indicators measuring *bonding* and *bridging social capital*:

- *bonding social capital* refers to strong ties connecting family members. This variable is measured by the first factor obtained from a principal component analysis (PCA) performed on a dataset of variables measuring the intensity and quality of family relationships, spatial proximity among members, and the relevance of other relatives besides the family unit (Sabatini, 2005). Basic indicators adopted within the PCA are described in detail in table B1, annex B.
- *Bridging social capital* is shaped by weak informal ties connecting friends and acquaintances. This variable is measured by the first factor obtained from a PCA performed on a dataset of variables representing people social engagement or, in other terms, what can be referred to as “relational goods” (Sabatini, 2005). Basic indicators are described in table B2.

Let x_1 be the years of schooling, x_2 the tendency to move financial investments or to buy and sell, x_3 parental work status, x_4 and x_5 the earned income in 2004 of employers and employees, x_6 bonding social capital, x_7 bridging social capital, and x_8 linking social capital. Once again, the dependent variable Y is the probability to become an entrepreneur, assuming a value equal to 1 if the worker is an entrepreneur and to zero in all the other cases. The probit model can be expressed as follows:

$$P(Y = 1|X = x) = \Phi(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8) \quad (2)$$

Parameters estimates are reported in table 4.

Table 4. Parameters estimates and Pearson goodness of fit chi-square for model (2)

Variable	Regression coefficient	Coeff. / St. error
Years of schooling	-,10925	-2,90897
Financial movements	,14722	2,89082
Parental work status	1,17692	2,01425
Bonding social capital	,18778	2,45363
Bridging social capital	,14383	1,79476
Linking social capital	,64635	2,44795
Earned income in 2004 (ent.)	-,00002	-2,31294
Earned income in 2004 (emp.)	,00003	2,18643
Intercept	-3,03575	-9,27863

Pearson Goodness-of-Fit Chi Square = 99,592; DF = 140; P = 0,996

Once again, the only one factor exerting a strong a positive influence on the entrepreneurial choice is parental work status, while almost all the other variables prove to be not relevant. More in particular, bridging social capital, i.e. strong and weak ties connecting friends and acquaintances, do exert a negligible influence, thereby contradicting part of the literature on social capital and entrepreneurship. On the contrary, the ability to create contacts with those in the institutions is confirmed to play a positive and significant role.

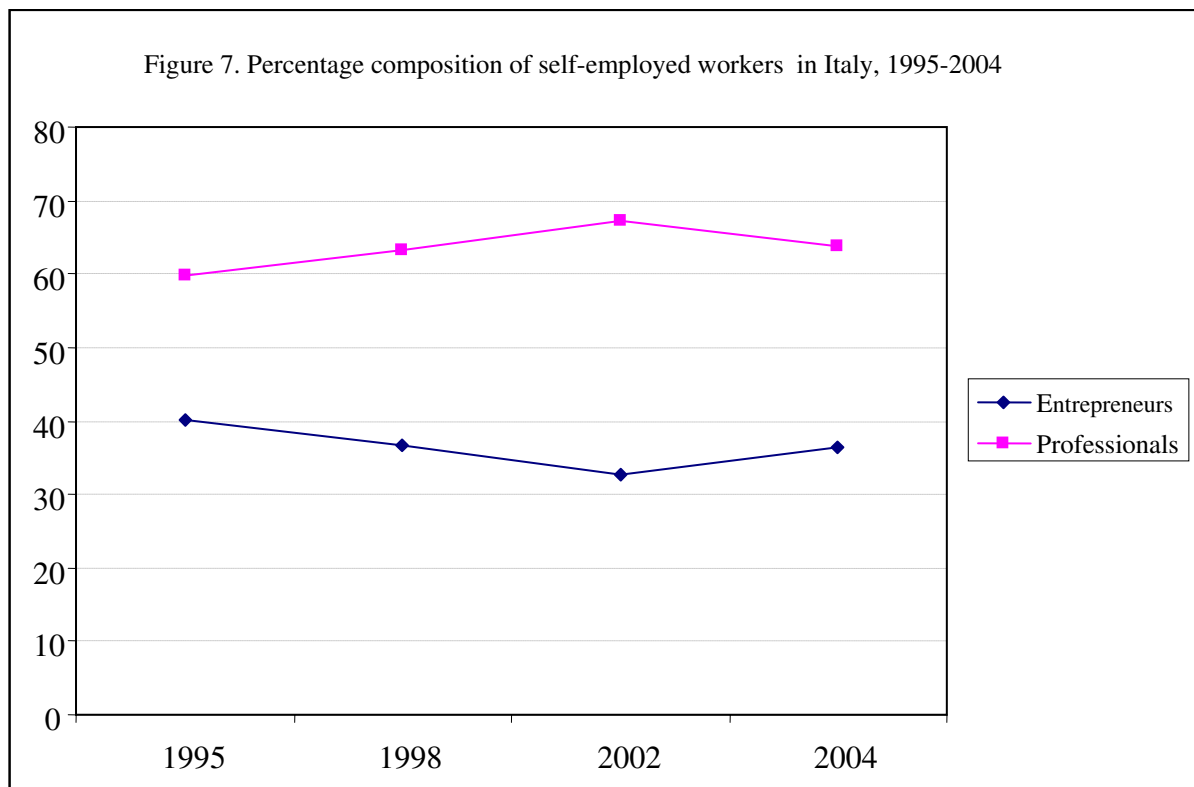
4.4 Inside the black box of self-employment in Italy

The returns-risk profile of educational investments differ among occupations. Typically, individuals with secondary or tertiary education willing to be self-employed can choose between entrepreneurial and professional activities.

In sections 4.1 and 4.2 we have already pointed out the difference occurring between entrepreneurs and members of the arts and professions, thereby introducing the inappropriateness of adopting self-employment rates as a tool for the measurement of entrepreneurship. Such statement is corroborated by the fact that, in Italy, just a minority of self-employed workers are entrepreneurs, while 63.69% are members of the arts and professions (figure 6).



Moreover, despite a slight increase registered from 2002 to 2004, the share of entrepreneurs within self-employed workers has constantly been lower than that of members of the arts or professions during the last decade (see the blue line in figure 7).



In this section we carry out a further probit analysis with the aim to shed some light on the factors shaping the choice to become an entrepreneur instead of a member of the arts or professions within the narrower population of self-employed workers.

Just as in the previous model, we adopt as predictors workers' years of schooling, parental work status, bridging social capital, and the index of regional per capita income. Here we add two more predictors, given by workers' gender, as taken from the last wave of the Bank of Italy's (2006) SHIW, and a proxy for the "environmental human capital", given by the percentage of the regional population holding at least a university degree. This measure is taken from data provided by the Italian Ministry of Education, University and Research.

Let x_1 be the years of schooling, x_2 workers' gender, x_3 parental work status, x_4 bridging social capital, x_5 the proxy for environmental human capital, x_6 the index of per capita income at the regional level, and x_7 the earned income in 2004. The dependent variable Y is the probability to become an entrepreneur, assuming a value equal to 1 if the worker is an entrepreneur and to zero when he is a member of the arts of professions. The probit model is as follows:

$$P(Y = 1|X = x) = \Phi(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7) \quad (3)$$

Parameters estimates are reported in table 5.

Variable	Regression coefficient	Coeff. / St. error
Years of schooling	-,00774	-,28690
Gender (Female = 0, male = 1)	-,24614	-1,45344
Parental work status	1,68628	2,00341
Bridging social capital	,31059	2,92647
Environmental human capital	,15173	1,15088
Regional per capita income	-6,61368	-2,60754
Earned income in 2004	-,00001	-1,27263
Intercept	,51134	,51272

Pearson Goodness-of-Fit Chi Square = 19,799; DF = 50; P = 1,00

Even within the narrower context of the self-employed workers population, the only one determinant of the entrepreneurial choice is parental work status. It is noteworthy that years of schooling are characterized by not significant regression coefficient in all the models we have tested within the analysis. If we limit the field of investigation to self-employed workers, the tendency not to undertake an entrepreneurial career is notably stronger in richer regions. In

other words, higher is the level of regional wealth, lower seems to be the stimulus to become an entrepreneur.

5. Summary, conclusions and agenda for the future.

One should expect that, in large populations, the distribution of innate traits and cognitive abilities is the same, and that they depend on factors that are not in the domain of economic analysis and that change only over a very long time span. Hence, leaving aside the role of social capital, geographical and temporal variations in the stock of entrepreneurial talent that might be relevant to economics are mostly due to abilities acquired through formal education, training and experience.

The importance of these sources of knowledge reflects the complexity of the data to be processed and of the technological and social environment in which firms are embedded. With economic globalization and the ICT revolution, in recent decades the technological and social environments has grown more complex and volatile and the amount of skill and knowledge required to take strategic decisions has increased both quantitatively and qualitatively.

On the other hand, it is evident that, the faster technology and the competitive environment change, the faster the value of specific knowledge acquired through experience decays while that of codified knowledge, acquired through formal education and training, increases: "The comparative advantage of schooling rises relative to that of learning from experience as technology becomes more complex and as a consequence of increases in specialization." (Schultz, 1990, p. 98). In short, the change in the demand for entrepreneurial human capital can be described as (a) an increase in the minimum amount of codified knowledge necessary to generate a unit of information and (b) a reduction in the degree of substitutability between codified and non-codified knowledge.

Our analysis shows that, so far, the choice to become an entrepreneur in Italy has been negatively correlated with educational attainment. Individuals choosing to become entrepreneurs are, on average, less educated than their employees. This outcome is not consistent with what we observe in other advanced countries and, specifically, in the U.S

More in particular, the main findings of our empirical analysis can be summarized as follows: firstly, the only one factor positively affecting the entrepreneurial choice is the parental work status. People whose parents are (or have been) entrepreneurs are more likely to become entrepreneurs too. A positive influence, even if weaker and less significant, is exerted also by the ability to establish fruitful relationships with the institutions as a mean to gain advantages

and resources. Secondly, there is a negative and significant relationship between the entrepreneurial choice and the level of “environmental wealth”. People living in richer regions are less likely to chose to become entrepreneurs, and prefer to undertake other less risky careers. Thirdly, and most important, education – as measured by years of schooling - proves to be highly significant but with a small negative sign, thereby confirming the idea, already pointed out in sections 4.1 and 4.2, that in Italy education cannot yet be considered as a determinant of entrepreneurship. As regards, the role of social networks, the so-called *bridging social capital*, i.e. strong and weak ties connecting friends and acquaintances, do exert a negligible influence, thereby contradicting part of the literature on social capital and entrepreneurship. On the contrary, the ability to create contacts with those in the institutions is confirmed to play a positive and significant role. Even within the narrower context of the self-employed workers population, the only one determinant of the entrepreneurial choice is parental work status. Moreover, if we limit the field of investigation to self-employed workers, the tendency not to undertake an entrepreneurial career is notably stronger in richer regions. In other words, higher is the level of regional wealth, lower seems to be the stimulus to become an entrepreneur.

On the premises of the interpretative framework sketched out in section 2, such results should not wonder us if we look at the size distribution of Italian firms and to their technological and international performance. Micro firms and small firms are over-represented in the Italian economy, vis a vis our European counterparts; firms are specialised in low and medium technology industries and their degree of foreign involvement through direct investments is comparatively low. Moreover, when firms enter the market their size is not small, as compared with our competitors, they remain small afterwards.

These elements provide an overall consistent profile of a country lagging behind in terms of those entrepreneurial cognitive abilities required to compete in complex and turbulent environments. We believe that this characterization can help explaining why Italy shows a much higher business ownership rate then expected given its per capita GDP (Carree and Thurik., 2002).

One should wonder whether the Italian model of entrepreneurs and firms selection, relying on networking and social learning, is sustainable in the face of the new competition coming from the East and of the ICT revolution. In the light of the low overall education attainment of the Italian workforce, and of the expected perverse impact of entrepreneurs’ education on the demand for human capital by firms, a related question is whether Italy is presently experiencing a low entrepreneurial education trap (Redding, 1997).

There is now broad consensus that entrepreneurial human capital, is an important factor in economic growth. Crucial questions are whether market and institutional failures affect the accumulation of entrepreneurial human capital and the selection of entrepreneurs and firms (Redding, 1996; Acemoglu, 1996; Iygun and Owen, 1998).

On more general grounds, our analysis suggest that theoretical and empirical analyses on entrepreneurship should account for the context-dependent nature of entrepreneurial talent and, specifically, should consider the role of technological and institutional factors in entrepreneurial entry and selection.

References

- Arrighetti A., Lasagni A. e Seravalli G. (2003), “Capitale sociale, associazionismo economico e istituzioni: indicatori statistici di sintesi”, in *Rivista di Politica Economica*, Vol. VII-VIII, July-August, 2003.
- Banerjee, A.V. and Newman A.F. (1993), Occupational Choice and the Process of Development, *Journal of Political Economy* 101(2), 274-298.
- Barca F. e Cannari L. (1997), Imprenditori ed investitori: ruolo dell'istruzione, in N. Rossi (a cura di), *L'istruzione in Italia solo un pezzo di carta?*, Il Mulino, Bologna.
- Bates, T. (1990), “Entrepreneur Human Capital Inputs and Small Business Longevity”, *Review of Economics and Statistics*, 72(4), 551-559.
- Baumol W.J. (1968), Entrepreneurship in Economic Theory, *American Economic Review*, vol. 58(2), 64-71.
- Baumol W.J. (1990), Entrepreneurship: Productive, Unproductive, and Destructive, *Journal of Political Economy*, vol. 98(5), 893-921.
- Baumol W..J. (2004), Education for innovation: entrepreneurial breakthrough vs. incremental corporate innovation, NBER WP n.10578.
- Brockhaus R (1982), “The psychology of an entrepreneur”, in: Kent, C, Sexton D, Vesper K (eds) *Encyclopedia of entrepreneurship*, Englewood Cli.s, NJ, Prentice Hall, pp 39–56.
- Cantillon, R. (1775), *Essai sur la nature du commerce en general*, version edited by T.Tsuda (1979), Kinokuya, Tokyo.
- Cohen W.M. and Levinthal D.A. (1989), Innovation and Learning: the Two Faces of R&D, *The Economic Journal* 99, 569-96.
- Conway P., Janod V. and Nicoletti G. (2005), *Product Market Regulation in OECD Countries, 1998 to 2003*, OECD Economics Department W.P. n. 419.
- Cowling M. (2000), “Are entrepreneurs different across countries”, *Applied Economics Letters*, 7, 785-789.
- Cramer J.S., Hartog J., Jonker N., Praag C.M. van (2002), “Low risk aversion encourages the choice for entrepreneurship: an empirical test of a truism”, *Journal of Economic Behavior and Organization*, Vol. 48, N. 1, May 2002, pp. 29-36(8).

- Davidsson P. and Honig B. (2003), The Role of Social and Human Capital among Nascent Entrepreneurs, *Journal of Business Venturing* 18(3), 3001-331.
- Djankov S., La Porta R., Lopez-De-Silanes F. and Shleifer A. (2002), The Regulation of Entry, *The Quarterly Journal of Economics*, MIT Press, vol. 117(1), 1-37.
- Evans D.S. and Jovanovic B.. (1989), An Estimated Model of Entrepreneurial Choice Under Liquidity Constraint, *Journal of Political Economy*, 97(4), 808-827.
- Fafchamps, M. and Minten, B. (2002), "Returns to Social Network Capital Among Traders", *Oxford Economic Papers*, 54: 173-206, April 2002.
- Fafchamps, M., Gabre-Madhin, E. and Minten, B. (2005), "Increasing Returns and Market Efficiency in Agricultural Trade", *Journal of Development Economics*, 78(2): 406-42, December 2005.
- Ferrante F. (2005), Revealing Entrepreneurial Talent, *Small Business Economics* 6, September 159-174.
- Federici D. e Ferrante F. (2005), Qualità del sistema imprenditoriale e riposizionamento competitivo dei distretti del tessile-abbigliamento, in Rapporto ICE 2005.
- Guiso L. and Schivardi F. (2005), Learning to be an Entrepreneur, CEPR Discussion Paper n. 5290.
- Istat (2005), *Le organizzazioni di volontariato in Italia. Anno 2001*, Roma, Istat.
- Istat (2006), *Le cooperative sociali in Italia. Anno 2001*, Roma, Istat.
- Iyigun, M.F. and Owen A.L. (1998), Risk, Entrepreneurship and Human-Capital Accumulation, *American Economic Review* 88(2), 454-457.
- Iyigun, M.F. and Owen A.L. (1999), Entrepreneurs, Professionals, and Growth, *Journal of Economic Growth* 4, June, 213-232.
- Kanbur S.M. (1979), Of Risk Taking and the Personal Distribution of Income, *Journal of Political Economy*, 87(4), 769-797.
- Kihlstrom R.E. and Laffont J.J. (1979), A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion, *Journal of Political Economy*, 87(4), 719-748.
- Kirzner, I.M. (1973), *Competition and Entrepreneurship*, University of Chicago Press, Chicago.
- Knight, F. H. (1965), *Risk, Uncertainty and Profits*, New York, Harper and Row.
- Klapper L. , Laeven L. and Rajan R. (2004), "Barriers to Entrepreneurship", WP.
- Kuncel K.N, Hezlett, S.A and Ones D.S. (2004) "Academic Performance, Career Potential, Creativity, and Job Performance: Can One Construct Predict Them All?" *Journal of Personality and Social Psychology*, Vol. 86, No. 1, 148-161.
- Legambiente (2005a), *Rapporto Ecosistema Urbano 2005*, Roma, Legambiente.
- Legambiente (2005b), *Rapporto Ecosistema Scuola 2005*, Roma, Legambiente.
- Leonardi, R. (1995), "Regional Development in Italy: Social Capital and the Mezzogiorno", *Oxford Review of Economic Policy*, Vol. 11 (1995), Issue 2, 165-179
- Loasby B. (2006), "A Cognitive Perspective on Entrepreneurship and the Firm ", RIDE WP, forthcoming in *Journal of Managerial Studies*.
- Lucas, R.E. (1978), On the Size Distribution of Business Firms" *Bell Journal of Economics* 9, Autumn, 508-523.

- Lucas, R.E. (1988), "On the Mechanics of Economic Development" *Journal of Monetary Economics* 22(1), 3-42.
- Lunaria (2004), *La finanziaria per noi. Come usare i soldi pubblici per diritti, pace, ambiente*, Roma, Editrice Berti.
- Lunaria (2006), *Come si vive in Italia?*, Roma, Editrice Berti.
- Masters, R and Meier, R. (1988), "Sex Differences and Risk-Taking Propensity of Entrepreneurs", *Journal of Small Business Management* 26(1): 31-35.
- Miner, J.B. and Raju, N.S. (2004), "Risk propensity differences between managers and entrepreneurs and between low- and high-growth entrepreneurs: a reply in a more conservative vein", *Journal of Applied Psychology*, 89(1):14-21.
- Murphy, K.M., Shleifer A. and Vishny R. (1991), "The Allocation of Talent: Implications for Growth", *Quarterly Journal of Economics* 106(2), 503-530.
- Nelson, R., and Phelps, E. (1966), Investment in Humans, Technological Diffusion and Economic Growth, *American Economic Review* 61, 69-75.
- Otani, K. (1996), A Human Capital Approach to Entrepreneurial Capacity, *Economica*, 63, 273-289.
- Putnam, R.D., (1994), "Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America", *PS Online: American Political Science Association's Journal of the Profession*.
- Redding, S. (1996), Low-Skill, Low-Quality Trap: Strategic Complementarities between Human Capital and R&D, *Economic Journal* 106, 458-470.
- Sabatini, F. (2005), "Social Capital as Social Networks: a New Framework for Measurement", Working Paper No. 83, University of Rome La Sapienza, Department of Public Economics.
- Sabatini, F. (2006a), "Social Capital, Public Spending and the Quality of Economic Development: the Case of Italy", FEEM Working Paper 14.06, Eni Enrico Mattei Foundation, Milan.
- Sarasvathy D.K., Simon H.A, and Lave, L. (1998), "Perceiving and managing business risks: differences between entrepreneurs and bankers", *Journal of Economic Behavior and Organization*, Vol. 33, N. 2, January 1998, pp. 207-225(19).
- Scarpetta, S., Hemmings P., Tresselt T. and Woo J. (2002), The Role of Policy and Institutions for Productivity and Firm Dynamics: Evidence from Micro and Industry Data, OECD W.P. n. 329.
- Schiller, B.R. and Crewson, P. (1997), Entrepreneurial Origins: a Longitudinal Inquiry, *Economic Inquiry* XXXV, 523-531.
- Schumpeter, J.A. (1936), *The Theory of Economic Development*, Cambridge, Mass.
- Schultz, T.W. (1990), *Restoring Economic Equilibrium: Human Capital in the Modernizing Economy*, Basil Blackwell, Cambridge, Mass.
- Sen A. (1992), *Inequality Reexamined*, Oxford University Press, Oxford, trad. (1994) *La disuguaglianza*, Il Mulino, Bologna.
- Storey D.J. (1994), *Understanding the Small Business Sector*, London: Routledge.
- Val Praag C.M. and Cramer J.S. (2001), The Roots of Entrepreneurial and Labour Demand: Individual Ability and Low Risk Aversion, *Economica*, February, 45-62.

Van der Sluis Van Praag Mirjam, Vijverberg W. (2003), "Entrepreneurial selection and performance. A meta-analysis of the impact of education in Developed Countries", Tinbergen Institute Discussion Papers 2003-046/3.

Van der Sluis J. and Van Praag C. Mirjam (2004), "Economic Returns to Education for Entrepreneurs: The Development of a Neglected Child in the Family of Economics of Education", WP presentato in occasione della conferenza "Self-employment and Entrepreneurship", Stoccolma.

Van der Sluis J., Van Praag Mirjam and Vijverberg W. (2005), "Entrepreneurial selection and performance. A meta-analysis of the impact of education in Industrialized Countries", *World Bank Economic Review*, 19, 2, 225-261.

Vandenbussche J., Aghion P. and Meghir C. (2005), *Growth, Distance to Frontier and Composition of Human Capital*, CEPR W.P. 4860.

Yli-Renko, H., Autio, E. and Tontti, V. (2000), "Social capital, knowledge and the international growth of technology-based new firms", Working Paper No. 2000/4, Helsinki University of Technology, Institute of Strategy and International Business.

Annex A. Educational qualification and work status

Table A1. Educational qualification of different types of workers in 2004 (percentage values)

	None	Elementary school	Middle school	Professional secondary school	High school	Associate's degree	Bachelor's degree	Postgraduate qualification	Total
Factory worker	1,12	13,89	53,84	11,01	19,06	0,22	0,82	0,04	100,00
White-collar worker	0,04	1,56	18,65	8,19	58,74	2,00	10,64	0,18	100,00
School teacher	0,00	0,00	0,68	1,36	42,27	2,27	53,18	0,23	100,00
Junior manager/Cadre	0,00	0,00	6,69	3,34	55,52	2,01	31,44	1,00	100,00
Manager, senior official, principal, headmaster, university teacher, magistrate	0,00	0,00	1,48	1,48	28,89	0,74	62,96	4,44	100,00
Member of the arts or professions	0,00	0,32	6,39	3,51	35,78	2,24	49,52	2,24	100,00
Sole proprietor	0,68	6,85	28,08	8,90	41,78	2,05	11,64	0,00	100,00
Free-lance	0,00	15,49	46,97	8,42	26,77	0,84	1,52	0,00	100,00
Owner or member of a family business	0,43	19,48	39,83	9,96	25,54	0,43	4,33	0,00	100,00
Active shareholder, partner	0,00	4,29	36,43	6,43	45,71	0,71	6,43	0,00	100,00
First-job seeker	0,16	3,76	34,21	4,75	36,66	1,80	18,49	0,16	100,00
Unemployed	2,16	19,05	48,27	8,44	18,83	0,22	3,03	0,00	100,00
Homemaker	6,46	36,26	36,37	4,42	14,46	0,27	1,77	0,00	100,00
Well-off	5,26	26,32	15,79	10,53	31,58	5,26	5,26	0,00	100,00
Job pensioner	10,60	46,93	20,18	4,52	12,90	0,33	4,47	0,07	100,00
Non-job pensioner (disability, survivors', social pension)	25,69	54,30	15,06	1,15	3,37	0,00	0,44	0,00	100,00
Student (from primary school up)	23,32	19,75	31,80	0,91	21,90	0,45	1,82	0,06	100,00
Conscripted soldier	0,00	5,26	31,58	15,79	42,11	5,26	0,00	0,00	100,00
Contingent worker (Co-co-co)	0,00	6,93	19,80	8,91	38,61	1,98	23,76	0,00	100,00

Source: authors' elaboration on Bank of Italy's (2006) data.

Table A2. Professional choice of workers holding different qualifications in 2004.

	None	Elementary school	Middle school	Professional secondary school	High school	Associate's degree	Bachelor's degree	Postgraduate qualification
Factory worker	1,17	7,58	24,56	28,41	10,77	4,38	1,66	3,57
White-collar worker	0,04	0,71	7,16	17,78	27,92	32,85	18,00	14,29
School teacher	0,00	0,00	0,05	0,58	3,93	7,30	17,62	3,57
Junior manager/Cadre	0,00	0,00	0,34	0,97	3,51	4,38	7,08	10,71
Manager, senior official, principal, headmaster, university teacher, magistrate	0,00	0,00	0,03	0,19	0,83	0,73	6,40	21,43
Member of the arts or professions	0,00	0,02	0,34	1,06	2,37	5,11	11,67	25,00
Sole proprietor	0,04	0,20	0,70	1,26	1,29	2,19	1,28	0,00
Free-lance	0,00	1,88	4,77	4,83	3,36	3,65	0,68	0,00
Owner or member of a family business	0,04	0,92	1,57	2,22	1,25	0,73	0,75	0,00
Active shareholder, partner	0,00	0,12	0,87	0,87	1,35	0,73	0,68	0,00
First-job seeker	0,04	0,47	3,57	2,80	4,74	8,03	8,51	3,57
Unemployed	0,39	1,80	3,81	3,77	1,84	0,73	1,05	0,00
Homemaker	6,52	19,26	16,16	11,11	7,95	5,11	3,46	0,00
Well-off	0,04	0,10	0,05	0,19	0,13	0,73	0,08	0,00
Job pensioner	17,59	40,94	14,72	18,65	11,66	10,22	14,38	10,71
Non-job pensioner	11,26	12,52	2,90	1,26	0,80	0,00	0,38	0,00
Student (from primary school up)	29,90	13,31	17,94	2,90	15,30	10,95	4,52	7,14
Conscripted soldier	0,00	0,02	0,10	0,29	0,17	0,73	0,00	0,00
Contingent worker (Co-co-co)	0,00	0,14	0,34	0,87	0,83	1,46	1,81	0,00

Source: authors' elaboration on Bank of Italy's (2006) data

Annex B. The measurement of social capital

Table B1. Indicators of bonding social capital

Label	Description	Year	Mean	St. Dev
CONTPAR	People aged 14 and more particularly caring relatives other than parents, children, grandparents and grandchildren, or counting on them in case of need, for every 100 people of the same area.	1998	3,905	1,037
COPFIG	Couples with children, for every 100 families of the same area.	2001/02	18,470	4,861
COPNOFIG	Couples without children, for every 100 families of the same area.	2001/02	71,500	5,424
FAM5COMP	Families with 5 components and more for every 100 families of the same area.	2001/02	10,990	3,995
FAMSINGL	Singles-families for every 100 families of the same area.	2001/02	72,790	5,022
FIG16KM	People aged 15 and more with children living 16 kilometers away or more (in Italy or abroad) for every 100 families with children of the same area.	1998	10,225	3,958
FIG1KM	People aged 15 and more with children living within 1 kilometer (cohabitants or not) for every 100 families with children of the same area.	1998	86,245	3,594
FRATELTG	People meeting their brothers and/or sisters everyday for every 100 people with brothers and/or sisters of the same area.	1998	6,955	3,199
GIOBAM2S	People aged 6 and more playing with children once a week or more for every 100 people of the same area.	2000	32,11	2,33
INCPARTG	People aged 6 and more meeting family members or other relatives everyday for every 100 people of the same area.	2000	59,735	5,448
MUM16KM	People up to 69 having their mother living 16 kilometers away or more (in Italy or abroad) for every 100 people with an alive mother of the same area.	1998	28,595	5,408
MUM1KM	People up to 69 having their mother living within 1 kilometer (cohabitant or not) for every 100 people with an alive mother of the same area.	1998	46,055	9,139
NOGIOBAM	People aged 6 and more never playing with children for every 100 people of the same area.	2000	36,22	4,19
NOINCPA	People aged 6 and more never meeting their family members and other non cohabitant relatives for every 100 people of the same area.	2000	10,790	4,937
NOPARENT	People aged 6 and more having neither a family nor other non cohabitant relatives for every 100 people of the same area.	2000	23,075	4,900
SODDPAR	People aged 14 and more declaring themselves satisfied of relationships with their relatives for every 100 people of the same area.	2002	36,27	6,34
VFIGTG	People meeting their children everyday for every 100 people with non cohabitant children of the same area.	1998	43,245	4,176
VMUMTG	People meeting their mother everyday for every 100 people with non cohabitant mother of the same area.	1998	17,075	3,253

Table B2. Indicators of the informal networks of friends and neighbors

Label	Description	Year	Mean	St.dev
ASSPORT	Non profit sport clubs for every 10.000 people of the same area.	2002	11,440	4,829
BAR2S	People aged 6 and more attending bars, pubs, and circles at least once a week for every 100 people of the same area.	2000	21,500	4,076
CENAF2S	People aged 6 and more having dinner outside more than once a week for every 100 people of the same area.	2000	5,045	1,198
INCAMI2S	People aged 6 and more meeting friends more than once a week for every 100 people of the same area.	2002	28,735	1,485
MUBAR	People aged 14 and more attending pubs and bars to listen to music concerts for every 100 people of the same area.	2000	18,620	2,411
NOBAR	People aged 6 and more never attending bars, pubs and circles for every 100 people of the same area.	2000	47,865	6,513
NOCENF	People aged 6 and more never having dinner outside for every 100 people of the same area.	2000	17,265	4,954
NOPARLCO	People aged 6 and more never talking with others for every 100 people of the same area.	2000	8,510	1,269
NOPARVIC	People aged 6 and more never talking with neighbors for every 100 people of the same area.	2000	25,585	3,314
PARCON2S	People aged 6 and more talking with others once a week or more for every 100 people of the same area.	2000	46,965	6,074
PARVIC2S	People aged 6 and more talking with neighbors once a week or more for every 100 people of the same area.	2000	22,940	3,328

¹ The SHIW began in the 1960s with the aim of gathering data on the incomes and savings of Italian households. Over the years, the scope of the survey has grown and now includes wealth and other aspects of households' economic and financial behaviour such as, for example, which payment methods are used. Actually, the survey's sample comprises about 8,000 households (24,000 individuals), distributed over about 300 Italian municipalities. The survey investigates in depth into the individual endowments of human capital through the collection of items regarding the work status, the educational qualification, and patterns of high-school, tertiary and post-degree studies of workers and of their family members.