

ENTREPRENEURIAL ACTIVITY AND EDUCATION IN ITALY

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Abstract

The paper contributes to the empirical literature on the relationship between formal education attainment, specific entrepreneurship training and the firm-formation process. The data come from the Global Entrepreneurship Monitor (GEM) survey, which collects information on business formation in many countries. After a validation check of GEM entrepreneurship measures with those of Labour Force Survey, the paper presents a descriptive comparative analysis of new business process in Italy and other EU countries, looking at how that process is related to gender, education and other specific characteristics of the new firms. The results confirm anecdotal evidence: much needs to be done in Italy to foster high-tech and high-job-growth entrepreneurship. The GEM 2008 survey gives an idea of the diffusion of entrepreneurship training in Europe. Italy lags behind other countries in this respect. Controlling for many factors, the empirical model tests the probability of becoming an entrepreneur in Italy: it is estimated to be higher than in other countries, but higher education attainment is related to lower probabilities of starting a business. Moreover, specific business education in Italy is shown to negatively affect start-up decisions.

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Introduction

It is widely recognized that entrepreneurship plays a pivotal role for economic development at both national and local level and that entrepreneurs are key agents of innovation in market economies. Recent policy papers of the European Commission (2010) and OECD (2010) have emphasized the importance of entrepreneurship for boosting growth in member countries. In recent decades growing attention has been paid to the role of start-ups and small firms in fostering economic growth and employment. Stimulating entrepreneurship in general and new business formation in particular is viewed as a way to ensure the creation of jobs in both the short run and over the longer term (Andersson and Noseleit, 2008).

In international studies Italy fares poorly in entrepreneurial dynamics compared with other developed countries, showing a low share of new high-tech firms. This is in vivid contrast with the directions of Europe 2020 programme that aims, as a general target, at knowledge-based innovation and, in particular, at promoting a new entrepreneurial culture across Europe (European Commission, 2010). Against this backdrop, it is important to investigate the factors affecting entrepreneurial dynamics.

Individuals may decide to start businesses when and because they recognize specific entrepreneurial opportunities. Others may decide that they want to “go into business” and then undertake a search for ideas. Entrepreneurs may recognize opportunities well in advance or on the eve of setting up their businesses. Consequently, the perception of promising opportunities in new business areas can take many different paths.

Education is one of the chief factors affecting the quantity and quality of the opportunities that individuals perceive and their beliefs about their personal ability to exploit them. A new entrepreneurial culture can also be formed by incorporating entrepreneurship education in the curricula of official educational programmes. Recent decades have seen an explosion of courses and degrees in entrepreneurship in the United States and a number of other countries. In Italy, only a few universities offer specific entrepreneurship courses or curricula, mostly within business programmes rather than in science and engineering programmes, where the need for them is greater (Iacobucci and Micozzi, 2012). This could limit the diffusion of an entrepreneurial culture and ultimately reduce the contribution of new firm formation to the country’s economic growth.

The aim of this paper is to assess the role of education in explaining the propensity to start an entrepreneurial career. The focus is on Italy versus other European Countries. A first step of analysis consists in presenting Global Entrepreneurship Monitor (GEM) measures of entrepreneurship and comparing them with those of Labour Force Survey (LFS), which come from a wider sample of individuals. The analysis confirms that GEM data perform well in measuring entrepreneurial

phenomena in Italy. Then further evidence about individual characteristics of entrepreneurs is presented, followed by an analysis of entrepreneurship training and education, classified by its nature (voluntary or compulsory) and its source (schools, universities, other).

The descriptive evidence introduces the empirical analysis of the determinants of new firm-formation process. A logit model of the probability of entering entrepreneurship is estimated using the 2008 GEM survey, which is the only one reporting data on entrepreneurship education. The results show that the probability of becoming entrepreneurs in Italy is higher than in the countries with which it compared, but higher education attainment is related to lower entrepreneurship rates. Even attendance of specific entrepreneurship training programmes in Italy seems to have a negative affect on new firm formation.

The paper is organized as following. Section 2 reviews the literature on the determinants of entrepreneurship, with a special focus on education and training. Section 3 describes the data and compares the two main sources available on new entrepreneurship activities available (GEM and LFS). Section 4 describes differences in entrepreneurship rates among some European countries. Section 5 analyzes entrepreneurship education on the basis of the 2008 GEM survey. Section 6 presents the empirical model. The final section summarizes the study's main conclusions.

Literature review

Cross-country differences in new businesses formation have attracted the attention of scholars and researchers, given the importance attributed to entrepreneurship in the development and transformation of economic systems. The empirical literature on this topic identified many explanatory variables of these differences. Davidsson et al. (1994) in a study on Sweden classified these variables into four categories:

- 1) Micro level variables, related to potential entrepreneurs: socio-demographic (age structure, education, employment status); work experience (occupational structure);
- 2) Macro level variables, related to market conditions (population density, population growth and income);
- 3) Variables related to availability of capital needed to start-up a new business: private capital (income and wealth per capita); direct and indirect public support;
- 4) Socio-cultural variables: culture of entrepreneurship, social preference for equality, etc.

Various conditions in environment should affect the individual perception of opportunities and personal beliefs about their own capabilities of exploiting them: for example, economic growth, culture and education.

Recognition of opportunities is only one step of the start-up process. A further step is evaluating the gap between personal capabilities and those needed for succeeding in the entrepreneurial activity. A

role in this process may be played by fear of failure, as pointed out by the self-efficacy theory (Bandura, 1982). Characteristics such as age, gender, ethnicity or education can influence fear of failure. Young people may not have families and mortgages as a support. Immigrants may have fewer options of generating income. The institutional environment can impact fear of failure: for instance, with legislation that deters aspirants to become entrepreneurs. This suggests that it could be possible to improve perceptions of opportunities and increase intentions to start businesses by reducing fear of failure. In this sense, a context favourable to entrepreneurship fosters the would-be entrepreneur. An entrepreneurial culture may be reinforced by the status society confers to entrepreneurs and the extent to which people think that being an entrepreneur is an attractive activity. Media can also emphasize common ideas about entrepreneurs: for example, magazines or TV shows can highlight entrepreneurs, or newspaper stories can feature about the achievements of such individuals. Policy makers may even take specific actions to highlight entrepreneurs and shape cultural perceptions. The GEM (2010) survey shows that perceptions about the attractiveness of entrepreneurship as a good career choice, the status of entrepreneurs and media attention toward entrepreneurship were all, on average, highest in the factor-driven countries¹ (i.e. developing countries). In both the efficiency-driven and innovation-driven groups of countries, perceptions about the status of entrepreneurs were similar. One possible explanation is that, generally speaking, people in factor-driven economies perceive entrepreneurship as an escape from a formal job: necessity entrepreneurship versus opportunity entrepreneurship².

Several empirical works show that entrepreneurship must be studied using an holistic approach in which human capital, social capital and financial capital affect, at different level, the probability to become a nascent entrepreneur.

In this paper the focus is on human capital. Various forms of educational and social resources contribute differently to the dynamic processes of opportunity recognition and exploitation. Formal education is one component of human capital that may allow the accumulation of explicit knowledge and skills for entrepreneurs.

Formal education can affect the likelihood of entrepreneurial entry through the acquisition of skills, credentialing and sorting people by ambition and assertiveness. The profile of the relationship differs somewhat between analyses: Davidsson and Honig (2003) for Sweden, indicate positive effects

¹ According to the World Economic Forum's classification, which is used by GEM, the factor-driven phase of economic development is dominated by subsistence agriculture and extraction businesses, with a heavy reliance on labour and natural resources. In the efficiency-driven phase, further development is accompanied by industrialization and an increased reliance on economies of scale, with capital-intensive large organizations more dominant. As development advances into the innovation-driven phase, businesses are more knowledge intensive, and the service sector expands.

² In GEM reports, nascent entrepreneurs are classified into a dichotomous category for contextual motivation - necessity versus opportunity - based on the respondents' perception of the entrepreneurial initiative. Opportunity entrepreneurship represents the voluntary nature of participation in an entrepreneurial venture. On the contrary, necessity reflects the individual's perception that such actions represent the best option available for employment, but not necessarily the preferred option. If a respondent starts his/her own business because he/she sees no better alternative to earn a living, he/she is labelled as a nascent necessity entrepreneur. If they start a new venture to realize a business idea, they are labeled nascent opportunity entrepreneurs.

along the whole spectrum or towards the high end of education; on the contrary, in US and in some international comparative analyses, it emerges an under representation of those with low levels of education among entrepreneurs, but with no further increase in the propensity to become nascent entrepreneur above medium levels of education (Reynolds, 2010).

The association between education and entrepreneurship depends also on the type of education. General business and technical skills can help nascent entrepreneurs in starting up basic business functions and avoiding common mistakes. Other courses facilitate students to learn specific trade and business skills or to develop critical thinking, communication, teamwork, and other general skills that will be necessary as an entrepreneur. Formal education could also provide access to certain social networks or serve as a positive signal for nascent entrepreneurs when evaluated by resource providers (e.g., venture capitalists, business angels, etc.).

There is evidence that the education and life experience can increase the likelihood of engaging in start-up activities and venture survival (Wiklund, Dimov, Katz and Shepherd, 2006). Starting from these findings, the expectation is that the education has a positive influence on entrepreneurship.

The Eurobarometer report (Flash Eurobarometer, 2009) shows that there is an equal proportion of EU citizens agreeing and disagreeing that their school education had helped them to develop a sense of initiative, or in other words, a sort of entrepreneurial attitude (49% of respondents “strongly agree” and “agree” while 49% of respondents “disagree” and “strongly disagree”). In Italy, the data of Eurobarometer shows a low perception that citizens have about the role of their school education in raising an interest in entrepreneurship and in preparing them to become nascent entrepreneurs. Roughly 4 in 10 agreed that their school education gave them the skills and know-how to enable them to become an entrepreneur (10% “strongly agreed” and 29% “agreed”); just a quarter agreed, however, that their education had also made them interested in becoming an entrepreneur (6% “strongly agreed” and 19% “agreed”). Finally, 11% of EU citizens strongly agreed and 33% agreed that their school education had helped them to better understand the role of entrepreneurs in society. This perception is confirmed by a study on entrepreneurship education in Italy: it is rather underdeveloped, compared with the situation observed in the US and in other European countries. Only a few universities have courses or specific curricula dedicated to entrepreneurship and these are concentrated within business faculties while very few exist in science and engineering faculties (Iacobucci and Micozzi, 2012).

This is in vivid contrast with previous studies that have concluded that entrepreneurship education and training can influence the behaviour and future attitude of students (Fayolle et al. ,2006). Research on entrepreneurship education and its outcomes has highlighted the role of entrepreneurship education in affecting the students’ attitudes towards entrepreneurship, their motivation and intentions in engaging in new ventures (e.g. Dreisler et al. , 2003, Peterman and Kennedy, 2003; Klapper, 2004, Fayolle, 2005; Pittaway and Cope, 2007; Athayde, 2009).

Entrepreneurship according to GEM and Labour Force Survey (LFS)

Global Entrepreneurship Monitor (GEM), through its Adult Population Survey (APS), measures individuals' involvement in entrepreneurial activities and their aspirations. This information is based on primary data collection among representative samples of adult individuals. In 2010, over 175,000 people were surveyed in 59 countries. The countries are grouped into three levels: factor-driven, efficiency-driven, and innovation-driven.

Main goal of the GEM project is to shed light on the firm's life span that combines the stage in advance of its birth (*nascent entrepreneurship*) with the stage directly after the starting moment (*owning/managing a new firm*). In order to identify the individuals involved in these stages, two main selection questions are asked. The first asks if respondents are "currently trying to start a new business, including any self-employment or selling any goods or services to others" (Bosma et al., 2012). The second selects those who are "currently trying to start a new business or a new venture for their employer as part of their normal work" (*ibidem*). In case the respondent answered yes or "don't know" to either of the two questions, further information is solicited. First, it is asked whether concrete activities have been carried out to set up the business over the past 12 months. Second, it is inquired if individual is the owner or at least the co-owner of the nascent business. Respondents who positively answer to these questions are classified as nascent entrepreneurs if the first financial payment (including the salary of the owner) has been made no more than 3 months before the interview; if the first financial payment has been made between 3 and 42 months before the interview, respondent is classified as baby business owner. Nascent entrepreneurship and baby business ownership constitute 'total early-stage entrepreneurship activity' (TEA), the main measure of entrepreneurship proposed by the GEM model. The ratio of TEA to 15-64 population in any given country is the TEA rate, which will be the main object of studying in what follows.

In the fourth column of Table 1, Italy's TEA rates are reported for 2001-2009 years. They vary from a minimum of 3.1 per cent in 2003 to a maximum of 6 per cent in 2001. Interestingly, from 2001 to 2007 nascent entrepreneurs prevail over baby-business owners, indicating that many persons tried to start their own business, successfully or not. In the last two available years nascent entrepreneurship rates declined sharply: this may be linked with the recession that hit Italy and the world economy in that period.

As a check on the validity of GEM data, which rely on a national sample of limited amplitude, we report in table 1 different measures of entrepreneurship calculated from Italy's ISTAT Labour Force Survey (LFS). The main advantage of LFS over GEM is the much higher dimension of the sample. Each year about 300,000 households are sampled by Italy's LFS while only 2,000 individuals are sampled by Italy's GEM. However comparison between the two data sets has to be conducted with

some cautions. The goal of the two surveys is completely different. LFS, focusing on labour market, identifies independent workers, which may be entrepreneurs, self-employed, professionals and members of cooperative societies. Moreover, the identification refers to the main working activity of the respondent. GEM's goal is to study entrepreneurship at its early stage. GEM definition of entrepreneurial activity includes also tentative entrepreneurial experiences that are probably excluded by LFS as the latter is more focused on the main activity of respondents. A way to circumvent this problem is to focus more on baby-business owners who eventually manage more solid businesses. Another problem is related to professionals. They normally operate as independent workers but their activities are generally legally protected and not market-oriented. Finally, in the LFS questionnaire the limit duration of 42 months to be classified entrepreneur as in the GEM's TEA measure cannot be identified. For all these reasons, columns 5 to 8 in Table 1 report entrepreneurship rates from LFS calculated including and excluding professionals and with duration limit of 36 and 48 months respectively, which are the closest to 42 months available in LFS.

We expect the baby-business owners rates (column B) from GEM to be included in the interval given by columns D and E, if we believe that professionals must be included, or by columns F and G, if not. If we exclude professionals from LFS entrepreneurship measure, as we prefer, baby business owners rates from GEM are included in the expected interval in 3 out of 6 years. In any case, absolute values calculated from GEM are not distant from those reported by LFS. Our analysis thus reinforces usage of GEM data to measure entrepreneurial activities.

Entrepreneurship in Italy and in other EU countries

Table 2 in the second column reports TEA rates for Italy and some other European countries: data are averaged over the period 2001-09. TEA rates differ significantly across countries. Italy performs poorly in the ranking with 4.5 per cent of adults involved in TEA. Only France and Belgium register a lower rate (4.0 and 3.4 per cent, respectively). Germany shows a similar pattern. In Norway and Spain early-stage entrepreneurial activity appears to be more performing.

GEM questionnaire allows distinguishing some relevant characteristics of the early-stage entrepreneurial activity. This is of particular interest as entrepreneurship is a quite broad concept that ranges from self-employed shopkeepers or craftsmen to owners/managers of incorporated firms with many employees. Thus, it is worth giving some further specifications of the TEA. The remaining columns of Table 2 are devoted to that.

First, as new entrepreneurship in the public debate is often called for boosting innovation, special attention has to be posed on entrepreneurs who offer products or services that are new to all or most customers and/or for which there are no or few competitors. The proportion of such entrepreneurs over total TEA is reported in the third column. Variation across countries is significant, ranging from

40 per cent of Denmark to 22.5 per cent of Italy. Spain has a proportion similar to Italy, while Germany and especially France show a higher share of innovative new entrepreneurs over total TEA.

Second, new entrepreneurship is an important source of job creation. Consequently, it is worth assessing the impact of new entrepreneurial activities on current and future employment. In the fourth column of Table 2 the share of new entrepreneurs expecting to employ more than 5 employees in a five years period is reported. In this context, in Italy almost one fourth of firm start-ups belong to this category. Again Denmark leads the ranking with about 30 per cent, UK shows a similar result, while Spain is the worst performer.

Third, the international profile of start-ups' customers is quite different among countries. In the sixth column of the table, one can see that about three quarters of start-ups in France and Germany has at least some customers from abroad. This contrasts with what happens in Spain where less than 40 per cent of new firms declares to have some foreigner customers. Italy is in an intermediate position with a share of international customers equal to 56 per cent.

Forth, Italy has the lowest share of new start-ups operating in medium- and high-technology sectors (5.3 per cent). France, Spain and UK show only slightly higher shares. On the contrary, almost 10 per cent of new firms in Germany operate in medium and high-tech sectors.

GEM data are survey data and, as such, present sample variability. Moreover, national samples have different size. In Table 3, for each country the total number of interviewed individuals is reported. UK and Spain have the biggest samples. This information is important in defining 95 per cent confidence interval for the average TEA rates reported above. The last column of Table 3 shows again the same TEA rates already reported in Table 2 but with the addition of 95 per cent confidence intervals. It emerges that Italy has a TEA rate not statistically different from that of France, the Netherlands and Germany. The other countries' TEA rates are statistically different from the Italian one: Belgium's is lower; Spain, UK, Denmark and Norway's are higher.

TEA rates differ among different socio-demographic groups. Gender and education are very likely to affect the propensity to start new entrepreneurial activities. In Table 3, second and third columns report TEA rates for males and females respectively. The propensity to start a new business is much higher for men than for women, with statistically significant differences everywhere. In Italy, TEA rate for males is 5.9 per cent, almost as double as the females' one (3.1 per cent). Germany has a similar gap, as well as Spain. Discrepancies are more marked for other countries. As a possible explanation of the lower gap in Italy and Spain, one can argue that the presence of a more traditional trade sector with small shopkeepers contributes to push women TEA rates. On the contrary, diffusion of part-time contracts in Nordic countries may eventually induce women to prefer dependent working to better reconcile working time and family care.

Differences in entrepreneurial activities across different education groups emerge neatly from the remaining columns of Table 3. TEA rates are higher for higher levels of education. The pattern is quite similar across countries. In Italy, individuals with up to some secondary education have a lower entrepreneurial propensity than the others and differences are statistically significant. A higher degree increases the probability of becoming entrepreneur. However, the increase is only slightly significant between those with a secondary degree and those with a post-secondary degree, while it becomes not statistically significant going from a university degree to a graduate experience. Results for other countries are variegated. In Belgium, UK and Germany, individuals with up to some secondary education have the lowest TEA rates as in Italy, while in the other countries differences in TEA rates among these and the ones with the immediate upper degree are not statistically significant. Going from a secondary to a post-secondary degree yields only mild improvements in TEA rates, with some peculiar cases, like Norway and Germany, where rates of new entrepreneurial activities are almost identical for the two groups. Finally, education at post-graduate level pays significantly off in Belgium, Spain, UK, Denmark and Germany, while in other countries, as in Italy, differences with education up to graduate level are not significant.

Evidence on entrepreneurship education and training

In the 2008 wave, GEM collected information on the diffusion of entrepreneurship education and training in European countries. Respondents were asked if they had ever received training in starting a business, either in (primary or secondary) school or outside school. In addition, they were asked about the voluntary or compulsory nature of the entrepreneurial training attended. Figure 1 reports percentages of the adult population receiving entrepreneurial training, classified in four typologies: only voluntary, only compulsory, both voluntary and compulsory, not classified. Belgium has the largest diffusion of entrepreneurial training: more than one third of the adult population attended some form of training. Denmark follows with 26 per cent. Spain performs relatively well and, as Germany, remains above the average. UK and France have lower rates and Italy remains in the last position with only 16.5 per cent of the adult population having received any form of entrepreneurial education or training. In addition, figure 1 tells us that entrepreneurial education in Spain, Germany, UK and Italy is voluntary in great majority. In France, Belgium and Denmark, compulsory training has relatively greater diffusion. Given this evidence, in evaluating the effect of specific education and training on the probability of starting up a new business, self-selection problems have to be carefully considered.

Sources of training may vary significantly across countries. A distinction can be made between ‘in-school’ training and ‘non-school’ training. ‘In-school’ training is provided inside primary or secondary education. ‘Non-school’ training comprises sources beyond schooling, such as colleges,

universities, public agencies, chambers of commerce, trade unions and employers. Figure 2 reports data on such classification. In-school training is highly prevalent in Belgium, where it almost doubles the rate of non-school training: this explains why compulsory training is so diffused in that country. The only other country where in-school prevails on non-school training is Italy. In all other cases, non-school training is more common than in-school training. This is in line with the evidence reported by Martinez et al. (2010) that the relative importance of non-school training is on average greater in more developed economies (to which all countries here considered belong) than in factor-driven economies (developing economies).

Since entrepreneurship training is mostly voluntary, it is worthy contrasting socio-economic characteristics of trained versus untrained individuals in order to understand what influences self-selection into training. Table 4 evidences the age distribution across countries. It emerges that entrepreneurship trained individuals are on average younger than untrained. Almost 35 per cent of all trained individuals in these countries are between 15 and 34 years old versus one fourth of untrained persons. On the opposite side, only 38.4 per cent of the trained individuals belong to the last two age classes (45-64 years) versus 48.6 per cent of the untrained portion. These differences are more pronounced in some countries. In Italy, 63.2 per cent of trained individuals are less than 44 years old versus only 43 per cent of untrained. Similar differences show up in Belgium. In Denmark the distribution of trained individuals is even more concentrated in the first two cohorts (15-34 years). In the other countries, age distribution of trained and untrained are more similar. This is especially true for France and Germany.

Besides age, educational attainments of trained versus untrained individuals are on average different. Here many forces are in action in determining the shape of the distribution. On one hand, given the relevance of schooling as a source of entrepreneurship education, one can expect that trained individuals are more educated than untrained ones. On the other hand, if people are pushed to entrepreneurship by the lack of more secure working alternatives and entrepreneurship training is needed in order to start new businesses, one can expect that more educated people, having better alternatives as dependent workers, have less incentives to attend entrepreneurship courses. Consequently, trained individuals may result to be less educated than untrained.

Table 5 displays the distribution of educational achievements among trained and untrained adults in the European countries. Overall, almost 60 per cent of those that have received entrepreneurship training at some point in their life have at least a post-secondary degree. In the untrained group, those with the same level of education are around 48 per cent. On the opposite side, individuals with only some secondary education are less represented in the trained group than in the untrained one, while adults with secondary education have almost the same weight in both groups. Even with regards to education distribution, differences across countries are relevant. Belgium, France, Spain, UK and

Germany (at a lesser extent) follow a pattern similar to the average one. Denmark and Italy show a peculiar education distribution. In Denmark, the share of individuals with secondary education is higher in the trained group than in the untrained, while those with an upper degree are relatively less represented in the former group. In Italy, more than 60 per cent of trained persons have only a secondary degree, a share much higher than in the other countries. Lower levels of educational attainments in Italy explain this evidence, even though many factors are at work. Indeed, the share of people with secondary education among the untrained group is at 46 per cent, a rate still higher than abroad but much lower than among the trained group. Hence, among trained individuals, those with a secondary degree are much more represented. One possible explanation has to do with the fact that dependent working has been seen as the preferred alternative for many graduated persons, while independent activities are chosen by not so highly educated individuals that, in order to succeed, may voluntarily decide to attend entrepreneurship training courses.

Estimation

In order to assess the effect of entrepreneurship training over entrepreneurial activity in Italy (with respect to other countries), a logit model for 2008 survey has been estimated. 2008 survey is the only wave of GEM's APS in which information about entrepreneurship training are collected. The aim is to evidence factors related to individual choice of starting a new entrepreneurial venture. The dependent variable is TEA variable, which is a dummy variable equal to one if the individual is a nascent entrepreneur or an owner/manager of a recently born firm. The first step has been to select a model that fits data for all the countries and then it has been checked if specific country (Italy) effects help explaining dependent variable. As data are collected in different countries and errors are likely correlated within countries, cluster-robust standard errors have been used, with the country of origin as cluster variable.

Table 6 reports three possible specifications of the model without Italy's country effects. The most basic model, denoted as Model 1, considers as explanatory variables only the participation to any form of compulsory entrepreneurship training and its interaction with formal education, together with other individual characteristics (gender, age, education attainments and household income tertiles). The restriction to only compulsory entrepreneurship training is to avoid endogeneity problems. In such a specification, few variables appear to be significant. Being female decreases the probability of belonging to the TEA group, as well as being one year older. Individuals belonging to higher income households show a higher propensity to start a new business. The dummy variable recording the frequentation of a compulsory entrepreneurship training is not significant either taken alone or in combination with education attainment.

Model 2 enriches Model 1 by adding a series of variables that, according to the GEM framework, describe entrepreneurial attitudes. These capture assessments, by the individual respondent, on what the national beliefs are with respect to some items associated to entrepreneurship: national preference for similar standards of living; people's consideration about entrepreneurship as a good career choice; high status attached to successful entrepreneurship in the society; public media's coverage of successful entrepreneurship. Wald test of joint insignificance of these four variables added to the previous model is strongly rejected. Among these, the public media's coverage of entrepreneurial success stories has a significant and positive effect over the probability of being involved in entrepreneurial activity. Even the consideration about entrepreneurship as a good career choice seems slightly significant (at 0.05 significance level) but the negative sign appears counterintuitive.

We finally enlarge the model to account for other variables included in the GEM framework to measure perceptions to entrepreneurship: the fact that respondent personally knows someone who recently started a new business (role model); respondent's perceptions of good business opportunities in the area where she lives; a self-efficacy variable, namely respondent's perception of having the required knowledge and skills to start a business; a risk-perception variable, measured by positive answers to question about whether fear of failure would prevent respondent from starting a business. Even in this case Wald test of the joint insignificance of these four variables in the model is strongly rejected. Furthermore pseudo-R2 improves substantially. The sign of the four estimated coefficients matches theoretical *a-priori*: knowledge of other new entrepreneurs, perception of economic opportunities and self-efficacy positively affect the probability of being an early-stage entrepreneur, while fear of failure has a negative effect. In this specification, even education attainments count: having a secondary degree, as well as a post-secondary one, increased the probability of belonging to TEA group with respect to those who have up to some secondary degree. Moreover, while compulsory entrepreneurship training *per se* remains not significant, the interaction between this variable and education now is significant. In particular, those who have a secondary or post-secondary degree and have been trained to entrepreneurship are less likely to be new entrepreneurs than those who are not. Then, in this specification, which is our preferred up to now, higher education increases the probability of starting a new business but not for those who have attended compulsory entrepreneurship training.

At this point, the preferred specification is enriched by a dummy variable equal to one if individual lives in Italy and zero if not. If it is significant, then in Italy the probability of being a new entrepreneur is different from that of other countries, even after consideration of all the variables reported above. Results of this estimate are reported in Table 7 and indicated as Model 4. The coefficient of the Italy's country effect is positive and (slightly) significant. Being in Italy is related to a higher TEA probability than being in other countries, for given values of other covariates.

Italy's country effect may enter this specification not only directly but also through a combined effect with education and entrepreneurship training. Model 5 adds to the previous specification two dummy variables that are equal to one if the individual lives in Italy and has a high-school diploma or an academic degree respectively. Both the coefficients are strongly significant and negative. Few changes are observed in the magnitude of other coefficients with the exception of the coefficients on education that slightly increase. Moreover, the Italy's pure country effect becomes stronger.

Finally, we add also an interaction effect between Italy and compulsory entrepreneurship training (Model 6). The coefficient is negative and significant at 0.05. Only few other minor changes are evident with respect to Model 5.

Figure 3 reports the model-predicted probabilities for individuals with different educational attainments, for Italy and other countries, distinguishing between trained and non-trained persons. Confidence interval at 95% are also reported. It comes out that the model predicts a higher probability of being in the TEA group for Italian, under-educated non-trained individuals than the non-Italian ones. No significant differences are found among mid- and highly-educated persons between Italy and other countries, having or not received any entrepreneurship training. In Italy, low-educated individuals have a much higher probability of becoming entrepreneurs than mid- or high-educated persons. Moreover, having been specifically trained for entrepreneurship actually decreases the probability of being in the TEA group.

Concluding remarks

Entrepreneurship is a crucial factor of competition and innovation, job creation and prosperity. A policy framework that identified strategic themes as key drivers for economic growth includes building an enterprise culture, encouraging a more dynamic start-up market and enhancing the scope for small business growth.

Starting from the premise that education, in particular entrepreneurship education, may influence entrepreneurial dynamics, this work investigates the relationship between education and entrepreneurial rate in Italy and other European countries.

A significant aspect of the work is its comparison of GEM and LFS entrepreneurship measures for Italy. The check confirms the validity of GEM's data for studying entrepreneurship in Italy. GEM's data are used to present descriptive evidence of the weaknesses of Italy's entrepreneurial environment: low rate of new entrepreneurial activities, which are less likely to be innovative, operate in more traditional sectors and do less business abroad than their counterparts in other countries.

New entrepreneurs in Italy have, on average, a lower level of educational attainment than new entrepreneurs abroad. Individuals with higher educational qualifications (tertiary versus secondary education) do not show a higher probability of becoming entrepreneurs in Italy. Entrepreneurship is

concentrated in the intermediate groups (up to an upper secondary school diploma). Italy has also the lowest rate of entrepreneurship training for the adult population; compulsory training is the glaring weakness, while the diffusion of voluntary training is closer to that of other EU countries. Finally, among trained individuals, those with no more than an upper secondary school diploma are over-represented: this may be because people with longer schooling prefer salaried employment and thus do not undergo any form of entrepreneurship training.

The main results of the empirical model confirm the findings of the descriptive analysis:

1. Overall for the countries considered, higher education has a positive effect on the probability of starting a new business; however, if higher educational attainment comes in conjunction with any form of compulsory entrepreneurship training, the effect becomes negative.
2. Holding all other factors constant, living in Italy increases the probability of becoming an entrepreneur.
3. This higher propensity to start businesses in Italy is negatively related with educational attainment and compulsory entrepreneurship training; Italy diverges from the pattern with regard to the relationship between education and entrepreneurship.

Lack of data prevents us from proposing a more detailed analysis of new entrepreneurship determinants. In particular, the fact that questions about entrepreneurship education are limited to the 2008 wave of GEM survey works against the use of more appropriate econometric techniques. An effort by GEM to include this information in the survey every time would be valuable.

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Table 1

Measures of entrepreneurship in Italy <i>(percentage values; ratio to 15-64 years old population)</i>							
Year	GEM data ¹			LFS data ²			
	Nascent entrep. (A)	Baby busin. owners (B)	TEA (C)	Including professionals		Excluding professionals	
				Less than 36 months old entrepr. (D)	Less than 48 months old entrepr. (E)	Less than 36 months old entrepr. (F)	Less than 48 months old entrepr. (G)
2001	4,36	1,83	6,00				
2002	3,68	2,25	5,74				
2003	1,96	1,31	3,11				
2004	2,51	2,13	4,32	2,41	3,11	1,83	2,36
2005	2,93	2,25	4,94	2,41	3,03	1,85	2,31
2006	2,23	1,37	3,47	2,46	3,06	1,90	2,35
2007	3,61	1,47	5,01	2,41	2,99	1,83	2,28
2008	1,99	2,70	4,62	2,37	2,93	1,78	2,21
2009	1,83	1,89	3,72	2,15	2,71	1,63	2,04
2010				2,15	2,64	1,64	1,99
2011				2,05	2,57	1,54	1,92
2012				2,06	2,58	1,51	1,89

(1) Total-early stage entrepreneurship is composed by those who are either nascent entrepreneurs (first financial payment done no more than 3 months before) or baby-business owners (first financial payment done between 3 and 42 months before): see the text for further details.

(2) Entrepreneurs according to ISTAT Labour Force Survey are those who declare to be independent workers, including entrepreneurs, professionals, self-employed and members of co-operative societies. To highlight the peculiar characteristics of professionals, which usually operate in not competitive and legally protected environment in Italy, columns 5 and 6 include professionals while columns 7 and 8 exclude them. We report both those whose business started less than 36 months before and those whose business started less than 48 months before. This is done for a better comparison with baby-business owners from GEM data source, whose duration limit is at 42 months.

Table 2

TEA rates in some European Countries <i>(percentage values; average over 2001-09 years)</i>						
Countries	TEA rates¹	<i>of which²:</i>				
		with new product market combination	expecting more than 5 employees in the next 5 years	with at least 25% of customers coming from abroad	with at least some of the customers coming from abroad	belonging to medium- or high-tech sector³
Italy	4.5	22.5	24.3	17.0	55.5	5.3
Belgium	3.4	26.1	23.3	34.6	71.8	8.4
Denmark	5.2	40.3	30.0	21.8	46.9	12.7
France	4.0	32.6	20.4	24.6	74.5	5.6
Germany	4.8	26.0	24.0	14.2	75.8	9.7
Netherlands	5.0	26.4	23.9	17.0	49.3	8.7
Norway	7.7	30.4	25.4	17.7	61.3	8.7
Spain	6.4	23.6	22.1	17.9	37.2	5.7
UK	5.8	28.6	28.6	17.9	46.1	5.8

Source: Elaboration on GEM Adult Population Survey 2001-2009
(1) Percentage of adult working-age (15-64 years) population
(2) Percentage of TEA individuals
(3) According to OECD technology industry classification

Table 3

TEA rates by gender and education ¹							
<i>(percentage values; average over 2001-09 years; 95% confidence intervals in square brackets)</i>							
Country	Gender		Education				Total
	Male	Female	Up to some secondary education	Secondary degree	Post secondary degree	Graduate experience	
Italy (n = 20,923)	5.9 [5.4-6.4]	3.1 [2.7-3.5]	2.9 [2.4-3.4]	4.4 [3.9-4.8]	5.6 [4.8-6.4]	7.4 [6.1-8.8]	4.5 [4.2-4.8]
Netherlands (n = 29,702)	6.6 [6.1-7.2]	3.3 [3.0-3.7]	4.2 [3.4-5.0]	4.6 [4.2-5.1]	6.2 [5.5-7.0]	6.6 [5.2-8.0]	5.0 [4.7-5.3]
Belgium (n = 26,220)	4.7 [4.3-5.1]	2.0 [1.7-2.3]	1.8 [1.3-2.3]	3.1 [2.7-3.5]	3.7 [3.3-4.1]	6.2 [5.1-7.3]	3.4 [3.1-3.6]
France (n = 17,947)	5.5 [4.9-6.1]	2.5 [2.2-2.9]	2.5 [1.6-3.4]	3.3 [2.8-3.7]	4.8 [4.0-5.6]	5.8 [4.7-7.0]	4.0 [3.7-4.4]
Spain (n = 158,333)	8.0 [7.7-8.3]	4.8 [4.6-5.0]	5.3 [5.1-5.6]	6.6 [6.2-7.0]	7.0 [6.6-7.4]	8.2 [7.8-8.6]	6.4 [6.2-6.6]
UK (n = 200,985)	7.9 [7.6-8.2]	3.6 [3.5-3.8]	4.6 [4.1-5.0]	5.4 [5.1-5.7]	6.1 [5.7-6.4]	7.9 [7.4-8.4]	5.8 [5.6-6.0]
Denmark (n = 26,083)	7.0 [6.5-7.5]	3.3 [3.0-3.6]	2.8 [2.1-3.5]	4.1 [3.4-4.8]	5.2 [4.8-5.7]	6.3 [5.8-6.8]	5.2 [4.9-5.4]
Norway (n = 19,921)	11.1 [10.3-11.8]	4.3 [3.8-4.8]	6.3 [5.0-7.7]	7.7 [7.0-8.4]	7.9 [6.9-8.8]	9.0 [8.0-10.1]	7.7 [7.3-8.2]
Germany (n = 58,565)	6.3 [5.9-6.7]	3.4 [3.1-3.6]	4.1 [3.8-4.5]	5.3 [4.8-5.8]	5.3 [4.9-5.8]	8.0 [6.6-9.4]	4.8 [4.6-5.1]

Source: Elaboration on GEM Adult Population Survey 2001-2009.
(1) Percentage of adult working-age (15-64 years) population

Table 4

Age Distribution of Entrepreneurship Trained and Untrained Individuals ¹							
<i>(percentage values; year 2008)</i>							
		Age class					
		18-24	25-34	35-44	45-54	55-64	Total
Belgium	Trained	17.1	23.7	26.1	16.9	16.3	100
	Untrained	9.4	13.3	19.6	25.8	31.9	100
	<i>Difference</i>	7.7	10.4	6.5	-8.9	-15.6	
Denmark	Trained	23.4	31.1	19.8	16.1	9.6	100
	Untrained	11.5	24.0	23.2	21.9	19.4	100
	<i>Difference</i>	11.9	7.1	-3.4	-5.8	-9.8	
France	Trained	16.3	21.2	24.8	18.4	19.3	100
	Untrained	13.8	20.3	24.2	20.0	21.7	100
	<i>Difference</i>	2.5	0.9	0.6	-1.6	-2.4	
Germany	Trained	9.9	10.0	25.5	28.9	25.8	100
	Untrained	8.7	9.0	24.0	31.6	26.7	100
	<i>Difference</i>	1.2	0.9	1.5	-2.6	-1.0	
Italy	Trained	16.3	18.2	28.7	20.2	16.6	100
	Untrained	7.5	10.1	25.4	26.6	30.3	100
	<i>Difference</i>	8.8	8.0	3.3	-6.4	-13.7	
Spain	Trained	14.2	21.7	27.8	21.5	14.9	100
	Untrained	10.0	18.1	27.5	25.7	18.7	100
	<i>Difference</i>	4.1	3.6	0.2	-4.1	-3.8	
UK	Trained	10.1	20.6	25.1	21.6	22.6	100
	Untrained	5.2	14.1	24.0	26.7	30.1	100
	<i>Difference</i>	4.9	6.5	1.1	-5.1	-7.5	
Total	Trained	14.1	20.7	26.8	21.6	16.8	100
	Untrained	9.0	16.3	26.0	26.2	22.4	100
	<i>Difference</i>	5.1	4.4	0.7	-4.6	-5.6	

Source: Elaboration on GEM Adult Population Survey 2001-2009.

(1) Percentage of row totals.

Table 5

Education Distribution of Entrepreneurship Trained and Untrained Individuals ¹					
<i>(percentage values; year 2008)</i>					
Education Attainment					
		Some secondary education	Secondary education	Post-secondary and graduate experience	Total
Belgium	Trained	13.0	15.1	71.8	100
	Untrained	23.8	15.4	60.8	100
	<i>Difference</i>	<i>-10.8</i>	<i>-0.3</i>	<i>11.1</i>	
Denmark	Trained	10.2	39.9	49.9	100
	Untrained	12.5	33.9	53.6	100
	<i>Difference</i>	<i>-2.2</i>	<i>6.0</i>	<i>-3.7</i>	
France	Trained	6.4	25.2	68.4	100
	Untrained	18.0	25.3	56.6	100
	<i>Difference</i>	<i>-11.6</i>	<i>-0.2</i>	<i>11.8</i>	
Germany	Trained	3.8	1.5	94.7	100
	Untrained	7.7	1.6	90.6	100
	<i>Difference</i>	<i>-3.9</i>	<i>-0.2</i>	<i>4.1</i>	
Italy	Trained	16.6	60.7	22.8	100
	Untrained	33.5	46.9	19.6	100
	<i>Difference</i>	<i>-16.9</i>	<i>13.8</i>	<i>3.2</i>	
Spain	Trained	23.7	21.7	54.6	100
	Untrained	32.4	21.5	46.1	100
	<i>Difference</i>	<i>-8.7</i>	<i>0.3</i>	<i>8.4</i>	
UK	Trained	7.6	36.1	56.3	100
	Untrained	15.8	43.3	40.9	100
	<i>Difference</i>	<i>-8.2</i>	<i>-7.2</i>	<i>15.3</i>	
Total	Trained	18.1	23.1	58.8	100
	Untrained	26.9	25.8	47.2	100
	<i>Difference</i>	<i>-8.9</i>	<i>-2.7</i>	<i>11.5</i>	

Source: Elaboration on GEM Adult Population Survey 2001-2009.
(1) Percentage of row totals.

Table 6

	Model 1 TEA	Model 2 TEA	Model 3 TEA
TEA			
Female	-0.368** (0.140)	-0.297* (0.130)	-0.115* (0.0531)
Age	-0.0145*** (0.00367)	-0.0159*** (0.00333)	-0.0178*** (0.00449)
Education (Some secondary education is ref. group)			
Secondary education	0.0361 (0.0747)	0.0662 (0.0636)	0.212** (0.0806)
Post-secondary education	0.0501 (0.0743)	0.0815* (0.0401)	0.173*** (0.0497)
HH income tertile (1st tertile is reference group)			
2nd tertile	0.762** (0.271)	0.811** (0.267)	0.776** (0.295)
3rd tertile	0.547*** (0.0680)	0.542*** (0.0664)	0.357*** (0.0881)
Entrepreneurship compulsory training (no training is ref. group)			
Received compulsory entrepreneurship training	0.146 (0.252)	0.277 (0.238)	0.326 (0.274)
Interactions: education and entrepreneurship training			
Secondary education & entrepreneurship training	-0.330 (0.219)	-0.477* (0.243)	-0.724** (0.268)
Post-secondary education & entrepreneurship training	-0.0573 (0.143)	-0.186 (0.139)	-0.445* (0.202)
Entrepreneurial attitudes			
Preference for similar standards of living in the country		-0.0969 (0.0609)	0.0248 (0.0766)
People consider starting a business a desirable career choice		-0.101* (0.0424)	-0.220*** (0.0507)
Successful entrepreneurs have a high level of status		-0.0270 (0.0352)	0.0339 (0.0289)
Public media deserve high coverage to successful entrepr.		0.288*** (0.0421)	0.102 (0.0551)
Perceptions to entrepreneurship			
Personally knows someone who recently started a business			0.407*** (0.0643)
Perceives good opportunities to start a business in the area			0.447*** (0.0522)
Perceives to have the required skills to start a business			1.602*** (0.141)
Fear of failure would prevent from starting a business			-0.589*** (0.0512)
Constant	-2.405*** (0.284)	-2.207*** (0.321)	-3.189*** (0.556)
N	43173	27035	17053
Pseudo-R2	0.0215	0.0261	0.125
Log-likelihood	-10788.4	-7958.0	-5593.4
Standard errors in parentheses * p<0.05 ** p<0.01 *** p<0.001			

Table 7

	Model 4 TEA	Model 5 TEA	Model 6 TEA
Female	-0.115* (0.0533)	-0.114* (0.0528)	-0.114* (0.0528)
Age	-0.0178*** (0.00448)	-0.0177*** (0.00444)	-0.0177*** (0.00445)
Education (Some secondary education is ref. group)			
Secondary education	0.208* (0.0827)	0.221** (0.0845)	0.220** (0.0847)
Post-secondary education	0.174*** (0.0497)	0.183*** (0.0547)	0.183*** (0.0551)
HH income tertile (1st tertile is reference group)			
2nd tertile	0.775** (0.295)	0.772** (0.297)	0.772** (0.297)
3rd tertile	0.356*** (0.0881)	0.354*** (0.0892)	0.354*** (0.0892)
Entrepr. compulsory training (no training refer. group)			
Received compulsory entrepreneurship training	0.324 (0.274)	0.319 (0.276)	0.329 (0.275)
Interactions: education and entrepreneurship training			
Secondary education & entrepreneurship training	-0.722** (0.267)	-0.717** (0.272)	-0.714** (0.275)
Post-secondary education & entrepreneurship training	-0.443* (0.202)	-0.438* (0.205)	-0.444* (0.203)
Entrepreneurial attitudes			
Preference for similar standards of living in the country	0.0247 (0.0768)	0.0237 (0.0762)	0.0248 (0.0764)
People consider starting a business a desirable career choice	-0.222*** (0.0505)	-0.221*** (0.0505)	-0.220*** (0.0505)
Successful entrepreneurs have a high level of status	0.0333 (0.0288)	0.0348 (0.0283)	0.0331 (0.0286)
Public media deserve high coverage to successful entrepr.	0.103 (0.0551)	0.102 (0.0551)	0.101 (0.0553)
Perceptions to entrepreneurship			
Personally knows someone who recently started a business	0.407*** (0.0645)	0.409*** (0.0637)	0.409*** (0.0638)
Perceives good opportunities to start a business in the area	0.447*** (0.0520)	0.448*** (0.0521)	0.447*** (0.0521)
Perceives to have the required skills to start a business	1.601*** (0.141)	1.600*** (0.142)	1.600*** (0.142)
Fear of failure would prevent from starting a business	-0.588*** (0.0511)	-0.589*** (0.0512)	-0.589*** (0.0512)
Italy's country effect			
Italy	0.256* (0.122)	1.060*** (0.0594)	1.150*** (0.0729)
Secondary education & Italy		-0.994*** (0.112)	-1.016*** (0.112)
Tertiary education & Italy		-0.914*** (0.0867)	-0.910*** (0.0861)
Entrepreneurship training & Italy			-0.660* (0.287)
Constant	-3.189*** (0.555)	-3.199*** (0.547)	-3.198*** (0.547)
N	17053	17053	17053
Pseudo-R2	0.125	0.125	0.125
Log-likelihood	-5592.8	-5591.5	-5591.1
Standard errors in parentheses * p<0.05 ** p<0.01 *** p<0.001			

Figure 1

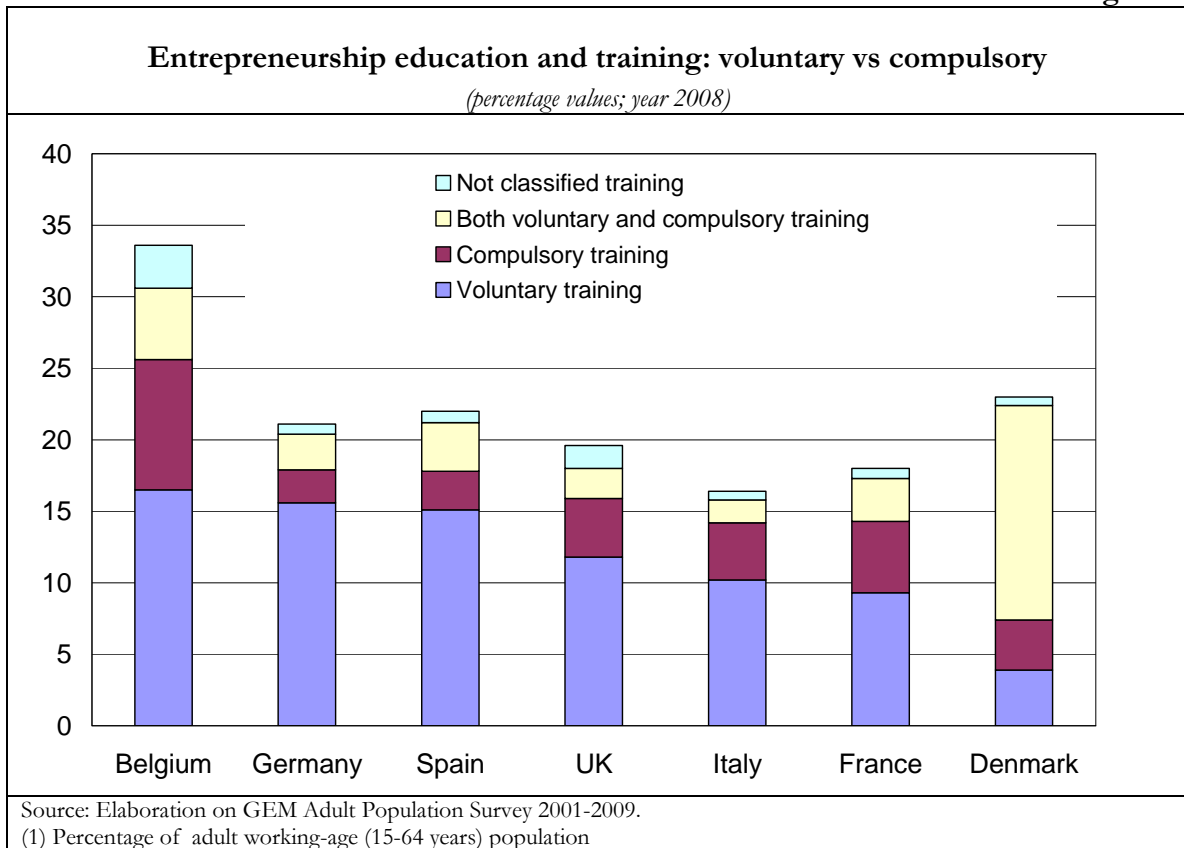


Figure 2

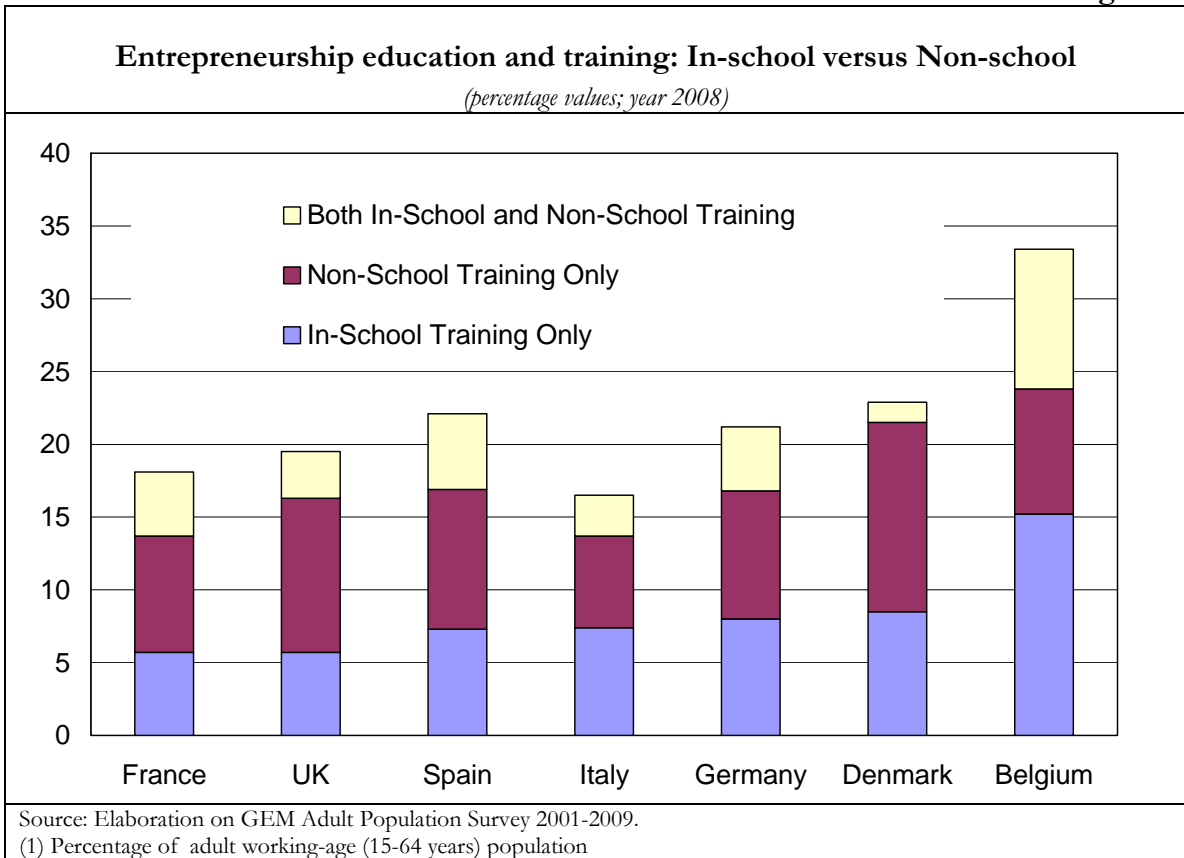


Figure 3

