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Entrepreneurship

How important are institutions and culturally-based prior beliefs?

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Abstract

Although there is still no consensus on the causes of large differences in income per capita across countries, a growing literature considers culturally-based beliefs and institutions as main drivers of the latter differences (Guiso et al. 2006; Tabellini 2010). The intuition is that institutions and beliefs affect the incentive to accumulate human and physical capital. Other strands of literature stress that the supply of entrepreneurship is a fundamental ingredient of economic growth and job creation. In this paper, we argue that the two views should be reconciled on the basis of the following arguments: a) occupational choices and the decision to accumulate human capital are affected by cultural and institutional factors; b) occupational choices are the main tool to allocate human capital within societies; c) entrepreneurs govern the allocation of resources in the economy, including the human resources.

Confirming our hypothesis, our empirical analysis show that cultural factors matter and fatalism exerts a particularly negative effect on opportunity perception and on opportunity driven entrepreneurship. For what regards institutional variables, three interesting and somehow non conventional results emerge from the analysis. First, low start-up cost are particular favorable for necessity driven entrepreneurship but not for the opportunity driven ones. Second, labor market flexibility yields a lower probability of being an entrepreneur and this results holds for both necessity and opportunity driven entrepreneurs. Third, the more burdensome the administrative requirement (permits, regulations, reporting) in entrepreneurial activity, the lower the probability of being an opportunity driven entrepreneur.

On the whole, our results yield some policy relevant implications: a) culturally-based beliefs matter for entrepreneurship and *fatalism* is more important than *trust in others*; b) education can affect people's fatalism; c) entrepreneurial education can be an important tool for fostering *good quality* entrepreneurship, i.e. opportunity driven entrepreneurship; c) institutions matter for entrepreneurship and growth but, somehow, in unconventional ways.

Key words: entrepreneurship, culture, fatalism, institutions, growth.

JEL: J2, L26, O43

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1. Introduction

Although there is still no consensus on the causes of large differences in income per capita across countries, a growing literature considers culturally-based beliefs and institutions as main drivers of the latter differences (Guiso et al. 2006; Tabellini 2010). The intuition is that institutions and beliefs affect the incentive to accumulate human and physical capital. Other strands of literature stress that the supply of entrepreneurship is a fundamental ingredient of economic growth and job creation. In this paper, we argue that the two views should be reconciled on the basis of the following arguments: a) occupational choices and the decision to accumulate human capital are affected by cultural and institutional factors; b) occupational choices are the main tool to allocate human capital within societies; c) entrepreneurs govern the allocation of resources in the economy, including the human resources.

We start with a simple question: what determines occupational choices in different countries, namely, in countries differing for their culture and institutions? Two intrinsically related questions are: what determines the quality of entrepreneurship in different countries and how can we measure it?

Our line of reasoning is the following. Occupational choices are based on people's expectations about the value of different options. The self-assessment of one's skills, business and job opportunities and, eventually, of well being deriving from different occupational choices, *ceteris paribus*, is shaped by people's psychological traits and by their culturally-based prior beliefs and the impact of different psychological and cultural traits is uneven across occupations. For instance, the value of being self-employed will be more responsive to self-confidence than the value of being an employee. Overconfident individuals may attach a higher value to their skills/opportunities in self-employment than less confident individuals. Since they feel better suited to govern life events, individuals characterised by an internal locus of control will attach a higher value to market opportunities relative to individuals with an external locus of control. One should expect that the same uneven impact across occupations is exerted by cultural beliefs and, among them, by people's trust in others and people's fatalism, i.e. people's propensity to believe that their destinies are ruled by an unseen power – Fate – rather than by their will. Of course, entrepreneurs should be more involved in market transactions, whose expected value depends on trust in others, than employees; moreover, expectations about the link between actions and results should affect more the value of being entrepreneurs than the value of being employees.

This is not the end of the story. Culturally-based beliefs and personality traits interact with the institutional setting in determining the returns to different occupational choices. In particular, entrepreneurial opportunities are shaped by formal and informal institutions, e.g. product market regulation, labour market regulation. Hence, both culturally-based beliefs and institutions determine which individuals become entrepreneurs, their performance as entrepreneurs and the interaction between personal characteristics and institutions may generate unexpected outcomes³. This is confirmed by

³ “[...]holding that entrepreneurs are always with us and always play some substantial role.[...] *How the entrepreneurs act 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*

data suggesting that the prevailing economic, political, and legal institutions affect both the numbers of individuals who choose to become entrepreneurs (Torrini, 2005) and their characteristics (Blanchflower and Oswald, 1998). However, which culturally-based beliefs and institutions matter? Furthermore, how does the latter shape entrepreneurial selection and determine entrepreneurial quality and performance?

Building on these premises, our research aim is to assess how institutions and culturally-based beliefs affect occupational choices and entrepreneurship across countries. We distinguish different notions of entrepreneurship (i.e. self-employed and entrepreneurs *strictu sensu*, *opportunity driven entrepreneurs* and *out of necessity entrepreneurs*) and we separate psychological traits from cultural beliefs.

Confirming our hypothesis, cultural factors matter and fatalism exerts a particularly negative effect on opportunity perception and on opportunity driven entrepreneurship. For what regards institutional variables, three interesting and somehow non conventional results emerge from the analysis. First, low start-up cost are particular favorable for necessity driven entrepreneurship but not for the opportunity driven ones. Second, labor market flexibility yields a lower probability of being an entrepreneur and this results holds for both necessity and opportunity driven entrepreneurs. Third, the more burdensome the administrative requirement (permits, regulations, reporting) in entrepreneurial activity, the lower the probability of being an opportunity driven entrepreneur.

On the whole, our results yield some policy relevant implications: a) culturally-based beliefs matter for entrepreneurship and *fatalism* is more important than *trust in others*; b) education can affect people's fatalism; c) entrepreneurial education can be an important tool for fostering *good quality* entrepreneurship, i.e. opportunity driven entrepreneurship; c) institutions matter for entrepreneurship and growth but, somehow, in unconventional ways.

The paper is organized as follows. Section 2 discusses the role of cultural beliefs and institutions in occupational choices and entrepreneurship. Section 3 illustrates the empirical strategy and results. Section 4 sketches the main conclusions.

2. Culture, institutions and entrepreneurship

The concept of culture and culturally-based prior beliefs is too broad for empirical investigation. Hence, the first step is to identify culture and prior beliefs in a sufficiently narrow way, so that it become possible to investigate the causal link from prior beliefs to occupational choices: building on Guiso et al. (2006, p. 23), “we define culture as those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.”; in addition, for our practical purposes, the latter customary beliefs must have a relevant impact on economic choices⁴.

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). Hence, according to Baumol, the institutional setting and its functioning determine the prevalent entrepreneurial model.

⁴ Another well known definition of culture has been proposed by Hofstede (1991): «*the collective programming of the mind which distinguishes the members of one group or category of people from another* » (1991,p.5). These two definitions allow to highlight the salient characteristics of culture. Culture is not directly visible but manifested through behaviors, is a collective not individual attribute, and is slow moving being an inheritance that fathers leave to sons. In particular according to Hofstede, being “a mental program” culture is not tangible and largely unobservable as it can only be studied through various

The distinction between psychological or personality traits and culturally-based prior beliefs is not neat⁵. Indeed, it is not a scope of this paper to discuss the ample literature in psychology and anthropology on the subject: building on latter contributions, our contention is that cultural beliefs pertain to the social sphere, i.e. cultural beliefs are a social construct, whereas psychological traits belong the individual sphere (Church, 2000). As long as the set of psychological traits and culturally-based prior beliefs are comparable across countries⁶, individuals should be characterized through two sets of idiosyncratic elements: personality traits and prior beliefs. As such, the latter distinction is relevant to the analysis of occupational choices on both empirical and policy grounds.

Whereas the connections between trust, institutions and economic outcomes has been widely investigated, the role of fatalism, in spite of its importance, is still omitted. It is surprising that a cultural trait so important in characterizing expectations about the link between actions and results has received so scarce attention in economics, in particular, in the context of the analysis of entrepreneurship. Although the actual meaning of the word fatalism changes slightly across cultures and religions, it can be linked with people's propensity to believe that their destiny is ruled by unseen powers, the Fate, rather than by their will. Indeed, the concept of locus of control, developed in psychology, is akin to the concept of fatalism: in fact, moving from an internal to an external locus of control, inevitably implies an increasingly fatalistic view of life. People's self-confidence, optimism and locus of control are all characteristics connected to culturally-based beliefs like people's trust and fatalism (Church, 2000). So, contributions based on those concepts are the natural starting point for our analysis. Still, we think that the distinction should be maintained between personality traits, belonging to the psychological sphere, and those traits confined to the cultural sphere.

Building on Harper (1998, 2003) and Ruiu (2012) we maintain that fatalism, undermining the perceived link between efforts and outcomes, may induce individuals to believe that the discovering of good business opportunities is much more a matter of luck rather than the outcome of a costly search effort. These beliefs may induce high ability individuals (those with a high reservation wage) to prefer wage-earning to entrepreneurship. However, this result doesn't rule out the existence of 'out of necessity' entrepreneurs, i.e. low ability owners of low productivity firms, who have decided to pursue an entrepreneurial career because they lacked good income generating alternatives. The perverse effect of fatalism on potential high ability entrepreneurs is that it may induce them to become employees or to choose self employment activities either very regulated or characterized by a low entrepreneurial content, such as being lawyers or consultants, thus undermining the innovative capacity of a country and then its growth potential.

verbal and nonverbal manifestations values, heroes, rituals, and symbols which influence behaviors. Values are the core of the definition of culture and represent the most deeply embedded manifestation of culture. According to Hofstede (1980,p.18) a value can be defined as: « *a broad tendency to prefer certain state of affairs over others*». The values shape the identity of group of individuals or more generally of countries and thus cultures can be compared with each other using values as a standard. Furthermore, this characteristic of culture is fundamental to distinguish this concept from the concept of personality.

⁵ There is an ongoing debate among psychologists to what extent culture and personality can be considered independent and distinct variables, and to what extent they are mutually constitutive.

⁶ The Big Five (Extraversion, Agreeableness, Conscientiousness, Emotional Stability vs. Neuroticism, Openness to Experience or Intellect) are an example of stable across culture traits.

Entrepreneurship may be influenced by culture both directly (through values, prior beliefs, etc)) and indirectly (through its relation with institutions). For what regards the direct channel, there is increasing empirical evidence showing that cultural beliefs and values are important determinants of entrepreneurial choices. According to Guiso, Sapienza and Zingales (2006) culture can influence occupational choice through its influence on preferences and prior beliefs. In particular, they argue that entrepreneurial activity entails being often involved in economic transactions with unknown counterparts. This means that individuals who are more willing to trust others may have a comparative advantage in becoming entrepreneurs. Using WVS data they show that trust is at least partly culturally determined (in particular it is influenced by religious beliefs) and since whether an individual expresses trust is highly correlated with whether that individual is trustworthy (Glaeser et. al., 2000; Butler, Giuliano and Guiso, 2009) they show that trusting others increases the probability of becoming an entrepreneur by 1.3 percentage points. Thébaud (2010) suggests that cultural beliefs about gender are a pervasive factor that constrains women's involvement in entrepreneurship across industrialized nations. Shared cultural beliefs about gender that prescribe different expectations of competence/skills for women and men and that frame entrepreneurship as a male-typed task may generate gender-biased assessments of entrepreneurial competence and business ideas and hence discourage female entrepreneurship. Furthermore the existence of gender stereotypes can also undermine the possibility of accessing to external sources of funding for female entrepreneurs. Therefore cultural barriers may explain why men have been shown to be more likely to start a business than women (Blanchflower, 2000; Kim, Aldrich and Kester, 2006, Guiso and Rustichini, 2011b).

However, alternative explanations are possible. For instance, one may argue that men are more endowed with managerial ability (in Lucas's sense) or that men are more risk tolerant than women⁷, and therefore gender differences in risk preferences (or in managerial ability) can explain the gender entrepreneurship gap.

As observed by Guiso and Rustichini (2011b) however it is difficult to distinguish a measure of entrepreneurial ability or entrepreneurial attitude that it is not influenced by previous individual choices or by cultural norms about gender. For instance, differences in risk aversion between the two genders may stem from differences in initial endowments or life-time wealth. Similarly, differences in the way men and women react to competition may not be due to an intrinsic dislike of competition among women but to the prevalence of culturally determined roles. To avoid these problems Guiso and Rustichini (2011b) building on Guiso and Rustichini (2011a)⁸ used a measure that reflects a biological component of the entrepreneurial ability given by prenatal exposure to testosterone (which is measured through the ratio between the second and the fourth digit)⁹ and combine it with variation in beliefs about men/women parity in areas where people are located. This

⁷ There exists empirical evidences showing that in representative samples women are less willing to take risks than men (Fehr et al., 2006 ;Guiso and Paiella,2008)

⁸ In particular Guiso and Rustichini (2011a) show that entrepreneur with higher prenatal exposure to testosterone tend to manage larger firms and to experience faster average growth over the years they manage the firm. Furthermore testosterone exposure is positively correlated with entrepreneurial skills such the ability to stand effort, cognitive ability and optimism.

⁹ The digit ratio is considered a reliable marker of the exposure to testosterone in the fetal period, with a lower ratio index associated with a higher level of androgens.

allows to explore whether women potentially endowed with intrinsic entrepreneurial ability actually succeed in becoming entrepreneurs or rather whether they have to give up because they face stronger cultural barriers than men. Finally, Guiso and Rustichini (2011b) show that in a random sample of individuals, men tend to have a lower digit ratio than women, hence a higher *biological entrepreneurial predisposition*, however when a sample of entrepreneur is considered women have a lower second to fourth digit ratio. Furthermore they show that in regions where the women are less emancipated, i.e. region where the traditional vision of the female role is predominant, their average digit ratio is lower than that of men compared to region where women are more emancipated. This finding is consistent with the existence of gender related obstacles to entrepreneurship so that only women with well above average entrepreneurial skills find attractive to become entrepreneur.

Also religion may play a role in determining attitude towards entrepreneurship. Max Weber (1930) explained the origin of the capitalism, among other factors, by the development of a moral system, which he called “the Protestant Ethic”¹⁰. The term Protestant ethic is still used to describe a positive attitude to hard work, possibly, unconsciously as a way of indicating an explanation of social approval. Using data from Britain, Clark and Drinkwater (2000) found that all else equal, exponents of religions that imply positive attitude towards entrepreneurship, i.e. Islam, Sikh and Hindu, had significantly higher probabilities of becoming entrepreneurs than Christians from ethnic minorities were. Using retrospective career life-history data from West Germany, Carroll and Mosakowski (1987) found some support for the classic Protestant ethic argument. Protestants show a greater rate of movement into self-employment, as do the other non-Catholic religions. However there are empirical works that have not found religion as a significant determinant of entrepreneurship (Pickless and O’Farrell, 1987; Pickless and O’Farrell, 1989).

Reynolds et al (1999) argue that both the stories in the media about successful entrepreneurs and the respect for those who start a new business, may be indicators of a culture that attach an high social value to entrepreneurship. In particular, Reynolds et al. (1999) have found a positive (however their sample was limited to ten countries) correlation of about 0.45 between respect for entrepreneurs and the rate of firm start-ups.

In **Errore. L'origine riferimento non è stata trovata.**, we have replicated Reynolds et al.’s analysis using GEM¹¹ master data 2007. In particular the GEM tea index for 42 countries is plotted against: the percentage of individuals declaring that in their country there is a lot of media attention for entrepreneurs (a), the percentage of individuals who have declared that people in their country attach high status to successful entrepreneurs (b), the

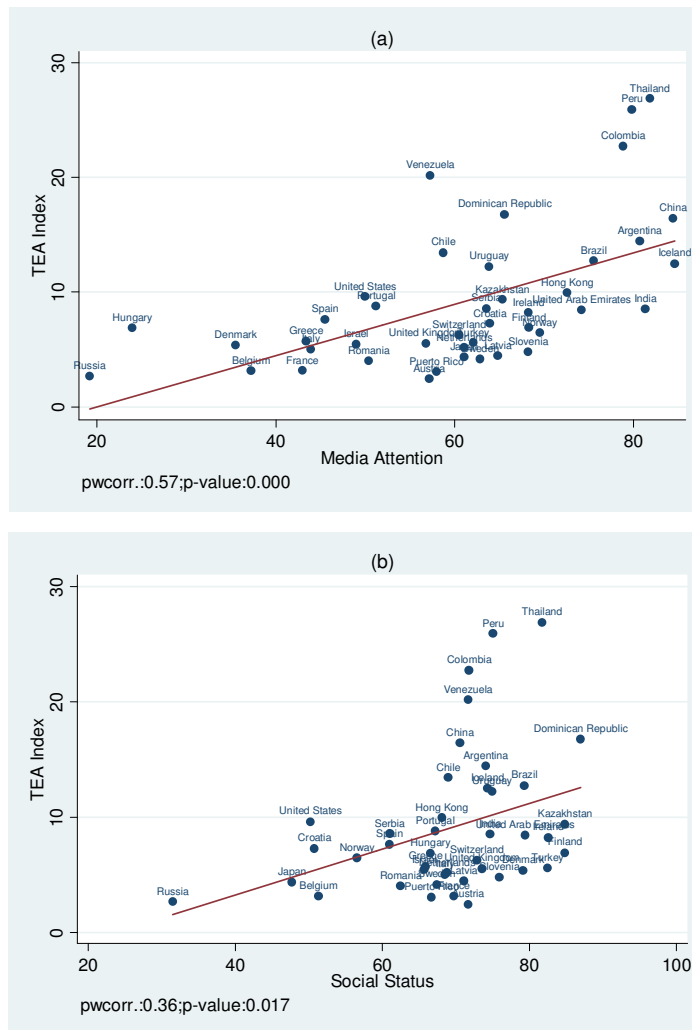
¹⁰ The notion of the Protestant Ethic is based on two fundamental concepts: the idea of “calling” and the “Puritan asceticism”. The notion of calling requires individuals to fulfill their duty in this world and interpret occupational success as a sign of being elected, and the notion of Puritan asceticism adds the positive evaluation of hard work and a negative view of idleness, luxury, and time wasting.

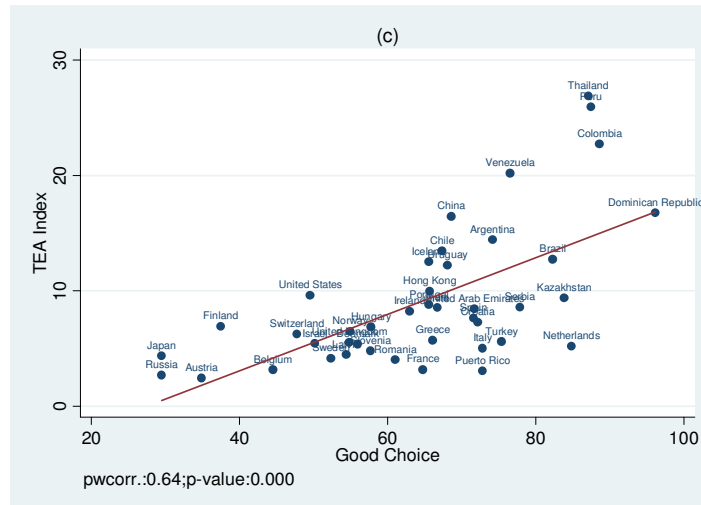
¹¹ The Global Entrepreneurship Monitor (GEM) research program is an annual assessment of the national level of entrepreneurial activity conducted by the GEM consortium. The aim of the research program is to obtain internationally comparative high quality research data on entrepreneurial activity at the national level. Representative samples of at least 2,000 individuals in the adult population are annually drawn for every country. The GEM tea index is defined as percentage of 18-64 population who are either a nascent entrepreneur, i.e. actively involved in setting up a business that they will own or co-own, or owner-manager of a new business, i.e. a business with less than 3.5 years of existence.

percentage of individuals who believe that in their country entrepreneurship is regarded as a good career choice (c). The three cultural variables are all significantly correlated with the index of entrepreneurial activity. Nevertheless the direction of the causality is an open issue here, since one may expect that the larger the number of entrepreneurs the more attention media will put on them and more socially acceptable becomes this career choice. At the level of more deeply rooted values, Shapero and Sokol argue:

« [...] the social and cultural factors that enter into the formation of entrepreneurial events are most felt through the formation of individual value systems. More specifically, in a social system that places a high value on the formation of new ventures, more individuals will choose that path More diffusely, a social system that places a high value on innovation, risk-taking, and independence is more likely to produce entrepreneurial events than a system with contrasting values» (1982,p.83)

Figure 1: TEA index against cultural manifestations





Giving empirical support to the above cited statement, several studies have found that entrepreneurs assign more importance to their independence (Reynolds,1999; Blanchflower and Oswald, 1998; Blanchflower, 2000; Blanchflower, Oswald and Stutzer, 2001) than employees. Moreover, there is large empirical evidence showing that entrepreneurial activity is characterized by high failure rates and low average returns¹² but, at the same time, by high job satisfaction: one may think that individuals attach value to some non pecuniary characteristics of entrepreneurship, i.e. independence, yielding benefits which induce entrepreneurs to be relatively more willing to forgo income and/or to bear the costs of increased income risk levels.

Frey and Benz (2003) explicitly traced the greater satisfaction to the use of initiative and to the weakness of hierarchy that characterizes entrepreneurship. Nevertheless, to confirm this idea one needs to show that entrepreneurs have alternative options with higher income and hence to show it is not necessary to push them to entrepreneurship. Using GEM master data (2007), Table 1 shows which percentage of entrepreneurs has declared that they have been pulled (or pushed in the case of necessity entrepreneurs) to entrepreneurship, because they desire *independence*, to *increase their income*, to *maintain their income*, *they have no other way of earning a living* (necessity-motivated entrepreneurs), respectively. Generally speaking, in more developed countries the majority of individuals opts for entrepreneurship because they desire independence while income motivations are prevalent in less developed countries.

This simple descriptive statistics suggest that one needs caution in interpreting the direction of the causality between cultural values and economic outcomes. On one side, it is possible that developed countries are those characterized by better job opportunities and hence the decision of becoming entrepreneur is mainly driven by the importance that national culture attach to independence, on the other it is reasonable to think that it is

¹² For instance, Hamilton (2000) has shown that, in the United States, median entrepreneurs' earnings after 10 years in business are 35 percent less than the predicted alternative wage on a paid job of the same duration.

economic development to shift the focus of the people from survival values to self-affirmation values (Inglehart, 1997).

Culture may also influence risk preference. In despite of its importance in determining economic choices, the theorized (Bisin and Verdier 2000, 2001)¹³ existence of a process of cultural transmission of risk preferences has received (at least to our knowledge) very scant attention on the empirical side.

Guiso and Paiella (2008) using Italian survey data show that when a set of dummies capturing the region of birth of the respondents are regressed together with a very large set of other controls against a measure of risk aversion, they are still economically and statistically significant. They interpret this finding as evidence of existence of regional differences in risk predisposition and culture that are transmitted with upbringing within the family.

Dohmen et al (2006) document a robust intergenerational correlation in risk attitudes using answers from a large representative survey of adults living in Germany.

In particular they show that parents' differences in risk taking across contexts— financial matters, health, career, car driving, and leisure activities, are reproduced in the child. Moreover, they show that individuals tend to marry persons with the similar traits, and that this mating strategy reinforces the impact of fathers on children.

However Dohmen et al. are not able to establish if the process of transmission is due to genetics, to child learning by imitation, or to deliberate efforts by parents to shape the preferences and beliefs of their children (as in Bisin and Verdier).

Therefore, the existence of a process of cultural transmission of risk preference has received some promising clues; however more robust empirical evidence is required to conclude that risk preference is culturally transmitted.

Cultural beliefs and values may also influence the attitude toward innovativeness and the latter plays a central role in the Schumpeterian theory of entrepreneurship (Schumpeter, 1934). Even if Schumpeter theory was oriented on individual motivations and not directed to study cultural values, it is reasonable to think that some national cultures could encourage the development of these motivations more than others. Several authors in social psychology have argued that innovativeness is tied with the extent to which cultural values promote autonomy over embeddedness. Supporting this view, Mueller and Thomas (2000) studying the cultural orientation of personality traits, show that the level of innovativeness is positively correlated with the degree of individualism of the country of origin and negatively with the degree of uncertainty avoidance ¹⁴ and hence conclude that

¹³ Bisin and Verdier (2000) model each parent as wishing to transmit his /her traits to his/her sons. Hence they can decide to exert effort to influence their children's process of preference formation. The effective socialization of children to a particular religious or ethnic trait is then determined by the interaction of the direct socialization effort of parents and the indirect influence of society toward assimilation (the melting pot factor). The direct socialization technology of parents operates at the level of the family. Families in which parents share the same cultural trait (homogamous families) enjoy a more efficient socialization technology for their shared trait than families with mixed cultural parents (heterogamous families). Therefore, each individual's choice of the marriage mate crucially determines his/her ability to transmit his/her set of cultural traits to their eventual children.

¹⁴ Individualism and uncertainty avoidance are two important cultural dimensions studied by Hofstede (1980) . The former reflects degree of emphasis that a society place on individual accomplishment rather than group accomplishment. The latter refers to a society's tolerance for uncertainty and ambiguity. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations

both these two cultural dimensions are conducive to entrepreneurship. Finally, Ruiu (2012) analyzes the impact of fatalistic beliefs on the entrepreneurial choice.

Table 1: : Entrepreneurial motivations

OECD Countries	Independe- Dence	Increase income	Maintain Income	Other	Non OECD Countries	Indepen- Dence	Increase income	Maintain income	Other
AUT	65.36	22.53	4.09	8.02	ARG	40.15	43.75	13.6	2.51
BEL	33.93	37.9	13.79	14.38	BRA	35.27	52.26	12.47	0
CHL	43.57	47.75	8.12	0.56	CHN	36.08	57.28	5.05	1.6
DNK	55.89	35.29	1.27	7.56	COL	39.37	50.15	9.98	0.51
FIN	59.66	29.74	3.57	7.03	HVR	49.85	28.08	18.19	3.88
FRA	70.42	9.93	19.64	0	DOM	23.66	63.89	12.45	0
GRC	36.47	60.27	3.25	0	HOK	42.13	48.87	3.45	5.55
HUN	43.06	39.64	17.31	0	IND	49.07	30.66	20.27	0
ISL	46.09	36.5	4.12	13.29	KZK	23.11	63.03	13.85	0
IRL	64.78	21.94	4.5	8.77	LVA	29.96	70.04	0	0
ISR	41.99	42.7	11.36	3.95	PER	25.35	64.41	10.24	0
ITA	52.35	39.24	5.51	2.9	PUE	35.33	49.6	15.07	0
JPN	57.82	25.16	13.25	3.77	ROM	48.27	51.73	0	0
NLD	67.68	6.43	10.61	15.28	RUS	44.35	37.9	17.75	0
NOR	43.5	32.51	17.14	6.86	SRB	35.72	51.33	12.95	0
PRT	24.74	53.23	18.48	3.55	THA	47.5	45.55	6.95	0
SLV	63.06	30.32	2.91	3.71	TUR	41.65	34.79	20.91	2.65
ESP	52.73	34.77	8.32	4.17	UAE	56.24	37.91	3.88	1.97
SWE	51.01	25.71	3.39	19.9	URY	39.31	50.73	7.79	2.17
CHE	72.33	12.56	8.53	6.58	VNL	41.65	48.53	5.68	4.14
GBR	64.73	26.24	5.78	3.25					
USA	52.07	34.03	10.21	3.7					

Source: GEM Master data 2007

The above empirical and theoretical findings indubitably show that cultural values and beliefs have an impact on people's choices, attitudes and behaviors, but the view that culture impacts on institutions is subject to the criticism of reverse causality, i.e. the argument according to which the causal relation does not go only from culture to institutions but also operates *vice versa*: that is, culture shapes institutions and institutions shape culture.¹⁵

¹⁵ A well known definition of institutions can be found in North :
«[...] *the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies.* » (1994, p.360)

Since Economists often define culture as the social norms and the individual beliefs that sustain Nash equilibria as focal points in repeated social interactions (eg. Schotter 1981, Myerson 1991, Greif 1994), one

According to Roland (2004) culture tends to be more slow-moving than political or legal institutions. Therefore, one can argue that culture might have an important effect on the choice of political and legal institutions itself. Among economists Guiso et al. (2003, 2006, 2009) share this view that cultural values and beliefs are the outcome of a process of cultural sedimentation taking place over very long time spans. As such, they are very stable and they may show high resilience in the face of both external, e.g. military invasions, immigration, or internal shocks, e.g. radical political reforms (Schwartz, Bardi, and Bianchi 2000; Inglehart and Baker, 2000). Of course, older cultures (South European, Chinese, Arab), will display more resilience relative to new ones (Australia, USA). This explains why the former cultures appear more conservative, less dynamic and more prone to oppose institutional innovations.

Tabellini (2010) suggests that culture is an important channel through which historical institutions influence current institutions.. In particular, he maintains that a low level of *trust in others* and scant confidence in the link between effort and economic success (fatalism in our interpretation), are different cultural traits, but they are both typical of hierarchical societies characterized by marked pessimism about the correctness of other people's actions. In such societies, the community requests the state to intervene by enacting rigorous regulations that prevent people from assuming opportunistic behaviors. These societies are also characterized by the central role of the family in the individual's life (Banfield, 1958). Young people tend to remain longer in the family of origin and to form their own families later. The traditional family values (obedience, respect for the father, etc.) are given priority over all other values (autonomy, good civic attitudes, etc). The family comes first, and people outside the household are regarded with suspicion and considered untrustworthy. This "family-centered" way of life may be an important determinant of the persistence of cultural traits.

Using differences in constraints on executive across a sub-national units (within current nations), as an instrument for contemporary culture variables, and controlling for current institutional aspects, Tabellini finds that culture is strongly correlated with regional economic development.

On the same line of research Gorodnichenko and Roland (2010) show that culture continues to play a statistically significant and quantitatively important role in determining long-run growth even after controlling for measures of institutions, implying that culture has an effect on economic development that is independent of institutions. Furthermore, they find that there is a two-way causality between culture and institutions thus suggesting that institutions are in part determined by culture.

Putting together all these theoretical and empirical findings, we believe that to justify the choice of considering culture as a determinant of economic behavior, it is therefore of crucial importance that the cultural traits which we consider not only influence economic

may conclude that culture is one aspect of broadly defined institutions. However, this interpretation is clearly conflicting with Hofstede who considers values as a manifestation of culture and hence as implication culture as determinant of the institutional settings. In particular, he sustains that:

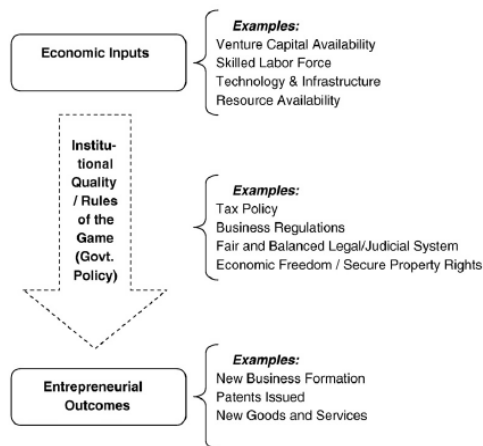
«the stability of cultural patterns can be ascribed to reinforcement by the institutions which themselves are products of the dominant value systems» (1980, p. 233).

Hence for Hofstede, culture shapes institutions and the latter reinforce the former being a sort of instrument to promote culture.

behavior and institutions but also are quite stable over time, being a legacy transmitted from one generation to the next .

Moving from the role or culture to that of institutions, a large body of economic literature has stressed the link between institutions and economic performance. In the context of entrepreneurship, institutions affect both the generation of recognizable business opportunities and the value attached to them. In particular, entrepreneurial opportunities are shaped by formal and informal institutions (Baumol 1990, Acs et al. 2004, Sobel 2008, Bloom, Sadun, Van Reenen 2009 Klapper, Lewin and Quesada Delgado, 2009; Djankov, La Porta, Lopez-De-Silanes, Shleifer, 2002), e.g. product market regulation, labour market regulation, law enforcement. Baumol (1990) observes that entrepreneurial activity is distributed between productive and unproductive entrepreneurship. He hypothesizes that entrepreneurial individuals channel their efforts in different directions depending on the quality of prevailing economic, political, and legal institutions. This institutional structure determines the relative reward to investing entrepreneurial energies into productive market activities versus unproductive political and legal activities (e.g., lobbying and lawsuits). Good institutions (secure property rights, a fair and balanced judicial system, contract enforcement, and effective constitutional limits on government's ability to transfer wealth through taxation and regulation) shift entrepreneurial activity towards productive entrepreneurship strengthening economic development (Acemoglu and Johnson, 2005). **Errore. L'origine riferimento non è stata trovata.** effectively summarizes Baumol's argument.

Figure 2: Institutions and entrepreneurship



Source: Sobel (2008)

Thanks to an increasing availability of data, there is a flourishing body of empirical literature looking at the relation between institutional settings and entrepreneurship. In this context, Aidis et al. (2009) by combining country-level institutional indicators for 44 countries with working age population survey data taken from GEM show that two specific institutional dimensions – the rule of law, and a more limited state sector– are significantly and positively associated with entrepreneurial entry.

Wennekers *et al.* (2005) explore the relationship between entrepreneurship levels, economic development and institutional variables. In particular they use 2002 GEM data from 36 countries to obtain for each country a mean value of nascent entrepreneurship rates and they regress this variable against a set of demographic, economic and institutional variable.

In particular their explanatory variables include income per capita, variables measuring demographics (population growth and education), and institutions (fiscal legislation, social security system and administrative requirements for starting a new business). Their results indicate that there is a positive effect of population growth on entrepreneurship development. For what regards institutions, they find a negative effect of social security but a positive effect of tax revenues as a percentage of GDP on nascent entrepreneurship. The impact of *taxes* on the level of entrepreneurial activity is complex and even paradoxical (Verheul *et al.*, 2002). On the one hand high tax rates reduce the return on entrepreneurship, on the other hand self-employment may offer greater opportunities to evade or avoid tax liabilities (Parker,1996). Hence the result about the positive effects of the tax revenues on entrepreneurship are consistent both with the “incentives for tax avoidance” theory and with a more benevolent vision that high-tax countries spend more on infrastructure and hence provide a better environment for new firms. The effect of *social security* on entrepreneurial activity may also be two-sided. First, there is a negative impact in so far as generous social security for employees increases the opportunity costs of entrepreneurship. Second, social security in general may have a positive effect on entrepreneurial activity by creating a safety net in the case of business failure. Koellinger and Minniti (2009) analyzing a cross-country panel of 16 OECD countries from 2002 to 2005 find that higher unemployment benefits crowd out nascent entrepreneurial activity and this result holds regardless of entrepreneurial motivation (necessity or opportunity) and entrepreneurial type (imitative or innovative) hence the first thesis on the negative effect of the social security system seems to be supported by empirical evidence.

On the same line of research, Van Stel *et al.* (2007) analyze the effect of a particular set of institutions, business regulations, on nascent entrepreneurs and young businesses (defined as less than 42 months old). Their analysis is based on countries aggregate mean values from GEM data (2002 - 2005 for 39 countries). Their measurement of business regulations is drawn from the World Bank’s *Doing Business* indicators and uses five categories: (1) starting a business, (2) hiring and firing workers, (3) obtaining credit, (4) paying taxes and (5) closing a business. Their results indicate that minimum capital requirements and labour market rigidity have a negative effect while availability of credit information has a positive effect on nascent entrepreneurship rates.

Fonseca *et al.* (2001) and Pissarides (2003) study the effects of start-up costs in a matching model where workers are heterogeneous with respect to the potential profit of starting a new firm. Both contributions argue that lower start-up costs lead to the creation of more firms and less unemployment. However the effect of reducing start-up costs on the efficiency of the market is ambiguous in their model: if too many workers start new firms, the workforce may become too small and output suffers. Building on Fonseca *et al.*, Dulleck *et al.* (2006) show that there is a double positive effect for the economy when the startup cost are reduced. In particular they study the implications of lower start-up costs in a situation where new firms with high productivity can be created only by high-skilled

persons. Lower start-up costs then affect education choices by improving the options of skilled workers. More workers obtain education and more high-skill firms will be set up, which is the first positive effect as in Fonseca et al. (2001). The increase in the proportion of workers who are educated induces, through a search externality, a second positive effect inducing an increase in the creation of high skill vacancies by incumbent firms. That is, because the odds of getting high-skilled workers to apply for a given vacancy increases, already existing firms create more jobs for high-skilled workers.

Klapper *et al.* (2009) study the impact of entry costs in terms of complying with bureaucratic requirements for incorporation on the creation of new firms. Their results indicate the rate of new corporation creation in industries that tend to be high-entry is relatively lower in countries with higher entry costs.

Finally, Guiso and Schivardi (2011) extend Lucas' model to investigate two potential explanations of differences in entrepreneurial density across locations: entry costs and external effects. In the first case, there are heterogeneous costs of entry across locations hence the locations characterized by lower costs of setting up a firm end up with more entrepreneurs and more firms because even relatively less talented individuals will find it profitable to start a business. The second possibility is that the distribution of individual productivity is shifted by local factors, for instance because of differences in learning opportunities, knowledge spillovers or intermediate input variety. They show that the two assumptions have very contrasting implications regarding the relation between the propensity of individuals to become entrepreneurs and their average productivity. Under entry cost heterogeneity hypothesis, areas with lower entry costs there should be characterized by more entrepreneurs and average TFP should be lower. Thus, in equilibrium there should be a negative correlation between firm density in a given location and their TFP. On the contrary, with externality heterogeneity, areas with stronger externalities should be characterized by higher entrepreneurial ability and more entrepreneurs. In this case, the model predicts that in equilibrium there should be a positive correlation between the share of entrepreneurs in a given location and their firms' TFP. They test these implications on a sample of Italian firms and unambiguously reject the entry costs explanation in favor of the externalities one.

Institutional factors can affect entrepreneurship also through their relation with prior beliefs.

Aghion et al. (2009) analyze the complex relation among a culturally-based belief, i.e. trust, the level of regulation, and the entrepreneurial outcome. In particular they propose a model where those who have not invested in social capital intended as civic attitudes, impose a negative externality on others when they become entrepreneurs (e.g. environmental pollution) while those who have not invested do not. The community regulates entry into entrepreneurial activity when the expected negative externalities are large. But regulation itself must be implemented by government officials, who are corrupt if they had not invested in social capital. As a consequence, when entrepreneurship is restricted through regulation, investment in social capital may not pay. Hence if people expect to live in a civil community (high level of trust in other people), they expect low levels of regulation, and so invest in social capital. Their beliefs are justified, and investment leads to civility, low regulation, and high levels of entrepreneurial activity. When in contrast people expect to live in an uncivil community (low level of trust), they do

not invest in social capital and remain uncivil and unproductive. Their beliefs are again justified, because a lack of investment in social capital leads to incivility, high regulation, high corruption, and low entrepreneurship.

Supporting this view on the empirical side, Aghion et al. (2009) show that *distrust in others* is strongly positively correlated with various measures of regulation (product and labor market regulation, judicial procedure).¹⁶

Pinotti (2009) has developed a model whose main conclusions are that, within each economy, the individual demand for regulation depends negatively on trust towards others, and that ignoring trust (as a proxy for average trustworthiness) biases estimations of the effects of market failures upwards. Licht et al. (2007) focus on three cultural dimensions proposed by Schwartz (1994): autonomy/embeddedness (relative to the relation between individual and group), hierarchical/egalitarianism (relative to the ways in which socially responsible behavior is ensured), and mastery/harmony (relative to humankind's relations with the natural and social worlds). They find that countries oriented to autonomy and egalitarianism are characterized by better social institutions (greater rule of law, less corruption, more democratic accountability). In order to assess the causality from culture to institutions, they used the grammar of pronouns as an instrumental variable for autonomy/embeddedness. Drawing on psychological evidence, they argued that languages in which it is permitted to drop the person-indexing pronouns (I, you, etc.) reflect a more embedded culture. By contrast, languages that require the explicit use of pronouns place more emphasis on a person's contextualization and uniqueness.

Finally, D'Orlando, Ferrante and Ruiu (2011) show that fatalism is at least partly culturally determined and that, controlling for the level of job protection and other institutional settings, the individuals who trust less others and are characterized by fatalistic beliefs tend to demand more job security.¹⁷

Therefore, it is reasonable to suppose that institutions affect the expected value of different occupational choices, and by doing so, the actual contribution of entrepreneurship to growth. The connections among cultural beliefs, institutions and entrepreneurship are shown in Figure 3. Individuals holding different culturally-based beliefs recognize business opportunity and assess the value of the latter differently. Institutions affect recognizable business opportunity and their value to individuals. The joint action of culturally-based beliefs and institutions determine how many people choose entrepreneurship and, most

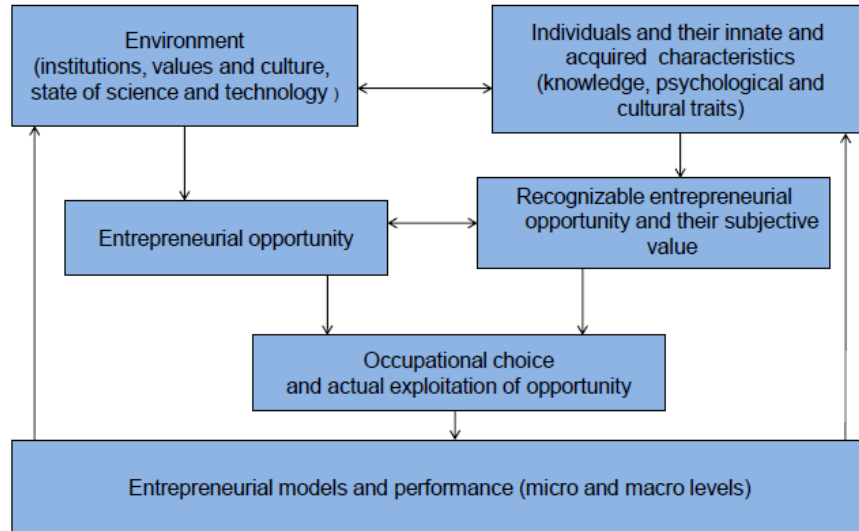
¹⁶ Guiso, Sapienza and Zingales (2003,2006,2009), Fernandez, Fogli (2009) show that certain behavioral patterns (e.g., the level of trust in others, fertility and women's labor supply) of second or third generation immigrants are highly correlated with these variables in their country of origin. They argue that the origin of this observed persistence must be cultural.

¹⁷ D'Orlando, Ferrante and Ruiu (2011) and Ruiu (2012) show that fatalism is a very time-persistent beliefs and that it is strongly tied up with religious beliefs. In particular, Ruiu (2012) using WVS data, shows that controlling for a very large set of socio-demographic variables and country fixed effect, being "Orthodox", "Muslim", "Evangelical", "Buddhist", "Protestant", "Catholic", or to a religion different from the formers, corresponds to an increase in the probability of being a person with extreme fatalistic tendency respectively of 3%, 3.3%, 3.9%, 3.5%, 3%, 2.9%, 1.8%. Other evidences on the cultural origin of fatalistic beliefs can be found in Mueller and Thomas (2000). They show that fatalistic beliefs are strongly correlated with Hofstede's cultural dimensions.

important, who becomes an entrepreneur, i.e. the typical profile of entrepreneurs in terms of subjective characteristics that are relevant in entrepreneurial activities.

Figure 3: Occupational choices and entrepreneurship

Source: De Bruin and Ferrante, 2011



On these premises, the present paper investigates how the institutional setting shapes the entrepreneurial selection. In particular, we try to establish which are the “good” institutions, i.e. those institutions that favor opportunity driven entrepreneurship, which presumably best represents the productive entrepreneurship in Baumol’s sense. Furthermore, we are also interested in establishing whether these “good” institutions produce the same or different impacts also on necessity driven entrepreneurship.

2.1. A deeper glance at fatalism

Fatalism as typical cultural belief has been neglected in economics particularly as regards the analysis of entrepreneurship. Tabellini (2010) uses the perceived degree of control over life-events as one of the cultural determinants of economic development. Wu (2005) finds that people characterized by a fatalistic view of life tend to save less than “not fatalistic individuals”. Ferrante, D’Orlando, Ruiu (2010) find that more “fatalistic individuals” tend to demand more job security. Harper (1998,2003) discusses the interdependence between entrepreneurship and the locus of control. In particular, he argues that an internal locus of control increases entrepreneurial alertness. This increased alertness, in its turn, leads to more opportunity perception and, therefore, to more entrepreneurship. However, there is no formal model explaining how external beliefs influence the choice of becoming an entrepreneur.

Empirical analysis has obtained mixed results on the effect of locus on entrepreneurship. Some empirical works find a significant positive correlation between internal beliefs and the probability of being an entrepreneur (Evans and Leighton (1989) and Schiller and Crewson (1997), Kaufmann et al (1995)) while others have not been able to find a significant relation (Begley and Boyd (1987), van Praag and van Ophem (1995)).

However, two main drawbacks in the literature may be underlined: is fatalism a mere consequence of objective individual characteristics or does it depend on cultural heritage? Determining whether fatalism can be considered a cultural belief is an important step in dealing with the reverse causality problem. The absence of clear theoretical predictions on the effect of external beliefs makes the econometrician's work difficult.

One can make different conjectures on how fatalism influences entrepreneurial choice. Our empirical paper is based on Ruiu's model (2012). Ruiu (2012) models¹⁸ the process of discovering entrepreneurial opportunity by using search theory. In his framework, an entrepreneur is someone searching for an entrepreneurial project that is sufficiently productive to ensure a higher return than wage earning. He shows that fatalism, by undermining the perceived link between the effort exerted in searching and the output that can be obtained, reduces the perceived probability of finding a 'good enough' project and hence increases the level of search ability (this latter is determined by individual characteristics positively evaluated also in the job market, e.g. cognitive ability) required to enter into entrepreneurship. Therefore, for a given level of ability, higher fatalistic tendencies imply a lower probability of becoming an entrepreneur. However, this result does not rule out the existence of 'out of necessity' entrepreneurs, i.e. low-ability owners of low productivity firms that decide to pursue an entrepreneurial career because they lack valid income-generating alternatives. Therefore, low-ability individuals with scant options in paid employment or alternative self employment alternatives, may prefer to *leave everything to luck*, undertaking highly uncertain occupations. The main prediction of the model is that fatalism reduces the likelihood that high-ability individuals (those for whom the entrepreneurial choice is mainly driven by the value of the discovered opportunity rather than necessity) opt for entrepreneurship. At the same time, fatalism may play a minor role for low-ability entrepreneurs whose choice is mainly driven by the paucity of job alternatives. This may explain why econometric analyses that put both type of entrepreneurs together often find a non-significant relation between beliefs and the probability of being an entrepreneur. In Appendix II we present a simple model explaining in greater detail how fatalism affects entrepreneurial selection.

3. Empirical strategy and results

The data sources used in our empirical investigation are the World Value Survey (WVS), the Global Entrepreneurship Monitor (GEM) and Gwartney and Lawson (2009)¹⁹. The WVS is a worldwide investigation about basic values and beliefs of individuals in a large cross-section of countries (more than 80) conducted by the World Value Survey Association. The survey contains information about demographics (sex, age, education, etc.), self-reported economic conditions, political preferences, attitudes, religion. In particular, WVS contains a very appropriate question to assess the degree of fatalism of the respondents.²⁰ A drawback of the WVS is that not being designed for the study of

¹⁸ See appendix II.

¹⁹ See appendix I for a description of these data sources.

²⁰ «Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale (1 means "none at all")

occupational choice, it doesn't allow to obtain a clear identification of entrepreneurs. In particular, WVS allows to distinguish the self-employed from the entrepreneur *strictu sensu* but it doesn't include any information about the motivation behind the entrepreneurial choice. To overcome this drawback an integration with GEM data has been necessary. We used data from 2001 to 2008. Descriptive statistics are shown in appendix I (Table 7).

In our analysis, we separated self-employed individuals from entrepreneurs. In particular two conditions had to be simultaneously fulfilled to consider an individual an entrepreneur:

- The individual declared that s/he was self-employed in reply to the question: : *“Are you employed now or not? If yes: About how many hours a week? If more than one job: only for the main job”* (1 = full time; 2 = part time; 3 = self employed; 4 = retired; 5 = housewife; 6 = student; 7 = unemployed; 8 = other).
- The individual declared²¹ that s/he was an owner/manager of a business in reply to the question: *“In which profession/occupation are you doing most of your work? If you do not work currently, characterize your major work in the past! What is/was your job there?”*

GEM data allows to identify more narrowly entrepreneurs than WVS data and to distinguish between opportunity driven entrepreneurs (those who have declared of being entrepreneurs because they have seen a good business opportunity) and necessity driven entrepreneurs (those who have declared of being entrepreneurs because they have not better chance to work).

In our analysis we address the following questions: b) do cultural beliefs, i.e. fatalism and trust, affect occupational choices, i.e. the decision to become entrepreneurs? b) do culture and institutions affect how people perceive the presence of business opportunities? c) does fatalism affect opportunity and necessity driven entrepreneurs differently?

3.1. Culture, institutions and occupational choices

Our first step consists of estimating the impact of culture and institutions on occupational choices. In short, the relation to be estimated is:

$$y_i^* = \gamma_0 + \gamma_1 \text{fatalism}_i + \gamma_2 \text{Institutions}_i + \gamma_4 \text{trust}_i + \gamma_3 X_i + \varepsilon_i \quad \text{where } \varepsilon_i \square \text{ i.i.d. } N(0, \sigma)$$

Where y_i^* represents the utility of being entrepreneur that we cannot observe. X_i is a vector of controls for individual characteristics (age, gender, education, etc.),

and 10 means “a great deal”) to indicate how much freedom of choice and control you feel you have over the way your life turns out.»

²¹ Options: 1 Employer/manager of establishment with 10 or more employees; 2 Employer/manager of establishment with less than 10 employees; 3 Professional worker lawyer; accountant, teacher, etc; 4 Supervisory - office worker: supervises others; 5 Non-manual - office worker: non-supervisory; 6 Foreman and supervisor; 7 Skilled manual worker; 8 Semi-skilled manual worker; 9 Unskilled manual worker; 10 Farmer: has own farm; 11 Agricultural worker; 12 Member of armed forces, security personnel; 13 Never had a job; 14 other job”.

Institutions represents the controls for institutional settings. Since one cannot observe y_i^* but only a dummy variable that takes value one when the utility of being an entrepreneur is higher than the utility of being a worker (for simplicity normalized to zero):

$$y_i = 1\{y_i^* > 0\}$$

So, for $i=1, \dots, n$, we are interested in:

$$(1) \quad \begin{aligned} P(y_i = 1 | fatalism_i, Institutions, X_i, trust_i) &= P(y_i^* > 0 | fatalism_i, Institutions, X_i, trust_i) = \\ P(\varepsilon_i > -\gamma_0 - \gamma_1 fatalism_i - \gamma_2 Institutions - \gamma_3 X_i | fatalism_i, Institutions, X_i) &= \\ = 1 - G(-\gamma_0 - \gamma_1 fatalism_i - \gamma_2 Institutions - \gamma_3 X_i) &= G(\gamma_0 + \gamma_1 fatalism_i + \gamma_2 Institutions + \gamma_3 X_i) \end{aligned}$$

where G is a Normal C.D.F. (alternatively a logistic distribution can be used to specify the link function G). We estimate the latter equation using data from two different sources: the World Values Survey (WVS) and the Global Entrepreneurship Monitor (GEM). The WVS allows us to control for variables that may be very important in the choice of becoming an entrepreneur like the level of risk tolerance and the self-perceived level of creativity. Hence in the case of WVS, the dependent variable used in equation (1) will be a dummy variable named *entrepreneur* that is equal to one when two conditions are simultaneously verified: the individual declares to be self-employed in question V241²² and the individual declares to being an employer/manager in question V242. Indeed, even if an entrepreneur is surely a self-employed, the definition of self-employment doesn't coincide with that of entrepreneurship. Self-employment is a "catch-all definition", that puts together lawyer, dentist, craftsmen and other professional men with entrepreneurs. Therefore with our empirical definition, we are able to separate the entrepreneur from other types of self-employed.

As said above the WVS, in addition to a question on trust in others, includes a question on fatalistic beliefs. In particular our measure of fatalism is based on the following question:

«Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale (1 means "none at all" and 10 means "a great deal") to indicate how much freedom of choice and control you feel you have over the way your life turns out.»

We reordered this variable in a such a way that a higher value indicates higher fatalistic beliefs. Other important controls that we include in our analysis are the following²³:

²² V241: "Are you employed now or not? If yes: About how many hours a week? If more than one job: only for the main job" (1 = full time; 2 = part time; 3 = self employed; 4 = retired; 5 = housewife; 6 = student; 7 = unemployed; 8 = other).

V242: "In which profession/occupation are you doing most of your work? If you do not work currently, characterize your major work in the past! What is/was your job there? 1 Employer/manager of establishment with 10 or more employees; 2 Employer/manager of establishment with less than 10 employees; 3 Professional worker lawyer; accountant, teacher, etc; 4 Supervisory - office worker: supervises others; 5 Non-manual - office worker: non-supervisory; 6 Foreman and supervisor; 7 Skilled manual worker; 8 Semi-skilled manual worker; 9 Unskilled manual worker; 10 Farmer: has own farm; 11 Agricultural worker; 12 Member of armed forces, security personnel; 13 Never had a job; 14 other job".

²³ Unfortunately the variables creativity and attitude toward risk were introduced only in the fifth wave. For this reason, we decided to focus on this wave for the estimation of equation 1.

- **Trust:** This variable is equal to one if an individual has answered “most people can be trusted” to the following question: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”.
- **Creativity:** This variable is based on the following WVS question : “Please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you? It is important to this person to think up new ideas and be creative; to do things one’s own way. We created a dummy variable for each of the possible answers. The reference category is very much like me.
- **Attitude toward risk:** This variable is based on the following WVS question : “Now I will briefly describe some people: “Adventure and taking risks are important to this person; to have an exciting life. Would you please indicate whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you?” We created a dummy variable for each of the possible answers . The reference category is very much like me.

Finally, we control for the institutional setting using the following indicators in addition to country fixed effects (Gwartney and Lawson, 2009):

- **legal:** it is an index that measures the quality of the legal system. This index ranges from 0-10, where 0 corresponds to ‘no judicial independence’, ‘no trusted legal framework exists’, ‘no protection of intellectual property’, ‘no integrity of the legal system’ and 10 corresponds to ‘high judicial independence’, ‘trusted legal framework exists’, ‘protection of intellectual property’, ‘integrity of the legal system’.
- **labflex:** this index measures the flexibility of the labour market and ranges from 0-10, where 10 is the highest level of flexibility.
- **busflex:** This index is designed to identify the extent to which regulations and bureaucratic procedures restrain entry and reduce competition. It ranges from 0-10 where 10 indicates the maximum level of flexibility in the regulation of business activities.

Table 2 shows some descriptive statistics for the variables *entrepreneur*, *labflex*, *legal*, *busflex*.

As said above we are also interested in establishing if institutions and fatalistic tendencies play a different role for different type of entrepreneurs, i.e. for opportunity and necessity driven entrepreneurs. To accomplish this end, we need to use a more refined data source on entrepreneurial motivation. The Global Entrepreneurship Monitor (GEM) data allows to identify more narrowly entrepreneurs than WVS data. A problem of GEM, is that it doesn’t contain any question on fatalistic beliefs, so we need to integrate the information on fatalism from WVS with the information on entrepreneurs coming from GEM. To this end we used an empirically strategy proposed by Algan and Cahuc (2007) to build a country level indicator of fatalism. In particular, in order to obtain this indicator we run an ordered probit regression where our measure of fatalism is regressed on a set of controls which allows to account for population composition effects and other possible confounding factors in the construction of the indicator. These controls are the gender of the respondent, the level of education, the marital status, the family income, the employment status, and the perceived health status of the respondent, wave fixed effects, country fixed effect. It follows that the fixed effect obtained for each country, i.e. the “country dummy variable”, is interpreted as the indicator of the country’s level of fatalism. To have the

widest span of countries we used all the five WVS waves to construct the indicator. We use this indicator as an explanatory variable (plus a set of socio-demographic controls) in the equation 1 estimated using GEM data²⁴.

To further investigate the role of institutions on determining opportunity and necessity entrepreneurship, in addition to above mentioned *labflex* and *legal*, we add the following institutional variable (also in this case the source is Gwartney and Lawson, 2009):

- **administr**: this index is based on the *Global Competitiveness Report* question: “Complying with administrative requirements (permits, regulations, reporting) issued by the government in your country is (1 = burdensome, 7 = not burdensome).”;
- **bribe** : this index is based on the Global Competitiveness Report questions. [1] “In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes connected with the following: A– Import and export permits; B–Connection to public utilities (e.g., telephone or electricity); C–Annual tax payments; D–Awarding of public contracts (investment projects); E–Getting favourable judicial decisions. Common (= 1) Never occur (= 7)”? [2] “Do illegal payments aimed at influencing government policies, laws or regulations have an impact on companies in your country: 1 = Yes, significant negative impact, 7 = No, no impact at all”? [3] “To what extent do government officials in your country show favouritism to well-connected firms and individuals when deciding upon policies and contracts: 1 = Always show favouritism, 7 = Never show favouritism”?;
- **Bureau**: this index is based on the Global Competitiveness Report question: “Standards on product/service quality, energy and other regulations (outside environmental regulations) in your country are: (1 = Lax or nonexistent, 7 = among the world’s most stringent)”;
- **Starting**: This index is based on the World Bank’s Doing Business data on the amount of time and money it takes to start a new limited-liability business. Countries where it takes longer or is more costly to start a new business are given lower ratings.

The results of our estimations for WVS data are shown in Table 3²⁵. Estimations (2) and (3) include the role of institutions and (3) also country fixed effects. All demographics exert the expected impact on the probability to be an entrepreneur, thus confirming previous evidence. Education seems to produce non linear effects (sig. 1%). As we expected, an increase in fatalistic tendencies leads to a decrease in the probability of being an entrepreneur in all our estimations (sig. 1%). Personal traits such as risk propensity and creativity show the expected signs (sig. 1%) too.

²⁴ See appendix I (Table 8 and Table 9) for details on this indicator

²⁵ See appendix I for the definitions of the explanatory variables..

Table 2: Descriptive statistics: entrepreneurship and institutions

Country	Entr*	labflex	busflex	legal	Country	Entr*	labflex	busflex	Legal
ARG	1.697	2.5	8.9	4.5	MDA	0.956	5.7	8.8	5.6
AUS	4.011	4.6	9.9	8.6	MEX	4.872	4.7	8.9	5.6
BFA	0.261	4.8	6.1	3.9	MLI	0.782	5.6	4.9	4.4
BGR	0.599	4.5	8.7	5.5	MYS	3.081	5	8.8	6.9
BRA	4.267	2.9	6.6	5.2	NLD	1.238	3.2	9.4	8.6
CAN	2.126	5.4	9.9	8.2	NOR	3.317	2.8	9.7	9
CHL	0.300	4.9	9	6.8	POL	0.800	4.8	8.1	5.7
CHN	1.538	5.3	8.1	5.8	ROM	0.732	4.2	9.6	5.7
CYP	6.571	3.6	.	7.6	RUS	0.394	6.8	9	5.6
DEU	3.149	2.4	9	8.7	SRB	1.230	5	9.1	4.7
ETH	1.467	4.6	5.7	4.5	SVN	1.157	2.9	7.8	6
FIN	1.775	3.8	9.5	9	SWE	4.487	1.9	9.4	8.3
FRA	3.197	2.4	9.8	7.2	THA	1.434	4.7	8.9	6.2
GBR	1.825	5.8	9.6	8.5	TTO	2.495	5.3	8.6	5.2
GEO	0.933	6.8	9.4	4.8	TUR	7.058	4	9.5	6.5
GHA	0.391	.	6.8	4.9	TWN	0.652	5.9	7.8	6.6
IDN	2.928	4.5	5.8	4	UKR	1.300	6.3	8.2	5.3
IND	3.948	3.3	7	6.4	URY	2.000	3.3	7.6	5.8
IRQ	0.407	.	.	.	USA	1.922	7	9.8	7.6
ITA	5.138	2.8	9.3	6.3	VNM	3.144	5.4	8.1	5.8
JPN	0.821	4.6	9.2	7.8	ZAF	1.473	2.4	8.8	6.6
MAR	5.333	5.3	9.3	6	ZMB	3.533	8.2	8.6	5.6

*percentage

Source: WVS(2005) and Gwartney and Lawson(2009)

Once we control for institutions and for country fixed effects, trust, legal and busflex are no longer statistically significant. Surprisingly, labor-market flexibility seems to exert a negative effect on the probability of being an entrepreneur (sig. 10%; as we will show, this result is confirmed using GEM data instead of WVS data).

Table 3: Fatalism, institutions and entrepreneurship

	(1) Probit	(2) Probit	(3) Probit
age	4.003*** (0.004)	3.502*** (0.004)	3.792*** (0.004)
agesquare	-3.340*** (0.000)	-3.196*** (0.000)	-3.381*** (0.000)
female	-0.668*** (0.019)	-0.708*** (0.020)	-0.687*** (0.020)
incprimary	0.090(0.057)	0.049(0.059)	0.175** (0.066)
primary	0.227*** (0.049)	0.076(0.052)	0.296*** (0.059)
inctechnical	0.275*** (0.055)	0.167** (0.057)	0.290*** (0.066)
technical	0.763*** (0.046)	0.523*** (0.048)	0.809*** (0.057)
insecondary	0.432*** (0.056)	0.240*** (0.059)	0.420*** (0.067)
secondary	0.877*** (0.046)	0.660*** (0.048)	0.877*** (0.056)
someuniv	0.750*** (0.051)	0.558*** (0.053)	0.670*** (0.062)
university	1.010*** (0.046)	0.820*** (0.049)	1.068*** (0.057)
nochild	-0.114(0.034)	-0.177** (0.035)	-0.093(0.036)
widowed	0.082(0.057)	0.124* (0.060)	0.164*** (0.062)
separated	0.049(0.071)	0.031(0.077)	0.008(0.079)
divorced	0.143*** (0.055)	0.128*** (0.057)	0.161*** (0.059)

cohabite	0.127** (0.044)	0.133** (0.045)	0.159*** (0.048)
married	0.357*** (0.037)	0.380*** (0.038)	0.409*** (0.039)
fhealth	0.172** (0.044)	0.123 (0.045)	0.124 (0.047)
ghealth	0.410*** (0.043)	0.280*** (0.044)	0.319** (0.046)
vghealth	0.461*** (0.045)	0.255*** (0.047)	0.248*** (0.049)
trust	0.161*** (0.020)	0.037 (0.021)	0.046 (0.023)
fatalism	-0.249*** (0.004)	-0.247*** (0.005)	-0.276*** (0.005)
creativityD2	-0.173*** (0.025)	-0.209*** (0.026)	-0.218*** (0.027)
creativityD3	-0.254*** (0.027)	-0.296*** (0.028)	-0.257*** (0.029)
creativityD4	-0.269*** (0.034)	-0.301*** (0.035)	-0.304*** (0.038)
creativityD5	-0.304*** (0.039)	-0.314*** (0.040)	-0.325*** (0.042)
creativityD6	-0.253*** (0.068)	-0.240*** (0.068)	-0.244*** (0.071)
riskD2	-0.182*** (0.038)	-0.215*** (0.040)	-0.181*** (0.041)
riskD3	-0.169*** (0.037)	-0.252*** (0.039)	-0.184*** (0.041)
riskD4	-0.154** (0.037)	-0.227*** (0.039)	-0.194*** (0.041)
riskD5	-0.177** (0.036)	-0.272*** (0.038)	-0.271*** (0.040)
riskD6	-0.239*** (0.039)	-0.302*** (0.041)	-0.295*** (0.043)
legal	-	0.831*** (0.011)	-0.294 (0.040)
labflex	-	-0.106** (0.006)	-0.253* (0.025)
busflex	-	-0.281*** (0.013)	0.245 (0.043)
Country fixed effects	NO	NO	YES
<i>N</i>	68379	61880	56926
pseudo <i>R</i> ²	0.075	0.080	0.112

Standardized beta coefficients; White Robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Fatalism has been recoded such that an increase in the variable indicates an increase in fatalistic tendencies

3.2. Culture, institutions and opportunity perception

The first step in the entrepreneurial process is the discovery/recognition of business opportunity. The estimation of the impact of fatalism and institutions on opportunity perception do not provide surprising results (

Table 4). In particular, in

Table 4 the dependent variable is a dummy (named *opport*), equal to one when an individual (entrepreneur or not) has declared that good opportunities for starting a business would exist in the area where they lived in the 6 months following the survey. We regress *opport* on a set of individual controls, the above depicted institutional variables, and our indicator of fatalism.

As we expected, fatalism exerts a negative impact on opportunity perception. Of course, more articulated is the evidence on institutions. The better the quality of the legal system, the less corruption is widespread, the less administrative requirements are burdensome, the more standards on product quality are stringent, the greater becomes the probability of seeing business opportunities. As before, surprisingly, opportunity perception is negatively correlated with labor-market flexibility.

Table 4: Entrepreneurial opportunity perception

	(1) opport	(2) opport	(3) opport
Age	0.127*** (0.001)	0.166*** (0.001)	0.174*** (0.001)

Agesquare	-0.251***(0.000)	-0.282***(0.000)	-0.292***(0.000)
Male	0.209***(0.005)	0.209***(0.005)	0.210***(0.005)
educD2	0.161***(0.053)	0.192***(0.053)	0.218***(0.053)
educD3	0.215***(0.053)	0.270***(0.053)	0.293***(0.053)
educD4	0.238***(0.053)	0.295***(0.053)	0.317***(0.053)
educD5	0.309***(0.053)	0.322***(0.053)	0.343***(0.054)
Fatalism	-0.297***(0.008)	-0.484***(0.053)	-0.426***(0.048)
Oecd	-0.211***(0.006)	0.131***(0.027)	0.199***(0.056)
Legal	-	-	0.058**(0.009)
Labflex	-	-	-0.302***(0.008)
administr	-	-	0.136***(0.007)
Bureau	-	-	0.065***(0.003)
Starting	-	-	-0.136***(0.007)
Bribe	-	-	0.035*(0.007)
Country fixed effects	NO	YES	YES
Year fixed effects	NO	YES	YES
<i>N</i>	449836	449836	446602
pseudo <i>R</i> ²	0.021	0.050	0.051

Standardized beta coefficients; Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Despite mainstream economics considers labour market regulation as a barrier to entrepreneurial activity, some authors (e.g. Agell, 1999) sustain that labour market rigidity can stimulate workers' investment in education and training by providing them with insurance against (*ex ante*) wage risk, and can promote workers' willingness to share their knowledge with colleagues and the firm because they will not have to worry of being dismissed due to the implementation of the resulting process innovations. Therefore, this increase in the level of human capital and of innovation may improve the entrepreneurial opportunities perception, thereby compensating for the costs imposed by labour market rigidity²⁶.

Another surprising result is that relative to start-up cost. In particular, lower start-up costs do not seem to favor opportunity perception. According to Guiso and Schivardi (2011), low start up costs may induce also low ability individuals to become entrepreneurs, thus lowering both the average level of TFP and the average level of managerial ability. Then, by lowering these barriers one may favor the entry of low ability entrepreneurs who are mainly driven by necessity rather than opportunity motivations. As a preliminary empirical support to this explanation, we will show in the next paragraph that low start-up

²⁶ See De Bruin and Ferrante (2011)

costs are positively related to the probability of becoming a necessity entrepreneur (but not to the probability of being an opportunity driven entrepreneur).

Finally, education seems to enhance entrepreneurship by exerting a positive and linear effect on the probability of seeing business opportunities.

3.3. Necessity vs. opportunity entrepreneurship

The distinction between necessity and opportunity entrepreneurship is fundamental to characterize the role of culture and institutions in entrepreneurial selection and performance. To accomplish this end, we need to use a more refined data source on entrepreneurial motivation. The Global Entrepreneurship Monitor (GEM) data allows to identify more narrowly entrepreneurs than WVS data. Furthermore it allows to distinguish between opportunity and necessity driven entrepreneurs. The former are those who have declared of being driven by opportunity in their occupational choice rather than by lack of alternatives, and who indicate that the main driver for being involved in entrepreneurship is being independent or to increase income (as opposed to just maintain income). The latter are those who are involved in entrepreneurship because they had no other chances. We created two dummy variables named *oppentr* and *necentr* for each type of entrepreneur and we use them as alternative dependent variable in the estimation of equation 1. As a further test of the effect of fatalism on the process of opportunity perception, we included the explanatory variable *opport*, and its interaction *with fatalism (fat_opp)*. We run 7 probit regressions and we included the role of institutions only in regressions 5 to 7; we focus our comments on regression 5 and 7.

Our results offer interesting insights on the different impacts of culture and institutions on the two types of entrepreneurship. First, education plays a positive role only for opportunity-driven entrepreneurship. This may explain our previous results and why the international empirical evidence on the role of education in entrepreneurship is not very neat. Fatalism exerts an adverse impact on both types of entrepreneurship but opportunity driven-entrepreneurship is more responsive to it. This differential impact is also captured by the interaction dummy which is statistically significant and negatively signed only for opportunity entrepreneurship.

As regards institutions, we find that labor market flexibility impacts adversely on both types of entrepreneurship, thus confirming our previous result. For what regards the negative effect of labour market flexibility on opportunity driven entrepreneurship, it may be explained with the redistributive effect, from skilled to unskilled workers, of labour rigidity (Boeri et al. 2004): the latter may induce high ability individuals whose career aspirations are frustrated to “escape” from a compressed wage structure by opting for entrepreneurship.

For what regards the explanation of the relation between flexibility and necessity entrepreneurship, we believe that it is reasonable to expect that, in a rigid labour market, the “outsiders” may be pushed to entrepreneurship because of the long term unemployment tenure that this system implies. This effect can be magnified the less generous is the system of unemployment benefits (see Koellinger and Minniti, 2009).

Surprisingly, the variable *adminstr* exerts a positive impact on opportunity entrepreneurship and it is not significant for necessity driven entrepreneurship. Conversely, the variable *bureau* is highly significant and negatively signed for necessity

entrepreneurship and significant at 10% and positively signed for opportunity entrepreneurship. Finally, the variable *starting* is highly significant and negatively signed for opportunity entrepreneurship and significant at 10% and positively signed for opportunity entrepreneurship.

On the whole these results depict a complex and non conventional picture of the role of institutions in entrepreneurship and they provide some general indications on how to design good institutions, i.e. institutions sustaining quality entrepreneurship. The main results of the effect of institutions on opportunity perception, opportunity entrepreneurship and necessity entrepreneurship are summarized in Table 6.

Table 5: Culture and institutions: opportunity vs. necessity entrepreneurship.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	teayyopp	teayyopp	Teayyopp	teayyopp	teayyopp	teayyopp	teayynec
Age	3.128*** (0.002)	2.768*** (0.003)	3.313*** (0.003)	2.910*** (0.003)	2.910*** (0.003)	3.317*** (0.003)	4.997*** (0.003)
Agesquare	-3.599*** (0.000)	-3.120*** (0.000)	-3.748*** (0.000)	-3.236*** (0.000)	-3.236*** (0.000)	-3.752*** (0.000)	-5.158*** (0.000)
Male	0.693*** (0.007)	0.545*** (0.008)	0.714*** (0.007)	0.562*** (0.008)	0.561*** (0.008)	0.713*** (0.007)	0.539*** (0.012)
educD2	0.106 (0.089)	0.120 (0.097)	0.321* (0.091)	0.154 (0.101)	0.198 (0.101)	0.357** (0.091)	-0.090 (0.118)
educD3	0.269 (0.089)	0.292* (0.097)	0.577*** (0.091)	0.369** (0.101)	0.409** (0.101)	0.611*** (0.091)	-0.190 (0.119)
educD4	0.429** (0.089)	0.415*** (0.097)	0.620*** (0.091)	0.406*** (0.101)	0.443** (0.101)	0.651*** (0.091)	-0.360 (0.119)
educD5	0.480*** (0.089)	0.464*** (0.097)	0.693*** (0.091)	0.482*** (0.101)	0.515*** (0.101)	0.722*** (0.091)	-0.417 (0.120)
fatalism4	-0.453*** (0.010)	-0.215*** (0.016)	-0.822*** (0.075)	-0.767*** (0.089)	-0.882*** (0.081)	-1.273*** (0.068)	-0.683*** (0.111)
Oecd	-0.605*** (0.008)	-0.483*** (0.009)	0.411*** (0.033)	0.447*** (0.040)	0.506*** (0.088)	0.609*** (0.076)	-0.095 (0.127)
Opport	-	0.887*** (0.009)	-	0.833*** (0.010)	0.829*** (0.010)	-	0.851*** (0.014)
fat_opp	-	-0.050*** (0.024)	-	-0.105*** (0.028)	-0.110*** (0.029)	-	-0.020 (0.043)
Legal	-	-	-	-	0.012 (0.015)	-0.022 (0.012)	-0.088 (0.022)
Labflex	-	-	-	-	-0.283*** (0.012)	-0.438*** (0.011)	-0.885*** (0.016)
administr	-	-	-	-	0.164*** (0.011)	0.196*** (0.010)	-0.129 (0.017)
Bureau	-	-	-	-	0.069* (0.005)	0.054 (0.004)	-0.431*** (0.008)
Starting	-	-	-	-	-0.207*** (0.011)	-0.168*** (0.010)	0.236* (0.015)
Bribe	-	-	-	-	0.068 (0.010)	-0.014 (0.009)	-0.163 (0.016)
Country fixed effects	NO	NO	YES	YES	YES	YES	YES
Year fixed effects	NO	NO	YES	YES	YES	YES	YES
N	624719	402476	624719	402476	399521	620131	379097

pseudo R^2	0.045	0.076	0.070	0.104	0.104	0.071	0.134
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Standardized beta coefficients; White Robust Standard errors in parentheses
Entrepreneurs are confronted with individuals who are not exerting entrepreneurial activity
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Institutions and entrepreneurship

Type of Institution	Effect on Opportunity perception	Effect on Opportunity driven entrepreneurship	Effect on Necessity driven entrepreneurship
Labour market flexibility	-	-	-
Standards on product quality	+	+	-
Start-up barriers	+	+	-
Widespread of corruption	-	Not significant	Not significant
Security of property rights	+	Not significant	Not significant
Strictness of Administrative requirements	-	-	Not significant

4. Summary and conclusions

A growing body of literature considers culture, institutions and their interaction as important determinants of cross-country disparities in income per capita (Guiso et. Al, 2006; Tabellini, 2010; Barro and McCleary, 2003; Gorodnichenko and Roland, 2009, etc). Another strand of contributions argues that entrepreneurship is a key ingredient of economic growth and job creation. Notwithstanding, comparatively few research efforts have been devoted so far to the analysis of the joint role of culture and institutions in determining economic growth through entrepreneurship. This paper addresses the latter gap by focusing on the country-specific institutional and cultural factors driving the selection of active entrepreneurs, i.e. entrepreneurship. We provide strong empirical support to the idea that culture and institutions matter a lot for entrepreneurship. We show that occupational choices, business opportunity perception and the share of opportunity entrepreneurship are all affected by peoples' fatalism and by the institutional setting of a country.

One should expect that entrepreneurship matters for the macroeconomic performance of a country in the short and the long run. In the short run the *quality* of entrepreneurship is one of the main determinants of the resilience of the economic system to adverse macroeconomic shocks and of the capacity of the latter to recover from the latter shocks. In the long run, entrepreneurship is the most important driver of innovation and economic growth.

A legitimate question is whether governments can and should affect the macroeconomic performance by determining the *quality* of entrepreneurship by choosing the appropriate institutions and, eventually, by shaping people's cultural beliefs. Since governments' action affects both institutions and people's culture anyway, we believe that policies aiming to improve the quality of entrepreneurship are a legitimate and efficient

means to improve a society's well being. The quality of entrepreneurship should be measured with the same criteria adopted to assess the quality of R&D investments. Innovation is based on experimentation, i.e. trial & error: to improve its productivity one should minimize the number of trials and errors necessary to achieve a given R&D output. This can be pursued by selecting the most promising research areas and the best researchers. Building on Baumol (1990), the general stance is that institutions should generate business opportunities of good quality and incentive systems leading to the selection of *good entrepreneurs*, i.e. institutions should favor entrepreneurial ventures of good quality. But which institutions can achieve these goals and how can governments identify the *good entrepreneurial ventures*?

Figure 4 and in Figure 5, show the 2005 real GDP growth rate for 22 developed countries plotted against the percentage of the workforce (those who are between 18 and 64 year old) who is involved in opportunity driven early stage entrepreneurship (TEAOPP05), and the percentage of the workforce who is involved in necessity driven early stage entrepreneurship, respectively (TEANECO5).²⁷ The figures and the estimated correlation coefficients show that the GDP growth rate is positively and significantly correlated with the TEAOPP05 but not with TEANECO5. Of course, this is just *prima facie* evidence suggesting that governments should implement institutions favouring opportunity driven entrepreneurship²⁸. On these premises, our paper provides some preliminary results and general insights. Surprisingly, labor market rigidities should not be the main concern of governments in that they are not the main barrier to *quality* entrepreneurship. Conversely high administrative burdens and poor product quality standards seem to discourage opportunity driven entrepreneurship. Our results are consistent with idea that too much entry of firms is not necessarily a good thing for employment and growth and that institutions should be designed, rather than for maximizing the entry of new firms, to produce a virtuous entrepreneurial selection (Shane, 2009). For instance, entry barriers motivated by the pursuit of social goals (e.g. environmental protection, public safety and health), if legally enforced, may discourage entry of low ability entrepreneurs, characterized by high failures rates, without affecting the others or motivating them to enter because of the improved quality of the entrepreneurial and legal environment. To this respect, a high level of regulation

²⁷ The data sources for calculating the real gdp growth rate are World Bank World Development Indicators, International Financial Statistics of the IMF.

²⁸ These are only correlations. We are not claiming a casual relation between the two variables.

associated to a low degree of its enforcement, i.e. a combination leading to a lot of firms entry and large shadow economies (Klapper, 2006), is one of the worse world.

Figure 4

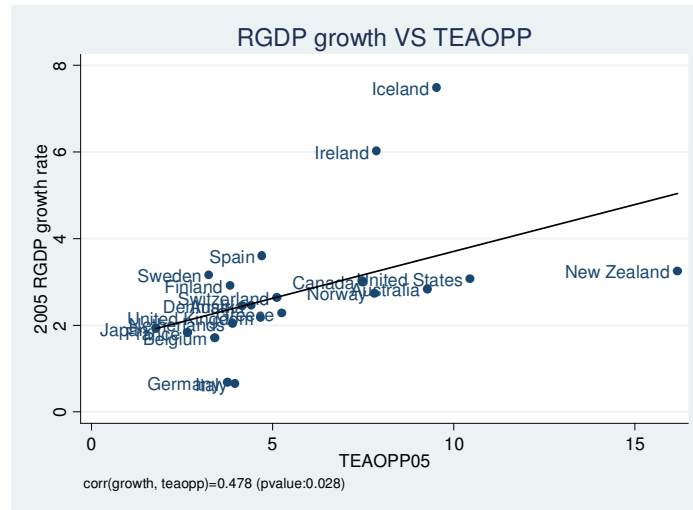
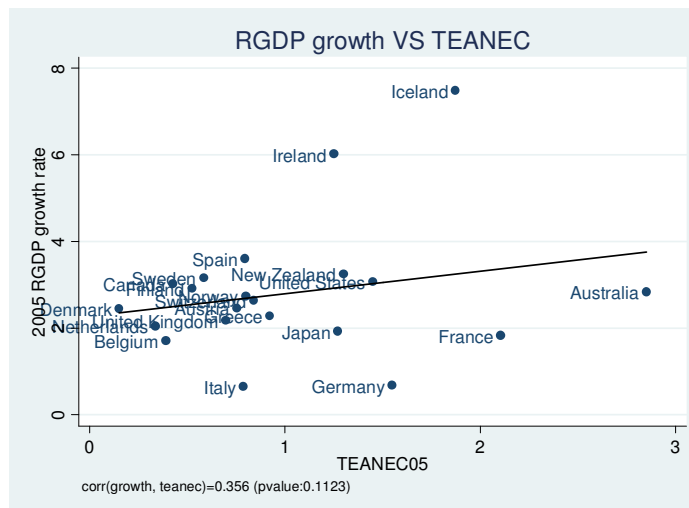


Figure 5



As culture is concerned, our results on the positive impact of education on opportunity entrepreneurship are consistent with recent empirical research showing that in high income countries opportunity perception has a significant positive association with higher education (Levie and Autio 2008). The link between education and opportunity driven entrepreneurship is twofold: it provides peoples with the skills to recognize and exploit opportunities and it reduces people’s fatalistic tendencies. On these grounds, in addition to increase general educational attainment in countries lagging behind, one can envisage two main ways to improve the quality in entrepreneurial selection. The first

consists of designing institutions providing incentives to allocate a larger share of a society's investment in education to entrepreneurial activities (De Bruin and Ferrante, 2011). This can be achieved mainly through measures leading to increase the expected returns, adjusted for risk, of human capital allocated to entrepreneurship, e.g. by increasing the returns to education in entrepreneurial activities. The second is support for the generation of entrepreneurial human capital through formal education and training, in particular, in those areas and industries where the nature of the process of opportunity recognition and exploitation yields higher social returns, is more complex and requires a large set of diverse skills, e.g. research intensive science and technology industries and the creative industries. As Schultz (1990: 98) points out, "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."

In relation to entrepreneurial education, its design should take account that a consistent part of entrepreneurial human capital is made up of those cognitive and non-cognitive traits acquired early in life and there is evidence that the technology of skills formation is characterized by strong irreversibility and complementarities (Cuhna and Heckman 2007). Therefore, cost-effective entrepreneurial education should start early in life and possibly should proceed into tertiary education to develop a wide set of general and specific skills (Lazear 2005) necessary in the different entrepreneurial ventures e.g., scientific or cultural entrepreneurship (OECD 2005: 25).

Appendix I

Definition of the variables (Table 3)

Education: We created dummy variables for each of the possible levels reported on the following WVS question: *What is the highest educational level that you have attained? [NOTE: if respondent indicates to be a student, code highest level s/he expects to complete]: (1) No formal education, (2) Incomplete primary school, (3) Complete primary school, (4) Incomplete secondary school: technical/vocational type, (5) Complete secondary school: technical/vocational type, (6) Incomplete secondary: university-preparatory type, (7) Complete secondary: university-preparatory type, (8) Some university-level education, without degree, (9) University-level education.* The reference category is *no formal education*. The associated dummy variables are named respectively: *noeduc, incprimary, primary, inctechnical, technical incsecondary, secondary, someuniv, university*. The reference category is *noeduc*.

Age: respondent's age in our analysis.

Agesquare: The square of age

Female: a dummy variable equal to one if the respondent's sex was female.

Marital status: It has been inserted by creating an indicator for each status: single, cohabiting, married, separated, divorced and widowed. Single is the reference category.

Nochild: Number of children of the respondent.

Health status: We created an indicator equal to one for each self-perceived state of health: poor health, fair health, goodhealth, very good health. These variables were respectively named, *phealth, fhealth, ghealth, vghealth*. *phealth* is the reference category.

Definition of the variables (Table 4,5,6)

Age : respondent's age in our analysis.

Agesquare: The square of age

Male: a dummy variable equal to one if the respondent's sex was male.

Education: We created a dummy variable for each of the following educational level: None, Some Secondary School, Secondary degree, Post Secondary, Graduated. The associated dummy names are *EducD1, EducD2, EducD3, EducD4, EducD5*, respectively. The reference category is *EducD1*.

Table 7: GEM descriptive statistics

country	Teaopp	Teanec	pport	Fatalism	legal	labflex	administr	bureau	starting	bribe
Argentina	0.079	0.041	0.429	-0.496	3.964	5.250	2.227	5.862	7.982	4.560
Australia	0.069	0.013	0.411	-0.478	8.870	7.634	3.615	5.571	9.560	8.942
Bosnia&H.	0.037	0.033	0.475	0.300	3.500	5.400	2.600	6.700	7.800	3.200
Brazil	0.065	0.055	0.429	-0.112	4.900	4.122	1.878	4.889	6.356	5.589
Canada	0.055	0.011	0.397	-0.416	8.405	7.987	3.911	5.744	9.617	8.375
Chile	0.080	0.039	0.421	-0.094	6.857	6.942	4.356	4.699	9.043	7.756
China	0.083	0.058	0.334	-0.152	5.757	4.961	4.329	3.895	7.056	5.740
Colombia	0.126	0.092	0.639	-0.520	4.467	5.467	2.836	4.733	8.798	4.866
Czech Rep.	0.044	0.018	0.265	0.253	6.200	7.700	2.300	2.600	9.200	6.200
Egypt	0.106	0.024	0.424	0.398	5.400	5.000	3.600	5.800	9.600	4.900
Finland	0.036	0.005	0.503	-0.079	9.062	4.788	5.875	5.473	9.213	9.400
France	0.022	0.007	0.178	0.077	7.424	5.400	2.345	4.924	8.860	7.897
Germany	0.035	0.011	0.226	0.015	8.690	3.494	3.425	5.470	8.227	8.693
HongKong	0.028	0.012	0.355	0.129	7.579	9.324	6.600	5.257	9.600	8.575
India	0.075	0.037	0.493	0.269	5.928	6.944	2.758	4.572	6.362	4.724
Indonesia	0.165	0.029	0.455	-0.281	3.900	5.200	4.800	4.600	5.700	4.100
Iran	0.060	0.028	0.352	-0.198	6.100	4.800	.	.	9.700	.
Italy	0.028	0.005	0.320	0.282	6.216	5.564	1.895	5.809	8.794	6.368
Japan	0.019	0.006	0.092	0.612	7.561	8.120	4.010	5.373	8.417	8.213
Jordan	0.151	0.029	0.396	-0.148	6.500	8.400	4.700	2.900	5.300	7.300
Korea	0.066	0.040	0.136	-0.174	6.466	4.267	3.368	5.536	7.765	6.401

Latvia	0.043	0.010	0.361	0.777	6.824	6.704	3.674	4.200	9.400	5.819
Macedonia	0.059	0.059	0.501	0.284	5.100	8.000	3.800	5.600	9.800	5.300
Malaysia	0.105	0.006	0.505	-0.159	6.900	7.700	6.000	2.800	9.000	7.000
Mexico	0.074	0.024	0.413	-0.486	4.962	5.664	2.475	4.514	7.720	5.405
Netherl.	0.030	0.003	0.396	0.212	8.729	6.495	3.297	4.245	9.125	8.686
N. Zealand	0.100	0.016	0.519	-0.687	8.934	7.971	3.431	6.827	9.138	9.445
Norway	0.051	0.004	0.451	-0.409	8.737	4.820	4.088	5.456	9.074	8.964
Peru	0.224	0.097	0.640	-0.303	4.953	6.729	2.177	5.176	7.430	5.623
Philippin.	0.114	0.099	0.610	-0.263	4.900	5.900	2.500	5.500	7.800	4.000
Poland	0.038	0.025	0.175	0.068	5.833	5.700	2.733	6.167	6.834	5.233
P. Rico	0.022	0.004	0.369	-0.819
Romania	0.016	0.008	0.258	0.007	5.900	6.700	3.637	5.152	9.600	5.756
Russia	0.025	0.007	0.195	0.173	5.032	5.704	2.258	4.633	7.744	4.604
Serbia	0.030	0.024	0.502	0.004	4.798	5.896	1.704	5.798	9.353	4.700
Slovenia	0.036	0.006	0.376	-0.405	6.139	5.321	3.622	4.323	8.384	7.622
S. Africa	0.031	0.015	0.239	0.130	6.585	6.008	3.260	4.907	8.606	6.811
Spain	0.052	0.009	0.335	-0.081	6.646	5.278	3.293	4.321	8.184	7.243
Sweden	0.027	0.003	0.410	-0.659	8.277	5.079	4.104	7.883	9.209	8.887
Switzerl.	0.049	0.008	0.363	-0.306	8.636	7.638	5.247	5.492	9.247	8.917
Taiwan	0.031	0.006	0.144	-0.454	6.400	4.500	5.200	6.000	7.700	8.000
Thailand	0.114	0.048	0.271	-0.104	6.216	7.228	4.410	3.380	8.900	5.775
Turkey	0.030	0.019	0.392	0.485	5.868	4.133	3.100	4.732	9.567	5.702
Uganda	0.154	0.133	0.708	-0.065	4.302	8.700	3.870	4.828	7.866	4.068
UK	0.035	0.006	0.335	-0.419	8.522	8.255	3.556	4.277	9.540	8.423
USA	0.070	0.010	0.327	-0.493	7.867	9.094	3.483	5.131	9.245	6.921
Uruguay	0.060	0.031	0.479	-0.419	5.567	6.300	3.533	4.666	7.699	7.266
Venezuela	0.142	0.088	0.572	-0.741	2.451	3.069	1.242	4.454	6.365	4.043

Table 8: Ordered probit of Fatalism

	Ordered probit fatalism
age	0.041*** (0.001)
agesquare	-0.051*** (0.000)
incomeD2	0.001 (0.013)
incomeD3	-0.006*** (0.013)
incomeD4	-0.012** (0.013)
incomeD5	-0.017*** (0.013)
incomeD6	-0.023*** (0.013)
incomeD7	-0.026*** (0.014)
incomeD8	-0.027*** (0.015)
incomeD9	-0.022*** (0.017)
incomeD10	-0.025*** (0.019)
secondary	-0.011*** (0.009)
secnottec	-0.014*** (0.009)
university	-0.018*** (0.009)
goodhealth	-0.079*** (0.012)
fairhealth	-0.041*** (0.013)
divorced	-0.000 (0.013)
widowed	0.003*** (0.014)
single	-0.002* (0.009)
parttime	0.002* (0.011)
selfemployed	-0.005*** (0.010)
retired	0.002 (0.012)
housewife	0.010*** (0.009)
student	0.006*** (0.013)
unemployed	0.009*** (0.011)

otherjob	0.005 ^{***} (0.022)
Country fixed effects	YES
Wave fixed effects	YES
<i>N</i>	180543
pseudo <i>R</i> ²	0.031

Standardized beta coefficients; White Robust Standard errors in parentheses
The variable Fatalism has been recoded so that an increase in the variable indicates an increase in level of fatalistic tendencies
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Country level indicator of fatalism

Argentina	-0.49642	New Zealand	-0.68711
Australia	-0.47817	Norway	-0.40858
Bosnia	0.299948	Peru	-0.30297
Brazil	-0.11207	Philippines	-0.26297
Canada	-0.41616	Poland	0.068479
Chile	-0.09354	Puerto Rico	-0.81888
China	-0.15177	Romania	0.007386
Colombia	-0.52013	Russia	0.173029
Czech Republic	0.253037	Serbia	0.003879
Egypt	0.398117	Slovenia	-0.40495
Finland	-0.07901	S.Africa	0.129944
France	0.077374	Spain	-0.08076
Germany	0.014945	Sweden	-0.65914
Hong Kong	0.129089	Switzerland	-0.30609
India	0.268809	Taiwan	-0.45414
Indonesia	-0.28073	Thailand	-0.10375
Iran	-0.19843	Turkey	0.485087
Italy	0.282225	Uganda	-0.06472
Japan	0.611996	UK	-0.41891
Jordan	-0.14769	USA	-0.49289
Korea	-0.17353	Uruguay	-0.41902
Latvia	0.776772	Venezuela	-0.74091
Macedonia	0.284122		
Malaysia	-0.15928		
Mexico	-0.48604		
Netherlands	0.21194		

Appendix II

Here, we present a simplified version of the model proposed by Ruiu (2012) to illustrate the main predictions about the effect of fatalism on the entrepreneurial choice. Consider a closed economy composed by workforce of risk neutral individuals of size normalized to unity. In this economy the individuals have two options: to become entrepreneurs or to work for others. The production function combine one manager/owner with labour to produce Y homogeneous units of output sold at unit price. The wage rate is given by w . The individuals are heterogeneous with respect to their ability as workers, b . Let assume that $b \in [0, \bar{b}]$ is distributed among the population according to a distribution with *cdf*

given by $F(b)$ with $F(0) = 0, F(\bar{b}) = 1$.

Assume that b is perfectly observable and that a worker endowed with a level of ability equal to b is able to offer b units of efficiency labor. Then the return of being an employee for the i -th individual is $W = wb_i$. The production function is given by:

$$Y = \alpha n^\gamma, \text{ with } 0 < \gamma < 1$$

Where α is the level the entrepreneurial ability and n are efficiency units of labour. Now, suppose that the individuals don't know ex-ante their level of entrepreneurial ability. We indicate with s an exogenous culturally determined level of fatalism of the workforce. In particular if $s=1$, the individuals are extremely fatalistic while $s=0$ indicates the opposite situation.

If $s=1$, the individual believes that entrepreneurial success is determined by the Fate. Since Fate is inscrutable, fatalistic individuals attach the same probability to each possible event included in the interval $[0, \bar{b}]$. Therefore, fatalistic individuals believe that level of

entrepreneurial ability is distributed according to $\alpha \sim U[\underline{\alpha}, \bar{\alpha}]$ with $[\underline{\alpha}, \bar{\alpha}]$ such that the

expected value of α , $E(\alpha) > 0$ but very small.

If instead $s=0$, the individuals believe that the level of the entrepreneurial ability is a deterministic function $\alpha = g(b)$ of their level of ability b . Assume that $g(0)=0$, and $g' > 0$, $g'' > 0$. Hence, if an individual is not fatalistic he believes that luck doesn't play a role in determining the success of an entrepreneur.

A fatalistic individual ($s=1$) with a level of ability equal to b will become entrepreneur if:

$$\pi(\alpha, w) := \max_n \frac{\alpha + \bar{\alpha}}{2} n^\gamma - wn \geq wb$$

A non fatalistic ($s=0$) individual with a level of ability equal to b will become entrepreneur if:

$$\pi(b, w) := \max_n g(b) n^\gamma - wn \geq wb$$

In the latter case, solving the maximization problem gives the optimal labour demand²⁹:

²⁹ It is straightforward to derive the solution also for the fatalistic entrepreneur.

$$n(b, w) = \left[\frac{w}{\gamma g(b)} \right]^{\frac{1}{\gamma-1}}$$

Note that the labour demand is decreasing in w and increasing in b .
How does profits react to an increase in b ?

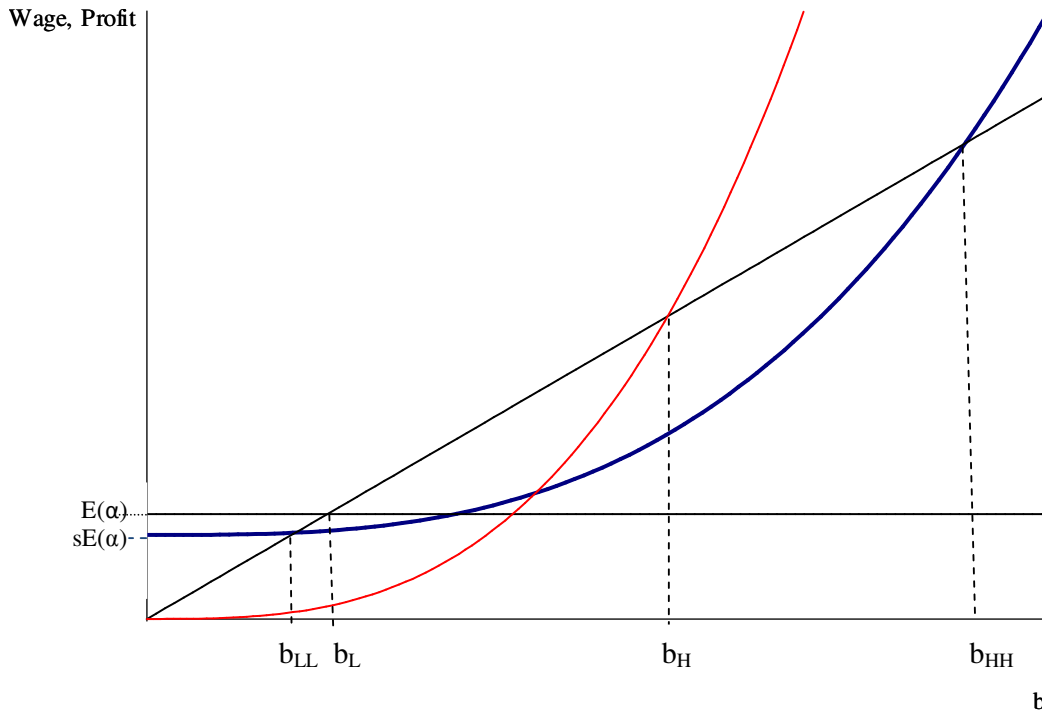
$$\begin{aligned} \frac{\partial \pi}{\partial b} &= g'(b)n(b, w)^\gamma + g(b)\gamma n(b, w)^{\gamma-1} n'(b, w) - wn'(b, w) = \\ &= g'(b)n(b, w)^\gamma + n'(b, w) \left[g(b)\gamma n(b, w)^{\gamma-1} - w \right] \end{aligned}$$

Then using the fact that $n(b, w)$ satisfies the f.o.c. of the maximization problem, i.e. $g(b)\gamma n(b, w)^{\gamma-1} - w = 0$, we have:

$$\frac{\partial \pi}{\partial b} = g'(b)n(b, w)^\gamma > 0$$

from which it is easy to show that also $\frac{\partial^2 \pi}{\partial b^2} > 0$.

Now, we graphically show the solution to the occupational choice problem of the generic individuals endowed with a level of ability equal to b :



On the vertical axis we plot the value of being a worker (represented the black curve which starts in the origin) and the value of being an entrepreneur corresponding to different levels of s .

The horizontal curve represents the value of being an entrepreneur of an extremely fatalistic individual. In this case, the individual will opt for entrepreneurship only when his level of ability as worker is extremely low, i.e. when $b < b_L$. Let's indicate these individuals as necessity driven entrepreneurs.

The red curve indicates the value of being an entrepreneur when $s=0$. In this case only high ability individuals with $b > b_H$ will become entrepreneurs. Let's indicate these individuals as opportunity driven entrepreneurs.

The blue curve indicates the value of being an entrepreneur for intermediate levels of fatalism ($0 < s < 1$). For these individuals the expected level of entrepreneurial ability is given by $sE(\alpha) + (1-s)g(b)$. With respect to the case of $s=0$, the curve is translated upward because a higher number of individuals believe that Fate plays a role in determining entrepreneurial ability. At the same time the blue curve is flatter than the red curve because individuals are less confident about the role of their ability, b , in determining entrepreneurial success.

When $0 < s < 1$ both necessity and opportunity driven entrepreneurs are present in the market. In particular, only those who are endowed with a level of ability below/above b_{LL}/b_{HH} will become necessity driven/opportunity driven entrepreneurs. However note that the number of high ability entrepreneurs is much lower than in the former case.

To close the model, note that the economy is in equilibrium when w is such that the total labour demand is equal to the total labour offer. Considering for simplicity the case where $s = 1$ (similar arguments apply to the other cases) :

$$\underbrace{\int_{b_H(w)}^{\bar{b}} n(b,w)f(b)db}_{L^D} = \underbrace{\int_0^{b_H(w)} bf(b)db}_{L^S}$$

Using the Leibniz's rule the for the differentiation of L^D we have:

$$\frac{d}{dw} L^D = - \underbrace{\frac{db_H(w)}{dw} n(w, b_H(w)) f(b_H(w)) + \int_{b_H(w)}^{\bar{b}} \frac{\partial n(w, b)}{\partial w} f(b) db}_{<0}$$

$$\frac{d}{dw} L^S = \underbrace{\frac{\partial b_H(w)}{\partial w} b_H(w) f(b_H(w))}_{>0}$$

Therefore the continuity of L^S and L^D ensures that a unique w^* exists.

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