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From Knowledge to Innovation Economy: Developing Education and Creating Entrepreneurial Ecosystems

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FROM KNOWLEDGE TO INNOVATION ECONOMY: DEVELOPING EDUCATION AND CREATING ENTREPRENEURIAL ECOSYSTEMS.

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ABSTRACT:

In a market economy, reward structures are more or less favorable to opportunity entrepreneurship, which brings growth and jobs (Schreyer, 2000). Currently the small group of high-growth firms generates a large proportion of permanent jobs (Henrekson and Johansson, 2010; Falkenhall and Junkka, 2009) and new companies are widely represented (Daunfeldt and al, 2014). How to nurture these new companies with high-growth potential in France is a major issue that, we believe, is mainly based on a better functioning of the labor market, and the development of entrepreneurial education and ecosystems favorable to entrepreneurship.

KEYWORDS: Entrepreneurship by opportunity, Entrepreneurial Education, Entrepreneurial Ecosystems.

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Introduction

In a market economy, the entrepreneurial function and the competition between companies are essential. They allow an optimal response to the satisfaction of consumer needs. After a growth in the size of enterprises, managerial economics of the late 70's has been shaken up by the emergence of new businesses in new industries, developing new business models. The current period, then, is a period of reemergence of Entrepreneurship in Europe and North America [Audretsch and Thurik (2000; 2001), Audretsch et al. (2006)]. While Europe is certainly more entrepreneurial than in the 1960's and 1970's, it remains insufficiently so compared to a global economy that has globally become more entrepreneurial (Audretsch, 2006, reports -Global Entrepreneurship Monitor- GEM, years 2000- 2006-2009)[1]. According to Schramm (2009), many young American companies are the creators and leaders of new industries and most of these companies are high-growth. In this later population firms are rather young (Coad and al., 2014) and they generate a disproportionate amount of jobs, innovations, patents and new technologies. Aghion (2014) emphasizes that innovation involves the creation/destruction just like the Schumpeterian entrepreneur and that some countries are better able to "surf" on new waves of innovations, such as information technology and communication, the "cloud computing" and renewable energy. Like the USA, Sweden and Canada benefit from these technologies due to reforms already undertaken in the labor market to make it more dynamic[2]. The comparison with the USA where strong growth of recent years is partly due to the creation of companies in new sectors may shed light on the need to further develop entrepreneurial intensity in Europe, particularly in the advanced technology sectors, and new collaborative social and environmental business models.

For Stam (2008), however, certain conditions are necessary for entrepreneurial activity. Firstly the existence of entrepreneurial opportunities that may be more or less important, the existence of individuals capable to catch them (that is to say having the will and the capacity to engage in the entrepreneurial venture) and ready to confront uncertainty (on demand, on the ability to stand comparison with competitors, on the importance of value creation, etc.). Then the opportunity is to be continued in an organization and must represent a real resource recombination which involves a change in the market. Stam says it takes a resource recombination in a new form that is not a perfect imitation of what was done before. The current economy can be described as an innovation economy. It means that the value of the business is related to knowledge, skills and creative and innovative capacity of staff. According to Audretsch (1995), the analysis of an industry's capacity for innovation needs then to be conducted at the level of the individual carrying the innovative project rather than at the enterprise level. The reason is the asymmetry of information between the innovative project carrier and business managers about the feasibility and profitability of the project. The appropriation of the gains of innovation can then constitute a powerful incentive to business creation directly linked to individual incentives and, in some cases, technological frustration (Shapero, 1975). Baumol (2004) notes that breakthrough innovations often result from new-firms startups. According to Mathias Fink[3], a physicist, professor at the ESPCI, who founded four start-up companies that employ over 140 people and develop products for automation building in the medical and telecommunications fields: "Entrusting innovation for large groups is a mistake because they are afraid of breakthrough innovations. These come from academics. Inadequate reward structure and functioning of institutionalized labor market may however affect the creation of innovative businesses".

How is it possible to make our societies more entrepreneurial, and especially to promote entrepreneurship opportunity? How can the transition from a knowledge economy to an innovation economy be made easier? These are major issues for Europe, and France in

particular, that we want to discuss in this paper in light of reference texts and a number of the results of our own research.

The entrepreneur is a key economic player for economic development according to the pioneering work in the field of Joseph Schumpeter, the special conditions of the current economy (technological changes, demographic and social trends, globalization and the deepening and widening of capitalism) restoring a new impetus to entrepreneurial economy. Europe and France lag behind and this mainly because of inadequate reward structures and a functioning of the labor market which affect the creation of innovative businesses. The institutional environment has now to be improved as the entrepreneurial education and the creation of ecosystems favorable to a true economy of innovation.

I) The Entrepreneur at the Heart of the Process of Economic Development

A dynamic view of the markets helps to understand how the entrepreneur achieves a positive effect on economic development. For Schumpeter (1911), the innovative entrepreneur drives the growth and breaks the economic circuit otherwise indefinitely reproducible. The innovative entrepreneur diverts resources from this operating cycle, resources that will enable him to achieve his innovation. For this he uses bank loans to buy raw materials and capital equipment necessary for the implementation of innovation. Ultimately the added value of innovation surpasses the rise in prices due to the increasing amount of bank loans. So with Schumpeter we have a highly dynamic vision of the role of the entrepreneur that is directly related to growth. Later the precursor entrepreneur and imitators' entrepreneurs will cause cyclical movements in economic activity (Schumpeter, 1939). During the cycle phases of growth, innovation waves are explained by the sectoral and chronological grouping of imitators-entrepreneurs. However, the role of the entrepreneur is so much linked to growth that it seems more driven by personal characteristics and that any explanation is enclosed in the characteristic of innovation without more detailed explanation on the functioning of the market (Van Praag, 2005).

A great deal of debates around market equilibrium and planned versus market functioning of economies arose in the twenties/thirties (Mises/Lange). According to the market hypothesis of pure and perfect competition, which constitutes the general framework of analysis in economics, all information is available at no cost nor any delay for every firm or consumer so that: "*For a society, then, we **can** speak of a **state** of equilibrium at a point of time-but it means only that the different plans which the individuals composing it have made for action in time are mutually compatible*". (Hayek, [1937], 1948, p.41). But the view of the market is obviously more complex. According to Hayek's notable works on the role of information and the discovery process in the market, the market is a process in perpetual adjustment where the building of the needs, preferences and production plans are themselves inseparable from interaction, demonstration and learning's effects (Heertje, 1982).

However the entrepreneur in this process of gradual discovery of relevant information is not dominant over the role of the consumer. Kirzner (1979, 1985), quoted by Bögenhold and al. (2016), stresses the essential role of the entrepreneur in the process of markets equilibrium. According to him, entrepreneurial profit is a pure profit, which is not linked to the use of production factors. It comes from simultaneous decision-making to purchase and sell following the discovery of advantageous price differences, the existence of which is based on the ignorance of the agents about the precise demand and supply. Profit opportunities, up until then ignored by economic agents, cannot be discovered by the sole setting of specific investments, they depend primarily on private individuals' capacities and especially on their alertness[4]. According to Baumol (2010, 15), while the schumpeterian entrepreneur destroys

all equilibrium, the kirznerian entrepreneur tends to reequilibrate the market. Kirzner (2009, 10) tries a synthesis of the two approaches: "*... **all** these price differentials (**both** attributable to Schumpeterian creativity and those present in the simplest of arbitrage contexts) can and should be seen as examples of entrepreneurial arbitrage activity. Such activity drives prices systematically in directions tending to eliminate the price differentials (i.e., the opportunities for pure profit) which are, always, the sparks which ignite entrepreneurial attention, drive, and creativity"*. Highlighting entrepreneurial arbitrage, Kirzner includes, somehow, Schumpeter in his theory. Does the uncertainty about the success of the innovation of the precursor entrepreneur indeed allow a real arbitrage? We can doubt it...

Facchini (2014) notes, however, that the Kirzner/Schumpeter opposition about the entrepreneur as a power of equilibrium versus the entrepreneur as a power of disequilibrium is no longer needed in a genuinely processual vision of markets where agents perpetually correct their errors of appreciation. The market economy is an open world. Alertness acts then positively on the coordination of supply and demand plans on the market. "*In the course of this entrepreneurial process, new products may be introduced, new qualities of existing products may be developed, new methods of production may be ventured, new forms of industrial organization, financing, marketing or tackling risk may be developed*" (Kirzner, 1985, 30). So, there is the idea that the market and entrepreneurs will allow the discovery of new methods, new uses, new productive organizations etc. (we return to the five types of innovation of Schumpeter), but especially that part of these discoveries cannot be predicted; it is the market and the information it dispatches that will ultimately select the most relevant projects. Who could have foreseen the rapid development, and on such a scale, of the so-called "collaborative economy"?

Audretsch et al. (2006) then define the entrepreneur as the missing link between investment in knowledge and growth. That is the entrepreneur, who adds value to scientific discovery. Entrepreneurship capital is then, just as capital and labor in a macroeconomic model, an essential factor of production in the economy. Acs, Audretsch and Lehman (2013), in their recent *Knowledge Spillover Theory of Entrepreneurship* (KSTE), highlight the importance of the local combination of entrepreneurs and knowledge disseminated mainly by universities and research centers: "*The ability to transform knowledge into economic knowledge involves not only a set of skills and insights, but also local proximity to the source of the knowledge*". The entrepreneur perceives the relevant economic information, transforms it into profit and reveals to others the value of their own information (Binet et al. 2010). By doing this, he reduces pockets of ignorance. The identification of a market advantage by an entrepreneur creates opportunities for others (Holcombe, 1998). It is for this reason that the more entrepreneurs there are, the more companies share new information that create new opportunities for business creation. The current period is a good period for entrepreneurship. Audretsch (2007a) goes on to describe the entrepreneurial society, where entrepreneurship acts as a catalyzer for knowledge spillovers, putting in competition new ideas and increasing diversity.

II) The Shift to the Entrepreneurial Society

Many macroeconomic and institutional causes may explain the differences in entrepreneurial intensity between countries or regions. These overlapping causes include economic growth, unemployment, development and operation of the financial system, the intensity of administrative barriers, the specifics of the labor market, the legal consequences of the failure, entrepreneurship and the collective perception of the defaulting entrepreneur... This set of causes refers to what Baumol denominated in a 1990 article "*the rules of the game*" - that is to say, the reward structure in the economy-. He notes that some societies have historically preferred reward structures more or less favorable to the development of

entrepreneurs. Over the recent period, this analysis allows us to understand why some European countries are off track and the difference between an entrepreneurial society that values entrepreneurial initiative and a wage society which increases the opportunity cost of starting a business. In particular it allows us to understand the difficult transition from a knowledge economy to an innovation economy.

The current period is in fact a re-emergence of an entrepreneurial period in Europe and North America. Audretsch and Thurik (2000; 2001), Audretsch et al. (2006) describe the transition from a managerial economy model to an entrepreneurial economy model. For Thurik (2011), the model of the entrepreneurial economy revolves around an economic growth based on the diversity of needs, novelty, turbulence, innovation and a functioning of networks that allow a maximum of entrepreneurial flexibility to play. It is opposed to the old model of the managerial economy that revolved around an economic growth based on mass production, specialization, certainty, predictability and uniformity that allowed maximum economies of scale to come into play. Entrepreneurial capital thus explains the different paths of growth among regions of industrialized countries in this evolution (Audretsch and Keilbach, 2004). In addition to traditional factors such as Capital, Labour or expenses in Research and Development in the macroeconomic production function of a country, entrepreneurial capital is contributing significantly to the growth differences (Carree, Thurik, 2003).

Stam (2008), quoted by Bonnet et al. (2012), identifies three main sources of opportunities to undertake this development:

- Technological changes which are the main source of entrepreneurial opportunities (information technology and communication sector but also biotechnology sector). The robot, as was noted early by Camagni (1985), presents three fundamental advantages in today's economy. It can multitask, i.e. it can be programmed to work on a variety of products of the same family, and at the same time. It is adaptable, meaning that light product modifications can be introduced in order to remain up-to-date. Finally, it can be converted for other uses, at a moderate cost, which reduces the risk of sunk cost.

- Social and demographic changes, especially with the aging population, the growing number of single parent families and finally the reduction of working time and the development of living standards that allow access to the consumption of new goods and services, leisure or cultural. One can also note a diversification of demand that moves from standardized goods to individualized and customized goods (market niches),

- Most political changes that involved a deepening of the market economy by the deregulation movement, privatization and liberalization. Philips (1985) has shown the positive effect of deregulation in the industrial sector on the formation of new companies in the USA. Berkowitz and Holland (2001) showed in the case of Russia that the large-scale privatization has increased the formation of new companies.

Audretsch and Thurik (2004) add the change in composition of the workforce with greater participation of women and immigrants, young and old workers, which is favorable to small businesses rather than large companies due to the emphasis on flexibility.

Entrepreneurs also appear in this new economy as facilitators of economic growth. Empirical studies suggest indeed that the creation and survival of enterprises are often perceived as an important issue, particularly for growth and employment (Carree and Thurik, 2003), growth in productivity (Holtz-Eakin and Kao, 2003) or for reducing social inequalities (Fairlie, 2004).

Naudé (2010) notes, however, that most studies focus on developed countries. Several reasons explain this. Firstly, there is the difficulty of modelling the vague concept of the entrepreneur in development theories and the belief that entrepreneurship is not a real constraint in developing countries. Entrepreneurship is also essential for structural change

(Naudé, 2010). It contributes to the transformation of agricultural economies into knowledge and service economies. The weight of the primary sector and the functioning of the informal economy explain the high rate of entrepreneurial activity in developing countries. With the development and the increase of interesting wage opportunities (the level of actual wages increases), we observe a diminution of the entrepreneurial activity but also a revival for the first innovation-driven economies (GEM, 2009, 9). This evidence leads to the so-called U-shaped curve (but is it U?) that links the GDP per capita with the rate of entrepreneurial activity (Carree et al., 2007). Wennekers et al. (2010) argue that the reemergence of independent entrepreneurship is based on at least two 'revolutions': the emergence of solo self-employment (Bögenhold and Fachinger, 2008, Bögenhold et al., 2016, Fachinger and Frankus, 2016) which is important for societal and flexibility reasons and the rise of ambitious and/or innovative entrepreneurs (Acs et al., 1999, Van Stel and al., 2005, Audretsch, 2007 a). Solo self-employment is not always idealized entrepreneurship. Thus it is sometimes constrained due to low material resources of certain populations, such as pensioners in the German case (Faschinger and Frankus, 2016).

III) France: Unfortunately the Predominance of "Push" Effects

In total the comparison in terms of entrepreneurial intensity between substantially similar geographic areas in terms of development levels and entrepreneurs meeting the same incentives therefore makes sense. In a study of self-employment, Congregado and Millan (2013) distinguish the "*true self-employed*" from the "*self-employed of the last resort*" and the "*dependent self-employed*". The "*true self-employed*" are distinguished by the fact that employers are therefore creating jobs, the "*self-employed of the last resort*" create their own jobs primarily for reasons of the low opportunity cost attached to the entrepreneurial undertaking (this is a way out of unemployment), and the "*dependent self-employed*" are forced to use this status for labor market flexibility reasons (or cost of employment) -the trade relationship being less restrictive than the wage relationship. The first type is obviously the ones to be sought.

The Global Entrepreneurship Monitor Program (GEM) measures the levels of entrepreneurial activity between countries by setting the Total Entrepreneurial Activity (TEA) as the proportion of 18-64 years old who are actively involved in creating a business or running a business for less than 42 months. If the results show a difference between North America and the European Union, they particularly show that opportunity entrepreneurship (as distinguished from an entrepreneurship of necessity) is lower in Europe, and especially in France but also in Germany (GEM 2009). It is therefore necessary to examine the conditions that enable an economy to foster opportunity entrepreneurship.

From a microeconomic perspective, the decision to become an entrepreneur is an allocation decision of one's human capital, balancing of an opportunity cost to undertake with a reward expectancy (monetary, symbolic –social recognition- or psychological). The usual way to describe an entrepreneurial economy is to consider that new entrepreneurs are pulled ("*pull*" effect) in entrepreneurship by the perception of profit opportunities (Kirzner in 2009). In this sense they respond to positive motivations to start a business (clearing markets or developing new ideas to make the most of). Yet parts of new entrepreneurs are also motivated by a "*push*" effect like being unemployed and trying to avoid the depreciation of one's human capital (Bhattacharjee et al., 2010). Thurik and Dejardin, (2011) give other examples of push factors like "*uncompetitive compensation schemes, weak social insurance benefits, but also limited autonomy associated with employee status, or the lack of attractive alternative occupational choice*". Baumol (1990) shows that while the total number of entrepreneurs (entrepreneurial intensity) varies in societies, their contribution to growth varies even more

according to their allocation in time and space between more or less productive activities according to studied periods and cultures. Thus, in ancient Rome, prestige is not associated with industry and commerce rather associated with former freed slaves but, for honorable persons, with holding land, lending money and holding political office -also allowing significant monetary gains-. There is a total divorce between science and practice, technology is not geared towards increasing productivity.

In an entrepreneurial society, being an employee does not give the insurance of a stable situation because of the greater flexibility for employers to fire workers. The flexibility of the labour market can more easily encourage individuals to undertake insofar as this action is a positive signal to future employers even if the business is not doing as well as expected. In a salaried society like France, employees have important historical advantages, with social security, relatively stable jobs and the opportunity to benefit from many public goods[5]. Rigidity of the labour market and the stigma of entrepreneurial failure divert a number of students and experienced qualified employees (including researchers) from enhancing their human capital through the entrepreneurial option. In the French case there is also a low commitment of elites in innovative entrepreneurial activity due to the existence of sunk costs for this population, related to network effects and the stigma of entrepreneurial failure should the startup be less successful than expected (Bonnet, Cussy, 2010)[6].

The employee may not engage in an entrepreneurial adventure unless the overall environment is favourable, that is to say that the rate of unemployment is rather low and the labor market is fluid and he/she perceives that his/her eventual entrepreneurial failure[7] will not penalize him/her. The same reasoning can be applied to young students in universities or engineering schools. The securing of career paths associated with greater labour market flexibility is in line with greater mobility and therefore preaches for the setting-up of new firms for good reasons. On the other hand, creation costs are higher in economies where unemployment is high: for an individual being forced out of entrepreneurship due to lower than expected levels of activity, finding back a job is harder. So an economy that insufficiently creates jobs (low growth rate) and a dysfunctioning of the labour market (an average duration of unemployment being high) reinforce entrepreneurship motivated by negative reasons and especially discourage entrepreneurs motivated by positive ones. Consequently the proportion in the population of new entrepreneurs driven by reasons of necessity is all the more important that the unemployment rate is high. The two motives are thus not independent. In Europe, Wennekers (2006) has shown that there is a negative relationship between the unemployment rate and the total intensity of entrepreneurial countries ("*push*" and "*pull*" effects).The French economy unfortunately is in a situation where the "*push*" effects (characterized by constrained motives) dominate, resulting in a global entrepreneurial intensity that is rather low. The prior occupation of new entrepreneurs illustrates our point.

Table 1: Distribution of new entrepreneurs according to their prior activity

Previous activity before the setting-up of the firm	*1994*	*1998*	*2002*	*2006*	*2010*
Salaried or entrepreneur	*42,2*	*50,3*	*53,8*	*51*	*61**
Unemployed	*43,8*	*34,8*	*32,8*	*40*	*33*
Without activity	*14,0*	*14,9*	*13,4*	*9*	*6*
Total	*100,0*	*100,0*	*100,0*	*100,0*	*100,0*

** New self-employed status (auto-entrepreneur since 2009)*

Source: INSEE (surveys Sine -Système d'informations sur les nouvelles entreprises- proper elaboration)

The proportion of unemployed people in the population of new entrepreneurs (new-firms startups/taking-overs) is about 2.5 to 3.5 times higher than the unemployment rate. Although we can see recent improvements, the share of unemployed people in the population of new entrepreneurs is big[8]. Entrepreneurial intensity is four times higher in the unemployed population in comparison to the active population and this proportion doubled between 1985 and 1994, the unemployment rate being particularly high in France the first six months of 1994 following the 1993 crisis. This reflects the effect of unemployment with decreasing opportunity costs to undertake during periods of unemployment and also less incentive for employees to engage in entrepreneurial adventure in times of crisis. "*Firms started by these "unemployed entrepreneurs" are typically started with zero employee but they eventually grow, create jobs, and crowd out small incumbent businesses*" (Hombert et al., 2014).

From 2009 onwards the effect of the new self-employment status ("*auto-entrepreneur*") can be observed; it appears primarily as an additional activity of individuals already active, thus increasing the share of individuals previously active in the global population. In recent research Aubry et al. (2015) show using quarterly regional data for the period 2000-2011, that, at the national level, a long-term relationship between unemployment and new-firms startups is to be found: an increase in the unemployment rate translates into an increased number of startups. It is the refugee effect (that is to say the "*self-employment of the last resort*") that dominates in the French case. Favouring the educational level of new entrepreneurs, thus developing quality in entrepreneurship is one way to support the development of entrepreneurship for good reasons.

IV) Improving the Institutional and Educational Environment: the Crucial Importance of Human Capital

Building a more entrepreneurial society appears as a key challenge for French society where the brakes to the creation of technological new-firms startups are strong[9]. How to encourage students or qualified and experimented individuals to set-up for good reasons (that is to say to want to develop their innovative ideas)? Lack of entrepreneurial spirit in the European and French cases causes the lack of appropriate financing structures. The need to create a more favourable social climate for entrepreneurship not only requires a change of mindset but also requires to improve the managerial skills of European and to eliminate obstacles to the setting-up, taking over and development of firms.

In France new innovative enterprises suffer from a higher credit rationing than other young companies (Bonnet et al., 2006). The young talents' startups (currently about 2000 in France financed, half by seed capital and the rest by investment capital) have difficulties in obtaining bank loans because of the risk and the information asymmetry attached to the innovative company. We also note that other means of financing, -venture capital and business angels- are still far below the USA standard and to a lesser extent the British Standard (CAS, 2011). Fink notes "*It would need a French or European plan to help start-ups to grow. Otherwise, they are bought by companies, often foreign, and do not stay in France*"[10].

According to Audretsch (2008) it is necessary to encourage policies that enable the creation and commercialization of knowledge. The entrepreneurial policy should include potential entrepreneurs: "*This suggests that the entrepreneurial policy being more oriented about the process of change [than policies towards small businesses]... the entrepreneurial policy also has a greater sensitivity to context and conditions that make the process of decision-making of potential entrepreneurs and entrepreneurs*" (Audretsch, 2003, p, 47). It takes more university spin-offs which require greater cooperation between schools of

entrepreneurs and academic scientific and technical departments. To encourage corporate behavior in universities and schools, we must develop the university-businesses networks[11], build management capabilities, enable nurseries, incubators and technology parks and develop venture capital (Siegel and Wright, 2015). For young people it is important to override the inhibitions that exist between the perception of the entrepreneurial state and the actual acting out to undertake. One of the most simple and relevant ways is through education[12]. Studies from the Kauffman center[13] show that small businesses that employ students with a degree in entrepreneurship realize higher revenues and experience greater jobs growth than others. Moreover these graduates are more likely to have founded, or work in, high-technology companies and they are more involved in research and development and developing new products.

Recent studies (Van Praag and al., 2013, Van Praag and Van Der Sluis, 2006) show that economic training returns are higher for entrepreneurs than for individuals who choose to work as employees.

Table 2: Effect of a supplementary education year on the average increase of earnings according to the future status of the student*

	Studies Van Praag (2006, 2013)
Entrepreneur	14,8%
Salaried	10,8%

*It measures the average increase in hourly earnings of individuals as percentage following an extra year of study according to the fact they become entrepreneurs or wage earners.

The increase in income following an additional year is higher by 37% for entrepreneurs than for employees. How is this to be interpreted? Lazear (2005) showed that students who will become entrepreneurs have a strategy of diversifying their education. An extra year may be an opportunity for them to educate themselves, for example in management, training which will be directly useful in their future entrepreneurial work. The additional year is then more profitable since it fills the skills gap of the future entrepreneur.

Another explanation is to consider that the knowledge acquired during the extra year requires some autonomy to be implemented. Working in his/her own business is just a way to have this autonomy and thus allows the most efficient use of his/her human capital. The additional year is more profitable because the acquired information is more easily implemented as an entrepreneur.

Theoretically, entrepreneurs exercising their business activity have more freedom to optimize their educational decisions. Indeed, they can decide how to organize their education so that it brings them a maximum productive effect by filling gaps and they are not constrained by the rules of their superiors. What is clear is that they often have little time to devote to training. Also recognizing the positive role of entrepreneurship on competition and on the dissemination of innovative ideas, which is widely accepted in the scientific community in economics, then the implications for public policy are clear:

- Students must be given the opportunity to follow diverse courses to enable them to opt more easily for an entrepreneurial career,

- The "*entrepreneurial human capital*" must be developed. This can be increased by raising awareness, education and experience; indeed entrepreneurial training and experience are beneficial and must be developed. Entrepreneurship is not yet open to any student who wants to engage into it: "*The distribution on each territory of Students clusters for Innovation, Transfer and Entrepreneurship* (PEPITE, "*Pôles Etudiants Pour l'Innovation, le Transfert et l'Entrepreneuriat*"), *involving representatives of the territorial ecosystem, should not only provide young people with the possibility to follow an entrepreneurial path in higher*

education, but also to improve the recognition and support for entrepreneurial projects led by students and graduates".

- More educated people must be encouraged to consider an entrepreneurial career - too highly educated individuals prefer to work in the public service or in large companies, including large multinationals-[14]. It may be noted that "*Grandes écoles*"[15] are making significant reforms to integrate entrepreneurship into their curriculum and their tools. For example, Polytechnic launched "*A very ambitious entrepreneurship program, which is to bring together in one place all activities related to business creation: prototyping, entrepreneurship education, an incubator, and especially an accelerator on the Y Combinator model of San Francisco, but also a place of exchange with the community of risk capital*".

- Education among entrepreneurs must be encouraged, especially education -or raising awareness-which aims to develop the ambition of entrepreneurs (Foidart, Surlemont, 2009).

- Finally, research about knowledge spillovers or organizational learning also suggess that there are continual interactions between the creators, owners and technology consumers that accelerate wealth, breadth of knowledge and new discoveries (Agrawal and Henderson, 2002). Also, in an objective to circumvent too technological or too conceptualized developments, the lean startup method can promote the development of products in direct contact with the market by an iterative process, building products or services to meet the needs of early customers. It is a mean that insures a permanent test of the prototype, reduces market risks and save the initial funds (Ries, 2011).

V) Developing Innovative Entrepreneurial Ecosystems: Integrating the Entrepreneurial Culture in the Societal Fabric

Venkataraman (2004) has conceptualized the development of performing regional systems of innovation in which the social status attached to the entrepreneur play positively in attracting talents and needed resources to develop ambitious ventures. In this ecosystem entrepreneurial culture is widespread, risk-taking is accepted as well as entrepreneurial failure at the social level. Emergence of venture capital appears naturally; the combination of venture capital is done with new and brilliant ideas, which are found primarily in research institutions. Yet in the first stage of development safety nets should be established to consider entrepreneurship as an opportunity rather than a risk. If we adopt an approach based on the human capital of the individual, even if he/she fails, entrepreneurship is always the guarantee of an extremely rewarding experience[16]. Often innovation results from the combination of knowledge from various research specialties. Meetings of science students with students of humanities, students of engineering schools with researchers could help to facilitate "*cross-fertilization*" i.e. individuals spillover effects[17].

Innovation lies in responding to real needs that can transit through the methods and practices of the innovative firm in the sense that only the firm and the sanction of the market allow to identify all marketing and technical requirements of a project. The crucial decision to develop new ideas for new markets also requires the use of specific financial resources that should be endorsed and promoted through networks of Business Angels who must also play the role of mentor.

Although according to Deffains-Crapsky and Klein (2015) these networks are poorly developed in France, but also in Europe, compared to the USA[18], there has been recently a development of investment operations in seed funds. According to Thesmar in (Chertok and al., 2009, comments of David Thesmar, p.83 and following) one explanation is that venture capital investment is not always profitable in Europe. In reality, there are wide disparities in terms of returns from a variety of funds. In the USA some standards funds are exclusive, they pull up profitability. These are usually funds that are the most important investors in

American universities and therefore have privileged access to R & D that is produced there (Lerner et al., 2008). It is also necessary to take into account the size of the USA market that allows the development of successful companies more likely to draw up profitability than in France or in other European countries.

The positive effects of academic spin-offs creations on the reference territory are recognized as very important (Shane, 2004, Vincett 2010). "*Universities wishing to stress economic and regional development (as many public universities might do) should focus on start-up creations since these companies can potentially create jobs in the local region or state"* (Siegel, 2013, p. 131). Fritsch (2014) recognizes that universities are important, particularly in the long term for regional innovation systems[19]. They allow to understand the emergence of new innovative enterprises. The creations of new companies generate significant positive externalities, such as information on sustainability concepts and products, and jobs creation. The USA keeps an advance in this area with more than 20,000 innovative companies representing 1.3 million jobs in Silicon Valley.

The success of this territory is mainly due to the proximity of Stanford University and communication between individuals that facilitates the transmission of knowledge among people, firms and localized industry. Gilson (1999) notes that because of weak non-competition clauses, an active labor market has developed between the territory of enterprises according to the system of open innovation. Thus, there are multiple opportunities to change jobs and enhance on-site experience in other companies of the territory. According to Saxenian (2004, p.36): "*These networks defy sectoral barriers: individuals move easily from semiconductor to disk drive firms or from computer to network makers. They move from established firms to start-ups (or vice versa) and even to market research or consulting firms, and from consulting firms back into start-ups. And they continue to meet at trade shows, industry conferences, and the scores of seminars, talks, and social activities organized by local business organizations and trade associations. In these forums, relationships are easily formed and maintained, technical and market information is exchanged, business contacts are established, and new enterprises are conceived. This decentralized and fluid environment also promotes the diffusion of intangible technological capabilities and understandings*". Silicon Valley attracts a large number of young European and Asian entrepreneurs making it the first global entrepreneurial attractiveness area[20]. Thus more than 60,000 French people live and work in Silicon Valley. Note that there is also a reseeding to countries of origin. According to Saxenian (2006), the technology of creating "*startup*" has been transmitted from engineers immigrants from the Silicon Valley to emerging regions such as China, India, Taiwan and Israel.

The creation of a new business usually has a net positive effect in the long term ; on job creation, it is not immediate (Dejardin and Fritsch, 2011). The most important positive effects on growth and jobs creation are subject to a period of 5 or 6 years which may even reach 10 years. "*The employment effects of new business formation will probably be rather positive in high productivity regions with high-quality entries, abundant resources and a well-functioning innovation system. They will be much smaller or may even be negative in low productivity regions with low-quality entries, scarcity of relevant resources and an inefficient innovation system*" (Fritsch, 2008, p.5). What Fritsch claims is that the long-term positive effects may exist and may be associated with a long term "*Schumpeter*" effect that appears only in the high-productivity regions.

In most French regions, entrepreneurship is motivated primarily by the desire to create one's own job and avoid unemployment, and this has consequences for the growth potential of these new businesses. The Île-de-France region is an exception since the "*Schumpeter*" effect prevails in the long term: increasing the number of startups results in a decrease in the unemployment rate (Aubry et al., 2015). The innovative power of this region and its ability to

promote new technologies are transcribed in a high rate of new-firms startups. Some of these new firms will become high-growth firms that will create jobs and contribute to the reduction of regional unemployment. The Île-de-France region is a leader in the world since it appears to be the 6th largest world center of research and development after Tokyo, California, Osaka and New York and London, and ahead of Baden-Württemberg and Bavaria. It accounts for over 18% of the French population but still contributes over 30% to the GDP of France. These results are important since long-term relationships can guide the implementation of appropriate economic policies. They emphasize the importance of encouraging and "*mentoring*" new-firms startups for the right reasons, i.e. the opportunity motives.

Conclusion

Although according to Fritsch it is not possible to replicate the Silicon Valley model, the establishment of technology transfer offices, incubators and university science parks responds to the desire to speed up the technological and innovative spillovers in the local area. Yet the market remains the essential condition for the viability of the firm. Academic spin-offs not only bring new technologies to the market, but they also contribute to the spread of knowledge and innovation and benefit to the whole society for which it is a real contribution to welfare, these new ventures often exploring new and creative ways in important concerns[21]. Moreover it is often the only means to transfer the high contents of tacit knowledge to the market. Because unemployment is an important determinant of the increase in the probability for an individual to become an entrepreneur in various European countries -Foti and Vivarelli (1994) for Italy, Ritsilä and Tervo (2002) for Finland and Abdesselam and al, (2004, 2014) for France-, these countries are deprived of the incentive to create for good reasons and so we can naturally expect that most of these new companies do not reflect strong growth potential. That is why Shane (2009) criticizes general policies to increase entrepreneurship: "*By eliminating incentives to create these low probability companies, policy makers can improve the average performance of new businesses… The important thing is to "pick winners" that are very often dispersed into the large population of new entrepreneurs*". According to a recent study (Bonnet et al., 2015), a small number of new businesses in France (about 10%) is the source of approximately 50% of permanent jobs created six years later. The promotion of an "*entrepreneurial capital*", that is to say people who can bring innovative and ambitious projects that generate strong growth should be developed in areas related to technological skills recognized in different regions. These entrepreneurs will be the vectors of the creation of new jobs, particularly jobs that will partly replace "*out of necessity*" entrepreneurship.

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[1] Already Erkki Liikanen -Member of the European Commission responsible for enterprise and information-society, wrote in 2003 "Europe Suffers from an entrepreneurship deficit in comparison to the USA". According to the Sapir report (An Agenda for a Growing Europe, 2004), entrepreneurship and especially innovative company creation appeared as an important means of implementing the Lisbon Strategy (2000) to strengthen the innovation and growth in Europe and to build "the most competitive and dynamic knowledge-driven economy by 2010".

[2] He also highlights the concentration of resources in the economy of knowledge, support for innovative firms, support for employees who leave their jobs and increasing competition in the market for goods and services.

[3] Holder Liliane Bettencourt - technological innovation chair at the Collège de France, first winner (with Ester Duflo and François Pierrot) of the Innovation Medal of CNRS, shared 27 April 2011.

[4] Leibenstein (1968) provides a useful description of these capacities by listing the different roles the entrepreneur exercises (Amit, Glosten, Muller, 1990). He is the one who connects different markets (buyers and sellers) across different geographical areas. He is a gap filler in providing, for example, private information for which there is no market, an input completer when he gathers all the resources to produce and market a product. Finally "he creates and is responsible for time-binding, implicit or explicit contractual arrangements or input-transforming organizational structures".

[5] GEM studies also point out the importance of the taxation and social benefit attached to the employment status in comparison with the independent status. In the case of France this regime was not very not very favorable to entrepreneurship till the new legislation on the "autoentrepreneurs" appeared at the beginning of 2009. Success was instant: over 600 000 auto-entrepreneurs got registered in 2009 and 2010. The self-creation of his/her activity has become an important intention of work for youth. It also unfortunately often stems from the lack of employment opportunities in existing businesses. This status affects more than 900,000 people in August 2013 - although for a large part of these new entrepreneurs it is more a complement of income related to paid employment or a pension supplement (less than 50 % are economically active and declare a positive turnover)-.

[6] The sunk cost is a notion of industrial organization that expresses the fact that certain investments, once they are made, lose any residual value if the object of investment is not used for what it was designed. By extending this concept to human capital, we show that certain educations (labeled "Grandes Écoles", see below) do not encourage risk-taking on the part of graduates because of sunk cost if graduates deviate from their classical trajectory of career.

[7] An entrepreneurial failure does not necessarily conduct to bankruptcy –it is rather the exception-. It is just the idea that some firms don't give the expected returns and that the entrepreneur has to come back to a wage position.

[8] These results should also be qualified by the economic conditions and developments of aid packages to unemployed persons/company buyers. For the 1994 Sine investigation, the crisis of 1993 must be taken into account (-1% GDP), and for the 1998 Sine investigation, good conditions and therefore stronger job opportunities in the labor market must be taken into account. In fact we see that if schemes aiming at favoring the creation of businesses by unemployed people increase the number of assisted companies, they have less effect on the number of unemployed people starting their company –who in most cases would have done so anyway-. Transiting through an unemployment position may a strategy but it is not a dominant one. The establishment of the PARE (Assistance Plan to Return to Employment) in 2001, [benefiting from the postponement of entitlements to unemployment benefits in case of failure within 3 years and complementing one's monthly income as a new entrepreneur up to one's rights to unemployment benefit], however, prompted a greater number of unemployed people to create (Hombert et al., 2014).

[9] Things are changing though with a recent effort by the government for the creation of innovative companies and the research tax credit "crédit d'impôt recherche" that makes "France one of the countries that supports the most their innovative companies", Distinguin S., *La Croix*, 6 janvier, 2016.

[10] France has developed the *French Tech* label. It refers to all players in the ecosystem of French startups, mostly in the numeric field. It is also an innovative public policy through the *French Tech* Initiative supporting the growth of startups.

[11] Cases studies and other interactive educational methods are underutilized so is the involvement of business executives into the learning process.
[12] Hetzel's report about the university-jobs link prescribes sensitizing students to new-firms startups. Les Echos, mercredi 25 octobre 2006, p.2.
[13] Private foundation that promote entrepreneurship and entrepreneurial education in the USA: "We focus our grant making and operations on two areas — educational achievement and entrepreneurial success — which our founder, Ewing Kauffman, believed were critical in developing self-sufficient people and a vibrant economy and society".
[14] http://www.capital.fr/carriere-management/actualites/critiquee-l-ecole-polytechnique-a-deja-entame-sa-mutation-1047718#moGToUgImybV5fu5.99
[15] Extract from "*Grandes Ecoles, la fin d'une exception française"*, Thomas Lebègue and Emmanuelle Walter - Calmann Lévy, 2008-. A true "Grande École" is independent from university, selects on entry via post-baccalaureate or post-preparatory school exams and delivers a diploma (master) of a baccalaureate +5 acknowledged by the State. Engineering schools must be certified by the Commission of Engineers Titles. They are majority: there are some 224". "Grandes Ecoles" train engineers, managers and executives, researchers-teachers, high civil servants. If the Conference of Grandes Ecoles numbers 236 members (among them 12 foreign schools), the higher education ministry estimates there are 431 "Grandes Écoles" (engineering schools, business schools, "les écoles normales supérieures", but also veterinary schools …)". Among them are found the "très Grandes Écoles", the ones which train the future senior executives of the State and the big firms. They come in particular from "Ecole nationale d'administration (Ena), Hautes études commerciales (HEC), Ecole normale supérieure de la rue d'Ulm (ENS Ulm), Ecole polytechnique (X)"… Courses preparatory to "Grandes Écoles" are the corner stone of selective education in France. They are organized within secondary schools and had in 2007-2008, 77 600 pupils.
[16] We must of course mentor young people and enable them to make measured bets that do not penalize them in case of failure.
[17] Report on the promotion of research, General Inspectorate of the Administration of National Education and Research, (Rapport sur la valorisation de la recherche, Inspection générale de l'administration de l'éducation nationale et de la recherche), January 2007).
[18] "In 2010 there were around 75,000 BAs and 391 BANs in Europe, compared to 259,480 BAs and 340 angels groups in the U.S. (EBAN, 2010). Total BA investments were €62.5 million in France, €426 million in Europe, and $20.1 billion in the U.S".
The Silicon Valley Bank owns warrants in 1625 companies and has done business with 10 of thousands of startups including Cisco System Inc., Twitter Inc., and Uber inc. in their infancies. According to Gregory Becker his president and chief executive, "It is a whole ecosystem we are building", TECH'S HOMETOWN BANK: startup boom and tight relationships fuel Silicon Valley loan surge, but risk loom, *The Wall Street Journal*, Monday, December 7, 2015.
[19] "Regional innovation policy in Germany", conference, organized by university of Namur on the invitation of his excellence M. Eckart Cuntz, Ambassador of Germany in Belgium, jeudi 9 octobre 2014.
[20] Dublin appears as a place of importance in Europe where most of the leaders of the Silicon Valley have concentrated their European headquarters.
[21] "The green era is giving birth to a broad and bewildering array of new companies with big ambitions. If fact, many promising clean-energy startups are hitting the market with products and services that could radically alter how we think of, and consume power". http://www.bloomberg.com/ss/09/07/0714_sustainable_planet/1.htm.