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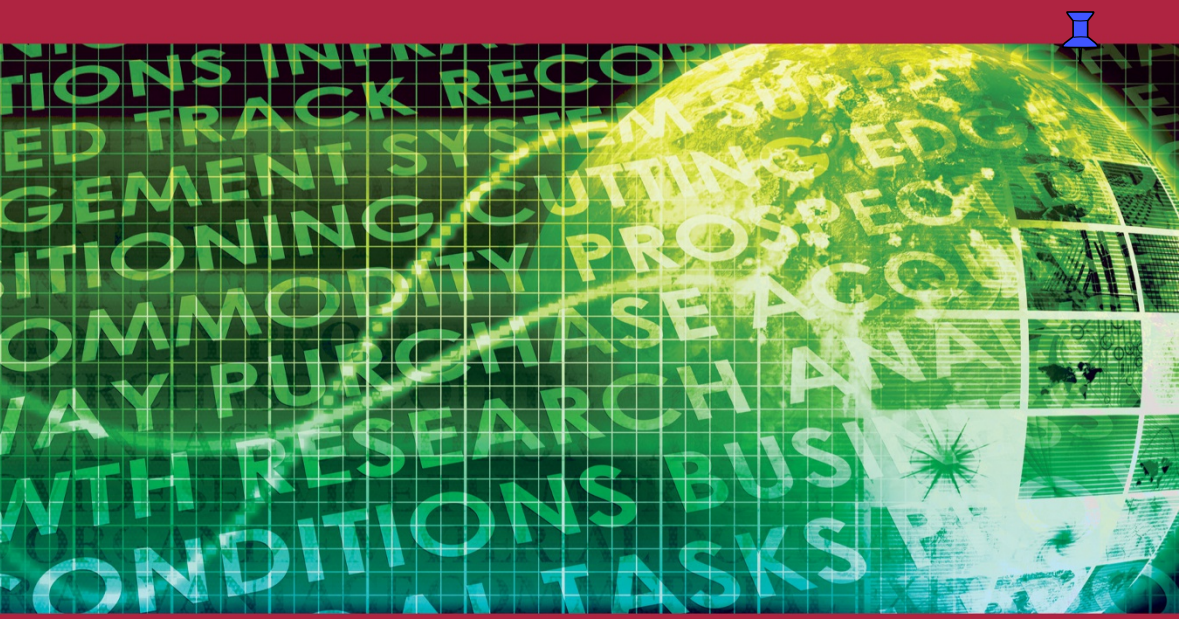

Volume 30

Entrepreneurship and Development

Realities and Future Prospects

Sonia Ben Slimane

Hatem M'henni

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Contents

Foreword

This book celebrates a special figure, that of the entrepreneur-innovator. It looks for his/her roots in economic thought, his/her symbiotic link with development. It examines the different ways of conceiving the role of entrepreneurship in the most modern conceptions of economic growth. It is also a work that questions the paradoxical link between entrepreneurship and innovation, as the latter is also called upon to explain economic development, the dynamism of countries, the strength of the creation of new opportunities in the economy. Macroeconomics, endogenous growth theories, industrial economics, firm theories, and even the theories of competitiveness have found it difficult to give a role to the entrepreneur in their models. As economic theory struggled to incorporate innovation, it also had difficulty in incorporating the role of the entrepreneur. Paradoxically, in the work of classic economists like Jean Baptiste Say and Adam Smith, the entrepreneur and the firm are the heroes of the economy. This alone says a lot about the questionable exploratory value of some of our contemporary models, especially when they are applied in developing countries.

Beyond Schumpeter's pioneering work, the firm reappeared as an important actor only after approaches in terms of innovation and learning systems (technological, economic, political) were developed. Even in the work of "heterodox" economists, where the microeconomic dynamic of the firm plays an explanatory role that neoclassical modelling had carefully set aside, the integration of the firm into economic theory is as complex as the phenomenon it attempts to explain. Our authors point to the numerous attempts to integrate entrepreneurship as key actors of economic dynamics in particular in the theories of development. This complete review of the

conceptions of entrepreneurship in different economic analyses and theories is the first quality of the book.

Next, the authors examine the complexity of the relationship between entrepreneurial activity and development, allowing them to introduce a fundamental distinction between "classical" and "innovative" entrepreneurs, although they use a somewhat a different vocabulary. This shows that the entrepreneurial function is a vital component of the process of economic growth, and therefore of history, although here again, the authors use a different vocabulary.

Moreover, the authors highlight the close link between knowledge and entrepreneurship: firms innovate using knowledge flows and produce a dynamic impulse in the economy because of their energy as well as because of their ability to design and disseminate innovations (and thus also knowledge). A close relationship that makes it possible to overcome blockages in the economy by promoting opportunities, but also sometimes just as a response to necessity.

This close link between knowledge and entrepreneurship also indicates the importance of various contexts in which the analysis is carried out. The economy is highly dependent on the use of knowledge, far beyond the "knowledge economy" that international organizations have been insisting in defining and promoting. The authors propose to take into consideration innovative entrepreneurship as a component of the innovation system, to define what the authors call a national system of innovative entrepreneurship, with its local roots, its multiple forms of knowledge transfer between various actors, and its innovation policies. Public policies and institutional ecosystems are presented in these pages in a pedagogical manner. Pedagogy is undoubtedly necessary as the literature indicates not only the complexity of the link between the economy and entrepreneurs, but also the variety of links that entrepreneurs can establish with the State. All these considerations show how difficult it is to measure the contribution of entrepreneurs to a country's innovative capacity. It depends on the society, culture, habits and routines in a given society.

In contrast to the most common discourses that clearly expect (young) entrepreneurs to provide only benefits to the economy, the authors show that business creation is not necessarily associated with increased innovation in

the economy as a whole. The positive or negative outcome is very strongly related to the complexity of development, which is reflected in the terms "developed economy" or "economy in transition".

The analysis proposed by Sonia Ben Slimane and Hatem M'henni shows that entrepreneurship is "embedded" in the social relations built by those economic actors. This explains why: "Entrepreneurship, as a determining element in the economic development of a country, has an aspect that is always unique to it, and therefore depends to a large extent on the behavior of its population towards entrepreneurship" (see section 3.6). Mainstream economists have found it very difficult to accept this "idiosyncratic" aspect, this uniqueness of economic relations, which are also, and perhaps above all, social relations. The analysis of networks has allowed to bring closer these political and sociological considerations to the most common economic analysis. This gap between the findings of the social sciences and humanities and economic analysis is due both to the difficulty of measuring the performance of entrepreneurial activities, and to ideological positioning. This is at least the wager of Hatem M'henni and Sonia Ben Slimane.

The authors use the composite indicators developed by the Global Entrepreneurship Index (GEI) and the Global Innovation Index (GII). These indicators are not direct measures, but they do allow to position different countries relatively to each other and thus allow for comparisons in order to disentangle the complex relationships between innovation, development and entrepreneurship. This is the subject of the second part of this book, which also provides its most original material and its real contribution to the literature. Through a series of statistical tests, the authors review the question of the determinants of entrepreneurship on innovation.

Classical tests, which measure the age, qualification, previous experience and demographic profiles of the population likely to provide future entrepreneurs, to more complex relationships, in an attempt to measure the effects of government programs dedicated to entrepreneurship, the ability to transfer the results of Research and Development (R&D) or differences in cultural and social norms in different countries.

These can be expected relations such as the relationship between a good business climate (and thus the ease of doing business) and innovation (always positive). Other relationships are less obvious, as they are true for developed

economies but not for developing economies. Thus, a policy that encourages entrepreneurship seems to have as much a beneficial effect on business creation as on innovation capacity, but the national context acts differently depending on whether we are talking about developed or emerging countries. While all researchers would recommend government intervention, the authors seem to emphasize that no relation is automatic nor can be taken for granted. Indeed, the implications of this observation are far-reaching: if public policies in favor of entrepreneurship are virtually ineffective in less developed or emerging countries, it would also mean that these policies deserve "a thorough revision to be more effective" (see section 5.4.1).

Similarly, the ability to transfer R&D results positively determines the innovation performance of a developed country, but this is much less the case for emerging countries. These differentiated effects are too easily overlooked. The authors confront the possible implications of this finding. They examine the role and quality of scientific research in these countries, which rarely produces breakthroughs, thus reducing entrepreneurial opportunities; they underline the lack of effective institutions (when they exist) and/or programs dedicated to the transfer of R&D results to economic players. For example, is the fact that R&D results are transferred by R&D researchers not proof of a weak entrepreneurial capacity? We believe this is a courageous investigation because it opposes the rather soothing dominant discourse on technology transfer. In effect, the dominant view praises technology transfers, dissemination and "popularization" of research, and the mobility of researchers from public research to the economic sectors instead of encouraging the R&D in enterprises and the financing of R&D for productive purposes by private capital, as is the case in an efficient economy.

Finally, it should be noted that the authors support the idea that the creation of an "entrepreneurial ecosystem" should always have a strong positive impact on innovation in all countries, regardless of their development. Fostering the innovation ecosystem is much easier said than done. The authors are particularly critical of public policies dedicated exclusively to entrepreneurship. Their conclusions underline the ineffectiveness or total absence of public policies aimed at linking the research sphere with the economic sphere, as well as the absence of programs dedicated at promoting entrepreneurship and creativity. In short,

the low capacity to engage in R&D or in the most innovative activities is closely linked to the lack of:

> [...] policies that facilitate transfer, or encourage the creation of research-based start-ups (*spin-offs*), as for example the creation of intermediating institutional agencies that act as facilitators of knowledge transfer, licensing and advisory services. On the other hand, the State must simultaneously offer direct and indirect incentives, such as targeted grants, specific and adapted funding, tax credits for research and innovation, and many other mechanisms. (see section 6.2)

The work done in this book encourages us to go beyond the framework proposed by the authors. This implies, for example, that even before measuring growth opportunities, we should take socio-economic and anthropological work seriously in order to observe the real conditions that promote the development of enterprises and new institutional frameworks that foster innovation. The authors note the importance of "institutional trust", they point out that the market growth that characterizes emerging economies "does not necessarily guarantee an innovation-oriented level of development or the existence of a genuine long-term strategy to foster innovative entrepreneurship" (see section 6.3). In this way, they underline the political nature of the trust that the elites of a country place in innovative and (also) research activities. This trust is based on what our colleague Roland Waast called a "social pact' in favor of innovation and research, an implicit pact that results from history as well as from the way national institutions are built. Confidence acquired through technological learning enables companies to absorb technologies, and learning is cumulative over time and is based to a large extent on knowledge that is carried collectively in society. The authors' recommendations are along these lines. We can therefore bet that this very useful book will be largely used in future work on the role of innovation in economic development.

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PART 1

Innovative Entrepreneurship and Economic Dynamics

Entrepreneurship and Development: Realities and Future Prospects,
First Edition. Sonia Ben Slimane and Hatem M'henni.

1

Entrepreneurship and Competitiveness in Literature

1.1. Introduction

Although competitiveness is a ubiquitous term in economic research, it remains a complex concept with regards to the specific scope and the scale it addresses, whether for a company, a country or a region. Indeed, at country level, policy-makers who analyze the pillars of the economic competitiveness focus on the specificities of their own industries, while business managers focus on the ability of their respective firms to compete in specific markets (Ferreira *et al.* 2017). But the importance of competitiveness remains historically linked to events that have emerged particularly in the 1970s, in the context of the trade battle between the United States and Japan (Wziatek-Kubiak and Magda 2005), when each country sought to develop new sources of comparative advantage in order to ensure their long-term economic growth.

Several macroeconomic research studies have focused on growth in a dynamic perspective by using the traditional factors that sustain the production function such as labor and capital, particularly by analyzing the localized determinants of attractiveness that favor investment in activities that are sources of comparative advantage.

This has revealed a pattern in some countries to develop specializations in competitive industries requiring greater involvement of the factors of production traditionally available in the country and thus ensuring competitive advantages at the international level (Alexandros and Metaxas 2016). Other

approaches have taken sectoral analysis angles, notably through innovative ecosystems or at the firm level, to analyze market structures, competitive positions, internal processes that promote innovation and the efforts made by players to remain competitive.

The Schumpeterian approach to competitiveness is both original and instructive, in that it integrates competitiveness within the framework of innovation-based entrepreneurial theory. The ability of the business owner to create innovations will affect his economic added value and this results in his competitive advantage. From a dynamic perspective, Schumpeter (1934) links entrepreneurship and growth through the process of "creative destruction". The entrepreneur will seek the innovative opportunities that make a sector competitive (Kirzner 1973). The entrepreneur becomes price competitive by exploiting new production activities, as opportunities for profit.

Further works have explored the relationship between competitiveness and innovation, including the contributions of Porter (1990) on the competitive advantage of nations, in which he suggests that a nation's competitiveness depends on its ability to innovate and to keep up with technological advances. His work laid the foundation of regional economy and development by analyzing the determinants of competitiveness. Porter (1990) suggests that competitiveness is not a national heritage, but rather is created by economic actors. Through his "diamond" model, he explains how firms in a given sector are more competitive than others in national and international markets. To be competitive, companies must constantly improve the productivity of their products, through price and quality, but should at the same time seek out strategic positions through innovation.

In addition, Porter links the determinants of competitiveness to the stage of development of a country, the latter measured by the degree of sophistication of production patterns and by targeting transition towards an economy based on new knowledge creation. He identifies first a *factors-driven stage* of development where countries compete with each other through low-cost and low value-added products. Second, an *efficiency-driven* stage, where countries target efficient production practices in large markets that allow firms to exploit economies of scale. Finally, an *innovation-driven* stage, in which countries invest in innovation in order to reach the technological frontier and knowledge-based position. At this ultimate stage, the economy is a producer of innovation and a source of new knowledge creation and new technologies production (see Figure 1.1).

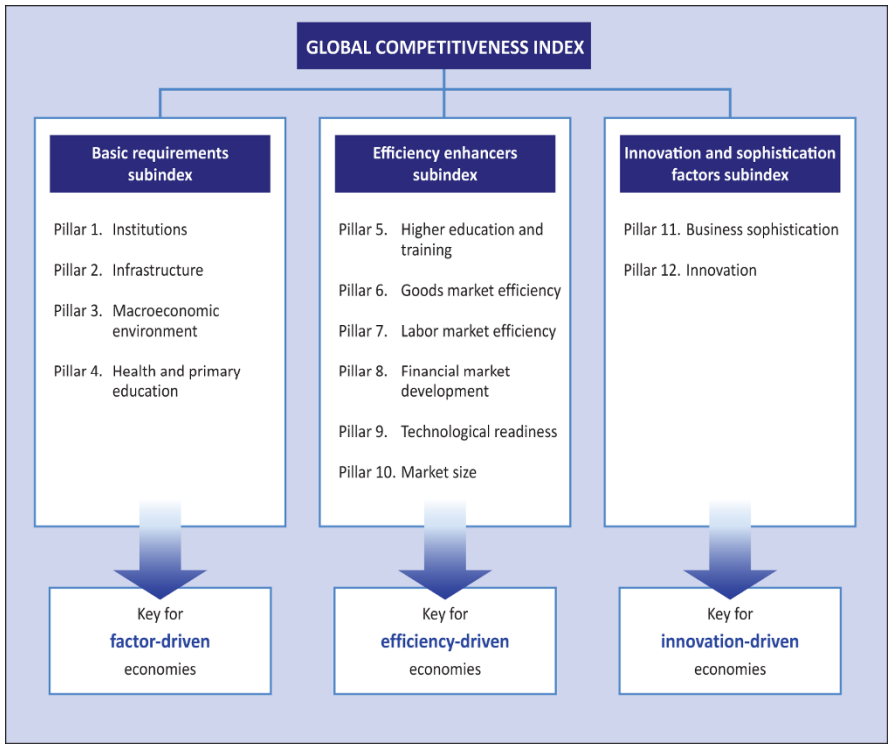

Figure 1.1. *Pillars of competitiveness according to the stage of development of the countries (source: adapted from the "Global competitiveness report 2012–2013")*

Innovation becomes a continuous challenge for the creation and commercialization of new ideas, new knowledge. The interaction between the market conditions and the returns on investment in innovation can contribute to economic development (Ferreira *et al.* 2017).

Entrepreneurship and innovation do not happen by chance, nor are they equitably distributed among industries or even countries. The explanation lies in the "national attributes" (Porter 1998) that might play a crucial role in fostering the entrepreneurial activities allowing marketable innovations to emerge. This means that the structure of the local environment and the existence of local factors and circumstances foster investment and favor the development of new opportunities for innovation. They are therefore the "drivers" of competitiveness. Porter (1998) illustrates this situation by analyzing the example of the wave of foreign entrepreneurs who immigrated

to the United States and who contributed greatly to the country's economic development, relying on the existence of a hospitable and welcoming environment that is ripe for entrepreneurship and innovation.

Nevertheless, Porter's contributions have two main limitations. First, there is a lack of clarification about the place of entrepreneurship and innovation in the competitive system. The second limitation concerns the ambiguity of evident links (direct or indirect) between entrepreneurship, innovation and competitiveness. In a recent contribution, Porter and Stern (2001) have provided new insights on the cross-cutting factors that foster innovation, in particular investment in human capital, the financing of scientific progress, and the level of technological sophistication, as well as the incentive and protection mechanisms for innovation. However, the link between entrepreneurship, innovation and competitiveness remains unclear.

Porter's view of competitiveness is akin nowadays to being incomplete to explain the business environment and thus economic development (Siudek and Zawojska 2014), and has attracted much criticism, notably from Paul Krugman (1994), who stresses the need to distinguish firm-level competitiveness from national competitiveness and to avoid confusing the determinants of performance in the analysis. In this perspective, he emphasizes that the concept of competitiveness is a "dangerous and confusing obsession" if we assess competitiveness of a given country as a firm competing with other firms-countries in a global market.

When a company is no longer competitive in a market, when it cannot improve its performance and therefore cannot pay its employees, suppliers and creditors, it will disappear. This cannot naively be transposed to the case of a country. The latter cannot disappear because it is not performing or solvent. Moreover, countries do not compete with each other as companies do. The companies' customers are not usually their own workers, whereas in the case of a country, goods and services are mostly produced for the local market and the export share represents only a small part of its usage.

Krugman (1994) suggests a more humanistic approach to competitiveness, according to which national competitiveness is based on the economy's ability to transform the results of productive activities to improve income levels, to create employment and to enhance welfare. But, once again, the role of the entrepreneur remains unclear in his approach, particularly in terms of the links

between entrepreneurship and competitiveness of an economy, compared to the emphasis on innovation and its determinants.

The international economic change and technological evolution that have characterized the last 20 years, particularly the rapid and continuous pace of progress and the renewal of technology, result in a new shift of firms' activities and a new mode of development, with an increasing prevalence towards small businesses that contribute the most to economic growth. Since the 1990s, we have witnessed the development of new technology sectors, particularly information technology and telecommunications, that have turned entire industries upside down, redefined some sectors and contributed to the emergence of new sectors. This economic and structural shift has even affected the international positioning of some countries with regard to technological innovation.

This disruptive shift has captured the researchers' interests towards exploring the role of the entrepreneur in economic growth (Wennekers and Thurik 1999) and thus breaking with the established view that has prevailed for a long time, both in innovation and development theories as well as at the country level and the market level. For a long time, large firms have dominated economic theories in the sense that they are the main source of innovation, given their size, their financial strength and experience in coping with risk. The recent changes in economic and business landscapes have fostered academic interests towards exploring the new determinants of growth and innovation and thus the extent to which small innovative structures contribute to economic development.

Nowadays, it is no longer appropriate to differentiate the macroeconomic level from the microeconomic perspective when it comes to analyzing motivations, or even individual behaviors and actions, leading to innovation, in an economic system. The accelerating pace of communication technologies and digitalization lead us to rethink the systemic innovation process including a framework that integrates entrepreneurial behaviors and actions and its interaction with the environment in which entrepreneurial actions evolve.

Several institutional studies have explored the new potential pillars of economic development and growth by combining both microeconomic and macroeconomic factors of development and growth performance. The Global Entrepreneurship Monitor (GEM) follows this perspective and has

the merit of providing an integrative framework which links entrepreneurial behavior and attitudes to macro-economic dimensions.

This framework has fostered further multi-dimensional studies and complementary approaches. Various recent studies have been conducted under this framework including the analysis of the influence of level of development on dynamic entrepreneurship (Wennekers *et al.* 2005), the relationship between entrepreneurial activities and economic change (Gries and Naudé 2010; Acs and Naudé 2013), the analysis of entrepreneurship under a systemic framework at the country level (Acs *et al.* 2014; Autio *et al.* 2014), the links between intrinsic and extrinsic knowledge aspects of entrepreneurship and innovation and competitiveness (Ferreira *et al.* 2017), the regional and local economic level of development and their effects on the type of entrepreneurship (Korez-Vide and Tominc 2017), as well as more systemic approaches of entrepreneurship such as those that have allowed the development of the concept of entrepreneurial ecosystems (Acs *et al.* 2008; Acs *et al.* 2014; Lafuente *et al.* 2016; Neumeyer and Corbett 2017) and studies in management (Autio *et al.* 2014; Autio and Levie 2017) that are targeted at innovation and entrepreneurship as subjects of exploration.

This chapter will discuss the contributions of the various and complementary macroeconomic, economic development and management theories in the way they have approached the links between entrepreneurship, innovation and development. This historical and multidisciplinary review is of critical importance and even instructive to understand the complexity of these links.

1.2. Entrepreneurship, innovation and development: key points of reference

In order to understand the relevant role of entrepreneurship in economic development, it is needful to undertake a complementary approach using, on the one hand, the discipline of management to explore the individual dimension, which refers to the personal aspirations and behaviors of the entrepreneur, his/her objectives and his/her actions in an environment that can be a source of opportunities and, on the other hand, the global perspective, using macroeconomic and economic development analyses, that

entails broader sophisticated and multifold interactions, and includes social, institutional, political and industrial actors.

From an innovation perspective, understanding the entrepreneur's behavior, motivation and actions in the environment in which he/she evolves requires exploring the historical evolvement of the links between the three key concepts of this book: entrepreneurship, innovation and development, under an integrative and complementary approach which uses different angles of analysis, particularly the economic and development theories, which focus on entrepreneurship as well as developments in innovation theory.

We will see that the various approaches have a historical foundation, closely linked to macroeconomic changes, and have sometimes been nurtured by one another and sometimes confronted or completed with a final objective of exploring the potential or evident links between the concepts of entrepreneurship, innovation and economic development. Additional approaches have narrowed the analysis to innovation and its driving forces at the level of the firm, particularly the internal knowledge and learning processes enabling innovation to take place. Finally, recent approaches have focused on entrepreneurial capabilities and have thus provided insights on the relationships between the quality of entrepreneurship and economic development.

1.2.1. *Economic development and entrepreneurship*

Schumpeter, whose works have often been considered as the foundation of the theory of entrepreneurship and innovation, has been inspired by Jean Baptiste Say's works (1846, 1852), who can be considered the "father" of the concept of entrepreneurship in a capitalist world. The outstanding contribution of Jean Baptiste Say is his consideration of the entrepreneur not only through the individual perspective but also with regards to his systemic role and "function", through ensuring links with the socio-economic structures of the economic system, particularly in terms of profit, social recognition and innovation (Boutilier and Tiran 2016).

Jean Baptiste Say, the classical but liberal economist, was an entrepreneur in the cotton sector, and had for his time provided an innovative vision through linking the macroeconomic vision, that of economic development, and a microeconomic vision at the level of the entrepreneur and his motivations. Jean Baptiste Say suggested that the entrepreneur is not

an individual disconnected from the dynamics of economic progress, but rather the driving force of these dynamics (Say 1846) through his contribution to the production function, by giving utility and marketable value to the final products. This key value has been explored and continuously updated, particularly to address innovative entrepreneurship, as a source of added value at both the individual and collective levels.

Later on, in a post-war context, the development theories with various academic streams and visions emerged. The neoclassical stream of literature which considers the entrepreneur in a capitalist economic system has been progressively dropped in favor of an economic growth stream of literature according to which the use of the classical production drivers (work and capital) ensures the general equilibrium. In this perspective, entrepreneurship becomes a peripheral phenomenon in economic growth (Baumol 1990).

Schumpeter (1934) was the founder of economic evolutionism and the dynamics of economic change by placing entrepreneurship and innovation at the heart of his theory. He broke out the economic conformism of general equilibrium by considering growth as a continuous process of technological progress. This progress is fostered by the entrepreneur, who has the ability to combine resources and factors to create business opportunities, source of added value.

Schumpeter also established a symbiotic relationship between innovation and entrepreneurship, where the main and probably unique function of the entrepreneur is innovation. The entrepreneur usually creates new combinations: new products, new markets, new materials and new forms of organizations, through the famous creative destruction process (Schumpeter 1934). Schumpeter therefore started emphasizing the role of small structures in supporting innovation in an economic evolution perspective. However, this link will be nuanced later in his work (Schumpeter 1943) when he associated innovation activity almost exclusively with R&D activities within large companies, distancing it therefore from the entrepreneurial activity.

Schumpeter's work has contributed to understanding the articulation between the concepts of entrepreneurship and innovation and the drivers of innovative entrepreneurial capacity, even though his main contributions on innovation were conducted and illustrated on large firms. It should be noted that, from a contextual point of view, Schumpeter was a witness of the expansion and success of large firms and was a good observer of their ability

to create economic value through the production of goods and thus the way they defend and preserve their market position. He particularly acknowledged their capacity to bear the risks and uncertainties associated with the innovation process (Naudé 2010a) and therefore suggested that, due to the high costs of R&D activity, associated with innovative activity, a threshold of a company size is necessary and even crucial, in order to be able to achieve economies of scale, cost-cutting and thus to obtain a market position and to have the ability to sustain and empower it.

In the same vein, Galbraith (1967) and Williamson (1968) approved these prerequisites and argued that the contribution of large firms to innovation is closely related to their size, the existence of a capitalistic capacity basis and a substantial R&D activity dedicated to innovation, which jointly help in moderating the risk inherent in innovative activity and thus ensure a contribution to economic development.

The neoclassical Baumol (1968) investigated the drivers of economic growth. He first proposed a conceptual model to adjust marginal cost to the price of the product and suggested impersonal relationships between economic stakeholders. In this perspective, he emphasized the role of the imitator in economic advance at the expense of the entrepreneur. Later on, Baumol (1990) took up Schumpeter's work and recognized the relevant role of the entrepreneur in innovation activity and economic development, thanks to his ingenuity and creativity, combined with his ability to seek and accumulate wealth and power. The author also distinguished three categories of entrepreneurs: productive, destructive and unproductive, in order to explain the type and the categories of impacts that could occur on development in a broader perspective.

The particular added value of Baumol's contribution lies above all in considering entrepreneurial innovation as the main source of competitive advantage and that entrepreneurs are essential for developing new businesses, while bringing about new business models and ideas that break with existing skills. In this perspective, he particularly underlined the role of investing in the education system toward developing entrepreneurial capabilities. He also suggested that institutional policies, incentive systems, property rights and access to information, should greatly impact the supply of innovative entrepreneurial ideas, and thus would explain the difference in development levels between countries.

Simultaneously, socio-behavioral approaches have been drawn on Schumpeter's approach to innovation to analyze the innovative role of the entrepreneur. According to Weber (1930), the pioneer of the societal approach of entrepreneurship, the social and cultural circumstances affect entrepreneurial action in specific environmental contexts, specifically where social norms and trust are decisive parts of social capital and can therefore foster entrepreneurial action.

This approach is also supported by Highfield and Smily (1987) who explain that when the economic environment is characterized by high unemployment and low growth rates, social and cultural conditions can foster creativity and entrepreneurship. But considering this aspect cannot solely explain the added value of entrepreneurship for innovation and economic development.

In parallel, new insights have been provided by the economic behavioral view of entrepreneurs mainly carried by Kirzner (1973), who belongs to the neo-Austrian economic school, and who has placed the personality and behavioral dimensions of the entrepreneur, synonymous with what he calls "human action," at the heart of his developments. According to the author, the entrepreneur is a passionate and opportunistic adventurer and a hero of dynamic capitalism. Even if his actions are motivated by irrational and opportunistic grounds, made possible with the lack of perfect knowledge among the market participants, his entire role arises from alertness to unnoticed opportunities and his risk-taking and contributes not only achieving personal profit, but also an overall value. The competitive-entrepreneurial adjustments in the type of products placed on the unbalanced market contribute to improving market failures and ensuring economic welfare. Regarding Schumpeter's work on the dynamic conception of markets, Kirzner criticized him particularly on the role of entrepreneurship as a disrupter of economic equilibrium. The author promotes the entrepreneur's perception of profitable opportunity. He sees the entrepreneur as a creator of information. His alertness to unnoticed knowledge about the market fosters his ability to detect profitable opportunities, and is sustained by a learning process, which in turn is nurtured by the entrepreneur's experience in identifying the needs and profit sources.

Additional studies have explored the drivers of entrepreneurial capability, particularly training and education aspects. According to Schultz (1980), who advocated investing in human capital, experiential learning is important, though the level of education can be crucial for entrepreneurship particularly in understanding the technical dimension of a product as an input of the entrepreneurial capability. Therefore, the entrepreneur is no longer a genius, but rather trained to develop entrepreneurial capability. Leibenstein (1968, 1987) supports this approach and suggests that training, learning and education, considered in a complementary perspective, contribute to the entrepreneurial *input* necessary for growth.

1.2.2. *New theory of economic growth, innovation and entrepreneurship*

For a long time, economic growth was closely associated with the allocation of the factors of production "labor and capital" (Solow 1957). Technological innovation, as an important component of the production system, was not yet considered as central for economic growth. The new theory of endogenous growth has been developed in the context of the 1980s, characterized by stagflation and rising unemployment in the United States, particularly in large firms. This historical event has raised concerns about exploring potential new drivers of economic growth, and academic developments have been undertaken, notably those which explore the role of small firms in economic development, through job creation and the diffusion of innovations.

The theory of endogenous growth establishes a central link between innovation and economic development, by considering innovation as an endogenous driver of growth and human capital as a source of innovation. From a dynamic perspective, knowledge and innovation are not merely intermediate variables but also crucial for growth (Lucas 1988; Romer 1990). The residual factor of technology function, which refers to human capital investment, the skilled employees and R&D activity, is a source of new opportunities for innovation, and thus for long-term growth (Lucas 1988).

Economic growth depends increasingly on possessing technical knowledge rather than on production cost-cutting while using a widely available technology. The appropriate use of knowledge will lead to improving machines, offering new products, reducing costs and increasing

productivity (Romer 1993). In extension to this, investment in knowledge and new skills development enables capitalizing on greater advantages, mainly in a context of openness for developed countries compared to developing countries (Szirmai *et al.* 2011).

The theory of endogenous growth has focused on exploring technological catch-up to explain the difference in growth between countries. It has greatly contributed to our understanding that catch-up processes can be enhanced through openness as a source of broader R&D diffusion, and that foreign direct investment (FDI) is an important channel for the technological catch-up, particularly for the least developed countries (Grossman and Helpman 1991). However, the catch-up process cannot be achieved consistently, since it depends on the availability of local circumstances and mechanisms that enhance the absorption of external knowledge and thus the specific characteristics of each country that enhance or slow down technological catch up.

The theory of endogenous growth has also highlighted the role of human capital as a source of knowledge acquisition which allows taking advantage of externalities (Lucas 1988). Technology as a public good is accessible to everyone, in opposition to human capital which accumulates knowledge and is not free. Human capital is a factor of production, specific to each country, and can thus explain the differences in growth between nations (Lucas 1993). Consequently, the more internal knowledge a firm has, the greater its ability to capture externalities and the more it accumulates new knowledge and contributes to growth. Moreover, endogenous growth theory shows the role of human capital in transforming resources and exploiting technological advances toward a country's prosperity (Romer 1990). The interaction between individual and collective skills contributes to the accumulation of human capital, a source of endogenous growth. Human capital is thus a crucial intermediate variable in the innovation process.

In this context, small structures and SMEs play an important role as agents of change through their innovative activities, which stimulate sectoral dynamics and contribute to creating new jobs (Acs 1992). With regards to entrepreneurship, the theory of endogenous growth did not tackle its potential contribution to growth. Instead, this theory emphasizes the role of political and socio-cultural dimensions in the growth process (Amable and Guellec 1992), in the sense that the firms' innovative capacity depends on the quality of institutional and social dimensions as well as the quality of

government involvement, in particular, through public investment in infrastructure as well as specific resources supporting innovation.

1.2.3. *Complementary insights from industrial economy lenses*

The neoclassical theory of development was challenged with the emergence of industrial economics, particularly Michael Porter's contribution, namely his paper "Competitive advantage of nations" (1990). Porter suggests that comparative advantage closely results from innovation. He distinguishes between invention and innovation in order to show that a firm that invents is not necessarily competitive if it does not know how to commercialize and adapt its inventions to the needs of the market. Innovation can thus arise both from R&D activity in large companies and from a newly created company. Porter places innovation at the heart of competitive advantage. Moreover, he noted that an innovation can result from a new company whose owner has a non-standard background and skills, which even characterize an entrepreneur, but Porter remained unclear regarding the relationship between innovation and entrepreneurship, since he talked about new companies' creations rather than clearly pointing out entrepreneurs.

In his early developments on competitiveness, Porter (1990, 1998) emphasized *national attributes* as drivers of competitiveness, including the investment in resources and infrastructure and the level of skilled labor and knowledge. The cultural dimension, highly associated with a country's socio-political history and shared values, also plays a role in shaping the environment in which a firm operates. All factors, such as the quality of governance, social capacity, technological capacity, modes of competition and evolving organizational structures, nurture and foster each other.

Economic competitiveness is to a large extent based on institutional supply which can explain the differences in development between countries. Governments particularly play a crucial role in setting up the foundations of an economic development, especially in structuring and configuring an environment that triggers innovation activity, including the investment in infrastructure and education to develop entrepreneurial capacity. Economic development becomes a sequential process which differentiates countries and their global position according to the ability of local factors to contribute to a country's innovation and competitiveness, which refer to the drivers of the stages of development (Porter *et al.* 2002).

Porter has in this perspective underlined the relationship between investment in knowledge and economic development. Indeed, the author characterizes three stages of economic development. First, a stage based on the use of traditional factors of production, which characterizes almost the poorest countries. Second, a stage in which an economy invests in the development of a capacity to absorb the externally developed technologies in order to increase its stock of knowledge and develop its innovation capacity. This situation refers to the efficiency factors stage of development. He finally defines an economy based on the creation of knowledge and the development of innovation at the technological frontiers, which refers to the innovation driven stage of development characterizing the most developed countries.

Drawing on these new insights on the stages of development linked to innovation, Fagerberg *et al.* (2010) studied the national innovation capabilities in developing countries, and have demonstrated correlations between the existence of an effective institutional environment and the development of innovation capabilities. The correlation between these two factors does not imply causal relationships. However, innovative capacity can be affected by the historical and geographical factors in each country. Moreover, the innovative capacity, depends not only on local enterprises, but is also fostered by FDI, which is often considered as a source of transfer, namely through alliances, joint ventures and strategic alliances. This is the case, for example, in Singapore, where *reverse* engineering and FDI have been an important source of technology transfer alongside local public policy consisting of huge investments in human capital through education. Finally, a country's stage of development affects the type of innovative activity in developing countries, where imitation, for example, can be considered as innovation, as long as the product is adapted to the local context.

Afterwards, Porter *et al.* (2008) took the analysis of the competitiveness of nations further by analyzing and presenting two levels of competitiveness: macroeconomic and microeconomic. Macroeconomic competitiveness is defined according to two groups of factors: the structural factors consisting of infrastructure, political institutions and human capital and the public policy factors, including monetary and fiscal policies that indirectly affect the productivity of firms (see Figure 1.2).

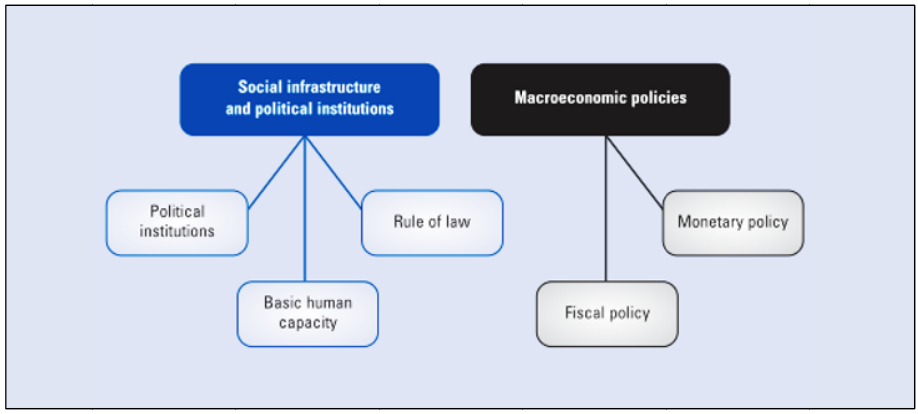

Figure 1.2. *Determinants of macroeconomic competitiveness (source: Porter et al. 2008)*

Microeconomic competitiveness, on the other hand, is based on the degree of sophistication of the company and its strategy, which is affected by the quality of its environment. It also depends on the economic context through which the government is represented by the agencies that facilitate the implementation of the national public policy strategy. Additionally, clusters that reflect the cooperation between the various economic players, including businesses, universities and professional associations, are also part of the microeconomic environment that operates in support of business dynamics (see Figure 1.3).

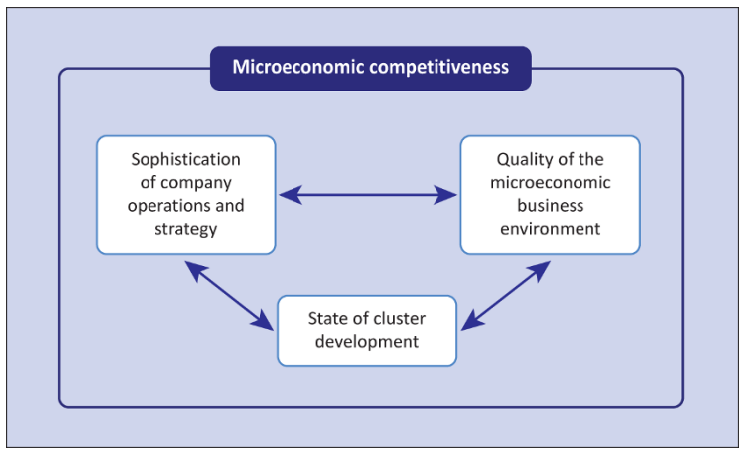

Figure 1.3. *Determinants of microeconomic competitiveness (source: Porter et al. 2008)*

By identifying the components of microeconomic competitiveness, Figure 1.3 reveals the complexity of the forms of collaboration affecting the development of a firm or sector and shows the effects of public policies on microeconomic competitiveness. It also reflects the fragility of microeconomic competitiveness depending on cyclical policy orientations. Moreover, the factors structuring macroeconomic competitiveness are certainly necessary, but not sufficient enough when the country aspires to higher productivity. The role of the government thus remains important particularly in adapting its strategy and tools to change and in supporting innovation, notably through public investment in R&D, education, improvement and modernization of infrastructure, regulatory policies, the development of the capital market and support for the development of technologically-based start-ups.

1.2.4. *Theories of the firm, innovation systems and entrepreneurship*

The context of the 1980s has been characterized by a technological leap combined with a rapid pace and disturbing technological machinery renewal, notably embodied in the ICT revolution, technological modernization, the production of new generations of machinery and equipment, and the shift to higher value-added activities in global value chains. This context has also been accompanied by a growing wave of vertical technological specialization in large technology sectors such as IT, and operated by small firms (Szirmai *et al.* 2011). This radical technological paradigm shift has threatened the survival of existing firms (Nelson and Winter 1982), especially since this paradigm shift is hence based on the knowledge economy and driven by small structures (Acs 1992; Audretsch and Thurik 2001).

The evolutionary theory has been developed in this new disrupting context to explore the survival factors of existing firms and thus to provide new insights on the new drivers of firm's growth in context of innovation being based on the analysis of the drivers of an innovative firm. This develops dynamic capabilities, sources of new knowledge acquisition and new capacity building. The analysis of firms' capabilities therefore implies studying the conception of the firm and its frontiers through analyzing how firms operate and exploring their ability to accumulate new knowledge in a perspective of growth.

This approach, which is centered on the firm and its internal dynamics, reflects the articulation and interactions between knowledge creation, capabilities

and competencies toward developing an innovation capacity. Therefore, knowledge capital accumulation requires substantially investing in R&D, which is not systematic given its cost, one that not all firms would be willing to bear. Moreover, the development of new products requires developing new capabilities or optimizing the combination of knowledge, competences (Ferreira *et al.* 2017). These competences result from a sequential process of acquisition, assimilation and dissemination of new knowledge (Cohen and Levinthal 1989, 1990). They evolve and depend on the context in which they are constructed. These competences are therefore specific to each firm.

Innovative capacity stems from both technological and organizational competences and their combination. The technological dimension refers to partly tacit knowledge, anchored in routines and therefore not easily transferable. The organizational dimension refers to the role of interaction between individuals, the share of knowledge and the learning dynamics that accompany the strengthening of these competences. However, firms do not all have similar competences and do not share similar core knowledge; the latter is crucial in the sense that it affects the future of knowledge acquisition and the nature of new capacity development (Cohen and Levinthal 1990).

Despite the new insights that have been provided by innovative capacity literature, the role of small firms as structural agents of change and their importance in industry in an increasingly evolving environment, requiring flexibility and adaptability (Acs 1992; Ferreira *et al.* 2017), has unfortunately not been clearly tackled. Recently, Acs (1992), who had conducted an analysis on 23 OECD countries over the period 1984–1994, shows that new smart SMEs belonging to innovative sectors affect industrial structure and dynamics, and have contributed to reducing unemployment through to entrepreneurial activity. Unfortunately, the innovation literature has not emphasized the role of the entrepreneur's capabilities, including creativity, experience, motivation and networks to innovation (Lynskey 2004).

Another limitation of the innovation theory to be noticed refers to the context of application. Indeed, most of the studies have been conducted on developed countries and on firms highly involved in R&D activities that are at the frontiers of global knowledge (Szirmai *et al.* 2011). For the case of developing countries, innovation capacity results rather from the absorption of an innovative technology widely disseminated in developed countries, which can be

considered as a full innovation when an adaptation effort is carried out by local firms to the specific need of the country.

However we note the relevant studies that have been conducted on innovation capacities under the technological catch-up perspective, particularly those on innovation capacities in the context of emerging countries, notably Venezuela (Pirela *et al.* 1993), Mexico (Arvanitis and Villaviciencio 1998) and China (Katz 1987; Arvanitis *et al.* 2006; Zhao and Arvanitis 2010). These studies have highlighted the role of technological learning in the development of innovative capacity for the case of emerging countries. In this vein, Katz's (1987) work on Latin America has highly contributed to fostering the exploration of learning as an economic catch-up mechanism, and also for the case of the "Asian dragons", where he emphasized the role of the government in industrial dynamics. More recently, Arvanitis *et al.* (2014) have suggested that the role of firm-based technological learning in economic catch-up perspective needs to be considered from a macroeconomic perspective that goes beyond the firm's boundaries. Indeed, they have raised the question of the role of learning in the innovation processes for emerging countries and have explored the firm's internal and external knowledge interactions applied to the case of Chinese industry. They have narrowed the analysis to exploring cognitive activities and practices inherent to the technological learning process. These activities include, among others, searching for suitable technological alternatives, negotiating technology, adaptation of external technologies, product or process improvement, or the development of new products adapted to the local needs and demands. They also underlined the role of human capital, particularly at the level of upstream steps of the production process, notably in consolidating information research, engineering and R&D services. They suggest that these activities lead firms to establish strong relationships with their environment and thus promote learning by interaction.

The premises of the development of a systemic approach to innovation rely on the contributions of Lundvall (1985) and Freeman (1987). We can find as backgrounds the approaches based on the theory of the firm and the evolutionary theory, including analyses of knowledge accumulation and development and learning. Therefore, the systemic approach of innovation has explored the sources of economic performance under the technological innovation angle by considering technological innovation as an interactive process aiming at adjusting technological supply to market demand (Lundvall 1985). Innovation is not analyzed at a purely individual level but becomes a

process depending on the economic stakeholders and the context that may affect its performance (Amable 2001). In this context, governance and institutional coordination supporting research and innovation are also crucial for innovation performance (Freeman 1987).

At the innovation process level of analysis, the contribution of Lundvall (1992) and Nelson (1993) on national innovation systems (NIS) is particularly relevant. Using the heritage of the evolutionary theory of the firm, they have explored the innovation process from the knowledge accumulation perspective, with regards to its cumulative and interactive characteristics (Fagerberg *et al.* 2010; Acs *et al.* 2016). Applied to the case of some examples of emerging countries, notably the Chinese firms, Zhao and Arvanitis (2010) suggest that the knowledge produced is cumulative, interactive, collective and specific to each firm. These authors have also emphasized the role of human abilities. These competences could become efficient and contribute to innovation as a result of the collective development of new knowledge (Villavicencio and Arvanitis 1994; Arvanitis *et al.* 2014).

The contribution of the regional studies in the framework of the systemic approach to innovation has contributed to highlighting the capacity of innovation in economic dynamics and firm performance (Lundvall 1992; Nelson 1993). The various contributions in the stream of innovation systems converge on the fact that a country's technological performance is a complex, cumulative and uncertain process, in which innovation performance at the microeconomic level depends on the interactions between the actors of the system and the regulatory role of institutions. The difference between countries would be mainly explained by the existence of "key" industrial sectors, the quality of institutions (Edquist and Lundvall 1993), as well as the existence of an education system and universities that support new knowledge creation (Nelson 1988).

However, systemic approaches to innovation have some limitations particularly related to the fuzzy weight of each component of the system and how the system ensures its own development and success. These limits question the universal characteristic of national innovation systems, namely with regards to their components and the mutual reinforced interplay between stakeholders' actions. In support of this, we can notice the inefficiency and lack of performance of national innovation systems in developing countries (Fagerberg *et al.* 2010), which have different development trajectories and an uneven way in terms of global functioning

including the lack of involvement of some components in the system (Cimoli 2000; Arvanitis *et al.* 2009; Arvanitis and M'henni 2010).

Amable (2001) has explored the social systems of innovation, intuitively infused by networks and proximity approaches and naturally integrating the cultural dimension. In order to ensure efficiency in innovation context, he advocated that national institutions have a crucial role in shaping the economy toward innovation and thereby setting up appropriate initiatives and supporting technical change at a national level, even if the interactions are rather localized in a sector or a region. The author therefore suggests delimiting the boundaries of each study system, which even evolves in a more globalized environment.

Regarding entrepreneurship, the national system of innovation theory has been unfortunately criticized for the fact that its level of analysis remains macroeconomic and that has thus implied exploring coordination and communication mechanisms between stakeholders (Autio *et al.* 2014), neglecting the role of the entrepreneur in the innovation dynamic. In this sense, innovation performance implies increasing not only the quantity of economic production but also the nature and quality of what is produced (Szirmai *et al.* 2011). Therefore, the entrepreneur is a central actor in the way he selects opportunities that can be sources of the development of new or better quality products on the market. Unfortunately, the importance of stakeholders' interactions and institutional coordination in the systemic approach to innovation does not leave room for exploring individuals' behaviors and firms' activities in the diffusion of innovation on the market (Zahra and Wright 2011; Acs *et al.* 2016).

This is even more relevant for developing countries, where the benefits of innovation for entrepreneurs depend on the characteristics of the innovation system in which they operate. The better the performance of the innovation system, the more a developing country will be able to exploit global technology, and the faster knowledge flows into the national economy and the faster the economy will undertake the technological upgrading process (Szirmai *et al.* 2011). Conversely, the lower the performance of the innovation system, the weaker it is, and the less the efforts of individual entrepreneurs to contribute to economic development and foster technological catch-up (Goedhuys and Sleuwaegen 2010).

In the specific context of emerging countries, some studies have focused on the analysis of the links between development policies and innovation capacities and have highlighted the role of entrepreneurship in development, particularly the contribution of Pirela (2007) on the case of Venezuela and Arvanitis and Zhao (2010) on China.

The findings of Arvanitis and Zhao's (2010) study on the automotive and electronics sectors in China are relevant on a twofold perspective and contribute to understanding the role of the historical and political dimensions in innovation-based economic development. The authors show first that the innovation system set up and promoted by the Chinese government has influenced the innovation capacity of firms and has thus supported some sectors over others, according to their proximity and relationships with the existing institutional system. They also have showed that rural entrepreneurs who were not at first glance supported by government had seized the opportunity of the availability of growing and unmet demand to mobilize the necessary funds and create market-driven enterprises to progressively position themselves as technology providers, while integrating interactive learning, diversifying sources of technology and maintaining interactive relationships with their clients and suppliers in their business model.

However, this case cannot be duplicated or even generalized to all emerging countries; nevertheless, this example provides information on the necessity to consider two crucial dimensions: first, the historical and cultural dimension are different from one innovation system to another and might explain the innovation process and how the local circumstances can influence the differences in economic development between countries; second, the role of entrepreneurship in supporting this innovative dynamic, in addition to the companies already in place. Entrepreneurship might shape the type and the pace of innovation and sectoral specializations.

This review of the literature has used complementary and even a variety of theoretical approaches from different analytical angles. These complementary enrichments have showed the influence of macroeconomic environment and circumstances in shaping economic development with an innovative component.

Table 1.1 summarizes the main contributions and approaches to development with a specific focus on their views of and level of understanding of the concepts of innovation and entrepreneurship.

Approaches	Entrepreneurship	Innovation	Main contribution
German School (Schumpeter 1934)	x	xxx	The entrepreneur brings innovation to market and contributes to economic development through creative destruction.
Institutional Approach (Baumol 1968, 1990, 1993; Baumol and Storm 2008)	xxx	x	The entrepreneurial offer depends on the institutional offer. The entrepreneur is creative, ingenious and opportunistic. He is motivated by wealth, power and prestige. The entrepreneur exploits unnoticed ideas and plays a role in the functioning of the market. The entrepreneur gives meaning to innovation by bringing innovation to market, by commercializing it. He increases productivity and contributes to consumer welfare.
Human Capital Approach (Leibenstein 1968, 1987; Schultz 1980)	xxx	0	The entrepreneur is a superhero, a rare resource and important for economic development. The function of the entrepreneur is to offer a creative response to X-inefficiency. The level of education contributes to the development of entrepreneurial competences.
Behavioral Approach (Kirzner 1973, 1985)	x	0	The entrepreneur's ability to perceive profitable opportunities. The entrepreneur combines resources to address unmet needs and improve market failures.

Approaches	Entrepreneurship	Innovation	Main contribution
Neoclassical Growth Model (Solow 1970)	0	x	Growth results from the factors of production labor and capital, with the exogenous residue attributed to technological change.
New Endogenous Growth Theory (Lucas 1988; Romer 1990; Aghion and Howitt 1992)	x	xxx	Entrepreneurship and innovation are integrated into growth models. The entrepreneur is part of human capital.
The Industrial Economy (Porter 1990, 1998; Porter *et al.* 2002)	x	xxx	Innovation is at the heart of the national advantage. Innovation can result in new businesses creation. A favorable context (national attributes) fosters innovation and entrepreneurship. A country's development is measured according to position to innovation.
The Evolutionary Approach (Nelson and Winter 1982)	0	xx	The innovative firm (ICT sector) characterizes the technological paradigm shift.
Managerial Approach (Drucker 1985)	xx	xx	Innovation contributes to wealth creation. The entrepreneur is an agent of change. He creates new opportunities.
Systemic Approach to Innovation (SNI) (Freeman 1987; Dosi *et al.* 1988; Lundvall 1992)	0	xx	Innovation is approached from a technological perspective. Role of institutional structures (*top-down* approach).

Approaches	Entrepreneurship	Innovation	Main contribution
New Development Economics (Acs and Audretsch 1990, 1993; Acs 1992; Audretsch and Thurick 2001; Arvanitis *et al.* 2006, 2014; Pirela 2007; Acs *et al.* 2008)	xxx	xx	Economic development refers to the knowledge-based economy supported by small innovative enterprises. Two types of entrepreneurship: necessity entrepreneurship and opportunity entrepreneurship. Entrepreneurial dynamics depend on the institutional context and the level of development of a country.
Development Economics and Entrepreneurship with a Systems Approach (Wennekers *et al.* 2005; Naudé 2013; Acs and Naudé 2013; Acs *et al.* 2014; Autio *et al.* 2014)	xxx	xx	The entrepreneur is a catalyst for change. The entrepreneur assimilates the technology spread. Adoption of new working methods. Role of the government in setting up the appropriate context for innovation and entrepreneurship. The macroeconomic context and individual and behavioral dimensions are linked. The local context affects the micro-process of entrepreneurial innovation.
0 = not mentioned x = indirectly addressed xx = clearly addressed xxx = at the heart of the analysis			

Table 1.1. *Synthesis of theoretical contributions to development on innovation and entrepreneurship*

As shown in Table 1.1, there is agreement on the role of innovation in development. But it is at the sources of innovation that these different approaches diverge or complement each other, particularly with regard to the place of the entrepreneur, whether he is a hero or an opportunist and whether he has an explicit or hidden role in this dynamic.

The different levels of analysis suggest that innovative behavior, be it individual, diffuse within a company or even within an ecosystem, is not independent of the structure and dynamics of the relationships between the different players. From this perspective, the government, through its institutional policies and actions, can regulate the innovation process. The government can also foster innovation in key sectors through investment in infrastructure and human capital, and thus can greatly contribute to economic development.

2

Towards an Integrative Literature of Entrepreneurship

2.1. Introduction

The renewed interest for the entrepreneurial phenomenon reflects a transition from a "managed economy", where the competitive advantage is associated with the prominence of the production factors of capital and unskilled labor, to a new economy, in which not only the knowledge production factor is a source of competitive advantage but also the entrepreneurship capital factor, reflecting the increasing and determinant role of the new and small enterprises in economic development. This situation was described by Audretsch and Thurick (2001) as an entrepreneurial economy. To illustrate this shift, they carried out an analysis on OECD countries from the 2000s onwards, and underlined a growing role of small and new enterprises in economic dynamics. They explain the causes of this evolvement first by globalization, which has become multidimensional on economic and social scales, with an increase of foreign direct investment (FDI), spurred by the existence of low-cost products on the markets and by competition for skilled labor in Eastern Europe and Asia. The second explanation is the digital revolution, which has shifted comparative advantage towards knowledge-based economic activity. A third reason, ironically deriving from technological progress, is the rise of unemployment worldwide, which has not spared the developed countries, and accordingly has prompted fundamental changes in public policies towards supporting new knowledge related to business creation, that are adapted to the changing socio-economic context (Boutilier and Uzunidis 2015) and driving forces of growth.

Entrepreneurship and Development: Realities and Future Prospects,
First Edition. Sonia Ben Slimane and Hatem M'henni.

Conventional wisdom would have predicted that globalization would benefit large firms, in particular because of the additional costs of globalization threatening the survival of small structures and with which foreign investment (FDI) would be the main prerogative of the large companies' activities (Caves 1982). However, the facts show an increasing prominence of small structures and their determinant role in the innovation dynamic and job creation. This phenomenon calls into question an idea that has been shared for a long time, that only large companies are able to create employment, resist and cope with economic fluctuations and contribute to technological performance (Acs 1992; Audretsch 1995).

Assuming that entrepreneurship can contribute in a direct way to development may seem *a priori* very complex, since entrepreneurship has not been at the heart of the development of a full-fledged discipline in economics or even in a particular sub-discipline such as labor economics or industrial economics. The topic of entrepreneurship is multi-disciplinary and multidimensional particularly with regards to social, cognitive and economic aspects (Wennekers and Thurik 1999; Acs and Audretsch 2005). Therefore, it is important to analyze this concept by adopting an integrative approach, which implies considering the various aspects of entrepreneurship, be they behavioral, organizational or macroeconomic. The final aim is to contribute to enriching the debate with complementary views and contributions and thus to better understand its interweaving in the dynamics of development and innovation.

2.2. The complex relationship between entrepreneurship and development

The macroeconomic and sectoral studies focused on the innovation process have not clearly integrated and displayed the potential contribution of entrepreneurial activity to innovation and they additionally present limitations in term of effectiveness particularly when applied to the case of developing countries (Wennekers and Thurik 1999; Szirmai *et al.* 2011). In parallel, the managerial vision of entrepreneurship from a value-creation perspective has almost exclusively focused on the behavioral and cognitive aspects of entrepreneurship. This vision suggests that, to develop a new venture, the entrepreneur must have the willingness and the opportunism (Van Praag 1996), which can be associated with behavior competences, enabling him to seize potential opportunities that meet demand needs, and

which can be a source of individual and collective value. In extension to this perspective, the human capital view considers the entrepreneur as a scarce resource which is necessary for economic development and as having a key role to overcome market inefficiency (Leibenstein 1979).

In the context of an operating economic paradigm shift, and where innovation, entrepreneurship and development have not been simultaneously analyzed enough, the existence of a various range of approaches with different analytical viewpoints has pushed forward the exploration of potential links between these three concepts (Ferreira *et al.* 2017). The concept of entrepreneurship has therefore received renewed interest, as a matter of change and entrepreneurs as agents of change (Audretsch 1995). The idea behind this statement is, first, because entrepreneurship is an activity that is a transversal organizational type in business and that accordingly there is no single organizational form that can be exclusively associated with entrepreneurial activity and, second, because change is relative, meaning that a change affecting one sector may not affect a country or region.

From a contextual point of view, the structural change that has affected industry since the late 1980s demonstrates a major and growing contribution of innovative activity of small firms in many sectors and industrialized countries, including those of the OECD (Wennekers and Thurik 1999; Audretsch and Thurik 2000).

Motivated by the still unclear links between entrepreneurship, innovation and economic growth, Wennekers and Thurik (1999) were interested in exploring the role of entrepreneurship in the process of economic growth through causal links. They reported from the European observatory of SMEs (EIM) that over the period 1988–1998, employment in SMEs in Europe grew faster than in large firms and explained this situation mainly by automation and the increase of technological sophistication that have led to the development of a vertical market for the same product, sourced by small firms.

Furthermore, the contribution of Wennekers and Thurik (1999) has highly contributed in laying the foundations for a multidimensional approach to entrepreneurship. Wennekers and Thurik have hence fostered both analyses linking the level of entrepreneurship in terms of the individual and behavioral dimensions that are difficult to grasp, and those exploring broader determinants of entrepreneurship, such as culture, the institutional

framework, the technological, demographic and the economic forces that affect the way entrepreneurs operate in practice. The authors have also linked entrepreneurship at the individual level to the higher levels of aggregation such as industry and national levels under a growth perspective. The authors proposed a global framework in which they highlighted the dimensions that affect the behavior of the entrepreneur and contribute to his action towards self-accomplishment, performance and growth. These dimensions/conditions are to be considered at different levels, including the individual level, the firm level and the macroeconomic level (see Figure 2.1).

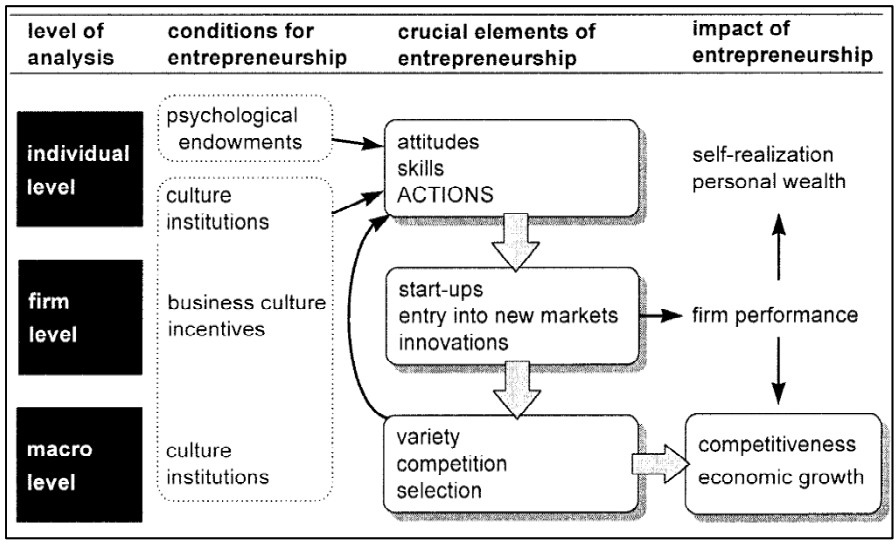

Figure 2.1. *Framework linking entrepreneurship to economic growth (source: (Wennekers and Thurik 1999))*

The originality of the theoretical framework proposed by Wennekers and Thurik results in highlighting three sets of factors linking entrepreneurship to economic growth. This framework is composed first of conditions that refer to the aggregated levels of the environment in which an individual carries out entrepreneurial activities, and second of specific conditions to the considered level of analysis. The framework also specifies the crucial and irreversible conditions that affect entrepreneurial action in terms of impacts. The crucial elements of entrepreneurship feed into each other through a

learning process and towards an enriched outcome that can be observed at the individual, the firm and the macroeconomic levels.

What is also interesting in this framework is the emphasis on the need to link individual actions to global actions, as well as learning by interacting in the dynamics of the model. For example, the mechanisms of competition and selection allow the individuals and businesses to learn from their successes, from their failures and from those of others. At the same time, individuals need to increase their skills and adapt their attitudes to help create a dynamic chain of links. But much is still unknown about these linked processes.

This integrative framework has been defended by Acs and Audretsch (2005). These authors have however emphasized that the various existing contexts and organizational designs involving entrepreneurship do not reflect the real value of the entrepreneurial activity, particularly in terms of innovation and explain that what is new and different for the individual may not be as such for industry or for the market. They finally pointed out that even for a developed country like the United States, only a tiny fraction of new start-ups are truly innovative.

Another limitation that can be highlighted in the Wennekers and Thurik (1999) framework is the lack of links between entrepreneurship and innovation. The authors analyzed entrepreneurship regardless of its type and perspective (innovative or only job-creating). From this point of view, Baumol (1990), who recognizes that the entrepreneurial function is a vital component of the process which leads to economic growth, has suggested in his work on developing countries to differentiate between classical and innovative entrepreneurship, the latter giving value to an innovation when commercializing it. We thus capture here the vision of the entrepreneur's role. Jean Baptiste Say's entrepreneur is an individual who contributes to economic growth and gives utility and value to the marketed product. We note that Wennekers and Thurik (1999) recognized that this framework is a starting point for further development and research avenues on the topic.

Many studies have been conducted from this angle and used the spirit of this framework and complementary approaches to explore the relationship between entrepreneurship and development. Some have explored productive, "innovative" and "non-innovative" entrepreneurial activities (Baumol 1990; Van Praag and Verslot 2007; Shane 2009; Szirmai *et al.* 2011; Marchesnay 2016), others have explored the potential link between entrepreneurial

activity and economic development, or the newness dimension of the entrepreneurial activity, in particular through *new entry,* start-ups or intrapreneurship (Audretsch 1995; Audretsch and Thurik 2001).

2.3. Types of entrepreneurship and development

The neoclassical William. J. Baumol, who has outstanding contributions in bridging theory to economic reality, was among the first economists to bring entrepreneurship back into the body of mainstream economic theory and hence has highly contributed to understanding the economic value of entrepreneurship, and how entrepreneurship fuels change and helps keep an economy dynamic, through allowing the spread and speed of adoption of new technology and ideas on markets.

Baumol (1993) redefined entrepreneurial activity according to novelty and differentiates between the new venture creation and the newness:

– new entry: refers to the figure of the entrepreneur, the founder of a new venture who creates and organizes his activity without necessarily being innovative on the market. The new entry can result from a new start-up or from an existing firm. This definition was later taken up in the Global Entrepreneurship Monitor (GEM) report (Reynolds *et al*. 2000), which qualifies them as "nascent start-ups". The start-ups are often found in industries characterized by an entrepreneurial technology regime which is different from the usual one and with high expected profits (Audretsch 1995). Additionally, willingness and opportunity are the drivers of the new entrepreneurial venture creation (Van Praag 1996), thus emphasizing both the individual and behavioral dimension of the entrepreneur and the "contextual" aspects such as economic and public policies, favoring the detection of opportunities (Audretsch and Thurik 2001);

– "newness": has been the subject of several studies in economics and management and allows for differentiating the entrepreneur (new entry) from the innovative entrepreneur (new venture source of innovation) (Wennekers and Thurik 1999; Audretsch and Thurik 2001). Here we find the Schumpeterian entrepreneur as a source of innovation for the existing market or new technological products (Wennekers and Thurik 1999). The newness may thus come from the adaptation of existing products or technology or from a new radical technology (Lumpkin and Dess 1996).

Keeping with Baumol's developments in defining "new entry" and "newness", Audretsch (1995) emphasizes that, from a methodological point of view, the process of creating a new venture is an important demonstration of change and innovation; however, it should be moderated because of the number and the influence of new business start-ups that differ among sectors and evolve over the years (Audretsch 1995) and because of all types and sizes of companies that contribute in some ways to change and innovation (Audretsch and Thurik 2001).

The publication of the first GEM report in 1999 put forward and fostered the first integrative and multidimensional analyses of entrepreneurship. This annual report combines two complementary approaches, and hence reconciles two visions of entrepreneurship: those focused on entrepreneurial behavior and attitudes of individuals and those related to the national context and its impact on entrepreneurship on the other. This framework has prompted further explorations of the relationships between entrepreneurship, innovation and development (Wennekers and Thurik 1999; Szirmai *et al.* 2011) and highlighted another type of entrepreneurship, the "dynamic" entrepreneurship. Thus, the definition of an entrepreneur becomes broader and includes both the business owner and the self-employed entrepreneur. The entrepreneurship dynamic is assessed according to evolvement of venture creation rates and its relationship with the level of economic development is expressed through a U-shaped curve, according to which as the stage of economy development evolves, the prevalence of "nascent" entrepreneurship and venture creation declines in number (Van Stel *et al.* 2005; Wennekers *et al.* 2005; Acs *et al.* 2008). In other words, dynamic entrepreneurship tends to decline as one moves from one stage of development to another as Porter *et al.* (2002) defined. This U-shaped curve can be explained by a shift from quantitative entrepreneurship (in number) to qualitative entrepreneurship, more intensive in technology (Naudé 2013). When an economy progressively evolves towards a knowledge-based stage, opportunity becomes more difficult to detect and the entrepreneur's willingness to develop his business will depend on the opportunity for profit he could appropriate and the added value he could offer to consumers, given the diversity of supply on the market.

In the spirit of this integrative approach aiming at exploring the links between entrepreneurship, innovation and development, recent studies have underlined that the entrepreneurial dynamic and its innovation added value depend on countries' stages of development. Accordingly, knowledge is

created endogenously and can lead to spillovers. These spillovers imply new sources of opportunities that entrepreneurs can identify and exploit (Acs *et al.* 2005) and can also spur on established firms to innovate using knowledge flows and spillovers. From a dynamic point of view an increase in the stock of knowledge and the knowledge flows have positive effects on product innovations that can result from existing companies as well as from entrepreneurs. However, the impacts of entrepreneurial activity may be reduced when the latter is faced with knowledge filters and obstacles such as regulations, administrative barriers or inappropriate government policies that impede entrepreneurial opportunities and actions.

In the same vein, a typology of entrepreneurship was proposed by Acs and Varga (2005), who use GEM data to analyze entrepreneurial dynamics and to explore potential links with stages of development. In order to explain the disparity in results between high-income and developing countries, they propose two types of entrepreneurship: the "opportunity entrepreneurship" and the "necessity entrepreneurship":

– "opportunity entrepreneurship" refers to an entrepreneur's voluntary nature to run a new venture, a choice based on the perception of the existence of a real opportunity in a given sector that has not yet been exploited and which can contribute to technological change and growth;

– "necessity entrepreneurship" refers to the perception of an entrepreneur whose action is the best available option for employment but not necessarily the preferred because there are no other and better options. This can be the case for economies facing structural change particularly related to technological change. Factory workers find themselves unemployed and the only way for them to survive and maintain a source of revenue is to develop their own business, which does not necessarily have an effect on innovation.

It is widely accepted that the relationship between entrepreneurship and development is positive in high-income countries. Nevertheless, entrepreneurship has relatively high rates in developing countries, compared to high-income countries, regardless of the entrepreneurship motives, but it is negative in middle-income countries, those whose development is "efficiency-driven". Acs *et al*. (2008) explain the latter situation by the fact that individuals seek constant revenue and stable and secure employment rather than being self-employed with less income security. In developed countries, where the development is innovation-driven, individuals move from being apaid employee to entrepreneur by choice in order to increase

self-achievement, rather than by necessity. However, Acs *et al.* (2008) put a limit to the "U" curve because of the trends and results that are not as such effective for some developing or emerging countries; notably for the cases of China and India, they found high rates of opportunity entrepreneurship.

The issue of exploring the relationship between entrepreneurship and development through the U-shaped curve has recently inspired many studies (Szabo and Herman 2012; Ferreira *et al.* 2017; Estrin *et al.* 2018) and has broadened the angles of exploration, notably by integrating the stage of development as a moderating factor in the relationship between entrepreneurship and development. Additional studies have conducted in-depth analyses of the typology of entrepreneurship, be it necessity or opportunity, and linked it to the context of development stages. All these developments have nurtured the debate from a development perspective on the determinants of innovative entrepreneurship.

Szabo and Herman (2012) conducted a study analyzing innovative entrepreneurship for economic development and applied it to European countries and thus have proposed a new typology of entrepreneurship:

– ordinary entrepreneurship, whose main contribution is job creation;

– innovative entrepreneurship is also a source of job creation but is rather motivated by the added value, wealth and a higher growth rate. According to Szabo and Herman (2012), innovative entrepreneurship is expressed by the ratio: number of SMEs introducing a new product or process compared to all SMEs.

In addition to this typology of entrepreneurship, these authors underlined that innovative entrepreneurship is the result of the combination between innovation and entrepreneurship. They introduced the development stage as an explanatory factor for the dominant type of entrepreneurship in a country or a region. Thus they found that in Central and Eastern European countries, those in the transition stage towards innovation (efficiency driven), innovative entrepreneurship is more important than in countries whose economies are based on innovation and the creation of knowledge (innovation driven stage). They explain these results by the fact that, as a country's level of development increases, the necessity as the main motivator for entrepreneurship decreases progressively towards improvement opportunity motives. The innovativeness of entrepreneurs increases with the increase of economic development stages

suggesting a clear link between innovation performance and economic development stages.

These results are in line with Ferreira *et al.*'s (2017) study, which used data from both the Global Competitive Index (GCI) at the macroeconomic level and the GEM at the individual level, on an average of 60 countries at different stages of development, over the 2009 and 2013 period. Their study aimed at exploring the relationships between entrepreneurial activity, innovation and competitiveness. Their results show that the stage of development of a given country has an influence on two factors. First, on the importance given to the characteristics of entrepreneurial activity, including the profile of the entrepreneur, particularly his or her intrinsic and extrinsic knowledge. Second, on innovation, which is not completely independent of entrepreneurial activity and competitiveness, and thus on economic growth.

The review of the entrepreneurship typology has contributed to a better understanding of the contribution of entrepreneurship as a driver of innovation according to a country's stage of development. The first finding that emerges is that entrepreneurship plays a decisive role in growth and economic development, whether it is driven by necessity or by opportunity motive. Particularly, when it comes to analyzing its contribution to an economy at the innovation driven stage, studies support that opportunity entrepreneurship increases at the expense of necessity entrepreneurship.

The second finding is that the studies' outcomes cannot be generalized particularly for the case of developing countries, and can be biased according to the measures used. Indeed, the U-shaped curve describes the relationship between entrepreneurship and development; however, development is measured by Gross National Product (GNP), which does not take into account the innovative dimension.

A third finding refers to how classical entrepreneurship and innovative entrepreneurship are sources of innovation. Indeed, Autio *et al.* (2014) show that only 30% of new start-ups are innovative, which means that not all entrepreneurs are innovative. Finally, the analysis of the "U"-shaped curve reveals disparities between countries and calls for further developments on the determinants of innovative entrepreneurship by taking into account the context of each country, particularly for certain emerging countries, such as India and China, where opportunity entrepreneurship is at very high rates (Acs and Varga 2005).

2.4. Towards a new vision of the entrepreneur in his environment?

Stam and Van Stel (2009) have conducted a study which analyzes the relationship between entrepreneurship and development, focusing on the impact of the local determinants on this relationship. Their results show differences within the group of emerging countries, such as China, dominated by a capitalistic model with little control and where the local culture fosters entrepreneurial willingness, whereas Russia is characterized by a model of capitalism "without capitalism", and where influential groups are dominating and social culture is rather oriented towards risk aversion. The authors thus suggest that in some transition countries entrepreneurship is fostered by the intensity of human relationships and the effectiveness of networks.

Local context and social culture could thus be one of the crucial factors of entrepreneurship development and can explain in a given country the propensity of entrepreneurship type, be it necessity or opportunity. Thus, the diversity of contextual and local factors has fostered more studies and theoretical developments that contrast with the approach of national innovation systems and pushing toward a multidimensional approach targeting at the same time entrepreneurship and innovation, or what is called the innovative entrepreneurial systems.

3

The Theoretical Emergence of an Innovative National Entrepreneurship System

3.1. Introduction

The driving idea of moving from an exploration of a National Innovation System (NIS) to a National Entrepreneurship System (NES) is based on an unsatisfactory economic reality compared to the promises displayed and demonstrated in theory when applied to the case of developing countries. Indeed, several authors have analyzed national entrepreneurship systems and their contribution to development, innovation and entrepreneurship in developing countries but have not always had the expected results of those for developed ones (Acs and Varga 2005; Wennekers *et al.* 2005; Naudé 2010a; Szirmai *et al.* 2011). Evidence shows that the economic impact of research and innovation efforts is low (Naudé 2010a; Bogliacino *et al.* 2012) and very few innovative firms are known and recognized as such at the international level. This can be explained by the fact that existing innovation policies give little room to entrepreneurship and those promoting entrepreneurship leave little room for innovation (Naudé 2010b; Szirmai *et al.* 2011).

The 2000s had been characterized by the development of technology or science parks (technoparks), considered a *sine qua non* condition to allow innovative companies to grow "naturally" (Ben Youssef *et al.* 2013) and thus stimulate the NIS. Moreover, the creation of business incubators and setting up programs dedicated to the scientific new venture creation deriving

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from higher education graduates would *a priori* solve the problem of youth unemployment. The underlying idea, which has been the driving force behind their implementation, particularly in developing countries, is that innovative entrepreneurship plays a fundamental role in the productive dynamics of modern economies. It represents an important channel for the development and implementation of innovations, as well as a source of competition that would foster the dynamics of innovation in incumbent firms. Nevertheless these mechanisms had shown their limits and did not contribute significantly to the development of innovative entrepreneurship.

The main questions studied in this section are: how and under what conditions do entrepreneurs in emerging countries innovate? And what needs to be considered to support innovation led by entrepreneurs in emerging countries? This section will attempt to provide some answers to these questions, trying to explain the much more fundamental relationship between entrepreneurship, innovation and development.

Our analysis is part of an approach that has become increasingly dominant over the past decade or so and which is based on the systemic approach to innovation. We will start by exploring the place of innovative entrepreneurship in a NIS, then we will explore the role of mix-policies. This mix-policies analysis will contribute to understanding the place of innovation in an eco-entrepreneurial system and will enable broadening the reflection in the context of national innovative entrepreneurship systems towards a better understanding of the common dimensions and those to be explored for emerging countries.

3.2. Innovative entrepreneurship in a national innovation system

The literature on national innovation systems, which had emerged mainly in the context of some developed countries since the late 1980s, has gradually enlarged to other economically less developed countries. We have thus seen the emergence of variations such as NIS for development (Edquist 2010; Cassiolato *et al.* 2018), taking off NIS (Djeflat 2009), inclusive NIS (Lundvall *et al.* 2008), and even *pro-poor* innovation systems, which is adapted to poor countries (Berdégué 2005). This range of literature fills a gap that has long been a source of criticism of the NIS approach itself and which specifically concerned the adaptability and applicability of such a concept outside developed countries' contexts.

As a reminder, a NIS links three main components: the institutional sphere (representing local and national public policies, which influence the economic structure, or even the industrial structure and a country's growth trajectory), the training/learning sphere (universities and other university training institutions, research institutions, research support institutions, formal and informal research networks, including associations) and the economic sphere (which refers to productive activity, as well as cooperation between companies and public research institutions).

The main characteristic of a NIS, at least in its initial configuration, is its rootedness in the national space (Lundvall 1985). This national context is central, since technological development and flows between firms occur more frequently within national borders than outside, even though this component is growing in volume. More conventionally, an innovation system is composed of a set of institutions, organizations and networks of actors that are supposed to interact towards promoting technological change in a geographical or institutional space which is shaped by firms (Touzard *et al.* 2015). The pivotal role of innovation in economic growth and in increasing well-being is now widely recognized. Companies and public institutions provide new products that raise the standard of living of consumers and create jobs. In order to support this process, public authorities have to work on the establishment of a general framework for innovation and invest in specific institutions that facilitate its development and dissemination.

With regards to innovation, a NIS enables grasping the modalities of knowledge production and dissemination that lead to technological innovation production. NISs have been mainly recognized as a response to the Washington Consensus and neoclassical approaches to growth linked to public policy for development (Lundvall 2005; Sharif 2006). As such, it has been adopted by both the scientific community and policy makers to explain how interactions between ranges of institutions contribute to technological change and the emergence and dissemination of innovations and thereby to a country's performance (Ben Slimane and Ramadan 2017).

The NIS approach has thus formalized the framework according to which actors, activities and regulation interact to contribute to better research and innovation performance. There are various and complex activities and transactions, agreements and relationships between the different actors, that justify the "systemic" analysis approach. Actors, we mean here, are first and foremost individuals, characterized by their skills and motivations. They also

include universities, public research organizations, transfer organizations, companies and start-ups. This human and social capital constitutes "the lubricant oil" which fluidizes relationships and interaction and enables an overall dynamic of all the actors of the innovation system (Ben Slimane and Ramadan 2017). From an innovative point of view, the interactions between the actors of the NIS are of multiple natures: knowledge transfers, cooperation for the production of new knowledge and commercial transactions of various outputs.

Within the system, the government, through all its components, representations and policies (central government, agencies, territorial authorities), ensures the functions of governance and that of encouraging and supporting innovation for national and international competitiveness. This is why the objective of developing an efficient NIS requires first seeking more contextualization and the orientation of research towards the country's priorities, because the process of knowledge creation in an NIS is intimately linked to the local institutional context that underpins it (Acs *et al.* 2014), particularly in the least developed countries (Djeflat 2009; Ben Slimane and Ramadan 2017), where creativity and innovation in general, and social innovation in particular, play a confirmed role in job creation and strengthening competitiveness (Szirmai *et al.* 2011).

Entrepreneurship plays a pivotal role in the transformation of new knowledge into marketable innovations and thus contributes to growth. However, its role has been neglected or even ignored in the NIS literature (Acs *et al.* 2014). The NIS literature has focused more on analyzing the institutional structure as a channel for the diffusion of innovations from a static perspective (Acs *et al.* 2013) than from a dynamic perspective. This evolving perspective emphasizes individual perceptions and motivations that underpin its behavior, particularly exploiting market opportunities and creating new knowledge-intensive firms that can be sources of new technologies, development and dissemination.

Since technology-intensive firms are the footprint of a NIS, the new innovative and knowledge-based venture creations should thereby characterize a NIS. These new venture creations are the expression not only of the operational action of the entrepreneur in general, but more specifically, of the innovative entrepreneur who gives the innovative footprint of an economic system.

On this basis, a semantic relationship can be underlined between entrepreneurship and innovation. From an individual angle, the existence of innovation opportunities is a driver of innovative entrepreneurship in terms of revenue generation. From a collective angle, the existence of innovation dynamics is determinant to stimulate and increase new entrepreneurial opportunities and collective welfare. Innovative entrepreneurship will thus act as a driver in this productive dynamic, particularly in advanced economies. It represents an important channel for the development and implementation of innovations and stimulates competition dynamics towards generating new innovations on the market.

The literature has identified new venture creations (science-based start-ups, for example) as organizational structures that more significantly contribute to innovation and knowledge creation than existing companies (Agarwal and Shah 2014). These technological start-ups in key technology sectors such as ICT, bio-technology, nanotechnology and electronics bring radical innovations to market and thus could change the dominant technological designs and business models already existing in a market, and examples of these technological disruptions abound.

In a more conciliatory standpoint, that of value creation, the innovation ecosystems approach has enabled highlighting potential synergies and complementarities between the actors of the system (Talmar *et al.* 2018). Small companies benefit from access to capital and markets more than large companies, while large companies benefit from the agility of projects and radical inventions stemming from science. Other less widespread contributions (Dalohoun *et al.* 2009) have analyzed the process of a "self-organized" innovation system based on promising technology, including the New Rice for Africa (Nerica) program, which is driven and shaped by entrepreneurial initiatives. On the other hand, there are very few studies on the benefits of the *pro-poor* innovation systems, those referring to a social learning process of multi-stakeholders that exploit and generate new knowledge and therefore expand the capabilities and opportunities for the most disadvantaged *(poor)* (Berdegué 2005).

However, it should be noted that not every entrepreneur is systematically innovative if he is not supported by an incentive environment that strongly promotes entrepreneurship and value creation, notably by investing in the education system and knowledge to attract new generations of innovation-oriented entrepreneurs and by providing targeted tools for entrepreneurship

in innovative sectors. Given the individual and opportunistic nature of entrepreneurship, the development of an entrepreneurial culture in the education system is crucial for a good functioning of the innovation system, particularly because training for anticipation, risk-taking, acceptance, learning to deal with situations of failure, and initiative-taking drive entrepreneurship motivation to engage new venture creation.

3.3. The role of the mix-policy in an innovation system

Understanding the process of innovation has been the subject of several theoretical and empirical works since the 1960s. The very first developed model is the "linear model" of innovation, which describes the innovation process as a sequence of steps from the production of knowledge to the introduction of a new product to the market. However, it is now recognized that the process is more complex and requires many loops of interaction and feedback between actors. The current model of open innovation emphasizes the fluidity of interactions between actors, where the flow of knowledge and skills allows agility and adaptation to take advantage of opportunities.

Given the complexity of the innovation process and the actors involved, innovation policy encompasses all policies and instruments that can positively influence the innovation process in order to improve its performance. Innovation policy also has a role in identifying and eliminating bottlenecks and limitations that may affect the innovation process, not exclusively through direct policies but also those contributing indirectly to their achievement.

Understanding the innovation process under this institutional perspective leads to broadening and deepening the scope of innovation policy. It is now recognized that actions and policies that are not directly targeting the innovation process can have unintended effects on firms' performance. Innovation thus seems to undermine all policies and is targeted by all policies. As a result, it is increasingly difficult to define the boundaries of "innovation policy". It is now considered as a complete concept that covers a wide range of policies, targeting various actors of the innovation ecosystem and various policy instruments that shape the interaction.

The term mix policy or "innovation policy mix" is currently used to describe the set of policies influencing the complexity of a multi-level and

multi-actor reality of the innovation process. More specifically, and starting with policies targeting actors, then policies shaping the relationships between actors and finally indirect policies, a first block of policies targets the actors in the innovation process through defining and shaping their operational functioning mode.

Three areas of action are essential to this extent:

– a Research & Development (R&D) policy, which sets up the framework for public and private institutions that carry out research activities and produce knowledge;

– an industrial policy and entrepreneurship policy, including policies targeting small and medium-sized enterprises (SMEs);

– an education policy covering all actors of the education system up to higher education, and including policies aiming at skills development and an active workforce.

Then there are the policies and instruments that shape the interactions in the innovation process and organize the flows of knowledge, skills and funds between the actors. They can be variously:

– direct financial support to actors under various configurations;

– government aid and fiscal policy;

– public procurement;

– regulatory framework;

– standard and norms setting;

– intellectual property rights (IPR);

– partnerships and coordination initiatives;

– culture of innovation.

Other policies have an indirect impact on the actors' interactions within the innovation ecosystem, such as investment policies, regional development policies, employment policies and competition laws and regulations.

When a context is characterized by these various direct and indirect policies, the problem which may emerge is that of consistency and balance in this mix of direct and indirect innovation policies, which becomes a

relevant objective itself. This is not an empty question. Consistency can be hindered by the compartmentalization of relevant and also of priority policies within the scope of each home ministry and linked agencies and that are not all directly targeting or supporting R&D and innovation.

It is also important to avoid the risks of inefficiency that may result from the overlapping of many programs at a relatively small scale of deployment. Moreover, adding new instruments on existing ones, which is furthermore widespread and long-standing, can lead to complex and dense policy mixes that are not efficient according to their final objective.

Economic policy instruments that have been developed over time have very specific contextual and cyclical characteristics and are often linked to related problems. For this reason, the use of the concept of policy mix in economic policy assessment and design work helps draw attention to inconsistencies and redundancies.

From a dynamic perspective, the setting up of an appropriate set of economic policies is not a task that can be resolved once and for all, as the scope and content of government policies evolve in response to external factors, the level of economic and institutional development, and the level of sophistication of the government itself. All of these evolving internal and external factors influence both the set of achievable objectives and the capacity to achieve them.

Innovative entrepreneurship policies are part of the policy mix we have described above. Therefore, some economic policies can directly support innovative entrepreneurship, for instance, through financing start-ups or the entrepreneurship incubators creation. Other rather indirect policies shape the interactions between actors in the economic system, such as taxation, public procurement policy, regional policies, trade policies or job policies. All these policies are certainly general, but they contribute to creating a favorable context to the development of entrepreneurial activity.

All these dimensions call for rethinking a better articulation and connection of economic policy instruments that allow a consistency and harmonization of all policy actions. It also calls for exploring the most efficient way of solving the bottleneck situations that already exist or that may appear both when designing new instruments in relation to the existing ones, or during the implementation of these public policies.

In order to ensure the effectiveness of policies targeting innovative entrepreneurship, it is necessary to take into account not only the innovation and entrepreneurship policies already in place, but also all the general policies that already exist and that also have an indirect impact on innovative entrepreneurship. It will therefore no longer be a question of systematically adding "another" policy, but rather of proposing "the" best suited policy to this context, given what is already in place.

3.4. Innovation in an entrepreneurial ecosystem

In the entrepreneurship literature, Bahrami and Evans (1995) were the first authors to introduce the term "ecosystem" when they focused their work on the Silicon Valley. The notion of ecosystem refers to an economic community supported by the interaction of individuals and organizations (Moore 1996). As with a natural ecosystem, Voelker (2012) represented the entrepreneurial ecosystem by equating the ecosystem linkages within an ecosystem to the various biological arrangements of its components as in a natural ecosystem.

The entrepreneurial ecosystem is composed of a diverse set of interconnected players with varied strategic objectives, but they all support the sustainable development of new ventures. The following dimensions include the social network made up of an informal network (advisors, mentors, friends, etc.), formal network (research universities, government agencies, capital sources, large corporations, the technopark, the physical infrastructure, etc.) and the entrepreneurial culture (Cohen 2006). However, for a long time, the entrepreneurial ecosystem or the entrepreneurial system has merged into the "space" dimension. Indeed, the entrepreneurial ecosystem was developed around the analysis of innovative and efficient regional ecosystems (Bahrami and Evans 1995; Kingler-Vidra *et al.* 2016). The concept of a national entrepreneurial system was introduced by Spilling (1996), who defined it as a complex set of actors in a given geographic region or area with diverse and interdependent roles, with specific contextual actors whose interaction influences the overall development of a region and its performance.

More recently, Audretsch *et al.* (2019) have questioned this ambiguity by specifying that the concept of entrepreneurial system has been inspired by the agglomeration phenomena that have characterized the previous decades and are currently part of a more globalized, more competitive environment and that are

increasingly knowledge based. They also emphasize the indirect factors that shape the environment in which a company operates and highlight the role of institutions. These institutions are sources of knowledge, as well as the impact of human capital and networks (Audretsch and Belitski 2017).

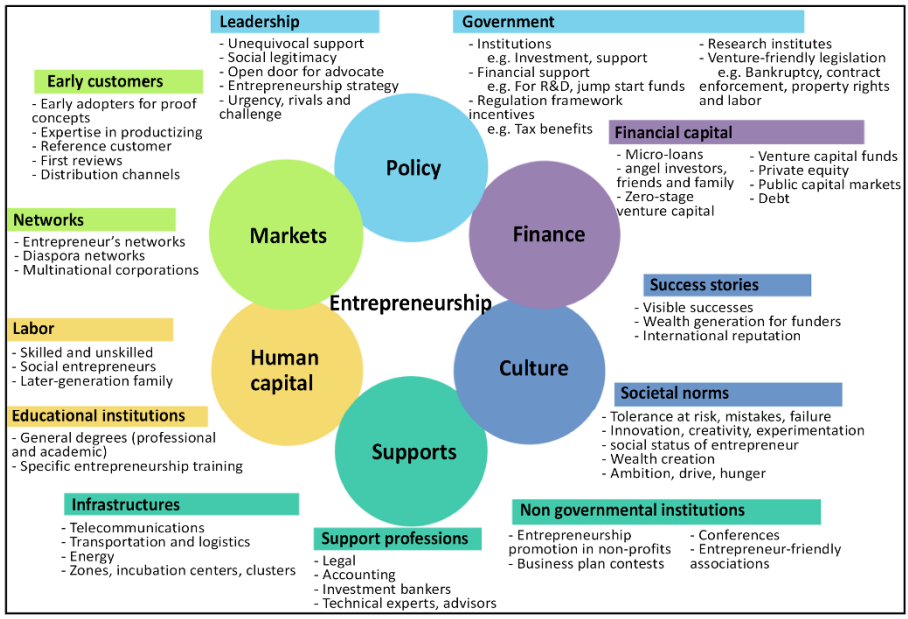

Figure 3.1. *The components of an eco-entrepreneurial system (source: (Isenberg 2011)). For a color version of this figure, see www.iste.co.uk/benslimane/entrepreneurship.zip*

Several entrepreneurship ecosystem models have been proposed in the literature, including the Morris and Sexton (1996) model, the Thurik *et al.* (2002), the model of Carree and Thurik (2003) and the model of Ahmad and Hoffman (2008). These models complement each other in the components that compose the entrepreneurial system and converge in the objective for a country or region to create its entrepreneurial community in order to remain competitive in an increasingly globalized and knowledge-based economy.

The entrepreneurship and innovation capacity should be the drivers of all contexts, so that an environment is created to be supportive of the development and success of entrepreneurial behavior, in particular new venture creation (Isenberg 2011). The innovative entrepreneurial ecosystem is unique

according to the political, economic and social conditions that are specific to each country. In this vein, Isenberg (2011) explains that using the entrepreneurial system approach can be decisive for the successful implementation of cluster strategies or national innovation system strategies (see Figure 3.1). He highlights the pillars of the entrepreneurial system, and emphasizes the pivotal role of an entrepreneurship culture, an appropriate funding system, quality of the human capital, the targeted institutional supports and markets that allow risk-taking and commercializing innovative products.

These components are themselves split into sets of subsequent components that interact in a dynamic way that bring to the forefront the importance of the local context in the dynamics of the whole entrepreneurial ecosystem.

More recently, the conceptual work of Neumeyer and Corbett (2017) has further contributed to understanding the identity of the entrepreneurial ecosystem and its components, already explored at the individual and organizational levels, but under their framework at a global and systemic level. Thus, they propose the development of an identity inventory including:

– constitutive norms, which refer to the formal and informal rules defining membership in a given group of the whole ecosystem. This includes norms targeting entrepreneurial characteristics (Ahl and Marlow 2012);

– social objectives, those shared by the members of the ecosystem. They offer examples such as growth willingness (Edelman *et al.* 2010) or social change (Calas *et al.* 2009);

– relational comparisons, which refer to the attributes used to differentiate between groups. They build on examples already discussed in the literature, such as differentiation between types of firms (Austin *et al.* 2006; Morris 2015);

– cognitive models, which are suitable frameworks to describe the ontology and epistemology of a group in an ecosystem, such as the means used to assess entrepreneurial opportunities (Dew *et al.* 2009).

All these routines and skills in organizations such as regularity, collective, recurrence, consciousness and unconsciousness, the specificity of the context, the influence of previous specialization and path dependency, enable better adaptation to the ecosystem as a whole (Becker 2001). The reassessment of

operational and dynamic capabilities also contributes to the effectiveness of the whole ecosystem (Helfat *et al.* 2009; Teece 2012).

An entrepreneurial system is thus composed of a multitude of dimensions, among which the economic and social dimensions play a decisive role in the effectiveness of investment in entrepreneurship.

The global entrepreneurship monitor (GEM) framework has emphasized that under an innovation perspective, the dynamics of an entrepreneurial ecosystem on a global scale should respond to conditions that favor new venture creations and researchers pointed out the difficulty of collecting and measuring the considered context conditions, particularly due to the lack of availability of some information for many countries. These conditions constitute "the necessary oxygen of resources, incentives, markets and supporting institutions for the creation and growth of new firms" (Bosma *et al.* 2009, p. 40). In the GEM methodology, the Entrepreneurship Framework Conditions (EFCs) are based on data from the World Economic Forum's Global Competitiveness Index and the World Bank's Doing Business allowing creating composite indicators, in which innovation is also considered (see Table 3.1).

These entrepreneurial framework conditions characterizing a successful entrepreneurial ecosystem do not consider innovation as a determinant *input* in this ecosystem, but rather as an *output*, which refers to the market phase of an innovative product. In this perspective, commercializing an innovation through entrepreneurial action is conditioned by the prior existence of a number of global and context factors, notably economic (investment, demand) or legal (regulations and taxation), that accompany this stage, as well as other factors more targeted to support entrepreneurial activity, for example, investment in knowledge or training for entrepreneurial activity.

Indicator	Meaning
Corporate finance	Availability of financial resources – equity and debt – for small and medium-sized enterprises (SMEs) (including grants).
Government policy	Extent to which public policies support entrepreneurship. This EFC has two components: (a) entrepreneurship as a relevant economic issue; and (b) taxes or regulations that are neutral in terms of size or aimed at encouraging new business start-ups and SMEs.
Government entrepreneurship programs	The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal).

Indicator	Meaning
Entrepreneurship education	Extent to which training in setting up or managing SMEs is integrated into the education and training system at all levels. The EFC has two components: (a) entrepreneurship education in primary and elementary schools; (b) entrepreneurship education at the post-secondary level (higher education such as vocational, college, business school, etc.).
R&D transfer	The extent to which research and development at the national level will create new business opportunities and be available to SMEs.
Commercial and legal infrastructure	The presence of property rights, business, accounting, legal and valuation services and institutions that support or promote SMEs.
Entry rules	This condition has two components: (a) market dynamics: the level of change in markets from one year to the next; (b) market openness: the extent to which new firms are free to enter existing markets.
Physical infrastructure	Ease of access to material resources – communication, public services, transport, land or space – at a price that does not discriminate against SMEs.
Cultural and social norms	The extent to which social and cultural norms encourage or permit actions that lead to new business methods or activities that may increase personal wealth and income.

Table 3.1. *Methodological framework of the formal institutional ecosystem for entrepreneurship (source: National Entrepreneurship Context Index (NECI) rankings and scores for 54 economies, GEM)*

Although innovation and entrepreneurship have received very little attention in the case of emerging countries, and even less for developing countries, the last two decades have been characterized by a profusion of young entrepreneurs looking to see their projects become a reality. Among them are many young graduates from higher education who intend to turn their ideas into concrete realizations and thus avoid graduate unemployment.

This new "entrepreneurial" niche is the result of a belief, which has become stronger and stronger over the years for these countries, of the importance of innovative entrepreneurship, considered as a driving force for personal fulfilment, as well as a lever for economic growth. Entrepreneurship has a decisive impact on the creation of wealth and employment, on the dissemination of innovation and creativity, and on ensuring a better quality of life for citizens.

3.5. Towards an adapted innovative entrepreneurial system

Very recently, new literature has been developed around entrepreneurial innovation systems. It integrates the analysis of NISs with that of the national entrepreneurial system. The latter refers mainly to the works of Acs *et al.* (2014, 2016), which complement the previous work of Szirmai *et al.* (2011), particularly on the links between entrepreneurship, innovation and development.

However, the theoretical contours of the literature on the national system of innovative entrepreneurship are not yet fully defined and outlined. We can even say that much remains to be done in this stream of literature. In this section, we will present the various and complementary developments' attempts that have led to the emergence of this concept. We therefore start from the observation of Carlsson (2003, p. 15):

> …the role of entrepreneurship connecting invention via innovation to successful commercial application and diffusion is poorly understood. While there has been a lot of recent work on entrepreneurship, it has not generally been integrated with innovation systems. Also, there has not been much theoretical work explicitly connecting innovation systems to economic growth. As a result, there is little formal modeling in the innovation systems literature.

NIS literature has neglected the issue of entrepreneurship because of the supposed incompatibility between the two concepts. This incompatibility results from the diversity of their theoretical foundations in that entrepreneurship has often been associated with the individual and behavioral dimensions, which accordingly creates methodological difficulties, particularly for the analysis of entrepreneurship at the macroeconomic level and particularly within the systemic framework. However, the two concepts seem to be complementary.

Ylinenpää's (2009) contribution, built on earlier research by Cooke and Leydesdorff (2006), is instructive, as it describes a typology of the characteristics at both the system level (NIS) and the individual level (entrepreneurship) to develop the concept of a regional institutional

innovation system (IRIS) and a regional entrepreneurial innovation system (ERIS) as bridging research concepts between innovation systems and entrepreneurship. Ylinenpää (2009) points out that due to a strong orientation towards individual actors, the ERIS approach is more oriented towards the main stream of entrepreneurship research whereas IRIS regional innovation systems have more similarities with research in conventional innovation systems. This author has thus suggested focusing on the concept of entrepreneurship to better understand the different rational reasons guiding these two types of regional innovation systems.

It should be noted that there are few attempts combining these two approaches that have been undertaken. First, Golden and Higgins (2003) analyzed the "national innovation and entrepreneurship system" (NIES) for Ireland, the Netherlands and Finland and assessed the impact of the NIS on entrepreneurship. They did not find any correlation between institutional indicators and entrepreneurship. They also highlighted some shortcomings of current economic measures, in areas related both to national innovation systems and entrepreneurship. They recommended that future research should reduce the number of the comparison indicators towards targeting the factors that mostly influence this link and explore public policies in order to explain differences in performance across countries.

From a conceptual point of view, Radosevic (2007) was among the first to criticize the literature on NIS and entrepreneurship, pointing out the limit of the NIS literature to give entrepreneurship a prominent place in the systemic approach to innovation. The author explained it by the differences in terms of theoretical streams of development underpinning the two concepts of innovation process and entrepreneurship, the level of analysis and the methodological approaches used to explore and analyze them. All these variations have made it difficult to integrate entrepreneurship into the NIS perspective. The author has therefore advocated developing a common theoretical and conceptual framework integrating the two concepts. By considering entrepreneurship as a systemic phenomenon based on the complementarity of technological, market and institutional opportunities that are already part of the NIS, Radosevic (2007) suggests that entrepreneurship should rather be considered as a full part of NIS components (see Figure 3.2).

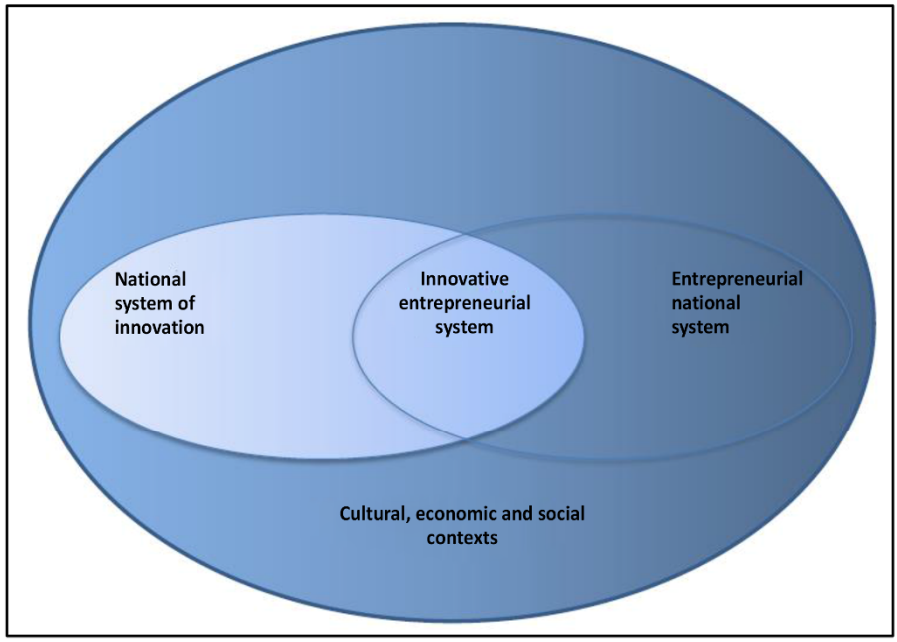

Figure 3.2. *The relationship between the two systems. For a color version of this figure, see www.iste.co.uk/benslimane/entrepreneurship.zip*

The argument sustaining such an approach is that the functional view of NIS and entrepreneurship provides an appropriate basis for developing a new integrative concept. In the same vein, Sepp and Varblane (2009) in their three case studies on barriers to the launch of new innovative products by Estonian high-tech companies, show that those barriers are linked to so-called "systemic" failures of the NIS. The sources of NIS failure are the factors of capacity and networking.

Indeed, Sepp and Varblane (2009) show that the sources of innovation of high-tech firms are very close whilst the links between domestic firms and higher education institutions, as well as with foreign firms that operate on the national territory, are poorly developed. Moreover, high-tech firms face capacity problems due to the existence of relatively weak support mechanisms, particularly funding at the seed and prototype stages of product development.

Radosevic and Yoruk (2013) have attempted to measure knowledge-intensive entrepreneurship and entrepreneurial opportunities at the national level by developing a composite index of the entrepreneurial propensity of innovation systems, applied to EU countries. Their results show that institutions influence knowledge-intensive entrepreneurial experimentation through technological opportunities and market opportunities. Thus, there is a need for a conceptual approach which links innovation, entrepreneurship and knowledge concepts within a dynamic perspective of an innovation system, given their interconnection and their pivotal role in the NIS dynamic.

In this same line of thought, Lindholm-Dahlstrand *et al.* (2017) suggest that entrepreneurial experimentation should include both "technical" and "commercial" dimensions and that entrepreneurship should be conceptualized according to its role in the innovation system, not as an outcome. At the system level, the central function of entrepreneurship is to foster the creation, selection and wider diffusion of innovations. Spin-offs and acquisitions are proposed as examples of micro-mechanisms giving rise to system-wide entrepreneurship. Interaction between established firms and new innovative firms becomes an important feature of a dynamic entrepreneurial innovation system.

The main conclusion from the previous literature review is that the resources needed for innovation should not be considered too narrowly but rather under an interactive perspective that combines capacity development, network development, interactive learning, and direct investment in scientific research. Knowledge-intensive entrepreneurship is a market-driven process, and its impacts are determined not only by market opportunities, but also by its interaction with technological and institutional opportunities. Therefore, knowledge-intensive entrepreneurship becomes a systemic feature of the innovation system and new knowledge creation, and inseparable from a dynamic innovation system.

Moreover, towards a successful innovative entrepreneurial system, a proactive government policy aiming at supporting entrepreneurial initiatives is crucial. This takes the form of diversified and targeted incentives, including administrative and legislative reforms and the creation of appropriate institutions that provide funding for innovative entrepreneurial activities (Sepp and Varblane 2009; Mani 2011).

In parallel, intermediary actors, such as economic, industrial associations or federations, can provide valuable information on how institutional capacity building occurs and how to manage it (Watkins *et al.* 2015).

Finally, social and cultural norms also play an important role. It has been shown that, even if the first two conditions are met, the system remains weak in certain socio-cultural contexts characterized by a lower social consideration for the entrepreneur (Estrin *et al.* 2018).

We note here that most of the work focusing on the national systems approach to innovative entrepreneurship has been applied to developed countries. However, this systemic approach of innovation is of importance also for the case of less developed countries when it comes to analyzing the role of intermediary actors, such as the involvement of associations in the long-term dynamic of such a system. Additionally, governance capacities in the developing countries are often lacking and thereby lead to inefficient innovation systems, stagnant economies and underdevelopment (Watkins *et al.* 2015).

In the same vein, Mani (2011), whose work focuses on emerging countries, particularly India, has examined through a systemic approach the factors behind the rapid growth of agricultural entrepreneurship. He has thus identified five major facilitating factors that he considers drivers of entrepreneurship, in particular:

– the liberalization of the economy, which has created many new market opportunities;

– a general increase in financial resources for innovation and entrepreneurship, including venture capital;

– more government support programs and public-private partnerships;

– the emergence of private institutions and initiatives to complement government innovation programs;

– the availability of skilled labor for high-tech products and services.

Despite the relevance of these drivers, it should be noted that a lack of involvement of institutions and government in the implementation and monitoring steps has shown many examples of failure. The example of entrepreneurship incubators that have flourished in developing countries to overcome weaknesses in the institutional environment (Akçomak 2009) has

shown its limits. This variation of the innovation system towards supporting the development of innovative entrepreneurship highlights the prominent role of entrepreneurship in the innovation processes and puts forward the challenges for each growth in the less developed countries. In order to ensure the performance of innovative incubators, Akçomak (2009) insisted on the necessity to clearly specify the purpose and the mission of an incubator, on ensuring maintenance costs and on providing qualitative incubators rather than a quantity without effectiveness in terms of management, administrative formalities, intangible services, the promotion of networking as a strategy, and financial sustainability.

The institutional dimension remains essential to explain the success of innovative entrepreneurship national systems, notably through the role of the government in building a consistent policy framework supportive of innovative entrepreneurship, and in setting up targeted incentive schemes, the financial support dedicated to innovation, as well as the role of intermediary institutions in promoting innovative entrepreneurial activity.

3.6. Conclusion

We are facing a pivotal and even central issue, that of innovative entrepreneurship, which, from the theoretical point of view and under the systemic approach, swings between two entry angles: the entrepreneurial system and the innovation system. Many studies have been conducted so far, in order to unify the two visions, but they still remain modest and parsimonious and not gathered under a unified stream of literature. We have mentioned a few of them, whose main characteristic is to pave the way for further thoughts in that direction.

Entrepreneurship, as a determining factor of economic development, has a dimension which is always unique and specific according to the individual and behavioral aspect of the entrepreneurship function. It depends to a large extent on the perception and even the behavior of the population of entrepreneurship, be it vital or opportunistic. This dimension is therefore a good indicator of a country's potential or in contrast to the lack of entrepreneurial dynamism.

Although we have many indications of entrepreneurial behavior, the most significant are those that refer to the motivation to create a new business,

such as the perception of the possibilities, such as improving the professional situation, risk taking, education level, expertise and know-how. These aspects have been the subject of several studies, inspired in particular by the GEM framework, which considers three composite indicators: attitudes, aspirations and entrepreneurial capacities.

A national innovation strategy must foster entrepreneurship and value creation and should allow a wide diversity of cultures and knowledge. It must also attract students, young researchers and entrepreneurs in order to encourage the transfer of research results into marketable innovations. In parallel, investment in education is important towards developing and anchoring a new entrepreneurial culture focused on innovation. We have seen that among the distinctive traits required for entrepreneurs are those related to the psychological dimension as well as technical skills. For this purpose, entrepreneurial education should include, for example, creativity and risk taking, in parallel to a public policy targeting young graduates (universities, training centers and engineering schools) and operating towards the development of innovative entrepreneurship in technological sectors.

Government policy has to support the transfer of research results to market, in particular through developing regulatory and legal mechanisms, as well as financial support for innovation and R&D (Autio *et al.* 2014). Governments must therefore define a clear and consistent vision of their actions based on tangible results and position public investments where they best contribute to growth and economic dynamics. Finally, a public innovation policy must support the growth of innovative companies by backing it up with private funding or public procurement, and facilitate and reward the creation of economic value and jobs.

In parallel, the ability of firms to capture the rewards resulting from their innovation activities has an impact on innovation itself. If SMEs are not able to protect their innovations against imitation by competitors, they will be less motivated to innovate. However, if an industry functions well without formal protection, promoting such protection can slow down the flow of knowledge and technology and will lead to higher prices for goods and services. A clear public policy regulating market and intellectual and industrial property may balance out these obstacles.

The impact of innovation on SME performance has direct effects on market share and indirect effects on improving productivity and efficiency.

The most important effects can be emphasized at the national level in terms of competitiveness and total factor productivity. As suggested earlier in this chapter, a national system has to encourage the creation of new knowledge and its sharing between the different actors through networks.

This is of importance in the case of emerging countries that are not very innovative, and even more crucial in the case of developing countries that suffer from a cruel lack of a clear political vision, both social and economic, towards long term economic catch-up based on innovation.

PART 2

An Innovative Entrepreneurial System in Emerging Countries

Entrepreneurship and Development: Realities and Future Prospects,
First Edition. Sonia Ben Slimane and Hatem M'henni.

4

Emerging Countries, Development Levels and Innovation

4.1. Introduction

Since Jim O'Neill first established the acronym BRIC in 2001 referring to the group of emerging countries that are Brazil, Russia, India and China, other acronyms have emerged to point out new countries that have reached the Grail of emerging countries, including MINT, standing for Mexico, Indonesia, Nigeria, Turkey, and CIVETS for Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa. Although emerging countries are initially developing countries on their way to being newly advanced countries, the development level of "emerging countries" is not steady and evolves over time for and across emerging countries in terms of socio-economic characteristics and evolvement. In her book, Casadella (2018) noticed that these countries have diversified economic profiles, though they have relatively large demographics compared to other countries, with a predominance of youth over the whole population. These countries also have high growth rates with high levels of trade exchange and a relatively strong commitment towards structural public policies.

However, maintaining a sustainable and advanced level of economic development remains difficult for some of these emerging countries. Depending on the targeted policies, youth unemployment can be a production factor which can impact economic growth or in contrast can cause among other factors economic decline. According to the World Bank (2013), the unemployment rate of young people (15–24 years old) in Indonesia was

21.8%, and 38.9% in Egypt which is relatively high for an emerging country and in contrast with the development outlooks.

Another aspect characterizing the emerging countries is the level of per capita income and infrastructures. We find a diversity of situations within emerging countries. These countries are identified as such because they are either middle- or lower-income countries with advanced market infrastructure or high-income countries with less developed infrastructure. Moreover, other emerging markets can be low- middle- or upper-income countries with reasonable and large market infrastructures. Finally, there are upper middle-income countries with less developed market infrastructure (Zaki and Rashid 2016). Given this diversity of characteristics, the classical indicators using GDP for example are not significant to explore the innovation and entrepreneurship perspectives in the development framework.

Entrepreneurship in emerging countries has recently been widely addressed, particularly according to its link with the level of development (Acs and Amoro's 2008; Marcotte 2014; Raposo *et al.* 2014; Zaki and Rashid 2016; Ferreira *et al.* 2017; Estrin *et al.* 2018; Tripathi and Brahma 2018). Most studies draw on the analytical framework of the Global Entrepreneurship Monitor (GEM), launched in 1999, which uses a systemic approach with both macroeconomic (institutional context) and microeconomic (attitudes and behaviors) data in order to explore the evolvement of nascent entrepreneurship worldwide. However, the GEM framework does not clearly define emerging countries. In the latest GEM 2018–2019 report, Bosma and Kelley (2019) proposed a classification of countries according to the level of development based on income, determined by the Gross Domestic Product (GDP) per person employed and based on household purchasing power parity in constant prices (2011) expressed in US$. Accordingly, they identified three groups of countries: those with a low income level, those with a medium income level and those with a high income level, the latter generally corresponding to that of developed countries.

Based on the GEM (2017–2018) report, Singer *et al.* (2018) drew on Porter's (Porter 1990) and Porter *et al.'s* (2002) model, to classify countries according to their level of development. As a reminder, the first level of development is "factor-oriented", in which an economy is driven by basic activities and natural resources, with high use of unskilled labor. The second level of development focuses on "factor efficiency", in which an economy is

more competitive with more efficient production processes and market-competitive product quality (see Figure 4.1). As the level of development evolves to the stage of "innovation driven", businesses use more knowledge, the service sector has a determinant part in economy development and is based on producing knowledge and innovation. Singer *et al.* (2018) have taken up this classification and underlined that developed economies are innovation-driven and are characterized by higher levels of intellectual property protection, with a more accessible and widespread education and university training system than in other economies. Moreover, the share of the labor force participating in sophisticated industries and service sectors is much higher in these economies, in the sense of better access to advanced technologies, which encourages entrepreneurs to be more innovative.

In their study on 54 countries around the world, Singer *et al.* (2018) show that entrepreneurs who consider themselves innovative (bringing innovative products to market) in innovation-oriented economies account for 31.2% of all entrepreneurs, while they account for 23.1% in efficiency-oriented economies, and 21% in factor-based economies (Figure 4.1).

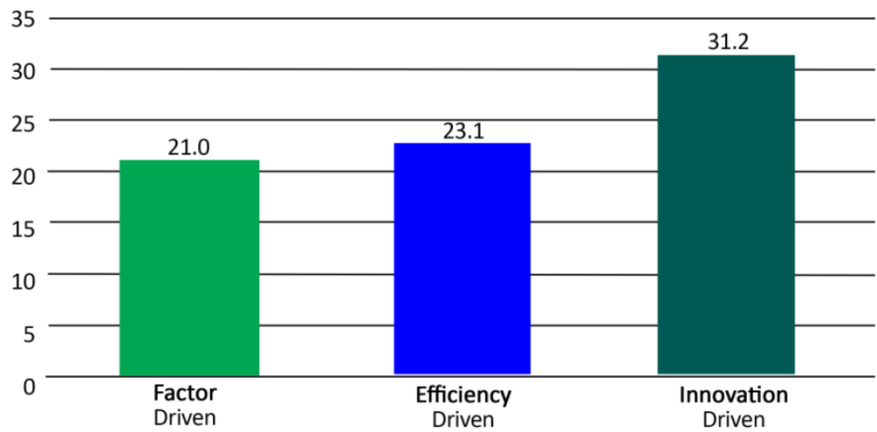

Figure 4.1. *Development phase average for innovation levels (source: GEM 2017–2018)*

This finding is very instructive, as it suggests that innovation is linked to economic development and that there is a correlation between proportion of innovative entrepreneurship and the economic level of development compared to the use of conventional factors of production and that the

correlations are positive. However, this finding remains global and tendentious in the sense that it cannot be confirmed for all countries because of the heterogeneity of the variables used and the local characteristics of each emerging country.

By comparing the two rankings' types of the same countries considered in the last two GEM reports (2017–2018 and 2018–2019) and by trying to match a country's stages of development both in terms of income and in terms of the use of factors of production with respect to innovation, we find exceptions that make these rankings questionable.

For example, a country at a factor-efficiency level of development may belong to a category of low-, medium- or high-income countries. This is particularly visible for some emerging countries such as Egypt, Morocco, Argentina and Indonesia, classified as low-income countries, and considered as factor-efficiency-based economies. Other emerging countries in Europe and Latin America have high income levels, though they belong to the group of economies in the intermediate stage of development. This stage of development, based on factors' efficiency, is characterized by structured and formalized economic and financial institutions that contribute to supporting growing industrialization, increasing factors productivity (Porter *et al.* 2002), and by openness to international markets, accompanied with the extended use of external technology. For the group of innovation-based economies, classifications are converging, since incomes in these economies are always high (see Table 4.1).

These results show first that the structures of emerging economies are heterogeneous, since they are characterized by a lower level of development than developed economies and have significant socio-economic, cultural and regulatory divergences compared to developed economies (Marcotte 2014). Second, the level of development based on income alone does not reflect the orientation of an emerging country with regard to innovation which calls for considering the institutional and contextual environment of each emerging country with its specificities. From an economic growth point of view based on innovation, most emerging economies have adopted trade liberalization measures (Koubaa and Ben Abdallah 2017) and changes towards legal and financial institutional formalization to support innovation.

Economy characteristics	Stage 1 and low income	Stage 1 and intermediate income	Stage 2 and low income	Stage 2 and intermediate income	Stage 2 and high income	Stage 3 and high income
Country	Madagascar	Kazakhstan	Egypt	Iran	Saudi Arabia	Israel
	India		Morocco	Lebanon	Argentina	Qatar
			Indonesia	China	Chile	South Korea
				Thailand	Panama	Taiwan
				Brazil	Uruguay	United Arab Emirates
				Colombia	Croatia	Japan
				Guatemala	Lithuania	Puerto Rico
				Mexico	Slovakia	Cyprus
				Peru		France
				Bulgaria		Germany
						Greece
						Ireland
						Italy
						Luxembourg
						Netherlands
						Spain
						Switzerland
						United Kingdom
						Canada
						USA

Table 4.1. *Distribution of the level of development of countries in 2018, by income level and stage of factor use*

In terms of innovation and entrepreneurship, however, the current incentives among emerging markets are neither systematic nor linear, with sometimes a lack of long term development vision and regulatory uncertainty. Moreover, institutional structures are neither formalized (Szirmai *et al.* 2011) nor mature enough to contribute to creating a sustainable system supporting innovative entrepreneurship (Marcotte *et al.* 2010).

It is therefore useful to understand the determinants of entrepreneurial intentions, particularly according to the local context and the institutional structures that support innovation-oriented entrepreneurship (Van Stel *et al.* 2007), towards ensuring sustainable development fostering innovative entrepreneurship.

4.2. Necessity entrepreneurship versus innovative entrepreneurship in emerging countries: a mitigated trend

Studies focusing on entrepreneurship and development converge on the fact that entrepreneurs in low-income economies are more likely to be motivated by necessity than those in high-income economies because of a lack of better options that could generate constant and stable revenue.

The contribution of Acs *et al.* (2008) is of significant importance to understanding the links between nascent entrepreneurship (new start-ups) and the level of development by showing that this link follows a "U-shaped" curve. Their results show that low-income economies are characterized by a predominance of necessity entrepreneurship as the economy moves from a stage of classical factors of production use to a stage of factors of production's optimization, where a country develops external technologies absorption and local adaptation. Skilled employees are enhanced to support the development of sophisticated industries, industrial activity becomes more dynamic and the level of income rises. As a result, individuals will be more attracted by stable work with a steady income rather than being engaged in risky entrepreneurial activity. The evolvement of an economy towards the factors efficiency stage contributes to lowering necessity entrepreneurship. When an economy moves to the stage of generating new knowledge and innovation, the entrepreneurship rate rises again but more for reasons of opportunity than for necessity, which refers to innovative entrepreneurship.

Bosma and Kelley (2019) confirm this overall trend in the GEM 2018–2019 report by showing that, in low-income economies, the entrepreneurship for reasons of necessity represents 35% of entrepreneurship activity, which drops to 28% for middle-income economies and to 18% for high-income economies. In parallel, entrepreneurship motivated by opportunity is 37% in low-income economies, rising to 42% in middle-income economies and to 51% in high-income economies (see Figure 4.2).

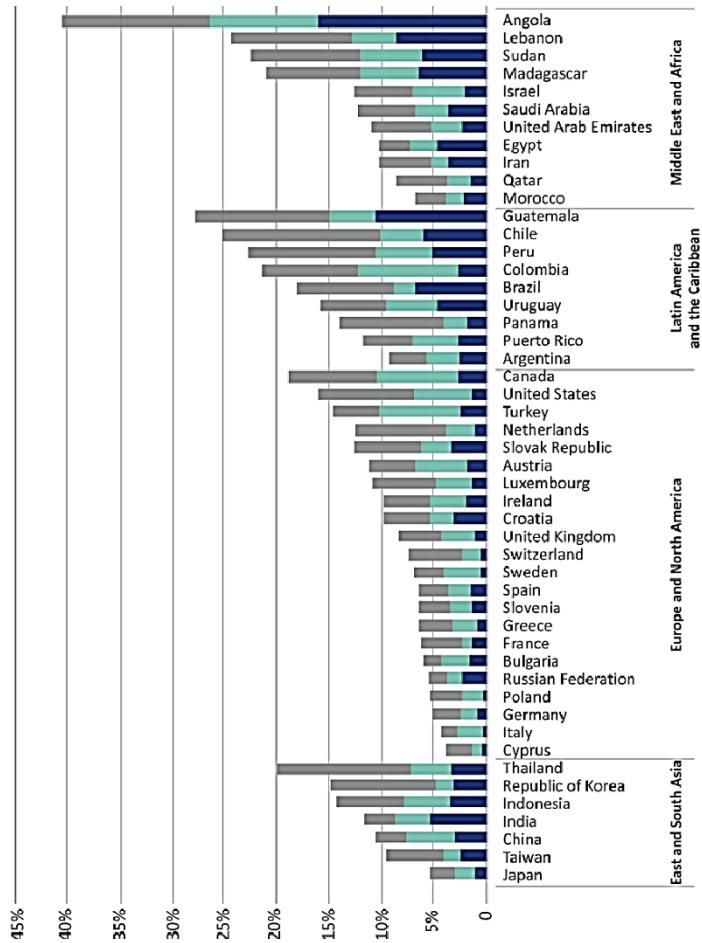

Figure 4.2. *Emerging Entrepreneurial Activity Rate (EAR) among adults (18–64 years) in 48 economies (source: GEM 2017–2018). For a color version of this figure, see www.iste.co.uk/benslimane/entrepreneurship.zip*

However, this trend is mitigated within the group of emerging countries, with a diversity of situations and distribution of entrepreneurs for opportunity or necessity reasons. In this sense, Estrin *et al.* (2018) show that in some East and South Asian countries, notably in South Korea and Thailand, there are three times as many entrepreneurs motivated by opportunities than by necessity, whilst in India, entrepreneurs are motivated more by "necessity entrepreneurship" than by "opportunity entrepreneurship" because they have no better option to achieve a steady income to survive.

As for the Middle East and Africa regions, both types of entrepreneurship play a major role, especially in Angola and to a lesser extent in Lebanon. Egypt has a necessity-based entrepreneurship rate close to that of India. At the level of the Latin American region, necessity entrepreneurship is more nuanced in Brazil. Finally, in Russia, 40% of entrepreneurs are motivated by reasons of necessity (Bosma and Kelley 2019).

These elements emphasize the heterogeneity of situations within the emerging countries group, whilst the theoretical view seems to statically homogenize the situation for all emerging countries and can be explained by the specific characteristics of each country, notably the institutional factors that may or may not support the development of innovative entrepreneurship (Baumol 1993) or local cultural, perceptions and social behavior regarding entrepreneurship, which call for further country-specific research.

4.2.1. *Entrepreneurs' profiles in emerging countries*

Searching for profitable opportunities is generally the driving force behind the majority of entrepreneurs who strive to improve their lives by achieving a steady income or personal fulfilment. These are at least the lessons of managerial and behavioral approaches to entrepreneurship (Kirzner 1973; Drucker 1985; Leibenstein 1987). However, the transition from an idea to its concretization or at least the perception of a potential opportunity may depend on the local context, which is particularly important in the case of opportunity entrepreneurship, a source of innovation. The orientations of public policies with regard to the major levers of development, particularly those supporting innovation, unemployment reduction and industrial competitiveness, can influence the motivations of entrepreneurs to engage in an entrepreneurial activity of necessity or opportunity (Bosma and Kelley 2019).

In developed countries, opportunity entrepreneurship is the predominant type of entrepreneurship. We have pointed out from recent studies dealing with emerging countries that it is not often the case for all emerging countries and linked to specific determinants that call for further investigation. We first explore the quality and determinants of human capital sustaining the idea that experience and education largely explain the predominance of opportunity entrepreneurship in developed countries.

4.2.1.1. *Age*

The demographic dimension, and specifically age, is a determining factor for entrepreneurship in general and for innovative entrepreneurship in particular, as it can reveal conditions that influence the type of entrepreneurial path engaged by individuals, be it driven by necessity or by innovative opportunity.

Under the framework of the GEM, Reynolds *et al.'s* (2002) study conducted on 37 countries representing about 62% of the world's population has shown that, from a global perspective, the age range for engaging in entrepreneurial activity was between 25 and 45 years. More recently, Kelly *et al.* (2016) showed within the framework of the GEM (2015–2016) that the age structure for developing an entrepreneurial activity is mainly fixed within two groups: between 25 and 34 years and between 35 and 44 years. These results show that in 15 years we still see the same stable and rather wide age distribution trend. Youth entrepreneurship is predominant, regardless of the stage of development of countries. It can be explained by the ambition of young people, especially those who have accumulated experience and networks, to have the desire to run an individual adventure of business creation. The results show also the exception of factors-driven countries, where the dominant age group for developing a new venture is between 55 and 64 years old and where entrepreneurship is rather of necessity.

In the same vein, Tornikoski *et al.* (2012) have conducted a study on a sample of the Finnish population, using the theory of planned behavior (TPB) in order to assess entrepreneurial intention. Their results show links between age and the formation of entrepreneurial intention. In particular, age has a significant and negative impact on entrepreneurial intention until the age of 40, which then decreases after 40. After the age of 45, the effect of age on entrepreneurial intention is no longer significant. These authors also

show that young people are more likely to be motivated by situations in which they can put forward their skills, while older people prefer situations that allow them to satisfy their intrinsic motivation.

Recently, Kautonen *et al.* (2017) analyzed the influence of the late career transition from organizational employment to entrepreneurship on revenues and quality of life, as factors of an individual's utility. They applied their analysis to a sample of the English population. Their results show that on average, transition to entrepreneurship activity at the end of individuals' careers experience is significantly associated with the increase in their quality of life, particularly by satisfying their fundamental psychological needs for autonomy, self-realization and pleasure whilst they significantly reduce their monetary outcomes.

These findings underline another aspect that has been little explored, that of the link between entrepreneurship and non-monetary dimension, those related to quality of life and that the desire for quality of life can have a greater individual value than income. However, this result is limited in scope, since the population studied is relatively protected from unemployment and lives in relatively high social conditions.

Regarding the motivations and the determinants of entrepreneurship in emerging countries, Kantis *et al.* (2002), who studied the case of Latin America and East Asia, show that for Latin Americans, the need to start an entrepreneurial activity is around the age of 26, whereas this need is on average from the age of 33 for East Asian entrepreneurs. These authors suggest that this difference is probably related to the relatively high structural stability of Asian labor markets compared to Latin American countries, which consequently increases opportunity costs and thus hinders them from engaging in an entrepreneurial activity. This is not the case in Latin America, where unemployment is higher and conditions are less favorable for labor market integration. Moreover, Estrin *et al.* (2018) believe that age is not among pivotal factors to explain entrepreneurship in emerging countries since, alongside the predominance of young people, older people who have less access to welfare are also likely to start entrepreneurial activities mainly for reasons of necessity.

Finally, the study findings of Chaurasia and Bhikajee (2016) on the triptych "science, technology and policy" in India shows that less than 16% of India's population aged 18–64 is involved in entrepreneurial activity,

compared to 41% in China and 48% in Brazil. They suggest that social factors affect the willingness to engage in entrepreneurial activity. The perception of entrepreneurship, as well as government policies, are not very supportive of entrepreneurship. In terms of innovation, entrepreneurs are mostly focused on frugal, more inclusive and accessible innovation. These findings open up from an innovation perspective for further exploration on the role of the demographic factor as a variable of entrepreneurship, particularly in emerging countries.

4.2.1.2. *Human capital*

The "U-shaped" curve, which reflects the relationship between the level of development and the type of entrepreneurship, shows a general trend in emerging countries towards necessity entrepreneurship, which should be seen as an indicator of a low level of development rather than as a potential engine of economic growth (Wennekers *et al.* 2010). This is all the more true as the necessity motivation for entrepreneurs in emerging countries often results from the inexistence of an alternative option to ensure steady income and avoid an unemployment situation. As the level of development evolves towards the "innovation driven" stage, necessity entrepreneurship decreases in favor of opportunity entrepreneurship, source of innovation and development of new technologies and which is predominant in developed countries.

Research studies exploring the determinants of innovative entrepreneurship remain heterogeneous and their results mitigated when it comes to their application within the group of emerging economies. One factor that appears to be a determinant is the quality of human capital, which may refer to professional experience, education or to social capital. Education contributes to the development of opportunity entrepreneurship in developed countries, compared to less developed countries (Estrin *et al.* 2018). Formal education promotes access to new knowledge and the development of individual skills and thus enhances the ability of individuals to discover and exploit opportunities for business development (Davidsson and Honig 2003).

Education also allows individuals to develop skills that enable them to obtain well-paid and steady jobs. As the stage of development evolves, this impact decreases since educated individuals are more likely to be attracted by stable jobs with constant incomes than in nascent and risky entrepreneurial experiences with unpredictable income (Acs *et al.* 2008; Estrin *et al.* 2018). Another factor of human capital refers to the role of

previous professional experience in willing individuals to start new entrepreneurial ventures. In this perspective, Estrin *et al.* (2018) show that, in developed countries, people with accumulated entrepreneurial experience are more likely to run an entrepreneurial activity of opportunity than of necessity. In the case of emerging countries, previous experiences seem to offer a fertile organizational context for the "incubation" of future entrepreneurs. Moreover, previous professional experiences enable the acquisition of complementary skills and talents such as "know-how" and "know-who", and thus promote the development of entrepreneurship at different stages of the value chain, particularly in similar activities (manufacturing the same products), as is the case in East Asia where entrepreneurs are more oriented towards technologically innovative sectors (Kantis *et al.* 2002). Thus, experience can be considered as one of the factors predicting the frequency of venture creation but does not predict the success of such entrepreneurial activity (Davidsson and Honig 2003).

This positive correlation relationship can be mitigated for socio-political reasons. This is the case for example in Latin America, where the percentage of entrepreneurs with previous professional experience is higher than in East Asia and is probably due either to the crisis of the 1990s in that region, which experienced a high rate of business mortality, or to the existence in Asian countries of barriers to "new entrepreneur" entry (Kantis *et al.* 2002). Finally, the existence of a network of strong family or social ties can be of benefit to entrepreneurs in terms of advice or financing in the seed phase (Davidsson and Honig 2003; Estrin *et al.* 2018) and can also foster in some cases rural entrepreneurship, in India for instance (Tripathi and Brahma 2018).

In the same vein, Bosma and Kelley (2019) show that the rate of female entrepreneurship in emerging countries is relatively high compared to developed countries, with a predominance of necessity entrepreneurship (Kantis *et al.* 2002; Estrin *et al.* 2018), which can be explained by cultural barriers and low access to education that prevent women from working as employees and therefore push them to work independently to support themselves. This aspect suggests that more work should be carried out on the place of women in society, including the personal, cultural and historical dimensions, as well as the potential impact of female entrepreneurship on entrepreneurial dynamics.

4.2.2. *Innovation and R&D*

Entrepreneurship as a driver of innovation has been widely discussed in the literature. Some empirical work has focused on the process starting from identification to exploitation of opportunities in technological entrepreneurship (Tripathi and Brahma 2018). Indeed, innovative entrepreneurship includes technological entrepreneurship, which is defined as an investment in a project which deploys skilled individuals and heterogeneous assets closely linked to advances in scientific and technological knowledge that captures value for firms (Bailetti 2012).

While education and work experience contribute to the development of innovative entrepreneurship as demonstrated for developed countries, they foster entrepreneurship in the same industry when they are related to the same field (Kantis *et al.* 2002). In other words, academic training and professional experience in the same field have an influence on the sector of activity in which the entrepreneur decides to start his activity. These findings do not suggest an obvious cause-and-effect relationship but may be instructive of the relationship between the orientation of education systems under government policies and its impact on supporting entrepreneurial development in specific sectors. This can broadly be referred to the notion of path dependency applied to organizations and to countries which condition future strategic orientations according to the specificity of past investments, associated here with the education system. Following this perspective, Bosma and Kelley (2019) show that 47% of Indian entrepreneurs and 48% of Chile's entrepreneurs are innovative and explain the Indian results by the openness of the Indian economy and the support of the ICT sector and rapid expansion of the mobile phone and Internet sector that has fostered the development of a large number of technology start-ups in this sector (Tripathi and Brahma 2018).

However, the term "innovative" is relative and cannot refer in an affirmative way to a technologically radical innovation. Many innovative entrepreneurs develop new products or services not offered by competitors that can be incremental and result from improvements and adaptations of existing products to local contexts (Kelly *et al.* 2016). Adaptive or imitative innovations are not trivial, however, because the specific capacities and skills of entrepreneurs have highly contributed to adapting them to the market. The review of experience and accumulated skills of entrepreneurs highlight the individual absorptive capacity and creativity that facilitate the transition from simple commercialization of widely known products to

technological imitations or even the development of new technological innovations (Szirmai *et al.* 2011).

In order to avoid ambiguity regarding the type of technologically innovative entrepreneurship, it is appropriate to analyze the level of R&D investment in emerging countries. Science, technology and innovation (STI) data on the evolution of R&D investment in different emerging countries over the period 2012–2017 (see Table 4.2) show that China and South Korea are the countries that invest the most in R&D, followed by Brazil and Singapore. Egypt and Turkey are far behind them (Unesco 2018).

Country	2012	2013	2014	2015	2016	2017
Argentina	0.63491	0.61849	0.59278	0.61408	0.53274	/
Brazil	1.12684	1.19567	1.26991	1.34264	1.26578	/
Chile	0.3622	0.3887	0.37497	0.3806	0.36244	/
China	1.90582	1.99021	2.02114	2.05643	2.10826	2.1286
Colombia	0.23458	0.27248	0.30799	0.2917	0.26955	0.24397
Egypt	0.50899	0.63895	0.63649	0.71858	0.70848	0.60595
India	/	/	/	0.61992	/	/
Indonesia	/	0.0847	/	/	0.23937	0.23807
Mexico	0.48684	0.49855	0.53044	0.52419	0.4865	/
Morocco	/	/	/	/	/	/
Nigeria	/	/	/	/	/	/
South Korea	4.02554	4.14853	4.28874	4.21702	4.22744	4.55324
Russian Federation	1.02675	1.02524	1.07011	1.09689	1.09557	1.10733
Singapore	1.9944	1.98597	2.15996	2.8498	2.22448	/
South Africa	0.73363	0.72488	0.77115	0.79816	0.82047	/
Thailand	/	0.44164	0.47988	0.61593	0.78133	/
Turkey	0.83217	0.81821	0.86077	0.8815	0.94464	0.96156
Vietnam	/	0.37359	/	0.44113	/	0.52654

Table 4.2. *R&D expenditure as % of GDP (2012–2017) in the main emerging countries (source: STI data, Unesco 2018)*

We note that data are not available for India, except for the year 2015, where no substantial investment in R&D is noted and which shows a lack of a structured policy to encourage the transition towards a technological economy, as is the case in China, South Korea and Singapore. However, Tripathi and Brahma (2018) noted that India's policy is currently putting science, technology and innovation policy forward in order to improve the national knowledge network, infrastructure and incentives for R&D investment in the public and private sectors which will contribute in the short run to the development of imitative or adaptive innovation, but which can in a following step imply the development of a technological absorption capacity, a source of acquisition of a knowledge basis, necessary to produce new knowledge.

4.2.3. *Institutional and cultural contexts*

The institutional environment is very complex and entrepreneurship is multidimensional, making it difficult to link the two concepts in a straightforward manner. The institutional environment is composed of structures and rules that guide and harmonize behaviors and economic activities to ensure fluidity and consistency of collective actions. This environment shapes the structure of economic, social and political incentives and facilitates choices and actions (Scott and Meyer 1991). It is composed of several formal and informal structures (Williamson 2000), financial and legal (Autio *et al.* 2014), and governance structures, that can be grouped into interdependent dimensions: normative, cognitive and regulatory (Scott 2003).

Several studies have focused on the structure and role of institutional coordination in creating an enabling environment for knowledge creation and innovation. In a perspective of long-term development, the government through its structural policy must ensure the setting up of an overall framework including incentive actions to sustain the whole national system (Laperche and Uzunidis 2007) and that also include institutions that promote the production of knowledge, enterprises that collaborate with each other, but also research centers to produce new goods and services, as well as adequate and available sources of financing.

Under an evolutionary perspective, innovation implies governments and firms negotiate policies to create and transfer the generated knowledge and

to sustain the innovation process (Metcalfe 1997) and institutional policy for development must be coordinated with science and technology for a better structuring of the innovation process under a systemic perspective (Ben Slimane and Ramadan 2017). The role of national regulation and institutional framework is also crucial in supporting entrepreneurial activities towards growth (Baumol 1990), in particular through legal and fiscal incentives targeting new venture creation and start-ups, regulation, removal of trade barriers and ensuring market transparency (Wennekers and Thurik 1999).

The role of the institutional context is even more decisive in the case of emerging countries. Market conditions and institutional policies in targeting innovation are not constant and may evolve (Marcotte *et al.* 2010). Moreover, markets are often imperfect; property rights are often inappropriate and can therefore affect innovation outcomes. In addition, infrastructure is challenging and per capita incomes remain relatively low (Szirmai *et al.* 2011).

This uncertain institutional environment provides little incentive for entrepreneurial actions that are inherently risky, even though regulatory institutions are essential to reduce uncertainty and the threat of expropriation of any returns that entrepreneurs might generate. To remedy this, the government has to, in some cases, influence business behavior by promoting opportunities and acting as an institutional entrepreneur (Raposo *et al.* 2014). This institutional stance requires the adaptation of regulations and the development of incentive mechanisms for investment and the reduction of institutional and structural barriers to entrepreneurship.

In addition, informal institutions (Williamson 2000; Tripathi and Brahma 2018) in the case of emerging countries are pivotal, are composed of social relationships pervaded by cultural aspects, and are characteristic of the entrepreneurial environment. These institutions operate in a fragmented and failing formal institutional environment with a lack of effectiveness, particularly in terms of financing. This is notably the case of rural entrepreneurship in China or India (Tripathi and Brahma 2018), wherein informal institutions are particularly socially determinant and closely linked to entrepreneurship activity and thereby can be barriers to entrepreneurial expansion and to the transition to innovative entrepreneurship.

The review of the research literature and empirical contributions on the determinants of innovative entrepreneurship from a systemic perspective, specifically for emerging countries, reveals a lack of both quantity and areas of exploration, particularly those related to the weight of cultural and social norms that are still not well explored, and thus open up ways for further targeted studies. Further windows of research should include the societal and the human capital aspects as well as the specificity of institutional context which influences the potential path of a given country towards innovative entrepreneurship. The following chapter, of an empirical nature and based on the GEM methodological framework, attempts to explore indicators that may contribute to the understanding of the development of entrepreneurship in these countries. Three factors are selected in this framework: government programs dedicated to entrepreneurship, the ability to transfer R&D results and cultural and social norms that may affect the performance of the entrepreneurial innovation system.

5

Assessing Innovative Entrepreneurial Performance of Emerging Countries

5.1. Introduction

The relationship between innovative entrepreneurial activity and economic development is not as simple and obvious as it may seem. We hypothesize that innovation is an intermediate variable which can clarify this assertion. The main objective of the previous chapters was to explore the variety of possible determinants of this relationship. It should be noted that this exploration has only made it possible to show correlation links with various and mitigated results due to the composite nature of certain determinants.

This chapter follows the perspective of analyzing this topical subject. We propose a series of correlation hypotheses to be tested. This is in line with recent work on the possible links between entrepreneurship and development, adopting a quantitative approach to explore reasons that explain the poor entrepreneurial performance in most countries of the world, especially emerging countries. Our hypotheses are derived from the analyses in the previous chapters and our first aim is to assess the relationship between innovation and entrepreneurship through two sources of composite indicators. Then, we evaluate the supposed levers of entrepreneurship and innovation in a development perspective.

We group these hypotheses into two parts: in the first, we test the relationship between the overall conditions or general context of

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First Edition. Sonia Ben Slimane and Hatem M'henni.

entrepreneurship on the one hand and the innovation capabilities of a country on the other.

A second set of hypotheses explores specific aspects supporting or negatively affecting entrepreneurship, including government policies, R&D transfer and social and cultural norms.

For this purpose, we use recent data that is internationally available. The data are taken from the latest GEM framework (2018–2019) for 49 countries in the world, as well as data from the World Bank's Doing Business (DB) and the Global Innovation Index (GII) of the Davos Forum (2018–2019). It should be emphasized that these are one-off observation data, which is certainly a limitation in that they do not provide dynamic indications that could be, to a certain extent, instructive in terms of the evolvement of actions supporting innovation. On the other hand, these data represent composite indicators that have many declinations and variables that allow us to refine the results.

5.2. Relationship between ease of entrepreneurship and the capacity to innovate

The positive relationship between ease of doing business and a country's ability to innovate has been advocated by many authors, particularly for developed countries, regardless of the type of causality. The underpinning ideas are that, first, performing well in innovation triggers a dynamic in terms of new knowledge creation and thus in the generation of innovative entrepreneurial projects. Second, supporting business creation activity, particularly through institutional incentive policies, contributes to innovation. Thus, our first hypothesis proposes to test these two relationships as follows:

– *H1a: does the DB or "ease of doing business" positively determine a country's innovation score/performance?*

– *H1b: is the inverse relationship verified?*

This hypothesis (H1) will be tested on three different country panels: the overall sample of all countries for which data are available, the sample of developed countries, and the sample of emerging countries, for which data are also available. The sum of the last two samples is not equal to the first

one because we opted not to include the Gulf countries; those are rich in natural resources and could bias the results.

In order to test the first hypothesis, we use two available databases: first, the Doing Business Index (DB) produced by the World Bank and second, the National Entrepreneurship Context Index (NECI) produced by the GEM initiative. We choose these two databases because the two inherent composite indicators are sufficiently rich in the information that give us a reasonably close idea of the reality of entrepreneurship in the sample and open up the prospect of conducting comparative analyses.

Having already presented the characteristics of the GEM framework in the previous chapter, we present in the following the main characteristics of the DB data. The DB assesses economies in terms of their "ease of doing business" using the score obtained in links to their "distance from the border", which illustrates, in relative terms, the distance of a given economy from a "border" representing the "best performance" benchmark observed across all the countries covered by the DB exercise. The score is calculated for each of the areas covered by the DB report, then for the 10 areas as a whole and using the simple method of averages, that is by weighting all subjects equally and then assigning the same weight to each component under each subject.

This consistent approach allows accumulating most of the relevant data through a case study of a given economy and transforming it into a border distance score for that economy.

The ranking of economies, which is often the subject of much attention, is the result of the breakdown of cumulative distance scores from the border. The border distance score reflects the gap between an economy's performance and a measure of best practice across the entire sample of 41 indicators for 10 DB themes (labor market regulation indicators are excluded). For example, to start a business, New Zealand has the fewest number of procedures required (1) and the shortest possible time to complete them (0.5 days). Slovenia has the lowest cost (0.0) and Australia, Colombia and 112 other economies have no minimum capital requirement. The 10 themes that make up the overall indicator are presented in the following table (see Table 5.1). Finally, the components of the Doing Business Index indicator are not directly related to innovation capacity, which reassures us of the existence of bias.

Theme	Definition
Starting a business	All the procedures officially required or routinely carried out, as well as the time and cost that an entrepreneur faces in setting up and officially managing an industrial or commercial enterprise.
Obtaining construction permits	All the procedures, time and costs involved in the construction of a commercial warehouse by a construction company. But also the quality of building regulations, the effectiveness of quality control and safety mechanisms, liability and insurance regimes for latent defects, and professional certification requirements.
Electricity connection	The study divides the electricity connection process into different procedures and measures the time and cost associated with each of these procedures.
Property transfer	This index is composed of five dimensions: reliability of infrastructure, transparency of information, geographical coverage, solving land disputes and equal access to property rights.
Obtaining credits	This corresponds to the sum of scores on the index of legal rights of borrowers and lenders and the index of the extent of credit information.
Protection of minority investors	This assesses the level of protection of minority investors in the event of conflicts of interest by one set of indicators and the rights of shareholders in corporate governance by another.
Payment of taxes	This takes into account all taxes, including compulsory contributions, that a medium-sized enterprise has to pay or that are withheld from it each year, as well as the administrative steps necessary for their payment and compliance with post-tax declaration procedures.
Cross-border trade	This lists the time and costs associated with the logistics process of exporting and importing goods. It also measures the delays and costs associated with three categories of procedures – meeting documentation requirements, complying with cross-border trade procedures, and domestic transportation – that are part of the overall process of exporting or importing a cargo of goods.
Execution of contracts	This measures the time and cost to resolve a commercial dispute in a trial court, as well as the index of the quality of judicial proceedings, which assesses whether each economy has adopted a set of good practices that promote the quality and efficiency of the judicial system.
Rules of insolvency	This examines the timing, cost and outcome of insolvency proceedings for domestic enterprises, and the soundness of the legal framework applicable to liquidation and reorganization proceedings.

Table 5.1. *Components of the DB (source: World Bank, IBRD.IDA)*

In the following empirical paragraphs, we use Excel graphs in their simplest form, adding a linear estimate plotting the general trend of the scatterplot/country cloud (if any). We also use in our comparative analysis the estimated value of the coefficient of the line and the degree of

explanation of the variance. We note that these types of graphs are often used in the international reports referred to in the last two chapters (Doing Business Report 2019, p. 62; Global Innovation Index Report 2019; Global Competitiveness Report 2018, p. 6), although they can be criticized, particularly with regard to the bias of the selection, representativeness, the number of observations or the significance of the coefficient.

Figures 5.1, 5.2, 5.3 and 5.4 present the relative results of the first part of our first hypothesis, according to which ease of doing business (DB score) has an effect on the ability to innovate (GII score). As a reminder, the H1a hypothesis is the following:

H1a: does the DB or "ease of doing business" positively determine a country's innovation score/performance?

The results show a positive correlation between the business climate (DB score) and the ability to innovate, for all the countries considered from the overall sample (127 countries), including developed, emerging and developing countries (see Figure 5.1).

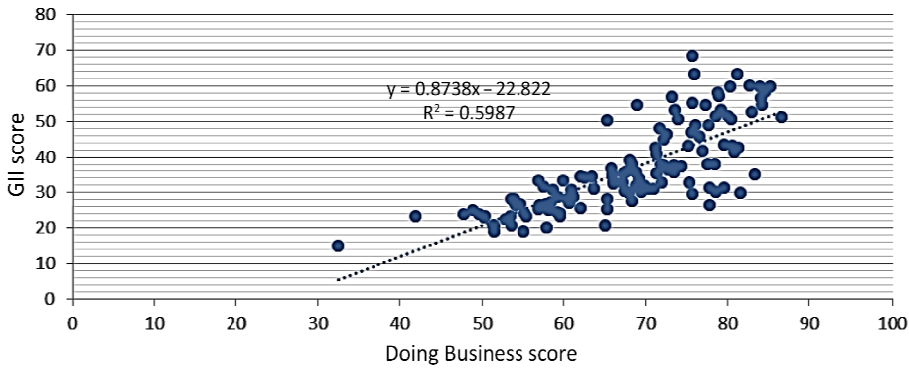

Figure 5.1. *Effect of the DB score on the ability to innovate (total sample of 127 countries)*

In order to specify the nature of the relationship for each category of countries (developed, emerging or developing), we applied the same assumption for each sample of countries. Not surprisingly, the results show a very positive correlation between the business climate and the ability to innovate in developed countries (see Figure 5.2).

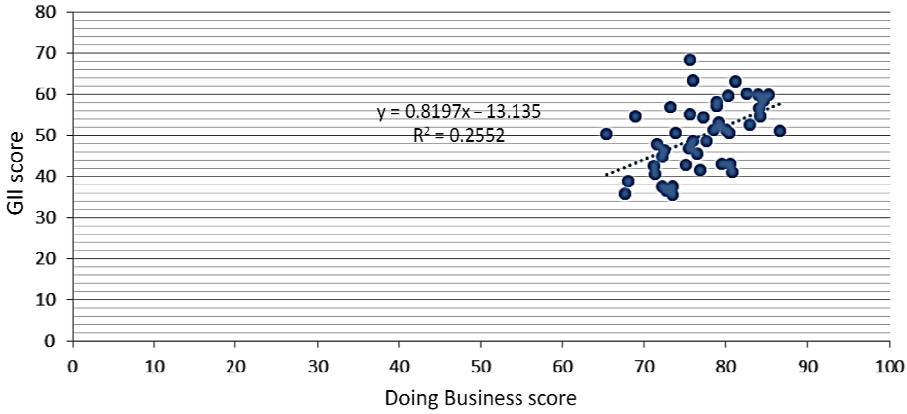

Figure 5.2. *Effect of the DB score on the ability to innovate (sample of 40 developed countries)*

Applied to the emerging countries (20 countries), the hypothesis is also verified (see Figure 5.3) and the same result is true for the sample of 72 developing countries (see Figure 5.4). This is interesting in the sense that, contrary to the general trend that emphasizes that policies applied to developed countries are not necessarily available for other development stage countries, the results support the hypothesis that a good business climate contributes positively to improving innovative capacity, regardless of a country's stage of development.

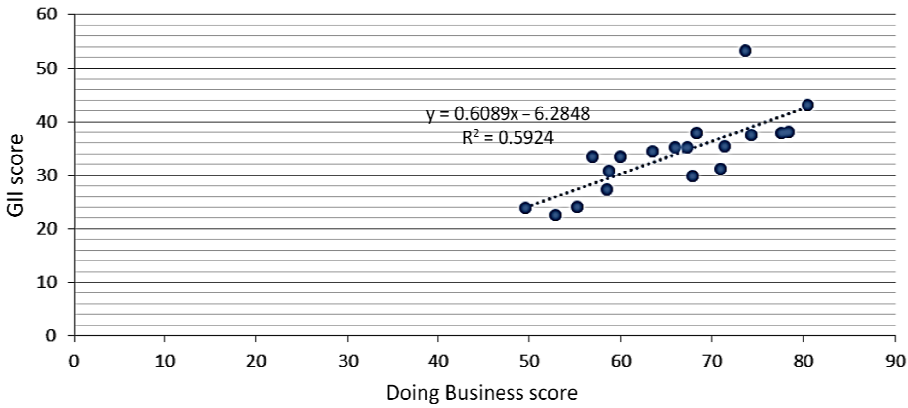

Figure 5.3. *Effect of the DB score on the ability to innovate (sample of 20 emerging countries)*

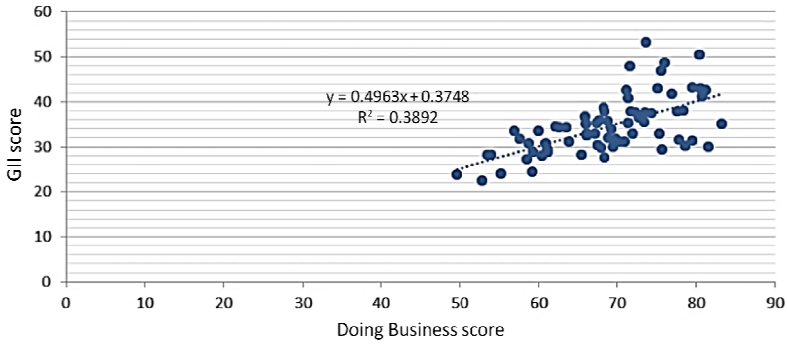

Figure 5.4. *Effect of the DB score on the ability to innovate (sample of 72 developing countries)*

The second step consists of testing the second part of the first hypothesis, according to which the capacity for innovation, measured by the GII score, has an effect on business development and entrepreneurship (DB score). The idea underpinning this hypothesis is to verify whether having a capacity for innovation contributes to fostering entrepreneurial and business dynamics. As a reminder, the H1b hypothesis is the following:

H1b: is the inverse relationship verified?

The results show a positive correlation between innovation capacity (GII score) and the DB score, although it is less significant in terms of its effects for all countries, regardless of their stage of development (see Figure 5.5).

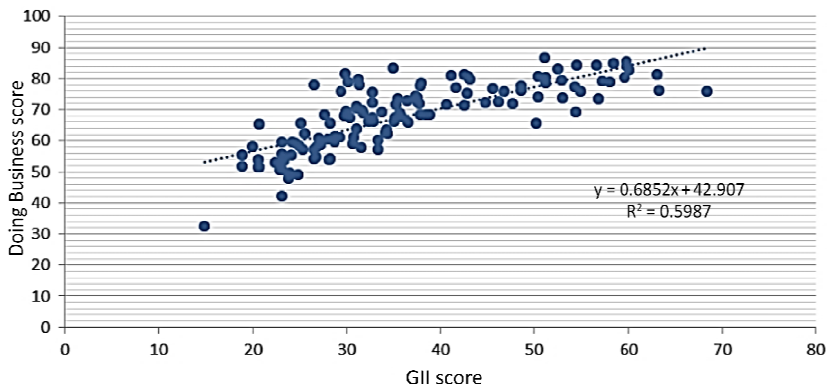

Figure 5.5. *Effect of ability to innovate on DB score (total sample of 127 countries)*

The comparison between the different panels shows that, in all cases, the relationship between a good business climate through doing business and performance in terms of innovation is always positive. The only mitigated result to be highlighted is the coefficient which decreases as the level of development declines.

It should also be noted that China and Malaysia stand out positively in the group of emerging countries, with respective scores for China (GII = 53.1; DB = 73.6) and Malaysia (GII = 43; DB = 80.6). For the other emerging countries, the scores are less consistent with regard to these two key variables, particularly in the case of Turkey (GII = 37.4; DB = 74.3), Russia (GII = 37.9; DB = 77.6), Morocco (GII = 31.1; DB = 71.0), Indonesia (GII = 29.8; DB = 67.9) and India (GII = 35.2; DB = 67.3), since we note that having a climate that facilitates entrepreneurship does not necessarily foster innovation. This can be explained *a priori* by the lack of a long-term strategy for innovation and entrepreneurship. Further country analysis should help to explain the sources of the results' variety.

This empirical exercise does not provide sufficient information on the levers to be put in place to ensure a positive impact on innovation given the composite nature of the indicator, which will further be the subject of analysis in the following section.

5.3. Relationship between the pro-entrepreneurship national context and the capacity to innovate

The GEM report also produces accurate indicators on the national entrepreneurial context (see Table 3.1), which is helpful for our analysis. Therefore, the objective of this section is in line with the hypothesis analyzed in the previous section and aims further to deepen our understanding of correlation relationships by analyzing the link between innovation performance, measured by the GII score, and the level of the national context for entrepreneurship, measured by the NECI score. Intuitively, the hypothesis is expected to be confirmed and consistent with the results of the first hypothesis. The second hypothesis to be tested is as follows:

H2: does the NECI score (or National Entrepreneurship Context Index) positively influence a country's innovation performance score (GII)?

To answer this question, we use data for only 50 countries, for which information is available in both the GII and GEM (see Table A.1).

The results show that the NECI score, capturing the level of the national context targeting entrepreneurship, is positively correlated (however lower than the DB score) with the GII score, which refers to the capacity to innovate and the innovation performance of countries. This correlation is observed in all panels (see Figures 5.6, 5.7 and 5.8).

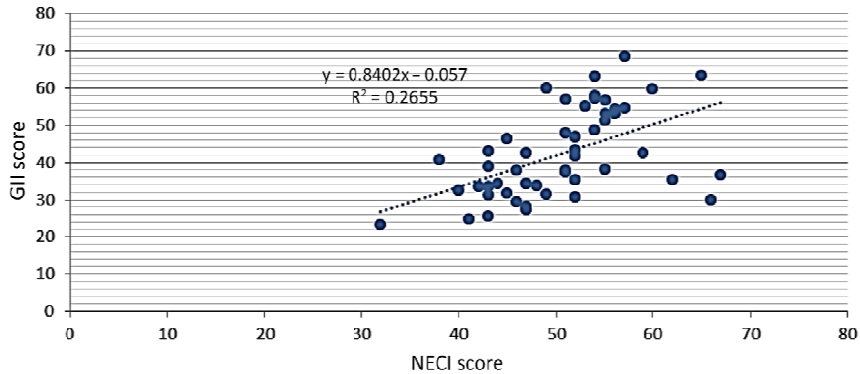

Figure 5.6. *Effect of NECI score on the ability to innovate (total sample of 50 countries)*

The results also show that the relationship is slightly positive for emerging countries compared to developed countries. The findings corroborate to a relatively significant extent the previous results for China (NECI = 56; GII = 53.1), whilst the scores are very low for Indonesia (NECI = 66; GII = 29.8) and India (NECI = 62; GII = 35.2).

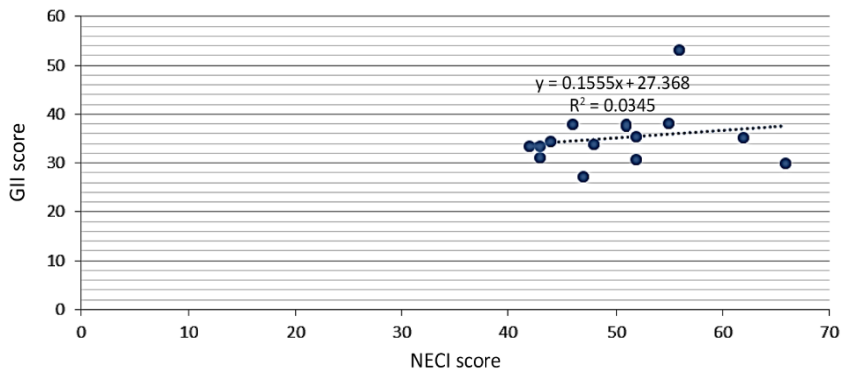

Figure 5.7. *Effect of the NECI score on the ability to innovate (sample of 15 emerging countries)*

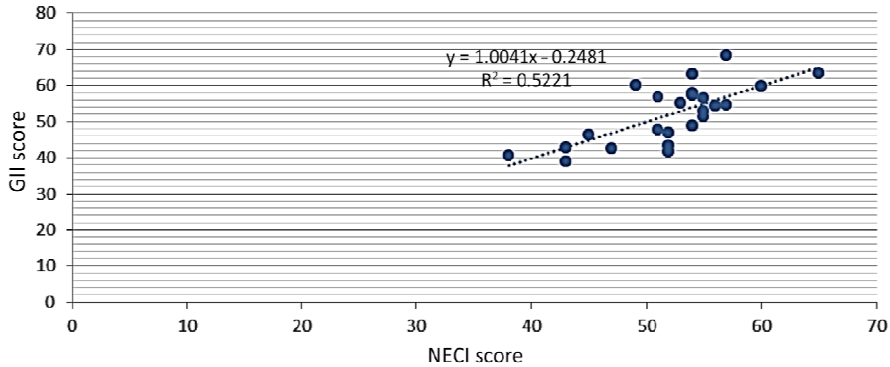

Figure 5.8. *Effect of the NECI score on the ability to innovate (sample of 24 developed countries)*

No progress will be made here in comparing the quality of the information produced by each score (DB or NECI), but it is undeniable that, even if the objectives of the choice of these two indices are similar at certain levels in their components, they do not produce the same information in terms of results, in particular because of the composite nature of each variable.

These results confirm the first hypothesis and suggest that governments should improve the climate facilitating entrepreneurial activity. In order to explore the components of innovative entrepreneurship, we analyze the potential effects of three sub-indices (determinants) derived from the NECI through the weight of each index on the overall result found so far.

5.4. The determinants of entrepreneurship for innovation

In order to analyze the main levers of the National Entrepreneurship Context Index (NECI), we focus on the components discussed in the previous chapter that correspond to common factors considered to be determinants of the NECI. The final objective is to analyze the impact of each of these factors, taken individually, on the GII. These factors are:

– government programs for entrepreneurship as measured by the GEP index;

– R&D transfer as measured by the RTD index;

– cultural and social norms, a factor measured by the CSN index.

Intuitively, each of these three factors is expected to have a positive effect on countries' innovation capabilities. The results are detailed in the following subsections. The influence of each parameter on the capacity to innovate is also discussed below.

5.4.1. *Government programs for entrepreneurship (GEP index)*

A shared idea among the researcher community suggests that government intervention in the national entrepreneurial system takes place mainly through the setting up of institutional intermediaries and/or support programs or direct or fiscal incentives (Guellec and Ralle 2001; Busom *et al.* 2017). In most developing countries, such measures have not yielded the expected results for many reasons, including a lack of appropriate skills to manage these institutions or the existence of governmental programs more or less unknown to the main beneficiaries or unsuitable to the economic and social reality and specificity of the country. Moreover, these programs are rarely assessed, corrected or adapted according to each country's strategy and its evolution over time. They are even less so when it comes to thinking about mix innovation policies along the lines of Borras and Edquist (2013).

Governmental programs dedicated to the promotion of innovative entrepreneurship are considered more complex and difficult to implement compared to public policy programs not directly targeting innovation or entrepreneurship (Allen *et al.* 2014). Indeed, in NISs that are ineffective in their structure or in the consistency of the actors' actions, such programs are even difficult and ineffective, and limited for the most part to more or less advanced technopole projects or entrepreneurship modules in training courses dedicated to engineers (Fayolle 2001). In this context, our first working hypothesis is as follows:

H3: do Government Entrepreneurship Programs (GEP index) positively influence a country's innovation capacity (GII index)?

This hypothesis is tested, as shown in the following graphs on a global sample (see Figure 5.9), for 15 emerging countries for which information is available (see Figure 5.10) and for the sample of developed countries (see Figure 5.11). The results for the first sample are very heterogeneous, and suggest further in-depth analyses on the sample composition to detect the potential impacts of each country's characteristics to explain this heterogeneity.

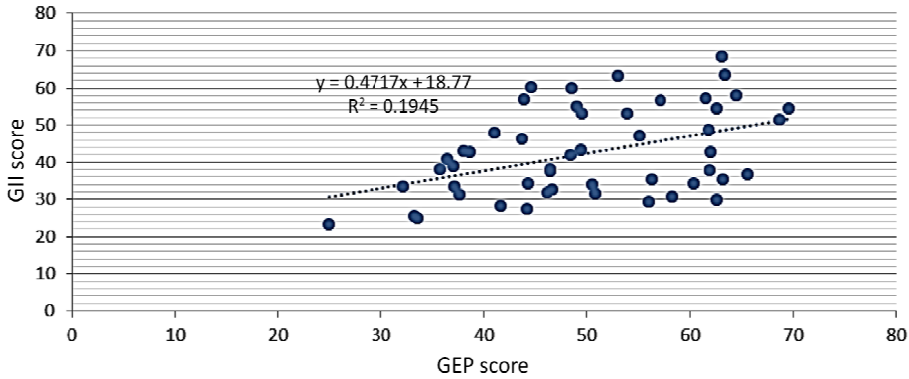

Figure 5.9. *Effect of GEP score on the ability to innovate (total sample of 50 countries)*

The following results (see Figures 5.10 and 5.11) show a confirmed correlation in each sample. However, this relationship is relatively strong for the developed countries sample, with an elasticity of almost half a point and a degree of explanation that corresponds to one-third. In the case of emerging countries, the results are very relevant in that they show that public policies in favor of entrepreneurship are almost not efficient, or even lacking, and thereby call for a thorough review in order to be more impactful.

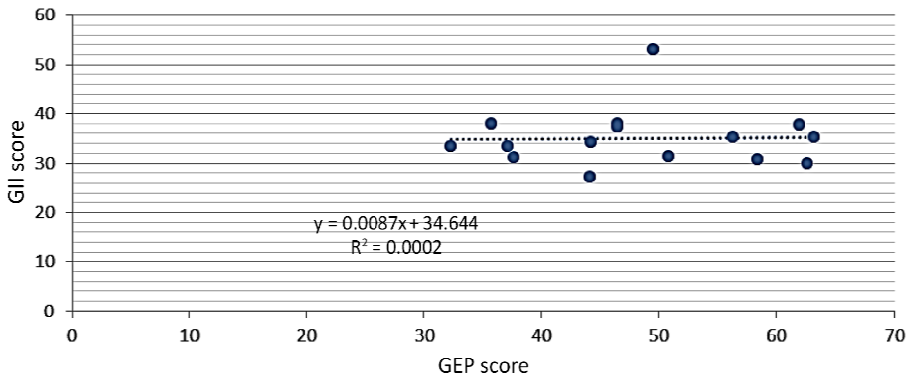

Figure 5.10. *Effect of the GEP score on the ability to innovate (sample of 15 emerging countries)*

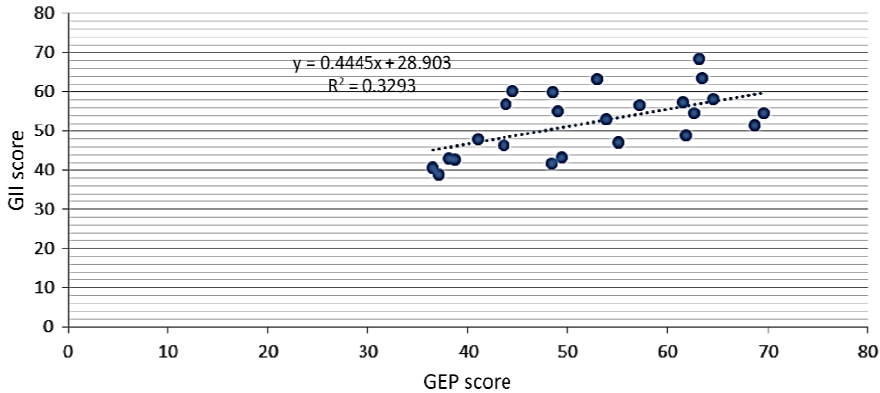

Figure 5.11. *Effect of the GEP score on the ability to innovate (sample of 24 developed countries)*

5.4.2. *R&D transfer (RTD index)*

National innovation systems in developing countries are known to be particularly fragile when it comes to transferring scientific research into technological innovation (Cohen 2004) for many reasons. First, the quality of scientific research in these countries rarely breaks down with what already exists, thereby reducing the entrepreneurial opportunities and initiatives. The second reason is linked to continued institutional inefficiency, and particularly to the lack of consistency in government action, the lack of institutional coordination structures and of incentives to foster technology transfer to market (Ben Slimane and Ramadan 2017). The third reason is linked to the lack of transfer structures within academic institutions, those pushing consequently researchers, even if they have not been trained, to ensure this transfer mission, which is not consistent and even not productive since this task requires specific skills, whose core mission is to bring scientific ideas to profitable products in market. Therefore, we test the following hypothesis:

H4: does the ability to transfer R&D results (RTD index) positively determine a country's innovation performance?

The analysis is always tested on three samples: a global sample (see Figure 5.12) to see the general trend, the sample of developed countries (see

Figure 5.13) and the sample of emerging countries for which we have information (see Figure 5.14). The results for the first global sample show a very heterogeneous trend and imply more specification for the two other samples.

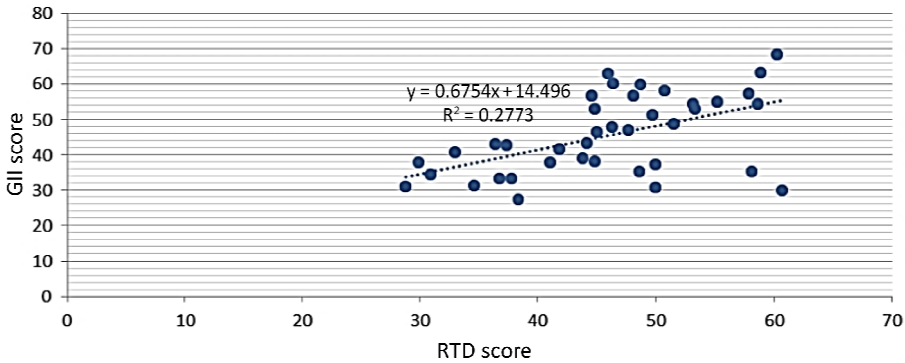

Figure 5.12. *Effect of RTD score on the ability to innovate (sample of all countries)*

The findings for developed and emerging countries are still relevant, showing a significant gap between the panel of advanced and emerging countries in terms of ability to transfer research results to the economic and social sphere (see Figures 5.13 and 5.14).

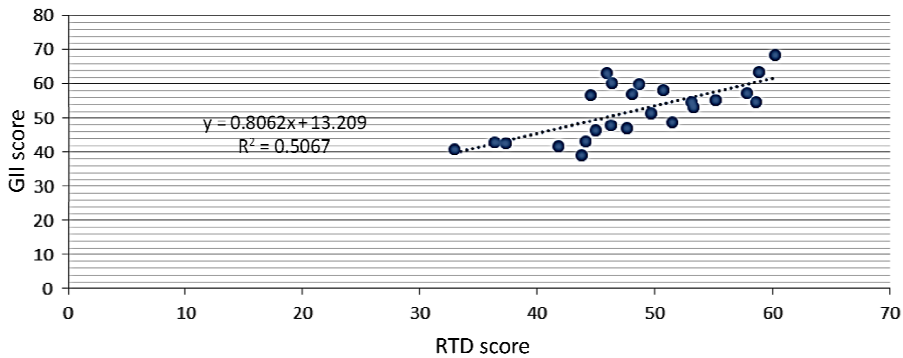

Figure 5.13. *Effect of RTD score on the ability to innovate (sample of 24 developed countries)*

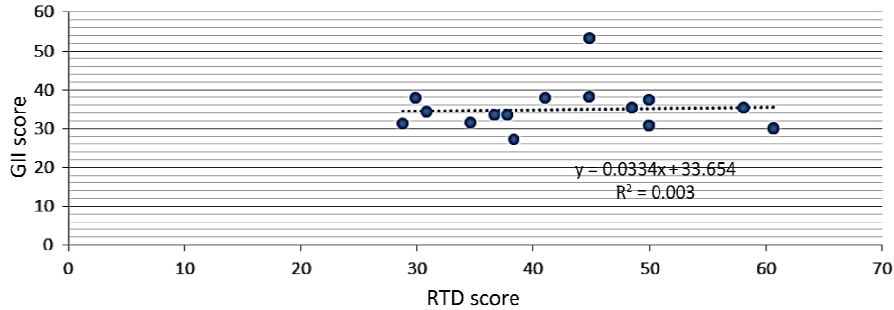

Figure 5.14. *Effect of RTD score on the ability to innovate (sample of 15 emerging countries)*

The very low coefficient for emerging countries shows the extent to which the current transfer policies or programs in these countries are inconsistent and inefficient. It also points out their insufficient capacity to generate marketable research results. The last explanation could also be based on the reluctance of researchers to enhance the results of their research, for reasons of low academic targeted incentives or simply their lack of appropriate competences because of lack of targeted training towards encouraging risk taking and developing entrepreneurial behavior to anticipate opportunities. Each reason does not merely explain the results and we believe that these explanations are interdependent and not dissociated from the institutional incentive environment. But in depth analyses should be conducted in this sense.

5.4.3. *Cultural and social norms (CSN index)*

This hypothesis concerns cultural and social norms. These aspects refer to the social capital based on shared beliefs among a group or community which may affect the behavior of individuals. At the level of a company, these social and cultural norms must be considered in the context of the cultural preferences of its clients and consumers. Within the national framework institutional policies should be adapted to local cultural and social context. Given the importance of this dimension on innovative entrepreneurial activity, the last hypothesis is as follows:

H5: does the score of cultural and social norms (CSN index) positively determine a country's score/capacity to innovate (GII)?

The results presented in the following graphs surprisingly show that, compared to the other tested factors, the cultural and social norms (CSN) indicator is the least significant one (see Figures 5.15, 5.16 and 5.17).

The results also show a positive but very weak relationship for both the total sample (see Figure 5.15) and the developed countries (see Figure 5.16). These results are relatively consistent with Kaasa and Vadi's (2010) results, who explored the relationship between cultural dimensions and the ability to develop innovation as measured by the number of patents filed in European countries. Their results show a negative relationship between cultural dimensions and patenting. These results are obviously difficult to argue, especially in the case of European countries, but we agree with Kasaa and Vadi (2010), who suggest that the cultural factor as a determinant of innovation cannot be considered alone as a factor explaining a high level of patenting.

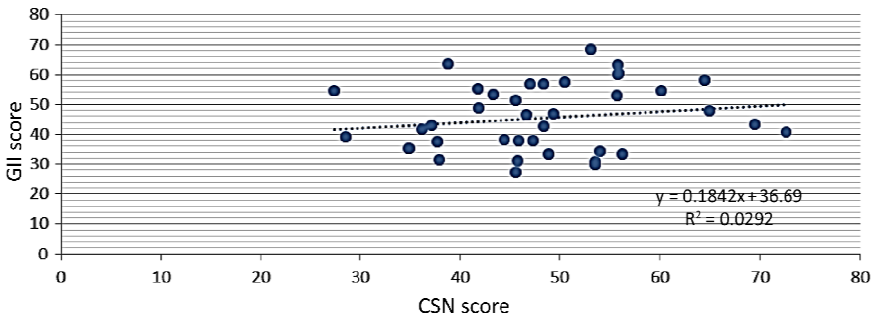

Figure 5.15. *Effect of CSN score on ability to innovate (sample of all countries)*

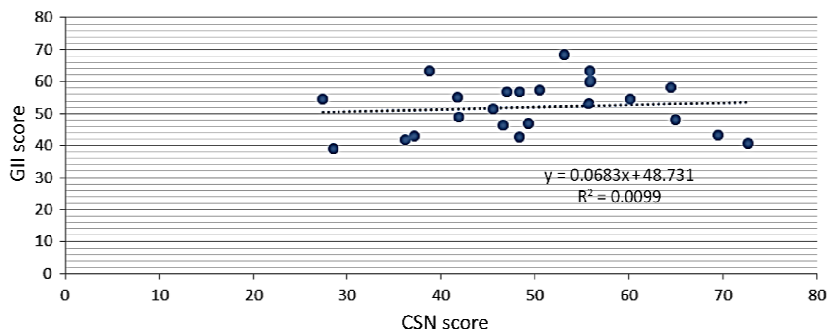

Figure 5.16. *Effect of CSN score on ability to innovate (sample of 24 developed countries)*

Even more surprising and questionable is the result for the case of emerging countries (see Figure 5.17) since the relationship even seems to be negative. While the degree of explanation for the variance is low, these results show that cultural and social norms are a real handicap to the development of a capacity to innovate, and for entrepreneurship in general.

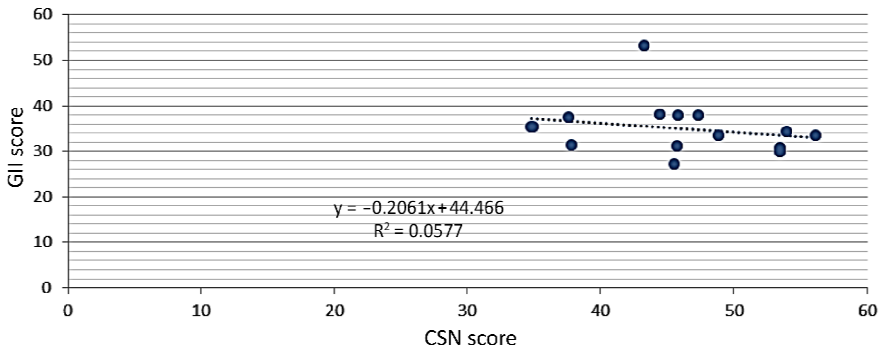

Figure 5.17. *Effect of CSN score on ability to innovate (sample of 15 emerging countries)*

However, this result is consistent with the findings of some theoretical developments and empirical studies, including those of Dakhli and De Clercq (2004), who showed that places with high social capital do not prosper when human capital is low, and who however underlined the difficulty of explaining such results. This link remains very complex, as it refers to psychological and social dimensions that are difficult to formalize, to express and to quantitatively address. In this vein, the systematic review of the literature conducted by Tian *et al.* (2018) on the effects of culture on innovation shows heterogeneous and mixed relationships that have led them to recognize the complexity of an in-depth analysis of the weight of cultural and social dimensions on innovation and thus proposed further exploration of this research niche for future studies.

5.5. Conclusion

The results of this empirical exploration lead us to a set of initial findings. First, we conclude that, regardless of the sample of countries studied, and the level of development, the general economic context and particularly that of entrepreneurship always has a strong positive impact on innovation. This

result confirms similar results, easily and notoriously found in the literature and in empirical studies. The only novelty, perhaps, is that we extend it to the level of emerging and developing countries with recent data. The effect is even slightly stronger in the latter two groups of countries. This shows the importance of such a factor and suggests that this determinant should be considered as the most important in improving countries' innovation capacity. We thus advocate continuing the efforts already undertaken by all countries towards a better entrepreneurship climate.

Regarding government programs directly supporting entrepreneurship, our results show that they are more effective in the context of developed countries than in other groups of countries. We can even argue that this effect is almost not significant in emerging countries. In order to explain this result, we suggest that even if such policies exist, their capacity to encourage and support firms to innovate seems very limited. By being not designed and set up under a systematic perspective, the scope and the effectiveness of their implementation are limited.

The capacity to translate, transfer and enhance research output into profitable and marketable products or services is an additional factor which has a direct impact on innovation. The empirical exercise carried out previously shows once again the insignificant contribution of this factor to the development of innovation in emerging countries, and even more so for developing countries. Even if this dimension seems difficult to implement, not only in emerging countries, it should be crucial to find the sources allowing such a dimension to be possible and successful. In this perspective, the technology transfer offices in universities and public research centers can help if not directly undertaking such a process.

All these results are discussed in depth in the following chapter in relation to the literature and recent studies on the subject, with a clear objective to identifying outlooks and new angles of analysis of the subject.

6

Outlooks for an Innovative Entrepreneurial System in Emerging Countries

6.1. Introduction

In the previous chapter, we adopted a methodology structured around three levels of analysis: first, at a global and multi-dimensional level, made up of testing the consistency of the correlations between the existence of a favorable entrepreneurship context and the capacity to innovate. This relationship was tested through two of the most commonly used composite indicators from the methodological framework of the World Bank and that of the Global Entrepreneurship Monitor (GEM). Hence, we examine the entrepreneurial system considering all its defined dimensions. The GEM methodological framework enables us to understand the predominant type of entrepreneurship: opportunity entrepreneurship and necessity entrepreneurship, which is important because it is the entry point for the analysis and the same indicator for all levels of development countries, be they developed, developing or emerging countries.

The first results show that the institutional environment, which reflects the government policies supporting business, has a very positive impact on innovation capacity development. The more developed the country is, the stronger this relationship is. In the same way, the pre-existence of an innovation national capacity contributes to strengthening an entrepreneurial system which encourages entrepreneurship and supports opportunity entrepreneurship.

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Considering the composite dimension of each indicator, our results did not enable exploring the influence of each component weight considered separately on innovation capacity. However, we show the importance of public policies promoting entrepreneurial activities and also their effectiveness in triggering a positive effect on innovation capacity. This approach also supports the idea that, in a complex and systemic context, the composite indicators should be considered together, and follow a complementarity of actions. The main limit of this approach is linked to the global trend it provides, but it pushes the analysis towards exploring the weight of each component of the indicators in explaining the correlation between the entrepreneurship context and innovation capacity.

In this chapter, we will discuss the factors that influence innovative entrepreneurship, including government programs for entrepreneurship, R&D transfer, and cultural and social norms, by comparing them with recent literature and studies. This discussion will allow us to propose in the third section of the chapter a theoretical model of a national innovative entrepreneurship system adapted to emerging countries, which takes into consideration the specific obstacles for innovative entrepreneurship in emerging countries. This conceptual model is presented as a first attempt to highlight the main components of an innovative national entrepreneurship system adapted to the emerging countries.

6.2. The determinants of innovative entrepreneurship

In the previous chapter, we explored three factors specific to the business environment most likely to influence innovative entrepreneurship. These factors are aligned to the latest theoretical developments and empirical studies that analyze the determinants of innovative entrepreneurship and link entrepreneurship to innovation and development.

We first selected the indicator of policy programs targeting entrepreneurship (GEP index). This indicator refers to the role played by the government through setting up appropriate public and institutional policies to support and encourage the development of entrepreneurship activities. The second indicator is technology transfer (RTD index), and refers to the process of transformation and diffusion of R&D activity into marketable results, whether they are innovative products or services. The third factor is cultural and social norms (CSN index) and refers to the contribution of

cultural and social capital to innovative entrepreneurial activity, which varies considerably from one country to another, and even from one region to another within the same country. Taking these three factors into account could potentially explain differences in development between countries. These factors provide information on the place that innovation occupies in the framework of strategic priorities in emerging countries and the pivotal drivers of opportunity entrepreneurship.

As explained in the previous chapters, the local context is very complex, with a variety of institutional, cultural and socio-economic dimensions that are specific to each country. This context follows a national strategy; the latter cannot be standardized and generalized to all countries regarding innovation and entrepreneurship. Moreover, the indicators used are composite and thereby affect their weight in an innovative entrepreneurship system which calls for further exploration on dimension assessment. The institutional factor, for example, must be understood in relation to government programs targeting innovative entrepreneurship activities, not only including the programs directly supporting SMEs at all levels (national, regional, local) but also in terms of quality from innovation and operational angles. This factor, having an integrative aspect, should ensure operational coordination towards an overall constancy of public policy implementation. According to the methodological framework of the GEM, this factor is crucial for the development of an efficient entrepreneurial system, in which connections, collaborations, financing arrangements and facilitation structures to service access and market are the determinants of its effectiveness. However, and as emphasized in the literature, there are still remaining constraints related to the difficulty and the complexity of setting up and implementing programs for innovative entrepreneurship (Allen *et al.* 2014).

Our results clearly show that the contribution of each selected factor to innovative entrepreneurship will be different whether in developed, emerging or developing countries. As expected the results confirm the effectiveness of government intervention on innovation performance in developed countries, reflecting the development of agencies, targeted direct and indirect programs for entrepreneurship, as well as the availability of technical and financial incentive programs supporting and fostering entrepreneurial activity development. Surprisingly the results are less impacting for emerging countries. In other words, public policies targeting entrepreneurship have no significant impact on innovation performance for

these countries. The first explanation suggests that government actions and policies are not as effective in practice in creating a supportive and appropriate context fostering the development of an innovative capacity. This explanation is obviously counter-intuitive. We suggest that the policies advocated in emerging countries are those inspired by other contexts, those of the most developed countries. Another issue arises, particularly with regard to the possible lack of consistency in the defined and implemented government policies particularly referring to the existence of cumulated initiative layers, without any significant adjustments, or monitoring new policies' implementation in order to ensure an overall effectiveness. Additionally, the relay bodies often fail in ensuring a coordination mission between system actors towards an overall coherence (Ben Slimane and Ramadan 2017). In the long run, this institutional failure can be unbearable and even damaging in a context of technological exclusion risk; a shift to underdevelopment is therefore relatively rapid. This result thus calls for the necessity to first review the current public policies that are widely implemented so that they are better adapted to the context of these countries and also to ensure a certain overall consistency of the public policies' actions, according to clearly defined national strategic orientation for innovative entrepreneurship. It should be noted that the public policies used in these countries are borrowed from developed countries where structure, strengths and level of development are different.

The second factor tested is the technology transfer RTD index which refers to the links between innovation (through R&D activity) and the market, particularly the extent to which investment in R&D creates new business opportunities that enable the transformation of innovative results into marketable products or services. According to the European Commission (2013), knowledge transfer encompasses all the functions that can improve the use of knowledge developed in the research sector for the benefit of society and citizens, with a perspective of disseminating knowledge and creating added value in the market. Knowledge transfer activities are thus placed between knowledge production activities (research) and economic activities in which knowledge is converted into market value (Holi *et al.* 2008). The European Commission had identified a set of performance single indicators, including inventions, patents, new start-up creation and R&D agreements with companies. The analysis of the relationship between the technology transfer (RTD) indicator and a country's innovative capacity is very significant and relevant according to the level of development of countries. Unsurprisingly, the coefficient is high for

developed countries and very low in the case of emerging countries. This result reveals a multitude of dysfunctions rather than a single one. Given the multidimensionality of the tested factor, and in light of the results we can suggest a variety of reasons, notably the lack of effectiveness, or even absence of public initiatives aiming at linking the research sphere activities with the economic sphere (Ben Slimane and Ramadan 2017), the inexistence of dedicated programs promoting entrepreneurial spirit and creativity, which would in appropriate circumstances allow entrepreneurial activities to evolve from the stage of imitation and adaptation of existing products to the stage of innovative entrepreneurship (Szirmai *et al.* 2011).

In emerging countries where R&D investment is low, entrepreneurs adopt an imitative behavior based on the improvement and adaptation of existing products to local contexts, which requires, admittedly, a threshold of specific skills from R&D, but which remains low to generate sustainable economic growth. This calls again for an in-depth analysis of the effectiveness of the public policies and their contribution to fostering and encouraging entrepreneurship activities (Minniti and Lévesque 2010).

The capacity of innovation refers not only to investment in R&D but also to technical skills and entrepreneurial qualifications to generate economic added value of innovation. These competences should not be considered separately within the research sphere (universities and research centers) or in the economic sphere (companies), but rather in a complementary and integrated perspective. Here the government plays its role in putting in place targeted policies to facilitate the transfer of knowledge, to encourage the creation of research-based start-ups (spin-offs), in setting up institutional agencies whose mission is to facilitate knowledge transfer, licensing and ensure consultancy services. Additionally, government has to simultaneously offer direct and indirect incentive tools, such as targeted subsidies, specific and adapted funding, tax credits for research and innovation, and many other possible supportive schemes.

The third factor analyzed is cultural and social norms (CSN index). This challenging and promising factor has just started being explored (Wach 2015; Estrin *et al.* 2018; Tian *et al.* 2018). According to the GEM methodological framework, this factor refers to the influence of shared local social and cultural norms in promoting entrepreneurial behaviors. This factor has been discussed in the previous chapters, and we have noted that it is still a vast and complex subject to be further studied. The socio-cultural dimension is visible in shared

beliefs and thought systems that have a great influence on individual behavior. The cultural context significantly influences the way a company is run, allowing the adaptation of company activities to the socio-cultural requirements of a given local community (Glinka and Thatchenkery 2013).

Social and cultural norms have a very subjective aspect but also evolving psychological dimension. In this sense, Wach (2015) shows that in entrepreneurial cultures, the status of the entrepreneur is widely appreciated in society and that the media report a lot about national entrepreneurial *success stories*. This study also shows that opportunity-driven entrepreneurship is positively correlated with entrepreneurial culture, while it is negatively correlated with necessity-driven entrepreneurship. Such results are instructive towards understanding the influence of collective psychology on entrepreneurial motivations and, in a wider extent on the relationship between social culture, notably entrepreneurship perception and the development of innovative opportunity entrepreneurship.

The results in Chapter 5 show a weak correlation between social and cultural norms and the capacity to innovate in the case of emerging countries, which corroborates the results of the few works exploring this aspect and applied to emerging countries (Dakhli and De Clercq 2004; Estrin *et al.* 2018; Tian *et al.* 2018). In this sense, Dakhli and De Clercq (2004) show that countries with high and predominant social capital do not prosper when human capital is low. For example, some communities or regions may have too much social capital, but highly unified social groups can impose significant constraints on members of local communities, preventing them from joining larger, more extensive and perhaps more innovative networks (Woolcock 1998).

Moreover, trust plays a driver role for innovation (Dakhli and De Clercq 2004). By facilitating exchanges and reducing the number of controls and formal hierarchies that are costly and time-consuming, trust promotes broader, more relaxed cooperation and a freer exchange of information. This freedom of informal communication and exchange can sometimes lead to more R&D-related activities and opportunities for invention (Jones and George 1998). This paves the way to exploring the role of institutional actions in fostering the link between social and cultural norms and the development of human capital.

6.3. Outlooks for an adapted innovative business model

The results of Chapter 5 show, under a systemic angle, the multidimensionality and complexity of the drivers of innovative entrepreneurship and therefore clear the way for an extensive examination of the effectiveness of existing public policies and the consistency of such policies regarding entrepreneurship and innovation as pillars of development.

The fact that a country is emerging does not necessarily guarantee a relatively high level of development in terms of innovation or even the existence of a genuine long-term strategy for innovative entrepreneurship. With the analysis methodology, we have been able to identify sets of positive as well as negative correlations linking innovation, entrepreneurship and economic development.

The results lead to further thought on the determinants of a performant National Innovation System (NIS) in which entrepreneurship must be fully part of the system and considered a cross-cutting dimension. NISs are underperforming in the majority of emerging countries. The literature now provides us with detailed information on "how to fill the gaps" of this system. To this regard, coordination and coherence actions between the different actors should not be neglected (Ben Slimane and Ramadan 2017). We also know what should "be avoided", namely the hierarchical and prescriptive obstacles that refer to government pervasiveness with neither subsequent positive policies nor coordination and facilitating actions. Finally, another aspect not to be neglected concerns local statistical indicators that should be integrated in the decision-making process, notably those qualitative and cultural aspects. Although these aspects seem to be normative, they can help to improve and better adapt offers.

Our study was not broken down into each composite indicator towards exploring its components and their respective weight in explaining the conditions that enable innovative entrepreneurship for development; however, our results allow us to propose the following five avenues for future exploration, depending on the specificity of the data in each country:

– the business environment remains an important prerequisite enhancing innovation and entrepreneurship in a context of economic development. *Ad hoc* and palliative initiatives are not enough to ensure long-term development. Many countries are practicing generic and not targeted policies without convincing results. Adopting a systemic vision, by filling the institutional and legislative

gaps, seems essential to ensure development in the long run. In this perspective, defining a clear and consistent strategic economic and social vision is crucial along with coordinating actions and seems to be the most appropriate way to increase the chances of effectiveness of this productive environment;

– economic, industrial and investment incentive policies already exist in many countries of the world, developed or less developed, notably upgrading programs, competitiveness funds and investment regulation laws that provide investment rules and fiscal frameworks and enhance favorable contexts for business investment. These policies often have direct and indirect impacts on the innovative capacity of these countries. However, the additional actions to ensure the consistency of undertaken programs is necessary in order to avoid overlapping actions that affect the efficiency of each actor's action as well as of the overall combination. In the literature, this comes under what is called policy mix (Flanagan *et al.* 2011). Unfortunately, many strategic and operational actions remain to be done in this area.

– give further impetus to the transfer process. Once again, government involvement, through institutional policy, must promote technology transfer, by facilitating administrative procedures, that are often slow and costly, and by increasing financial incentives and channels to help develop a meaningful technological absorptive capacity which drives an innovation capacity. This must be aligned with a policy which reconciles and promotes the collaboration between the education sphere, notably universities and research laboratories, and the economic sphere, by fostering technological cooperation programs between universities and private companies, through common research projects, apprenticeship, and financial and tax credits. Simultaneously, the government must set up targeted policies to support the development of research-based start-ups by adapting academic programs to promote entrepreneurship curricula and by setting up transfer agencies to facilitate the research sphere to the industrial sphere;

– very often, innovation is rather approached from technological and industrial angles. Specific industrial policies must be set up to promote local human resources as well as natural ones that should be advocated in order to align innovation policies to national human capital and national resources and thus promote appropriate competitive sectors.

At the psychosocial level, it would be important to build a positive entrepreneurial culture and to implement structural and repetitive actions to change mindsets about the citizen's perception and behavior with money,

profit, business and success. This aspect is still lacking and remains complex to explore but paves the way for further country-cultural exploration.

These recommendations lead us to propose a model for the development of a national innovative entrepreneurial system adapted to emerging countries, in which we highlight the most pivotal factors, taking into account the weaknesses underlined both in the literature review and the empirical analysis (see Figure 6.1).

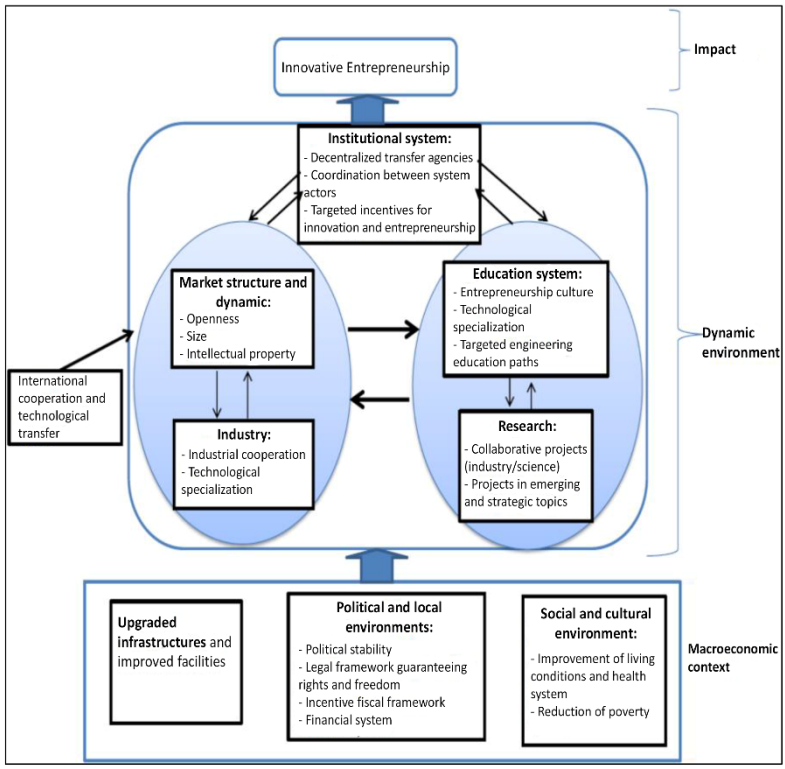

Figure 6.1. *Proposal for a national system of innovative entrepreneurship*

As shown in this model, economic development is based first of all on a strong and reliable "macroeconomic context", which is composed of socio-cultural and political conditions that are critical and can provide important information for the socio-economic health and wealth of a country. This set of conditions influences the potential weight and the impetus that the

macroeconomic context can give to the industrial dynamics. For example, it is currently accepted that socio-cultural conditions have an influence on a country's health. A country in which living and health conditions do not reach the minimum threshold cannot claim to have good and sustainable "economic" health over the long term. Moreover, political and institutional conditions are prerequisites that influence economic survival and development, as well as the potential motivations to engage new venture creation. Therefore, fragmented and outdated infrastructures do not provide opportunities for dreaming and having ambitions for change and innovation. Otherwise, they only contribute to fostering the entrepreneurship of necessity to survive.

In order to ensure economic dynamics, two sub-systems must operate closely together and act towards a mutual learning and economic added-value perspective: the education and research sub-system, and the economic system. These interactions must both be based on spontaneous mechanisms and also be developed under a formalized institutional framework which fosters a collaborative approach and alignment of actions. This interaction will therefore foster long-term learning processes, strategic orientations in promising technological sectors, an increase of the knowledge basis in both spheres, and the development of core qualified competences. Capacities are thus built over time and can influence the development of an entrepreneurial culture focused on innovation.

From the socio-cultural norms angle, the collaborative interactions between the two sub-systems, supported by government policies, can contribute to building an ambitious entrepreneurial educational culture focused on innovation. This point is very important and is still lacking in some emerging countries. This environment contributes to building an entrepreneurial DNA that is transmitted over generations, as is the case for Great Britain, the United States and Israel (Toma *et al.* 2014).

The institutional system in place, both at the national and local levels, must offer more targeted incentives and appropriate supportive tools in order to reduce the obstacles hindering the development of entrepreneurial activity, with a final aim of helping individuals to transform their ambitions into innovative entrepreneurial activities.

6.4. Education in an innovative entrepreneurial system

The analysis of the education system targeting the development of entrepreneurship has for a few years attracted increasing interest in institutional analyses. The OECD report (2008) explored the entrepreneurship education system in 22 transition economies. The results highlight the importance of specialized units for co-ordination between research and teaching, showing some good examples of programs, particularly in terms of international connectivity. More recently, the Lackéus (2015) report for the OECD emphasizes the added value of entrepreneurship as the essence of entrepreneurship education. To this end, Lackéus (2015) proposes a variety of approaches to entrepreneurship education. For each approach, the author proposes specific levels and related added values. A given approach may, for example, have an added value at the individual level, assessed through competence development, and economic added value assessed in terms of job creation or innovation for organizations and society in general.

This study puts forward the importance of approaches used in the educational sub-system in terms of systemic impact on development. With the multiplication of international initiatives focused on entrepreneurship, it is important to explore the education strategy for entrepreneurship in emerging countries and to consider it as a pillar of innovation-based development and which has the merit of being sustainable.

Rethinking the education system for entrepreneurship towards building new skills and competences that are sources of innovation implies first rethinking teaching by supporting multidisciplinary approaches that open up possibilities for developing entrepreneurial specialization trajectories and promote new fields discovering, for instance, nanotechnologies, digital technologies or artificial intelligence. Moreover, interdisciplinary interactions stimulate the transfer of scientific results into promising products and services to market. They enable the acquisition of complementary inputs and cognitive resources. They then promote mutual learning and innovative training and enlarge technological and market understanding that avoid risk aversion. Finally, they open up possibilities for the development of marketable innovations, sources of income. At a personal level, they contribute to personal fulfilment, creativity, autonomy and initiative. New professional orientations can thus take shape, including smart entrepreneurship.

In this evolving world, where competitiveness is increasingly transitory, this systemic dynamic must be used to achieve sustainable and national economic performance, but under certain conditions. Indeed, this dynamic can only be fertile if there is substantial tangible and intangible institutional investment to support this final aim, including providing appropriate facilities such as digital tools, resources and infrastructures dedicated to research. These resources must be provided within the framework of a national policy aiming at encouraging entrepreneurship in innovative sectors for economic and strategic long-term added value.

This national strategy must be defined and implemented towards breaking down disciplinary silos and fostering fertile interdisciplinary interactions. This strategy must include the definition of the teaching and research system strategies and objectives, the methods and tools for implementation, and processes for assessment and adjustment. The benefits in terms of strengthening common, diversified and complementary knowledge bases increase the absorptive capacity and thus the innovation-based development perspective.

At the social level, this institutional commitment contributes to the establishment of an innovative entrepreneurial social culture, which could change cultural and social norms towards building a positive perception of entrepreneurship economic and social impacts, an aspect that is still lacking in some emerging countries.

Conclusion

In a steadily evolving environment, innovation is a prerequisite for preserving national economies from instability caused by economic and political change over time. Emerging economies have started restructuring their national systems, and the actors they are composed of, with their interactions boosting and empowering their economies with the discovery of new sources of profit (Uzunidis 2015). Even if the approach was sometimes experimental and often based on trial and error, without any long-term strategic vision, these endeavors have nonetheless fostered economic dynamics and, in some cases, enabled entrepreneurial innovation activities.

The role of entrepreneurship in economic development has remained for a very long time marginal, if not neglected, in the economic literature. In recent years, the "innovative" entrepreneur in emerging countries, as a key factor of "smart" development, has aroused renewed interest in the academic community (Acs and Amoro's 2008; Marcotte 2014; Raposo *et al.* 2014; Zaki and Rashid 2016; Ferreira *et al.* 2017). The originality of these studies lies in the emphasis on exploring the determinants of innovation from the perspective of the entrepreneurial system analysis (Estrin *et al.* 2018; Tripathi and Brahma 2018). The new insights provided by these studies have been facilitated by the analytical framework of the Global Entrepreneurship Monitor (GEM) initiated in 1999, which produces both macroeconomic and microeconomic data that address institutional indicators but also behavioral and attitude ones linked to entrepreneurship activities from different geographical regions and countries.

The review of the literature in chapters 1 and 2 has enabled highlighting the role played by entrepreneurship in economic development, under

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different angles of analysis, notably according to the development economy perspective, the social approach of the entrepreneur, the innovative firm analysis, and the management perspective. The latter refers to organizational and behavioral dimensions and provides information on the entrepreneur's motivations, aspirations, constraints, skills and actions that are important in the entrepreneurial process and affect its activity development. Recent literature emphasizes the role of the national context in the economic entrepreneurship value-added activity, which enables the diffusion of innovation and contributes to structured and sustainable economic development over the long term (Szirmai *et al.* 2011; Acs *et al.* 2014, 2016). The theoretical developments, with all the insights that they can intrinsically bring in understanding the contribution of entrepreneurship activity to innovation and economic development should not, however, overshadow assessing their validation in practical experiences and situations that are themselves sources of knowledge and good practice.

Although we have not answered the question of "why" results are not often similar and cannot be generalized to all situations, we have tried to explain the evolvement of theoretical thinking by referring to the main streams of literature and contexts, while underlying the necessity for convergence of the various levels of analyses towards consistent contributions. The analysis of the various international indicators, mixing both entrepreneurial and innovation-related dimensions, shows that there are "common" reasons that explain the obstacles faced by emerging countries to develop innovative entrepreneurship.

We first show that public/governmental policies dedicated exclusively to entrepreneurship are not sufficiently effective in these countries, and even less so for developing countries. When such policies even exist, their capacity to encourage firms to innovate seems very limited. The fact that they are not set up and then implemented from a systemic perspective with a clearly defined long-term strategy considerably reduces their scope and calls for further adaptation to the context of each country.

Second, the ability to translate, transfer and disseminate research results into marketable and profitable products and services is a crucial, if not central, driver for innovation. The empirical exercise conducted in Chapter 5 supports the critical role of this capacity in the development of innovation in emerging and developing countries. Even if this innovative capacity seems to be lacking when it comes to its implementation, the unstable and

discontinuous nature of the "emerging" positioning, appropriate institutional policies and support actions must be put in place in order to ensure a better efficiency of actions. Existing policies in developed countries can be very instructive and insightful, particularly the role played by technology transfer offices in universities and public research centers in initiating and facilitating such a transfer and valorization process.

Moreover, the social and cultural factor has a negative effect on the innovative capacities in emerging countries. This result confirms other recent studies on the topic and calls into question the role of family and, broadly, social ties and social culture in influencing entrepreneurship behavior and motivation. In the "emerging" countries group, the political contexts differ and the trajectories of economic development are also different. Thereby, the weight of the socio-cultural dimension should be considered with a hope to explaining among other dimensions the differences in economic development, based on innovation, as well as the determinants of entrepreneurship development. Only an institutional policy adapted to social and cultural history could mitigate this negative impact.

Another factor already identified as a driving factor for entrepreneurship development in Chapter 6, and whose impact is transversal, is the education system. The underlying idea is that education must be explored and developed beyond traditional boundaries (Hughes 2019). The education system needs to be adapted to changes in knowledge and society in this evolving international context, particularly due to the speed and the pace of innovation and its impact at all levels: social, economic and technological renewal. Teaching entrepreneurship for technology and engineering disciplines can help educate a new generation of entrepreneurs, trained not only to obtain technical qualifications, but also to follow courses that broaden their core fields (Atkinson and Pelfrey 2010). The opposite is also true; business students must acquire technical knowledge in order to enlarge their knowledge basis in other scientific fields and foster their motivations to detect new ideas and thus explore innovative entrepreneurial opportunities.

Towards complementarity consistency of actions, the interaction dynamics take place at different levels (local, national and global) between the different actors of the national system (individuals, scientific communities, enterprises and public institutions) and imply the usage of a variety of complementary knowledge and know-how (scientific knowledge, experience, market skills, financial skills). In this context, it is essential to

develop an efficient education system, capable of endowing the entire system with valuable human capital (researchers/innovators/entrepreneurs), whose interactions enable developing marketable solutions that meet the needs of the society, and also finding new diversified engines for economic growth.

This system contributes greatly to the development of an entrepreneurial culture at the national level. Comparative work of Wach (2015) using GEM data and applied to European Union countries shows a positive correlation between the existence of an entrepreneurial culture at the national level and the development of entrepreneurial activities. This study also shows that the higher the level of entrepreneurial culture, the lower the level of necessity entrepreneurship and the higher the level of opportunity entrepreneurship.

International institutional reports, notably the report "Education at a Glance 2019" (OCED 2019) or "Learning to Realize Education's Promise" (World Bank 2018) emphasized the inescapable role of education in any process of economic catch-up. The cases of China, South Korea, Singapore and other emerging countries are perfect examples. The contribution of education to economic performance should not merely be assessed through the classical indicators such as "education expenditure" in relation to GDP or the evolution of the percentage of illiterates in any country. Rather, it should also be necessary to include into assessment new factors, including the quality of education and its impact in order to rightly assess the innovation and entrepreneurship development in the long run. In many emerging countries, questions are arising notably about the return on investment of their education investments over several decades and their economic and social impacts. The countries of North Africa and some countries of South America are today in this critical situation. It is therefore not surprising to see these countries facing difficulties in achieving success, both in the field of innovation and entrepreneurship.

The existence of a consistent and coherent national entrepreneurial system is essential to boost and even foster mutual interactions between actors and thus reduce the level of uncertainty inherent in the entrepreneurial activity. The actors of the system offer not only the right infrastructure, facilities and steady environment but also appropriate complementary knowledge, experiences and tools, including funds and advisory arrangements that favor new venture creation.

Finally, emerging markets are most often large in size, which can be a potential source of profit for innovative entrepreneurs, and on a broader scale, can also be a real field of promising opportunities to respond in an innovative way to as yet unresolved social and environmental challenges.

Appendix

The graphs in Figures 5.1 to 5.5 use the data available in Table A.1, which shows respectively the scores for the data on ease of entrepreneurship (DB score) and innovation performance by country (GII score).

Country	GII Score	DB Score
China	53.1	73.64
Estonia	50.5	80.5
Czech Republic	48.7	76.1
Cyprus	47.8	71.71
Slovenia	46.9	75.61
Latvia	43.2	79.59
Malaysia	43	80.6
Slovakia	42.9	75.17
Bulgaria	42.6	71.24
United Arab Emirates	42.6	81.28
Poland	41.7	76.95
Lithuania	41.2	80.83
Croatia	40.7	71.4
Ukraine	38.5	68.25
Thailand	38	78.45
Vietnam	37.9	68.36
Russian Federation	37.9	77.59
Chile	37.8	71.81
Moldova	37.6	73.54

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Country	GII Score	DB Score
Romania	37.6	72.3
Turkey	37.4	74.33
Qatar	36.6	65.89
Montenegro	36.5	72.73
Mongolia	35.9	67.74
Costa Rica	35.7	68.89
Serbia	35.5	73.49
Mexico	35.3	71.41
India	35.2	67.33
South Africa	35.1	66.03
Georgia	35	83.28
Kuwait	34.4	62.2
Saudi Arabia	34.3	63.5
Uruguay	34.2	62.6
Colombia	33.8	69.24
Brazil	33.4	60.01
Iran	33.4	56.98
Tunisia	32.9	66.11
Brunei	32.8	72.03
Armenia	32.8	75.37
Oman	32.8	67.19
Panama	32.4	66.12
Peru	31.8	68.83
Bahrain	31.7	69.85
Philippines	31.6	57.68
Kazakhstan	31.4	77.89
Mauritius	31.3	79.58
Morocco	31.1	71.02
Bosnia and Herzegovina	31.1	63.82
Kenya	31.1	70.31
Jordan	30.8	60.98
Argentina	30.7	58.8
Jamaica	30.4	67.47

Country	GII Score	DB Score
Azerbaijan	30.2	78.64
Albania	30	69.51
Macedonia	29.9	81.55
Indonesia	29.8	67.96
Belarus	29.4	75.77
Dominican Republic	29.3	61.12
Sri Lanka	28.7	61.22
Paraguay	28.7	59.4
Lebanon	28.2	54.04
Botswana	28.2	65.4
Tanzania	28.1	53.63
Namibia	28	60.53
Kyrgyzstan	27.6	68.33
Egypt	21.7	58.56
Ghana	24.5	59.22
Pakistan	24.1	55.31
Algeria	23.9	49.65
Nigeria	22.4	52.89

Table A.1. *Table of World Bank and Davos Forum Doing Business (DB) data for the Davos Forum's Global Innovation Index (GII) (2018–2019) (source: adapted by the authors; in red: emerging economies). For a color version of this table, see www.iste.co.uk/benslimane/entrepreneurship.zip*

The graphs in Figures 5.6 to 5.14 use data from Table A.2 corresponding respectively to the data for the innovation performance indicator (GII score) and the national context level indicator for entrepreneurship (NECI score).

Economy	GII Score	NECI Score
Switzerland	68.4	57
The Netherlands	63.3	65
Sweden	63.1	54
United Kingdom	60.1	49
United States	59.8	60
Germany	58	54

Economy	GII Score	NECI Score
Ireland	57.2	54
Israel	56.8	51
South Korea	56.6	55
Japan	55	53
Luxembourg	54.5	57
France	54.4	56
China	53.1	56
Canada	53	55
Austria	51.3	55
Spain	48.7	54
Cyprus	47.8	51
Slovenia	46.9	52
Italy	46.3	45
Latvia	43.2	52
Slovakia	42.9	43
Bulgaria	42.6	47
United Arab Emirates	42.6	59
Poland	41.7	52
Croatia	40.7	38
Greece	38.9	43
Thailand	38	55
Russian Federation	37.9	46
Chile	37.8	51
Turkey	37.4	51
Qatar	36.6	67
Mexico	35.3	52
India	35.2	62
Saudi Arabia	34.3	44
Uruguay	34.2	47
Colombia	33.8	48
Brazil	33.4	42
Iran	33.4	43
Panama	32.4	40

Economy	GII Score	NECI Score
Peru	31.8	45
Kazakhstan	31.4	49
Morocco	31.1	43
Argentina	30.7	52
Indonesia	29.8	66
Dominican Republic	29.3	46
Lebanon	28.2	47
Egypt	27.2	47
Guatemala	25.5	43
Madagascar	24.8	41
Mozambique	23.1	32

Table A.2. *Data for the innovation performance indicator, measured by the GII, and the national context indicator for entrepreneurship, measured by the NECI (source: adapted by the authors; in red: emerging economies; in green: advanced economies). For a color version of this table, seewww.iste.co.uk/benslimane/entrepreneurship.zip*

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In analyzing the complex link between entrepreneurship, innovation and development in the context of the emerging world, this book offers a holistic reading of this triptych based on a theoretical foundation that is itself subject to controversy: the national system of innovative entrepreneurship. The "emerging" nature of the studied countries provides specific insights, and allows the theoretical developments to be fine-tuned to the current issues.

In a context that makes competitive advantages transient, emerging markets can provide a real test case for responding in a structural and innovative way to social and economic challenges, thus ensuring the sustainable performance of their innovative entrepreneurial system.

Entrepreneurship and Development advocates for the integration of the social and cultural history of a given country within the framework of public policies, and proposes more targeted actions for innovative entrepreneurial activities. Moreover, the education system must integrate the entrepreneurial culture and foster multidisciplinarity to support the transfer of knowledge to markets.

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