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Innovation and Entrepreneurship for the growth and diversification of the GCC Economies

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Abstract

The region of Gulf Arab states has vast reserves of petroleum that make it a vital source of the global economy. The reduction in oil prices and, in general, their high volatility pose strong challenges to the GCC economies. In the present contribution we argue that innovation and entrepreneurship can be the main drivers to diversify and develop the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE). In fact, in the long-run, diversified economies perform better than mono-sector economies. Moreover, innovation and entrepreneurship are key factors that trigger economic development and contribute to the degree of competitiveness, playing also an important stakeholder role in boosting the overall economic growth rates. Therefore, having an entrepreneurial and innovative capacity is very important in order to facilitate competitiveness and growth in a region such as that of GCC countries.

More specifically, in this article we analyze the innovation environment in the GCC countries and their innovation performance. Also we consider the innovation policies, underlining the important role of institutions for innovation. To support our analysis, we take into account of several data and information sources, and surveys. In addition, we provide an overview on entrepreneurship in the GCC countries and grasp the current state of entrepreneurship in these countries. We also aim to identify the conditions to stimulate entrepreneurship and qualify the human capital in order to diversify and develop the non-oil private sector and improve the competitiveness of the GCC economies.

Keywords: Innovation, Entrepreneurship, Diversification, Competitiveness, Growth, GCC countries

JEL Classification: L10, L26, M13, O31, O38

1. Introduction

In the present article we argue that innovation and entrepreneurship can be the main drivers to diversify and develop the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE). This region of Gulf Arab states has vast reserves of petroleum that make it a vital source of the global economy. However, the reduction in oil prices and, in general, their high volatility pose strong challenges to the GCC economies. For oil-producing countries, in fact, the decline in oil prices is having significant effects on production, consumption and public finance, thus creating an uncertain economic environment. Several studies, including those from the World Bank (e.g. Lederman, Maloney, 2007; Hesse, 2008), have established that in the long term diversified economies perform better than mono-sector economies. We maintain that innovation and entrepreneurship are key factors that trigger economic development and contribute to diversification of the economies and their degree of competitiveness, but these factors also play an important stakeholder role in boosting the overall economic growth rates. Innovation, in particular, is intimately tied up with changes in the structure of the economy. Further, innovation is a main driver for competitiveness and business success. Since competition in the global economy has increasingly become knowledge and innovation driven, technological advance and innovation in the widest sense have become the keys to growth both in traditional industrial sectors and in high-tech sectors, and also in services. In addition, entrepreneurship spurs economic growth and employment by favoring a competitive environment and by supporting a globalised market infrastructure. Therefore, having an entrepreneurial and innovative capacity is very important in order to facilitate competitiveness and growth in a region like that of GCC countries.

More specifically, in this contribution we analyze the innovation environment in the GCC countries and their innovation performance. Also we consider the innovation policies, underlining the important role of institutions for innovation. To support our analysis, we take into account of several data and information sources, and surveys. In addition, we provide an overview on entrepreneurship in the GCC countries and grasp the current state of entrepreneurship in these countries. We also aim to identify the conditions to stimulate entrepreneurship and qualify the human capital in order to diversify and develop the non-oil private sector and improve the competitiveness of the GCC economies.

2. The GCC countries and the diversification problem.

The GCC is a region of 6 countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE. Altogether they have a population of around 49 million inhabitants. The GCC is an oil-based region with the largest proven crude oil reserves in the world representing about 36% of the world's total. This region ranks as the largest producer as well as exporter of petroleum and plays a leading role in the world in general and OPEC in particular. Thus this region is a vital source for the global economic stability.

The economic model of GCC countries relies on oil and gas as the main sources of fiscal revenues (in 2015 oil and gas revenues accounted for 46% of the six Gulf nations' GDP) and exports (oil and gas represent around 75% of total exports), where the government is the dominant player in the economy that receives the revenues from oil exports and manage the revenue distribution.

The present economic situation of lower and volatile oil prices, widening fiscal deficits, rising competition and high youth unemployment represents a problematic economic scenario for an area that is still controlling a very important share of the world's energy supply. Actually, the drop in oil prices¹ in the GCC countries has determined rising budget deficits and dampening economic growth, but it has also weakened the conditions of corporate and infrastructure sectors, and make more difficult to fund investments. IMF(2016) still forecasts a slowing growth in oil exporters in 2016, assuming an oil price decline. This oil price decline mostly reflects a higher oil supply, but also a weaker global demand. The current situation in the GCC countries necessitates a shift from the classic *rentier* state economy involving a reduction in their dependence on oil revenues. In general, lower oil prices have weakened the external and fiscal balances of oil exporters. Some of the GCC economies are facing fiscal deficits for the first time in two decades and this will imply some cuts in government spending.

IMF (2016) reports that GCC economies as a whole are expected to slow their growth to 1.8% in 2016 from 3.3% in 2015, and from a rate of 3.4% in 2014. Thus the gross domestic growth in the region is going to experience a significant decline, but it is still positive and inflation remains under control. Since fiscal deficits have reached 13.2% of GDP in 2015 (IMF, 2015), the Gulf countries are currently involved in fiscal consolidation, which translates in spending cuts and increases in taxation. Additional retrenchment in spending could be motivated by a tightening of global financial conditions and market perceptions of heightened sovereign risk. These measures are having inevitably implications on investments². The fiscal restructuring is particularly evident in Saudi Arabia, Kuwait and UAE. These countries have started rethinking their huge spending on subsidies. Nevertheless macroeconomic imbalances in the region will continue in 2016 and very likely in the following year. But restoring fiscal balances is not sufficient to guarantee the development of the economies of the region, rather the reforms must be broadened to promoting an efficient allocation of resources in the economy, boost job creation and nurture non-oil sectors.

So far the GCC countries have experienced some of the world's highest public investment in physical capital. With oil receipts they have financed massive physical infrastructure investment, but the distribution of oil revenues within the economy have tended to crowd out non-oil tradable production. In addition, the production of non-tradable has proved more convenient and less risky for firms because they could have benefited from the rapid growth in government spending, while the easy availability of low skilled, low-wage foreign labor has helped extract larger rents. The availability of public sector jobs have discouraged nationals from pursuing entrepreneurship and private sector employment. It is thus clear that, over the longer term, low oil prices are likely to reduce the availability of financing needed to sustain this model, raising the urgency of increasing private capital growth and requiring a different allocation of resources. The overall volatility in the economy due to the changes in the price of oil and its ensuing spillover effects can be mitigated with the diversification and the effective development of high-value-added production, but also through the increase in exports of goods and services of high quality (Schilirò, 2013). Thus, today more than ever, diversification becomes a must for the GCC countries since it would make these

¹ Oil price is today about 50 per cent less than in June 2014 when it was \$ 106 for barrel (WTI). Prices, after experiencing a drop below \$30 in January 2016, are now recovering, and they range from \$45 to \$50.

² Although governments continue to spend on development and infrastructure projects, the level of their spending will be curtailed over the medium term as spending needs are realigned with the reality of lower oil revenues.

economies less reliant on volatile hydrocarbon revenues and, at the same time, it would create more employment in private sector for nationals, especially high-value-added jobs in industries and services. Consequently, GCC countries, which are high-income countries, need to develop the private sector of their economy. The strategies to be followed to reach this goal are essentially that of favoring innovation and stimulate entrepreneurship. Diversification will be more effective if it is able to increase the quality, sophistication and differentiation of the exports and to supporting workers in acquiring the relevant skills and education to boost productivity. In addition, to spur growth these countries should go on building infrastructures that could provide the platform for economic diversification. Actually, most of the oil producing states have changed their structure of the economy in the last decade, making significant investment in health, education and infrastructure, and implementing reforms to business environment. The GCC countries have also devised long-range economic and social development strategies that emphasize the importance of economic diversification. These strategies aim to promote sustainable development, reduce dependence on oil revenues, and increase private sector job creation for nationals. Economic diversification is considered to be an important stepping stone to achieving all three objectives. Thus, we have the long-term strategy Vision 2020 in Oman, Vision 2021 in the United Arab Emirates, Vision 2030 in Bahrain, and Qatar National Vision 2030 and the most recent new Vision 2030 in Saudi Arabia. While some variation exists across countries, economic diversification and development efforts are geared toward boosting the human capital of nationals and developing high-productivity industries and services that require high-skilled labor. Although all the GCC countries embarked upon a policy of economic diversification, the only clear ‘success story’ is the UAE. In fact, the expansion of the private sector and the diversification away from oil that are needed to absorb the growing workforce have so far proven elusive in many cases. Though some progress has been made, most economies in the region are still deeply dependent on the capital-intensive hydrocarbon sector, which generates limited direct employment. The private sector itself is highly reliant on government spending, but it needs to become self-sustaining through increased competitiveness in the internal market but also in export markets. Thus, it is crucial to change the incentive structure within the economy to create the necessary shift towards the private non-/hydrocarbon sector (Callen *et al.*, 2014). Nationals must be stimulated with appropriate incentives to improve their skills, and making those skills more relevant to the private sector by improving the quality of education.³

Experience and empirical analysis show that diversification usually takes a long time, and it undergoes a decisive push just as revenues from oil start to decrease (Callen *et al.*, 2014). However, success or failure of diversification appears to depend on the implementation of appropriate policies. Callen *et al.* (2014) suggest several targeted measures to improve the business environment in order to alter the current incentives that avoid the production of non-oil tradable goods. Among the measures, they propose reorienting public spending, strengthening the role of private sector competition, developing backward and forward linkages across sectors with a comparative advantage, and implementing labor market reforms to incentivize private sector employment of nationals and improvements in productivity. Mitra *et al.* (2016) also suggest to favor productivity growth and the improvement of the business environment; this will require

³ Hanushek and Woessmann (2015) in a recent research show that oil exporters could increase their long-run growth significantly if they achieved universal secondary education and all students acquired basic skills. Oman would gain 1.7 percentage points of GDP, Qatar 1.3 percentage points, Saudi Arabia 1.25 percentage points, and Iran and Bahrain about 1 percentage point (Hanushek and Woessmann 2015, Table 5.5).

streamlining business regulations and reducing bureaucratic red tape to significantly lower the cost of doing business, raise the efficiency of government services. These authors stress the importance of advancing financial markets for fostering the accumulation of physical capital in the private sector—also critical for economic diversification, since financial market development hinges on improving access to finance. We broadly agree with these measures and proposals. However we believe that, to launch the private sector and improve competitiveness in the GCC countries, the major step is to create the conditions for an environment conducive to innovation, and stimulate entrepreneurship with particular focus on small and medium enterprises (Schilirò, 2015).

3. Innovation, competitiveness and innovation policies in the GCC countries.

Innovation is one of the basic factors for economic diversification, and a crucial driver of economic success and to boost growth. Innovation is also seen as key to addressing pressing societal problems such as pollution, health issues, and unemployment. Peter Drucker (1985) viewed innovation as the tool or instrument used by entrepreneurs to exploit change as an opportunity. Innovation involves more than just science and technology. It involves discerning and meeting the needs of customers. Improvements in marketing, distribution, and service are innovations that can be as important as those generated in laboratories involving new products and processes. Although innovation is largely driven by entrepreneurs and the private sector, government action can play a strategic supportive role. Especially in an economy that aims to become knowledge and/or innovation driven, investing in knowledge it is a must (Schilirò, 2010). This is true for the private sector, although it may consider such an investment risky and expensive, and it is an obligation for the government that should address the failure of the private sector by investing adequately in knowledge, to demonstrate the potential returns of such investment. Thus the strategic role of the government can be optimized if nations develop well-designed national innovation and productivity strategies (Cornell *et al.*, 2015). A successful innovation strategy constitutes a coherent approach that seeks to coordinate disparate policies towards scientific research, technology commercialization, information and communication technology (ICT) investments, education, taxation, trade, intellectual property (IP), government procurement, and regulation in an integrated fashion that drives economic growth.

One important goal of an innovation strategy is to create a favorable innovation environment and move the country toward the global frontier of innovation. Furman, Porter and Stern (2002) have developed a framework to identify the sources of innovative capacity that enable a nation to innovate at the global frontier. They argue that innovation depends on strength along multiple dimensions, therefore a healthy innovation environment depends on the quality of human resources, effective public policy, and innovation-oriented corporate investment. Also, since companies are the ultimate engine for innovation, vital clusters in which firms compete on the basis of innovation but cooperate on shared priorities are crucial to the process of producing global innovation. Finally, the role of universities in facilitating knowledge transfer is very important, determining the innovative capacity of a particular location (Porter, Stern, 2001). Furman, Porter and Stern (2002, p.900) have also highlighted the relevance of national innovative capacity, which is “the ability of a country – as both a political and economic entity – to produce and commercialize a flow of new-to-the-world technologies over the long run”. National innovative capacity focuses on the economic application of new technology reflecting a series of investment and policy choices by government and private sector that affect the incentives for research, development and commercialization activities in a

country, and that influence productivity. Furman, Porter and Stern (2002), by means of their empirical analysis, have found that public policy plays an important role in shaping a country's national innovative capacity. Therefore, policy choices such as the extent of IP protection and openness to international trade are very significant, but also policies that encourage human capital investment in science and engineering as well as greater competition on the basis of innovation are relevant. Moreover, inputs devoted to innovation such as R&D manpower and spending, the *share* of research performed by the academic sector and funded by the private sector, the degree of technological specialization contribute significantly to develop the innovation capacity of a country. In general, national innovation system literature emphasizes the active role played by government policy and specific institutions. However, although this literature puts great emphasis on the role of human capital and institutions for innovation and development, usually these innovation input factors seem to be the most difficult of all inputs in which to achieve good results.

GCC countries are aware that technology adoption alone is no longer sufficient to maintain a high-income level and boost economic growth, thus they have developed national innovation policy programs. However, an *innovation system approach* is the result of complex interactions among all innovation actors, policies and institutions. According to this approach, apart from incentivizing research, the framework conditions for innovation must be improved, which include the business environment, access to finance, competition, and trade openness. Collaboration is another essential requirement; consequently, collaborative research projects, public-private partnerships, and clusters involving the innovation actors should be targeted. There is the need to create a strong human capital and a research base that includes research infrastructures, sophisticated firms and markets, innovation linkages, and knowledge absorption as well. Another important factor is a legislation that supports future innovation and the related markets, but also the international harmonization of regulations for new technologies so they can diffuse more rapidly. Thus an innovation policy is multifaceted, involving many policy domains (e.g. education, international trade) and various institutional reforms.

Since, according to Furman, Porter and Stern (2002), one of the key factors of innovative capacity that contributes the country to innovate at the global frontier is represented by R&D, patents can represent the level of valuable innovative output. Thus, it is interesting to look at the patent activity in the GCC countries. Patents, in fact, can provide a uniquely detailed source of information on inventive activity. Patent statistics, viewed as an indicator of R&D output, is an imperfect proxy of the rate of technological innovation that is unobservable (Eaton, Kortum, 1999; Kortum, 1997).

In the Tables hereunder we show the number of patents in the GCC countries. Table 1, in particular, shows the number of patent applications per GCC from 1988 to 2014. This Table contributes to highlight the technological strength of the various GCC countries⁴. Saudi Arabia is the first country in the ranking and it is very distant from the other countries having the highest number of patent applications (1643) and the overwhelming percentage over the total (86.8). The second country in this ranking is the UAE, but it has only 89 patent applications and a percentage over the total of 4.7. The country with the smallest number of patent applications is Oman (17). These patent data contribute to our understanding of the innovation system and the factors that support economic growth. They can also be considered the expression of the stock of knowledge in each GCC

⁴ Patents have a close, if not perfect, link to inventions; although not all inventions are patented. Each patent document contains detailed information on the inventive process. At the same time the value distribution of patents is highly skewed: many patents have no industrial application, whereas a few are of very high value.

country in the period 1998-2014, while the total number for all GCC (1893) represents the stock of knowledge in the region in the same period.

Table 1.
Number of patent applications per GCC country (from 1998 to 2014)

| GCC Country | Bahrain | Kuwait | Oman | Qatar | Saudi Arabia | UAE | All GCC |
|------------------------------|---------|--------|------|-------|--------------|------|---------|
| Number of Patents | 29 | 69 | 17 | 46 | 1643 | 89 | 1893 |
| Percentage of Patents | 1.5% | 3.6% | 0.9% | 2.4% | 86.8% | 4.7% | 100% |

Source: GCC Patent Office⁵

Thus the data in Table 1 can be interpreted as an imperfect proxy of the rate of technological innovation even if they actually represent the potential towards innovation. Table 2 instead shows the patents delivered per GCC country from 1998 until February 2015. Of course these numbers are smaller than in Table 1. In terms of percentage over the total of all GCC, comparing Table 2 with respect Table 1, the weight of Bahrain, Kuwait, Qatar, UAE slightly increases while that of Oman and Saudi Arabia decreases.

Table 2.
Number of patents delivered per GCC country (until February 2015)

| GCC Country | Bahrain | Kuwait | Oman | Qatar | Saudi Arabia | UAE | All GCC |
|------------------------------|---------|--------|-------|-------|--------------|------|---------|
| Number of Patents | 5 | 9 | 1 | 7 | 197 | 13 | 232 |
| Percentage of Patents | 2.15% | 3.87% | 0.43% | 3.01% | 84.91% | 5.6% | 100% |

Source: GCC Patent Office

Patents are usually classified according to technological categories; the classification provided in Table 3 considers the main technical fields in the GCC region.

Table 3.
Number of patent applicants per fields in the GCC region from 1998 to 2014.

| Fields | Chemistry & Engineering Chemistry | Pharmaceutics & Technical | Oil & Gas | Mechanical & Electrical Engineering | All Fields |
|--------------------------|--|--------------------------------------|----------------------|--|-------------------|
| Number of Patents | 1491 | 459 | 442 | 800 | 3252 |

Source: GCC Patents Office

Table 3 clearly shows that the field in which the number of patents is highest is Chemistry and Engineering Chemistry (1491), since this field is more related to petroleum realm, but also Mechanical and Electrical Engineering is a field where the number of patents is considerable (800).

⁵ The GCC Patent Office (GCCPO) is a regional patent office based in Riyadh, Saudi Arabia, within the Secretariat General of the Gulf Cooperation Council (GCC). It was established in 1992 and began operations in 1998. The GCC Patent Office grants patents valid in all GCC member states. The first GCC patent was granted in 2002.

Pharmaceuticals and Technical (549) and Oil and Gas (442) are the fields with a number of patents far inferior to the first two.

Although these data highlight that some innovative vitality exists in the countries of the GCC, especially in Saudi Arabia, followed at a distance by the UAE and Kuwait, and it is concentrated in the fields of Chemistry and Engineering Chemistry, and Mechanical and Electrical Engineering, the whole GCC region need to further support patent activity and innovation through an appropriate innovation policy.

However, innovation policy is strictly related to entrepreneurship and to the capacity to create an 'innovation culture' with businesses, students, and society at large. This is why we suggest that a Triple Helix approach based on university-industry-government relationships (Etzkowitz, Leydesdorff, 1995; Ranga and Etzkowitz, 2013) can be very helpful for innovation, since the hybridization of elements from university, industry and government can generate new institutional and social formats for the production, transfer and application of knowledge. We also believe that there is no single model of innovation policy, but innovation policies and institutions need to be context specific, reflecting the extensive heterogeneity and varying trajectories of countries. In general, it is better fostering bottom-up entrepreneurship that thrives on the creation of an open and competitive level playing field that gives space to potential local innovators. At the same time, the disruptive and remarkable nature of innovation that is more service-based and works from the bottom up should not be underestimated.

3.1. Evidence from the Global Innovation Index in the GCC countries.

The Global Innovation Index (GII), released by Cornell University *et al.* (2015), offers a global view on innovation, providing a tool of action for decision makers. The 2015 GII is based on data available for all 141 countries included on the various pillars of innovation. This index can help in monitoring the impact of innovation policies. According to the report, the GII consists of two Sub-Index, the Innovation Input Sub-Index, which is comprised of five input pillars that capture elements of the national economy that enable innovative activities: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, (5) Business sophistication, and the Innovation Output Sub-Index with two pillars: (i) Knowledge and technology outputs and (ii) Creative outputs (Cornell University *et al.*, 2015, p.10)⁶.

The top five economies according to the Global Innovation Index rankings in 2015 and the rankings of GCC countries are shown in Table 4. Since the GII 2015 ranks a total of 141 countries, the Gulf Cooperation Council (GCC) countries are almost all (apart Kuwait, 77th) in the first half the ranking. If we look at the North Africa and Western Asia region, Saudi Arabia is the third country among the regional innovation leaders (Israel is the first). However, in this region three out of six Gulf countries, namely Saudi Arabia (43rd), the United Arab Emirates (47th), and Qatar (50th), are among the top five after Israel (22nd) and Cyprus (34th). In spite of that, Saudi Arabia, the United Arab Emirates, Bahrain, Oman, Kuwait, and Qatar show below-par performances compared to their income levels. In fact, these economies perform at least 10 percent below their similar countries for GDP level (Cornell University, *et al.*, 2015, p.28).

⁶ Each pillar is divided into three sub-pillars and each sub-pillar is composed of individual indicators for a total of 79 indicators.

Table 4
Global Innovation Index rankings in 2015 (Top and GCC countries)

| | |
|----------------------|---------------------------------------|
| | <i>Switzerland (1st)</i> |
| | <i>United Kingdom (2nd)</i> |
| | <i>Sweden (3rd)</i> |
| | <i>Netherlands(4th)</i> |
| | <i>United States of America (5th)</i> |
| <i>GCC Countries</i> | <i>Saudi Arabia (43rd)</i> |
| | <i>United Arab Emirates (47th)</i> |
| | <i>Qatar (50th)</i> |
| | <i>Bahrain (59th)</i> |
| | <i>Oman (69th)</i> |
| | <i>Kuwait (77th)</i> |

Source: Cornell University *et al.* (2015).

The GII metrics confirm a core principle of international policy literature: good innovation policies start with good innovation institutions. So institutions matter, as Douglas North (1990) had already highlighted. Another key message is that quality matters at the top. Thus an economy can make its way into the top rankings, provided it focuses the efforts on improving key areas of innovation such as innovation institutions and the quality of innovation. Finally, the GII report shows that innovation achievers seem to perform the strongest in Market sophistication and Knowledge and technology outputs.

Let's consider now the Innovation Input Sub-Index of the GII model. This Innovation Input index is crucial to understand the innovation framework of a country, since it includes the business environment, access to finance, competition and trade openness (Cornell University *et al.*, 2015, p.6). After all, Furnam, Porter and Stern (2002) have already stressed the importance of the innovation framework to assess the innovative capacity of a country.

Table 5 lists the top five economies and the rankings of the GCC countries relative to the Innovation Input Sub-Index. In particular, the top countries are innovation leaders since they have succeeded in creating well linked innovation systems, where investments in human capital thrive in fertile and stable innovation infrastructures to create high levels of innovation outputs.

Table 5
Innovation Input Sub-Index in 2015 (Top and GCC countries)

| | |
|----------------------|------------------------------------|
| | <i>Singapore (1st)</i> |
| | <i>Switzerland (2nd)</i> |
| | <i>Finland (3rd)</i> |
| | <i>Hong Kong (China) (4th)</i> |
| | <i>USA (5th)</i> |
| <i>GCC countries</i> | <i>United Arab Emirates (25th)</i> |
| | <i>Qatar (40th)</i> |
| | <i>Saudi Arabia (45th)</i> |
| | <i>Bahrain (48th)</i> |
| | <i>Oman (68th)</i> |
| | <i>Kuwait (87th)</i> |

Source: Cornell University *et al.* (2015).

As far as the GCC countries, the United Arab Emirates (UAE) (25th) is the country with the highest index of Innovation and it is relatively well placed in the total ranking. The UAE has always been a supporter of innovation. The country is characterized by a collaborative effort among public and private stakeholders which is driving a move towards diversification where entrepreneurs and small-medium-sized enterprises play an important role, encouraging the entrepreneurial aspirations

of UAE millennials. UAE's leaders ambition of fostering innovation and knowledge-driven growth is documented in the country's Vision 2021 national strategy. In October 2014, with the National Innovation Strategy the UAE government has provided a framework for innovation to flourish even further. Moreover, in February 2015, within the National Innovation Strategy, the UAE's government has introduced an innovation policy in the education sector that aims at improving the technology standard in schools and universities to disrupt and rebuild the system with innovation as the driving force (Schilirò, 2015, pp.156-157). This last policy decision can be considered an effective innovation policy for development. Kuwait (87th), on the opposite, shows a relatively low ranking, below the middle of the ranking index of Innovation. The country should strengthen the process of structural change of its economy, and to implement a more effective innovation policy. In particular, the country needs an improvement in the institutions, and the prioritization of resources towards research and development but also in education. In fact, the education system of Kuwait does not offer graduate skilled and highly competent workers. Therefore it is necessary to improve the educational system, promoting professional vocations among students, upgrade the quality and efficiency of higher and tertiary education.

On the whole the resource-rich GCC countries tend to exhibit relative shortcomings in major areas such as 'Institutions', 'Market sophistication', and 'Business sophistication'. In any case it is crucial to provide the framework conditions that stimulate a process of innovation and knowledge diffusion such as supportive institutions, good and widespread technical and tertiary education to enhance absorptive capacity, excellent provision of ICT property rights, and stronger links and interaction between publicly funded research institutes and private companies. Furthermore, these countries have large groups of micro and small businesses, operating far below the frontier of innovation, with low levels of human capital. Innovation and the adoption of better technologies will affect positively the productivity of these smaller producers, and they will have a aggregate impact on employment and economic growth. Most of these small firms are without patents, and with little experience in intellectual property protection. Usually, instead of investing in R&D, to a large extent these firms try to reap the benefits of catching up through adoption and international technology transfer. Among the various possible channels for transfer are imports of capital goods, subcontracting agreements, technical assistance programmes, technology licensing contracts, and inward foreign direct investment. But any effort to innovate with success and improve the technological level of the firms depends on the technological capabilities of the firms themselves, as Furman, Porter and Stern, 2002 argued. These capabilities are necessary to select and acquire the adequate technologies, to adapt those technologies to local circumstances, and to operate and develop them further, and they include skills, experiences, attitudes, and schooling (Cornell University, *et al.*, 2015, p.84). Also, it exists a broad consensus that the process of business internationalization triggers innovation and the development of capabilities (Altomonte *et al.*, 2013; Cornell University *et al.*, 2015; Schilirò, 2015).

In conclusion, GCC governments and enterprises can and must do more for innovation, particularly countries such Oman and Kuwait. Cornell University *et al.* (2015) suggest some principles that the innovation policy should follow to be successful, and this also applies to the GCC countries. First, the spurring of innovation must involve all the sectors, not just high-tech production, thus including traditional sectors such as farming, retail, logistics and business services. In support of this principle, Kucera and Roncolato (2012) find that productivity growth across all sectors is more powerful than reallocating the mix of sectors towards those with higher productivity growth.

Second, innovation activity should consider all points of the innovation value chain. Third, countries need to enable disruptive innovation, which is often generated by new market entrants, especially those emerging in their own economies⁷. Fourth, ICT, which is a general purpose technology, and, more generally, investments in new capital equipment have large benefits on the economy; therefore, it is important to keep the price of capital goods imports low. Fifth, support the creation of key innovation inputs, such as digital infrastructure, skilled workforce and knowledge. Finally, it is important to have a clear and well-designed national innovation strategy and organizations to support the innovation activity (Cornell University *et al.*, 2015, pp.90-94).

3.2. The Global Competitiveness Index and the GCC countries

It is well known that innovation and competitiveness are strictly related. Enhancing competitiveness requires a high capacity to innovate. There are, of course, other keys to success that include strong institutions – that ensure the ability to adapt, the availability of talent, and well functioning markets. On the whole, competitiveness is directly correlated to the strength and robustness of an organization’s collaborative networks and ecosystems.

To understand the level of competitiveness in the GCC countries we have examined the report of the World Economic Forum by Schwab (2015) concerning the Global Competitiveness Index (GCI). GCI is another important index, based on surveys over 140 countries, which is made of 12 pillars⁸ and combines 114 indicators which, in turn, capture concepts that matter for productivity⁹. Competitiveness is defined as the set of institutions, policies, and factors that determine the level of productivity of a country. The focus on productivity is important because growth models suggest that, in the long run, productivity is one of the most fundamental factors explaining the level of prosperity of a country and its citizens. Furthermore, in the Global Competitiveness Index education has a critical role since is a major component of a country’s human capital¹⁰. According to the economic literature, education affects a country’s productivity, since it increases the collective ability of the workforce to carry out existing tasks more quickly, and it also boosts a country’s own capacity to create new knowledge, products, and technologies. In addition, a qualified education facilitates the transfer of knowledge about new information, products, and technologies created by others. The rankings of the three top countries and GCC countries according to the Global Competitiveness Index is showed in Table 6.

If we focus on the GCC countries, we find that Qatar leads the region (14th in the GCI ranking). The country’s main strengths are its relatively stable macroeconomic environment and high efficiency in goods and services markets. Access to finance is world class (1st on ease of access to loans) and businesses and individuals use latest technologies, including the Internet, widely. Government procurement plays a key role in promoting innovation, yet the patenting rate of Qatari nationals remains low. Promoting inward trade and investment could contribute to bringing in new technologies and know-how and enhancing a culture of innovation (Schwab, 2015, p.25). The

⁷ Empirical literature shows that FDI can contribute significantly to regional innovation capacity and economic growth.

⁸ The twelve pillars making up the GCI are: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, innovation.

⁹ The two indexes, GII and GCI, are built on different methodologies and data, thus the same country can show divergent positions in their related rankings.

¹⁰ Education can be defined as the stock of skills, competencies, and other productivity-enhancing characteristics embedded in labor, or in other words the efficiency units of labor embedded in raw labor hours.

United Arab Emirates (UAE) is also well positioned in the ranking (17th). This is due to its macroeconomic environment, highly developed infrastructure, and strong institutions that provide a solid base. The UAE has benefitted from high levels of openness to trade and investment which ensure intense competition and good levels of innovation. Its business environment is characterized by regulations that are easy to comply with, a fairly efficient labor market, and the presence of sophisticated businesses. In addition, the Emirati economy is significantly more diversified than other GCC countries. The country will have to continue its gradual path of fiscal consolidation to ensure that its fiscal position remains strong despite the drop in oil prices. The recent decision to abolish energy subsidies is a step in the right direction. The UAE will also need to strengthen its capacity for innovation (26th), including the upgrading scientific research. (Schwab, 2015, p.26).

Table 6
Global Competitiveness Index rankings (Top and GCC countries)

| | |
|----------------------|----------------------------|
| | <i>Switzerland (1st)</i> |
| | <i>Singapore (2nd)</i> |
| | <i>United States(3rd)</i> |
| <i>GCC Countries</i> | <i>Qatar (14th)</i> |
| | <i>UAE (17th)</i> |
| | <i>Saudi Arabia (25th)</i> |
| | <i>Kuwait (34th)</i> |
| | <i>Bahrain (39th)</i> |
| | <i>Oman (62nd)</i> |

Source: Global Competitiveness Index 2015–2016 (Schwab, 2015, p.7, Table 1)

Saudi Arabia is the biggest country among the GCC and it is 25th in the GCI ranking. Although its macroeconomic environment remains an important point of strength, low oil prices (at present around \$50 per barrel) are having a strong impact on Saudi’s economy as the country is dominated by oil, and it is characterized by a government that relied on it for up to 90 per cent of its revenues until 2014. In fact, since 2014 the country has experienced a budget deficit. In 2015 the deficit swelled to 15% of GDP, even if, in the 2015 budget, oil revenues accounted for 72 percent of total, and non-oil revenues rose by almost \$10 billion from 2014. Thus, the economy and its structure need to change (IMF, 2015). However, the recent new “Vision 2030 plan” announced by the government in April 2016 goes towards the direction of diversification¹¹. The first step is fiscal consolidation. The goal is to eliminate the budget deficit in the next years. This means dismantling the system of not taxes, that is pay for free education and health care, but also stop to subsidize electricity, water and housing. The lower oil price will also necessitate further efforts toward diversification and private-sector growth to create employment opportunities. As a matter of fact, the economy has so far proved chronically unproductive and dependent on foreign labor. Saudis tended to avoid working and live on rent or to find jobs in government offices. One important point of this new plan and of the recent long term strategy “2030 Vision” is to publicly list less than five percent of Aramco in order to create a massive sovereign wealth fund to develop the cities in the country. In fact, the Public Investment Fund (PIF) a country’s powerful institution is to be

¹¹ In June 2016, the National Transformation Plan (NTP), a list of policies and targets for 2016-2020 and a pivotal element of the "Vision 2030", has been approved by Saudi government with the aim to wean the economy off its dependence on oil. This NTP involves 500 projects and initiatives to more than triple the country’s non-oil revenue and reduce public-sector salaries over the next five years. It also aims at creating 450.000 non-government jobs.

developed into a \$2 trillion sovereign fund that creates jobs and jump-starts new industries with strategic investments that reduce Saudi Arabia's reliance on oil exports. In particular, a major idea behind the kingdom's new vision plan is to create millions of new jobs and raise the participation of women in the workforce from 22 currently to 30 percent by 2030. Consequently, it is important to create new ventures in areas where effective service impacts the well-being of the population or where it could compete effectively with the private sector that will generate revenues. In this regards, the government wants private firms to develop tourism facilities on some of its islands, plans to create "free zones" with minimal red tape near airports, and even wants private investment in some schools. New infrastructure such as roads and port facilities will be constructed under build-operate-transfer contracts, in which private firms finance the projects and then operate them to recoup their investments. Despite these good aims, entrepreneurship and private-sector growth should be supported by reducing administrative barriers to entry, which are still high; but also by developing further the financial sector, and improving corporate governance standards. More focus on broad-based access to quality education and promoting access to and use of ICTs could also create employment opportunities (Schwab, 2015).

Kuwait, a country with a per-capita income of 43,100 US dollars in 2014, ranked 34th in the GCI. Its annual GDP growth rate fell sharply in 2014 to 0.1 per cent. But in 2015 IMF (2015) forecasts an improvement of Kuwait's GDP to 1.2 per cent, while in 2016 the growth should be even stronger. The country holds the world's sixth biggest proven reserves of oil; in fact oil sector accounts for 40 percent of GDP. But all hydrocarbons continue to play a major role for the economy, in 2014 oil and gas sector accounted for around 95 percent of export earnings and it contributed for 80 percent of state revenues. Thus, the hydrocarbon sector remains dominant in the economy and has substantial indirect effects on the non-oil sectors, while the manufacturing sector accounted for 6.8 per cent of GDP in 2013 (according to the Central Statistical Bureau). The public spending funded by oil and gas revenues remains essential to activate various economic activities. The government sector employs about 300,000 Kuwaiti nationals, while in the private sector, the number of workers amounts to more than 1.6 million, of whom only 76,000 are Kuwaitis. Moreover, Kuwait is still the least attractive Gulf country to investors, as many businessmen refrain from investing their money there given the bureaucratic impediments and long procedures necessary to obtain business licenses. Thus it is necessary a change in the institutional framework, the simplification of the bureaucratic procedures, incentives to shift Kuwaiti nationals towards the private sector coupled with the upgrading of the education system. Bahrain, with a per capita income of 28,270 US dollars in 2014, is 39th in the GCI rankings. In this country, oil accounts for around 60 percent of export receipts and for 70 percent of government revenues. Although, according to Schwab (2015, p.106), the most problematic factors for doing business in Bahrain there are: restrictive labor regulations, insufficient capacity to innovate, inadequately educated workforce, the country ranked 1st among four GCC countries, with the UAE ranked 2nd for business based on capital investment, corporate expansion, and FDI¹². This latter result is probably due the low operating costs and mature regulatory environment. Oman, which is a country with a population similar to Kuwait but a lower per capita income (equal to 19,000 US dollars), is the 62nd in the rankings of the Global Competitiveness Index. The most problematic factors for doing business in this country are in order: restrictive labor regulations, inefficient government bureaucracy, inadequately educated workforce, insufficient capacity to innovate.

¹² Annual "Global Best to Invest Awards, 2016"

Let us focus now on the ‘Innovation’ pillar of the Global Competitiveness Index. The top five countries are respectively Switzerland, Finland, Israel, United States and Japan. The GCC countries have the following ranking: Bahrain 56th, Kuwait 109th, Oman 103th, Qatar 14th, Saudi Arabia 34th, UAE 26th. There is a large consensus in the business literature that the innovation process is a function of two aspects of a company (Schilirò, 2015). The first is its corporate culture: the extent to which it promotes the vision and capacity to manage new technologies, develop new business models, and exploit old technologies in new ways. Openness to new, unconventional, and disruptive ideas has a first-order impact on creative innovations that break new ground in knowledge creation. Such openness is influenced by society’s prevailing norms, such as the degree of risk aversion. The second aspect is business execution, since, for instance, ideas may not be implemented because of a lack of human capital or because the effectiveness of marketing that influences the degree to which new ideas are implemented. In addition, the more a company is able to create product differentiation through strong branding¹³, the more it can bear the risks associated with introducing innovative new products.

Table 7 shows the rankings and the scores, relatively to the three top countries and the GCC countries, of ‘Innovation’ and ‘Business Sophistication’ factors that constitute the key for innovation-driven economies¹⁴.

Table 7.
Innovation and Business Sophistication – Rankings and Scores (Top and GCC countries)

| | Rank | Scores |
|---------------------|-----------|-------------|
| Switzerland | 1 | 5.78 |
| Japan | 2 | 5.66 |
| Germany | 3 | 5.61 |
| Qatar | 12 | 5.18 |
| UAE | 21 | 4.83 |
| Saudi Arabia | 29 | 4.18 |
| Bahrain | 43 | 3.92 |
| Kuwait | 82 | 3.48 |
| Oman | 85 | 3.45 |

Source: Global Competitiveness Index 2015–2016 (Schwab, 2015, p.8, Table 2)

Qatar (12th) is performing fairly well in terms of innovation and business sophistication. Also United Arab Emirates (21st) and Saudi Arabia (29th) are well positioned in the ranking. The other Gulf countries, specially Kuwait and Oman, are still behind, but still over half the country rankings.

¹³ Branding is in fact reducing the sense that a firm’s products are substitutable by those of its competitors.

¹⁴ Business sophistication, in particular, concerns two elements that are intricately linked: the quality of a country’s overall business networks and the quality of individual firms’ operations and strategies.

Table 8 shows three indicators concerning the pillar ‘innovation’ (i.e. capacity for innovation, company spending on R&D, availability of scientists and engineers) and the relative rankings of the six GCC countries.

Table 8.
Rankings of the six GCC countries in the three indicators of innovation

| | Capacity for innovation | Company spending on R&D | Availability of scientists and engineers |
|----------------------|-------------------------|----------------------------|--|
| Bahrain: | 70th | 87th | 42nd |
| Kuwait: | 101st | 102th | 85th |
| Oman: | 119th | 120th | 108th |
| Qatar: | 12th | 9th | 2nd |
| Saudi Arabia: | 57th | 38th | 38th |
| UAE: | 28th | 22nd | 7th |

Source: Global Competitiveness Index 2015-2016 (Schwab, 2015, Country/Economy Profiles)

From Table 8 we see that Qatar is second in the overall ranking for Availability of scientists and engineers, this is because this country enjoys a high quality of scientific research institutions. The UAE, which ranks 7th, has a medium-high quality of scientific research institutions. Saudi Arabia is on a medium position, while Bahrain and, even more, Kuwait and Oman must improve a lot in all three indicators concerning innovation.

In conclusion, in the present globalized world, the innovation pillar becomes a major strategic factor. Especially digital innovation can impact the growth of a country significantly. The digital economy with its stream of communication, transactions, ideas, and information has tremendous value in its own right, but it also play a role in enabling other, more traditional types of flows. In fact, the digital and physical worlds converge within manufacturing, therefore the path to manufacturing competitiveness is achieved through advanced technologies (e.g. Internet-of-Things). That is why GCC countries and their enterprises must boost digital innovation and favor the development of the digital economy. Also renewable energy is an important field for innovation. All this can be a profitable way to diversify the economies and enhance competitiveness and growth in the GCC region.

4. An Overview on Entrepreneurship in the GCC countries

Entrepreneurship is key for economic diversification, employment creation and sustainable growth especially in the GCC countries. Although for many decades economists have ignored the role of entrepreneurship in the economy, Joseph Schumpeter strongly contributed to the its understanding, mainly in a development perspective. In addition, Schumpeter highlighted the virtuous combination of entrepreneurship and innovation. Recent literature shows that economists have realized that the degree to which the entrepreneur will engage in innovation and specialization depends on the size and functioning of the market. But the functioning of markets requires the action of institutions,

such as property rights and rules to enforce contracts. A well-defined system of property rights and an apparatus of market regulation to ensure competition are "good" institutions, which help innovation and entrepreneurship and favor the economic growth of a country (North, 1990; La Porta, *et al.*, 1999; Acemoglu *et al.*, 2001).

According to the Global Entrepreneurship Monitor (GEM) reports (Amorós and Bosma 2014; Singer, Amorós, Arreola, 2015), there are a number of advantages associated with entrepreneurship and innovation including the creation of new companies from investment in local economies, creating new jobs, increasing competitiveness and developing the instruments needed for the establishment and continuation of innovative companies. GEM surveys have confirmed that entrepreneurial activity in different forms (i.e. nascent, start-up) is positively correlated with the economic growth, but that this relationship differs along phases of economic development. Wright and Dana, 2003, in accordance with GEM reports, confirm that entrepreneurship is a key factor in promoting economic growth, innovation, competitiveness and job creation by supporting a competitive and globalized market infrastructure.

We now focus on the report *Entrepreneurship in the MENA Survey* by Bayt (2015) that seeks to get insights about the current level of understanding and interest in entrepreneurship within the MENA region and, therefore, it includes the GCC countries. The key information areas covered in the report are: current work preferences and reasons for being self employed vs. employed; current level of entrepreneurship in the region; the perceived barriers to starting a business; the ease of setting up own business in current country of residence; perception of entrepreneurs in the region. The total number of respondents achieved in the present survey was 8,164. As far as the research findings related to ‘work style preferences’ for the whole MENA region, 64 per cent would prefer to be self-employed; moreover, the top reason for preferring self-employment is personal fulfillment (54 per cent of respondents).

Table 9 shows the respondents from the GCC countries and also the whole MENA region regarding ‘work style preferences’.

Table 9
‘work style preferences’ for GCC countries and the whole MENA region
(percentage values)

| GCC Countries | respondents | | | |
|----------------------|--|---|---|-----------|
| | be self-employed/ have my own business | seek employment in a company (work for pay) | work in a family business (if applicable) | others |
| Bahrain: | 74% | 22% | 2% | 2% |
| Kuwait: | 63% | 32% | 2% | 3% |
| Oman: | 61% | 32% | 1% | 6% |
| Qatar: | 66% | 30% | 3% | 1% |
| Saudi Arabia: | 67% | 28% | 2% | 3% |
| UAE: | 66% | 29% | 2% | 3% |
| Whole MENA | 64% | 31% | 2% | 3% |

Source: Bayt (2015)

The only GCC country in the Table that shows a result of ‘be self-employed’ significantly above that of the whole MENA region is Bahrain; Saudi Arabia is also above, together with Qatar and UAE; Oman, instead, is below, while Kuwait is nearly the same level of the whole MENA region. These results highlight a strong propensity towards self-employment and entrepreneurial activities within GCC countries. Another interesting result of the survey is that the majority of the respondents (over 60%), who are currently employed in the private or public sector, think of starting own business. ‘More income’ followed by ‘greater independence’ emerge as the top two reasons to start a business. On the contrary, respondents mainly prefer to seek employment in a company because of ‘regular income’ and for the ‘stability of employment’, but also because ‘no investment required’.

Table 10 shows the results of the respondents regarding the choice of sector (private or public) in a company relative to GGC countries and the whole MENA region.

Table 10
Choice of Sector for GCC countries and the whole MENA region
(percentage values)

| GCC countries | respondents | |
|----------------------|------------------------|-----------------------|
| | Private Sector Company | Public Sector Company |
| Bahrain: | 47% | 53% |
| Kuwait: | 76% | 24% |
| Oman: | 65% | 35% |
| Qatar: | 48% | 52% |
| Saudi Arabia: | 69% | 31% |
| UAE: | 56% | 44% |
| Whole MENA | 57% | 43% |

Source: Bayt (2015)

The percentage value in the table prompts two considerations. The first is that in some GCC countries (Kuwait, Oman, Saudi Arabia and UAE) the respondents are mostly inclined towards private sector company, in accordance with the whole Mena region, while in others (Bahrain and Oman) the respondents are mostly inclined towards public sector company. Kuwait, in particular, shows a rather high percentage of respondents (76%) that prefer the private sector company. The second consideration is that compared to the benchmark (whole MENA) there is a greater dispersion of results, than that found in Table 9.

In addition, if we look at the barriers that have prevented respondents from starting own business, the most frequent answers are: ‘inability to self-finance’ and ‘not being able to get financial support’. In UAE the unavailability of finance concerns 71% of the respondents, where in Oman is 51%. Thus, ‘Procuring startup finance’ is by far the top concern for setting up a business. However, the GCC countries where respondents see more difficult (‘somewhat difficult’ and ‘extremely difficult’) set up their own business are Qatar (59%), followed by Bahrain (58%), Kuwait (54%),

and Saudi Arabia (51%), whilst it seems relatively less difficult in Oman (45%) and UAE (48%). Another important result concerns the role of education in the entrepreneurial endeavors. In the GCC countries more than 7 in 10 respondents claim that the education they received has helped them develop an entrepreneurial attitude. Respondents in Oman (82%) and Qatar (81%) believe that to a higher extent. About the ‘most appealing industry for entrepreneurship’, the first three industries chosen by the respondents in the GCC countries are those shown in Table 11.

Table 11
First three industries preferred in the GCC countries (ranked in preference order)

| GCC countries | first three industries | | |
|----------------------|-------------------------|-------------------------------|-------------------------------|
| Bahrain: | Hospitality & Leisure | Advertising/Marketing | Finance/Insurance/Real Estate |
| Kuwait: | Advertising/Marketing | Hospitality and Leisure | ITC |
| Oman: | Architecture & Engin | Finance/Insurance/Real Estate | Hospitality & Leisure |
| Qatar: | Architecture & Engin | Hospitality & Leisure | Finance/Insurance/Real Estate |
| Saudi Arabia: | ITC | Advertising/Marketing | Finance/Insurance/Real Estate |
| UAE: | Hospitality and Leisure | Advertising/Marketing | Architecture & Engin |

Source: Bayt (2015)

Table 11 proves that each GCC country seems to have a different sectoral vocation or different sectoral interest. The UAE together with Bahrain have as top preference the ‘Hospitality & Leisure’ industry, Oman and Qatar ‘Architecture & Engineering’, Kuwait ‘Advertising/Marketing’, while Saudi Arabia respondents prefer ITC.

On the whole, the data shown from this report highlight a good propensity and attitudes towards entrepreneurship in the GCC countries. But there is still much to be done. As a matter of fact, promote entrepreneurship and create entrepreneurs is not an easy task in practice, since social, cultural, political and economic factors influence the decision to become an entrepreneur. Certainly, quality education is fundamental to any country’s long-term economic success because of the positive externalities in investment in knowledge and human capital.

4.1. Education and Entrepreneurial Skills for Entrepreneurship in the GCC region

Today global competition requires major investments and spending in knowledge creation and innovation as much as investment in capital formation. Education needs to be radically transformed to fit the new and changing business environment. The new required education systems should address students' creativity and critical thinking to transform the available knowledge and information into new products, new innovations, and new knowledge. Therefore, any strategy that aims at entrepreneurship and innovation must have therefore education and training as a core

component. The reason is that both entrepreneurship and innovation are increasingly knowledge and skill intensive. Furthermore, innovation requires not only highly knowledgeable and skilled entrepreneurs, but also high-skilled employees (OECD, 2014). A country's successful strategy needs more than broad-based quality education; it requires a serious focus on science, technology, engineering, and math (STEM) and it should also encompass entrepreneurship as a specific topic. GCC countries must improve education in these areas to favor job creation and entrepreneurial activities. Especially Oman, Kuwait and, to a less extent, Bahrain and Saudi Arabia must push in this direction and enhance their education system.

Recent literature has highlighted the importance of entrepreneurship skills. At the same time, policy makers around the world have increasingly come to realize that entrepreneurship, particularly high-growth entrepreneurship, is critical for economic development, and public policy can play a central role in supporting entrepreneurship and enhance the skills of potential entrepreneurs.

Yet little is known about the skills required for successful entrepreneurship. Entrepreneurship skills are often associated with competence in the process of opportunity identification and/or creation, the ability to capitalize on identified opportunities and a range of skills associated with developing and implementing business plans to enable such opportunities to be realized¹⁵. Entrepreneurship education is more than teaching management, finance or writing business plans, it is also developing creative thinking and the entrepreneurial mind. Entrepreneurship education lies above all in the provision of experiential learning and real-world experiences (e.g. industry projects, competition, internships, providing links to the entrepreneur network) (De Faoite *et al.*, 2003, Fayolle, 2007). Empirical evidence suggests that there is a positive association between entrepreneurship skills and some measures of business success. Although there is a limited evidence regarding the impact on business performance of specific education, and about training or support programmes to promote entrepreneurship. Overall, entrepreneurship skills appear to be related only loosely to factors such as the demographic or educational background of the entrepreneur. Even if some entrepreneurship skills can be taught and/or learned, entrepreneurs tend to learn less effectively from the conventional didactic approaches typical of much of the educational sector. The most effective approaches to developing entrepreneurship skills involve experiential learning based around task-oriented development focused on real business problems.

But what is the essence of being “entrepreneurial? Entrepreneurship scholars have underlined some general traits of the entrepreneurs such as their attitude to be proactive and aim to change the world, their will of never stop learning, a natural inclination to creativity; but also qualities such as self confidence (i.e. a belief in your own abilities and ideas), analytical abilities (being capable of researching and evaluating each aspect of the business), the focus on results, and, not least, being innovative/inventive. According to Norris Krueger (2007) successful entrepreneurs can be characterized by an expert mind-set. However, expertise needs to be learned: expert entrepreneurs are definitely made not born. Krueger applies constructivism to cognitive development. Therefore it is important to understand how entrepreneurs structure their expert knowledge and skills and how these evolve. Krueger argues that behind the cognitive structures there are deep beliefs which form the entrepreneurial mindset. Education has a fundamental role to create an entrepreneurial mindset.

¹⁵ Although the concept of skill maybe slippery, skills can be seen as multidimensional constructs. “They comprise the cognitive – knowledge and what is learnt; the affective – emotional expression and what is experienced felt; the behavior – action at strategic, tactical and personal levels; and the context – sectoral, occupational, job and tasks levels, including the breadth, the demands and the inherent responsibilities” (Chell, 2013, p.8).

In particular a learning-centred approach based on problem-based learning can help in forming this entrepreneurial mindset.

To sum up, in general, entrepreneur must have the ability to see, understand and take advantage of evolving markets. So he should have a risk-taking propensity. But first the entrepreneur must possess the ability to think differently, have an expert mindset, use insights, see what others do not, envision what does not yet exist, and identify opportunity when it's ripe. These are the prized qualities of today's entrepreneur that the GCC countries must favor.

4.2 Entrepreneurship, SMEs and Start-ups in GCC countries.

Entrepreneurship skills can be very important for supporting the growth and development of small and medium-sized enterprises (SMEs), since significant numbers of small businesses are with relatively underdeveloped entrepreneurship skills. Thus, there is the potential for substantial impacts on performance. After all, SMEs represents a very large part of the companies in the GCC region¹⁶. They also employ a large number of people and give a significant contribution to the GDP's region. That is why SMEs are becoming increasingly important for GCC countries and attract more attention by their governments¹⁷. Today, SMEs can take advantage of the increasing fragmentation of production in global value chains. Yet small-scale entrepreneurs are survival entrepreneurs who are hampered by weak infrastructure, lack of finance, lack of capability, lack of innovation. Instead, a dynamic set of SMEs can make a positive contribution to innovation, development and employment, but it is important that the innovation system is able to provide the incentives for small-scale entrepreneurs to become innovative. Definitely, policy and institutional environment are important determinants of innovative behavior.

We already argued that GCC countries need more entrepreneurs to boost their competitive performance. While GGC region is certainly more entrepreneurial than in the past, it remains insufficient compared to a global economy that has become altogether more entrepreneurial (Amorós and Bosma 2014; Singer, Amoròs, Arreola, 2015)¹⁸. In the United States, Canada, Singapore, South Korea, Sweden, Switzerland, and in other innovation-driven economies many young companies are the creators and leaders of new industries, and most of these companies are high-growth, generating a great amount of jobs, innovations, patents and new technologies. Entrepreneurship in innovative industries like information technology and communication, "cloud computing", biotechnology and renewable energy are driving many innovation-driven economies. Breakthrough or disrupting innovations often result from new firms startups, as Baumol (2005) pointed out. To unlock the potential for entrepreneurship in the GCC region it is necessary fostering

¹⁶ Not all the GCC countries have a well developed SME sector. For instance, in Saudi Arabia it is still relatively undersized; while in UAE, SME sector is vital and accounting for as much as 60 per cent of the economic activity (for an analysis of SMEs in the UAE see Schilirò, 2015).

¹⁷ Qatar, for example, established already in 2011, "Enterprise Qatar" to promote entrepreneurship and boost the SME sector by offering training, advisory, consultancy and financial services, as well as free office space for SMEs owned by Qatari nationals. While, in January 2014, Kuwait approved a National Fund for Small and Medium Enterprises, which aims to invest about \$7 billion in the SME sector. The UAE, which is driving forward small business initiatives, announced in April 2014 that 10% of all future government tenders had to be awarded to SMEs, making it easier for all potential entrepreneurs to gain access to the lucrative public sector market.

¹⁸ In general, entrepreneurship is much lower in the Gulf countries than in the West, and many entrepreneurs in the Gulf region are from other Arab countries like Jordan and Lebanon.

a more entrepreneurial mindset among young people, reducing the stigma of failure, providing support for women, promoting a legislation that make it easier to start a new venture and to transfer a business to new owners. Also designing a reward structures more favorable to the development of entrepreneurs is important. However, it is crucial that governments in the GCC countries should support entrepreneurship education at both the high school and college levels. In addition, GCC's governments can help provide entrepreneurial 'infrastructure' such as accelerators and incubators that offer space for entrepreneurs and linkages to mentors and potential customers.

Although Gulf countries have been trying in the last few years to develop a startup-fueled digital economy, in general they have not been very successful. But technology startups are very important for developing new products, particularly in ITC services. There are several reasons why GGC countries have fewer tech-startups. Certainly the lack of an ecosystem and a base of skilled executives and product creators/ managers contributes significantly to the scarcity of start-ups in these countries. In particular, engineers are the backbone of the digital revolution, Gulf countries have practically very little engineering talent available locally. However, a major factor is culture, which breaks down into a number of elements: i) aversion to risk. In general, risk is perceived differently in the Gulf region than it is in the Western countries. Risk taking is more culturally acceptable in the latter; also failure is perceived differently in the Western countries with respect to the Arab world¹⁹. This is why the GCC is not full of investors willing to risk their capital. The majority of high net-worth individuals and families invest their money in safer bets like real estate and hospitality. ii) Ownership. Usually, Arab entrepreneurs feel uncomfortable to give up any portion of their equity to raise financing. iii) The development of start-ups underlies the existence of a knowledge community where people share their ideas, and test. Among Arab entrepreneurs there is a tendency to hide ideas until they are fully built, which is a very inefficient way to run a startup. Other important factors, which are external and concern the enterprise environment, are: bureaucracy, bankruptcy laws, lack of capital, difficulty to get loans from banks and, more generally, unavailability of finance. Actually, although the region has a lot of capital going around, almost none is for seed-stage ventures²⁰. In addition, the lack of developers limits firms in the GCC region building high quality products themselves. Finally, the GCC countries needs more research-focused universities, since technology development needs hosts of technologists.

However, in the whole GCC region, there is a growth of programs to support entrepreneurs and start-up ventures, since public policies can contribute to shape the entrepreneurial process. The recent plans by the governments in Bahrain, Oman, Qatar, Saudi Arabia, UAE demonstrate that there is a strong will to support entrepreneurship and innovation with the aim of diversifying the economy. Gulf governments are giving greater attention to improving access to debt and equity finance. Governments are also developing mentoring and coaching programs to help new entrepreneurs or those experiencing fast growth (e.g. business incubators, business accelerators, etc.), and network initiatives to strengthen the competencies of co-located entrepreneurs through knowledge spillovers (e.g. cluster programs and science parks). Science parks, in particular, are major institutions that aim at promoting innovation and entrepreneurship at local level. Their role is to stimulate the flow of knowledge amongst universities, R&D Centers and enterprises. Although

¹⁹ Although there are signs of changes regardin these attitudes (see Bayt, 2015).

²⁰ Today the economy needs sophisticated investors who understand the emerging innovative trends and technological developments, not wealthy individuals with a trading mindset and a trading attitude.

the empirical literature about their performance is controversial²¹, they constitute key elements of the research-based development policy to foster the blooming of innovative start-ups and local clusters. GCC countries have created several Science Parks. In the UAE we can mention Dubai Science Park in Dubai, or the most recent DuBiotech (Dubai Biotechnology and Research Park), in Abu Dhabi CERT Technology Park. In Saudi Arabia there are KAUST Research Park, King Abdullah Science Park at King Fahd University of Petroleum and Minerals, and the Riyadh Technology Valley of King Saud University. In Qatar there is Qatar Science & Technology Park, which is part of Qatar Foundation Research and Development. In Kuwait there is the Kuwait Institute for Scientific Research that is working with Kuwait's Public Authority for Industry to build a Technology Park.

But education is key in the plans of GCC countries, since as we have just seen in the survey by Bayt (2015), education can help very much in entrepreneurial activities.

Education and the importance of the role of government for entrepreneurship is highlighted in a recent research carried by Teh, *et al.* (2015) and based on a survey of 135 students in Dubai. These authors found that entrepreneurial attitude is positively and significantly related to entrepreneurial intentions. Further, having a university playing a greater role in providing entrepreneurship training and assistance would also increase students' intentions to become entrepreneurs. In addition, the research revealed that, contrary to expectations, having a family member as an entrepreneur did not increase the respondents' intentions to be an entrepreneur themselves. An important implication of these findings is that governments and institutions can do much to foster more entrepreneurial intentions and, by extension, more entrepreneurial activity. Thus, greater attention can be paid to identifying potential entrepreneurs early during their education, and providing specialized training to encourage and develop their entrepreneurial skills. Finally, aside from specific entrepreneurship courses, the education system as a whole should be predicated on a curriculum to help their students develop autonomy, independent thinking, creativity, risk-taking, and the ability to learn from mistakes (Teh, *et al.*, 2015).

Actually, the UAE is a country that has been favorably ranked on various economic and entrepreneurship indices (e.g. World Economic Forum, 2015; The Global Entrepreneurship and Development Institute, 2015), but it has the second lowest rate of established entrepreneurs compared to other innovation-driven economies (Teh, *et al.*, 2015). However, in February 2015 the UAE's government launched a seven-point scheme to make innovation the driving force in schools and universities. In addition, UAE has seen a surge in start-up accelerators and incubators for technology companies. The accelerator Flat6Labs Abu Dhabi, for instance, is a global hub for digital innovation that will support entrepreneurs from the UAE and abroad to launch digital businesses in Abu Dhabi and scale to regional and global markets. Another important example of accelerator is TURN8, a remarkable collaboration between enterprise and innovators launched by DP World to foster a global entrepreneurial and innovation culture. Regarding incubators, there is the Dubai Technology Entrepreneurship Centre (DTEC), the free zone's entrepreneurship support outlet, launched in 2015 within Dubai Silicon Oasis Authority, which is the largest entrepreneurship hub in the MENA region (a 100% government-owned free zone), and complement to Silicon Oasis Founders, another high-tech incubation centre currently running in Dubai. As an increasing numbers of incubators will emerge, we can expect the quality and experience of the entrepreneurs to

²¹ See, for instance, Minguillo *et al.* (2015) for an analysis in UK.

rise, and with them the risk attitude and the expertise of investors. No doubt, the startups landscape in Dubai, and, in general, in the UAE is changing quickly and positively.

5. Conclusions

In this contribution we pointed out the importance of economic diversification for the oil-based GCC region, which is made up of six high income countries, to make their economies less reliant on volatile hydrocarbon revenues. We also argued that innovation and entrepreneurship constitute the main drivers to diversify and develop the GCC countries. These countries need to expand the private sector, create job opportunities and improve competitiveness, so it is important build the conditions for an environment conducive to innovation, and to stimulate entrepreneurship with a particular focus on the small and medium enterprises. Our analysis highlights that the GCC countries have so far not performed satisfactorily in innovation. However, there is a great effort by the GCC governments to develop and implement national strategies to improve the innovative capacity, during this stage of decline and high volatility in oil prices. A developed knowledge and innovation-driven economy, which is the kind of economy that GCC countries are trying to follow, has technology, innovation and high quality education as key drivers. Education is therefore very important for innovation, but it is also basic for entrepreneurship. Improve the education system becomes strategic for the diversification and growth in the GCC countries. We have underlined that governments in the Gulf region can play an important role in developing a successful innovation strategy in order to create a healthy innovation environment. Further, the Triple Helix approach can be very helpful for knowledge and innovation generation of a country that aim to become knowledge-based. As far as entrepreneurship, our analysis highlights that the GCC countries have a fairly significant propensity towards entrepreneurial activities and self-employment, but there are several barriers for starting own business, of which the most frequent is the availability of funding. In addition, GCC countries must boost SMEs open to global markets and also high-tech start-ups. UAE is changing quickly and in the right direction of diversification. All the others GCC countries, taking into account the natural differences and the different vocation, should follow soon.

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