

Article

The Incentives and Efforts for Innovation and Entrepreneurship in a Resource-Based Economy: A Survey on Perspective of Qatari Residents

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Abstract: This paper studies the local perspective on innovation and entrepreneurship in the resource-based state of Qatar. The effective utilization of abundant natural resources (oil and gas) have propelled the country's rapid economic development over the last four decades. However, accelerating decarbonization efforts of the global energy system due to climate change put the future value of these hydrocarbon resources into doubt and hence the country's revenue streams from international trade. Rapidly growing the local population adds further pressure to the social welfare system amid dwindling oil and gas revenues for the state. The argument for economic diversification and theoretical foundations of innovation and entrepreneurship in a resource-rich state are discussed. A survey to measure the attitude of the residents in Qatar towards innovation and state-led initiatives is prepared and conducted with people living in the country. The analysis of the survey shows that Qatari residents are relatively risk-averse and state-dependent in their pursuit of new entrepreneurial opportunities. We identify three possible reasons for such an outcome; they are, (1) the country's unique economic structure (natural resource-based), (2) demographic structure (expatriates vs. citizens), and (3) lack of previous experience in innovation and entrepreneurship (path dependency) in a relatively young country. The country's spectacular success in the last three decades has become its Achilles-heel in decoupling the current economy away from hydrocarbon dependence.

Keywords: economic diversification; innovation; entrepreneurship; Qatar; Rentier State

1. Introduction: A Resource-Based State and Economic Diversification: The Case of Qatar

Some countries in the world are blessed with abundant natural resources such as emeralds, gold, or oil and gas. The discovery of those natural resources has changed the fortunes of such countries, from Latin America to the Arabian Peninsula, in a very short time span thanks to the income from selling these resources [1]. However, the change in fortunes is not always in a positive direction as some of those countries succumb to civil strife, especially those challenged by weak state institutions [2–4]. This paradoxical reverse relationship between the discovery of large natural resources and subsequent chaos and strife is explained by The Resource Curse Theory (RCT) [3–5]. Some industrialized countries have witnessed the erosion of their manufacturing and services sectors after the discovery of natural resources and have become vulnerable to the price (value) volatility of those resources. The Dutch Disease Theory (DDT) explains the dynamics of this dilemma for advanced countries such as the Netherlands (natural gas) and the United Kingdom (oil and gas) [4,6]. Several countries, in the Arabian Peninsula, grew in wealth and geo-political influence built upon resources gained from the discovery of large oil and gas deposits in territory once haphazardly and barely populated with nomadic tribes [7–10]. Bahrain, Kuwait, Oman, Saudi Arabia Qatar, and the United Arab Emirates (UAE) had formed the Gulf Cooperation Council (GCC) where revenues from oil and gas industries have dominated those economies since the 1970s after utilization of the natural hydrocarbon resources [11].

As a member of the GCC states, Qatar is located in the central-west of the Arabian Peninsula, bordering Saudi Arabia by land and having maritime borders with Bahrain, the UAE, and Iran [12]. The country gained its independence in 1971 after the United Kingdom withdrew its military and political stewardship from the region, which coincided with booming oil and gas businesses in the region [9]. The country is a relatively small crude oil producer compared to its neighbors and had lackluster economic development in the 1970s and 1980s as a result [13]. However, the government of Qatar started the utilization of the massive natural gas reserves (North Field, the largest single non-associated gas reservoir in the world) in the 1990s [13]. The country had become the largest exporter of liquified natural gas (LNG) thanks to its state of the art supply chain, with the lowest costs on the planet [14]. The citizens of the country are now among the richest in the world thanks to a highly generous welfare system run by the state [15]. Therefore, Qatar's development trajectory does not include the challenges of the RCT or DDT; rather, Qatar is working to develop new industries by utilizing the resources garnered from the extractive sectors in a bid to diversify its economy [16]. The country has an authoritarian governance system centered around the ruling tribe (Al Thani), which prevented any clash for the economic resources and hence avoided any civil strife or curse of the resources seen in some countries [17]. Therefore, it can be argued that Qatar neither experienced the demise of its industrial base (non-existing prior to oil and gas) or faced political upheaval or chaos. The GCC states, especially Qatar, have been dexterous in utilizing this large oil and gas wealth to fund nation-building and construction resulting in state of the art infrastructure and living standards for their citizens that are far above the world average [18,19].

Section 2 discusses the background, scope, and methodology of the paper in regard to economic diversification efforts in the GCC states with a special focus on Qatar. Section 3 analyzes the challenges to those states' oil and gas-oriented economies due to the decarbonization efforts of the global economy and subsequent collapse in the value of those resources. Section 4 delves into the theoretical foundations of innovation and entrepreneurship. Section 5 presents the result of the survey, which has been prepared based on the analysis of the GCC states and innovation and entrepreneurship. Section 6 discusses the main findings of the paper. Section 7 reviews the analysis of the paper while laying out future work.

2. The Background, Scope, and Methodology of the Paper

The GCC states are increasingly viewed as important global economic players [20]. Their importance is not just coming from the supply security of the oil and gas to large industrial economies (Japan, China, Germany, India) but also these states are actively investing surplus revenues overseas [21]. The combined overseas investment of the six states now exceeds 3 trillion US Dollars through their sovereign wealth fund investment arms [21]. They spend very large amounts of money in purchasing military-grade arms from international markets, creating competition among the exporter countries vying for influence in the GCC states [22]. The economic and political security of these states and sustenance of the status quo in a highly volatile region are quintessential for the global economy [17].

There are three critical factors playing in tandem that make the economic diversification and hence the preservation of the political status-quo more urgent than ever [23]. The elevated concern exists within the context of global-scale efforts towards decarbonization of the world energy system to mitigate the negative effects of climate change [24,25]. As a result, many governments around the world are actively supporting the deployment of renewable energies such as solar and wind technologies and promote the use of electric and hydrogen vehicles at the expense of future demand for oil and gas [26]. Contributing to competition for a share in the energy markets are technological advancements that have also made available the new oil and gas deposits in the form of shale, deep offshore drilling, and tar sands. These additional sources have resulted in an excess supply of these resources [27]. The combination of demand and supply shocks are expected to significantly lower the prices (value) of oil and gas in international markets circa 2030 [28]. The rapid growing economic activity and the population have caused sharp growth in domestic consumption of oil and gas products in those states [19]. Highly subsidized prices for oil and gas products have encouraged consumption

at the expense of potential exports [29]. The problem reveals itself in all the GCC States as declining government revenues from the oil and gas sales due to lower prices and export volumes coincide with the rapidly increasing populations that expect continued patronage [30]. Thus, the economic diversification towards value-added sectors (knowledge-based economy) has become urgent in those states to preserve citizens' welfare and the political status quo.

Consequently, there have been efforts to diversify their economies in a bid to lessen dependence on oil and gas revenues to safeguard the current welfare and living standards [16,31,32]. The political systems in these countries are governed by autocratic regimes that limit public representation in the decision-making process in exchange for compensation in terms of economic handouts and privileges garnered from revenues from oil and gas exports [33]. There is a dire need in the GCC states to lessen the reliance on whims of highly volatile international oil and gas markets for funding the public largesse and economic handouts [34]. To preserve the current political status-quo and regime survival, the GCC states strive to sustain the economic well-being of their citizens in a bid to keep this ruling-bargain (rentier bargain) alive and intact [35].

All the government-led economic initiatives in the GCC envisage a vibrant private sector-led by the citizens and also employing them [31]. Increasing the employment of citizens in the private sector will lessen the burden on those governments for running their social welfare system [36]. Inducement of nationals working in public-owned entities to private enterprises is quite a challenging issue due to higher salaries and less-cumbersome workloads in public sectors [37]. A potential panacea for this conundrum is to support the locals in pursuit of innovation and entrepreneurial activities, which may yield higher monetary value and hence attract more of them [38]. The increasing participation of the citizens in pursuing their own businesses will lessen the pressure on the welfare system as well as contribute to the growth of the domestic economy [39,40]. As a result, all the economic vision plans announced by these GCC states explicitly state targets and incentives for attracting the citizens towards private sector participation, especially through innovation and entrepreneurship [35].

This paper focuses on the economic diversification in the GCC state of Qatar by analyzing the perspective of citizens and residents towards innovation and entrepreneurship. A lot of analysis has been conducted recently by scholars on the role of the GCC governments and their initiatives towards economic diversification [17,20,35,38,40]. Since GCC governments tightly control the production and revenue of the oil and gas products as well as decision making in almost all matters [31], it is not surprising that they are also spearheading the economic diversification towards a post-oil era [41]. The active roles pursued by those states in drafting and legislating numerous economic diversification schemes, new policy schemes as well as investments into infrastructure, new industries, education, and logistics are well documented [17,31,35,41]. However, there is a gap in the literature in terms of the perception by the citizens and residents in those states towards a new economic paradigm, especially for innovation and entrepreneurship. This paper is trying to address this perceived gap in the literature by analyzing a survey conducted with Qatari citizens and residents regarding their perception of innovation and entrepreneurship and the related initiatives inside the country. An overview and reflection of the current state of innovation and entrepreneurship initiatives in the state of Qatar are intended to be gathered by a broad spectrum of the society inside the country as a prelude to specific interviews with the critical actors in the future.

3. Potential Fall in Hydrocarbons' Value Around 2030 and Implications for Oil and Gas-Rich States

As efforts regarding the fight against climate change accelerated, the development of renewable energies and electric vehicles have seen a spectacular growth [28]. The share of wind and solar energies in global electricity production was almost trivial at the beginning of this century but now it has reached more than 8% in less than two decades [42]. The rapid development in technologies of both solar and wind energies resulted in phenomenal cost reductions, which has translated into an exponential

deployment of these technologies on a global scale in the last two decades, shown in gigawatts (GW) as shown in Figure 1 [43].

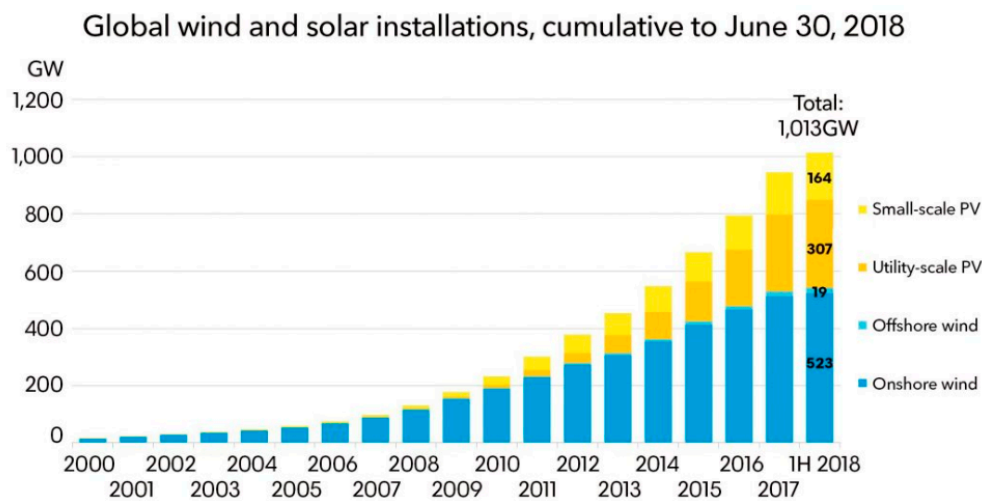


Figure 1. Global Total Installed Cumulative Capacity of Wind and Solar Energies.

The exponential development of wind and solar energies has just started, where further cost reductions and improvements promises to replace coal, oil, and gas for electricity production in an accelerated manner in every part of the world [42]. According to the Energy Information Administration (EIA), it is now cheaper to build and operate new solar photovoltaic (PV) and wind energy plants instead of operating existing gas plants in most of the United States based on purchasing power agreement (PPA) as shown in Figure 2 [44].

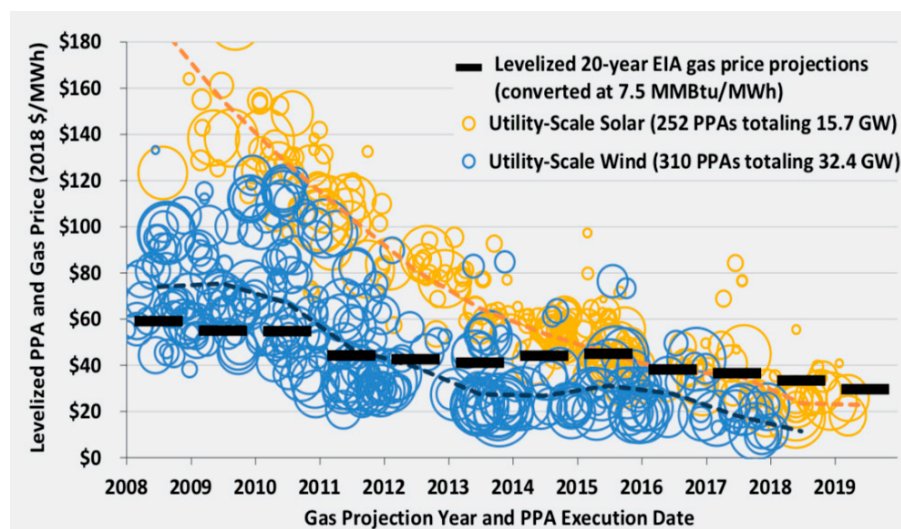


Figure 2. Cost Comparison of New Wind and Solar Plants vs. Fuel for Existing Gas Plants in the US.

The rapidly falling cost of renewables, battery (energy storage) technologies and the advancement of electric cars pose a mortal threat to one of the core uses of oil and gas in modern life, namely transportation. The apparent superiority of electric motors turning electricity into motion will be aggravated by cheap electricity coming from renewable energies in the not too distant future [45]. In fact, researchers from BNP Paribas Bank (8th largest in the world in terms of assets) point out that oil prices have to go below 20 US Dollars per barrel to remain competitive with electric vehicles (supplied mainly with renewable energies) by 2030 [45]. Figure 3 indicates the stark challenge posed by the rapid development of these technologies to the dominance of hydrocarbons [45]. Due to the superiority of

electricity in transmission and conversion to kinetic motion, the international oil prices need to be 17 US Dollars per barrel for an internal combustion engine (ICE) car to compete with an electric car getting its electricity from offshore wind energy [45]. Consequently, the current oil prices (around 60 US Dollars per barrel) or historically high oil prices (100 US Dollars per barrel) make ICE cars a minimum of four times more expensive for the same amount of kilometers driven, circa 2030.

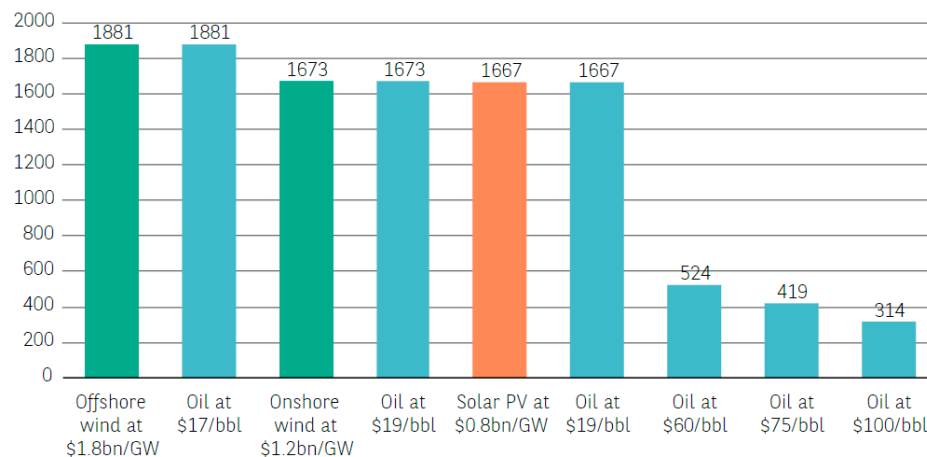


Figure 3. Mobility Level of Electric Vehicles vs. Petrol Powered Cars for the same Investment Amount.

It is clear that current oil prices (60 USD per barrel) will continue to spur investment into renewable energies and electric vehicles due to their rapid advancements and other clear advantages such as very low carbon and other dangerous emissions [45]. Electric vehicles run by energy coming from solar and wind technologies have much more driving range compared to the current oil prices, as seen in Figure 3. It is extremely naïve to think that the advent of renewables along with electric vehicles will not result in a lesser global demand for oil and hence permanently low prices [28]. The prospectus of permanently low oil and gas prices below 20 USD per barrel by around 2030, as indicated in Figure 3, should be alarming to the GCC states since their fiscal breakeven oil prices have been much higher than this level for the last two decades, as per the International Monetary Fund (IMF) as shown in Figure 4 [46]:

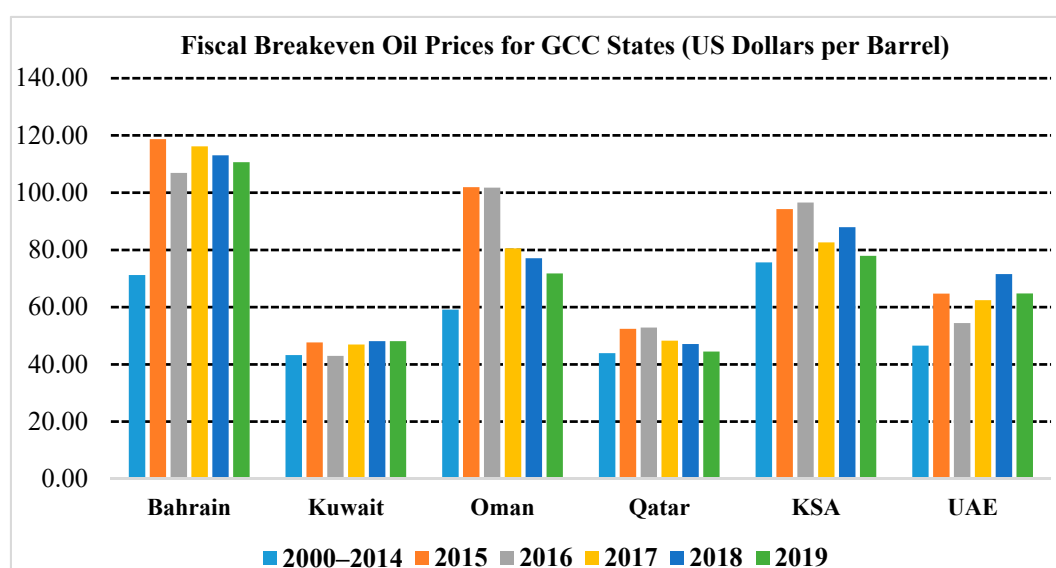


Figure 4. The Gulf Cooperation Council (GCC) States Fiscal Breakeven Oil Prices for the selected years.

Even though Qatar has the lowest fiscal breakeven oil price among the GCC states, it is not totally immune to the expected low-and-permanent oil prices at the end of the next decade. This becomes a more serious issue when considering the continuous increase in the local population and higher domestic energy consumption (less export) [13]. Even though the country has heavily invested its extra oil and gas revenues overseas through the Qatar Investment Authority (QIA), economic diversification towards an innovation-driven and knowledge-based economy gained traction by both private and public stakeholders due to the apparent challenges mentioned above [38]. Due to low oil prices and high fiscal breakeven prices, those countries have accrued significant budget deficits (except for Kuwait and the UAE) compared to their gross domestic product (GDP) since the oil-price crash of 2014, as seen in Figure 5, which may pose a significant challenge in the long term unless a certain course of actions is taken.

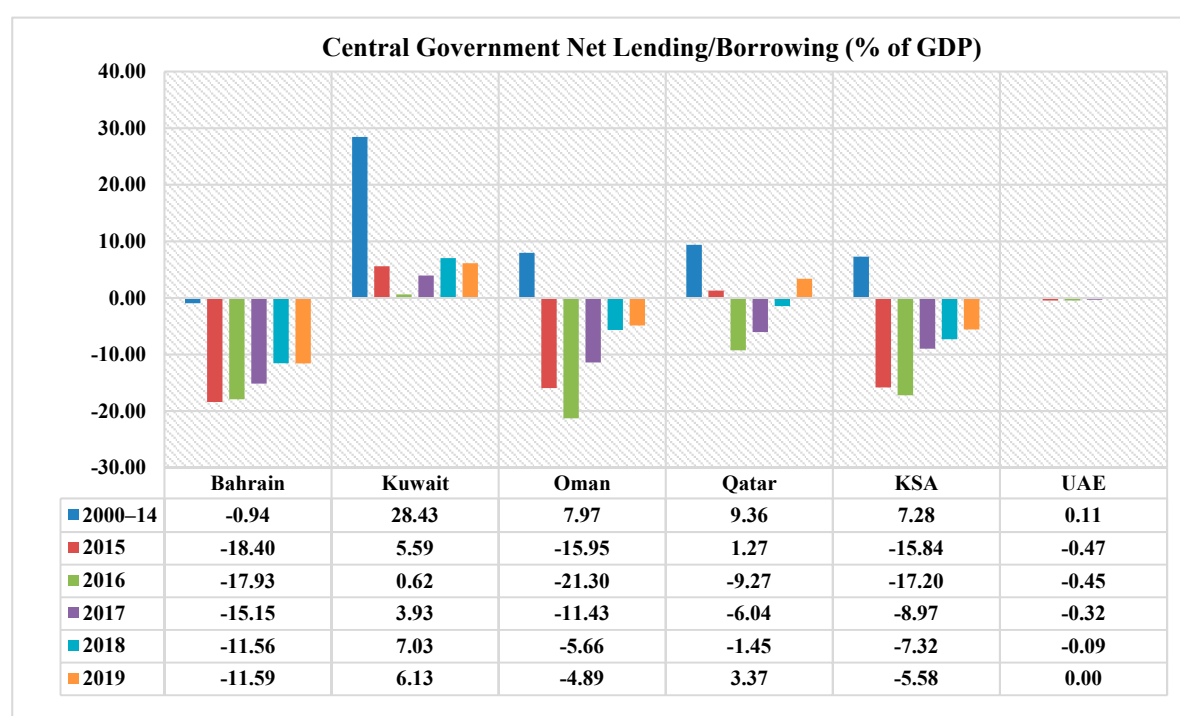


Figure 5. The GCC States Government Lending (Surplus) as % of GDP for the selected years.

The literature of economic development has been focusing on the potential of economic diversification for resource-rich countries, especially for the GCC states, recently [35]. Policies and strategies pursued by those states are discussed and analyzed with the reflections on past attempts [10,31,41]. The societal and governmental capacity in pursuing these economic diversification initiatives are also investigated in depth by various scholars [47,48]. The limits of institutional capacity, as well as its potential future trajectory as a critical prelude to successful economic diversification, have been heavily studied in recent works by various scholars [7,20,23,35,49]. Harvard University's economic complexity index (ECI) measures the level of sophistication and knowledge embedded in the exports of a nation. The higher the value of ECI, the higher the economic diversification of a country in terms of its economic activity and especially its export capabilities [50]. Figure 6 shows that all the GCC countries have very small diversified economies, as the ECI values are way lower than those of industrialized nations (Japan, Switzerland, and Korea) or some developing countries like Lebanon. The UAE, Saudi Arabia, and Bahrain scored relatively positive values albeit were near to the value of 0, which can be interpreted as these countries being average in terms of complexity and knowledge creation in their economic activities. Qatar, Oman, and Kuwait have negative ECI values, which can be broadly interpreted as those countries still being heavily reliant on exports of crude oil, natural gas, or LNG in their export earnings. They are still not near the end spectrum of the economic complexity,

such as Guinea, which has an extremely low economic complexity and knowledge-embeddedness in its exports [51]. It should be also noted that the GCC states have achieved some significant economic diversification, albeit temporal and local, regarding the sectors, regions, and countries [23,36,52].

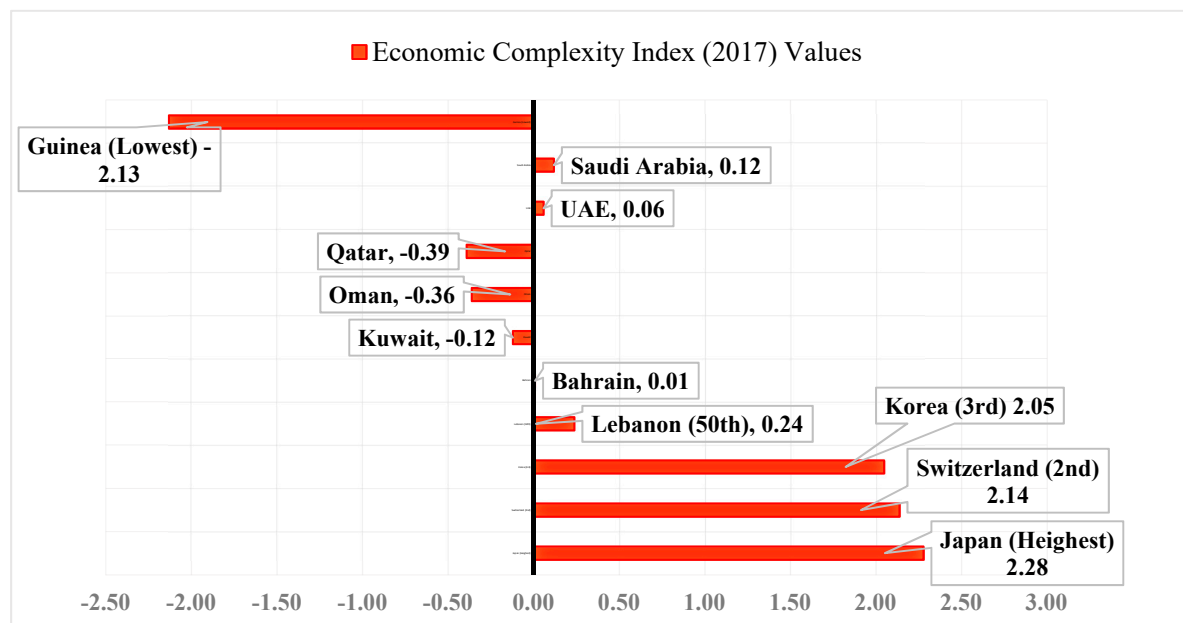


Figure 6. Economic Complexity Index (ECI) Values of the GCC States and Some Selected Countries (atlas.cid.harvard.edu/rankings/2017).

This paper focuses on the determinants and core pillars of innovation in a country and the implications for a resource-rich country such as Qatar to contribute ongoing economic diversification efforts from a very critical point of innovation and entrepreneurship in Section 3. We conducted a survey with the residents of the country. We present the survey results to analyze the perceptions and mindset of Qatari residents towards innovation and entrepreneurship. The conclusions and discussions of both the current literature and the survey are presented in Section 4.

4. Theory of Innovation and Entrepreneurship and Implications for the Resource-Rich States

As Qatar needs to diversify further its economy away from oil and gas industries towards value-added sectors, the role of innovation and entrepreneurship has become very critical to transform the economy and safeguard the welfare of future generations. The key aim of the government is to substitute dwindling oil and gas revenues with the creation of new income sources from value-added sectors [38]. As explained earlier, the preservation of the current living standards for the next generations urgently requires economic diversification towards value-added goods, products, and services [53]. Qatari government actively supports numerous economic diversification schemes centered around innovation and entrepreneurship activities [10]. Understanding the nature and structure of innovation and entrepreneurship plays a key role here for effective economic diversification for Qatar.

Determinants and Characteristics of Innovation

Innovation can be defined as the process of turning an original idea or invention into goods or services, resulting in new value addition that customers will pay for [54]. Generation of the idea (patent, copyright, trademark, firm secret) and its translation into implementation (experimentation, trial and error, commercialization) are two main stages of innovation [54].

Innovation is a very broad subject and scholars have defined many varieties of innovation, such as incremental or evolutionary, and disruptive or revolutionary, depending on the impact on the market, customers, industries, or even countries [55]. Innovation has certain characteristics, such as

path-dependency, need for rules-based governance, a strong educational system, access to venture capital, clarity, and ease of the regulations [56–60]. Adding value to a firm, industry, or market and eventually to a country's economic structure is the key tenet of innovation.

A significant amount of innovation occurs through upgrading the current systems or industrial processes and is known as incremental (evolutionary) innovation where existing skilled labor, the culture, and organization capacity (ecosystem) feed each other continuously [60]. This surely gives a great advantage to the industrialized and highly diversified countries (economies or industries) for further economic expansion and development [57]. Qatar has been quite effective in utilizing incremental innovation in its oil and gas businesses as the country has become the largest exporter of hydrocarbons per capita [13]. Particularly, the country developed the world's most complex and advanced LNG industry in addition to gas-to-liquids (GTLs) production with its international partners [61,62]. From helium to ethylene production, the petrochemical industry of Qatar has seen a continuous growth, with a variety of products and services [14]. The spectacular growth in oil and gas industries, including petrochemicals, was partly repeated in other industries such as steel and aviation without, most of the time, spreading into other industries [19].

Disruptive (revolutionary) innovation completely upends and replaces the existing market, service, product, or the whole industry itself by bringing a completely new set of ideas and applications into commercialization [63]. Digital cameras, touch screen telephones, electric cars, internet, ride-hailing (Uber), and shale oil can be given as examples of results of disruptive innovation as those products or services or technologies dominated or upended the existing markets (firms, products) totally [28]. Compared to incremental innovation, disruptive innovation has more chaotic development stages, uncertainties, and usually higher profit and returns to those who manage the process successfully [60]. This kind of innovation requires a much more complex ecosystem than does incremental innovation, such as access to venture capital, highly skilled labor, strong research and development, well defined and protected property rights, and easy entry to the final markets [58]. It is not surprising that the majority of disruptive innovation has come from the United States in the last 50 years (transistors, computers, internet, online search engines, ride-hailing, electric cars, and social media, etc.) as the country boasts the best universities, a strong research and development culture, a large venture capital system, along with strong protection of property rights and easy access to the markets for newcomers [28,59].

Figure 7 depicts the stages of innovation and the critical factors influencing each of these stages that result in a value-adding product, service, or goods from an idea. The innovation process starts with the creation of new knowledge to solve a problem, upgrade an existing system, or bring new value [55]. There are numerous ways and channels in which new knowledge (expertise, methodology, practice) can be created [64]. Three broad mechanisms in the creation of new knowledge are research results from public or private entities and the efforts of individuals, all of which aim to solve a specific problem or create a new demand [64,65]. Universities, research centers, and other public-funded organizations employ academicians, entrepreneurs, and students in a bid to advance society's advancement and development, especially in emerging technologies and services that may be found too risky by private corporations [66]. The basic research and science conducted in these institutions especially later pave the way for groundbreaking inventions and developments such as transistors, information technologies, artificial intelligence, and renewable energy technologies [67]. Those institutions also educate, train, and prepare the cadres for research and development in private organizations and contribute to the skilled labor of a country [68]. Private corporations and organizations also play a critical role in fostering innovation and development by utilizing their own research and development in a bid to increase profits and stay competitive [69]. Regulations and mandates are other factors pushing private entities to innovate and abide by new rules, especially for public safety and environmental concerns [70]. Talented individuals working as freelancers, in public or private organizations, can also undertake individual research and create new knowledge without being under any particular project or assignment [71]. The knowledge created by such an individual would likely be related

to his expertise and past experience. Therefore, countries that have strong research institutions, a developed and diversified industrial base, along with skilled labor create most of the new knowledge that can be measured through scientific publications, granted patents, or trademarks [57,71]. Countries such as Qatar that have a relatively young history of economic and scientific development and a narrow industrial base may find it difficult to expand new knowledge creation into new industries and sectors [72].

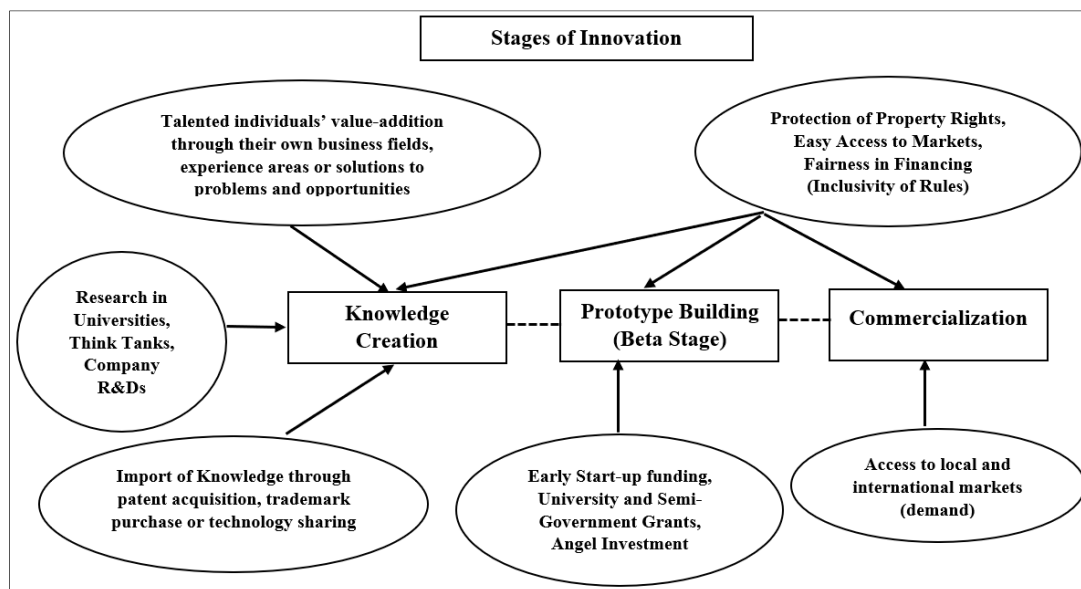


Figure 7. Stages of Innovation and The Factors Influencing Each Stage.

Turning knowledge into a prototype such as a pilot plant, sample product, or web-based application constitutes the second and very critical stage of innovation, known also as the beta-stage [73,74]. In this stage, the usefulness of knowledge and its adaptability to a working prototype are tested either through university or private labs or startups [75,76]. Due to the difficulty and complexity of the process, the risk and associated payoffs are very high in this stage, especially for those groundbreaking innovations and inventions [73]. The funding required in this stage is not as high as in the later commercialization stage because investors are wary of putting their funds into projects where they do not usually have a sufficient understanding of the technology's nature and potential (information asymmetry) [77]. Research centers, universities, innovators, and private organizations with a proven history and a strong reputation of past successes are likely to acquire the required funding easier than their peers or competitors, which is an essential feature of the path dependency of innovation [78]. High failure rates are also very common across numerous sectors and industries in the beta-stage of innovation in addition to the problem of information asymmetry [57]. These two challenges result in the risk-averse behavior of many investors for funding beta-stage projects, especially those conducted by relative newcomers [77]. Many governments, research centers, and universities around the world have established their own funding schemes, early investment vehicles, and programs to overcome the challenge of fund-raising by their innovators and entrepreneurs, especially at this stage [74]. While such initiatives are clearly an important support mechanism at this stage for numerous entrepreneurs and innovators, the amount of funding and a fair selection of projects to be supported by the right amount (potential of moral hazard) are challenging issues [79,80].

The final stage of successful innovation is the commercialization of the new knowledge, practice, system, or technology with a payoff to its stakeholders [81]. The journey of innovation ends with the successful introduction of a service, technology, or product to the market by creating new value to its users [66]. The most critical part of the commercialization stage is to have access to both local and international markets without any hindrance or unfair treatment (heavy levies, taxes, or

regulatory hurdles vis-à-vis to the product's competitors) [82]. The second important aspect of the commercialization stage is to have a sufficiently big local market where the product receives the initial demand and feedback for its performance before going to international markets [83]. Local markets are thus critical for off-taking of the new product or service and patching the initial hurdles and defects before expanding to highly competitive foreign markets [84].

The inclusivity of economic institutions and the governing rules play a critical role in fostering innovation through each of these three stages [85]. Basically, the protection of private property in all its forms, lack of corruption, free access to the markets, and ease of doing business for everyone are important rules in the realization of successful innovation [23,86,87]. In fact, the countries having inclusive economic institutions are leading in innovation and economic development compared to countries that have extractive or the opposite of inclusive economic institutions [58]. The empirical evidence suggests that inclusive economic institutions find it difficult to emerge under absolute (authoritarian or extractive) political systems in which a few control the fortunes and power of a country [88]. Countries leading in ease of doing business, lack of corruption, fairness in the legal system, and transparency in governing the economic affairs are usually democratic countries granting freedom of speech and critical media coverage [19]. It is still possible for non-democratic countries to instill inclusive economic institutions under certain conditions to boost the innovation and economic development of the country [23]. Countries such as Singapore, the UAE, and Qatar are implementing numerous business-friendly reforms and regulations to attract foreign capital and boost their economies, albeit the fact that they have absolute political systems [17].

The most important agent bringing innovation into commercialization is an entrepreneur who takes a new idea, an invention, a prototype, or an approach into practicality [89].

A skilled pool of entrepreneurs is thus critical for innovation in an industry, market, or country [82]. The building up of such a pool (skilled entrepreneurs), incentivizing them, and supporting them legally, financially and logistically are critical steps in turning ideas into businesses, services, or new approaches for value creation [90]. In the resource-rich GCC states, a push for entrepreneurship of the local population was seen as an essential target due to two important reasons [23,63]. First, entrepreneurs are critical for the transition to a knowledge-based economy to lessen dependence on hydrocarbon-related industries by being the center agent in the whole process [19]. For the GCC states, a transfer of some local population to entrepreneurship from the government-related workforce means less burden on public finances (lower fiscal breakeven oil prices as opposed to Figure 4) and better service to the remaining population [23].

5. The Survey Results

As a part of the project titled "Localizing Entrepreneurship Education in Qatar", an online survey consisting of 20 questions has been conducted with the nationals and expatriates residing in Qatar through the online survey platform of SurveyMonkey. The survey lasted more than 16 months (April 2018 to August 2019), and 323 responses were garnered from people with a diversity of backgrounds defined by age, gender, local vs. expatriate, and profession. Figure 8 shows the age level distribution, share of local vs. expatriate, gender ratio, and sectoral allocation of the survey attendants. The majority of the responders were female, while age distribution was close to normal. One of the potential reasons for the high participation of females compared to males could be the high participation of females in higher education in the country [10]. Similarly, non-Qataris constituted the majority of the survey, which is quite normal due to the fact that expatriates constitute more than 85% of the country [91]. The majority had more than five years of working experience, whereas employees (33%) and undergraduate or graduate students (19%) comprised more than 50% of the responses. The sectoral distribution was almost even among public, private, and academia. Considering the majority of non-nationals (expatriates) and the size of the government sector as well as the prevalence of academic institutions, the profile of survey participants represents a relatively fair picture of the country.

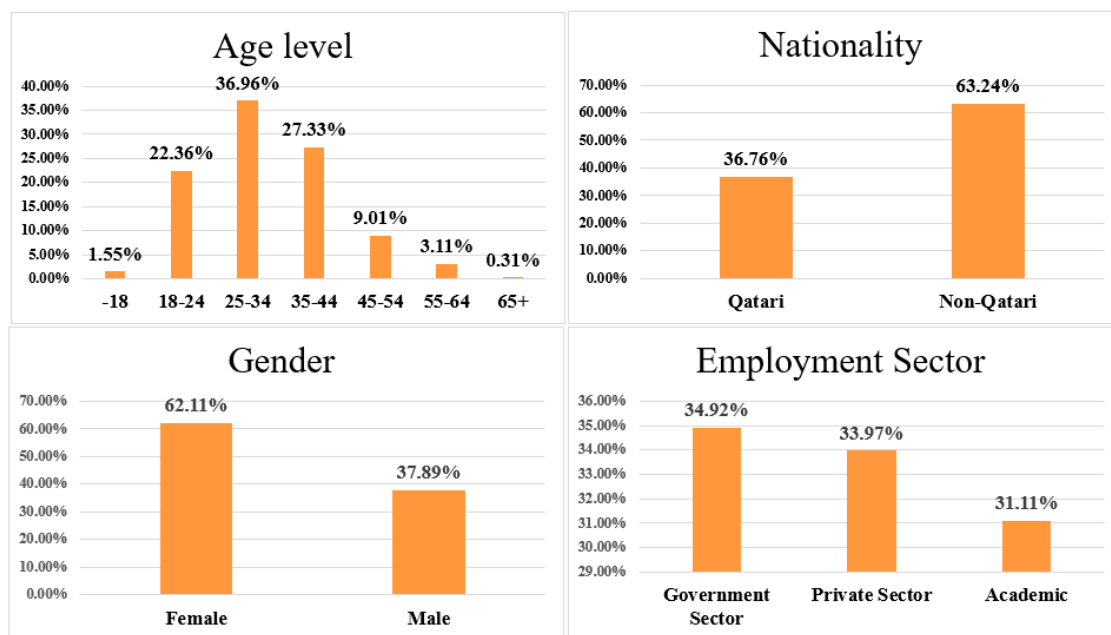


Figure 8. The Profile of Survey Participants.

We asked the participants how they would react to a compelling entrepreneurial opportunity while being currently employed. Whereas 96% of the participants wanted to pursue the opportunity, only 14% were willing to quit their current jobs completely. Sticking to their existing job and pursuing a part-time entrepreneurial career is the preferred option of the participants, shown in Figure 9. There are two immediate explanations for this risk-averse preference. Both citizens and expatriates are employed with very onerous packages as one of the perks of living in the richest nation on earth [72]. Leaving all these benefits and privileges at once does not seem to be a desirable option. Indeed, many current entrepreneurs in Qatar are either coming from business families or are a part-time entrepreneur [38]. As explained above, innovation is a quite risky and path-dependent process with a high chance of failure and a big pay-off in the case of success. Being a relatively young and developing country with no historic culture of innovation and industrialization (especially in non-oil sectors) may contribute to the risk-averse behavior of the citizens and expats living in the country.

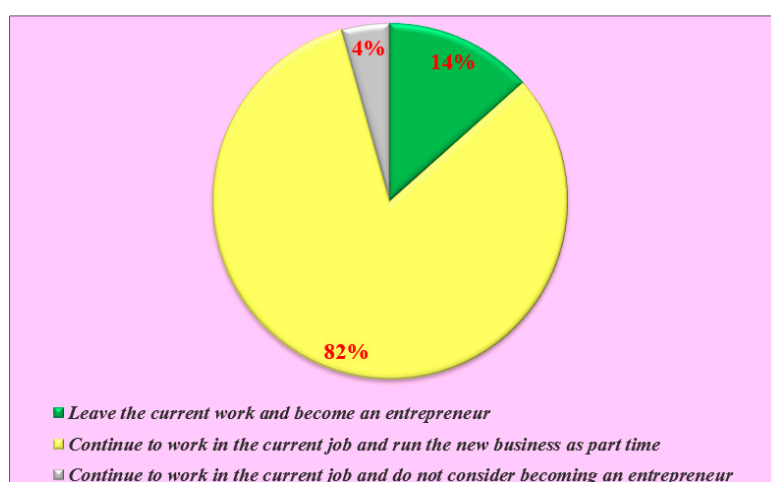


Figure 9. The Risk Preferences of The Participants for Entrepreneurship.

The respondents were open to new ideas, including establishing their own businesses, and the majority of the respondents (60%) were willing to enter any type of business as long as they saw an

opportunity. However, most of them (77.88%) would want to spend less than 50% of their personal savings for such an initiative, which can be seen in Figure 10. This risk-averse behavior further vindicates the result in Figure 9, as the majority of the participants were neither willing to quit their current jobs nor were willing to spend a sizeable portion of their personal savings.

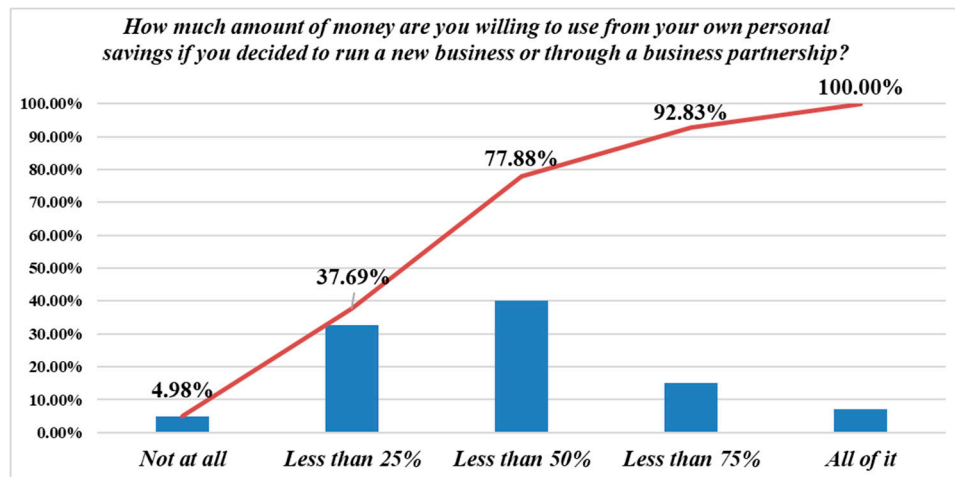


Figure 10. How Much Money Willing to Be Spent from Personal Savings to Open a New Business.

Expectations from the government and supporting agencies are high as lack of adequate funding and bureaucratic difficulties were the top reasons preventing people from taking new initiatives. As explained by the other researchers, the citizens and even the residents of a resource-rich country are accustomed to opulent government in countless economic ways [34]. The recent push for GCC-wide innovation and entrepreneurship has resulted in numerous investment, education, and support agencies (policies, schemes) across the six countries, which turned into another form of rent channel for the citizens due to lack of prior expertise and lax auditing [38]. Figure 11 reveals the perception of Qatari citizens and residents towards the state being the leading actor and supporter for innovation and entrepreneurship in the multiple-choice question of the factors blocking innovation and entrepreneurship in the country. On the positive side, participants of the survey agreed that their educational backgrounds (inside or outside of Qatar) are motivating the citizens and residents to pursue entrepreneurial quests by the majority of the respondents (60%), as seen in Figure 12. At least some of this must be due to the country's strong push for education initiatives and reforms in the last 25 years, such as Education City.

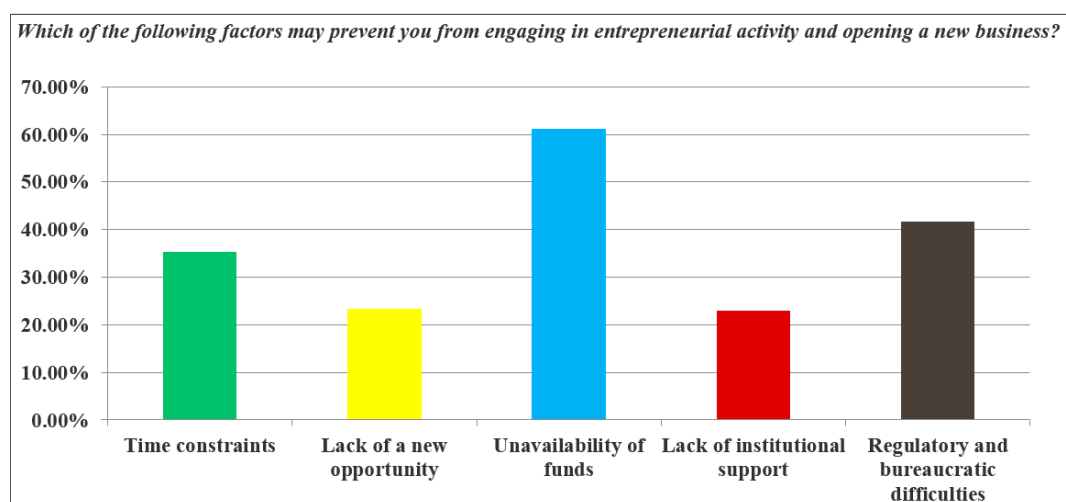


Figure 11. The Stumbling Blocks for Innovation and Entrepreneurship in Qatar.

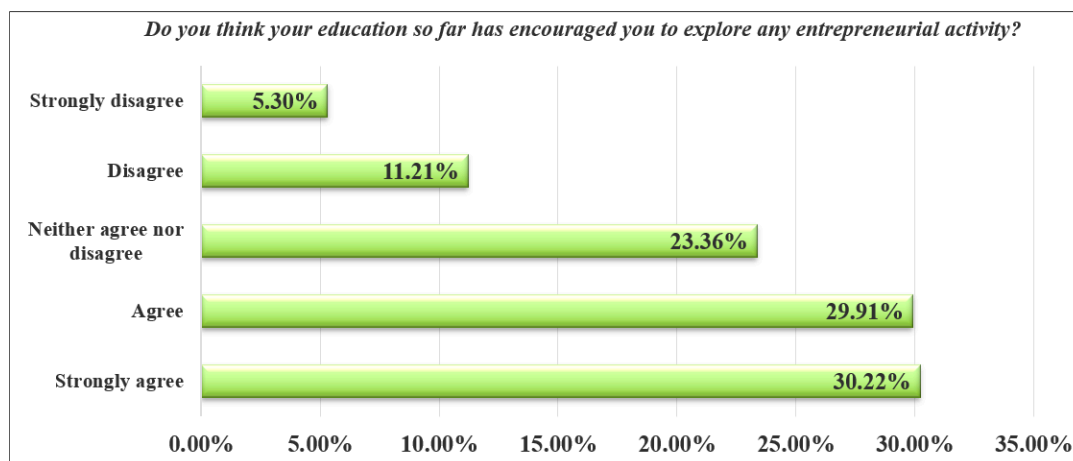


Figure 12. Education of the Participants and the Effects on Motivation for Entrepreneurship.

Participants of the survey expected more governmental support in terms of finance, regulation, and tertiary support with continuity in investment into education, especially to vocational training. Figure 13 highlights the importance of expectations from government and the upgrading of the educational system towards an entrepreneurial mentality as well as investment into vocational training. The common GCC practice of sending students to study at universities overseas was not perceived as critical by the participants. Participants' response to whether they will get the support of their families, especially in terms of financial support, is normally distributed, with the majority not being sure, as can be seen in Figure 14. Not following the norm and pursuing financially risky avenues may not receive strong familial backing in a usually traditional and status-quo preserving society such as Qatar [38,47].

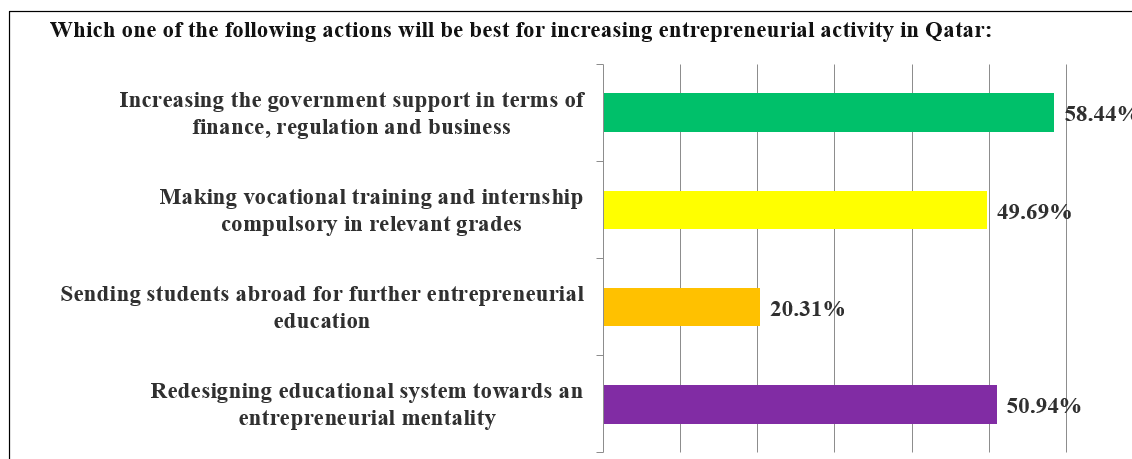


Figure 13. Expected Improvements for Better Entrepreneurship in Qatar.

Overall, the participants thought that all those government-led initiatives as a response to the recent economic and political developments (oil price collapse, regional crises) have spurred awareness and interest towards innovation and entrepreneurship in Qatar, as can be seen in Figure 15. The majority of the respondents (more than 60%) thought that the government was undertaking its responsibility in spurring innovation and entrepreneurship inside the country through both legislative and executive plans. The main worry was whether such a strong government presence would stifle the actions and initiatives by the traditional private sector and hence stymie a truly independent and private economic sector [23,38,40].

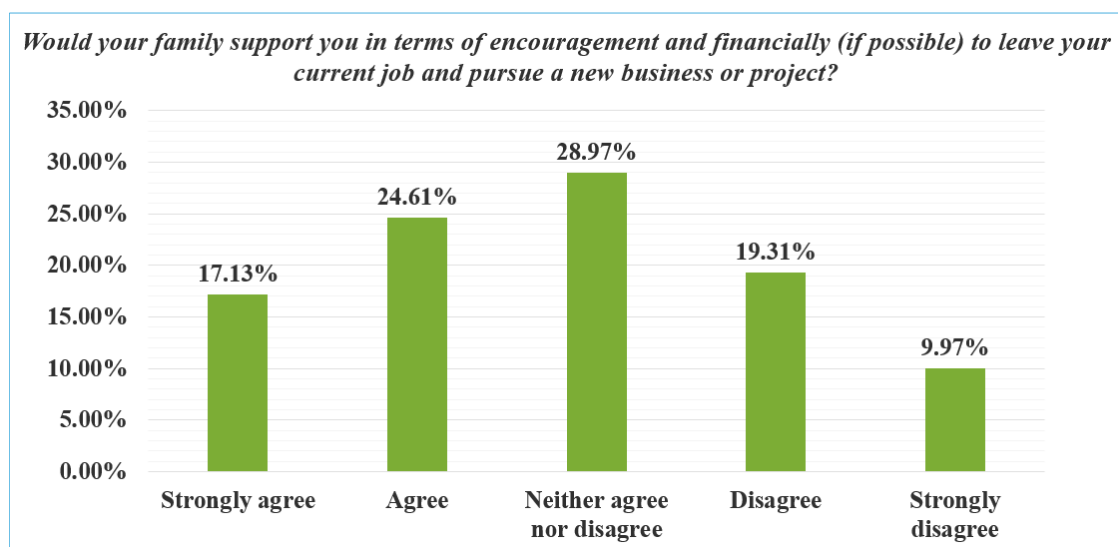


Figure 14. Familial (Societal) Perception of Entrepreneurship in Qatar.

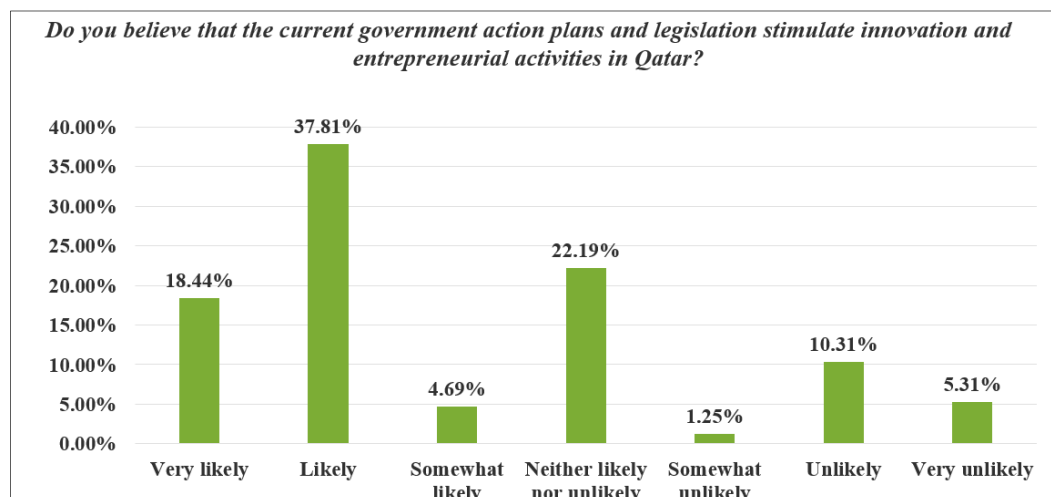


Figure 15. Participants' Perception of Entrepreneurship Initiatives by The Qatari Government.

6. Conclusions

The economic diversification in the GCC states towards value-added sectors and industries has become a must due to declining revenues from hydrocarbon resources and increasing populations [35]. These two dynamics put a significant strain on those governments to sustain the welfare of their citizens and hence preserve the social status-quo. They had already accrued significant budget deficits in the last five years, which is expected to only accelerate towards 2030 [23]. Domestic innovation and entrepreneurship are critical in any of those desired economic diversification (transformation) schemes, which may alleviate the burden on the government [10,32,34,35]. Qatar, as one of the six GCC states, is, fortunately, endowed with huge oil and gas reserves compared to its small local population [13]. The country's leadership has been very effective in utilizing these vast resources as the country owns and operates the largest gas-to-liquid plant and a state of the art LNG complex with the lowest cost in the world [13,14]. The country is the largest LNG exporter in the world; it also sends a sizeable amount of crude oil, petrochemicals, and related products overseas [14]. Nonetheless, the expected challenges to all hydrocarbon products and sectors are being well noticed by all the stakeholders in the country, with the government striving to lessen its dependence on hydrocarbon revenues significantly [92]. The economic vision 2030 laid out by the government explicitly accepts the challenges discussed in

this paper and points to innovation and entrepreneurship across numerous sectors as the ultimate panacea and goal [38].

This paper first studied the brief economic and political background of Qatar before discussing the theory of innovation and entrepreneurship in depth. The abundant oil and gas resources are both a blessing and a blocking mechanism for the country's economic diversification towards other industrial value-added sectors. The utilization of oil and especially gas reserves have been excellent so far as the country is among the richest nations on earth in terms of per capita basis [13]. The government bankrolled one of the most generous welfare schemes in the world for its citizens, including high-paying government jobs, subsidized utility services, and free education [93]. In exchange, the government granted limited political and representative rights to the citizens while most authorities rested in the hands of the ruler [10]. To preserve this status-quo (rentier agreement), the reliance on hydrocarbon revenues may not be sustainable, especially after 2030. Economic diversification of the country towards different value-added industries is a target agreed unanimously by all the stakeholders in the country [23].

The economic complexity index (ECI) value of Qatar shows a very limited and focused economic activity, which further indicates the urgency of economic diversification (Figure 6). However, this can also be interpreted as a big potential for economic diversification. The role of innovation and entrepreneurship becomes critical at this juncture as the only way to preserve current welfare for future generations. Considering the fact that innovation is quite a chaotic process, with a very low success rate and extremely high returns in the case of success, Qatar had, so far, limited advantages outside the traditional hydrocarbon and energy-dense industries such as steel and aluminum [35]. As the path dependency of innovation, along with a need for the cultural goodwill that is required for funding risky businesses, the country is relatively new to the game, which has been admitted by the government itself [38]. Therefore, the road to an innovative and diversified economy is long and is filled with many challenges and obstacles.

Innovation can be divided into three stages; the creation of knowledge, prototype building, and commercialization. Qatar has invested heavily in its education system, especially for the undergraduate and above, through the numerous universities in The Education City [72]. The research done by researchers from all around the world in excellent facilities with generous budgets has been increasing the in-house knowledge capacity of the country significantly, from medicine to engineering [94]. The results of our survey also show the satisfaction of the overall population in the country for the government's education incentives. While the tangible results of that newly created knowledge may take some time to realize, the world-class research and education, both in the universities of Education City and Qatar University, will greatly help the country in diversifying its economy [95]. On the other hand, the survey participants thought that a greater focus on entrepreneurship and vocational training were the key areas that must be improved further. Building any kind of prototype out of the knowledge constitutes the second part of innovation. At that stage, the chance of failure is quite high, and it is very challenging for entrepreneurs to raise early stage funds. Lack of any historical practice and information asymmetry faced by private investors may dis-incentivize them from investing in any venture or early startup. Entrepreneurs may need to use their own savings for early capital funding, if possible. However, our survey indicates that the majority of the participants were neither willing to invest a sizeable amount from their personal savings nor borrow from close family members. The government is thus providing the seed capital in this stage through its universities' venture arms or specific venture initiatives [38]. The survey results indicate both the appreciation of that critical support and the expectation of its continuance until an innovation and entrepreneurship culture is firmly established in the country.

To our knowledge, the survey presented in this paper is unique in the sense that it reflects the views of the populace on the current state of economic diversification in Qatar. Both the analysis and the survey results indicate that residents and citizens of Qatar rely on the government when it comes to venture into risky businesses and initiatives, thus confirming the previous studies [20,38]. The rentier

paradigm that has existed in the country since its establishment is not easy to overcome overnight. Considering the mammoth oil and gas reserves of the country and its extremely visionary and generous government, this rentier paradigm may even be stronger and stickier compared to the other GCC states [96]. Free healthcare, housing support, family income contribution, and easily attainable and high-paying public jobs are available, especially to all of the Qatari citizens. Such an unmatched welfare system would clearly lessen the motivation of its people in pursuing very risky venture projects. This may also be the case for the country's business elite, which historically benefitted from the sponsorship system and preferential treatment by the government in the distribution of business licenses [19]. The highly lucrative domestic business opportunities, such as product dealerships and commercial activities other than oil and gas-related industries, are generally given to specific families or tribes (including the ruling family) as a part of the rentier agreement [10,19,48]. Therefore, it is very probable that the country's business elite may also refrain from entering risky ventures outside of their current activities.

The survey results show that more governmental support, in terms of finance, regulation, and tertiary support with continuity in investment into education, especially vocational training, is deemed critical. Participants were not certain of getting financial support from their families when launching their own business. Not following the norm and pursuing financially risky avenues may not receive strong familial backing in a usually traditional and status-quo preserving society such as Qatar [47]. Overall, the participants thought that all those government-led initiatives as a response to the recent economic and political developments (oil price collapse, regional crises) have spurred awareness and interest towards innovation and entrepreneurship in Qatar. Ironically, the economic diversification in the country through private entities seems lackluster and depends heavily on the government, especially for innovation and entrepreneurship. This finding further cements the mounting challenge of avoiding rentier pitfalls and building a diversified economy, especially in such a wealthy state as Qatar.

7. Discussions and Future Work

This paper omits the discussion of two relevant subjects when it comes to innovation and entrepreneurship in Qatar. First of all, the state is no longer a classic rentier state just overseeing the collection and distribution of hydrocarbon income [10]. Instead, Qatar has become a globally active investor with its surplus revenue from hydrocarbons through the Qatar Investment Authority (QIA) [21]. The government is also very active concerning the domestic economy, with the launch of numerous business initiatives in media, transportation (metro, airline), logistics, and other industries such as steel and aluminum [97]. The completion of world-class sea and airports, along with the rapid completion of many infrastructure projects, is readying the country for future growth [98]. Expansion of LNG production, compression, and transportation to overseas customers had been initiated recently by Qatar Petroleum (QP) with an aim to retain the country's number one status in terms of global LNG exports in the 2020s [61]. The country is almost ready for the World Cup 2022, as most of the work regarding the infrastructure of the tournament, such as stadiums, hotels, and supporting facilities, completed ahead of schedule [92]. The country is poised to host numerous high-profile international sports events other than the World Cup 2022, which will further cement its status as a global hub. Therefore, The State of Qatar and its government can be categorized as highly entrepreneurial when it comes to the management of its hydrocarbon wealth both domestically and internationally.

The long political differences among the GCC states of Bahrain, Saudi Arabia, and the UAE versus Qatar ultimately resulted in the Gulf Crisis of 2017, where the former three, along with Egypt, ceased any economic or political relationship with Qatar [92]. These four countries imposed a sea, air, and land closure of Qatar, which significantly restricted traffic of the country's airline (Qatar Airways) and sizeable import restrictions (goods, machinery, raw material), especially from Saudi Arabia and the UAE. Qatar responded to these closures in a systematic way, from establishing new trade routes to the rapid ramping-up of domestic production in numerous areas [14,62,92]. This paper and the survey omit

the analysis of the effects of the Gulf Crisis in terms of spurring domestic and foreign entrepreneurial activities of both the state and the private sector. How the initial shock affected the mindset and perceptions of all the stakeholders in the country regarding innovation and entrepreneurship is a very critical research subject. A whole set of analysis must be conducted in this subject in the near future after a certain time has passed since the Gulf Crisis.

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References

1. Sachs, J.D.; Warner, A.M. The big push, natural resource booms and growth. *J. Dev. Econ.* **1999**, *59*, 43–76. [CrossRef]
2. Ross, M.L. The political economy of the resource curse. *World Polit.* **1999**, *51*, 297–322. [CrossRef]
3. Van der Ploeg, F. Natural resources: Curse or blessing? *J. Econ. Lit.* **2011**, *49*, 366–420. [CrossRef]
4. Apergis, N.; Payne, J.E. The oil curse, institutional quality, and growth in MENA countries: Evidence from time-varying cointegration. *Energy Econ.* **2014**, *46*, 1–9. [CrossRef]
5. Sachs, J.D.; Warner, A.M. The curse of natural resources. *Eur. Econ. Rev.* **2001**, *45*, 827–838. [CrossRef]
6. Gylfason, T. Lessons from the Dutch disease: Causes, treatment, and cures. *Oxf. Econ. Pap.* **1984**, *36*, 359–380.
7. Mehlum, H.; Moene, K.; Torvik, R. Institutions and the resource curse. *Econ. J.* **2006**, *116*, 1–20. [CrossRef]
8. Beblawi, H. The rentier state in the Arab world. *Arab Stud. Q.* **1987**, *9*, 383–398.
9. Heard-Bey, F. Labour Migration and Culture. The Impact of Immigration on the Culture of the Arab Societies of the Gulf. In Proceedings of the BRISMES Conference, Oxford, UK, 6 July 1997.
10. Gray, M. A Theory of ‘Late Rentierism’ in the Arab States of the Gulf. *SSRN Elec. J.* **2011**. [CrossRef]
11. Atalay, Y. Understanding Input and Output Legitimacy of Environmental Policymaking in The Gulf Cooperation Council States. *Environ. Policy Gov.* **2018**, *28*, 39–50. [CrossRef]
12. Al-Siddiqi, A.; Dawe, R.A. Qatar’s oil and gasfields: A review. *J. Pet. Geol.* **1999**, *22*, 417–436. [CrossRef]
13. Ibrahim, I.; Harrigan, F. Qatar’s economy: Past, present and future. *Q. Sci. Connect* **2012**, *9*, 24. [CrossRef]
14. Tsafos, N. Qatar Leaves OPEC. Available online: <https://www.csis.org/analysis/qatar-leaves-opec> (accessed on 23 December 2019).
15. Kaya, A.; Choucri, N.; Tsai, I.-T.; Mezher, T. Energy consumption and transition dynamics to a sustainable future under a rentier economy the case of the GCC states. In *Sustainability in the Gulf: Challenges and Opportunities*; Routledge: Abingdon, UK, 2017.
16. Flamos, A.; V Roupas, C.; Psarras, J. GCC economies diversification: Still a myth? *Energy Sources Part B Econ. Plan. Policy* **2013**, *8*, 360–368. [CrossRef]
17. Gengler, J.; Lambert, L.A. Renegotiating the ruling bargain: selling fiscal reform in the GCC. *Middle East J.* **2016**, *70*, 321–329. [CrossRef]
18. Yalcin, S. Adam Hanieh: Capitalism and Class in the Gulf Arab States. *Cap. Cl.* **2015**, *39*, 167–170.
19. Kaya, A.; Tsai, I.-T. Inclusive Economic Institutions in the Gulf Cooperation Council States: Current Status and Theoretical Implications. *Rev. Middle East Econ. Financ.* **2016**, *12*, 139–173. [CrossRef]
20. Gray, M. Theorising politics, patronage, and corruption in the Arab monarchies of the Gulf. In *Clientelism and Patronage in the Middle East and North Africa*; Routledge: Abingdon, UK, 2018; pp. 59–80.
21. Amar, J.; Carpentier, J.-F.; Lecourt, C. *GCC Sovereign Wealth Funds: Why Do They Take Control?* HAL: Paris, France, 2018.
22. Kim, S.; Sheikh, N.J. Developing a Decision Model Framework to Assess Arms Supplier Policies. In Proceedings of the 2018 Portland International Conference on Management of Engineering and Technology (PICMET), Honolulu, HI, USA, 19–23 August 2018; pp. 1–15.
23. Kaya, A.; Tok, E.; Koc, M.; Mezher, T.; Tsai, I. Economic Diversification Potential in the Rentier States Towards for a Sustainable Development: A Theoretical Model. *Sustainability* **2019**, *11*, 911. [CrossRef]

24. Kaya, A.; Csala, D.; Sgouridis, S. Constant elasticity of substitution functions for energy modeling in general equilibrium integrated assessment models: A critical review and recommendations. *Clim. Chang.* **2017**, *145*, 27–40. [\[CrossRef\]](#)
25. Khalil, H.A.E.E.; Ibrahim, A.; Elgendy, N.; Makhoul, N. Could/should improving the urban climate in informal areas of fast-growing cities be an integral part of upgrading processes? Cairo case. *Urban Clim.* **2018**, *24*, 63–79. [\[CrossRef\]](#)
26. Al-Khatteeb, L. Gulf Oil Economies Must Wake Up or Face Decades of Decline. *Brook. Inst.* **2015**, *8*, 14.
27. Kilian, L. The impact of the shale oil revolution on US oil and gasoline prices. *Rev. Environ. Econ. Policy* **2016**, *10*, 185–205. [\[CrossRef\]](#)
28. Arbib, J.; Seba, T. *Rethinking Transportation 2020–2030*; RethinkX: CA, USA, 2017. Available online: http://static1.squarespace.com/static/585c3439be65942f022bbf9b/t/591a2e4be6f2e1c13df930c5/1494888038959/RethinkX+Report_051517.pdf (accessed on 15 December 2019).
29. Krane, J.; Hung, S.Y. Energy Subsidy Reform in the Persian Gulf: The End of the Big Oil Giveaway. *Issue Br.* **2016**, *28*, 16.
30. Ali, I.; Elbadawi, O. *The Political Economy of Public Sector Employment in Resource Dependent Countries*; Economic Research Forum: Cairo, Egypt, 2012.
31. Hvidt, M. Economic diversification in GCC countries: Past record and future trends. *Lond. Sch. Econ. Polit. Sci.* **2013**, *27*, 1–55.
32. Callen, M.T.; Cherif, R.; Hasanov, F.M.; Hegazy, A.; Khandelwal, P. *Economic Diversification in the GCC: Past, Present, and Future*; International Monetary Fund: Washington, DC, USA, 2014.
33. Levins, C.M. The rentier state and the survival of Arab absolute monarchies. *Rutgers J. Relig.* **2012**, *14*, 388.
34. Hvidt, M. Economic and Institutional Reforms in the Arab Gulf Countries. *Middle East J.* **2011**, *65*, 85–102. [\[CrossRef\]](#)
35. Tsai, I.-T.; Kaya, A. Economic Diversification and the Emergence of Inclusive Economic Institutions in the Gulf Cooperation Council States. In *Policy-Making in the GCC: State, Citizens and Institutions*; I.B. Tauris: London, UK, 2016; pp. 118–143.
36. Hertog, S. *The Private Sector and Reform in the Gulf Cooperation Council*; LSE Kuwait Programme: London, UK, 2013.
37. Hvidt, M. The United Arab Emirates: Modernity and Traditionalism in Petroleum Sector Management. In *Public Brainpower*; Springer: Cham, Switzerland, 2018; pp. 311–328.
38. Ennis, C.A. Between trend and necessity: Top-down entrepreneurship promotion in Oman and Qatar. *Muslim World* **2015**, *105*, 116–138. [\[CrossRef\]](#)
39. Tseng, C.-Y. Technological innovation capability, knowledge sourcing and collaborative innovation in Gulf Cooperation Council countries. *Innovation* **2014**, *16*, 212–223. [\[CrossRef\]](#)
40. Alabbasi, Y.; Sandhu, K. Blockchain Technologically Driven Innovation at the Gulf Cooperation Council Countries: An Overview. In *Technology-Driven Innovation in Gulf Cooperation Council (GCC) Countries: Emerging Research and Opportunities*; IGI Global: Hershey, PA, USA, 2019; pp. 89–110.
41. Hertog, S. Defying the resource curse: Explaining successful state-owned enterprises in rentier states. *World Polit.* **2010**, *62*, 261–301. [\[CrossRef\]](#)
42. Sawin, J.L.; Sverrisson, F.; Rutovitz, J.; Dwyer, S.; Teske, S.; Murdock, H.E.; Hamirwasia, V. *Advancing the Global Renewable Energy Transition-Highlights of the REN21 Renewables 2018 Global Status Report in Perspective*; Renewables 2018-Global Status Report. A Comprehensive Annual Overview of the State of Renewable Energy; REN21: Paris, France, 2018.
43. Bloomberg NEF. *World Reaches 1,000GW of Wind and Solar, Keeps Going*; BloombergNEF: London, UK, 2018.
44. Timmer, J. Wind Power Prices Now Lower than the Cost of Natural Gas. Available online: <https://arstechnica.com/science/2019/08/wind-power-prices-now-lower-than-the-cost-of-natural-gas/> (accessed on 15 December 2019).
45. Lewis, M. WELLS, WIRES, AND WHEELS—EROCI AND THE TOUGH ROAD AHEAD FOR OIL. Available online: <https://investors-corner.bnpparibas-am.com/investment-themes/sri/petrol-eroci-petroleum-age/> (accessed on 10 December 2019).
46. IMF. *November 2018 Regional Economic Outlook: Middle East and Central Asia*; IMF: Washington, DC, USA, 2018.
47. Kshetri, N.; Ajami, R. Institutional reforms in the Gulf Cooperation Council economies: A conceptual framework. *J. Int. Manag.* **2008**, *14*, 300–318. [\[CrossRef\]](#)

48. Krane, J. *City of Gold: Dubai and the Dream of Capitalism*; Macmillan: London, UK, 2009.
49. Ross, M.L. Does taxation lead to representation? *Br. J. Polit. Sci.* **2004**, *34*, 229–249. [[CrossRef](#)]
50. Hausmann, R.; Hidalgo, C.A.; Bustos, S.; Coscia, M.; Simoes, A.; Yildirim, M.A. *The Atlas of Economic Complexity: Mapping Paths to Prosperity*; Mit Press: Cambridge, MA, USA, 2014.
51. Hartmann, D.; Guevara, M.R.; Jara-Figueroa, C.; Aristarán, M.; Hidalgo, C.A. Linking economic complexity, institutions, and income inequality. *World Dev.* **2017**, *93*, 75–93. [[CrossRef](#)]
52. Luciani, G.; Ferroukhi, R. *Political Economy of Energy Reform: The Clean Energy-Fossil Fuel Balance in the Gulf States*; Gerlach Press: Cicerostraße, Germany, 2014.
53. Gengler, J. Political segmentation and diversification in the rentier Arab Gulf. In Proceedings of the Gulf Research Meeting 2013 Conference at the University of Cambridge, Cambridge, UK, 1–5 July 2013.
54. Quintane, E.; Mitch Casselman, R.; Sebastian Reiche, B.; Nylund, P.A. Innovation as a knowledge-based outcome. *J. Knowl. Manag.* **2011**, *15*, 928–947. [[CrossRef](#)]
55. Rogers, M. *The Definition and Measurement of Innovation*; Citeseer: Melbourne, Australia, 1998.
56. Scheel, C. Knowledge clusters of technological innovation systems. *J. Knowl. Manag.* **2002**, *6*, 356–367. [[CrossRef](#)]
57. Fuchs, G.; Shapira, P. *Rethinking Regional Innovation and Change: Path Dependency or Regional Breakthrough*; Springer Science & Business Media: Berlin, Germany, 2005.
58. Acemoglu, D. Oligarchic versus democratic societies. *J. Eur. Econ. Assoc.* **2008**, *6*, 1–44. [[CrossRef](#)]
59. Nelson, R.R. National Innovation Systems: It is. In *Regional Innovation and Global*; Routledge: Abingdon, UK, 2013; pp. 19–34.
60. Lau, A.K.W.; Lo, W. Regional innovation system, absorptive capacity and innovation performance: An empirical study. *Technol. Forecast. Soc. Chang.* **2015**, *92*, 99–114. [[CrossRef](#)]
61. Rystad Energy, Qatar Is Poised To Win Race For New LNG Projects. Available online: <https://www.rystadenergy.com/newsevents/news/press-releases/liquefaction-projects-FIDs/> (accessed on 21 December 2019).
62. D'Alessandro, C. Liquefied Natural Gas (LNG): Prospects and Opportunities for Qatar in Sub-Saharan Africa. *Arab World Geogr.* **2018**, *21*, 93–113.
63. Miniaoui, H.; Schilirò, D. Innovation and entrepreneurship for the diversification and growth of the gulf cooperation council economies. *Bus. Manag. Stud.* **2017**, *3*, 69–81. [[CrossRef](#)]
64. Fischer, M.M. Innovation, knowledge creation and systems of innovation. *Ann. Regional Sci.* **2001**, *35*, 199–216. [[CrossRef](#)]
65. Zhou, K.Z.; Li, C.B. How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strateg. Manag. J.* **2012**, *33*, 1090–1102. [[CrossRef](#)]
66. Tödtling, F. The role of universities in innovation systems and regional economies. In Proceedings of the Expert Meeting on The Future of Academic Research, Vienna, Austria, 19–20 October 2006.
67. Gunasekara, C. Reframing the role of universities in the development of regional innovation systems. *J. Technol. Trans.* **2006**, *31*, 101–113. [[CrossRef](#)]
68. Brundenius, C.; Lundvall, B.-Å.; Sutz, J. The role of universities in innovation systems in developing countries: Developmental university systems—empirical, analytical and normative perspectives. In *Handbook of Innovation Systems and Developing Countries*; Edward Elgar Publishing: Trotterham, UK, 2009; Chapter 11.
69. Martin, S.; Scott, J.T. The nature of innovation market failure and the design of public support for private innovation. *Res. Policy* **2000**, *29*, 437–447. [[CrossRef](#)]
70. Gann, D.M.; Wang, Y.; Hawkins, R. Do regulations encourage innovation?—the case of energy efficiency in housing. *Build. Res. Inf.* **1998**, *26*, 280–296. [[CrossRef](#)]
71. Nonaka, I.; Nishiguchi, T. *Knowledge Emergence: Social, Technical, and Evolutionary Dimensions of Knowledge Creation*; Oxford University Press: Oxford, UK, 2001.
72. Parcerro, O.J.; Ryan, J.C. Becoming a knowledge economy: The case of Qatar, UAE, and 17 benchmark countries. *J. Knowl. Econ.* **2017**, *8*, 1146–1173. [[CrossRef](#)]
73. Elitzur, R.; Gavius, A. Contracting, signaling, and moral hazard: A model of entrepreneurs, 'angels,' and venture capitalists. *J. Bus. Ventur.* **2003**, *18*, 709–725. [[CrossRef](#)]
74. Mitteness, C.R.; Baucus, M.S.; Sudek, R. Horse vs. jockey? How stage of funding process and industry experience affect the evaluations of angel investors. *Ventur. Cap.* **2012**, *14*, 241–267. [[CrossRef](#)]

75. Enos, J.L. Invention and innovation in the petroleum refining industry. In *The Rate and Direction of Inventive Activity: Economic and Social Factors*; Princeton University Press: Princeton, NJ, USA, 1962; pp. 299–322.
76. Kline, S.J.; Rosenberg, N. An overview of innovation. In *Studies On Science And The Innovation Process: Selected Works of Nathan Rosenberg*; World Scientific: London, UK, 2010; pp. 173–203.
77. Millar, C.; Udalov, Y.; Millar, H. The ethical dilemma of information asymmetry in innovation: Reputation, investors and noise in the innovation channel. *Creat. Innov. Manag.* **2012**, *21*, 224–237. [[CrossRef](#)]
78. Minniti, M. Entrepreneurial alertness and asymmetric information in a spin-glass model. *J. Bus. Ventur.* **2004**, *19*, 637–658. [[CrossRef](#)]
79. Muscio, A.; Quaglione, D.; Vallanti, G. Does government funding complement or substitute private research funding to universities? *Res. Policy* **2013**, *42*, 63–75. [[CrossRef](#)]
80. Borlaug, S.B. Moral hazard and adverse selection in research funding: Centres of excellence in Norway and Sweden. *Sci. Public Policy* **2015**, *43*, 352–362. [[CrossRef](#)]
81. Kelm, K.M.; Narayanan, V.K.; Pinches, G.E. Shareholder value creation during R&D innovation and commercialization stages. *Acad. Manag. J.* **1995**, *38*, 770–786.
82. Buettner, B. Entry barriers and growth. *Econ. Lett.* **2006**, *93*, 150–155. [[CrossRef](#)]
83. Van Hemert, P.; Nijkamp, P.; Masurel, E. From innovation to commercialization through networks and agglomerations: Analysis of sources of innovation, innovation capabilities and performance of Dutch SMEs. *Ann. Reg. Sci.* **2013**, *50*, 425–452. [[CrossRef](#)]
84. McCann, P.; Simonen, J. Innovation, knowledge spillovers and local labour markets. *Pap. Reg. Sci.* **2005**, *84*, 465–485. [[CrossRef](#)]
85. Acemoglu, D.; Johnson, S.; Robinson, J.A. *The Colonial Origins of Comparative Development: An Empirical Investigation*; National Bureau of Economic Research: Cambridge, MA, USA, 2000.
86. Weingast, B.R. The economic role of political institutions: Market-preserving federalism and economic development. *J. Law Econ. Organ.* **1995**, *11*, 1–31.
87. Acemoglu, D.; Johnson, S.; Robinson, J.A. Institutions as a fundamental cause of long-run growth. *Handb. Econ. Growth* **2005**, *1*, 385–472. [[CrossRef](#)]
88. Acemoglu, D. Why not a political Coase theorem? Social conflict, commitment, and politics. *J. Comp. Econ.* **2003**, *31*, 620–652. [[CrossRef](#)]
89. Minniti, M.; Bygrave, W. A dynamic model of entrepreneurial learning. *Entrep. Theory Pract.* **2001**, *25*, 5–16. [[CrossRef](#)]
90. Parker, S.C. Why do small firms produce the entrepreneurs? *J. Soc. Econ.* **2009**, *38*, 484–494. [[CrossRef](#)]
91. Fargues, P. Immigration without inclusion: Non-nationals in nation-building in the Gulf States. *Asian Pac. Migr. J.* **2011**, *20*, 273–292. [[CrossRef](#)]
92. Ulrichsen, K.C. Lessons and Legacies of the Blockade of Qatar. *Insight Turk.* **2018**, *20*, 11–20. [[CrossRef](#)]
93. Hertog, S. *The Political Economy of Labour Markets and Migration in the Gulf: Workshop Proceedings*; LSE Kuwait Programme: London, UK, 2016.
94. Khodr, H. The dynamics of international education in Qatar: Exploring the policy drivers behind the development of Education City. *J. Emerg. Trends Educ. Res. Policy Stud.* **2011**, *2*, 514–525.
95. Ibnouf, A.; Dou, L.; Knight, J. The evolution of Qatar as an education hub: Moving to a knowledge-based economy. In *International Education Hubs*; Springer: Cham, Switzerland, 2014; pp. 43–61.
96. Malik, M.; Nagesh, T. FISCAL SUSTAINABILITY AND HYDROCARBON ENDOWMENT PER CAPITA IN THE GCC. Available online: <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/06/OEF-118.pdf?v=7516fd43adaa> (accessed on 20 December 2019).
97. Morakabati, Y.; Beavis, J.; Fletcher, J. Planning for a Qatar without oil: Tourism and economic diversification, a battle of perceptions. *Tour. Plan. Dev.* **2014**, *11*, 415–434. [[CrossRef](#)]
98. Agence France-Presse. *Qatar Spending \$500m a Week on World Cup Projects*; Agence France-Presse: Paris, France, 2017.

