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Entrepreneurship in a transformative and resource-rich state: The case of Qatar

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ABSTRACT

Countries blessed with natural resources have generally struggled to achieve sustainable economic development and prosperity. Population growth, the depletion of natural resources coupled with mismanagement, and sharp fluctuations in prices of those resources are among the main reasons for sub-optimal economic performance. Some resource-rich countries have been expending effort and money in an attempt to change this inverse relationship (a.k.a. “the resource curse”) by designing policies to diversify their economies with high-value-added industries and sectors. Qatar is a such country and point of the interest in this article. Qatar’s political and economic structure, its efforts to diversify its economy, and the potential for improved entrepreneurial outcomes are analyzed. The country has been very effective in maximizing the benefits of its oil resources and especially its large natural gas reserves, becoming the largest exporter of liquefied natural gas (LNG) in the world. Revenues from oil and gas sales have been invested in the domestic economy and global assets. Thus far, however, it has not shown the in-house capacity for innovation and entrepreneurship critical for sustainable economic diversification going forward.

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1. Introduction

Across the world, a significant number of countries have substantial natural resource reserves such as minerals, oil, and natural gas. The fortunes of those countries often underwent dramatic changes as the discovery of resources spurred economic activity and substantially increased their revenues, but not necessarily improving the well-being of their citizens overall. Many of these countries have faced political upheavals and the reversal of initial economic gains, and some have ended up in a worse situation than they were before the discovery of the natural resources. Countries which have suffered from this “resource curse” (Sachs and Warner, 1999) include Zimbabwe, Iraq, Libya, and DR. Congo. The primary reasons for such undesired outcomes are mismanagement of the new resources, internal power struggles, rampant corruption, sharp fluctuations in the value of the rent resource, increasing population, and de-industrialization in other sectors (Hertog, 2010; Hvidt, 2013; Kaya and Tsai, 2016; Van der Ploeg, 2011). However, not all resource-rich countries suffer from this inverse relationship between resource wealth and social chaos and underdevelopment (Gray, 2011; Levins, 2012). Norway, Australia, and Canada are among the industrially advanced countries which possess large natural resources but have maintained a stable political system and relative immunity to wild fluctuations in the value of their resources (Mehlum, Moene, and Torvik, 2006).

The states of the Gulf Cooperation Council (GCC) — Bahrain, Kuwait, Oman, Saudi Arabia, Qatar, and UAE — have also utilized their large oil and gas wealth to propel rapid development starting from the 1970s, with a relatively stable social order (Hertog, 2013; Kubursi, 1986; Tsai and Kaya, 2016). However, these states rely heavily on oil and gas revenues for funding state expenses as well as covering the costs of imports (Kaya and Tsai, 2016). They are keenly aware of the potential pitfalls of such a dependence on a single natural resource, and have therefore initiated a series of developmental plans and visions to diversify their economies (Tsai and Kaya, 2016). In this paper, we define them as “transformative states” in their quest for economic diversification, and focus on their potential to achieve this target through a case
The paper is organized as follows. Section 2 examines the economic structure of Qatar from a transformative state perspective, highlighting three important economic “circuits”. Section 3 then discusses the challenges posed to the current transformative economic structure of the country with a special focus on the future of the oil and gas sectors. Section 4 visits the literature on innovation and analyses the potential, incentives, and capacity for innovation and entrepreneurship in Qatar. Section 5 discusses the paper’s findings and offers some conclusions.

2. The economic structure of Qatar as a transformative state

Located in the east-central section of the Arabian Peninsula, Qatar is itself a peninsula as 80% of its land is surrounded by the Arabian Gulf. The country’s only land border is with Saudi Arabia, and it shares maritime borders with Bahrain, Saudi Arabia, UAE, and Iran. The total land area of Qatar is a little over 11,000 km². Qatar gained its independence from the British colonial administration in 1971 after the latter’s withdrawal from the region, which coincided with the discovery of large oil reserves beginning in the 1960s (Hanieh, 2016). Prior to the discovery of oil, Qatar was a barren land with a small population focused mainly on fishing and pearlaring activities. The biggest — and only sizeable — city of the country is Doha, where the majority of the population lives. The country’s total population is around 2.6 million of which 1.9 million are male and 0.7 million are female, according to the Ministry of Development Planning and Statistics of Qatar (https://www.mdps.gov.qa). Although there are no official statistics on the proportion of immigrants, the CIA World Factbook estimates that immigrants comprise more than 88% of the total while the local population constitutes less than 12% (https://www.cia.gov/library/publications/the-world-factbook/geos/qa.html). The majority of the migrant population come from Southeast Asian countries and work in low-skilled jobs such as housekeeping, construction, and basic services (Gardner et al., 2013). A small migrant workforce with advanced education and experience fills critical engineering jobs, consulting services, and management positions alongside Qatari nationals (Fargues, 2011; Gardner et al., 2013).

Like the other GCC member states, Qatar is considered a transformative state economy which indicates that while extraction and utilization of oil and gas provide the country’s main export revenue (rent), it has simultaneously been attempting to diversify its economy using such revenues. The country’s political system is a tribal monarchy ruled by The Al-Thani Family which has a strong alliance with all the leading tribes in the country (Gray, 2011). The government has exclusive control of the country’s oil and gas revenue, which allows it to provide numerous benefits to its citizens, such as a zero-taxation regime, high salaries for public sector workers, free schooling, healthcare, and housing, in exchange for the transfer of political representation to the ruling family (Kaya and Tsai, 2016). This exchange of economic benefits for political rights is known in the literature as “the ruling agreement” (Hvidt, 2013) and is depicted in Fig. 1 (Kaya and Tsai, 2016); overall, such a ruling agreement guides economic, social, and political structures, decisions, and transformations.

Within a transformative economic system, there are three important zones of operation which can be labelled the productive circuit, the finance circuit, and the commodity circuit (Hanieh, 2016). The productive circuit involves rent-creating business activities such as the oil and gas sectors, including petrochemicals: it is an essential part of the transformative economy as it brings export revenue to the state. The cost of oil and gas production in the GCC states is relatively cheap compared to the rest of the world due to the concentration of conventional oil and gas wells in the region (Shah, 2006). The governments of the GCC states, including Qatar, exercise exclusive control over most of the sectors in the productive circuit (especially oil and gas production) through laws and decrees (Tsai and Kaya, 2016), which allows them to implement “the ruling agreement” mentioned above (Hvidt, 2013). Apart from the oil and gas sectors, GCC governments have gradually expanded the scope of the productive circuit by investing in energy-intensive sectors such as aluminum and steel production to increase their profits by utilizing the inexpensive energy available to them (Hertog, 2010). The GCC governments first allowed private businesses to operate in limited areas of the productive circuit such as the construction industry and subcontracting services (Kaya and Tsai, 2016); this has been followed by the creation of service sectors in the productive circuit such as telecommunications and aviation in which GCC governments are leading players (Callen, Cherif, Hasanov, Hegazy, and Khandelwal, 2014).

The second important circuit in a transformative state is the finance sector (Hanieh, 2016). After gaining independence from the colonial powers, the GCC states rapidly established numerous local banks to transfer income from the oil and gas industry. These banks transferred resources to domestic firms and individuals in the form of credit that stimulated the local economy. Many of these local banks are owned by the government, the ruling families, or the merchant families in the Gulf who form the political and economic elite of the GCC countries (Hanieh, 2016); these powerful owners are represented on the Boards of Directors, giving them effective control over the management of the bank and its capital (Al-Muharrami, Matthews, and Khabari, 2006). Therefore, the finance circuit is effectively used to entrench “the ruling agreement” in the Gulf states, allocating capital not in the most efficient way, but through preferential treatment to the selected families and groups.

The final circuit in a transformative economy is the commodity circuit. A transformative state usually imports a significant share of consumer goods such as cars, home appliances, and personal products from abroad (Hvidt, 2013). The “Dutch Disease” theory argues that income from the export of oil and gas results in an increase in the price of nontradable goods and domestic services due to the overall income increase in the country (Issawi, 2010). This is because nontradable services or goods are hard to exchange with tradable ones, which results in higher prices of nontradable goods and hence better profits in those industries (Matsen and Torvik, 2005). The commodity circuit includes the trading and selling of these nontradable goods and services such as product dealerships, education and healthcare (Kaya, Tok, Koc, Mzheber, and Tsai, 2019). A transformative government usually allocates to local businessmen exclusive trading licences for importing or re-exporting a

![Fig. 1. “The Ruling Agreement” in Qatar (Kaya and Tsai, 2016).](image-url)
certain commodity product as part of “the ruling agreement” (Krane, 2009). Thanks to preferential treatment by the government, there are famous trading and business family conglomerates in each of the GCC states which control certain sectors (Yalcin, 2015). Coupled with the circulation of rent revenue from productive and finance circuits in the domestic economy, exclusive trading rights have allowed elite families to conglomerate to realize sizeable profits and rapid expansion of their businesses (Hanieh, 2016). The family conglomerates consist of known tribal leaders including some royal family members and merchant families of the GCC states.

2.1. The productive circuit in Qatar

The first discovery of oil in Qatar was in 1939 in Dukhan Field, from which production of 4000 barrels a day started in 1940 (Al-Siddiqi and Dawe, 1999). After a lull during World War II, international interest in oil in the region resumed post-war, and investment for exploration and drilling in the region increased rapidly (Kubursi, 1986). During the 1950s and 1960s, a string of new oil fields, both onshore and offshore, were discovered that propelled the country’s oil production to more 400,000 barrels per day (Al-Siddiqi and Dawe, 1999). After Qatar gained independence in 1971, the largest single natural gas field in the world (the North Field) was discovered, which stretches from the northern shores of Qatar to its maritime borders with Iran. The North Field contains 872 trillion cubic feet of non-associated gas in a single location, which accounts for 14.3% of the world’s total known conventional gas reserves (BP, 2018). The exploitation of this huge gas field was very limited in the 1970s and 1980s (Al-Siddiqi and Dawe, 1999), but there has been rapid development regarding extraction and utilization of the natural gas in the North Field since the 1990s. Large-scale investments in liquefied natural gas (LNG) and its sale on world markets have made Qatar one of the largest natural gas exporters in the world. While a relatively small producer of crude oil (accounting for less than 1% of the world’s production), Qatar is currently the world leader of LNG production and export, with a capacity of more than 80 million tons of LNG per year (D’Alessandro, 2018; Tsafos, 2018). Furthermore, the country has the largest gas-to-liquids (GTL) facility in the world with a capacity of around 200,000 barrels per day, in which natural gas is processed into oil derivatives such as naphtha and diesel (Ahmed et al., 2019). Fig. 2 shows the timeline of developments in Qatar regarding the utilization of the natural gas found in the North Field.

Qatar currently produces crude oil, liquefied natural gas, paraffin, helium, and some other petrochemical products such as ammonia, urea, and polyethylene, with its international partners on an output-sharing basis (Rystad Energy, 2018). The government of Qatar has pursued a vertical integration strategy in capturing the value of its oil and gas reserves. The state-owned Qatar Petroleum (QP) has joint ventures (JV) and sub-units covering all aspects, from exploration and drilling of oil and gas to their refinement and liquefaction, transportation, and marketing to international customers (Ibrahim and Harrigan, 2012). QP-owned Nakilat operates more than 14 large-tonnage ships to transport LNG to the world markets. QP is currently studying an ambitious plan to expand its operations from LNG production to petrochemical products in tandem with its international partners. Qatar has greatly benefited from the strategic and wise management of its oil and gas reserves by QP. However, the volatility and recent fall in international oil prices have seriously affected state revenues and made economic diversification a matter of urgency. Fig. 3 highlights the fluctuations and downward trend in Qatar’s revenues from exports of oil and gas products in the five years 2013-17.

The country has a relatively small manufacturing capacity outside of the oil and gas industries, and petrochemicals and GTL production. The Mesaieed Industrial Area is home to Qatar Steel and Qatar Aluminum companies, both owned by QP. Qatar Steel has a production capacity of more than 1 million metric tonnes of steel derivatives per year. Qatar Aluminum has a production capacity of 585,000 tnes per year. These two companies are among the largest manufacturing entities in the GCC (Hanieh, 2016); however, their outputs are comparatively minor in terms of the global steel and aluminum industries whose outputs exceed 150 million tonnes per year for each sector. While there are notable family conglomerates operating in construction and consultancy businesses in Qatar, such as Al-Mana, Al-Fardan, Nasser Bin Khaled (NBK), Faisal Bin Qassem, Rumailah, Ghanem Al-Thani holdings (Snjo, 2017), the size, scale, and scope of private entities in the productive circuit are limited and much smaller than those of the state-owned companies due to the structure of the transformative state (Hanieh, 2016; Tsai and Kaya, 2016).

Fig. 4 shows the sectoral decomposition of Qatar’s Gross Domestic Product (GDP) by sectors for the years 2009-2017.
Production for the three years 2016–18 (IMF, 2018). Oil and gas exploration and production activities are grouped under the mining and quarrying sector, whereas petrochemical production is included in the manufacturing sector in the report published by the Ministry of Development Planning and Statistics of Qatar. This report indicates that the majority of Qatar’s manufacturing activity occurs in the petrochemical sector, which is directly linked to oil and gas (MDPS, 2018). As a result, oil and gas-related businesses in the productive circuit, which is solely under state control, constitute the majority of the economic activity in the country (Gray, 2011). Countries in the Middle East have the lowest oil and gas production costs in the world (less than USD 15 per barrel) thanks to the concentration in the region of conventional oil and gas fields, which are less technically challenging and less costly to develop than unconventional sources (Kilian, 2016). With average oil prices in excess of USD 50 per barrel, the profits from hydrocarbon-related revenues have been unmatched in any other sector in the productive circuit. Fig. 5 shows the average cost of oil production, in USD per barrel, across the world for the year 2015.

2.2. The finance circuit

The finance circuit in Qatar is heavily controlled by the government, the ruling family, and merchant families, although the level of control is less rigid than in the other GCC states (Hanieh, 2016). Fig. 6 highlights the ownership structure of the major banks operating in Qatar where majority of the shares are either owned by the state via Qatar Investment Authority (QIA) or merchant families touted as Khaleeji Capital (Hanieh, 2016). The finance circuit in Qatar serves a crucial role in transferring revenue surplus (excess profits) from the productive circuit to domestic economic activities, especially to the commodity circuit. By having a significant degree of control in the management of the financial system, the Qatari government is able to use these excess funds to further strengthen “the ruling agreement” (Gray, 2011; Levins, 2012). The allocation of credit by state-controlled banks to domestic private businesses (merchant families) is not just based on their economic performance, but also on the relationship between the two entities (Hvidt, 2011). The business families and tribes which have a close relationship with the ruling family, and hence the state, are usually able to access easy and favorable credit from the banks (Yalcin, 2015). The finance circuit, therefore, is effectively used as a bridge between the productive circuit and the commodity circuit.

![Qatar Export Revenues from Oil and Gas Products](Tsafos, 2018).

![Qatar Real GDP Decomposition by Sectors (%)](IMF, 2018).
2.3. The commodity circuit

There is no significant manufacturing of capital goods used for production (machinery and heavy equipment) in the GCC states. This has resulted in the import of necessary capital goods from advanced economies. Rapid improvements in the economic conditions of GCC citizens and expatriate workers have also created a huge demand for basic consumer goods such as food products, cars, luxury goods, home appliances, and apparel (Hanieh, 2016). Due to the lack of industrial base, most consumer goods also need to be imported. The state has given exclusive licences to family businesses established by influential locals to import certain capital goods and many consumer goods as part of “the ruling agreement”. In the commodity circuit, Qatar’s economic structure is similar to the other GCC states (Tsai and Kaya, 2016).

There are numerous families from known tribes who operate in the commodity circuit through exclusive business contracts, licences and dealerships in Qatar (Snoj, 2017). Members of the ruling Al-Thani family take a lead in activities in the commodity circuit of the Qatari economy, as they do in the productive and finance circuits. Members of the Al-Thani family own and operate NBK, HBK, Doha Group, 7 Brothers Group Holding, Al-Jabor Group, TransInd Holding, Al-Ahli Hospital, Al-Faisal Holding, ARTIC, Ghanem Al-Thani Holdings, Rumailah Group and QIPCO, providing services from healthcare to education as well as trading in numerous products and goods (Snoj, 2017). The value of the firms and holdings owned by Al-Thani family members and listed in the Qatari Stock Exchange exceeds 150 billion Qatari Riyals equivalent to 41 Billion US Dollars (Snoj, 2017). Darwish Trading Company (DTC) is owned and managed by the powerful Fakhro family. The conglomerate operates in numerous businesses such as car dealerships, distribution networks for timber and other commodities within the domestic economy, imports of building materials, domestic apparel, furniture, and office supplies. DTC was established in 1934 as one of the oldest family firms in Qatar with more than 500 employees. Overall, the Fakhro family owns around 20 billion Qatari Riyals worth of domestic companies, including DTC. There are other notable families operating in various commodity circuit sectors, including the Al-Mahmood, Al-E-madi, Al-Mana, Al-Hajri, Al-Fardan, Al-Mannai, Al-Kuwari, and Al-Mohannadi families. Fig. 7 summarizes the list of families in Qatar who own more than 10 billion Qatari Riyals (2.74 Billion USD) worth of businesses listed in the Qatari Stock Exchange, including both productive circuit and commodity circuit sectors (Snoj, 2017).
3. The argument for economic diversification for Qatar

As there is currently no form of taxation in Qatar — whether income tax, value added tax or corporation tax (Gray, 2011) — Qatar’s economy depends on income from oil and gas businesses to cover government spending and to stimulate economic growth. The completion of LNG production, filling, and exportation facilities have compounded that dependency: Qatar has become the richest nation on earth in terms of per capita GDP with a large amount of revenue particularly from LNG sales (Parcero and Ryan, 2017; Rystad Energy, 2018). The country’s economic growth rate was spectacular in the last 20 years, even outstripping that of China (IMF, 2018). Fig. 8 highlights the phenomenal increase in Qatar’s GDP since 2000, when the LNG investments of the 1990s started yielding large revenues (Ibrahim and Harrigan, 2012).

The state of Qatar is able to run a generous welfare program for its citizens, which includes free public education, healthcare, and housing; it offers well-paying public sector jobs, and salaries for unemployed and dependents (Gray, 2011); it provides food support and it heavily subsidizes electricity, water, and gas for its citizens and residents, although there have been some recent tariff hikes as a part of an economic reform (Krame and Hung, 2016). Due to its relatively small population and huge oil and gas revenues, Qatar can afford to be the most generous among the GCC states in terms of supporting its citizens under the ruling agreement (Babar, 2014). Based on statistics from the IMF (2017), Fig. 9 shows the dominance of oil and gas revenues in the Qatari economy which enable the government to provide such high levels of welfare in the country.

There are three dynamics to be taken into account when examining the ability of Qatar and other GCC states to maintain current levels of social spending with money generated from selling hydrocarbons, mainly oil. First, the price of oil in international markets has always been volatile, which directly affects the revenue of the GCC states from exported oil (Kilian, 2016). Second, the size of the local population in all the GCC states has been increasing (Fargues, 2011). This increase in the population means that the state has to distribute more resources locally as a part of “the ruling agreement”, even in the face of dwindling revenues. Third, domestic consumption of oil and gas in the GCC states is continuously increasing, which reduces the oil and gas available for export (Al-Khatteeb, 2015). These factors negatively affect the revenue of the GCC governments, and hence the balance of their relationships with their citizens.

3.1. Price volatility

Oil is the most traded commodity in the world in terms of monetary value per annum. Following the oil embargo of 1973, it became not just a valuable but also an extremely strategic commodity for the global economy (Hamilton, 2011). The price of oil has been subject to fluctuation and change throughout the last 50 years (Baffes and Kshirsagar, 2016). Fig. 10 illustrates this constant volatility in the oil price between 1970 and 2014. Since 2010, the supply of oil and gas extracted from shale, Canadian tar sands, and offshore production have increased, culminating in a sharp price drop (Arezki and Blanchard, 2014). There is a good chance that oil prices may never go back to a point where most oil-producing states can balance their budgets (Kilian, 2016). In addition to the invention of new oil technologies and the discovery of new oil deposits, increasing efforts to decarbonize the global economy in a bid to tackle climate change have already started to dent the demand for oil and gas in the transportation and power sectors (Kuczyński and Denis, 2018). This increases volatility in the revenues Qatar receives from oil and gas exports (as shown in Fig. 9 above).

Newly discovered shale oil formations, deep-ocean oil, and Arctic oil basins have the potential to provide plenty of oil and gas for years to come, which may further reduce oil prices (Kilian, 2016). Moreover, thanks to new technologies, the cost of producing oil from such difficult locations is falling rapidly (Mlada, 2017), which is also likely to have an impact on international oil prices. Fig. 11 shows the production cost curves from the biggest shale oil fields in the world (Mlada, 2017). The fall in the production cost of shale oil has propelled US oil production to historic levels, as shown in Fig. 12 (Pioneer, 2017).

Meanwhile, rapid advancements in, and deployment of, renewable energy technologies such as solar energy, wind energy, and battery storage are reducing the consumption of fossil fuels in the transportation and power sectors (Adib, 2015). The development of electric vehicles (EV) which can potentially replace the internal combustion engine (ICE) as the main mode of land transportation has been accelerated (Arbib and Seba, 2017). The anticipated replacement of oil-based ICE cars with EVs should result in much lower demand, and therefore in a lower price for oil by the 2030s. The advancement of EVs is expected to shave a sizeable demand for oil and gas more than 20 million barrels per day for the whole world (the red bar in Fig. 13) with dramatic repercussions for the oil and gas rich countries such as Qatar (Arbib and Seba, 2017). It is very likely that global oil prices could drop to a range of USD 20 to USD 30 per barrel once EVs spread widely across the global market circa 2030 and lower the demand for oil and gas.

\footnote{Oil prices are currently much lower than 50 USD per barrel in the international markets due to Corona Virus and excess supply in the markets. This will only increase the urgency of the economic diversification in the country.}
3.2. Population increase

As mentioned earlier, the rapid growth in local population will strain the government finances further due to increasing spending for social commitments in the form of various government spending. Table 1 shows the total population of the GCC states, including both citizens and residents, i.e. native Qataris and immigrants. Due to a lack of detailed data, it is difficult to isolate the number of citizens and their growth projections from the totals. However, there is a general perception that the population growth rate of the citizens in the GCC states is higher than the total population growth rate (Kinninmont, 2009). Table 1 shows rapid population growth in all GCC states since 2000; there is no sign of this dramatic population increase coming to an end. For Qatar, this increase in the size of the population implies increased state spending to maintain “the ruling agreement” described above.

3.3. Domestic demand

Partly related to population growth, the domestic use of hydrocarbon resources in GCC states has also been increasing continuously (El-Katiri, 2013). Table 2 highlights the increasing trend of domestic consumption of petroleum products in GCC states between 2000 and 2009, and shows that Qatar has seen the highest increase. Meeting this increased domestic demand means a reduction in the amount available for export, which has clear implications for state revenues. The three patterns discussed above have already started to strain the ability of governments of the GCC states, including Qatar, to maintain their transformative policy framework. Al-Khatteeb (2015) shows that even under conservative fiscal policies, most GCC states will be running significant budget deficits given the average oil price level in the last four years. Fig. 14 shows the fiscal breakeven point for GCC states in 2015–2018. For most countries, the average oil price of USD 56 per barrel (the broken red line in Fig. 14) is lower than the oil price needed to achieve a balanced budget (IMF, 2018).

The consistently low level of international oil prices, rapid rise in the population, and increasing domestic use of oil are testing the ability of the GCC states to sustain “the ruling agreement”. These states need to diversify their economies through knowledge-based and innovation-
Fig. 10. International Oil Prices (https://blogs.wsj.com/moneybeat/2014/11/28/oil-prices-the-good-the-better-the-ugly/).

Fig. 11. Production Cost of Shale Oil Production in USD per Barrel across the US Regions (Mlada, 2017).

Fig. 12. Average US Domestic Oil Production in Millions of Barrels per Day (Pioneer, 2017).
driven economic structures if they are to maintain the current living standards and welfare of their citizens. Economic diversification has thus become a priority for the GCC states to keep the ruling agreement intact (Hertog, 2013). Although it is the richest GCC state in GDP per capita, and highest in oil and gas exports per capita, Qatar also needs to pursue economic diversification in order to meet these challenges. The Qatari government itself is fully aware of this, as its Vision 2030 document clearly demonstrates (Hvidt, 2013).

4. The potential, incentive, and capacity for innovation in Qatar

Innovation and entrepreneurship outside of the oil and gas industries have become a must in order to transform the economy and safeguard the welfare of future generations in Qatar. The process of innovation is path-dependent, and has certain requirements such as rules-based governance, a strong education system, access to venture capital, and clarity and ease of regulations (Acemoglu, 2008; Fuchs and Shapira, 2005; Lau and Lo, 2015; Nelson, 2013; Scheel, 2002). Innovation can take the form of an upgrade to existing technology, products, services or systems, as well as the creation of a completely new value. Innovation is defined by Business Dictionary as:

"The process of translating an idea or invention into a good or service that creates value or for which customers will pay. To be called an innovation, an idea must be replicable at an economical cost and must satisfy a specific need. Innovation involves the deliberate application of information, imagination, and initiative in deriving greater or different values from resources and includes all processes by which new ideas are generated and converted into useful products. In business, innovation often results when ideas are applied by the company in order to further satisfy the needs and expectations of the customers. (http://www.businessdictionary.com/definition/innovation.html)"

Incremental (evolutionary) innovation occurs when changes to an existing method or product or service make it either cheaper or more effective, which results in increased value (Lau and Lo, 2015). This type of innovation is very common in industrialized and highly diversified countries (economies or industries) (Fuchs and Shapira, 2005). This paper has already mentioned Qatar’s achievement of incremental innovation in its advanced liquefied natural gas (LNG) industry and its gas-to-liquids (GTL) production with its international partners (D'Alesandro, 2018; Rystad Energy, 2018). However, given the sheer dominance of the oil and gas industries, this level of incremental innovation has only been repeated in a few other industries such as steel and aviation (Kaya and Tsai, 2016).

Disruptive (revolutionary) innovation, on the other hand, completely revamps an existing market, service, product or entire industry by bringing a totally new set of ideas and applications to commercial realization (Miniaoui and Schilito, 2017). Internet banking, blockchain, electric cars, social media, ride-hailing (e.g. Uber), and shale oil are all examples of disruptive innovation which have fundamentally altered existing markets and their related dynamics (firms, products) (Arbib and Seba, 2017). Compared to incremental innovation, disruptive innovation is more unpredictable and chaotic but it usually yields higher profits and returns to those who manage the process successfully (Lau and Lo, 2015). This kind of innovation requires a much broader supportive ecosystem than incremental innovation, such as access to venture capital, highly skilled labor, strong research and development capacity,
well-defined and protected property rights, and easy entry to the final markets (Acemoglu, 2008). It is not surprising that the majority of disruptive innovation of the past 50 years — transistors, computers, the internet, online search engines, ride-hailing, electric cars, social media, etc. — has come from the United States, as the USA boasts many of the best universities, a strong research and development culture, and a well-functioning venture capital system, along with strong protection for property rights and easy access to the market for newcomers (Arbib disruptive innovation of the past 50 years)

The most important actor during an innovation process is the entrepreneur who transforms a new idea, a patent, a prototype, or a design into reality (Minniti and Bygrave, 2001). Business Dictionary defines entrepreneurship (the acts of an entrepreneur) as:

"The capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. The most obvious example of entrepreneurship is the starting of new businesses. In economics, entrepreneurship combined with land, labor, natural resources, and capital can produce profit. Entrepreneurial spirit is characterized by innovation and risk-taking, and is an essential part of a nation’s ability to succeed in an ever-changing and increasingly competitive global marketplace. (http://www.businessdictionary.com/definition/entrepreneurship.html)"

An entrepreneur pool is thus critical for innovation in an industry, market or country (Buettner, 2006). The build-up of such a pool of talented individuals, and the provision of incentives and legal, financial, and logistical support are essential for value creation through innovation (Parker, 2009). In the resource-rich GCC states, the development of entrepreneurship within the local population is seen as an essential goal for two important reasons (Kaya et al., 2019; Miniaoui and Schilitro, 2017). First, entrepreneurs are critical for the transition to a knowledge-based economy to reduce dependence on hydrocarbon-related industries (Kaya and Tsai, 2016). Second, encouraging an entrepreneurial spirit which shifts employees out of the public sector workforce also reduces the burden on the public finances (lowering the fiscal breakeven point as it relates to oil prices, as depicted in Fig. 14). This in turn enables the continuation or improvement of services to the population as a whole (Kaya et al., 2019).

In this context, the authorities in Qatar have shown an increasing interest in supporting entrepreneurship and small and medium enterprises (SMEs) in the push towards an innovation-based economy (Ennis, 2015). The highest echelons of the state apparatus have made support to SMEs and entrepreneurs inside the country a top priority in order to diversify the economy away from the oil and gas sectors. These initiatives and support schemes are driven by the expectation that well-paying jobs will be created in the private sector, easing pressure on the state’s welfare capacity (Kshetri and Ajami, 2008). In line with other GCC states, countless initiatives have been launched in Qatar to foster innovation and entrepreneurship to spearhead economic diversification (Miniaoui and Schilitro, 2017). The Education City was established in 1997 and gradually expanded by opening campuses of well-known US universities to deliver vital education and knowledge transfer from abroad (Ennis, 2015). To help the commercialization of ideas and the opening of SMEs, numerous agencies and centres have opened, including Qatar Science and Technology Park (QSTP), Qatar Business Innovation Center (QBIC), Bedaya, Injaz, the Roudha Center and Qatar Social Development Center (QSDC). Financial support and guidance for entrepreneurs and new business people are delivered through Qatar Development Bank (QDB) and Qatar Financial Center (QFC) with generous packages and flexible payment plans, especially for Qatari nationals (Ennis, 2015). The state of Qatar has recently taken regulatory actions to make business easier and to remove hurdles faced by entrepreneurs (Ennis, 2015). However, the country’s “Ease of Doing Business” rankings have slipped globally since 2010, as can be seen in Fig. 15. The “Ease of Doing Business” index measures a country’s performance in terms of the ease of establishing a new firm or company (permits, licences, and registration) and protecting its rights (cross-border payments, a predictable tax regime, and contract enforcement), where the top-ranked country has the best environment for doing business (Jayasuriya, 2011). This index thus provides a broad measure of a country’s receptivity to foreign investment and its position with regard to the protection of business rights such as equal access to the market and contract enforcement. In 2018, Qatar ranked 83 out of 190 countries.

Taking the Middle East and North African countries which were ranked within the top 100 in the index, Qatar fell in the middle of the group in 2018. While it did better than Saudi Arabia, Kuwait or Djibouti, it has a long way to go to catch up with UAE which was ranked 11th globally, well ahead of any other country in the Middle East and North Africa. Table 3 shows the top 10 countries in the region in terms of the ease of doing business for the year 2018.

Since UAE is close to Qatar in terms of population, income, and geographical location, the experience of the UAE can provide both important lessons (Parcero and Ryan, 2017). The federal structure of the UAE, in which each emirate has its own jurisdiction, creates an
internally competitive economic environment which has paved the way for a business-friendly environment since the 1990s, especially in Dubai (Krane, 2009). The establishment of numerous free zones and a sound legal system attracted much-needed entrepreneurial talent which culminated in the creation of the region’s most successful startups such as Souq.com and Careem (Parcero and Ryan, 2017). The absolutist political system seen in most of the GCC states has been countered in UAE by the federal structure and economic autonomy of each state (Tsai and Kaya, 2016). Although relatively limited — and quickly depleted — Dubai’s oil and gas reserves played an active role in the 1990s in creating a business-friendly environment and acting as a magnet to attract talented expatriates (Davidson, 2008). UAE’s high score in the ease of doing business index takes account of a variety of inclusivity factors such as protection of private property, ease of entry to markets, and low levels of corruption, which can be partly attributed to its structure, which is postulated as “market-preserving federalism” (Kaya and Tsai, 2016; Weingast, 1995). UAE has also diverted some of its sovereign wealth fund (SWF) investments into more technical companies, startups and other potentially risky investments in a bid for higher returns, in contrast to the classical and risk-averse approach generally pursued in the GCC states (Amar, Carpentier, and Lecourt, 2018; Braunein, 2019; Hvidt, 2018). Given Qatar’s limited industrial and manufacturing base, the scope for innovation and entrepreneurial success in high value-added sectors seems limited, at least in the short term. To compensate for the lack of investment opportunities in advanced and high value-added domestic industries, Qatar can look overseas for investment in these areas. QIA has assets of more than USD 300 billion invested globally (Amar et al., 2018). Some of those funds, together with future surpluses from oil and gas sales, can be invested in high-tech startups and companies in countries like the USA or China. This will diversify Qatar’s portfolio and help to safeguard the government’s income stream against any dramatic change in the value of oil and gas.

Whatever the incentives, the potential for innovation and entrepreneurship cannot be realized if there is not enough capacity within the system which has been built on past experience and knowledge (Coombs and Hull, 1998; Ernst and Kim, 2002). A country’s industrial and services infrastructure and a pool of experienced labor are great sources of innovation and entrepreneurship particularly in terms of responding to problems and opportunities that occur during normal work operations (Fuchs and Shapira, 2005). A sizeable number of entrepreneurs work on fields and areas closely related to their previous employment and experience, often driven by the search for solutions to a problem or the quest to fill an identified product gap (Parker, 2009). Miniti and Bygrave (2001) similarly note that entrepreneurs greatly benefit from their previous experience in industry or service sectors while pursuing new business. As discussed in Section 2, the productive circuit in Qatar is largely concentrated in the oil and gas industries and petrochemicals sector. Further industrial expansion has happened on a limited scale in energy-intensive sectors such as aluminum and steel production (Ibrahim and Harrigan, 2012). The commodity circuit in the country encompasses general service sectors such as dealerships, education, and healthcare, catering to local demand. Compared to a more industrialized country, therefore, the level of industrial and service experience of Qatar’s labor force is limited to a few areas. Moreover, a sizeable portion of those skilled jobs are held by short to medium-stay expatriates in the absence of a large local population. It can be argued that the country does not possess a very large pool of entrepreneurial talent due to the transformative economic structure, the temporary status of skilled labor, and the small size of the local population. In this context, too, Qatar might consider following the example of UAE’s attempts to attract foreign talent by offering incentives such as full ownership of a company and residency, and a fair and equal playing level (at least in certain non-oil industries and businesses). In fact, Qatar has passed a number of laws and amendments in recent years to allow...

![Qatar’s Ranking in “Ease of Doing Business” out of 190 countries (The World Bank: https://www.doingbusiness.org/en/rankings).](image-url)
foreigners to purchase real estate and to set up a company with full ownership in certain zones and sectors, as well as granting residency visas without a local sponsor (Ulrichsen, 2018). These are sensible steps for the country to take in attracting international talent while heavily investing in the education of locals and supporting them in their entrepreneurial ambitions.

5. Conclusions, discussions, and remarks

Discoveries of oil and natural gas reserves propelled Qatar into becoming a significant energy power; it now ranks as the largest LNG exporter in the world. After gaining its independence in 1971, Qatar embarked on a rapid development trajectory with a world-class infrastructure and very high living standards. It has the highest GDP per capita in the world as a result of the successful utilization and channeling of its oil and gas fortunes (IMF, 2018). The state has retained its centuries-old tribal system and absolutist governance while spearheading the way for a transformative economic structure based on oil and gas revenues (Luciani, 1990). In exchange for the lack of political rights and representation in decision making, the population has been economically compensated by the state in two ways. First, and akin to the other GCC states, Qatar established a very generous welfare system whereby citizens are entitled to free education, housing, and healthcare, as well as well-paying public sector jobs (military, police, bureaucracy) all funded by oil and gas revenues (Gray, 2011). Additionally, the merchant families, including some of the ruling tribe (Al-Thani), were granted exclusive business licences and favourable credit to establish and run firms in the commodity circuit such as dealerships, services, and trading companies as the second leg of economic support to citizens (Kaya and Tsai, 2016). The state has kept the majority of the productive circuit to itself, including all oil and gas-related activities, the petrochemical industry, and energy-intensive industries such as aluminum and steel, in order to maintain its economic authority (Ibrahim and Harrigan, 2012).

This paper has highlighted three important dynamics that may challenge the sustainability of the current economic system in all the oil-and-gas-rich transformative states. The rapid development and exponential deployment of renewable energy technologies coupled with the electrification of transportation pose a serious threat to the value of oil and gas and hence to the revenues collected by the state (Arbib and Seba, 2017). All the GCC states including Qatar have experienced rapid growth in their local populations which puts considerable pressure on those states which seek to maintain the transformative status quo for a larger population (Kaya and Tsai, 2016). The high oil and gas prices of the past decade encouraged the development of previously uneconomical reservoirs such as deep offshore, shale formations, and tar sands (Kilian, 2016). The additional supplies from those new reserve fields have resulted in a glut and driven oil prices well below earlier levels, with the possibility that they may never recover (Kilian, 2016). Thus, the transformative states need to diversify their economies through knowledge-based and innovation-driven initiatives in order to maintain the current living standards and welfare of their citizens. Economic diversification has become a top priority in the GCC states to keep “the ruling agreement” intact (Hertog, 2013).

The construction of world-class infrastructure from housing to telecommunications, the significant expansion of the LNG industry along with petrochemicals, and rapidly growing higher education capacity all give reasons for optimism about Qatar’s future in a world where oil and gas are no longer as valuable as before. The completion of numerous museums, sightseeing areas, and world-class hotels will boost the domestic economy and further income will flow into the country from major events such as the FIFA World Cup in 2022, and beyond (Henderson, 2014; IMF, 2017; Morakabati, Beavis, and Fletcher, 2014). Given its small local population and its immense oil and gas reserves — as well as their effective utilization — Qatar is well-placed to survive the challenges of energy transition dynamics discussed above (Van de Graaf and Bond, 2019). Fig. 16 depicts oil and gas production per capita across the GCC states and clearly shows the favourable position of Qatar, whose per capita production is more than three times that of any of the other states.

Qatar is especially well-positioned in global LNG markets due to its conventional (cheap) gas reserves and its integrated infrastructure, as discussed in Section 2. The government recently lifted the self-imposed

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![Fig. 16. Daily Combined Oil and Gas Production per Citizen](Authors’ calculation based on BP, 2018; Hvidt, 2018; Malik and Nagesh, 2019; Mathew, 2019; CIA World Factbook).
moratorium on further gas production from the coveted North Field, and announced the expansion of natural gas production and an increase in LNG export capacity of more than 30% in the next four years (Rystad Energy, 2018). QP continues to pursue a very active oil and gas exploration, production, and exporting strategy on a global scale with its long-term partners such as Exxon Mobil and Total (Visconti, 2018). Beyond oil and gas, the country has undertaken infrastructure investment on a massive scale since 2000, with a special focus on the preparations for the 2022 FIFA World Cup (Agence France-Presse, 2017). The complete revamp of the country’s infrastructure from seaports and airports to roads and hospitals is expected to be completed by 2021 (Agence France-Presse, 2017). The phase-out of this large-scale capital spending is expected to leave a surplus of rent revenue which the government can use for overseas investment in the years following 2021.

The process of innovation and entrepreneurship has been analysed in three sub-components for the case of Qatar. The potential, incentives, and capacity for innovation and entrepreneurship to promote a successful economic diversification away from dependence on oil and gas revenues appear to be limited in Qatar. The country has a unique demographic structure in which more than 80% of residents are expatriates, many working on short-term contracts and/or in low-skilled jobs (Ennis, 2015). Expatriates also constitute the majority of the technical and specialty employment positions, usually on a short- to medium-term basis. The recent push by the government for Qatarization of the workforce has slightly changed that dynamic as more Qatari nationals were employed in private or semi-government industries (Hertog, 2016). To date, attempts at innovation and entrepreneurship in the country have been largely geared towards import-substitution of basic goods (such as dairy products or perishable goods) and services, rather than risky high-tech ventures with much more promising returns (Ennis, 2015). However, the expansion of petroleum-related industries and energy-intensive sectors such as steel and aluminium could unlock further innovation and entrepreneurship opportunities in the country. Thanks to massive oil and gas revenues, “the ruling agreement” between the leadership and the people has resulted in a cradle-to-grave welfare system which is unparalleled in the world (Kaya and Tsai, 2016), but which does not encourage innovation. The support provided to powerful merchant families by the government in the simple but lucrative “commodity circuit” is another hidden barrier suppressing the motivation for entrepreneurial activity (Hanieh, 2016). These traditional measures to ensure the economic well-being of the citizens may become counterproductive to the incentives rolled out by the government in pursuit of innovation and entrepreneurship.

Before closing, it is important to point out a lacuna in this paper with regard to the future of innovation and entrepreneurship in Qatar. In recent years, political differences among the GCC states of Bahrain, Saudi Arabia and UAE, on the one hand, and Qatar, on the other, came to a head in the Gulf Crisis of 2017, in which the former three countries along with Egypt ceased any economic or political relationship with Qatar (Ulrichsen, 2018). Sea, air, and land closures were imposed on Qatar, limiting flights by the country’s airline, Qatar Airways, and restricting certain critical imports from Saudi Arabia and UAE. Qatar, in turn, established new trade routes and ramped up its domestic production in various sectors and industries (D’Alessandro, 2018; Tsafos, 2018; Ulrichsen, 2018). The effects of this crisis on the mindset and perception of all the stakeholders in Qatar and its repercussions regarding innovation and entrepreneurship have yet to be studied, but represent a critical research subject. A detailed analysis must be conducted in this regard to assess Qatar’s new reality.

Declaration of competing interest

None.

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