ISSN:2229- 6247
Antonio Crupi et al | International Journal of Business Management and Economic Research(IJBMER), Vol 14(5),2023, 2286- 2300

The UAE Economy and the Path to Diversification and Innovation

Antonio Crupi[1] and Daniele Schilirò[2]*

Abstract:

This paper analyzes the economy of the United Arab Emirates (UAE) and the diversification process that has characterized it for several years. Since 2010, when the UAE launched its "Vision 2021", the UAE government was committed to implement a long-term vision that traces a path towards the realization of a sustainable and diversified economy, based on knowledge and innovation. Furthermore, the UAE government has continued to implement this long-term vision through various plans and initiatives in alignment with the goals of the United Nations 2030 Agenda. The UAE's strategy to diversify the economy has been based on a combination of market deregulation, support for foreign trade, and the efficient provision of infrastructure and institutions to facilitate private sector participation.

The paper discusses the evolution of reforms implemented to pursue an innovation-driven strategy with the increasing adoption of digital technologies, the positive mindset towards innovation and entrepreneurship, and the commitment to sustainable growth. The paper then focuses on the results in economic diversification achieved through the development of non-oil sectors in the last decade. These results show that the diversification process has made some progress, but there are still wide margin for improvement. The UAE experience demonstrates that a clear vision is important, but it also is crucial that the country's leadership is able to foster a healthy culture that values its people, who will then act accordingly to implement the strategic plan.

Keywords: Diversification; Innovation; Digital Technologies; Sustainable Growth

1. INTRODUCTION

About ten years have passed since one the co-author wrote an article on the diversification of the United Arab Emirate's economy which was published in 2013 (Schilirò, 2013). This timeframe provides sufficient opportunity to assess whether the intentions outlined in the UAE's "Vision 2021" have translated into concrete results.

The UAE has persistently tried to implement a long-term vision focused on comprehensive reforms aimed at achieving a diversified economy based on knowledge and innovation. This vision and its developments encompass expanding and diversifying the economic base, strengthening the private sector (especially the non-oil sector), ensuring long-term fiscal sustainability, as well as fostering technological capabilities to position the country as a leader in innovative technologies.

This paper provides a descriptive but in-depth analysis of the UAE economy, with a focus on the evolution of the diversification process and the economy's ability to innovate, which has been a distinctive feature for several years.

The ambitious goal of the UAE is to become a leading country in the MENA region and beyond in various sectors, including renewable energy, healthcare, education, biotech, fintech, aviation, space, real estate, and hospitality. Additionally, it seeks to establish itself and a major hub for transformative technologies such as artificial intelligence and blockchain. The recent launch of the Mars probe in July 2020 and the operational Barakah nuclear power plant has further contributed to the UAE's economic evolution, particularly in the aerospace and nuclear energy sectors. Reforms are important factors of its diversification strategy. In the last few years, the UAE has implemented noteworthy reforms, such as the reduction of costly and distortionary subsidies, the introduction of a VAT and other fiscal measures, improvement in the business environment, and labor market reforms. Despite the economic challenges posed by the COVID-19 pandemic, the UAE has exhibited resilience and a strong commitment to adopting new technologies across all sectors of the economy. The country is continuously trying to implement its vision of transforming the economy into a diversified one, while minimizing reliance on the distribution model.

The next section of the paper discusses the methodology adopted. The third section analyzes the UAE economy, the features of labor market, FDI, trade, the diversification of exports, and growth. The fourth section delves into the topics related to innovation development, which are crucial for the successful implementation of an innovation-driven and diversified economy. Finally, a discussion and conclusion section end the paper.

[1] Research Fellow - Department of Economics, University of Messina, Messina, Italy.
[2] Corresponding Author. Associate Professor - Department of Economics, University of Messina, Messina, Italy.
E-mail: dschiliro@unime.it

2. METHODOLOGY

This paper aims to analyze the diversification process of the economy of the UAE and the importance of innovation in the evolution of the UAE economy. The paper contains a description of the path of the UAE economy over the period 2012-2021 and the efforts made by the UAE to diversify its economy. We follow a holistic approach, considering various factors that drive economic diversification, including macroeconomic variables, economic policy decisions, structural reforms, and institutional aspects. There is no attempt to statistically test hypotheses due to the complexity of the factors to be analyzed. Furthermore, there is no agreement in the literature on which index is best, and empirical analysis heavily depends on the statistical methods and measures employed (UNCCC, 2016). A descriptive analysis using mainly official UAE data is likely to be more effective in showing positive or negative changes in the economic diversification process.

3. THE UNITED ARAB EMIRATES ECONOMY AND ITS DIVERSIFICATION PATH

3.1. The literature on economic diversification

Economic diversification refers to a strategy aimed at transforming the economy from reliance on a single source of income to multiple sources distributed across primary, secondary, and tertiary sectors. This strategy is essential in safeguarding national economies against unpredictable external risk factors that can impact demand and supply shocks. Economic literature extensively explores the topic of economic diversification in resource-rich countries. The literature provides some evidence that countries with more diversified production structures tend to have lower volatility of output, consumption, and investment (Moore and Walkes, 2010; Papageorgiou and Spatafora, 2012). Furthermore, economic literature emphasizes that economic diversification is crucial for commodity-dependent nations because it reduces their vulnerability to external events such as price volatility and uncertainties in global economic markets. Policies aimed at designing diversification strategies for economies that heavily rely on a single commodity, as seen in hydrocarbon-rich countries, are appropriate (Jmbs and Wacziarg, 2003; Shediac et al., 2008; Al Kawaz, 2008; Schilirò, 2013; Callen et al., 2014; Shayah, 2015; Cherif, Hasanov and Zhu, 2016; Murdaa and Atyeh, 2017; Miniaoui and Schilirò, 2017; Mishrif and Al Balushi, 2018; Shadab, 2019; Siddiqui and Afzal, 2022). This strategy also applies to countries rich in minerals, such as diamonds, like Botswana (Schilirò, 2022). Additionally, countries heavily dependent on a single economic sector, exhibiting low levels of economic diversification, often experience adverse effects on productivity and competitiveness (Callen et al, 2014). To achieve economic diversification, it is important that GDP is not concentrated in one or a few sectors, but rather distributed across multiple sectors. Additionally, export diversification plays a significant role in facilitating the diversification of the economy. Papageorgiou and Spatafora (2012) emphasized that a characteristic of an economy that is not diversified or is little diversified is the limited diversification in exports.

According to Callen et al. (2014), international experience shows that the success or failure of diversification appears to depend on the implementation of appropriate policies. Diversification also reduces overall macroeconomic risk and helps to avoid the "curse of natural resources", while a low level of diversification hinders the expansion of the technological frontier.

The economic diversification strategy is fundamental for achieving a balanced economy, sustainable economic growth, sustained trade, and job creation. This strategy, involving the structural change of the economy, enables the reorientation of economies towards knowledge-based and innovation-driven activities. Developing new, efficient technologies, including in the energy sector, is a primary goal of a diversified economy rooted in knowledge and innovation. A well-designed and targeted policy on economic diversification can effectively accomplish these multiple goals.

3.2. An overview of the diversification in the UAE

Over fifty years since its inception as a nation, the UAE has transformed from a country primarily reliant on nomadism and pearl fishing to a wealthy nation due to its oil resources. From the beginning, the UAE has embraced a free trade regime, and managed to obtain continuously developing rates of economic growth.

The UAE, an economy rich in natural resources, has emerged as the second-largest economy among Gulf Cooperation Council (GCC) countries, sustaining a strong commitment to diversification. Its achievements in economic diversification are largely attributed to a clear-cut vision and the implementation of a robust legislative framework that encompasses regulations in various sectors of the economy, as well as policy decisions on investments and trade, facilitating the expansion of the private sector.

Since its launch in 2010, the UAE's “Vision 2021”[3] has been the cornerstone of the government's commitment to a long-term vision: "to become a diversified global competitive economy based on knowledge and innovation, led by Emirati competencies" (MOE, 2021). The year 2021 holds significant importance for the UAE, as it marks both the country's five decades since its foundation and the remarkable progress and

[3] https://www.vision2021.ae/en

development witnessed in various aspects and sectors, thanks to 'Vision 2021' and related initiatives with a forward-looking approach. The UAE government has in fact introduced numerous plans and initiatives that complement its “Vision 2021”. In 2014, the UAE introduced the National Agenda aiming to instill an entrepreneurial culture in schools and universities, nurturing young generations with leadership, creativity, and responsibility. The goal was to transform the country into a competitive knowledge economy and a global economic and commercial hub.

Another important strategic initiative was the ‘UAE National Innovation Strategy’[4] designed to establish an innovation-enabling environment, foster innovation champions, with the target to stimulate innovation across seven key sectors (UAE Ministry of Cabinet Affairs, 2015). In 2017, the UAE Government launched the innovative ‘UAE Strategy for Artificial Intelligence (AI)’ marking the transition to a post-mobile government phase that leverages various future services, sectors and infrastructure projects.[5] The National Artificial Intelligence Strategy 2031 encompasses eight strategic objectives and numerous initiatives, aiming to leverage AI in vital areas such as education, government services, and community well-being.[5]

“Vision 2021" and the related plans have paved the way towards a sustainable and diversified economy, built upon knowledge and innovation. This vision has helped to expand the economic base, empower the private sector, and ensure long-term fiscal sustainability (Schilirò, 2015; Miniaoui and Schilirò, 2017).

Following the global crisis (2008-2009), the UAE progressively oriented its economy to be less dependent on the oil sector (Schilirò, 2013). Trade, tourism, construction, logistics, aviation, infrastructure, finance, and manufacturing have become the main drivers of the non-oil sector (Shayah, 2015). Mourdaa and Atyeh (2017), employing regression analysis, highlighted that the UAE experienced an increase in GDP after implementing diversification plans from 2000 to 2014, with manufacturing and services playing significant roles. Jensen (2018) emphasized that the UAE's economic diversification policies have primarily impacted sectors such as trade, manufacturing, financial services, and the development of the private sector and Emiratization. Additionally, Mishrif and Kapetanovic (2018) focusing on Dubai’s diversification paradigm, highlighted the emirate’s success in developing sectors such as trade, tourism, finance, and manufacturing. They also noted Dubai's strong integration into the global economy, attracting significant foreign direct investment (FDI) flows. The investment strategy was also guided by the imperative of diversification.

A key policy of the UAE government is to attract more investments into promising sectors, such as advanced technology, artificial intelligence, research and development, and the digital economy. Investments and foreign direct investment (FDI) are indeed important macroeconomic variables that may drive economic diversification (UNCCC, 2016) and stimulate innovation.

In conclusion, diversification necessitates a restructuring of the economy, involving the adoption of new technologies across various sectors such as manufacturing, services, and trade. To this end, the United Arab Emirates has implemented important reforms that also pertain to the organization of the state, the social contract, and the education system. However, for the UAE government, the primary objective of its strategy has become to promote an entrepreneurial spirit, with an emphasis on the pivotal role of the private sector in the economy.

While the UAE was already pursuing economic diversification prior to the pandemic, COVID-19 has expedited its strategic plan. Factors such as the decline and volatility of oil prices during the pandemic, as well as the economic downturn, have contributed to transforming the economy and accelerating the diversification process. Furthermore, the IMF (2022) has highlighted the UAE's macroeconomic policy support and relatively high level of digitalization, which have helped mitigate some risks associated with long-lasting crisis effects. In fact, in recent years, the UAE has made significant advancements in the growth of the digital and industrial sectors.

Finally, the UAE, in its efforts to diversify its economy, has heavily invested in renewable energy sources and fostered solutions based on solar and wind power. The country also aims to promote the deployment of nuclear energy, enhance energy efficiency, drive research and development (R&D), and innovation in energy technologies, and increase local clean energy capacity.

3.3. The UAE’s GDP, distribution, and weight among sectors

In this section, we present and discuss data taken from the official sources in UAE concerning the country’s GDP and non-oil GDP, as well as the relative weight of each sector in the overall economy over the period 2012-2021. This descriptive analysis helps evaluate the development of the UAE economy during this period and aids in understanding some aspects of the diversification of the UAE.

[4] UAE Minister of State for Artificial Intelligence (2018).

[5] https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/government-services-and-digital-transformation/uae-strategy-for-artificial-intelligence

The Competitiveness and Statistics Centre of the UAE provides data on 18 economics sectors/ activities.[6]

In Table 1, we provide the data of non-oil GDP and Total GDP at constant prices for that period 2012-2021 (base year 2010).

Table 1

Total GDP in the UAE and non-oil GDP over the period 2012-2021 at constant prices (base year 2010). The values are in million AED.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP	1,192,338	1,499,016	1,252,617	1,304,797	1,393,351	1,470,842	1,481,654	1,501,121	1,517,759	1,442,523
Non-Oil GDP	803,684	851,503	905,227	956,332	1,016,180	1,058,460	1,059,079	1,087,415	1,028,348	1,087,626

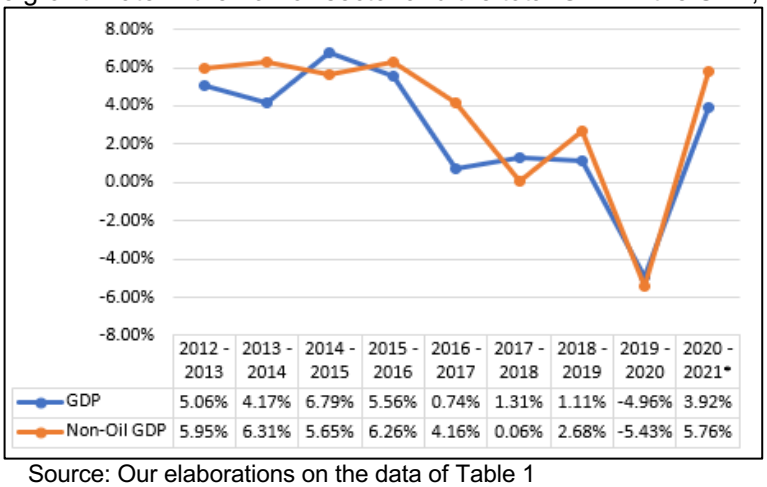
Source: Federal Competitiveness and Statistics Centre of the UAE[7]

According to Table 1, it is evident that the UAE's GDP has consistently increased over the entire period of 2012-2021. The total GDP witnessed notable growth from 2013 to 2016, with an average increase of over 5% annually. However, in the subsequent years from 2017 to 2019, the pace of economic growth decelerated, resulting in an average growth rate of approximately 1% during that period. In 2020, the COVID-19 pandemic caused a significant recession, leading to a sharp decline of -4.96% in the economy. In 2021, the economy initiated its recovery, displaying a positive growth rate of 3.92%. Furthermore, non-oil GDP outperformed total GDP, exhibiting larger annual percentage changes over the period, except in 2015, 2018, and 2020 when the non-oil sector as a whole experienced the most negative impact, with an annual growth rate percentage change of -5.43%. However, in 2021, the recovery proved to be more robust, with a positive change of 5.76%. Despite the adverse repercussions of the COVID-19 pandemic on the national economy, such as a decline in aggregate demand and the activities of most economic sectors, some sectors have experienced benefits during the pandemic. According to MOE (2021), the agriculture, forestry, and fishing sector recorded remarkable growth in 2020. The public administration, defense and education sectors also witnessed significant growth in 2020 compared to 2019. The manufacturing sector was able to maintain stability in its activities.

Figure 1 shows the trends of total GDP (blue line) and non-oil GDP (orange line) for the period 2012-2021, confirming the trends of the two variables reported in Table 1.

Figure 1

Trend of the growth rate in the non-oil sector and the total GDP in the UAE, 2012-2021



Source: Our elaborations on the data of Table 1

The non-oil GDP expanded faster than the total GDP every year except for 2014-2015 and 2017-2018. During the COVID-19 pandemic (2019-2020) performed worse.

[6] Non-financial corporations, Agriculture, Forestry, and Fishing, Mining and Quarrying (including crude oil and natural gas), Manufacturing, Construction, Public Administration, Defence, and = Compulsory Social Security; Education. Electricity, gas, water, and waste management activities; Wholesale, retail trade, repair of motor vehicles, and motorcycles; transportation; Storage accommodation and food service activities; Information and communication; Financial and insurance; Real estate activities; Professional and support services; Human health and social work activities; Arts, recreation and other service activities; Households as employers.

[7] https://fcsc.gov.ae/ar-ae/Pages/home.aspx

In turn, the data shown in Table 2 below helps assess the relative weigh of each sector of the economy (18 sectors). Thus, the table enables to have a more detailed picture of the degree economic diversification in the UAE economy.

Table 2, which contains the official data by the Federal Competitiveness and Statistics Centre of the UAE, shows the distribution of the GDP at constant prices for the base year 2010 in each economic sector/activity on the total GDP over the period 2012-2021.

This table highlights that the oil sector has progressively lost weight over the decade (2012-2021), decreasing from 32.6% of real GDP in 2012 to 27.4% in 2021. However, despite the gradual and continuous decline in oil GDP, oil remains a crucial element in the UAE economy. After all, the UAE ranks 7th in the world for oil reserves, and the country is the 7th largest producer of crude oil. Therefore, oil will continue to be an important source of income for the country. At the same time, the non-oil sector has shown growth over the same period, increasing from 67.4% to 72.6%, indicating a steady progressive diversification of the economy.

Table 2

Distribution of the UAE's GDP at constant prices for the base year 2010 in each economic sector/activity on the total GDP over the period 2012-2021.

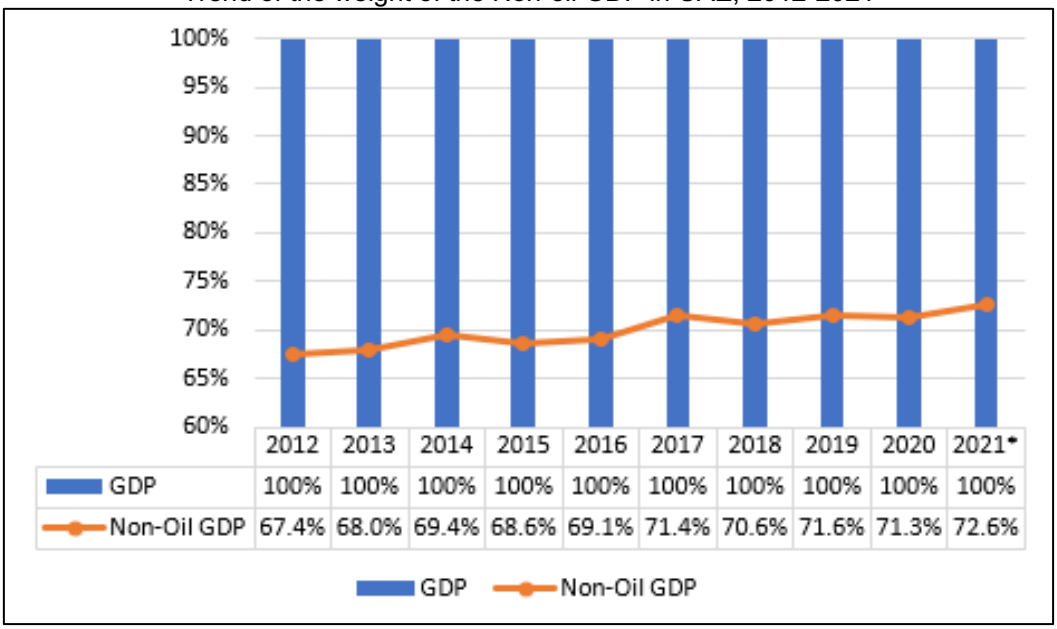
Economic Sectors/Activities	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021***
Non-financial Corporations	87.4	86.1	85.5	85.7	85.1	85.5	86.2	86.1	84.9	85.3
Agriculture, Forestry, and Fishing	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.9
Mining and Quarrying (Includes crude oil and natural gas)	32.6	32.0	30.6	31.4	30.9	28.6	29.4	28.4	28.7	27.4
Manufacturing	7.9	7.9	7.8	8.5	9.1	9.3	9.3	9.5	10.3	11.1
Electricity, gas, Water, Waste Management Activities	2.6	2.5	2.6	1.8	1.9	2.1	2.2	2.3	2.4	2.5
Construction	9.7	9.2	9.1	9.1	8.6	8.7	8.8	8.5	8.4	8.1
Wholesale, Retail Trade, Repair of Motor Vehicles and Motorcycle	11.4	11.6	11.6	12.1	11.6	12.7	12.7	13.0	12.8	13.3
Transportation, Storage	5.8	5.6	6.0	5.4	5.3	5.5	5.5	5.7	4.1	4.2
Accommodation and Food Service Activities	1.9	1.8	1.9	2.0	2.0	2.1	2.1	2.3	1.7	2.0
Information-Communication	2.6	2.6	2.7	2.7	2.7	2.9	2.8	2.9	3.0	2.9
Financial and insurance	6.9	7.8	8.3	8.4	8.5	8.4	7.9	8.0	8.2	8.1
Real Estate Activities	5.4	5.1	5.4	5.2	5.4	5.7	5.5	5.7	5.2	5.3
Professional, Scientific, Technical Activities, Administrative and Support Services	4.4	4.3	4.4	4.3	4.3	4.4	4.3	4.1	4.2	4.0
Public Administration, Defence, Compulsory Social Security	5.3	5.6	5.6	5.3	5.9	5.6	5.4	5.2	6.2	5.9
Education	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.6	1.6
Human Health and social work Activities	1.0	1.1	1.2	1.1	1.0	1.0	1.1	1.1	1.3	1.4
Arts, Recreation and Other Service Activities	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5
Households as Employers	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.7	0.7	0.7
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Non-Oil GDP	67.4	68.0	69.4	68.6	69.1	71.4	70.6	71.6	71.3	72.6

Source: Federal Competitiveness and Statistics Centre of the UAE[8]

Figure 2 better illustrates the trend of the Non-oil GDP in the UAE from 2012 to 2021.

[8] https://fcsc.gov.ae/ar-ae/Pages/home.aspx

Figure 2
Trend of the weight of the Non-oil GDP in UAE, 2012-2021



Source: Our elaborations on the data of Table 2

Looking specifically at the changes in the distribution of the various sectors over the period 2012-2021, as shown in Table 2, the non-financial corporations sector continues to represent a major sector throughout. It primarily comprises companies with government ownership. Murdaa and Atyeh (2017) observed that UAE has a significant presence of state enterprises.[9] These government-related entities (GREs) hold a substantial portion of the UAE economy and play a crucial role in its economic diversification. Their efficiency and competitiveness are relatively high, whereas SMEs, prevalent in many sectors of the economy, generally lag behind in terms of productivity, innovation, and competitiveness (IMF, 2022).

In 2012, the non-financial corporations sector weight was 87.4%, whereas in 2021 this weight decreased to 85.3%. Over the decade, notable changes, including significant shifts, have occurred among various non-oil sectors. For example, the "Manufacturing" sector witnessed a substantial increase, reaching a weight of 11.1% in 2021. Similarly, between 2012 and 2021, the "Education" and "Human Health" sectors experienced consistent and substantial growth, with weights of 1.6% and 1.4% respectively. Notably, the "Education" sector achieved a significant cumulative growth rate of 92.3% during this period, while its weight increased by 60%. Even though the 'Buildings and Construction' sector has seen a decline in weight, now standing at 9.1%, it still holds a crucial role, particularly when compared to the relatively smaller 'Education' sector. In this regard, Siddiqui and Afzal (2022) highlight that the "Construction and Building" sector has continued to be the largest employer of labor.[6] Sectors like "Transport, Storage" and "Professional, Scientific and Technical Activities, Administrative and Support Service" have experienced a decline. Meanwhile, “Public Administration, Defence, and Compulsory Social Security” sector has witnessed a slight increase, now accounting in at 5.9%.

Considering the data presented and other insights provided in the next section, it can be argued that the degree of diversification in the UAE is becoming increasingly significant. However, there is a need for ongoing progress in economic diversification. Siddiqui and Aftal (2022), by adopting the Herfindahl-Hirschman Index (HHI) to determine the UAE’s economic diversification level, appear less optimistic about the performance of the UAE diversification that they assess as “moderate”.[10]

What is of greater importance is not only the quantitative aspects but also the qualitative ones. The Emirates are undergoing a profound transformation of their economy. Visible changes include the completion of infrastructure projects, a strong emphasis on sustainability in various economic activities and mobility, as well as significant progress in the adoption and diffusion of digital technologies. Above all, the game-changer in

[9] Murdaa and Atyeh (2017) also underlined the continued sizeable government involvement of the employment sector, which is primarily funded by oil export earnings.
[10] Siddiqui and Aftal (2022) use the gross fixed capital creation referred to 18 UAE industries to calculate the HHI with the aim to quantify economic diversity, while their analysis covers the period 2010-2017.

recent years has been the emergence of a new mindset and awareness among citizens. This mindset recognizes that progress, well-being, and sustainable growth are achieved through entrepreneurship, innovation, knowledge, efficiency, and environmental considerations, rather than relying solely on a state that distributes resources.

3.4. Employment, FDI, trade, exports, growth, and diversification of UAE economy

It is crucial to acknowledge that the UAE economy heavily depends on a labor market that is predominantly composed of foreign workers. The UAE is home to expatriates from more than 200 nationalities, surpassing the number of nationals (MOE, 2021). The majority of these workers are unskilled and originate from diverse Asian and African countries. While qualified managers and professionals employed in various sectors mainly originate from the United States and Europe. However, the overall level of human capital in the labor force is relatively low. A key indicator for the transformation towards a diversified and knowledge-based economy in the UAE is the proportion of highly skilled workers, particularly those in high-level professions, within the total workforce. According to the Ministry of Human Resources and Emiratization,[11] this share in the UAE was 39.93% in 2020.

As reported by the MOE (2021), the construction sector had the highest percentage of laborers in the UAE in 2020, accounting for 17.3% of the workforce. The manufacturing sector employed 8.0% of the labor force. The wholesale and retail trade sector, including vehicle repairs, and the household activities sector had the majority of unskilled foreign workers. In contrast, public administration, defense, and compulsory social security were sectors where Emirati workers were primarily concentrated. In the same year, the education sector employed 4.5% of the laborers. The agriculture, forestry, and fishing sector employed only 1.8% of the laborers.

The UAE has the 7th highest net migration rate in the world, surpassing 12 percent. The country demonstrates favorable comparisons to regional peers in terms of human capital; however, it still lags behind advanced economies. Despite recent progress in education and the Emiratization campaign, youth unemployment remains high (IMF, 2022).

As part of its ambitious reform agenda to transition into a knowledge and innovation-based economy, the UAE government has endeavored to modernize the labor market. In this regard, the UAE made the decision in 2019 to initiate the issuance of the 'Golden Visa' to attract highly skilled human resources, offering them stable residency and the opportunity to become members of the country.[12] The changes in visa system rules and work permits tend to promote market flexibility and adaptability, while also assisting in the upskilling of the labor force to meet future productivity and growth needs.

Overall, the reforms aim to establish more flexible and equitable labor markets, consequently promoting efficient and inclusive investments in education and training in emerging fields, and creating increased opportunities for the youth.

World Trade Organization (2019) highlighted that the factors determining economic diversification can be grouped into three categories: economic reforms, structural factors, and macroeconomic variables.

Other reforms are those aiming to promote a favorable investment legislative regime in the country to create a more business-friendly environment while also prioritizing fiscal sustainability such as the Federal Decree Law No. 47 of 2022 on the Taxation of Corporations and Businesses.

Among the macroeconomic variables affecting economic diversification, investment is a crucial factor that significantly influences growth dynamics and enhances the productive capacity of emerging economic sectors. Promoting private sector investment in non-extractive sectors is recognized as a significant constraint to enable export diversification.

Furthermore, the inflow of foreign direct investment (FDI) is a significant macroeconomic variable contributing to economic diversification. In this regard, the UAE has witnessed year-on-year increases in FDI inflows over the past five years (Alshamlan et al., 2021). The UAE stands as the most important FDI destination in the Middle East. According to UNCTAD (2023), FDI inflows to the UAE stood at $22.7 billion (Dh84 billion) in 2022, up 10 percent from $20.6 billion in 2021, securing a position in the list of top 20 economies. Additionally, the UAE received 997 greenfield projects, marking the fourth largest number of such projects and representing an 84 percent increase. These record figures were achieved despite a 12 percent decline in global FDI inflows. Dubai, in particular, holds a prominent position as one of the leading global business centers for FDI. The UAE possesses several key factors that contribute to its attractiveness for foreign direct investment (FDI). These factors include political stability, a strategic geographic location, well-developed

[11] https://www.vision2021.ae/en/national-agenda-2021/list/card/share-of-knowledge-workers-in-the-labor-force

[12] The UAE's 'Golden Visa' is a long-term residence visa which enables foreign talents to live, work or study in the UAE while enjoying exclusive benefits which include among others: a long-term, renewable residence visa valid for 5 or 10 years and the privilege of not needing a sponsor.

infrastructure, a stable currency, a robust financial system, and proactive, investor-friendly government policies. Specifically, the government's liberalization policies have allowed for 100% foreign ownership of companies across various sectors, ranging from manufacturing to renewable energy. Moreover, the UAE introduced a new insolvency law, and has signed the Abraham Accords, all of which have enhanced its appeal for FDI (Alshamlan et al., 2021).

Free zones also play a significant role in attracting investments and fostering the development of the UAE economy. There are more than 40 multidisciplinary free zones in the UAE,[13] where expatriates and foreign investors are allowed to have full ownership of companies. Free zones play an indispensable role in supporting the UAE's entrepreneurial ecosystem. With various incentives, infrastructural, and mentoring support, free zones help entrepreneurs on their journey to scale. As a result of these factors, the UAE has become an attractive destination for foreign investment, trade, and business development.

Trade is key in the UAE economy, and it is a vital factor for fostering growth. The UAE is the seventh-largest oil producer in the world and a major oil-exporting country that still relies heavily on oil export revenue to maintain its economic growth, although it remains susceptible to oil price volatility. Therefore, export diversification becomes a strategic macroeconomic tool to achieve economic diversification, which, in turn, requires greater investments and production in non-oil exports. The literature (Balassa, 1978; Hesse, 2008; Bahmani-Sookie and Economidou, 2009; Singer, 1999; Herzer and Novak-Lehnmann, 2007; Shadab, 2021; Bozatli, Bal, and Albayrak, 2023) supports the view that export-led growth tends to create greater opportunities for employment and foster economic growth, generating positive externalities such as dynamic learning activities. Furthermore, export-led growth leads to economies of scale, specialization, and facilitates the adoption of new technologies (Shadab, 2021).

Among the few studies on the role of exports in the UAE, Alodadi (2016) conducted empirical research, employing the Johansen Cointegration test and the VECM test to examine the impact of total exports and other variables, such as the oil sector and the non-oil sector on GDP. The findings confirm that, for the UAE's economy, the oil sector remains a crucial contributor to economic growth. The results also revealed that non-oil exports significantly impact the UAE's economic growth.

Shadab (2021), in her empirical contribution on the link between export diversification and economic growth in the UAE, recognizes that, even if she were to accept the validity of the export-led growth hypothesis for the UAE economy, she questions whether this implies that the UAE has successfully achieved export diversification over the years. The results of her analysis indicate that an indirect causal relationship (via imports)[14] does exist between export diversification and economic growth. Shadab (2021) also affirms the validity of the Import-Led Growth hypothesis for the UAE economy.

The UAE has historically had a strong commercial vocation, which it continues to maintain and strengthen. The UAE has prioritized open international trade and competition in the global market. Thus, trade policy stands as one of the major contributors to the diversification of the UAE economy. In fact, Shadab (2019) emphasized that international trade has been regarded as the most vital component of economic diversification in the UAE, with re-exports, in particular, playing a crucial role.

In 2022, UAE non-oil foreign trade reached unprecedented high levels, registering double-digit growth across all areas of trade, including exports, imports, and re-exports. In fact, the UAE's non-oil foreign trade in 2022 experienced a growth of 19% over the same period of 2021 and a rise of 50% over 2020. This coincided with a noticeable increase in the country's non-oil exports, whose contribution to total foreign trade amounted to 20%. In this regard, the UAE Central Bank (CBUAE, 2023) reports that data up to September 2022 show the UAE's trade balance at AED 1.637 trillion. Re-exports also increased significantly by 22.7% year-on year, reaching AED 407 billion in the first nine months of 2022. Telephones, diamonds, textiles, automobile parts, and oils were the key re-exported goods.[15] Re-exports have an essential role in the UAE economy and contributed 45% in the non-oil exports in 2022. Finally, the World Trade Organization (2023) shows that in 2022, the UAE secured a significant 11th rank globally in the export of goods, with a total trade value of USD 599 billion, accounting for 2.4% of global merchandise exports. This result proves the UAE's growing influence as a major player in the global economy and its capability to foster trade, representing a key factor in its efforts to diversify the economy.

[13] Examples of these free zone are: Masdar City Free Zone, Dubai Multi Commodities Centre, Dubai International Financial Centre (DIFC), Sharjah Publishing City.

[14] "Imports encourage greater innovation and investment in the export sector by improvement in technology and productivity that ultimately results in the lesser concentration of exports, greater diversity in the range of export categories, and hence diversification of exports." (Shadab, 2021, p. 13).

[15] Saudi Arabia is the leading importer of UAE re-exports, followed by Iraq, India, the US and Kuwait.

International tourism is also a fundamental component of the UAE's development and economic diversification program. As highlighted by Schilirò (2013), tourism is closely tied to advances in transport and easy air access. The UAE has made substantial strides in international tourism, attracting visitors from all corners of the world. The country also stands as a leading nation in providing an appropriate and modern communications infrastructure and boasts a rapidly advancing civil aviation industry. Nonetheless, the UAE must continue its efforts to establish a tourism industry that is both economically and environmentally sustainable.

Regarding recent growth, in its 2022 Annual Report (CBUAE, 2023) the UAE Central Bank estimated the UAE's GDP growth rate for 2022 at 7.6%, compared to 3.9% in 2021. According to the Central Bank, this sharp increase in UAE's GDP in 2022 can be attributed to the significant rebound of the oil sector by 10.1%, while the non-oil sector experienced a growth of 6.6%. Furthermore, the manufacturing sector's contribution to GDP in 2022 was 12%, which is interesting result that indicates a significant performance in terms of diversification and development of the industrial non-oil sector.

The CBUAE (2023) projects a real output growth of 3.9% in 2023, primarily due to a decline in oil production, with the oil GDP equal to 3.0%. However, this lower growth in oil GDP is partially offset by the strong performance of the non-oil sector, with the non-oil GDP equal to 4.2%. Instead, the IMF (2023), which classifies the UAE as an emerging economy, estimates the annual percentage change of the UAE's real GDP in 2023 to be 3.4%. The report also acknowledges that non-hydrocarbon GDP growth is expected to exceed 4 percent in 2023 and remain at a similar pace in 2024. This growth is driven by developments in tourism, construction, and real estate.

In a previous report, the IMF (2022) expressed concerns about total factor productivity (TFP) in the UAE economy. The report shows that both aggregate and firm-level analyses confirm a long-running decline in TFP growth among UAE companies. This decline is widespread, as TFP growth either decreased in all companies or remained unchanged for the last 10 years. Small and medium-sized enterprises (SMEs), lacking continuous substantial government support unlike UAE government-related enterprises (GREs), were particularly penalized, especially given their prevalence in job-rich sectors such as construction, tourism, hospitality, and trade. However, IMF (2022) acknowledged that a transformation of the workplace through further digitalization, fintech, and e-commerce is likely helping to offset some of the adverse productivity shocks.

4. Innovation In The UAE Economy

4.1. A general perspective on UAE innovation

As highlighted in Schilirò (2015), in recent years, the evolution of technology has transformed the innovation landscape in the United Arab Emirates. The UAE has proven itself ready to embrace new digital technologies, recognizing that the convergence of various technologies, with AI and blockchain at the forefront, is disrupting numerous industries and sectors.

Despite the adverse repercussions of the COVID-19 pandemic, the UAE economy has shown remarkable resilience, with digital innovation emerging as a key enabler for recovery. This response has been accelerated by the government's ongoing economic diversification initiatives. Aligned with Vision 2021, numerous strategic plans, initiatives, and programs have been launched, including the UAE National Innovation Strategy, the UAE Energy Strategy 2050, and the UAE Artificial Intelligence Strategy 2031[16]. The UAE's 'twin transition' towards digital and environmental transformations is evident in efforts like Dubai's Smart City policy and Masdar City in Abu Dhabi. While Dubai leverages advanced technologies like IoT, AI, and blockchain to transform public services and infrastructure, Masdar City aspires to become an international epicenter for clean technology and renewable energy.

Additionally, the UAE's investments in the aerospace and AI sectors underscore its commitment to technological advancement. Significant milestones like the 2020 Mars Mission and the ambitious goal of establishing a human colony on Mars by 2117, exemplify the country's visionary approach. Finally, the startup ecosystem in the UAE, marked by numerous incubators, accelerators, and venture capital firms, supports innovative entrepreneurs, illustrating the country's steadfast dedication to becoming a major leader in digital and environmental transformation.

The UAE's active involvement in technological advancement[17], coupled with a robust pro-business regulatory framework, has established the country as a preferred destination for tech corporations and startups. Among regional economies, the UAE leads with the highest proportion of total startup funding, reaffirming its dominance in this sphere. Digital technologies and digitalization are priority objectives in the

[16] The UAE is the first country in the world to appoint a state minister for Artificial Intelligence (AI) (UAE Minister of State for Artificial Intelligence, 2018).

[17] The launch of the 'Strategy for the Fourth Industrial Revolution' in September 2017 by the UAE government was an example in that direction, aimed at enhancing the utilization of digital economy and blockchain technologies.

UAE's strategic economic plans. In addition to oil-related ventures, financial services and real estate are the most lucrative sectors in the UAE and exhibit considerable promise in terms of digital asset utilization and tokenization. Additionally, the landmark reform in 2020 that allowed foreign nationals to have complete ownership of businesses, thereby eliminating the requirement for Emirati sponsors in several business license categories, represents another important step in the UAE's commitment to attracting foreign investment.

Although the UAE acknowledges that continuous and rapid innovation is vital and requires a nurturing environment, successful modern-day innovations necessitate high levels of education and culture, posing a significant challenge for the UAE (Siddiqui and Afzal, 2022). This challenge also underscores the importance of an efficient rule of law, a transparent bureaucracy, and risk-taking financial actors who grasp the intricacies of innovation.

Indeed, the UAE's advanced digital infrastructure, superior to that of other regional nations, has enabled a smooth transition to digital payment systems, online health initiatives, and remote working practices. According to IMD (2022), with a population of 9.56 million and a GDP (PPP) per capita of $73,582 in 2022, the UAE ranked 13th in the digital competitiveness ranking.

However, the UAE needs to enhance its efforts in investing in digital skills, particularly in emerging areas. This necessitates ongoing training and the transformation of its human capital. Moreover, the legal framework should be strengthened to provide clear and concise rules for digital business models, including e-commerce, sharing economy, and fintech.

4.2. The innovation protection system

To foster the development and adoption of innovation, the UAE government has also dedicated significant attention to its IP system. Indeed, a critical facet of stimulating the progression of patent registration and innovation development hinges on the establishment of a robust intellectual property protection framework (Zhang et al., 2020). Recognizing this, the UAE has instituted laws and regulations to safeguard the rights of inventors. These include Federal Law No. 31 of 2006 on Industrial Regulation and Protection of Patents, Industrial Designs, and Undisclosed Information (Trade Secrets), the Patent Cooperation Treaty (PCT), and the acceptance of the Berne Convention for the Protection of Literary and Artistic Works.

To further encourage patent registration, the UAE government has established specialized IP courts[18] dedicated to efficiently managing disputes and enforcing IP rights. Alongside this, the UAE has maintained a steadfast dedication to upholding data, content, and IP rights. This commitment is exemplified by the introduction of Federal Law No. 38 of 2021 pertaining to Copyright & Neighbouring Rights, which supersedes Federal Law No. 7 of 2002. This law implements rigorous safeguards against IP violations, ensuring enhanced protection for renowned trademarks and broadening its jurisdiction to include peculiar instances such as 3D holograms, colors, and scents.

These wide-ranging regulations signify a pivotal change in the UAE's approach towards IP rights, emphasizing the protection of data and content, particularly within the digital domain.

According to the World Intellectual Property Office (WIPO, 2022), in 2021, the UAE experienced an increase in patent applications, receiving 2,423 compared to the 1,908 in 2020. This surge underscores the UAE's drive towards nurturing innovation and technological progression, further establishing its instrumental role in the wider landscape of intellectual property. Alongside patents, the UAE has shown an increase in trademark registrations from 18,620 trademark registrations in 2020 to 25,488 in 2021. This surge in registrations reflects the nation's evolving commercial landscape and its efforts to ensure the protection of business interests.

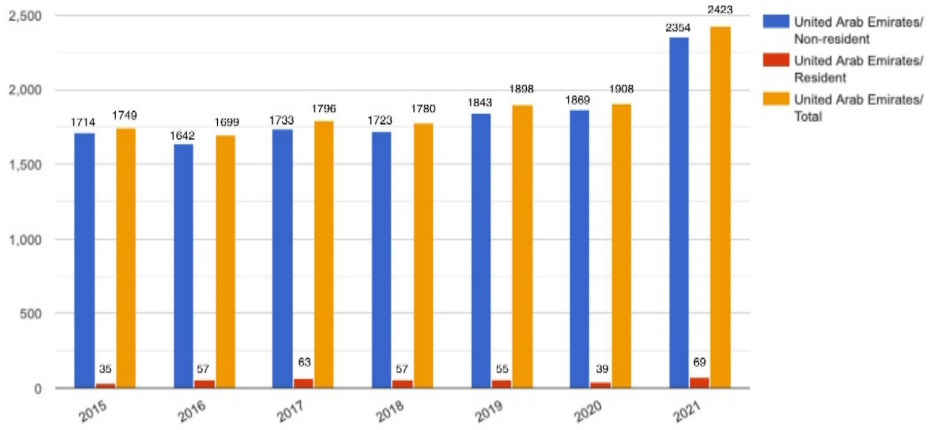
Several UAE universities have emerged as prolific domestic patent applicants, highlighting the growing trend of academic patenting and positioning the UAE as a leading force within the MENA region. In recent years, the UAE has become a technological innovation and development hotspot, symbolizing a notable transition towards the generation of "Mode 2 knowledge," which prioritizes practical applications and real-world problem-solving. Key to this transition is the emphasis on co-assignment networking and partnerships. Higher education institutions in the UAE are forming ties with both domestic and international organizations. These collaborations with the industrial sector reveal an ecosystem conducive to the interchange of ideas, the invention and marketability of novel technologies.

However, as shown in Figure 3, the majority of patents registered in the UAE continue to originate from abroad.

Figure 3

[18] These courts are an integral part of the Dubai International Financial Centre (DIFC) Courts.

Total patent applications[19] with their country of origin from 2015 to 2021



Source: WIPO[20], Authors' elaboration

This is a noteworthy aspect of the nation's ambition to become a global innovation hub.

This trend can be attributed to a myriad of motivations and carries several implications for the UAE's development trajectory. One key factor contributing to this achievement is the UAE's attractive business environment, given its strategic location and modern and efficient infrastructures. Furthermore, the introduction and strict enforcement of intellectual property rights, coupled with a stable political environment, have created a conducive ecosystem for international companies to establish their operations in the UAE. Additionally, favorable tax policies have further incentivized companies to register their patents in the UAE.

This trend also fosters partnerships that extend beyond the borders of the UAE, especially with leaders in technological innovation like the United States and the United Kingdom. These cross-border collaborations offer mutual advantages, bringing together resources, competencies, and knowledge to promote the development and realization of innovative solutions.

While the influx of foreign patents adds to the diversity and richness of the UAE's innovation ecosystem, it also implicitly highlights the importance of nurturing domestic innovation. In this regard, there is the emerging recognition that nurturing local talent and promoting homegrown technologies are vital for development. This realization has prompted the UAE government to initiate programs aimed at fostering research and development, entrepreneurship, and STEM education.

The implications of the current patent landscape in the UAE are manifold. The presence of foreign patents brings along an exchange of knowledge and technology, which can stimulate local innovation and inspire UAE-based businesses to explore new technological frontiers. It also contributes to the local economy by attracting foreign investment and creating jobs. However, an over-reliance on foreign patents could potentially limit the growth of indigenous innovation. Therefore, striking a balance between encouraging foreign patents and promoting domestic innovation will be crucial for the UAE's ambition to establish itself as a global leader in technology and innovation.

Ultimately, the implications of the trend of foreign patent dominance in the UAE present a complex interplay between international attraction and local development.

4.3. R&D and innovation development

As the UAE steadfastly progresses toward becoming a recognized hub of innovation, it acknowledges the fundamental role of R&D. This understanding is manifested through its strategic investments in the development of a robust research and development infrastructure.

However, the UAE's R&D expenditure in 2021 amounted to 1.5% of GDP, which is a noteworthy achievement, although it still falls below the average for upper-middle-income countries (The World Bank, 2023). In their review of research productivity in the UAE (1998–2017), Al Marzouqi et al. (2019) acknowledge the significant potential within the UAE and note a notable increase in the number of research publications over the observed 20 years; yet, they emphasize the need for further investment in research. Moreover, Ryan and Daly (2019)

[19] Direct and PCT national phase entries.

[20] https://www.wipo.int/edocs/pubdocs/en/wipo_pub_2000_2022/ae.pdf

emphasize the insufficient research intensity within the UAE's education environment, noting associated implications for the quality of research profiles among academic researchers attracted to the UAE.

However, the UAE has implemented strategies to encourage businesses to invest in R&D and innovation. These strategies aim to enhance private sector engagement and inspire greater corporate involvement in R&D projects and patent submissions.

Furthermore, in recognition of the catalytic potential of startups in driving innovation and fostering economic growth, the UAE government has outlined various policies and initiatives tailored to nurture and strengthen the startup ecosystem. These actions are integral components of the country's comprehensive strategy to transform the economy into a knowledge-based and innovation driven, aligning with the UAE Vision 2021 and the UAE National Innovation Strategy.

The UAE's ambitious efforts to establish itself as an innovative business hub are underpinned by a comprehensive approach, with one of its key elements being the creation of an enabling business environment. This strategy encompasses an array of mechanisms, including simplified business registration procedures, the reduction of bureaucratic hurdles, and the establishment of free zones, offering attractive incentives such as tax exemptions, unrestricted foreign ownership, and a host of other advantages for startups. The goal is to lower entry barriers, thereby facilitating and expediting the growth of startups within the country.

A crucial element concerning the innovation activity is the role of venture capital (VC). VC investments play a pivotal role in nurturing an innovative and entrepreneurial culture, particularly prominent in sectors focused on technology. Despite the substantial reduction in VC investments in the UAE in 2021 due to the disruptive effects of the COVID-19 pandemic (WIPO, 2022), thanks to a robust entrepreneurial ecosystem and a wide range of policy measures promoting business growth, the UAE still managed to secure a strong position on the global venture capital stage, clinching the 11th rank worldwide.

Additionally, it is important to acknowledge that VC investments often follow a cyclical pattern, experiencing periods of contraction and expansion as fresh opportunities surface and investor sentiment fluctuates. Therefore, the UAE's strategic focus on advancing sectors such as AI, blockchain, and FinTech, coupled with its commitment to fostering innovation, is expected to attract venture capital investors, possibly ushering in a surge in future VC funding.

In terms of regulatory policies, the UAE has introduced several measures to support startups. One such measure is the Bankruptcy Law, which was implemented in 2016. This law provides a legal framework for entrepreneurs to restructure their businesses in the event of financial difficulties, with the aim of reducing the stigma associated with business failure and encouraging entrepreneurs to take calculated risks in the pursuit of innovative ideas.

As the UAE aspires to become a global innovation hub, there is a strong emphasis on nurturing homegrown talent and fostering a spirit of entrepreneurship. To achieve this goal, integrating entrepreneurial elements into educational curricula and organizing activities designed to cultivate an entrepreneurial mindset are essential. Initiatives such as the Young Entrepreneurs Competition and the Innovation Impact Grant Program can play a crucial role in fulfilling this commitment, aiming to inspire and equip the next generation of Emirati innovators. Nonetheless, the UAE must prioritize the growth of knowledge-intensive employment, with a focus on jobs that demand a high degree of expertise, training, and innovation.

5. Discussion And Conclusion

This contribution offers an analysis of the UAE's economic diversification and innovation process from 2012 to 2021. The UAE government has been committed since 2010 to implementing its “Vision 2021”, a long-term vision that traces a path towards the realization of a sustainable and diversified economy driven by knowledge and innovation. We tried to assess whether the intentions outlined in the UAE’s "Vision 2021" have translated into concrete results.

Over the period 2012-2021, the UAE economy has prioritized the development of the non-oil sector, which has grown in significance, thanks to the implementation of numerous industrial projects and innovations across various sectors, aligning with its 'Vision 2021' and other related forward-looking initiatives.

This long-term strategy has placed innovation, research, science, and technology at the core of the economy aiming for high productivity and competitiveness. The country has sought to enhance and expand its knowledge base while promoting innovation to seize the opportunities arising from technological advancements.

Our analysis suggests that diversification has made significant progress during the decade from 2012 to 2021. Not only has the non-oil sector grown, but the diversification of exports from this sector have also increased, both contributing significantly to the diversification of the Emirates' economy.

However, the degree of diversification in the UAE needs to continue progressing. Indeed, the comprehensive reform program by the government of the Emirates, and market forces, have played a key role in gradually reshaping the economy's production structure. Moreover, certain macroeconomic variables such as exports, trade, infrastructure investment, foreign direct investment (FDI), and credit have significantly

influenced the diversification process. Furthermore, innovation and new technologies, particularly digital technologies, have received a significant boost due to Vision 2021 and related plans such as the UAE Strategy for Artificial Intelligence. This growth of digital technologies in recent years can be attributed to substantial foreign direct investment (FDI) flowing into the UAE, along with various reforms and efforts to attract a skilled human capital pool. Therefore, the results appear promising, although the hydrocarbons sector continues to play a significant role in the country.

At the same time, challenges remain in terms of total factor productivity improvements and employment growth which have not improved as expected. Moreover, investment in education and human capital still appear insufficient. As observed by Siddiqui and Afzal (2022), citizen participation in advanced education in the UAE remains limited. These challenges have adversely affected diversification efforts, creating risks of long-lasting effects in key non-oil sectors (IMF, 2022). Thus, the diversification process in the UAE needs to continue, focusing on the improvement the education sector, research and on SMEs' innovation and competitiveness. The expansion of the education sector, in particular, is a vital component in supporting the generation of innovation and patents. Despite significant growth in the education sector over the past decade, the overall investment in education and human capital remains a relatively small portion of GDP, particularly in light of the country's aspirations to become a hub and leader in innovation.

Nevertheless, the positive aspect of the UAE's diversification strategy is its clear vision that explicitly counters an economic culture that favors a distribution model. This strategy also addresses hindering factors, including high-risk aversion, a tendency for short-term behavior, and a lack of incentives to adopt innovations, among others.

By promoting a knowledge-based economy, encouraging entrepreneurship, and investing in strategic sectors, the country is effectively trying to decrease its reliance on oil revenues while nurturing a dynamic and resilient economy, with the ambitious goal of becoming a key player in the emerging industries of the future.

In conclusion, the paper emphasizes the necessity for the UAE to persist in diversifying its economy and underscores the importance of implementing a long-term strategy for economic diversification. Furthermore, the paper highlights that, while the excellence of the strategy is crucial, fostering a healthy culture where individuals at all levels feel involved and respond positively to challenges is equally important for enhancing the country's performance.

Acknowledgements

I would like to thank Alexandar Williams for his helpful suggestions and comments. The usual disclaimer applies.

REFERENCES

Al Kawaz, A. (2008). Economic Diversification: The Case of Kuwait with Reference to Oil Producing Countries. *Journal of Economic Cooperation, 29*(3): 23-48.

https://sesricdiag.blob.core.windows.net/sesric-site-blob/files/article/277.pdf

Al Marzouqi, A. H., Alameddine, M., Sharif, A., & Alsheikh-Ali, A. (2019). Research productivity in the United Arab Emirates: A 20-year bibliometric analysis. *Helyion*, *5*(12), 1-8. https://doi.org/10.1016/j.heliyon.2019.e02819

Alodadi, A. A. S. (2016). An econometric analysis of oil/ non-oil sectors and economic growth in the GCC: Evidence from Saudi Arabia and the UAE. Plymouth University.

https://pearl.plymouth.ac.uk/ handle/10026.1/4375

Alshamlan, M. A., Fernandez, V. M., & Fernandez, M. (2021). Foreign Direct Investment in the United Arab Emirates: A Study on the Main Contributors. *European Journal of Business and Management Research*, *6*(1), 97–101.

https://doi.org/10.24018/ejbmr.2021.6.1.694

Bahmani-Oskooee, M. & Economidou, C. (2009). Export led growth vs. growth led exports: LDCs experience, *Journal of Developing Areas*, *42* (2), 179-212.

Doi: 10.1353/jda.0.0030

Balassa, B. (1978). Exports and economic growth: Further evidence. *Journal of Development Economics*, *5* (2), 181-189.

https://doi.org/10.1016/0304-3878(78)90006-8

Bozatli, O., Bal, H., & Albayrak, M. (2023). Testing the export-led growth hypothesis in Turkey: New evidence from time and frequency domain causality approaches. *Journal of International Trade and Economic Development, 32*(6), 835-853. https://doi.org/10.1080/09638199.2022.2144932

Callen, T., Cherif, R., Hasanov, F., Hegazy, A., & Khandelwal, P. (2014). Economic Diversification in the GCC: Past, Present, and Future. *IMF Staff Discussion Note, SDN/14/12, December*. https://www.imf.org/external/pubs/ft/sdn/2014/sdn1412.pdf

CBUAE (2023). *Annual Report 2022. Safeguarding Stability*. Central Bank of the UAE.

https://www.centralbank.ae/en/news-and-publications/publications/cbuae-annual-reports/central-bank-annual-report-2022/

Cherif, R., Hasanov, F., & Zhu, M. (2016). *Breaking the Oil Spell: The Gulf Falcons' Path to Diversification.* Washington (DC): International Monetary Fund.

https://www.imf.org/en/Publications/Books/Issues/2018/02/26/Breaking-the-Oil-Spell-The-Gulf-Falcons-Path-to-Diversification-43480

Herzer, D., & Nowak-Lehnmann, F. (2007). What does export diversification do for growth? an econometric analysis. *Applied Economics*, *38*(15), 1825–1838.

https://doi.org/10.1080/00036840500426983

Hesse, H. (2008). Export diversification and economic growth. *Commission on Growth and Development Working Paper*, No. 21. World Bank, Washington, DC.

http://hdl.handle.net/10986/28040

IMD World Competitiveness Center (2022). *IMD World Competitiveness Ranking 2022*.

https://worldcompetitiveness.imd.org/countryprofile/overview/AE

IMF (2022). United Arab Emirates. Selected Issues. *IMF Country Report* No.22/51.

https://www.imf.org/en/Publications/CR/Issues/2022/02/17/United-Arab-Emirates-Selected-Issues-513270

IMF (2023). *World Economic Outlook, October 2023*. Washington (DC): International Monetary Fund. https://www.imf.org/en/Publications/WEO/Issues/2023/10/10/world-economic-outlook-october-2023

Jensen, S. (2018). Policy Implications of the UAE's Economic Diversification Strategy: Prioritizing National Objectives. In *Economic Diversification in the Gulf Region, Volume II. Comparing Global Challenges.* A. Mishrif, & Y. Al Balushi (Eds.), London: Palgrave Macmillan, 67-88.

Jmbs, J., & Wacziarg, R. (2003). Stages of Diversification. *American Economic Review*, *3*(1), 63-86. https://doi.org/10.1257/000282803321455160

Miniaoui, H., & Schilirò, D. (2017). Innovation and Entrepreneurship for the Diversification and Growth of the Gulf Cooperation Council Economies. *Business Management Studies*, *3*(3), 69-81. https://doi.org/10.11114/bms.v3i3.2594

Mishrif**,** A., & Al Balushi**,** Y. (Eds.) (2018). *Economic Diversification in the Gulf Region, Volume II. Comparing Global Challenges*. Berlin: Springer.

Mishrif, A., & Kapetanovic, H. (2018). Dubai's Model of Economic Diversification. In *Economic Diversification in the Gulf Region, Volume II. Comparing Global Challenges.* A. Mishrif, & Y. Al Balushi (Eds.), London: Palgrave Macmillan, 89-111.

MOE, (2021). *Annual Economic Report 2021.* Abu Dhabi: United Arab Emirates Ministry of Economy.

https://www.moec.gov.ae/documents/20121/0/Annual_Report_MOE%20-%20ENG%20%282%29.pdf/ad3ea4ed-770e-4741-f8d2-0dfa08f7af12

Moore, W., & Walkes, C. (2010). Does industrial concentration impact of the relationship between policies and volatility?, *International Review of Applied Economics*, *24*(2), 179-202. https://doi.org/10.1080/02692170903424315

Mourdaa, R., & Atyeh, M.H. (2017). Multiple Regression Analysis of Diversification Effect on GDP Per Capita: The Case of UAE & Saudi Arabia, *Asian Journal of Economic Modelling*, *5*(3), 253-265.

https://doi.org/10.18488/journal.8.2017.53.253.265

OECD (2018). Market Opening, Growth and Employment. *OECD Trade Policy Papers, No.214*, Paris: OECD Publishing. https://doi.org/10.1787/8a34ce38-en

Papageorgiou, C., & Spatafora, N. (2012). Economic Diversification in LICs: Stylized Facts and Macroeconomic Implications, *Staff Discussion Note 12/13*, Washington (DC): International Monetary Fund. https://www.imf.org/external/pubs/ft/sdn/2012/sdn1213.pdf

Porter, M.E. (2004). Building the microeconomic foundations of prosperity: Findings from the business competitiveness index. In *The Global Competitiveness Report 2003– 2004*. X. Sala-i-Martin, (Ed.), New York: Oxford University Press.

Ryan, J.C., Daly, T.M. (2019). Barriers to innovation and knowledge generation: The challenges of conducting business and social research in an emerging country context. *Journal of Innovation & Knowledge*, *4*(1), 47-54.

https://doi.org/10.1016/j.jik.2017.10.004

Schilirò, D. (2013). Diversification and Development of the United Arab Emirates' Economy. *Journal of Applied Economic Sciences*, *VIII* (2(24)), 228-239.

https://www.researchgate.net/publication/256378376_Diversification_and_development_of_the_United_Arab_Emirates'_economy#fullTextFileContent

Schilirò, D. (2015). Innovation in Small and Medium Enterprises in the United Arab Emirates. *International Journal of Social Science Studies, 3*(5), 148-160.

https://redfame.com/journal/index.php/ijsss/article/view/1014

Schilirò, D. (2022). Botswana's Economy and the Question of Diversification. *International Journal of Business Management and Economic Research*, *13*(2), 2066-2073. https://ijbmer.com/docs/volumes/vol13issue3/ijbmer2022130303.pdf

Shadab, S. (2019). Economic Diversification and the role of non-oil sector in the United Arab Emirates, *Asian Journal of Multidimensional Research*, *8*(7), pp.65-76.

https://doi.org/10.5958/2278-4853.2019.00249.0

Shadab, S. (2021). The nexus between export diversification, imports, capital and economic growth in the United Arab Emirates: An empirical investigation. *Cogent Economics & Finance*, 9 (1), 1914396, 1-15.

https://doi.org/10.1080/23322039.2021.1914396

Shayah, M. H. (2015). Economic Diversification by Boosting Non-Oil Exports (Case of UAE). *Journal of Economics, Business and Management*, *3*(7), 735-738.

http://www.joebm.com/index.php?m=content&c=index&a=show&catid=45&id=579

Shediac R., Abouchakra R., Moujaes C.N., & Najjar, M. (2008). *Economic Diversification. The Road to Sustainable Development*, Abu Dhabi: Booz and Co.

Siddiqui, S.A., & Afzal, M.N. (2022). Sectoral diversification of UAE toward a knowledge-based economy, *Review of Economics and Political Science*, *7*(3), 177-193.

https://doi.org/10.1108/REPS-07-2021-0075

Singer, H. (1999). Beyond terms of trade–convergence and divergence. *Journal of International Development*, *11*(6), 911-916.

https://doi.org/10.1002/(SICI)1099-1328(199909/10)11:6<911::AID-JID635>3.0.CO;2-X

The World Bank (2023). Research and development expenditure (% of GDP) – United Arab Emirates, Unesco Institute for Statistics. Accessed September 19 2023. apiportal.uis.unesco.org/bdds.

UAE Ministry of Cabinet Affairs (2015). *UAE National Innovation Strategy*. Prime Minister's Office at the UAE Ministry of Cabinet Affairs. https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/innovation-and-future-shaping/national-innovation-strategy

UAE Minister of State for Artificial Intelligence (2018). *UAE National Strategy for Artificial Intelligence 2031.* UAE Minister of State for Artificial Intelligence. https://ai.gov.ae/wp-content/uploads/2021/07/UAE-National-Strategy-for-Artificial-Intelligence-2031.pdf

UNCTAD (2023). *World Investment Report 2023, July.* Geneva: UNCTAD.

https://unctad.org/publication/world-investment-report-2023

UNFCCC (2016). The concept of economic diversification in the context of responses measures, FCCC/TP/2016/3, May. https://unfccc.int/documents/9179

WIPO (2022). *Global Innovation Index 2022.*

https://www.wipo.int/edocs/pubdocs/en/wipo_pub_2000_2022/ae.pdf

World Trade Organization (2019). *Aid for Trade at a Glance 2019: Economic Diversification and Empowerment*, Geneva: World Trade Organization. https://www.wto.org/english/res_e/booksp_e/aid4trade19_chap5_e.pdf

World Trade Organization (2023). *Global Trade Outlook and Statistics, April*. Geneva: World Trade Organization. https://www.wto.org/english/res_e/booksp_e/trade_outlook23_e.pdf

Zhang, Y., Crupi, A., & Di Minin, A. (2020). Pursuing justice or protecting local firms? Shenzhen courts move beyond judicial local protectionism. *R&D Management*, *50*(5), 614-630. https://doi.org/10.1111/radm.12422