

United Arab Emirates Economy Diversification through the Space Sector and its Diplomacy

(Executive Summary)

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Economic diversification is based on a structural transformation from the natural resources sector to sectors generating higher added value. One such sector is the space sector, whose global expenditure in 2023 amounted to USD 117 billion. Most (over 80%) are satellites, especially satellite navigation and communications. Another significant element of the space economy is Earth observation (16%), which is used in many areas of the economy. In 2023, the United States (USD 73 billion) was the leader in spending on space programs, followed by China (USD 14 billion). In the context of all satellites launched in the 21st century, the United States is also the leader (67%), followed by Europe (12%) and China (8%). The space sector can only be a source of long-term growth if it can generate a lasting effect of increasing industrial and production productivity. Therefore, the advanced technology production sector, including the space industry, should be dynamically developed. The research findings show that the United Arab Emirates' strategies have yielded some benefits. However, the UAE's economic diversification journey still needs to be completed. There needs to be more than state-led efforts to achieve the goals. They must be complemented by significant investment and expertise from the private sector. Building its space industry will also require greater coordination and integration with other Gulf countries and the dynamism of bilateral and multilateral space diplomacy.

1. Introduction

In 2024, the United Arab Emirates Space Agency celebrated its 10th anniversary. In 2016, the National Space Policy was adopted, emphasizing the need to build its space industry, which should contribute to diversifying the economy. In 2017, the United Arab Emirates announced the construction of Mars Scientific

City, a simulation of human settlement on Mars, which is also intended to develop the technology. In 2019, the National Space Strategy 2030 and the National Space Investment Plan were announced to coordinate various space industry initiatives. In the same year, Hazza Al Mansouri completed the first UAE mission into space to the International Space Station (ISS). In September 2020, the Mohammed bin Rashid Space Center adopted a space strategy for 2021-2031. In the same year, Dubai launched the Space Science Strategy to support the development of the necessary space sector infrastructure. In October 2020, the UAE Space Agency joined Artemis Accords, a multilateral partnership that aims to further cooperate on lunar exploration.

One example of the UAE's space diplomacy is the Emirates Mars Mission (EMM), which in July 2020 sent the first spacecraft to Mars - Hope Probe, which landed in February 2021. The program was part of cooperation with scientists and engineers from several countries, including those from the United States, Japan, and Great Britain. The United Arab Emirates became the first Arab country and the fifth in the world to reach Mars. The EMM space program is an instrument for national transformation by diversifying the country's economic potential. In 2021, Emiratis built a lunar rover at MBRSC in Dubai. In 2021, the Ministry of Industry and Advanced Technology adopted a strategy called Operation 300bn to increase the industrial sector's contribution to GDP from AED 133 billion (USD 36.2 billion) to AED 300 billion (USD 81.7 billion) by 2031.

In 2022, the UAE Space Agency launched the "Space Means Business" campaign to encourage the private sector to participate in the Emirates Mission to the Asteroid Belt (EMA). In July of the same year, the United Arab Emirates announced plans to launch a group of radar satellites. In 2022, the UAE approved a plan to establish a National Space Fund for domestic technology companies, allocating nearly USD 820 million. For comparison, in 2023 alone, the global expenditure on the space sector reached USD 117 billion. By 2030, the value of the dynamically developing global space sector is estimated to exceed 1 trillion USD. Therefore, economic diplomacy involved in developing bilateral and multilateral cooperation should be accompanied by technological and innovation diplomacy, focused on acquiring new technologies, including for the space sector, whose tool is also space diplomacy. This, in turn, can more effectively lead to more sustainable development of the country and adequate economic diversification.

In 2022-2023, the United Arab Emirates chaired the Committee on the Peaceful Uses of Outer Space, one of the most significant UN committees. The Committee is part of the United Nations Office for Outer Space Affairs, reporting to the Fourth Commission of the General Assembly, which adopts an annual resolution on international cooperation in the peaceful uses of outer space. In 2023, another Emirati astronaut, Dr. Sultan Al Neyadi, reached the ISS, joining NASA's mission. In January 2024, the Mohammed Bin Rashid Space Center and NASA announced that the United Arab Emirates would provide a crew and science

airlock module, called the “Emirates Airlock”, for NASA’s new “Gateway” lunar space station, humanity’s first international outpost in lunar orbit.

Despite the existing extensive literature on how to move away from dependence on one sector and the negative consequences for the oil-based economy, there needed to be more publications drawing attention to the role and importance of the United Arab Emirates’s space industry in its economic diversification. Therefore, the presented document is original. The paper’s primary objective is to provide practical insights through strategic analysis of the UAE’s challenges and, through conclusions on economic diversification based on the space sector and diplomatic support, to provide input to key policy documents. In this way, the document presented has a measurable social impact.

2. Research Question(s)

The primary research questions have been identified: what initiatives can significantly contribute to developing the United Arab Emirates’ space industry, increasing non-oil exports, and economic diversification? What international space programs should be key to diplomacy?

3. Research Methods

The author used empirical methods, quantitative research, statistical analysis, case studies, comparisons, and observation, including participant observation. Data from the World Bank Group, Statista, OEC, and Global Economic Diversification Index, among others, were used to examine the correlation of economic diversification with economic development based on the analysis of the contribution of various sectors to the UAE’s GDP. Data collected from the UAE government institutions, the Ministry of Economy, the Minister of Foreign Affairs, the Ministry of Industry and Advanced Technology, the Space Agency, and the government of Abu Dhabi were used to analyze trade, industrial strategy, economic vision, space policy, and space diplomacy activities. In addition, the Herfindahl Hirschman Index (HHI) was used to show which economic sectors concentrate the most on revenues. It is expressed in the formula: $HHI = \sum(x_i/x)^2$, N = total number of sectors; x_i = gross fixed capital formation value of sector i ; x = total gross capital formation.

The Herfindahl Hirschman Index was also supported by the Dickey-Fuller (ADF) test to examine economic diversification based on time trend regression analysis. Moreover, the VAR model, the Johansen cointegration test, the vector error correction model (VECM), and the Granger causality test were used to explore the correlation between diversification and economic growth. The document’s author compared the research results with several years of experience in the United Arab Emirates of the examined economic

processes and phenomena, including participating in them as Ambassador and Senior Advisor to Dubai Expo 2020.

4. Key Findings

The oil sector's contribution to the UAE's GDP has declined significantly. The study results show that petroleum product share decreased from over 70% in 2000 to 55% in 2022. However, these differences are minor when considering the precious stones together, from over 70% to almost 60%. Moreover, in the non-oil trade, imports and re-exports constitute the overwhelming part of trade. This, in turn, contributes to a large negative trade balance. Oil is still a significant part of the UAE's federal budget revenues. In 2022, industrial production represented just under 10% of nominal GDP, below the average for the Arab world. The share of industrial production in nominal GDP is lower in Dubai (8.7%) and Abu Dhabi (6%) than in Ras Al Khaimah and Sharjah. However, real production growth increased compared to pre-pandemic trends. The growth of Abu Dhabi's manufacturing sector remains highly vulnerable to oil price changes, which impacts petrochemical production. The contribution of the mining and quarrying sector to the UAE's GDP is highly variable. 2018-2019 saw a higher share of this sector than 2010. However, the largest industry in terms of the value of large infrastructure projects is construction, with USD 345.3 billion. However, planned or implemented projects in the industrial sector amount to only about USD 9.7 billion. Moreover, only slightly over USD 1 billion is being implemented, most of which, USD 662 million, are warehouses, car showrooms, food production plants, and glass and paint production. Aluminum projects took the next place. The rest is still being planned or designed. This seems likely to stay the same in the near term.

The Global Economic Diversification Index shows that the United Arab Emirates has made moderate progress in diversifying its economy. There has been an increase from 90.9 points in 2000 to 95.7 points in 2022. For comparison, China's index increased from 104.4 to 146.9 during the same period, and Singapore, smaller than the UAE, increased from 115.1 to 126.5. The Johansen cointegration test results and the VAR model confirm the long-term interdependence between economic growth and export diversification in the United Arab Emirates. Also, the Vector Error Correction Model (VECM) shows these relationships, highlighting that a 1% decrease in export concentration would lead to a 3.27% increase in the UAE's GDP. So, export diversification is crucial for the economic growth of the United Arab Emirates.

Research indicates that within the space sector engaged in economic diversification, more investment should be made in projects related to satellite launches, which account for 50% of the growth of the global space sector, Earth observation, satellite communications, space tourism, space mining, space debris, among others. The United Arab Emirates has partially produced its high-resolution imaging satellites - KhalifaSat and MBZ-SAT, which allow remote monitoring of territories disputed with Iran, particularly the

islands of Abu Musa and the Greater and Lesser Tunbs in the Strait of Hormuz. In addition, the UAE has invested in space situational awareness (SSA) technologies to improve the ability to detect and track potential threats.

The United Arab Emirates recognizes the need for satellite-based remote sensing applications, including natural resource mapping, environmental monitoring, urban planning, and security. In this context, in 2019, the UAE Space Agency joined the cooperation with the French National Center for Space Research (CNES) in the Space Climate Observatory (SCO). This is primarily intended to exchange satellite and field data and conduct research to monitor and model climate change. In the same year, the United Arab Emirates launched the first pan-Arab Space Coordination Group comprising 11 Arab countries. One of the main goals is to develop an Earth monitoring satellite. The UAE's space diplomacy is focused on international cooperation, which will contribute to acquiring new technologies for the space sector, serving economic diversification.

5. Implications

Over the years, the United Arab Emirates has reduced GDP and revenue growth dependence on the hydrocarbon sector. However, its size depends on the fluctuations of GDP, which since 1975 has had a similar trend to the average of the entire Arab world. However, the share of the manufacturing sector in total GDP is subject to variability. Its share was the highest (13%) in 2001, but in 2017 it dropped to 8.7%. Therefore, the topic of economic diversification in the United Arab Emirates is crucial for the future of the country. Therefore, the presented findings are significant for practitioners, policymakers, or other stakeholders. The space sector, supported by diplomacy, has a special place in the UAE's strategy for developing production and innovative technology. Therefore, this sector should have a significant impact on economic diversification. The United Arab Emirates has been consistently trying to build its economy and state revenues by reducing its share of crude oil.

In December 2023, the decision was announced to increase oil production from 3 to 5 million barrels per day by 2027. This level is the first in history. It may hinder the process of economic diversification. However, in the long term, if the funds obtained are invested in the space industry, they can accelerate it. One example is the National Radar Satellite Project, the first Arab satellite to take radar images. The United Arab Emirates operates several satellites for various purposes, including remote sensing, Earth observation, and communications. These satellites are crucial to the economic, social, and strategic development of the United Arab Emirates. Consequently, these activities are expected to build society's resilience for the UAE's upcoming post-oil future. For this purpose, it is necessary to attract foreign partners, which should be achieved through diplomacy.

6. Conclusion

The study will contribute to an in-depth political and economic analysis. Despite numerous economic development and diversification initiatives, the UAE remains dependent mainly on the hydrocarbon sector, which contributes significantly to total GDP. This, in turn, makes the economy highly sensitive to drastic changes in oil prices and, consequently, to the economic situation. The research highlights that the UAE could focus on geological satellites. Organizing your production should be straightforward. Moreover, as a partner country of the European Global Navigation Satellite System (GALILEO), the United Arab Emirates should make greater use of the service that guarantees signal quality and continuity. Emirates Airlines and maritime carriers will benefit from this. In addition, the United Arab Emirates could participate in the Earth observation program and global environmental and security monitoring - Copernicus. Communications, remote sensing, and Earth observation satellites are crucial to the UAE's economic diversification and strategic development and will ultimately impact the future of society. By identifying the challenges facing the economic diversification of the United Arab Emirates-based on the space sector, the presented document should inspire further future research. One area of future research could be the question of to what extent the pan-Arab Space Coordination Group can be a platform for deep cooperation in developing the space industry. Can the Gulf Cooperation Council be a platform for coordination and integration in space policy?