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Research article

ECONOMIC DIVERSIFICATION OF THE UNITED ARAB EMIRATES THROUGH THE SPACE SECTOR AND ITS DIPLOMACY

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Abstract. The article's subject is the state of the United Arab Emirates, established in 1971 in a primarily desert area with approximately 180,000 inhabitants, almost entirely Arab. Today, the country is home to over 10 million people from over 200 nations and is undergoing a massive transformation. However, to avoid the consequences of becoming dependent on oil revenues, the UAE (top oil producer) is implementing economic diversification programs. This process is accompanied by a dynamic development of the state's activity in space. The research objective is to examine the UAE's space sector's phenomenon and diplomatic activity, which impacts the country's economic diversification. Consequently, research questions were posed: what initiatives can significantly contribute to the development of the UAE space industry, nonoil export, and, consequently, to economic diversification? What international space programs should be crucial for diplomacy? At the epistemology level, within the theoretical framework, the paper applied international political economy to explain the issue of diversification. Meanwhile, economic development theory focuses on production, consumption, and trade changes. In its light, the article discusses the rentier state theory, the concept of the resource curse, and the "Dutch disease" syndrome. To find answers to the research questions, appropriate empirical methods were used: quantitative research, statistical analyses, observation, including participant observation, and case studies. Additionally, the Herfindahl Hirschman Index (HHI), the Dickey-Fuller test (ADF), the autoregression model (VAR), the Johansen cointegration test, the vector error correction model (VECM), and the Granger causality test were applied. The methods contributed to obtaining the results and finding answers to the research questions. Hypothesis validation shows that numerous initiatives of the United Arab Emirates to build the space industry have not yet impacted economic diversification, but they have great future potential.

Keywords*:* United Arab Emirates; economic diversification; space; diplomacy; industry

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1. Introduction

The United Arab Emirates's economy outside the oil industry is gaining a significant GDP share. Nevertheless, manufacturing and innovative technology are crucial for economic diversification. However, manufacturing's percentage of the overall GDP is susceptible to variability. 13% in 2001 was the most significant proportion. Nevertheless, in 2013, it dropped to 8% [1]. The decision to boost the daily oil production from 3 to 5 million barrels by 2027 [2], announced in December 2023, will make economic diversification from oil more challenging. However, if higher oil revenues are invested in research and development and the space industry, this should result in greater economic diversification. Therefore, the country should dynamically adapt its economy and space diplomacy to shape the space industry for economic diversification. It will impact society's resilience and a sustainable future in the post-oil era. The space sector and its industries can contribute to the efficiency and prosperity of the UAE in the long run.

Since establishing the United Arab Emirates Space Agency in 2014 and two years later adopting the National Space Policy [3], the UAE has focused on supporting the growth and diversification of its economy and developing a diversified national space industry. In 2019, the UAE's National Space Strategy 2030 was introduced to coordinate projects in this sector [4]. Then, in September 2020, the Mohammed bin Rashid Space Center launched a new space strategy for 2021-2031 [5]. In 2022, the UAE announced the creation of a national fund of nearly USD 820 million to develop space for domestic companies and technologies [6].

Economic diplomacy by expanding economic cooperation involving foreign nations and international organizations is meant to contribute to the expansion and economic diversification of the UAE. Technology and innovation diplomacy is collaboration to obtain new technology, including for the space sector, whose tool is also space diplomacy. The dynamically developing global space sector, whose value will exceed USD 1 trillion by 2030, is an excellent opportunity to attract investments for the local industry [7].

This article aims to answer research questions: what initiatives can significantly contribute to developing the UAE's space industry, increasing non-oil exports, and economic diversification? What international space programs should be crucial to diplomacy? To find the answers, an appropriate paper structure has been adopted. First, the literature in the subject area was reviewed, including various theoretical approaches to diversification. Then, the article presents the adopted research methods that led to obtaining the research results. This part draws attention to the importance of the UAE's space sector and diplomacy for economic diversification. Finally, the conclusion briefly summarises the study's most significant findings.

2. Literature Review

2.1. Theoretical Approaches to Diversification

Changing an economy from relying on one source of income to having several distributed across several industries is known as economic diversification [8]. So, it's the art of reducing risk by dispersing assets and sources of income [9]. Within the framework of political economy, Hvid [10] explains diversification by distinguishing its horizontal dimension, i.e., within the same sector, and its vertical dimension, i.e., moving from one industry to another, from primary

to secondary and tertiary sectors, and the creation of added value. Economic development theory emphasizes that simultaneous production, consumption, and trade changes drive diversification. According to Ross [11], the most crucial thing is macroeconomic volatility and, above all, the volatility of oil prices, which can shock a concentrated economy.

To explain the difficulties in diversifying economies, the rentier state theory has been developed within the political economy, which points out that oil-rich countries become dependent on the mining sector and external factors. At the same time, they generate wealth in a small way by focusing more on the distribution of oil revenues and using the oil industry as a tool of political stability [12]. According to Corden and Neary [13], a boom in one part of a country's tradable goods sector results in an appreciation. It causes the relative price of non-tradable goods to rise more than that of tradable goods [14].

Richard Auty [15] introduced the concept of the resource curse, referring to the lower economic achievement in rich natural resources than in poor countries. According to research on the resource curse, if a nation is overly dependent on oil revenues, it is detrimental to its economy due to "Dutch disease", i.e., resulting from the economy's over-dependence on oil and the neglect of other productive sectors.

Ross [16], who has made a significant contribution to the theory of the resource curse, points out that, although sparse, there is literature suggesting that despite the harmful effects of dependence on the oil industry, there are countervailing beneficial effects that are usually ignored. In this sense, Boschini, Petterson and Roine [17] emphasize that adequate improvement in the quality of institutions turns the abundance of natural resources from a curse into an asset. Therefore, Graham [18] points out that the Dutch disease terminology is misused and has the unfortunate connotations suggested by the word "disease". Moreover, the resource curse is the exception rather than the rule. Smith [19] draws attention to the resource curse, considering the stability of exporting countries even during recessions and price shocks, emphasizing the importance of the strength of the state and its institutions. Therefore, Vahabi [20] distinguishes between political and economic resource curses.

In developing this concept, Ricardo and Rigobon [21] propose three approaches related to Dutch disease: rent seeking and the harmful effects of volatility. The first refers to the negative consequences of increasing income from natural resources, leading to decreased production. But this is not a sufficient interpretation. Second, there is a lack of interest in making an investment in other industrtive sectors to increase revenue. Third, the variability of the low-price elasticity of providing oil hurts economic growth, investments, and income distribution. Gylfason and Zoega [22] point out that oil-exporting countries receive significant revenues from oil, which may not be sustainable in the long run [23]. This is caused by exogenous factors such as ineffective policies and institutions.

This article contributes to the international political economy literature by raising the new context of the UAE's space industry and its diplomacy committed to economic diversification. There is extensive literature on ways to move away from dependence on one sector and the negative consequences for the oil-based economy, such as a rentier economy, resource curse, Dutch disease, and price volatility. However, the current scientific literature lacks a publication

drawing attention to the role and importance of the potential of the UAE space industry in its economic diversification.

3. Methods

Considering the methodology of economic sciences, the United Arab Emirates was researched in this study's scope considering measures that have the potential to significantly advance its space industry, non-oil exports, and economic diversification. For this purpose, methods used in economics were adopted to determine how the adopted economic phenomenon should be studied. The author relied on empirical methods, quantitative research, statistical analysis, comparisons, observation, participant observation, and case studies to detect and describe the regularities governing these economic processes.

In examining the relationship between economic diversification and the economic development of the UAE, the contribution of various sectors to GDP has been analyzed; the worth of non-oil sectors compared to the oil sector based on data obtained from, among others, World Bank Group, Statista, OEC, Global Economic Diversification Index. However, data from UAE institutions, such as the Ministries of Economy, Foreign Affairs, Industry and Advanced Technology, Space Agency, and Abu Dhabi government, allowed for trade, industrial strategy, economic vision, space policy, and space diplomacy activity analysis.

The Herfindahl Hirschman Index (HHI) was also applied to examine economic diversification, supported by the augmented Dickey-Fuller test (ADF), to obtain the most accurate result. This reduced the imperfections of the HHI, which is based on a simple regression analysis of time trends. However, using the autoregression model VAR as well as the Johansen cointegration test helps identify the long-term correlation between diversification and expansion of the UAE's economy. To support this research process and check short-term dependencies, a vector error correction model (VECM) with the test of Granger causality was also used [23]. The Herfindahl-Hirschmann index [24] illustrating the degree of concentration of revenues from individual activities is expressed in the formula:

$$\mathrm{HHI} = \sum_{i=1}^{N} \left(\frac{x_i}{x}\right)^2, \tag{1}$$

where N is the total number of sectors; X_i is the gross fixed capital formation value of sector I; and X is the overall gross capital formation [25].

The research problem determined the selection criteria for the methods. Therefore, the methods mentioned above were used because they allowed for comprehensive answers to the research questions. What initiatives can significantly contribute to developing the UAE's space industry, increasing non-oil exports, and economic diversification? A quantitative method and statistical analysis were primarily used. Statistical analysis made it possible to quantitatively describe the state of the economic and social phenomenon in question. Moreover, the method contributed to examining the dynamics of phenomena and determining the nature and intensity of connections between them. Numerical parameters made it possible to characterize the studied economic phenomenon. Moreover, to increase the credibility of the findings, HHI from ADF was used,

which showed the degree of concentration of a given sector, the VAR model and the Johansen cointegration test to examine economic diversification in the light of economic growth, and the VECM with the Granger causality test was used to identify the relationships. To find the answer to the research question, what international space programs should be crucial to diplomacy? A case study was appropriate, showing what should be further developed and what mistakes to avoid, as well as observation, including participant observation, enabling scientific observations of the scientific phenomenon under study. Case studies supported understanding the economic phenomenon examined in detail and formulated conclusions.

4. Results and Discussion

4.1. Economic Diversification

In the first decade of the third millennium, the United Arab Emirates federal authority established a strategy called Vision 2021, based on six pillars, the third of which focuses on building a competitive economy built on knowledge [26]. The country has transformed its economy into one of the most diversified in the Gulf Cooperation Council (GCC) by carrying out several development projects. Over the years, the UAE has reduced GDP and revenue growth dependence on the industry of hydrocarbons [27]. However, its dimensions are determined by the fluctuations of GDP, which since 1975 has had a similar trend to the average of the entire Arab world, as shown in Figure 1.

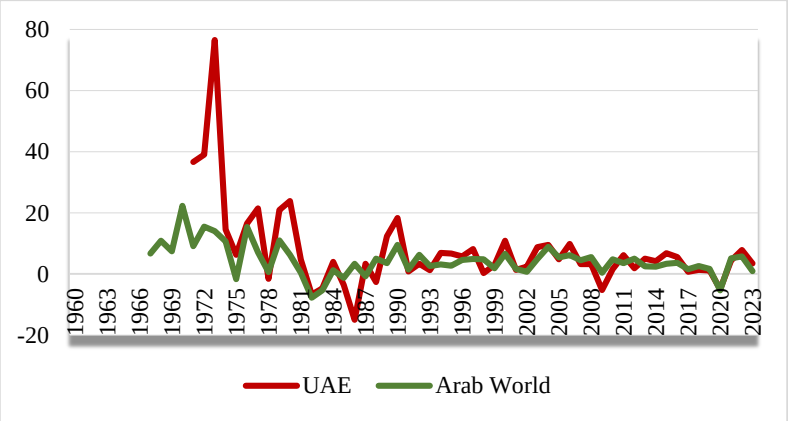


Figure 1. UAE GDP growth (annual %)
Source*:* Developed by the author based on the World Bank (2024) [28].

The United Arab Emirates' GDP contribution from the oil industry has declined significantly. However, industrial production accounted for just under 10% of the UAE's nominal GDP in 2022, below the average for the Arab world (Figure 2). In Dubai, industrial production is a smaller portion of the nominal GDP (8.7%). Nevertheless, it was even less (6%) in Abu Dhabi than in Ras Al Khaimah and Sharjah. However, real production growth in the UAE has increased compared to pre-pandemic trends. The manufacturing sector's GDP grew by 8.75% in 2022, significantly higher than the 2.8% average for 2017-2019 [29].

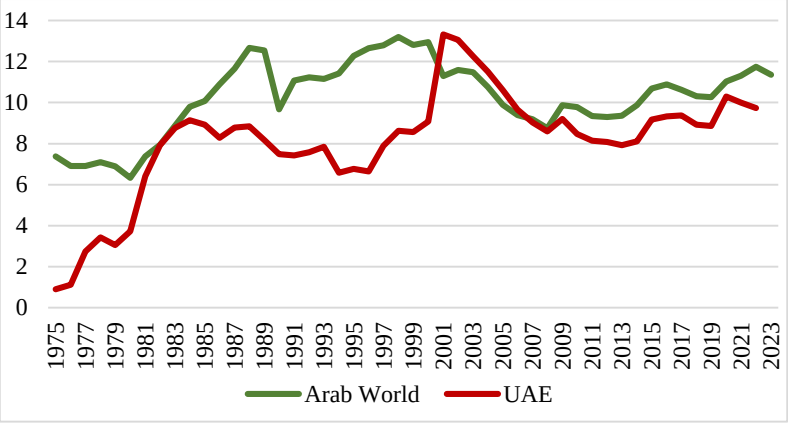


Figure 2. Manufacturing value added (% of GDP)
Source*:* Developed by the author based on the World Bank (2024) [1]

The manufacturing industry's expansion in the UAE has been uneven. In 2022, Dubai's manufacturing sector's real GDP increased by a meagre 0.26% yearly. After 2013, its annual growth rate in this industry fell from an average of 5.8% to 1.2% between 2014 and 2022. In turn, the rise in real GDP of the manufacturing sector in Abu Dhabi was much more robust and was 9.7% year over year in 2022. [30]. Nevertheless, manufacturing growth in Abu Dhabi is subject to much greater volatility due to changes in oil prices, which may have a knock-on effect on petrochemical production. The basis for production diversification is based on the structural transformation from the natural resources sector to sectors generating higher added value. These sectors can only be a source of long-term growth if they can develop a lasting effect of increasing industrial/production productivity. However, in the case of the UAE, the share of the mining and quarrying sector in GDP fluctuates. 2018-2019, preceding COVID-19, had higher share levels of this sector than 2010, as shown in Figure 3.

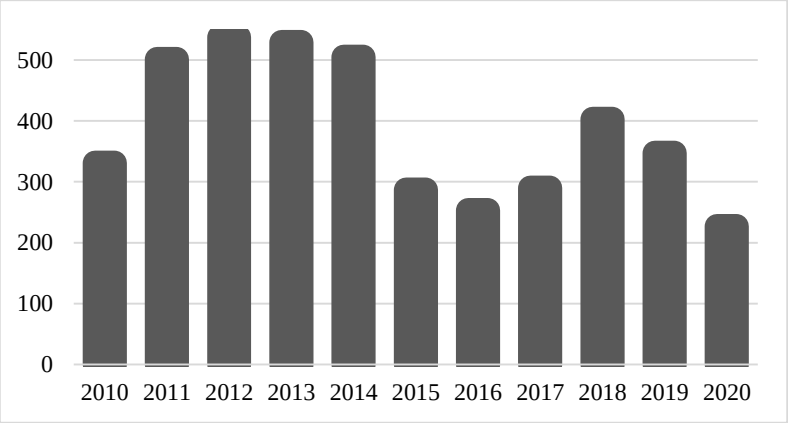


Figure 3. Mining and quarrying sector contribution to the UAE GDP (in billion USD)
Source*:* Developed by the author based on the Statista (2024) [31].

Crude oil remains a significant part of the UAE's federal budget revenues despite efforts to become independent from this raw material. At the same time, the production and trade of oil per barrel do not decline significantly [32]. Furthermore, the Economic Complexity Index (ECI), which is an appropriate measure indicating potential future economic growth based on trade (ECI trade), patent (ECI technology), and research publication data (ECI research) [33],

shows that the United Arab Emirates has an index below 1 in all elements, as shown in Table 1. Countries with the highest index have over 2 and the lowest -2.

Table 1. Economic Complexity Index

Year	ECI trade	ECI technology	ECI research
2022	0.24		-0.2
2021	0.16	-0.03	-0.14
2020	0.16	0.10	-0.4
2019	0.19	0.33	-0.53
2018	0.11	0.23	-0.68
2017	0.14	0.38	-0.07
2016	0.19	0.31	0.45
2015	0.09	0.24	0.9
2014	0.11	0.10	0.9
2013	0.06	0.14	0.54
2012	-0.01	0.13	0.58
2011	0.02	-0.03	0.57
2010	-0.14	-0.3	0.61
2009	-0.21	-0.15	0.62
2008	-0.2	-0.02	0.72
2007	-0.18	-0.01	0.71
2006	-0.12	-0.06	0.71
2005	-0.23	-0.26	0.12
2004	-0.24	-0.48	0.15
2003	-0.39	-0.57	-0.17
2002	-0.51	-0.28	0.03
2001	-0.5	-0.11	0.05
2000	-0.71	-0.44	-0.09

Source: Developed by the author based on the OEC (2024) [34].

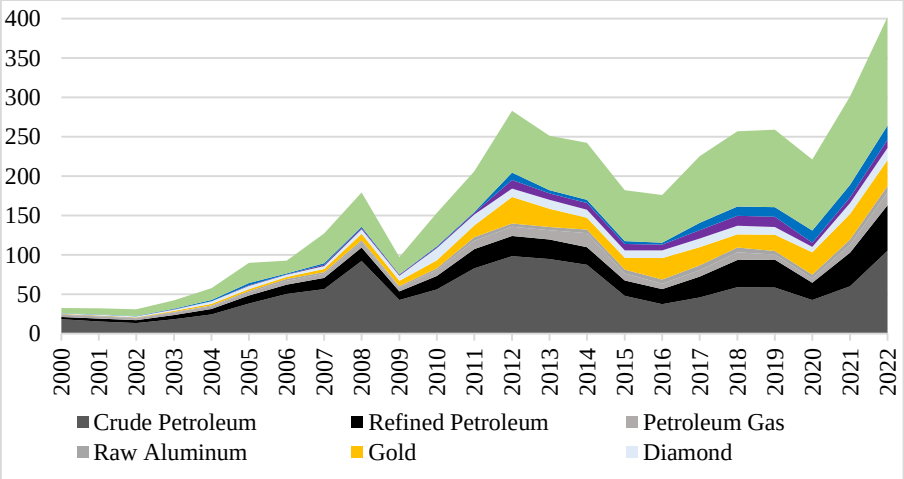


Figure 4. UAE Export in USD billion
Source*:* Developed by the author based on the OEC (2024) [34].

Industrial products constitute a significant portion of exports other than oil. Operation 300 billion strategy seeks to raise the United Arab Emirates's export competitiveness globally. In line with the goal of greater diversification beyond oil and exports that are not oil, they have become most important in the United Arab Emirates' commercial activities during the previous several years [35]. However, the most significant export segments are still oil, pearls, stones, precious metals, articles, and aluminium (Figure 4).

Analyzing and comparing trade exchange since 2000, it should be emphasized that the percentage share of petroleum products has decreased from over 70% in 2000 to nearly 55% in 2022. However, these differences are minor when considering the precious stones together, from over 70% to almost 60%, as shown in Figure 5.

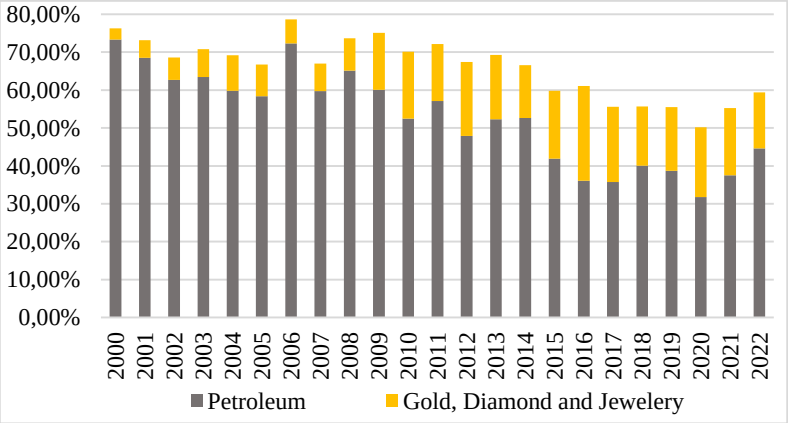
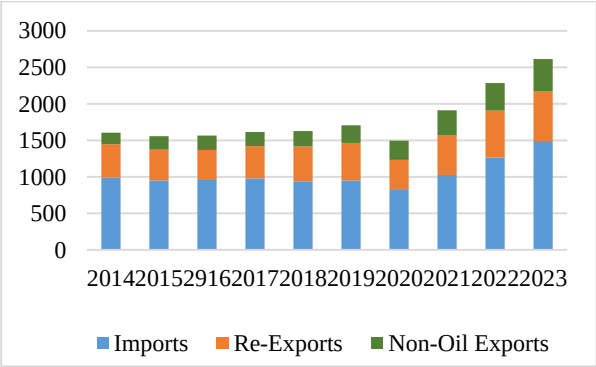


Figure 5. UAE Export (%)
Source: Developed by the author based on the OEC [34].

Moreover, in the non-oil trade, imports and re-exports constitute the overwhelming part of trade, as shown in Figure 6. This, in turn, contributes to a large negative trade balance (Figure 7).



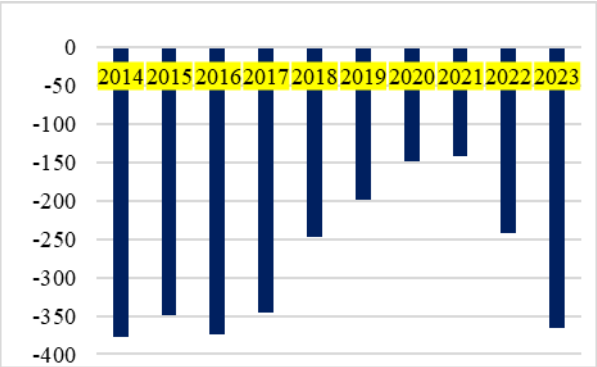


Figure 6. UAE Non-Oil Trade **Figure 7.** Trade balance
Source: Developed by the author based on the UAE Ministry of Economy (2024) [36].

Meanwhile, the Global Economic Diversification Index shows the UAE has made moderate progress in diversifying its economy. There was an increase from 90.9 points in 2000 to 95.7

points in 2022 (Figure 8). For comparison, during the same period, China's index increased from 104.4 to 146.9, and Singapore, smaller than the UAE, increased from 115.1 to 126.5 [37].

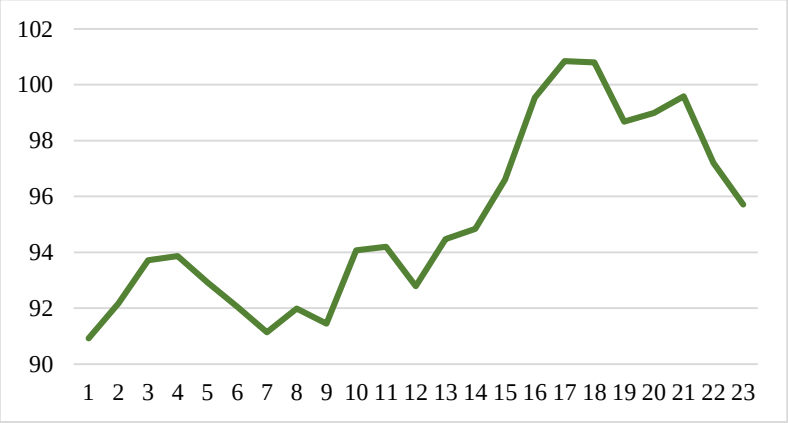


Figure 8. UAE Global Economic Diversification Index
Source*:* Developed by the author based on the Global Economic Diversification Index (2024) [38].

The outcomes of the Johansen cointegration examination based on the VAR model confirm the long-term interdependence between the UAE's economic expansion and export diversification. The vector error correction model (VECM) also displays both long-term and short-term dependencies. Furthermore, the VECM demonstrates that the country's GDP would rise by 3.27% for every 1% reduction in export concentration. Export diversification significantly impacts the economic expansion of the UAE [39]. The VECM Granger causality test confirms the short-term bidirectional causality between diversification and expansion of the economy.

The country is successfully reducing its dependence on the oil sector for economic development, achieving greater economic diversification [39]. At the same time, there is a one-way negative relationship between economic growth and the production sector. Moreover, the negative association between economic development and manufacturing is demonstrated by the sector's concentration on the petrochemical and construction industries, which are impacted by changes in oil prices. Therefore, the UAE economy should intensify the development of the high-tech manufacturing industry and the private sector to allow them to make constructive contributions to the country's future prosperity [39].

Investment in infrastructure projects in the industrial sector is limited compared to other industries. Major infrastructure projects worth more than USD 500 billion are scheduled or in progress in the UAE. However, the largest industry in the value of big infrastructure projects is construction, worth USD 345.3 billion. In contrast, the industrial sector has only the smallest of all industries, with projects planned or in progress totaling USD 9.7 billion. Most of these are still in the research or design stage, with slightly over USD 1 billion presently in development. Cement (USD 228 million) and "other manufacturing" (USD 662 million) are the two largest subsectors among those that are currently in operation.

„Other production" includes warehouses, car showrooms, food production plants, and glass and paint production. Industrial manufacturing provides air conditioning systems, electronics,

automobiles, and furniture. Roughly 80% of projects in 2020-2022 were other production. Aluminium projects came next. It seems unlikely to alter soon, given that the planned significant projects worth USD 8.7 billion continue to focus on remaining production (USD 5.5 billion), followed by steel (2 USD 5 billion) and aluminium (USD 400 million) [30].

According to Abu Dhabi Economic Vision 2030, the aerospace sector is essential to the country's future economic expansion [40]. The establishment of Strata Manufacturing by the state-owned Mubadala Investment Company in 2009 was one of the projects. Since then, the business has collaborated with Airbus, Boeing, Pilatus, and FACC to design and manufacture airplane parts. The aerospace sector is another goal of the Dubai Industrial Strategy 2030. One of the world's biggest fleets is flown by Dubai-based Emirates Airlines, which the emirate's government controls. The industrial strategy envisions the long-term localization of manufacturing capacities in specific aviation and space industry sub-industries [41].

Operation 300bn, a plan announced by the Ministry of Industry and Advanced Technology, aims to increase the industrial sector's GDP contribution from AED 133 billion (USD 36.2 billion) in 2021 to AED 300 billion (USD 81.7 billion) by 2031 to hasten the process of economic diversification. The program primarily intends to support SMEs in driving innovation and applying new technologies in the national industrial sector. Emirates Development Bank has allocated over USD 8 billion over five years to priority production sectors, including space [42].

4.2. Space Sector and Its Diplomacy

According to predictions, the global space sector will exceed USD 1 trillion in 2020-2030, increasing to 186%, inspiring the local industry. Critical areas for economic diversification include projects related to satellite launches, communications, Earth observation, space tourism, mining, manufacturing, trash, exploration, and research and development. Satellites alone are predicted to provide 50% of the growth in the global space sector, making them essential expansion factors in subsectors [7].

Since establishing the UAE Space Agency in 2014, the Mohammed bin Rashid Space Center in 2015, and the adoption of the National Space Policy in 2016, the United Arab Emirates has focused on supporting the growth and diversification of its economy, supporting the development of a diversified national space industry. It seeks to boost specialised skills, advance scientific and technological capabilities, foster innovation, and elevate the country's position globally [3]. The UAE will strive to become a regional and global leader in establishing, developing, and sustaining a thriving, diverse commercial space sector.

In 2017, the UAE announced the construction of Mars Scientific City, a simulation of human settlement on Mars to conduct research and develop technology to enable manned exploration of Mars [43]. As part of space diplomacy, a Memorandum of Understanding was signed by the UAE Space Agency and the State Space Agency of Ukraine in November of the same year [44]. In 2019, France launched the Space Climate Observatory (SCO), a collaboration between the UAE Space Agency and the French National Center for Space Research (CNES). The partnership aims to exchange satellite and field data and conduct research to monitor and model climate change and its impact on a global and local scale [45].

As part of its economic diversification, the country announced in 2019 its ambitious National Space Strategy 2030 and National Space Investment Plan to coordinate space industry projects and public and private sector operations in the years leading up to 2030 [46]. The same year, Hazza Al Mansouri made history as the first UAE astronaut to fly into space, embarking on the country's first science journey to the International Space Station (ISS). Another noteworthy accomplishment of the national space program and its goal of being a global space exploration and innovation leader is the launch of a UAE astronaut to join the ISS [47]. The United Arab Emirates 2019 formed the first Pan-Arab Space Coordination Group promoting the development of the "813" an earth-monitoring satellite that bears the year of the reign of Al-Ma'mun, founder of the Arab Academy of the famous House of Wisdom [48].

To improve the national space research capabilities, Dubai introduced the Space research Strategy in 2020 [49]. The Emirates Mars Mission (EMM), which launched the first spacecraft to Mars in July 2020, and the Hope Probe, which touched down in February 2021, are two of the most prominent instances of the UAE's space diplomacy. The mission involved cooperation with engineers and scientists from several nations, including the UK, Japan, and the US. The United Arab Emirates' involvement in the project demonstrated how dedicated the nation is to global collaboration in space exploration and research. History was made by the United Arab Emirates by successfully placing the Hope spacecraft into Mars orbit. The EMM serves as a mechanism to catalyse national transformation by diversifying the country's economic potential [48].

In September 2020, the Mohammed bin Rashid Space Center adopted a new space strategy for 2021-2031. The lunar mission is one of its key elements. The plan intends to improve the Emirates' space exploration and technology potential, establish new international knowledge-based alliances, and make the Center more globally competitive. The UAE Space Agency became a member of the multinational Artemis Accords in October 2020, which intends to increase collaboration on lunar exploration [5].

In 2022, the UAE announced the inauguration of a National Space Fund of USD 820 million to support Emirati space enterprises and technology. The fund is intended to assist groundbreaking programs and companies cooperating with space science and engineering [6] and the Space Economic Zones Program, which aims to help space start-ups and other small and medium-sized enterprises. The first investment announced was a project to create a constellation of remote-sensing satellites. Moreover, in the same year, the UAE Space Agency launched the "Space Means Business" campaign aimed at inviting private entities to participate in the Emirates Mission to the Asteroid Belt (EMA) [50].

In July 2022, the country launched the National Radar Satellite Project, which includes the first Arab satellite taking radar images. For various uses, such as communications, Earth observation, and remote sensing, the United Arab Emirates uses a few satellites essential to the strategic, social, and economic advancement of the United Arab Emirates. Among the Arab Gulf states, the Saudi space program is the only one that rivals the UAE in scope and ambition [51].

Being an active member of the Committee on the Peaceful Usage of Outer Space (COPUOS) and contributing to its work on defining international space law and promoting space

cooperation is another example of Emirati space diplomacy. 2022-2023, the UAE chaired COPUOS, a significant UN committee. The Fourth Commission of the General Assembly, which passes an annual resolution on international cooperation in the peaceful uses of outer space, receives reports from the Committee, a part of the United Nations Office for Outer Space Affairs (UNOOSA) [52].

Federal Decree-Law No. 46 of 2023 Regarding the Organization of the Space Sector governs the space industry in the country. The Act provides a legislative framework to accomplish the National Space Policy's objectives, such as attracting investments and enticing the private sector to engage in space-related endeavours [53]. In 2023, another Emirati astronaut, Dr Sultan Al Neyadi, travelled to the ISS, joining NASA's SpaceX Crew-6 mission. The UAE plans to send two other astronauts into space, Mohammed Al Mulla and Nora Al Matrooshi, the first UAE woman in space. NASA and the Mohammed Bin Rashid Space Center announced in January 2024 that the United Arab Emirates would supply the "Emirates Airlock," a crew and science airlock module, for NASA's proposed "Gateway" lunar space station, which would be the first international outpost in lunar orbit [51].

To improve its capacity to identify and monitor possible threats to its space assets, the United Arab Emirates has made investments in space situational awareness (SSA) technologies. The country is committed to being a center for space research and innovation in the Middle East and beyond, as evidenced by several projects and programs. The UAE has partially produced its high-resolution imaging satellites - KhalifaSat and MBZ-SAT. This allows it to monitor territories disputed in the Strait of Hormuz remotely, the islands of Abu Musa, and the Greater and Lesser Tunbs [54].

Among other things, space diplomacy focuses on international cooperation, acquiring new technologies for the space sector, serving economic diversification, and increasing global technological influence. The United Arab Emirates cooperates with international space agencies and organizations when implementing space diplomacy. In charge of creating and carrying out the nation's space strategy and expanding its potential, the Mohammed Bin Rashid Space Center (MBRSC) is essential to the country's space industry. The UAE Space Agency has partnered with several nations, including the US (NASA and US Strategic Command - USSTRATCOM), the UK, China, Japan, and international organizations like the European Space Agency [47].

The United Arab Emirates recognizes the need for satellite-based remote sensing applications, such as mapping natural resources, environmental monitoring, urban planning, and security. The country seeks opportunities to develop satellite communication technologies and apply the newest space technologies for terrestrial applications. The UAE's 2024 Emirates Lunar Mission sought to build a lunar rover in the country and send it to the Moon by that year. On April 14, 2021, Emiratis built the rover at MBRSC in Dubai, making it the first Arab nation to send a mission to the Moon. A lunar rover named Rashid was sent to the Moon on December 11, 2022. On April 25, 2023, a few seconds before the landing attempt, communication with the lander was lost. The spacecraft hit the Moon and was thus destroyed. The next rover, Rashid 2, was announced on April 26, 2023. The United Arab Emirates views space exploration as a chance to improve its standing internationally and establish the nation as a global leader in science and

technology. By funding space-related endeavours, the UAE hopes to establish itself as a space research and innovation centre in the Middle East and beyond [55].

The United Arab Emirates conducts economic diplomacy dynamically by developing economic cooperation with other nations and foreign actors, which is intended to support the UAE's economic expansion and diversification. One example is the Joint Economic Committees chaired by the Ministry of Economy and Joint Committees led by the Ministry of Foreign Affairs, which are carried out with dozens of countries worldwide [56]. Consequently, the government is establishing economic partnerships based on economic and free trade agreements, as well as the Comprehensive Economic Partnership Agreement (CEPA). They are intended to support economic growth and diversification and strengthen their position in the world.

In addition, the influential Sovereign Wealth Fund implements economic diplomacy for the UAE's economic diversification. One of them is the fourth-largest sovereign wealth fund globally, and the biggest in the Middle East is the Abu Dhabi Investment Authority (ADIA), with total assets worth approximately USD 1 trillion. On the list of the most essential funds of this kind worldwide are seven SWFs from the United Arab Emirates (Table 2).

Table 2. The United Arab Emirates' SWF

Name	Assets in USD	Global rank
Abu Dhabi Investment Authority (ADIA)	1 trillion	4
Investment Corporation of Dubai (ICD)	341 billion	11
Mubadala Investment Company PJSC (Mubadala)	302 billion	12
Abu Dhabi Developmental Holding Company PJSC (ADQ)	225 billion	15
Emirates Investment Authority	91 billion	21
Dubai Investment Fund	80 billion	24
Sharjah Asset Management Holding LLC	10 billion	55

Source: Developed by the author based on the SWFI (2024) [57].

However, there are numerous difficulties with the UAE's economic diversification plan. These include potential global financial crises, volatility of the oil price and the regime of currency rates, regional tensions and conflicts, and geopolitical issues. Additionally, Emiratis' demographic imbalance and low percentage of private sector participation present societal challenges [58].

5. Conclusions

The research objective of the UAE's space sector and its diplomatic initiatives that strive for the country's economic diversification have shaped the research questions: what initiatives can significantly contribute to the development of the United Arab Emirates space industry, nonoil export, and, consequently, to economic diversification? What international space programs should be crucial for diplomacy? In the search for answers within the framework of international political economy, the study carried out the findings.

Despite numerous economic diversification efforts, the UAE mainly depends on the hydrocarbon industry, contributing substantially to the total GDP. This, in turn, makes the economy highly sensitive to drastic oil price variations and, consequently, to the financial situation. Indeed, the country has achieved overall improvements in economic performance in various non-oil sectors, often avoiding the severe consequences of the rentier economy, resource curse, and Dutch disease. However, dependence on the oil sector remains an important issue. The UAE has now become a noticeable model of economic diversification. However, the advanced technology production sector, including the space industry and the private sector, should be dynamically developed. Moreover, modern diplomacy should be based on a vast network that covers many state sectors, including space.

The research conducted considering the international political economy demonstrates the need for a dynamic foreign economic policy. In this context, the findings emphasize 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. Emirati airlines and maritime carriers will benefit from this. In addition, the UAE could participate in the Earth observation program and global environmental and security monitoring - Copernicus. Communications, remote sensing, and Earth observation satellites are crucial to economic diversification and will ultimately impact Emirati society.

The findings demonstrate that the United Arab Emirates initiatives have produced benefits, but the country's economic diversification journey is still far from over. The economic growth theory supported the identification of the premises and conditions of economic diversification based on the analysis of processes, quantitative dependencies, inputs, and the institutional structure of the economy. The authorities have discovered challenges. One of them is the absence of a unit of industrial standards. Another difference is the differing rules in the country's industry. Moreover, the industry requires significant private-sector ventures and know-how. Additionally, there is a need for improved collaboration and industrial integration within the Gulf Cooperation Council to prevent excessive effort replication.

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