

Skyscrapers and Economic Strategy and Development: The Case of Bahrain's Proposed Murjan Tower

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Abstract—With the recent proposal of building the world's largest skyscraper in Bahrain, this paper examines the history of the economic, social and environmental impact of skyscrapers in other countries and examines the specific case of Bahrain's proposed skyscraper project, the Murjan Tower. A SWOT analysis is performed in regards to the decision of whether to build this proposed tallest structure in the world. It is determined that although this project does fall in line with Bahrain's best interests for future economic growth, the recent instability, both politically and economically, gives stronger reasons to delay the project. Many lessons can be learned from other developing countries that have built skyscrapers, such as Malaysia and Dubai, and are thus included in the paper.

Index Terms—Bahrain, economic development, skyscrapers, strategy.

I. INTRODUCTION

A. Skyscrapers History

Skyscrapers were originally created in the United States of America as a symbol of economical strength and increasing global business operations. Most of the tallest buildings in the world were located in the US. However, the popularity of tall buildings has recently decreased in the US among American investors due to a low performing real estate market, skepticism of the buildings' profitability, rise of urban critical thinking on skyscrapers and the catastrophic incident of 9/11 and its after psychological effects [1]. In Western countries, skyscrapers have also decreased in popularity as they lost their symbol of power, wealth and importance, while restaurants, shops and museums became more prominent. In developing countries though, tall buildings are still attractive as they are still looking to "announce themselves" in the global business world [1].

B. Impact on Nature

There has also been work to study the impact of skyscrapers on the natural environment. Reference [2] studied the establishment of well-planned urban development including skyscrapers at specific locations as well as their required infrastructures. It was assessed if this would help in lowering the pressure on the natural resources and providing habitants with an enjoyable living environment. Reference [2] concluded that integrating the skyscrapers with its surrounding urban landscape requires a holistic perspective that emphasizes the knowledge transfer and integration with overall design to achieve harmony. Only the proper

integration can lead to improved air circulation, resource conservation, waste reduction, lower operating costs, lesser strain on local infrastructure, and last but not least, an enjoyable life [2]. Reference [3] assessed how the design of the skyscraper itself can contribute positively to the environment. For that he studied some examples in Bahrain, United Arab Emirate and Kuwait. Some of them are equipped with wind turbines, others with Photovoltaic and others with a combination of both. Other examples achieved this purpose because of their unique cooling and innovative design. In fact, there are several mechanisms and policies that can accelerate the construction of sustainable buildings.

C. The Skyscraper Dimensions.

Reference [4], [5] investigated the factors determining the skyscraper's height. Among several factors, the skyscraper height increases with local population and office employment growth, and is negatively affected by increasing construction costs. In addition, height competition increases during boom times. Calculations have been drafted illustrating the specific economical height in terms of number of floors [4], [5]. Reference [6] added the differentials determining land price variations in addition to the heights. There is significance of being the tallest as it pre-empts later rivals. A game-theoretic model has been developed for the skyscraper development capturing all these factors. On the other hand, reference [7] assessed space efficiency in skyscrapers, concluding that special care should be given to the structural system and core configuration of the skyscraper as they highly affect the space efficiency of it. This is because they are closely related with the available shape of each floor slab, leasing depth, floor height and hence the requirements for lifts. This conclusion was based on assessments of height & area of skyscrapers worldwide [7].

D. Skyscrapers Economics

According to [8], the building of skyscrapers has not reached its doom yet and that tall buildings are still in demand and are still considered to be distinctive landmarks. The 9/11 incident did not reduce the trend of building tall buildings. It merely resulted in extra precautionary measures taking place in their construction. For example, the London Bridge Tower was re-examined to improve stability and reduce evacuation times.

Construction height of tall buildings is more likely to be linked to general economic conditions and real estate fundamentals instead of fear of extreme heights [8]. Tower height has also been found to be correlated with profit maximization and not related to the need to stand out in the skyline [4].

A link between construction booms and financial busts has also been studied [9]. This is portrayed through the

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skyscraper index which can predict economic downturns through overinvestment, monetary expansion and speculation as foundations for the index. The ability of most market indicators to predict severe business cycle changes are weak compared to the skyscraper index [9].

Research on the business dynamics and economics of skyscrapers has occurred for over 80 years. Reference [10] studied the cost and return on investment of the skyscrapers in relation to land cost. More recently, reference [11] studied the effect on the macro scale. More specifically, it was found that skyscraper development helps kick start stock markets. Construction starts of record-breaking skyscrapers triggers subsequent stock returns as it indicates over-confidence [11].

The financing architecture of skyscraper development projects is very crucial to managing risks & maximizing returns. Focusing on the risks associated with skyscrapers construction specifically, it is recommended to start by categorizing the risk types (market-related, completion & institutional) first to be able to address them with the adequate risk management tools [12], [13].

There are other economic factors inspiring the decisions leading to the construction of skyscrapers, including population growth and urbanization, economic cycles and the 'Skyscraper Index', regulation and 'regulatory tax', and resource availability. There are drivers influencing the development of skyscrapers & proposed cost model for skyscrapers construction costs [14]. Reference [6] studied these points with the emphasis on overbuilding and found that a skyscraper contest can explain it since the chosen height usually slightly exceeds the height suggested by profit maximization. This overbuilding may positively affect real estate cycles; increases in vacancies and declines in rents, leading to subsequent slowdowns or even shutdowns in construction [6].

II. TOWERS IMPORTANCE IN DEVELOPING COUNTRIES

A. Malaysia

Malaysia's rapid economic and social development caused its poverty level to decrease from 49% in 1974 to 6% in 2004. It was able to do that through the power of human capital which resulted in an increase in manufacturing and lower commodity prices. Thus it transformed itself from being a poor country to being an industrial powerhouse symbolized by the Petronas Towers [15].

B. Dubai

Dubai's rapid development has been successful so far. However, it gained with its success associated risks and challenges that may harm its sustainability [16]. These challenges/risks involve Dubai's diversification strategies and its ability to maintain its status as an international tourist destination. Another risk is that only 22 percent of its population is native as it uses expats as a resort for cheaper labor. Also a challenge is the growing criticism from NGOs regarding Dubai's treatment towards foreigners which may harm its image and reduce FDI. Moreover, maintaining federation stability in its emirates is a challenge, and its geographic location is a growing attraction for crime and

terrorism through acts such as money laundering [16]. Dubai is considered to be a transitory space for low income migrants who tend to "resist globalizing influences" and establish linkages, through available settings in Dubai, to their home countries [17]. This shows that such scenery could be applicable in similar developing countries with similar economical and social strategies.

Burj Khalifa in Dubai was an anchor project to drive investment towards the downtown area in order to have a central business district. Thus, it was part of a master plan for the area. The construction of the tower and the area caused rent rates to boost in the surrounding area [18].

III. BAHRAIN'S POTENTIAL FOR TOWERS DEVELOPMENT

A. Economy

Bahrain's economy was able to go through development through its cornerstone of having a world class regulatory Central Bank and establishing the Bahrain Monetary Agency. This enabled it to obtain financial strength that is depicted in its modern architecture. Furthermore, its government policies enabled it to achieve political and economical stability, which is attractive for business stakeholders. Through its political maturity it was able to provide a flexible and innovative environment for development supporting growth and expansion [19].

The prominent element in Bahrain is its sweet water found in natural springs beneath the sea which formulated natural pearls. Its second important element is its history and civilization. The discovery of oil allowed it to become a major oil financial trading centre through an economic diversification plan in its industries [19]. Currently, Bahrain's focus is to diversify its industries through macroeconomic investment in order to sustain economic stability and development instead of depending on oil exports solely [19].

In alignment with Bahrain's development, Bahrain has established a free trade agreement with the US enabling it to become a regional hub for the US to enter the Middle East market. It also ensures that all matters of trade and investment are regulated in a transparent, objective, and predictable manner [19]. This shows that it may potentially have similar agreements with other countries, making it a possible centre for global and regional business operations.

B. SWOT Analysis

1) Strengths

When describing the financial and economic situation in Bahrain, reference [20] found that "the banking sector is exceptionally vibrant and sophisticated, on par with the Organization for Economic Cooperation and Development (OECD) standards. "Bahrain remains an attractive regional base for the globe's multinationals due to its business-friendly economy, coupled with a developed/transparent legal and institutional framework" [20]. Bahrain represents a financial hub in the Middle East as it was ranked, according to the Heritage Foundation, as "the most liberalized country in the Middle East and the fourth in the world, after Hong Kong, Singapore and New Zealand" [20].

From a cultural perspective Bahrain was initially famous for its ancient pearl industry: the first record of pearl diving in history was of it taking place in Bahrain. Several cultural projects are under way in Bahrain which should fuel the country's bid to become a UNESCO Arab Capital of Culture [21].

Bahrain has motivation to promote tourism. Since the mid 1990s, all of the GCC countries have been trying to promote their tourism sector, which soon became a prominent economic sector. Reference [22] tried to assess to what extent Bahrain has introduced a cohesive and economically viable tourism industry that contributes to a more sustainable economy of this country.

From a geographical perspective, Bahrain is unique in the Middle East as it is the only island country. From an economic point of view, the Bahraini economic diversification, in addition to the banking sector, also included the development of heavy and light industry. The largest of Bahrain's non-oil industries is the Aluminum Bahrain (ALBA) plant which was set up in 1971 and rapidly emerged as one of the largest aluminum smelters worldwide.

The same strategy was followed by UAE, which traditionally did not promote heavy labor-intensive industries and was firmly opposed to tourism, started in the mid-1990s to promote tourism, including the building of grandiose tourism attractions, such as Dubai's Palm Islands, Dubailand, Durrat al-Bahrain, and many other extravagant projects.

2) Opportunities

Since the oil in Bahrain, which was the major source of income in the country, was suspected to be depleted before the end of the century, leading to financial constraints and economic difficulties, reference [23] investigated the major factors that contributed to oil depletion in Bahrain in order to design some development policies that could potentially solve the problem. A model was developed that would predict the oil depletion by focusing on three major areas of development in Bahrain: organizational, physical infrastructure, and social [23]. As a result, it was suggested that Bahrain should adopt a new paradigm of development, where limitations to growth would be realized, self-sustained development would be achieved, and cultural values would be recognized. It was suggested that Bahrain should move to a postindustrial era, where a traditional economy is revived, brain power is focused on, and some alternative sources of energy are used, namely, conservation of energy and solar energy [23].

As a result of Bahrain's depletion of oil reserves, reference [23] suggested that Bahrain should adopt a new paradigm of development, where limitations to growth are realized, self-sustained development is achieved, and cultural values are recognized. It was thought that Bahrain should move to a postindustrial era, where a traditional economy is revived, brain power is focused on, and some alternative sources of energy are used, namely, conservation of energy and solar energy.

Reference [24] concludes that future economic direction should be focused in the service sector because it offers the best opportunities for growth. Their conclusion was reached following a study of Bahrain's economic structure, problems

and more importantly the limited resources of this country [24].

It is actually logical that the service sector represents a genuine opportunity as it is broad enough, encompassing numerous fields including trade, tourism, education, medical services, marketing as well as banking. This is clearly observed by the government entities such as the pension fund and the housing bank that are constantly in a race with private entrepreneurs for the building of shopping centers. Finally, it is worth mentioning that "Bahrain's hot and humid temperatures only add to the reasons for shopping malls" [24].

Many articles have highlighted the substantial efforts of Bahrain to encourage and attract private sector investment in the country. For instance, the BFH project (Bahrain Financial Harbor) has been designed as a "Strategic Investment Zone" to offer liberal terms to attract private sector investment. This financial centre includes the development of the dual towers which at 50 levels high are the tallest buildings in Bahrain and are located on the Manama Corniche, reflecting the unique heritage design and the modernized financial sector of Bahrain.

3) Weaknesses

At a first glance, it might seem that there are several alternatives for Bahrain. However, a closer examination of facts reveals that the options are limited for this country.

In fact, it has been said that "focusing on the petroleum industry is not workable as Bahrain is expected to be the first oil producing country in the Middle East to run out of oil" [24]. Emphasizing the manufacturing does not provide growth opportunities due to several weaknesses including high prevailing wages and lack of technological edge. Also with a labor force of merely 225,000 of whom 65% are expatriates, Bahrain cannot sustain manufacturing economy. Moreover, manufacturing jobs at large do not fit the qualifications and nature of many locals who prefer white collar jobs [24].

The conclusion here is that the future economic direction should be focused in the service sector because it offers the best opportunities for growth, given Bahrain's economic structure, current problems and the limited resources.

4) Threats

There are many risks that might threaten Bahrain. The impact of sea level rise (SLR) is a major risk. Procedures have been followed to build up the SLR scenarios and to assess the vulnerability of the coastal areas of the 36 islands of the Kingdom of Bahrain using Geographical Information Systems (GIS) integrated with Remote Sensing (RS) and geo-processing approaches.

To surmount these issues and obstacles, many adaptation policies and priorities are recommended for Bahrain. It is strongly recommended for this country to follow adaptation measures to help reduce the adverse impacts of climate change on the Kingdom of Bahrain's natural and human systems. The development and implementation of adaptation strategies will definitely require the active involvement of all parties in the country, government sectors, private sector and the community. "Basic policy initiatives are needed to protect investments in vulnerable areas, minimize coastland loss of

vulnerable low-lying areas, conserve natural ecosystems, control coastal erosion, and protect groundwater resources. The basic policy initiatives should recognize the ever-continued pressures on coastal areas and the need of the society for developing these sites including the vulnerable ones. These needs and major impacts of SLR are to be addressed in a plan composed of actions and processes [25].

There are also patterns and problems of development in Bahrain due to it being an oil exporting country. The economic development of Bahrain can be studied in the form of a rentier economy context. The government's and private sector's patterns of resource allocation and their consequences for the country's long term growth and development have been very well studied in particular [26]. Reference [26] also gave the prospects of the Bahraini economy in the light of declining oil reserves and outlined the necessary policy reforms for sustaining economic growth in Bahrain in the post oil era.

Competition, particularly Dubai, also needs to be addressed. The tourism in Dubai is a very important component of the Dubai government's strategy to maintain the flow of foreign cash into the country. The economy of Dubai heavily relies on shopping and this was reached by building the most sophisticated and luxurious malls. As a result, Dubai also has a rich collection of buildings and structures of various styles, including the Burj Dubai, the tallest building in the world.

The size of the UAE's trade is substantial. Regarding the cooperation between India and UAE, reference [27] showed that the Indo-UAE trade increased from \$1,499 million in 1990 to \$3,429 million in 1998, thus, it grew by 105%. Empirically, it has been observed that Indo-UAE trade during the period of analysis increased faster than the increase in both UAE and Indian trade with the world [27].

Many researchers have questioned the viability of the oil and gas development plans of the United Arab Emirates (UAE) and tried to assess the economic repercussions of the severe oil oversupply problems of Gulf countries. Reference [28] proved that there is a need to diversify the economies of Gulf Arab states, to install business confidence in the UAE and to increase the focus of the UAE on gas refining, petrochemicals and investment capacity of the UAE.

According to [29], Kuwait has quite a lot of catching up to do with regional rivals such as Dubai, Qatar and Abu Dhabi having raced ahead in recent years. Reluctance to invest in Kuwait at that time was due to the Iraqi invasion and that no one knew what might happen next. But with the removal of Saddam Hussein in 2003, a sense of security has returned. This was coupled with the booming oil prices and the return to the Gulf of much Arab capital previously invested in the United States. Therefore, all the ingredients were there for a boom. [29]. Also, the Kuwaiti authorities are now in the process of passing laws allowing buildings of up to 100 stories. Consequently, many projects have started in Kuwait such as the Pearl City and the Diamond investment's towers over the Dubai marina [29].

Finally, the recent political instability in both Bahrain and the Middle East and North Africa (MENA) region as a whole is a major threat to Bahrain's economic viability. This has had a negative impact on the recent growth of foreign

investment in particular. Coupling this with the recent global economic crisis, Bahrain has many reasons to be weary of investing heavily in the near future.

IV. CONCLUSION

There are many economic factors that go into the decision of whether to build a skyscraper as well as to its height and dimensions if built. These buildings also have a major social and environmental impact in the designated region. A SWOT analysis was performed to discuss these factors.

Skyscraper construction has been seen to provide a mostly positive impact in other developing countries. Bahrain is very similar to Dubai in that they are trying to diversify their assets as they know their energy resources will eventually run dry. As such, they have been focusing on setting up trade policies to attract foreign investment. This has resulted in developing a financial district which already includes a dual tower building that is the tallest every built on the island country. Bahrain has also added more shopping centers in recent years which are helping promote tourism. These factors suggest that the Murjan Tower project is a reasonable step in Bahrain's growth.

The factors holding Bahrain back at the moment are most likely the reasons the tower is not yet being built. The competition from other financially strong countries in the region, those particularly being the United Arab Emirates and Qatar, are a major threat to Bahrain. Furthermore, the recent instability of the region and Bahrain in particular, as well as the global economic crisis still lingering, makes it a very risky time to make big investments for any country in the world. As a result, Bahrain has most likely made the right choice in waiting to start this project. When economic and political stability comes, this decision should be re-examined.

Finally, if the tower project is eventually approved and Bahrain continues to push for stronger foreign investment, this development will need to be accompanied by an influx of migrant workers as well as foreign entities. The country will then need to make decisions in how to maintain federation stability, keep crime rates low, and manage migrant workers respectfully so as to avoid the same pitfalls that Dubai has encountered.

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