Bachelor Thesis

International Bachelor in Economics and Business Economics (IBEB)

"The role of Port Development in the Economic Development of Dubai"

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Abstract

The last 20-25 years has seen Dubai turn into a global financial and trading center, contributing actively to the economic growth of UAE. This recent progress has attracted plenty of investments into Dubai developing its major port Jebel Ali to a great extent and turning it into the largest commercial port in the Middle East. However, the question that arises is whether this recent port development and the economic development have some sort of link with each other. With the influx of Foreign Direct Investment, Tourism and other growth-related factors, it can be argued that Dubai's recent growth is due to a mix of factors rather than only it's port development. This paper aimed to examine if there exists a link between the economic development of a region and its port performance. If there does exist a relationship, then how influential was the Port of Dubai in its economic development. First, an overview would be given regarding the area of Dubai and how influential it's port is in the Middle-Eastern region. Then a literature review would examine the relation between port performance and economic development, along with explaining some key indicators used to measure economic development and port performance. After discussing a mix of other factors that could have also contributed to the development of Dubai, a quantitative analysis was conducted to assess the empirical link between economic growth and port performance. The analysis showed a positive link between the economic development and port development with some interesting findings related to Tourism, FDI and education. It was concluded that in terms of logistical and cost-purposes, development of Jebel Ali did enhance the economic development of Dubai between the years 2006-2017, but other factors also played a significant role.

Table of contents

1 - Introduction

The influential role of seaports as gateways for international freight transport and a variety of other economic activities, makes them very crucial for the economic success of a country. For centuries, seaports have had a strong impact on the economic progress and development of many countries (Stopford, 1999). They have been considered as points of convergence of inland and coastal transportation systems, defining the foreland of various regions. In a region like Dubai, that is centrally located and connects multiple international destinations, one can expect the role of a seaport to be very powerful. In the recent decades, United Arab Emirates (UAE) has grown at a spectacular rate converting many desert areas into functional economic cities. Dubai is a strong example of that, as a region that was previously known only for its pearl industry, is now the main financial hub of the Arabian Gulf. This paper aims to monitor the economic progress of Dubai in this short span of time and investigate if maritime/port economics played a role in this quick economic development of the region.

1.1 – Importance of Seaports

Seaports perform many direct and indirect operations as freight reaches a seaport through road transportation as well as through inland ports like rail stations. In addition, they perform many different types of operations including loading, unloading and transshipment of cargo to and from the vessels (Georgia Tech Panama Logistics Innovation & Research Center). Seaports, all around the world, have evolved to a great extent by adapting their activities to the external environment. Political changes, the great geographical discoveries, wars, colonial expansion of European countries, economic development, social crisis, technical development or industrial revolution are only some examples of the external factors affecting the functioning of seaports. Other than providing complimentary services to shipping carriers, they also provide inland access and intermodal connections (Montwiłł, A. 2014)

These widespread areas of operations have stimulated their development and affected the regulations for their functioning and organization. They were created to become important organizations, and the scope of implementation of their various objectives and spatial functions have an impact on the form of legislation, as well as the place and role of seaports in the transport and economic state of the region or city. For years, seaports have been perceived as areas that are situated at the interface between land and sea with economic facilities properly prepared with regard to technical-technological and organizational handling of foreign trade, carried out by sea, designed to serve maritime and land transport engaged in their carriage. (Szwankowski, 2000). However, this is the traditional perception of the role of ports in the transport and economic systems and their role in the development of countries, regions and cities should be seen differently.

1.2 - Dubai – The Commercial Hub of UAE

United Arab Emirates (UAE) is located along the eastern coast of Arabian Peninsula and borders important Arabic regions like Saudi Arabia, Oman and Qatar. The region has abundant resources of oil reserves and the economy is dominated by the petroleum produced in Abu Dhabi and Dubai, the two major cities of UAE. Abu Dhabi, the capital has nearly one tenth of the world's proven oil reserves and contributes more than half of the national budget. UAE is one of the fastest growing economies in the Arab region. Its recent economic diversification strategy has increased the contribution of the non-oil sector to the UAE's Gross Domestic Product (GDP) to 71 percent *(Kader, B. A. 2011).*

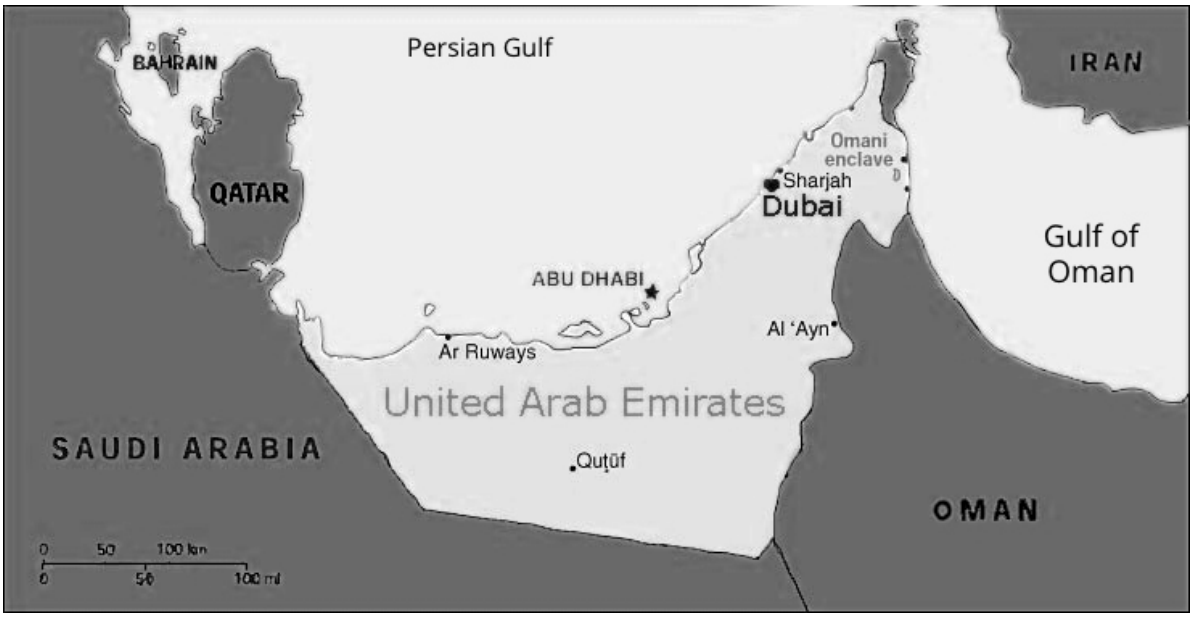

Figure 1: Dubai's Strategic Location

The nation widely known for its reliance on petroleum (oil) and natural gas reserves. However, Dubai is the exception. Dubai, the financial center of the UAE, has contributed to the economic development of its nation to a great extent. Compared to other states of UAE, Dubai had relatively smaller oil reserves and has coped very well in its bold move towards diversification strategy. Dubai's entrepreneurial government has succeeded in developing Dubai's fortune by crafting it as the contemporary business hub of the region. Middle East's most global city, Dubai, has linked international financial and consumer markets through its ports, firms and institutions. The city has attracted myriad firms engaging in several intermediary industries, including re-exportation, and regional headquartering *(Sigler, 2013).* The city attracts an enormous amount of tourists every year due to the provision of numerous places of interests together with some of the world's most luxurious hotels. Since its independence, the nation has realized that the sole dependence of oil reserves might not be the best option to progress economically. The efforts made by its lively real estate market/construction sector that facilitates more than $350 billion worth of active construction projects, has considerably contributed to the economic development of the region *(Emirates News Agency)*. After the 2008 crisis, the pace at which Dubai has recovered and achieved its current state of urban development is just remarkable. Its resilience to international

economic downturn has assisted the economy to grow and expand, producing some outstanding infrastructure projects in the recent years *(Ramos, 2010)*

Perhaps one of the most crucial roles in the relatively fast economic development of this region has been played by the diversification of Dubai around trade. In the past 30-40 years, Dubai has established itself as the main hub of the shipping and logistics centers in the Middle East. The creation of Port Rashid, Port Jebel Ali and the Dubai International Airport has made Dubai a major global player in shipping, transportation and logistics *(DP World, DPW)*. Jebel Ali Port is the largest marine terminal in the Middle East and is strategically located at the crossroads of a region providing market access to over 2 billion people. "As an integrated multi-modal hub offering sea, air and land connectivity, complemented by extensive logistics facilities, Jebel Ali Port plays a vital role in the UAE economy. It is a premier gateway for over 90 weekly services connecting more than 140 ports worldwide. Expansions currently underway at the Port will bring total handling capacity to 22.1 million TEU by 2018." *(DP World Emirates)*

1.3 – Research Question and Hypotheses

The increasing developments occurring at Dubai's port have led to an overwhelming increase in trade-operations. The continuous economic progression of Dubai seems to have some sort of correlation with the development of its port. However, there are many other factors that have also contributed to the development of this region. Proved via previous research on other economies, it has been seen that many other factors like developments in education, increased investment via developments in tourism, increased employment opportunities etc play a significant role in the economic development of a region. These factors not only boost the economic growth on a temporary basis but are considered as factors that lead to persistent long-term economic growth. In order to investigate how trade along with these other factors play a vital role in the economic growth of a region, this paper aims to use the seaport of Dubai as an example.

Hence, the main research statement of this paper is as follows:

"How did Port Development affect the Economic Development of Dubai?"

To investigate this research statement, it is very important to indicate what is actually meant by the two defining terms, Port Development and Economic Development. In the Theoretical Framework, more emphasis will be placed on these concepts and how can one actually measure them. In addition to the research statement, some testable hypotheses were also formulated which would eventually help to get to the central theme of this paper.

The first hypothesis simply aims to examine the relation between Port Development and Economic Development. The next section will talk about the factors that explain economic development and contribute to the economic growth of a region. With this hypothesis, an attempt would be made to see if Port Development is one of those factors that contribute to economic growth. It is assumed that increasing port development contributes in a positive way to the economic development of a country so the hypothesis is as follows:

"There is a positive relationship between Port Development and Economic Development"

The second hypothesis, very similar to the first one, simply compares two of the most important factors that helped Dubai to grow at a fast pace, trade and tourism. The next few sections would give notable views of some authors and journalists, how they view the economic development of Dubai in the recent years. Many associate this quick development to the increasing trade and tourism that Dubai has experienced in the recent years due to its increasing investments in these areas. This hypothesis attempts to examine which of these two factors were more influential in bringing about the economic development in this short span of time. Hence the hypothesis is as follows:

"Trade played a stronger role compared to Tourism in increasing the Economic Development of Dubai."

The last hypothesis aims to examine if the link between Port Development and Economic Development is only one-way. Many previous researches, as will be seen in the next sections, state that Economic Growth and its related factors are linked in a benevolent cycle. Many factors that cause economic growth are also going to be affected by the increasing economic growth itself. For instance, if high education levels are thought of as a means of increasing economic growth, one can also argue that increasing economic growth can also lead to high levels of education. This chicken-egg phenomenon can also be associated with the main theme of this paper, Port Development. Hence, the hypothesis tests if there is a reverse causality meaning increasing Economic Development leading to increasing development of Port and Trade. The hypothesis is as follows:

"Economic Development has contributed to the increasing Port Development of Dubai."

These hypotheses will help to answer the main research question in a comprehensive manner as an attempt would be made to test these hypotheses with a combination of some quantitative and qualitative research. The second hypothesis compared to the other two will be emphasized more on via qualitative research as there has already been a lot stated about the development of Dubai in the past. The other two will use a mix of several quantitative research methods to see if they are correct or not.

1.4 – Structure of the Paper

The following sections would discuss the Theoretical Framework, in which emphasis is placed on the qualitative analysis of Dubai's economic development in the recent years. Some important functions of seaports would be explained highlighting the important effect that it has on the economic development of a region. This would assist in the formation of a link between the development of a port in an economic region and how it affects the region's economic growth. In addition, emphasis will be laid on developing an understanding regarding the factors that explain economic growth other than the development of a port itself. Finally, some quantitative measures of economic development and port development will be discussed before moving to the quantitative analysis of the research statement. In the Methodology section, the main quantitative

research methods would be discussed along with the factors/measures being used. Lastly, the results and conclusion section would state the final implications of this paper and the research statement would be discussed to deduce the findings.

2 - Theoretical Framework

2.1 - Seaports Nowadays and the role of Dubai's port.

Currently, seaports have become a key part of the supply chain network. They have become important economic spaces that provide a wide range of services and serve a wide range of customers including shippers, forwarders, transport companies and logistics operators. One of their main task is to facilitate the domestic and international trade of goods, often on a large scale. It is also a socio-economic space with the multi-faceted impact on the environment combining the processes of transport - thanks to the technical and technological equipment - between the sea and the mainland, which are interpenetrating, interdependent and interrelated, and which provide objective and spatial functions related to the trade and movement of people *(Montwiłł, A. 2014)*.

The continuous development of logistics chains and their network system is possible due to the developed node link system, where the most important nodes are seaports and integrated logistics centers. Therefore, they have also become key elements of distributions systems in highly urbanized areas focused on the spatial range of services related to the transport, forwarding and logistics to optimize supply, which leads to the reduction in congestion and other external costs of transport *(Montwiłł, A. 2014)*. The embarking, disembarking and transferring of passengers and crew, provision of inland access and intermodal connections, and their role as a mean of storage and warehousing of various commodities are some of the important functions that seaports all around the world perform *(Georgia Tech Panama Logistics Innovation & Research Center)*. Dubai's port has gained its status as the busiest trading port in the Gulf Region due to its heavy reliance on commerce as its main source of income. The largest city of UAE, known as the 'City of Merchants' has developed into a thriving commercial center in the past two hundred years. The Merchants, who helped Dubai earn its fame and prosperity from trade, played a highly influential role when they introduced fundamental economic and political reforms. Their varying roles from urban planners and culture mediators to internationalists helped Dubai in its development in the pre oil-era and shaped the future of the Arab Gulf *(Al-Sayegh, F. 2006)*.

The success of Dubai Port as a thriving commercial center is mainly due to its strategic location. Located at the Mouth of the Gulf, it serves as a stopover for ships heading to and from Persia, India, China and East Africa. Secondly, its establishment as a Free Port in the early 20th century by the abolishment of customs duty, lead to an influx of immigrants causing increasing commercial and residential activity. *(Al-Sayegh, F. 2006)*. *Sigler (2013)* stated that Dubai's success could be attributed to its position as a regional safe haven and that most of its growth strategies were based on throughput rather than output. Its national development strategy has featured vital re-exporting and logistic plans in the recent years, and now tourism also a key objective on the agenda.

In addition, Dubai's territorial impact on its large-scale trade infrastructure has been both foundational and definitive *(Ramos, 2010)*. This unique structure of Dubai's economic and political system played a crucial role in this Emirate's development. In the mid-twentieth century, when oil was discovered in 1966, Oil Revenues were utilized to spur infrastructure development in Dubai. Schools, hospitals, roads, modern telecommunications networks lead to development at a frenetic pace. A new port and terminal building were built at Dubai International Airport along with the largest man-made harbor in the world to boost Trade Operations. Trade via port generated income that contributed to make Dubai an International Business Center within no time *(Al-Sayegh, F. 2006)*.

Dubai's formula for development was becoming evident to everyone – visionary leadership, high-quality infrastructure, an expatriate-friendly environment, zero tax on personal and corporate income and low import duties. Predicated on the success of Jebel Ali, Dubai has more than a dozen free zones, most dedicated to the re-exportation of specific products such as gold and automobiles *(Sigler, 2013)*. Technological innovations in the field of transportation and communication helped to internationalize finance and intensify the transnational flows of goods and services for Dubai. The city's development was heavily tied to global trade, finance and investment and occurred within a very specific political, economic and historical context *(Ramos, 2010)*. However, the question that still remains is was this solely due to the openness to Trade and if yes then how can a link be created between the development of its port and the economic development of the region.

2.2 - Link between port development and economic development

As stated earlier, one of the many functions of ports is to facilitate trade in the global economy. This function itself is so influential that it can determine the economic performance of a region. The engagement of a region in domestic and international trade contributes to the local and national development in a number of ways. The performance of the port itself depends on the performance of the firms operating in it. Development of a port attracts more firms attracting even more labor and investments, creating a number of employment opportunities. This helps the port to become an economic center contributing to the national, regional or local economy *(Langen, 2004)*.

Jung (2011) used the example of Korea to state the role that ports play in the integration of local and national economies into the international economy. The mutual dependence of port and local economies supported the integration and facilitated a sustainable development of its national economy. The creation of local employment opportunities and the value added production effects also exert positive influences on the economic development both on a local and the national level. In this example, the role of increasing TEU was mentioned for Korea that how the increase in cargo throughputs facilitated trade for that region. Since the Korean economy, just like most economies, had majority of its trade via the seaports, the increasing throughput lead to an increase in GDP. *Cullinane & Song (2006)* mentioned in their paper how adapting to the dynamic changes in the market structure of the port industry via developments, can prove to play a pivotal role in the globalization of the world economy.

Li-zhuo (2012) also stated an important viewpoint regarding the development of ports and their effect on the economy from a cost perspective. Development of a port facilitates its logistical operations which in turn assists in bringing down the transportation costs in the production sector leading to increased efficiency. *Fujita et al (1999)* discussed the importance of ports from a competitive point of view that the development of maritime activities at ports provide comparative advantage to the cities where they are located. The various port activities like transfer and transportation, loading and unloading, distribution, customs processing etc have multiplier effects on local, regional and national economies. *(Walters, 1977; Itami, 1980; Suykens, 1989; Jung, 2011).*

Suykens (1989) emphasized in his paper the role of ports in the industrial and urban development. The transport integration provided by seaports contributes to the cultural and economic interchange, providing numerous employment opportunities and influencing the urban development of the region as well as the nation. Port cities support a wide variety of maritime activities with positive implications for the urban development. In the US, these port cities are considered as the most important cities due to their significant impact on the national welfare *(Konvitz, 1978).* Rapid industrialization at different ports around the world has attracted a lot of foreign investments, especially for the oil refineries at ports. In addition, studies in the US explain the indirect contribution of port activities in terms of payrolls, federal, state and local taxes. *(Suykens, 1989)*

Ferrari et al (2010) mentions the increasing use of maritime transport in the recent years and how ports have emerged as influential means of connecting territories. From an infra-structure perspective, better port facilities via developments do boost transport operations enhancing the development of local, regional and national economies. *Balassa (1997)* used trade as an important determinant of economic growth and investigated how increased exports via different channels, including seaports, can enhance the economic development of a region. As it's going to be mentioned in the following sections, exports are considered as an important component of a country's GDP and a boost in exports as a result of port development can lead to increasing GDP ultimately increasing the economic development of a region *(Balassa, 1997).*

Grobar (2008) analyzed whether it's true that the location of ports has significant positive effects for the region and the economy. They examined the economic status of the areas surrounding major U.S container ports and found that ports are really the engines of economic development for the cities where they are located. The development of ports creates significant direct local employment effects and attracts infrastructure investments since firms wish to locate close to the port in order to minimize land transportation costs. *Deng et al (2013)* focused on the major port-cities in China's port clusters to examine how successful has the economy been as a result of the successful development of port clusters. They found that the development of the port-city was very important for the national economy and all the individual ports played a vital role for the development of the port city.

Haddad et al (2005) mentioned the synergetic effects of port development on the regional welfare and how their expansion in the transport network leads to a reduction in inefficiencies and congestion. Their development assists in exploiting transportation costs and in achieving scale economies with positive implications for both national and regional welfare. *Goss (2006)*

suggested the importance of ports for the region with respect to the wide range of secondary activities that they perform. They have the ability to exploit potential economies of scales to a great extent. Any improvements/developments in port logistics would enable them to carry out their operations at a significantly reduced cost. Such an increase in port efficiency would benefit both consumers and producers, ultimately benefitting the economy. Better seaports are a source of more efficient international transport services which would enhance trade and lead to more trading partners, facilitating more imports and more exports. This consequently will increase economic growth and raise the gross domestic product of a nation.

The direct and indirect role played by ports in the development of an economy, as mentioned above is quite significant. Due to the fact that a port's performance is directly dependent on the firms' performance that are located within the port, many firms want to locate near developing ports with a qualitative infrastructure. The development of ports into global hubs attracts Foreign Direct Investment (FDI) from multinationals that indirectly affects positively on the economic growth of the region *(Borensztein et al, 1995)*. Ports have accounted in large measure for the existence of many great cities like Tokyo, London, Shanghai, New York etc *(Suykens, 1989)*. Dubai's port 'Jebel Ali' operates at the center of the exporting trade in the Middle East. The symbiotic relationship of the port with the *Free Zone* has facilitated Dubai's participation in the continuous growth of trade and consumption in the UAE region. This has ensured the attraction of numerous value-added activities in the Free Zone enhancing the trade volume at the port *(Jacobs & Hall, 2007)*.

Previously stated contributions of this port to the economic development of Dubai can be backed by the literature evidence provided above. With the recent establishment of Dubai International Financial Center (DIFC), it has transformed itself into a financial hub of the Gulf Region. Along with the trading operations facilitated by Port Jebel Ali, the existence of such influential entities has allowed Dubai to become the global center for trading as well as service industries such as IT and Finance. These recent developments portray Dubai as a successful example of the transformation from a local port to a global terminal. The construction of the most modern port facilities in the region, combined with a provision of a sophisticated package of investment incentives for foreign businesses, Dubai has taken full advantage of its strategic location *(Jacobs & Hall, 2007)*. This does give an indication of a positive link between Dubai's economic development and its port development. However, the main question that still lies is whether all these recent successes can be directly and solely related to the development of its port.

2.3 - Measures of Port Development/Port Performance

The performance of seaports has traditionally evaluated by comparing its actual throughput with its optimal throughput overtime. According to the Bureau of Transport Statistics, the port throughput measures state the amount of cargo or the number of vessels the port handles overtime. There are several measures used as throughput statistics including the cargo tonnage, container TEU and vessel calls characterized by the commodities carried. All these measures can be affected by variables that are beyond their physical capacity *(Bureau of Transportation Statistics, 2017)*. Langen et al mention a range of other factors that can be used as Port Performance Indicators (PPIs) and explain how a good indicator shouldn't just provide an insight to the port authority on

the port performance but also should be relevant for the stakeholders showing a socio-economic interest *(Langen, Nijdam, Horst, 2007)*. The throughput measure that is most likely going to be used in this report for the quantitative analysis would be the container TEU. Twenty-Foot Equivalent Unit (TEU) is a standard measure used throughout the world to measure the capacity of container ships and the container movements. This use of cargo volumes as a performance indicator is very widespread and these figures are prominently accessible through the websites of port authorities.

With the availability of many performance indicators, one can question about the factors that possibly affect these performance measures. These determinants mainly include the economic conditions of the hinterlands/region of the port as port demand is basically a derived demand from imports and exports. *Seabrooke et al, (2003)* suggested that the value of imports have a very significant impact on the throughput volumes and the activity taking place at a port. The presence of the firms at a port and the port charges for various services used by them also determines the activity level/popularity of the port. Perhaps a very important factor that affects port performance directly is the terminal efficiency of the port itself. *Tongzon (1995)* stated that the terminal efficiency like the speed at which containers are loaded/unloaded, gross working time representing delays, and the productivity level of labor at the port directly determines the performance of the port and these factors have a statistically significant influence on port performance.

2.4 - Measures of Economic Development

The most common measure/indicator of economic development is GDP. Gross Domestic Product (GDP) is the total output goods and services produced within the boundaries of a region in a given year. GDP takes into account only the value of goods and services that are produced within a defined boundary. This means that for a country's GDP, the national boundaries are taken into consideration where as for the GDP of specific regions, only the local boundaries are taken into account. The income that people generate outside the national borders/jurisdiction are excluded from the count. The main reason why GDP is very widely used is because it is merely a very complete measure. The quantitative analysis of this paper uses GDP as the main measure of economic development because the definition of GDP incorporates trade, which is the main theme of this paper. The mathematical expression for GDP comprises of several important components:

$$GDP = C + I + G + (X - M)$$

This expression consists of household consumption (C), investment (I), government expenditure (G) and trade (X – M). This incorporation of trade in the form of the balance of trade, which is the difference between the exports and imports of a country makes GDP a distinguishing measure. This assists in forming a relation between port and economic development, as most goods are likely to be transported via maritime transport. To summarize, developments in port can possibly facilitate trade leading to more exports and imports. If the value of exports increases more relative to the value of imports, then (X – M) in the GDP function goes up leading to a higher value of GDP.

Some other important indicators of economic development include measures like Gross National Product (GNP), Human Development Index (HDI), Infrastructure, Structure of the labor force etc. HDI is a relatively comprehensive indicator with a mixture of three important components: life expectancy, education (literacy rate and school enrolment) and real GDP per capita. This is a summary measure of average achievement in the key areas of human development: a long and healthy life, being knowledgeable and have a decent standard of living *(UNDP, 2016)*. It was initially created to emphasize that the people and their capabilities to progress should be the ultimate criteria for assessing the development of a country, not economic growth alone.

The link between port development and the economic development between a region, as explained in the previous sections, does explain a lot about Dubai's recent growth. However, the main question of concern, that still remains, is that whether the recent growth can be solely attributed to the development of Port Jebel Ali. As mentioned earlier, there are many factors that can explain economic growth in a region, and the following section gives an overview of those factors.

2.5 - Other factors that could affect economic development in a region

Tourism

For many countries, Tourism has emerged as an important policy objective to foster the local development in economically lagging regions Tourism and Poverty Alleviation: Untapped Potential" *(DFID, 1999)*. These attempts to alleviate poverty in many regions show some correlation between Tourism and Economic Development. According to *UNCTAD*, tourism exports have grown to become a quantitatively important channel of global integration. *Faber & Gaubert (2016)* state in their finding that tourism brings about a unique form of market integration and involves the export of non-traded local amenities. In their study, they used Mexico's example to assess how has beach tourism become a major force of development over there. They found that variation in local tourism activity brought about significant long-term effects on municipality total employment, population, local GDP and wages. According to their more specific results, one standard deviation increase in local tourism expenditure of Mexican municipalities led to a doubling of municipality total employment, and increased nominal municipality GDP by a factor of 2.5. *Thea Sinclair (1998)* also analyzed the contributions that tourism makes to the economic development in the form of foreign currency, income and employment. Compared to traditional primary exports, tourism is a source of more foreign currency and has recently emerged as a major economic activity within developing countries.

Dubai has been an important tourist destination in the Middle East and attracts millions each year due to the provision of a vast variety of tourist amenities. Dubai is the second wealthiest Emirate of the UAE, and contributes a big chunk of its share to the National Output. Most tourists believe that Dubai's economic development mostly came from its oil revenues but in fact, Dubai is probably the most dynamic and diversified economy in the Middle East. Approximately 95% of Dubai's GDP does not come from oil-based revenues. Dubai has used only a moderate amount of its oil reserves to generate the infrastructure for trade, manufacturing and tourism. This diverse strategy has aided Dubai to build its economy together with surviving the decay of fossil fuels. Being one of the most favorite tourist destinations in the Middle East, it has recently shifted its

focus to tourism as a long-term revenue-generation strategy. In the past two decades, construction of some gigantic hotels has attracted even more tourists giving Dubai a hope to successfully achieve its goal of becoming the world's top tourist destination *(Dubai Economy)*.

According to the stats provided by the air traffic in 2013, Dubai was the 7th most visited city in the world and it is expected to accommodate millions more in the coming years. Dubai won the bid to host the most awaited 2020 Expo, which is expected to boost the number of incoming tourists together with creating more than 270,000 jobs for its local population. The establishment of some diverse souks and innumerable shopping centers has also surfaced Dubai as the shopping capital of the Middle East. In addition, it is aptly referred to as the 'City of Gold' as the city houses more than 250 gold shops. Dubai offers a lot to appeal to discerning travelers from around the world and offers a host of activities not only for families, but for everyone else to enjoy. His Excellency Helal Saeed Almarri, the director general of Dubai Tourism said,

"Today Dubai's travel and tourism sector is not only well positioned to offer a superlative destination experience across its eight core strategic propositions, but also geared to accelerate its appeal to the diverse and evolving needs of our global travelers," *Nasir, S. (2018)*

Education and Employment

Education has also emerged as a very important force in increasing economic development and many economies are increasing their expenditure on education as an attempt to increase the level of human capital. Public expenditure on education can include direct expenditure on educational institutions as well as the indirect expenditure like education-related public subsidies, school vouchers etc. In most developed economies, this area of spending has always been given priority by the governments relative to other areas of investment, such as health care, social security etc *(OECD, 2018)*. The benefits of increased education cannot be ignored as increased education leads to increased human capital, which is regarded as a very skillful resource and increases economic growth. Education stimulates economic growth and improves people's lives through many channels. More and better education is a prerequisite for rapid economic development around the world. Education is an important source of increased efficiency of the labor force and assists in fostering democracy *(Barro, 1997)*.

Increasing level of education assists in enhancing the employability of individuals and can help in improving re-employment options among unemployed workers *(Riddell & Song, 2011)*. Education is found to have substantial impacts on labor market outcomes such as earnings and employment. In addition, it affects the non-market outcomes of an economy as well including health, longevity, civic participation and criminal activity *(Card, 2001; Grossman, 2005; Oreopoulos and Salvanes, 2009)*. This probably why its regarded as a vital force behind economic growth. The technological advancements in recent years has seen many people getting unemployed due to their lack of skills to adapt to the advancements. However, *Globerman (1986)* and *Bartel & Lichtenberg (1987)*, have concluded in their studies that education can help to cope with this issue as better educated workers are found to have a comparative advantage with respect to adjustment to and implementation of new technology. *Farber (2004)* also stated that job losers with higher levels of education have higher post-displacement employment rates and are more likely to be re-employed full-time.

Education in Dubai has seen some great improvements and the quality has doubled this past decade. According to reports from Knowledge and Human Development Authority (KHDA), the number of Emirati students attending good or better schools has grown significantly in the recent years. KHDA's chairman claimed that parents and educators have shown a genuine interest in taking steps to ensure good quality education due to increasing awareness regarding educational benefits *(Nasir, 2018)*. In addition to better educational opportunities, Dubai's openness to emigrants for better job opportunities has attracted many people. The provision of tax-free packages with an improved lifestyle has attracted skilled and unskilled labor from different parts of the world suggesting the existence of strong employment conditions in this region. The inception of Dubai as an international IT hub that serves numerous industries has helped in housing many well-known IT firms. The availability of jobs and opportunities in sectors such as construction, IT, telecom and banking have also facilitated the inflow of skilled professionals. With an amazing growth rate in the past, it has become one of the fastest growing economies in the world strengthening its relations with multiple countries in the world giving an amazing boost to its economy. Dubai's booming economic condition continues to improve its job market opportunities attracting even more labor, contributing to its overall economic development *(Employment in Dubai)*.

Foreign Direct Investment

Perhaps one factor that is closing the gaps between the developed and under-developed regions, faster than ever, is the influx of foreign direct investment in the form of infrastructure, multi-nationals, human-capital, technology etc. Foreign Direct Investment (FDI) has played a central role in the process of economic development for many regions. FDI is considered as an important vehicle for the transfer of technology, contributing not only to the domestic investment inflow but more importantly to the growth of a region *(Borensztein et al, 1995)*. In addition, the strong complimentary effect between FDI and human capital enhances the contribution of FDI to economic growth. When new funds come in, it supports the expansion of domestic firms by increasing productivity through the spillover of advanced technology. FDI leads to the internationalization of markets across national boundaries which gives rise to the international enterprise. This process continues until the benefits outweigh the costs *(Aliber & Click, 1999)*. *Romer (1993)* stated in his paper that there are massive "idea gaps" between the rich and the poor countries, and FDI is attempting to ease that transfer of technological and business know-how to poorer countries. The foreign investment not only boosts the productivity of firms receiving the foreign capital, but enhances the productivity of all firms via spillover effects *(Moran; Graham; Blomström, 2005)*.

Dubai's ease with the business environment has always welcomed and nurtured enterprises from all over the world. According to the FDI Markets Data, Dubai has always been regarded as one of the most preferred global FDI destinations. Dubai has shown an overall growth in investments in the recent years, and the Real Estate sector, especially, has attracted very large projects from the main FDI investor countries. However, this paper would be making a lot of assumptions to accommodate FDI into the regression model for the quantitative analysis. The main focus is entirely on Jebel Ali and Dubai, and the data available for FDI for the time between 2006-2017 only relates to the investment made in the entire UAE region. The specific details about yearly

Foreign Investment in Dubai has been made available recently (since 2015), with introduction of Dubai FDI Monitor. This means that the required data for FDI in Dubai is only available for the past 3 years, and this would require some extrapolation to ensure there is sufficient data available for the analysis.

The National Beureau of Statistics, UAE publishes yearly Foreign Direct Investment made in the UAE region. For the required time period, this data was available so using the data available at Dubai FDI Monitor, an average proportion of contribution was estimated. This average indicated what proportion of FDI flowing into the UAE region is absorbed by Dubai itself. It was approximately 73% of the FDI flowing into UAE that was absorbed by Dubai. So based on this rough approximation, the FDI data available for UAE was adjusted accordingly to estimate for Dubai's annual FDI.

Political Stability

As argued by many previous researchers, political instability in an economy can have many negative consequences for the growth of an economy. *Alesina et al (1996)* took a sample of 113 countries to investigate if there exists a relationship between political instability and per capita GDP growth. They found that after controlling for several economic determinants of growth, political instability did lead to a lower growth rate and countries with high degree of instability had to face many problems. The example of Argentina was very thoroughly used in their paper that how it used to have one of the highest income per capita during the mid 20^{th} century, and then due to prolonging political violence and uncertainty associated with an unstable political environment affected its growth. *Barro (1998)* also investigated regarding the various factors that can influence economic growth. His analysis for 98 countries lead to findings that political stability and less market distortions are positively related to the growth rates. *Feng (1997)* stated in his paper how democracy plays a positive role in long-run economic growth and that political change arising from instability can be very costly for an economy's growth.

Dubai has seen a relatively stable political environment since the Second Gulf War of 1991. This stability has fostered the growth of Dubai turning it into a thriving market economy. Perhaps it can be said that this form of certainty has definitely played a vital role in turning Dubai into the busiest port in the region. With reducing dependency on oil, its government has diversified its sources of income and given the private sector an influential role in the economy *(Al-Sayegh, 2006)*. Due to the stable regulations and certainties, Dubai continues to attract business from all over the Middle and Far East as well as from Europe, evolving it into the most active business center of the region.

3 - Quantitative Analysis

3.1 - Data and Methodology

As mentioned in the previous section, the main Port Performance Indicator (PPI) that will be used for the quantitative analysis would be the TEU. In addition, the impact of overall trade via Port Jebel Ali would also be assessed on the economic development of the region, and for that the values of imports and exports would be used. Data was collected from the Dubai Statistics Center (DSC). Information regarding Dubai's annual GDP (in millions), annual Imports/Exports (in millions), annual population, number of students in university and the number of passengers at the arrival section of the airport, was collected from the DSC's website. In addition, Dubai's Port Jebel Ali's performance was assessed using its annual throughput figures (TEU) and that was collected from its operator DP World's annual statements. DP World, one of the world's leading port operators, has authority over the facilitation of the Port Jebel Ali and provides its financial information like Annual Throughput Revenues (in millions), Throughput Capacities (both gross and consolidated) etc. From its available annual statements, Port Jebel Ali's and the Middle Eastern/European Region's Twenty-Foot Equivalent Unit (TEU) figures were extracted. All the data used was for the last 10-12 years, which was easily accessible (2006-2017).

To measure the economic development of Dubai, its GDP (in AED millions) would be used. The value of exports (in AED millions) stated in the data is a sum of exports and re-exports. The value of imports and exports will be used as an indicator of the level of trade carried out by the port of Dubai. The number of students in university will be used as a proxy for the level of higher education. It is expected to increase as the number of students enrolled in a university increase. Annual population was expected to be used for the quantitative analysis but due to its overlapping with the foreigners, it was decided to exclude it. Lastly, the variable that will be used for the level of tourism is the number of passengers at the arrival section of Dubai's airports. Since Dubai has two operating airports, the sum of both of their passengers will be used. In Appendix A, the complete dataset is available. In addition, to assess the competitive position of Jebel Ali in the Middle Eastern region, its TEU is expressed as a percentage of the consolidated TEU of the entire Middle-Eastern region.

To answer the research question and test the hypotheses, correlation and regression would be used. A simple correlation analysis would give an indication about the direction of the relationship between different variables. The direction would ultimately examine the assumptions/predictions made in the previous sections regarding the direction of different variables. If the two variables being analyzed would move in the same direction, they would be labelled as positively correlated. If they would move in the opposite direction, in such a way that an increase in one is matched by a decrease in the other and vice versa, they would be labelled as negatively correlated.

Then a regression analysis would provide a more concrete overview regarding the causality of that relationship. This would testify whether GDP/economic development is numerically related to its determinants or not and if it changes due to changes in one or more dependent variables. Since the main objective is to estimate how does GDP respond to changes in different dependent variables, regression would assist in analyzing that average relationship. This multiple-regression analysis

would attempt to model a relationship between a few explanatory variables (introduced in the previous sections) and the response variable 'GDP'. The data being used for the regression analysis is yearly data so a Time-Series Regression could have been used to examine the effect over time. However, due to the lack of sufficient data, a multiple linear regression would be used since it's a relatively simple technique. For a time-series analysis, the division of yearly data into quarterly data would have been preferred but that type of data was not easily accessible. Several linear-regression analyses are planned to be conducted with different variables of interest. This use of multiple variables would help to deal with the problem of Omitted Variable Bias (OVB) to some extent and fulfill the main objective of this paper.

3.2 - RESULTS

For the first hypothesis, a simple correlation analysis was conducted. The results of this Pearson Correlation Analysis were as predicted. The import figures were used as negative figures due to their dismissive impact on the GDP function, as explained under theoretical framework. Appendix A contains a table with the names of the variables used and their respective meanings. Table 1 shows the results:

	MIDDLE~T	JEBELA~E	GDPAED~s	IMPORTS	EXPORTS	NoofSt~s	Passen~s
MIDDLEEAST	1.0000						
JEBELALIUAE	0.9836	1.0000					
GDPAEDmill~s	0.9329	0.9450	1.0000				
IMPORTS	-0.8333	-0.8890	-0.8285	1.0000			
EXPORTS	0.8468	0.8800	0.7456	-0.9059	1.0000		
NoofStudents	0.8851	0.9067	0.8442	-0.8408	0.8218	1.0000	
Passengers~s	0.8987	0.9090	0.8436	-0.8362	0.8704	0.9798	1.0000

Table 1: Correlation Analysis

The table above displays the results and as expected all variables are positively correlated with GDP except the Imports. This directly follows from the GDP function that was given under theoretical framework. Port Development (TEU) is quite strongly correlated with GDP which does give some indication regarding their positive relationship. Exports, relatively, does not have a very strong positive correlation with GDP, compared to variables like Tourism (PassengersArrivals) and Higher Education (Students).

For a more concrete relationship, a regression analysis was used to see if there was a causal relationship between these variables and GDP. Since there are many variables, multiple regression analysis as well as single variable analysis was conducted for most of the variables. In this section, the most important ones would be discussed. The rest can be found under the section Appendix A.

The most important analysis was the regression of GDP on Port Development (TEU) of Jebel Ali. It can be seen from the output below that the model with only TEU as the explanatory variable of GDP has a considerable high R^2 which means that TEU for Jebel Ali explains a good amount of variation for the GDP of Dubai. The coefficient shows that it is statistically significant on both a 5% and a 1% level, and a change in TEU by 1000 units leads to an increase in GDP by approximately AED 22.5 million.

```
Linear regression                               Number of obs     =         12
                                                F(1, 10)          =      70.93
                                                Prob > F          =     0.0000
                                                R-squared         =     0.8931
                                                Root MSE          =      18425

------------------------------------------------------------------------------
             |               Robust
GDPAEDmill~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  JEBELALIUAE |    22.5354   2.675746     8.42   0.000     16.57347    28.49733
        _cons |   47844.66   37410.28     1.28   0.230    -35510.63    131199.9
------------------------------------------------------------------------------
```

Output 1: Regression of GDP on TEU

Since it was expected for trade to also have a relationship with GDP, the value of Imports and Exports were also taken as explanatory variables for the GDP. The outputs below show the separate regressions of GDP on Exports and Imports respectively.

```
Linear regression                               Number of obs     =         12
                                                F(1, 10)          =       9.40
                                                Prob > F          =     0.0119
                                                R-squared         =     0.5559
                                                Root MSE          =      37548

------------------------------------------------------------------------------
             |               Robust
GDPAEDmill~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     EXPORTS |   .4000292   .1304459     3.07   0.012     .1093777    .6906807
        _cons |   177485.2   59235.52     3.00   0.013     45500.24    309470.2
------------------------------------------------------------------------------
```

Output 2: Regression of GDP on Exports

```
Linear regression                               Number of obs     =         12
                                                F(1, 10)          =      15.14
                                                Prob > F          =     0.0030
                                                R-squared         =     0.6865
                                                Root MSE          =      31550

------------------------------------------------------------------------------
             |               Robust
GDPAEDmill~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     IMPORTS |  -.3440708   .0884416    -3.89   0.003    -.5411309   -.1470106
       _cons |   104768.7   66564.26     1.57   0.147    -43545.68    253083.1
------------------------------------------------------------------------------
```

Output 3: Regression of GDP on Imports

The results show that both the analyses confirm the GDP equation and the role played by Imports and Exports. Both coefficients are statistically significant at a 5% level. Coefficient for exports shows that an increase in the value of exports by 1 AED million leads to an increase in GDP by 0.4 AED million, on average, which is quite significant. Imports analysis shows that there exists a negative relationship between the value of Imports and GDP, and as imports increase by 1 AED million, GDP decreases by 0.3 AED million, on average.

For the second hypothesis, that aimed to compare the effect of trade with that of tourism in the economic development of Dubai, a regression analysis was conducted with only these variables being used as the explanatory ones for GDP. Since the main focus was on trade but not on port development, only imports and exports were used in the analysis. A new variable 'Balance of Trade' was created to give the balance between imports and exports. The output below shows that Balance of Trade had a negative effect on GDP and it was statistically significant on a 5% level. This could have been predicted before as well due to the high level of Imports compared to the level of Exports for Dubai between the years 2006-2017. On the other hand, the number of Tourists had a positive effect on the GDP of Dubai and it was statistically significant on a 1% level. According to the results, each additional tourist, on average, contributed to about 9000 AED increase in Dubai's GDP.

Linear regression

Number of obs	= 12
F(2, 9)	= 15.59
Prob > F	= 0.0012
R-squared	= 0.7886
Root MSE	= 27311

GDPAEDmillions	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
BalanceTrade	-.2788858	.1150108	-2.42	0.038	-.5390583	-.0187133
PassengersArrivals	.0039589	.0010814	3.66	0.005	.0015126	.0064052
_cons	149537.6	40094.71	3.73	0.005	58837.05	240238.1

Output 4: Regression on Tourism and Trade

In addition to these models, another model was created with all the relevant variables as explanatory variables. The output below shows that TEU of Jebel Ali is still an important variable in explaining Dubai's GDP on a 5% level. The coefficient shows that an increase in TEU by 1000 units leads to an increase in GDP by 28.2 AED million. Exports are significant on a 5% level but not Imports, however, the coefficient of Exports is rather unexpected. It shows a negative relation between the value of Exports and GDP, which is contradictory to the initial analysis that was conducted. Imports still have more or less the same relationship with the GDP. Variables used for Higher Education, FDI and the number of Tourists are rather insignificant on a 5% level, so they won't be interpreted.

Linear regression

Number of obs	= 12
F(6, 5)	= 35.86
Prob > F	= 0.0006
R-squared	= 0.9586
Root MSE	= 16223

GDPAEDmillions	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
JEBELALIUAE	28.20963	8.219101	3.43	0.019	7.081763	49.33751
IMPORTS	-.2452056	.1940715	-1.26	0.262	-.7440823	.253671
EXPORTS	-.5032925	.1541109	-3.27	0.022	-.8994472	-.1071379
NoofStudents	-4.35611	2.45292	-1.78	0.136	-10.66154	1.949321
PassengersArrivals	.0057336	.0029779	1.93	0.112	-.0019215	.0133887
FDIDubai	-.346116	1.344807	-0.26	0.807	-3.803054	3.110822
_cons	66815.77	36093.77	1.85	0.123	-25966.22	159597.8

Output 5: Full model with all variables.

For the last hypothesis, a new model was created that aimed to test for reverse causality. As indicated earlier, GDP and Port Development can have an opposite relation the one that was predicted. A regression of TEU was conducted on GDP to check if Port Development is also affected as a result of increasing economic development. The output below shows that there does exist a relationship that is statistically significant on a 5% level. The coefficient indicates that an increase of 1 million in GDP brings about, on average, an increase in TEU by 30 units.

```
Linear regression                               Number of obs     =         12
                                                F(1, 10)          =     163.44
                                                Prob > F          =     0.0000
                                                R-squared         =     0.8931
                                                Root MSE          =     772.66

------------------------------------------------------------------------------
             |               Robust
  JEBELALIUAE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
GDPAEDmillions |   .0396296   .0030999    12.78   0.000     .0327226    .0465365
       _cons |  -507.2879    1103.35    -0.46   0.656    -2965.704    1951.128
------------------------------------------------------------------------------
```

Output 5: Regression for Reverse Causality

4 - Conclusion and Discussion

4.1 - Answer to the Research Question

Therefore, the quantitative analysis combined with the qualitative theoretical framework gives many implications for a region's economic development. The qualitative research from a number of papers did suggest that the port development of a region definitely increases its economic development. To get a more empirical analysis, the quantitative analysis was conducted which showed a similar implication. The increase in trade via port together with its development, in the form of increasing TEU figures, did increase Dubai's annual GDP, on average, overtime. But from the analysis done in the previous section, it seems like there were other factors that also contributed to the economic development of Dubai.

For the first hypothesis, it can be said that there was a positive relationship between the port development and economic development of Dubai. The correlation figures between the GDP of Dubai and the TEU figures of Jebel Ali were positively correlated and this was also confirmed with a positive relationship between these two variables in the regression analysis. So the first

hypothesis "There is a positive relationship between Port Development and Economic Development" cannot be rejected.

The second hypothesis showed some surprising results. According to the regression analysis conducted above, it was seen that Trade had a negative effect on the economic development of Dubai, on average, and on the other hand, Tourism had a significantly positive effect on the GDP. This means that the second hypothesis "Trade played a stronger role compared to Tourism in increasing the Economic Development of Dubai" can be rejected. From the analysis, it seems like it was the inflow of tourists that lead to a positive impact on the economic development of Dubai compared to the level of trade.

The last hypothesis, which tested the reverse relationship between Port Development and the Economic Development, also showed some interesting results. The analysis depicted the existence of a reverse relationship between the TEU figures and Annual GDP. The relationship was statistically significant and showed that increasing development of the region does lead to the development of the port as well. Thus the hypothesis "Economic Development has contributed to the increasing Port Development of Dubai" cannot be rejected.

4.2 - Research Limitations

The conclusions mentioned above could have been influenced by many factors. Even though the quantitative analysis was heavily backed by the qualitative research provided in the Theoretical Framework, the methods used themselves were quite simplistic. The use of correlation and regression are valid statistical methods but are easily affected by many factors like Multicollinearity and OVB. Ordinary Least Square Regression (OLS) which was used in the quantitative analysis in this paper, is quite sensitive to outliers and the results can be easily disrupted if they are present in the data. The model assumed for this paper was a linear one but it is always a possibility that there exists a non-linear relationship between the variables used. The reliance on a simple Pearson Correlation Analysis obviously gives only the direction and strength of the relationship but doesn't provide conclusive information. In addition, its sensitivity to the normal distribution of variables can also be a problem since in those situations a Rank Correlation method makes more sense.

Even though attempts were made to deal with the problem of multi-collinearity by removing some variables and creating models that don't include highly correlated independent variables, it wasn't entirely eradicated from the analysis. The occurrence of correlation within the independent variables used in a regression analysis. The correlation analysis used in the quantitative section shows very high positive correlation between the independent variables, and this could have led to increased variance of the coefficient estimates, making them very sensitive to minor changes in the models. This sensitiveness makes the coefficients unstable and difficult to interpret creating problems for the entire analysis. However, multi-collinearity doesn't necessarily produce bad predictions and doesn't really affect the overall fit of the model. This makes it questionable whether it is extremely important to be reduced or not. Since, this paper's main objective was to determine the precise effect of each predictor, multi-collinearity could have disrupted it leading to not necessarily a fully accurate analysis.

4.3 - Recommendations for further research

Due to limited statistical knowledge, only the basic statistical methods were used that lead to problems like multi-collinearity, OVB, inaccurate estimates of coefficients to some extent etc. Therefore, more advanced statistical analysis can be used to ensure these issues are entirely eradicated from the research. For example, the use of *Partial Least Square Regression (PLS)* instead of the *Ordinary Least Square Regression (OLS)* can help to deal with the problem of multi-collinearity. PLS can cut the number of predictors to a smaller set of uncorrelated components. This use of multiple variables helped to deal with the problem of *Omitted Variable Bias (OVB)* to some extent but it's nearly impossible to get rid of it entirely. Some additional research can be done to include more explanatory variables to the analysis so that OVB can be as low as possible.

The area/region that this paper focused on was only the city of Dubai. This did lead to many complications as city level data, in terms of GDP, education level, FDI etc was very difficult to gather. In addition, the focus was too narrow to examine the broad relationship between port development and economic development. Use of more ports, regions and possibly entire countries can definitely aid in examining the true relationship between port development and economic development. In addition, many port regions are experiencing enhanced economic growth like Gwadar, Rotterdam, Rauma etc. So a focus on those regions along with Dubai can give a broader analysis of whether the growth is truly because of the developments in their ports or there are other factors associated with it.

As mentioned in the previous section, the data was very limited for the broader research objective that was initially aimed to achieve. Even though the main objective of the research was more or less achieved, but with an access to more detailed data for eg: for more variables, for more years, quarterly data etc, could have added an extra edge to this research. The access to the initially required data was very limited but if attempts are made to extract additional data, it can elevate the scope of the research.

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Appendix A

Variable Name	Meaning
MIDDLEEAST	TEU (000s) of the Middle Eastern Region.
JEBELALIUAE	TEU (000s) of Port Jebel Ali.
GDPAEDmillions	Dubai's Annual GDP (in AED millions)
IMPORTS	Value of Imports (in AED millions)
EXPORTS	Value of Exports (in AED millions)
No.ofStudents	Number of Students enrolled in a University.
PASSENGERSARRIVAL	Count of Passengers at the Arrivals section of the airports.

Table 2A: Variable Names

```
Linear regression                               Number of obs     =         12
                                                F(4, 7)           =      35.87
                                                Prob > F          =     0.0001
                                                R-squared         =     0.9360
                                                Root MSE          =      17035

------------------------------------------------------------------------------
             |               Robust
GDPAEDmillions |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  JEBELALIUAE |   26.62346   9.70514     2.74   0.029     3.674453    49.57247
      IMPORTS |  -.1066897   .0918315    -1.16   0.283    -.3238365    .1104572
      EXPORTS |  -.2955987   .1161425    -2.55   0.038    -.5702321   -.0209654
PassengersArrivals |   .0005039   .0011354     0.44   0.671     -.002181    .0031887
        _cons |   27671.02   57475.92     0.48   0.645    -108237.9      163580
------------------------------------------------------------------------------
```

Output 6: Regression without Students

```
Linear regression                               Number of obs     =         12
                                                F(2, 9)           =      36.64
                                                Prob > F          =     0.0000
                                                R-squared         =     0.8944
                                                Root MSE          =      19297

------------------------------------------------------------------------------
             |               Robust
GDPAEDmillions |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  JEBELALIUAE |   24.46111   7.442684     3.29   0.009     7.624593    41.29763
PassengersArrivals |  -.0004788   .0016548    -0.29   0.779    -.0042223    .0032647
        _cons |   36567.91   55219.98     0.66   0.524    -88348.37    161484.2
------------------------------------------------------------------------------
```

Output 7: Regression on Port Development and Tourism

Years	MIDDLE EAST	JEBEL ALI (UAE)	P (AED millio	IMPORTS	EXPORTS	lo. of Studen	sengers (Arriv	FDI (Dubai)
2006	12,500	8,500	214,418	532,428	279,824	34,943	16,459,873	28,908
2007	14,700	10,800	314,735	580,879	284,372	36,128	17,021,356	32,996
2008	17,800	12,000	347,258	643,198	291,554	37,093	18,454,988	36,792
2009	16,500	11,100	302,115	471,558	282,584	39,284	20,711,822	10,731
2010	17,500	11,600	310,494	546,835	355,346	39,217	23,877,808	14,746
2011	19,110	13,000	319,966	658,385	430,596	43,212	25,689,607	20,586
2012	19,202	13,750	338,914	737,328	497,634	48,058	29,020,881	25,769
2013	18,993	13,600	364,282	810,488	518,191	49,879	33,427,210	28,105
2014	20,973	15,200	378,881	844,588	486,731	57,994	32,731,257	28,981
2015	21,556	15,600	388,816	795,795	486,723	60,310	39,495,989	28,600
2016	21,279	14,800	395,835	802,510	473,747	65,798	42,502,309	25,500
2017	22,289	15,900	410,564	798,308	503,480	69,632	44,822,943	27,300

Table 3: Actual Data Extracted