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Urban Planning as an Instrument for Economic Diversification in High-Income Developing Countries of the Arabian Peninsula:

The Case Abu Dhabi

The Transformation of Abu Dhabi to a post-Oil Global City of the 21st Century: From Super-Branded-Mega Development to an International (Shipping) Hub, and the Sustainable Shift

Submitted in partial fulfilment of the requirements for the degree of Master of Science in Environmental and Infrastructure Planning

By

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Abstract

The cities in the Arabian Peninsula are at the core of contemporary urban planning as urban shifts alternate rapidly and urban planning is used for economic diversification (economic planning). Strangely, very little research is done at such forms of non-Western planning and a big scarcity is at this, sometimes extreme, transformations. Moreover, the Gulf-model has proven that its influence is far wider than the Middle East itself and goes as far as Arica and Asia. Nevertheless is a comprehensive study at this subject is missing as the excesses are primarily highlighted; but the motives and (positive) side effects are largely unmentioned. As the topic of the entire Persian Gulf is for too extensive for a master thesis, this research focuses on Abu Dhabi as the example for the region. The emirate awakens as the capital of the region, has a direct link between urban and economic planning (policy, theory and data), and could be compared to its neighbour and precursor Dubai, as its urban and economic climate shows many similarities but has at the same time a less diversified / developed economy. In their ambition to become global cities of the twenty-first century these high-income developing countries use urban planning solely as an instrument to diversify their oil-economy. Due to the implementation of policies as super-branded-mega-development (SBMD) and the international hub (IH) these cities emerge as influential competitors (to the West and to each other), with remarkable similar strategies throughout the region due to the singing of the same (Western) consultants. However, a truly unique method of urban planning in the form of ''sustainability'' is now visible.

The findings of the research discovered some noticeable lessons for future (urban) planning in Abu Dhabi and the Arabian Peninsula. In contrast to the preliminary assumptions and previous studies, are the possibilities and benefits of these forms of urban planning far more extensive and wide reaching than the mostly discussed extremes or outbursts of urbanization and architecture; let alone the possible side effects for both the city and the region. The goal to become the 'next' global metropolis of the twenty-first century is, to put it gently, ambitious but the city may have the greatest potential of the Middle East. Nowadays, many contemporary 'global' or 'tier 1' cities are backed with a large hinterland and often a long trade history. However, in the highly globalized and consumerist world of today these developments could succeed rapidly, as undeniably occurs in the UAE, and the (re-) generation of cities may occur rather fast. Abu Dhabi could position itself as the 'new' gateway of the Middle East, both as business and political centre. When it benefits from its geographical location and positions itself as the regional hub, rather than an international hub, combined with its influence as an initiator of the GCC; the small home market and limited (military) dominance, this can be major assets to become the 'capital of the region', similar to Singapore in South-East Asia. The cities of the Gulf are often seen as ''Instant Cities'' and even though this not entirely true, especially for cities as Doha and Dubai, Abu Dhabi has transformed from pre-industrial to industrial to post-industrial in half a century and now seeks to become ''developed''. In this transformation and the search for global recognition, urban planning is definitely the cornerstone in (economic) planning. This clear link between 'urban' and 'economic' is visible in all levels of planning (policy, theory, practice) and all stages (SBMD, IH and EM) with as ultimate goal, often stated in these exact words, to diversify the economy and wean their one-sided, oil economy. Were the focus of urban growth and developments shifts to Abu Dhabi with the lessons learned by Dubai, its more measured fashion, the acknowledgment of sustainability (both economic and ecological), its young population, its growth rates (one of the highest growth rates of GDP per capita in the world), and its immense deep oil-rich pockets as the biggest assets.

There are some adjustments to make and the transformations far from complete but it is defendable that the city in on the right way, certainly more than realized on forehand. If Abu Dhabi becomes a or the global metropolis of the twenty-first century is difficult to predict but when aiming at its (regional) hub function (i.e. trade hold up better, the vacant position), when acknowledging the downsides as the risk of cannibalization and the enormous investments, these sectors has proven to perform better in a crisis (or post-oil era) and has the potential to make the next step. But it could be the sustainable shift or ecological modernization (i.e. ecological protection, global importance and 'modernization' itself) that has the greatest potential of them all as future research may reveal. There are, however, more candidate cities.

Key words: Urban planning, economic diversification, Arabian Peninsula, Abu Dhabi, Global City, Super-Branded-Mega-Development (SBMD), International Shipping Hub (ISH), Sustainable Shift, Ecological Modernization (EC), High-Income Developing Countries, post-Oil economies.

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Even during the three major setbacks that I experienced during this research he kept supporting me and provided me useful advise to carry on. Besides personal circumstances in the inner family circle, it was to my great regret at the last moment not possible to study a semester in Abu Dhabi. This would have sincerely improved my research and understanding of its culture.
I would like to thank the members of registrar of the Masdar Institute of Science and Technology (MIST), and therefore also the MIT, for their efforts, useful help and possibility to study further at the university. I regret this till today but I hope to see the institute in the near future some day. The last setback that I have to mention for the overall picture is that it proved to be more difficult than I expected to get results from my questionnaire. This may have given me new insights and would have improved the relevance of my research but unfortunately the response was negligible. However, this observation itself is perhaps the most important lesson of the all.

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I am grateful for the contribution of some great scientific researchers relating urban planning in Abu Dhabi and without them my research would contain essential missing links. In such an unexplored field of research, few articles are of an exceptional level and many are 'less qualitative' and could therefore not be used for my academic research. With the help of these articles I could connect the by myself discovered hypothetical stages of urban planning in Abu Dhabi with previous well-grounded research. I depend on these authors and without them this thesis wouldn't have been possible. Therefor I would like to acknowledge authors as Ponzini of the Politecnico di Milano (Italy), Murel and O'Connell of the Cranfield University (United Kingdom) and O'Brien, Keivan and Glasson of respectively the Croydon College and Oxford Brookes University (United Kingdom) for there contribution. For example: O'Brien, Keivan and Glasson made it clear that it was necessary to implement the sustainable shift, which wasn't incorporated in the draft because of the substantial amount of extra work. However, this extra chapter proved to be essential for the full understanding of urban planning in Abu Dhabi. I'm glad that I did a little more and integrated this additional chapter, of course after consulting my supervisor dr. Justin Beaumont.

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Regarding the layout of the thesis; the font used is ''Optima'', similar to the urban planning vision and economic vision 2030, with the font size ''9'' and line spacing ''1.15'' (due to the number of pages). The references and citations are conform ''Harvard – Anglia'', as built in by the references generator of Microsoft Word. Finally, the author would recommend reading this document as PDF-file or print the document two-sided, possibly without appendices, because of environmental concerns.

Table of Contents

List of Figures

List of Tables

1 Introduction

This academic research is done for the Master of Science 'Environmental and Infrastructure Planning' of the university of Groningen, the Netherlands. Urban planning is nowadays repeatedly used as an instrument for economic planning in high-income developing countries. Especially the oil-rich developing countries in the Arabian Peninsula emerge as new global cities of the twenty-first century and step more on the foreground of the contemporary urban and economic planning debate. These oil-exporting, developing countries form a separate category as this category cuts across the income classification (Szirmai, 2005). In spite of their high incomes they are still considered to be developing countries since their economic structure is extremely one-sided. This research will focus on recently implemented urban planning methods that are used to transform their one-sided, economic structure. Or in other words, how is urban planning used to diversify their economies.

The influence of Abu Dhabi and the Arabian Peninsula in 'our' daily, Western, life increases rapidly. When taken Abu Dhabi as an example; the first glimpse of its power was in the past decades primarily at the petrochemical market. Due to recent shifts in policies and transformations in planning its influence increases clearly and caused an increased attention of journalists and governments. The super-branded-mega-development phase created new icons as the Louvre and Guggenheim Abu Dhabi and the new annually held Formula One Grand Prix. As a result of its increased fleet and huge sponsor deals (e.g. Manchester City) the national airline Etihad Airways became a new 'super-connector' in the competitive aviation market. The most recent sustainable shift created the new 'eco-metropolis' Masdar City, eventually resulting in the unlikely selection of Abu Dhabi as the world headquarters of the International Renewable Energy Agency (IRENA) and the annual World Future Energy Summit (WFES).

Analysing recent urban planning shifts in the Middle East they may appear capricious and are often misunderstood. The excesses of such contemporary urban planning make it in the news but the thoughts behind it are often underexposed. Examples as the Burj Khalifa and Ferrari-world appear in documentaries and newspapers around the globe. While the excesses of urban planning in the Arabian Peninsula are documented, there is a big scarcity about the motives behind such policy. Especially the focus on the relationship of urban planning and economic planning is lacking. That while analysing transformations in urban policy and urbanization could clearly indicate the economic ambitions and policy goals. This strong inter-linkage between urban planning and economic diversification could give insights on both matters.

When understanding urban planning in the Arabian Gulf and the affiliated economic drivers, an answer can be given about the post-oil future of the region. Moreover, the influence of this ambitious model of planning (often referred to as the Gulf-model) goes as far as the Middle East, Africa and cities in Asia (Bloch, 2010). The quantity, and quality, of research done at this matter is remarkably scarce as most academic research focuses on Anglo-Saxon models of urban planning, especially striking as rapid transitions and observations are not limited to Western planning (Berry-Chikhaoui et al., 2007). Some research does analyse, sometimes partly, aspects of the model but it is often seen as a 'freeze-frame' (a single moment in time) (Koolhaas et al., 2010). A comprehensive report on the various transformations in (urban) planning, the inter-linkage between these shifts, and connectivity with its 'neighbours' is definitely lacking. Furthermore, the fact that this 'new' cities and economies, with seemingly endless financial resources, are almost completely created on the drawing board could give useful insights about how mankind would build a future metropolis from scratch, especially relevant for the Masdar Initiative as Abu Dhabi calls it ''a blueprint for future sustainable cities'' (Pacione, 2005).

In summary, remarkable little research is done at this subject. In the past, research is done on individual transformations and excesses of urban planning but a comprehensive research is lacking. Moreover, most research is done on Anglo-Saxon models of urban planning and little on non-Western, particularly the Middle East. This 'Gulf-model' is often falsely seen as a freeze-frame moment but its influence in the region increases continuously and reaches meanwhile far beyond the Middle East. Furthermore, the ambitious post-oil transformation of a high-income developing country to a new; global city of the twenty-first

century is heavily underexposed. The direct link between urban planning and economic planning (economic diversification) indicates the re-use of urbanization and may give useful insights that could be missed otherwise. In a region were urban planning is of such importance, perhaps the most important of the world, and is used an instrument with far wider reaching influence than that we may realize in Western planning, it is therefore more than wise to do an extensive and integral search at this matter.

The focus of research lays on the nations on the Gulf Cooperation Council (GCC) and especially the Emirate of Abu Dhabi, the United Arab Emirates. Urbanization in Abu Dhabi is associated with rapid growth and transformations of (urban) planning. Abu Dhabi as the capital and biggest emirate of the United Arab Emirates has immensely deep oil-rich pockets and has some of the highest growth rates of GDP per capita in the world. The city is a perfect example of what is called the 'new Middle East' with their aim is to become less dependent on the petrochemical sector and transform to a future global metropolis. A transformation that took urban planners and policymakers in the Western world centuries and these emerging markets try to accomplish it in a few decades. Like many countries in the region, Abu Dhabi gained its independence of the British around 1970 and aimed its policy for diversification of the economy in 2030, a timeframe of barely sixty years. Abu Dhabi is pre-eminently the example of the new Gulf-city as the excesses are high but this transformation occurs at the same time in a more measured fashion. The emirate learned the lessons from its precursor Dubai and, maybe more important, put them into practice. Furthermore, the strong inter-linkage between economy and urban planning is remarkably explicit in Abu Dhabi. Urban planning is used as an instrument for diversifying and enhancing the economy, which translates to the Urban Planning Vision 2030 and Economic Vision 2030 (the same document). As a result, when fully understanding urban planning and recent transitions, an answer can be given about the (economic) future of the city and possibly the region.

This research is divided into introduction, theory, methodology, practice (data) and policy chapters. The theoretical chapter is divided into three segments, namely: super-branded-mega development (SBMD), the international shipping hub (ISH) and Ecological Modernization (EM). Analysing academic literature strengthened the hypothesis that recent urban planning could be separated between these transformations. First, literature and theories are discussed on every singular urban planning phase and affiliated subjects are discussed. Secondly, as in Abu Dhabi urban planning and economic planning are inter-linked, it is possible to give answers about urban planning when analysing its statistical (economic) data. This is done for both Abu Dhabi and Dubai in order to give a well-funded answer. Especially the financial crisis of 2008 is essential when discussing these statistics. Due to the global crisis it is, for the first time, possible, to examine the individual sectors that are linked to the urban planning phases of this research. Therefore is possible to give an answer about the feasibility of the shifts and how it reacts in a declining economy. Dubai is essential because it may give a harbinger of how these urban planning methods react when the economy is not largely oil-driven. The analyses chapter will discuss the used data and draw relevant conclusions from it. The policy chapter examines if these shifts are visible in recent policy, for both Abu Dhabi and their counterpart of the GCC. Finally, the concluding chapter will make a synergy of policy, theory and practice in order to give one comprehensive answer about urban planning as a tool for economic diversification. Hopefully, at the end of this research, it is possible to give new insights in urban planning in this perhaps future global city of the twenty-first century and draw useful lessons that are relevant for a far larger region than the Arabian Peninsula.

→ [1] Focus on petrochemical industry; [2] super-branded-mega development; [3] the international shipping hub; [4] the sustainable shift (Ecological Modernization).

1.1 Background

The Emirate of Abu Dhabi is one of the seven emirates that form together the federation the United Arab Emirates, were it is the largest emirate with an area (67.340 km^2) and accounts for approximately 87% per cent of the total land area of the UAE (appendix 7). Abu Dhabi has also the largest population with an estimate of 2.120.700 (census 2011) inhabitants, of which 439.100 (more than 20%) are Emirati citizen. A relatively low number, but higher number than in some of its neighbouring countries. Abu Dhabi city is the capital of both the emirate and the UAE. In the early 1970s two important developments helped the Emirate of Abu Dhabi achieve quantum leaps on the path of development. The first was the establishment of the United Arab Emirates in December 1971 with Abu Dhabi as its political and administrative capital.

The second was the sharp increase in oil prices following the October 1973 war, which accompanied a change in the relationship between the oil countries and foreign oil companies, leading to a dramatic rise in oil revenues. Nowadays Abu Dhabi has continuously contributed around 60 per cent of the GDP of the United Arab Emirates, while is population contributes only for 34 per cent of the total UAE population. Resulting in an overall GDP for the UAE of 360.000 (million USD), which translates to the 33th place (CIA, 2009), and GDP per capita of 67.500 (USD), which results in the 8th of the world (CIA, 2009). Abu Dhabi's economy is mainly based on 'mining and quarrying' (crude oil and natural gas) that accounts for 58.5% (figure 9-2) and construction related industries (10.1%) in 2011. In order to become less dependent on this petrochemical sector Abu Dhabi's main goal is to diversify its economy and attain the status of a developed country, this in contrast to the status as a high-income developing country. In order to fulfil this goal the emirate positions itself increasingly on the world stage and it uses therefore urban planning at the core of its policy. Due to massive investments in super-branded-mega-development, the international hub and the sustainable shift it aim to wean their one-sided economy, move up the global ladder and uses its immense oil-resources to secure its future.

1.2 Significance of Research

Most urban studies discuss the extensive building of skyscrapers and malls in relation to economic growth, especially in the foremost global cities of the developed world (Sassen, 1991). However, there is a scarcity of studies investigating the degree to which non-Western and developing countries take part in the global urban transformation (Berry-Chikhaoui et al., 2007). Therefore its necessary to focus on such undiscovered fields of urban planning. Nowadays the focus is primarily on Anglo-Saxon forms of (urban) development and where the progress of the Gulf could be seen as ''unguided frivolity'' from a Western perspective; it represents for the Indians an opportunity, for the Iranians freedom, and for Arab that modernity could work. This is essential to acknowledge before a statement should be given. What has been surprising is how the Gulf in general have been discussed and criticized strictly as a 'new', freeze-frame occurring (a single moment in time) (Koolhaas et al., 2010). Throughout the region, the history of modernization and its shifts (or transformations) in planning are almost completely left out the debate. Their remarkable progression, in such a small timeframe, from an insignificant fishing settlement on the Persian Gulf to a regional domination, cosmopolitan in the twenty-first century could not happen without challenges and difficulties, therefore they are important to research. The city now faces the challenge of providing infrastructure in a context of (extreme) rapid urban growth and expansion. It has ample land resource in the form of a tabula rasa landscape, no legacy of industrial dereliction, no sprawl of spontaneous settlements, political stability, strong inward flows of capital investment, and is proceeding with a clear development blueprint that aims to create a city of regional significance for the twenty-first century (Pacione, 2005). The influence of this new Gulf-model, sometimes called ''Dubainization'' (Choplin & Frank , 2010), will continue to influence the current wave of global suburbanization in the Gulf, the Middle East, Africa and even trough Asia (Bloch, 2010). This model epitomize a new way of development based on hypermodernity, economic development, success and opulence thanks to oil exploitation.

In order to become less dependent on oil, urban development forms a cornerstone of the strategies in the Emirate. To explain current transitions in urban planning its necessary to indicate recent changes of the development strategies in Abu Dhabi. Investment by both private sector and government agencies is being used in a number of ways (Al Kaabi, 2011):

- As a mechanism to expand and diversify the urban economy by creating intra urban growth centers, focused on specific activities. An example is tourism (United Nations, 2011).
- In image creation and place marketing, manifested in iconized architectures and global scale mega-projects, which perform a dual role as sources of pride and national identity and as a means of attracting investment.
- To extend the network of urban infrastructure (including the enlargement of aviation and maritime ports), promote population growth, and facilitate urban expansion.

→ [1] Scarcity of comprehensive research; [2] possible metropolis of the future / emerging market; [3] almost all research is done at Anglo-Saxon-forms of urban planning; [4] blueprint for the Middle East, Africa and cities in Asia; [5] strong inter-linkage between urban planning and economic planning (diversifying the economy).

1.3 Why Abu Dhabi?

In short: Abu Dhabi is a unique case and the city is booming. The extreme transformations of the Middle East, especially the Gulf, are even more extreme in Abu Dhabi. Were its 'neighbours' Dubai and Doha have a history of some small-scale trade, the city of Abu Dhabi transformed from almost from an unoccupied desert to a global city in less than 60 years (Pacione, 2005), this in contrast to the major Western cities where the transformation from pre-industrial to industrial to post-industrial occurred in centuries. In their search for a life beyond oil, the economy of Abu Dhabi transforms from an insignificant fishing settlement to a (future) global city of the twenty-first century. This seemingly endless amount of money, and the search to diversify the economy, creates a new type of city. Its immensely deep pockets (90% of UAE oil reserves, a USD 500 billion Sovereign Fund) are a glaring contrast with, for example, its better known neighbor Dubai, which boomed after its oil ran out (The Economist, 2009). As the focus of urban growth and developments shifts nowadays southwards to Abu Dhabi, and its developers emulate global-city strategy, albeit in a more measured fashion, the city-state emerges as a competitor to Dubai as a regional business hub (Acuto, 2010). Moreover, in this more 'modest' way of urban planning are the lessons of its precursor taken into practice. As is the case for its the aviation sector and its national airline 'Etihad', which develops in a more collaborative and measured pace. This results in an increasing focus on Abu Dhabi, not only in the region but in the globalized word, as the city is as the core of the contemporary (urban) planning debate and emerges as a, or the, capital of the region. Furthermore, their influence is, in contrast to the past, now internationally visible due to the headquarters of firms / companies, its national airline, sporting events and advertisement deals. Also, the city of Abu Dhabi is relevant to study as the experiences of the region are implemented in their further planning and therefore it could be stated that it is a 'perfect' example of the new Middle East.

The inter-linkage in Abu Dhabi of urban planning and economic planning (economic diversification), which is clearly visible in the emirate, makes the country especially suitable to examine. The main policy document 'Abu Dhabi Vision 2030' is a combination of both urban planning and economic planning, and the 'Structure Framework 2007' was even limited to economic planning. Thus, city and regional planners are not only present in the physical development but also the economic development (MIT, 2013). Planning encompasses not just the concern for the structure and experience of the build environment but also economic development, international development, and environmental policy and planning. Economists were among the early contributors to the literature on urban planning and there is a strong link between this two sub disciplines. Despite the historical divergence in perspectives and methods, urban economics and urban planning share an intense interest in many topic areas: the nature of cities, the prosperity of urban economies, the provision of urban services, efficient systems of transportation, and the proper allocation of land between urban and environmental uses (Brooks et al., 2011). Even between skyscrapers and the economy is a connection as the 'skyscraper index' (Lawrence, 1999) showed. This shows that the world's tallest buildings have risen on the eve of economic downturns and it is used as a predictor of economic crisis. The buildings may actually be completed after the onset of the recession or later. For example, the model successfully sent a signal for the financial crisis in 2007 (Thornton, 2005). This had enormous impact on Dubai (Voigt, 2010), which housed the highest (unfinished) building and putted this index again in daylight. Although this does indicate the possible connection between urban and economic this is not the main focus of this research as this thesis connects affiliated sectors to forms urban planning forms, as is done by Bloch in Dubai (Bloch, 2010). However, this history and links between both urban and economic planning are essential for this research and therefore important to discuss. As will be discussed in further detail in chapter 6, ''methodology''. Moreover, as the just mentioned processes in Dubai had a significant impact on the region, and for the global recognition of the United Arab Emirates, this will also be examined as a reference case. Thus, by understanding urban planning it is possible to give answers about the economy and economic planning in the emirate of Abu Dhabi.

→ [1] higher extremes; [2] more documentation of the process; [3] lessons taken intro account; [4] clear link between urban planning and the economy, [5] new development strategies.

1.4 Theoretical Framework

As the subject of research is rather extensive the theoretical framework has some clear boundaries. At the start of this research the aim was to research the 'current' forms of urban planning visible in Abu Dhabi, after the 'footloose' period of planning, namely: super-branded-mega-development (Ponzini, 2011) and the International hub ((Murel & O'Connell, 2011). While acknowledging that the most recent shift sustainable shift or ecological modernization (O'Brien et al., 2007) has no (statistical) data, this transformation has potentially far reaching impact in the Arabian Peninsula and is therefore also analysed. The field of research is focuses specifically on the link between urban and economic planning and how it is used as an instrument for economic diversification. As urban planning in Abu Dhabi is, almost, solely used for economic diversification, which is therefore the main focus of research. This in contrast to many (Western) countries were urban planning is also used to solve, for example, societal problems. Due to this focus on economic diversification and (possible) shift from the high-income developed status this forms the centre of research. Although other processes are not forgotten nor considered as ''less important'' it is, because of the time, necessary to make a selection. However, other processes do interfere and the area of research could be set much wider. Processes as the transition from a traditional society to modernity, faith-based developments, influence on society, migrant labour, (absence of) democratics, and institutions are all relevant to research, as this thesis also witnessed. As a result the framework of this thesis is 'limited' to urban developments and the link urban planning / economic planning, and could be used in this manner. Other processes are definitely not forgotten and briefly discussed in the conclusion but it is, in the opinion of the author, necessary to understand the dynamics and reasons behind current transformations first before further statements could be given. When understanding the motives and rapid progress of Abu Dhabi it becomes apparent that no pace of evolution is without problems and, while local dynamics must not be forgotten, it are the current transformations that influence our (Western) daily life the most. On the basis of these three recent shifts or transformations the emirate is discussed in order to understand the goals and feasibility of urban planning and why these transformations occur. However, it is important to acknowledge that these transformations do not occur continuously, or in a step-by-step manner, but interfere with each other and show many links. This paragraph will discuss the three transformations and indicate how others use them and how other trends are relevant. As for example super-branded-mega-development, which is a hodgepodge of various 'views' and it is perhaps not possible to give a clear definition. Furthermore, the links between the transformations and value / limitations are discussed before the research goals and questions are indicated.

Super-Branded-Mega Development

The SBMD-shift, with many references and links to this topic, is definitely not an undiscovered field in literature. However, much research is ''footloose'' and indicates clear connections with the subject; but do not cover the whole entity or do not incorporate non-Western transformations. Especially relevant as now many second and even third tier cities compete in the consumerist, twenty-first century, global world. This topic is often discussed by authors as Harvey and Sassen but focuses almost always at first tier cities as New York and Tokyo. Regarding large-scale projects this is not a new formula in infrastructure as constraints and uncertainties are discussed in detail by authors as Flyvbjerg. However, the use of cultural attractors for urban development is a more recent shift. As Ponzini states in his article ''*Large-scale development projects and star architecture in the absence of democratic politics: the case of Abu Dhabi*'', these new capitals of consumerism could count on massive resources and their global recognition is rising. The city of Abu Dhabi is certainly a capital that uses mega projects and spectacular architecture on a massive scale for marketing purposes, even compared to other rising capitals in Asia. The city, with its extremes, is therefore a perfect example to discuss effects as urban landscape homogenization, Disneyfication and the Bilbao-effect. The paradoxical effect of homogenization, cities distinguish themselves by the multiplication of similar aesthetically striking artefacts, and resulting in homogeneity of architectural outcomes is highlighted by authors as; Plaza, Sassen and Munoz. But as Sudjic states, studying the avoidance of isolated cultural artefacts and the implications of the use of large-scale spectacles is necessary, especially when it is such a generic process of globalization. Research is done at similar processes in contemporary planning but the scale where it occurs in the Arab Gulf is, safe to say, mainly unmentioned. Remarkable to acknowledge as these nations may create homogeneity at an entirely new (regional) scale, as general processes and strategies are implemented throughout the region. Perhaps the Bilbao-effect is most striking example of this statement. By authors as Plaza, the regeneration of Bilbao and far reaching implementation for contemporary planning are highly detailed discussed. This image

creation and branding of the city has definitely influenced SBDM-projects in Abu Dhabi, such as the Guggenheim and Louvre, but processes in the nation or region are severely undiscovered. The city-state Dubai created some interest of researchers with its planning excesses and processes as Disneyfication but the real estate crisis; bailout and its oil-independent economy are largely unknown in the general public. This analysis will not highlight the influence of this model in further detail but goes it as far as the Middle East, Africa, Asia, and beyond.

Concluding, it is possible to say that the (general) topics the SBMD-shift, such as globalization, branding, and large-scale development, are discussed by many Western researchers but mainly specified to the 'old' global or first tier world cities. The new second and third tier cities, competing for global recognition and creating higher extremes, are largely unmentioned. Striking is that when non-Western researchers, at least the studies that the author read, researched the subjects of this thesis relating urban planning in the region, the quality and grammar was often poor and links between governmental bodies were visible. However, when research is done by Western planners; cities as Abu Dhabi and Dubai are mostly (falsely) seen as ''Instant Cities'' and often even identical while the differences are enormous; for example in trade history, economy and the pace of development.

International Shipping Hub

The (aviation) hub is a difficult subject as, in spite of the huge importance, there is little consensus relating the exact definition. Documentation on aviation and airport is sufficient available in policy journals and literature but mainly on Western transformations, this in spite of complexity and importance of such developments. Especially now hubs are transformed into destinations on their own, these 'hubs' become increasingly part of contemporary planning. An airport with similar characteristics that is researched is Singapore, were Lohmann et al (2009) make an explorative study on aviation-based transformation processes in both Singapore and Dubai. Authors as Murel and O' Connell do make the connection with the new 'superconnectors' and recent processes within the GCC but the field of research is limited. The international shipping hub is a popular (urban) planning method throughout the Middle East and similar processes in the region are understudied. The connection is made between old and new 'super connectors' but the whole variety of new 'super connectors' and the massive investments throughout the region are not incorporated. Such is the limitation of the both the article by Murel and O' Connel, and Vespermann. Moreover, this transformation in policy is, similar to the SBDM-phase, mostly unmentioned or only partly researched relating the non-Western planning. Processes are analysed separately (some in great detail, see Singapore) or the connection is made to one city (such as Dubai) but a full, comprehensive research is lacking. As explained in this paragraph, the scarcity of non-Anglo-Saxon research is also relevant for the international hub and therefore not discussed in further detail.

Sustainable Shift

The sustainable shift in, or ecological modernization of, urban planning of Abu Dhabi is in literature predominantly discussed relating some extreme outcomes of this transformation but, for example, the possible impacts on both the environment and government are not specified or only partly. Such as the new eco-city of Masdar that is extensively discussed in journals but mainly due to its star architect, enormous costs and 'extreme' view. Their motives behind the project are remarkably unmentioned, as are the possible positive effects for and in the region. Also striking is that the policy of the 'Specialized City', which appointed Abu Dhabi as capital for renewable energy, is only discussed in the article of Khodr (Khodr, 2012). Noticeable is that in recent years the ideology of Ecological Modernization has emerged as one of the most promising ways of understanding environment society and clear references to its are visible in Masdar. Authors as Spaargaren, Mol and Murphy made a huge contribution to the topic of EM, which is essential for understanding this form of sustainable development in the emirate. For example the sensitive and ecological fragile environment of the Gulf, the (individually) unrecognizability of the Arab nations, possible establishment of economic trading block through ecological partnership (a la the European Union) are almost completely left out of the debate.

Similar conclusions could be made referencing to the missions and drivers of Masdar City; as for example ''a meaningful contribution to sustainable human development'' is largely unmentioned. However, in the article of O'Brien et al (2007) ''*towards a new paradigm in environmental policy developing in high-income developing countries*'' the direct link between sustainable development and their opportunities is discussed, which gave the essential link needed to connect the various theoretical paragraphs.

Concluding: Interlinked
Analysing the theory framework some important similarities and dissimilarities could be noticed, where the dissimilarities are presumably the most visible. In this research the transformations of urban planning are discussed separately and if they are chronological, that they follow each other step-by-step. This is however in practice not that simple as the processes are highly inter-linked and influenced by each other. But it has to be done in order to make the topic more manageable. Moreover, these processes show multiple similarities with each other. They are implemented in order to diversify the economy, tourism is central in all the shifts, gain global recognition and (cultural) branding with the use of starchitects is noticeable during all transformations. What is striking for the entire research that little research is done at non-Western forms of urban planning, especially the Middle East, while research that is done is of a questionable level. Even more remarkable when acknowledging that in the globalized world of the twenty-first century such developments could be influential at the world stage.

The cities of the Arabian Gulf are often, falsely, classified as identical or instant cities. Research is done at one city (mainly Dubai) and developments in the region are marginal taken into account. This is the big shortage in my research; due to a scarcity of research on non-Anglo-Saxon forms of urban planning, their planning is compared with Western principles. Note that this is similar to their policy planning, were Western policy and planners implement their view on local planning. Moreover, an integrated research on 'new' global cities of either the Arabian Peninsula or the Middle East is missing. Essential as planners and designers construct similar developments throughout the region. This form of urban landscape homogeneity is not only visible in the SBMD-phase but also in ISH, however by the policy of the specialized city this is acknowledged by the policy makers. The processes in the region are definitely not identical as local adjustments are made but it is necessary to make a full research of ''identical processes'' in order to compare the cities. Furthermore, research on individual academic topics is (partly) available but a complete, comprehensive document is missing and therefore such an document is needed in order to examine processes in the region, with Abu Dhabi as the example, at a wider scale and by indicating interfaces and identifying 'pain points' of urban planning a better understanding of urban development of the region could be achieved.

1.5 Value and Limitations of Theory

In this paragraph are the main limitations of the used scientific literature discussed with the doubts and relevance on the theory regarding urban planning and economic planning in Abu Dhabi. This is essential to acknowledge when reading the research and results in a greater awareness of the subject, as the limitations are also important lessons to be learned. When acknowledging these shortcomings it is possible to state that this as well the weakness as strength of research. The big scarcity at the scientific literature, field of research and especially the location make this study necessary. With the integration of the empirical findings and various theories it will be possible to give a well-funded answer about urban planning in the Arabian Peninsula and perhaps its future of a new twenty-first century global city.

Anglo-Saxon models and policy in a non-Western environment, however still Western-models
The feasibility of theoretical research is, perhaps, questionable due to the fact that Anglo-Saxon forms of urban planning are analysed in a non-Western, Middle Eastern environment. Such 'consumerist' models may be even questionable in the West and are almost directly implemented in foreign policy, mainly by Western consultancy firms and (urban) planners. This could be, as various authors discuss, a risky process as the principle values are not identical throughout nations, and especially the Arab Gulf and Middle East governments are highly centralized and ruled by a few actors. However, the urban policies and models discussed in Abu Dhabi are Western evolved shifts and therefore presumably Anglo-Saxon forms of urbanization. Moreover, as stated before, little research is done at non-Western forms of urban planning and therefore almost impossible to compare. It is also necessary to acknowledge that many rulers in either the Arabian Peninsula or the contemporary Middle East are educated, and therefore highly influenced, in the West. As is visible when analysing the strong focus on capitalism and consumerism in modern cities like Abu Dhabi and Dubai. Thus, the most legit way to discuss urban planning in the field of research is to analyse the transformations and cities as 'Western cities' with Anglo-Saxon forms of planning and policies. But the region of research must not be overlooked as values, views and policies most likely differ and its urban history differs from its European and American counterparts.

Transformations occur not chronological or in a step-by-step manner

The transformations of urban planning in Abu Dhabi seem to occur in a step-by-step manner. This is however, a far too simplistic view of the recent transformations in the past decades. Moreover, the assumption that Abu Dhabi is a 'freeze-frame' in time or 'instant city' does not accurately describe them. After the discovery of oil the first signs of urbanization were visible and occurred in a largely unstructured manner. But, they did occur. Furthermore, the urban transformations of Abu Dhabi, as I discuss them in this research, are super-branded-mega development (SBMD), followed by the international shipping hub (ISH) and then by the sustainable shift. Necessary to acknowledge is that this is also a simplified model of reality. As appendix 4 indicates, these urban shifts react and even influence each other, resulting in far more complex model. This more unelaborate model of 'three stages' is implemented to make the topic more manageable.

Super-branded-mega development is divided in theoretical influences as homogenization, Disneyfication and the Bilbao-effect; the international shipping hub chapter by theories on the aviation hub and location; and the sustainable shift by ecological modernization and its advantages. The various stages have, perhaps despite the different aims, numerous comparisons and links. For example the main goals SBMD, ISH or EM are in theory significant different, in practice they influence some of the same sectors and strategies. All of three the transformations are heavily influenced by the tourism industry, flamboyant design and 'starchitects' and a result of the collective goal of economic diversification. As the country is a high-income developing country, mainly due to its one-side economic structure, the search to become less dependent on the petro-chemical industry and became a developed nation with the ultimate end goals of being a global city of the twenty-first century. Those shifts and policy statements echo through all transformations and are, when analysing the emirate, visible in all layers of planning; either urban or economic. This strong connection between urban planning and economic planning is essential to acknowledge and both topics (urbanization and the economy) are necessary to analyse in order to explain one of them.

Many, questionable value of literature

When reading this research the image may arise that the amount of relevant literature is far higher than is actually the case. It is striking that there is little literature available for the Arab Gulf and it is even more limited for Abu Dhabi. Even on Dubai, the city that in the past decade became most the recognizable and perhaps the best-known Arab city is less than expected on forehand. Most of the scientific literature that is available is published in 'regional' policy journals, connected with a (semi-) governmental bodies and / or questionable due to a lack of scientific background and, more basic, the amount of grammar errors. However, for all the three transformations or shifts there are at least one or two detailed and valid publications available; with more or less comparable circumstances than Abu Dhabi. For example authors as Acuto, Elsheshtawy, O'Brien, O' Connell, Ponzini, and Vespermann made a huge contribution for the connection between theory and 'theory on the matter'. This in combination with relevant theory of globally known researchers as Harvey, Lohmann, Mol, Plaza, Sassen, and more, improved the relevance of research. However, this is only theory, to make a contribution to the understanding of urban planning and its broad scalar of goals for Abu Dhabi and the region the connection with practices should be made.

Limited 'scope' of cities and airlines

The information used and implemented for the research is far more than expected starting this research. This is (partly) a result of not only a strong inter-linkage between phases of urban planning but also for similar processes throughout the region. Perhaps it is the highlighted bail-out of Dubai by Abu Dhabi that is the best example of the strong connection between some countries of the Arabian Peninsula. The collective order to wide-body aircrafts and regional policy made by the GCC are also noticeable. Besides this connection in policy and government between those cities, the transformations and policy aims in the (broad) region are to a large extent similar and do interfere with each other. The recent focus on becoming a tourist destination due to mega development, branding or the help of aviation is also visible outside Abu Dhabi, Doha and Dubai, and also other cities in the Middle East or beyond. Regarding the aviation industry and the destinations served it could be Turkish Airlines (appendix 6) that will be the main competitor to the three Gulf 'super-connectors', even more than the incumbent carriers of the West.

In other words, it is of great importance when reading this research to understand that this research is primarily on three 'extremes' of the Middle East; Abu Dhabi and to a lesser extent Doha and Dubai. Processes in the Gulf region are sometimes highly similar but not identical, as Abu Dhabi and Dubai indicate in their differing pace of urban generation. However, similar processes are, maybe to a lesser extent, visible throughout the Arab Gulf and beyond. In order to give a full, comprehensive answer about the feasibility of such transformations and the future of the cities it is necessary to research its 'competitors', for both nations and airlines. Due to the inter-connectivity of the nations and links in planning, this is also the case for Abu Dhabi. This research examined its direct neighbouring, fellow GCC nations and presumably main (future) competitors in combination with far reaching theory on the topic. This will give a good image of urban and economic planning in the Arabian Peninsula but to give a 'water-solid' answer is it useful for further research to analyse SBMD on a wider scale, ISH and airlines on a wider scale and differing recent policies as 'the Eco-City', 'Education City' and 'Healthcare City'.

1.6 Goal Definition

The main goal of this research is to give an answer to the pressing question about the future and feasibility about the high-income developing countries of the Arabian Peninsula. As the transition to (post-) modernity and transformations occur rather rapidly it is useful to understand whether these changes are permanent or temporary. Also, why these transformations occur and why now are essential for the further development of the region. Especially relevant when acknowledging that possible shifts in these, perhaps, future metropolis of the twenty-first cities may have far reaching influence on the current distribution of 'global cities'. With an increasing influential Middle East these transitions could have far more impact on the tier 1 cities of today than one might think. However, this is not limited to the global cities alone as it also affects traditional important sectors as the aviation and cultural sector. In order to give an answer regarding urban planning and how its used as an instrument for economic diversification the Emirate of Abu Dhabi is set as the main example. When researching their current or future transformations independently, the goal is to understand them and indicate their characteristics, possibilities, limitations, value and mutual relationship. The aim is to analyze them in theory, link them to economic / statistical data (affiliated sectors), analyze them and eventually merge them to one comprehensive conclusion. As a result these transformations are extensively analyzed, put in a broader context and the set as an example for the Arabian Peninsula. With as ultimate goal, the understanding of current processes and transformations in order to give a well-funded, weighted, image about the future of these perhaps global metropolis and if their diversified economies, by the use of urban planning and development, could be resilient and guarantee a life post-oil.

1.7 Research Objective

This research will examine the current, major transitions of urban planning in Abu Dhabi and with a specific focus on the diversification of its economy. The focus is especially, but not limited to, the most recent shifts, namely: super-branded-mega development (SBMD), the international hub (IH) and the sustainable shift (or Ecological Modernization; EM). The relatively young metropolis implements these strategies to become less oil-dependent and to reform its one-sided economy. Due to extensive urban and infrastructure projects the emirate tries to re-create, or possibly even create, a global city of the twenty-first century. In their goal of diversifying its economy the emirate focuses mainly on tourism (SBMD), transportation (ISH) and energy innovation (EM). This latest transformation differs from the previous ones, as it isn't similar to policies on neighboring countries. The objective of this research is to examine urban planning in Abu Dhabi and analyzes the cities, or emirates, policies and economy. In order to do so the three main phases of urban planning are examined and compared to each other. This is done in order to understand the motives, goals and the feasibility of each individual shift. The sustainable shift, as the latest or future urban planning phase, is not directly visible in the (statistical) data and therefore limited to an analyses of policy and theory. This has as result that SBMD and ISH are the main topics of this research, were both phases have either dissimilarities or similarities (such as tourism). Relevant for the data research and the analyses of the related economy industries or sectors is the financial crises of 2008. For, perhaps, the first time it is possible to discuss both planning shifts in economic terms, or in other words in financial resources. This ensures that a direct comparison can be made on both subjects. Especially seen the inter-linkage between economic planning and urban planning, or urban planning as an instrument for economic planning.

1.8 Research Questions

The goal of this research is to provide an explanation about the current transformations in urban planning of Abu Dhabi. Central in this goal is the aim to give an answer to the 'why-question', why is this transition happening and why occurs it at that specific moment. When analyzing policy, theory and data it is possible to give a well-funded answer about this rapid developments that are not only relevant for Abu Dhabi but also for the Middle East, Africa and even cities in Asia.

The title of this research is ''Urban Planning as an Instrument for Economic Diversification in High-Income Developing Countries of the Arabian Peninsula: the case Abu Dhabi''. When decomposing this sentence multiple relevant questions arise.

The main research questions:

1. How is urban planning used in Abu Dhabi as an instrument for economic diversification?
2. Why the shift from super-brand-mega development (SBMD) to an international shipping hub (ISH)?
3. Why the shift from an international hub (IH) to the sustainable shift (theoretically)?

These main research questions could be separated in multiple sub questions:

- What is super-branded-development and how is this reflected in academic literature?
- How is SBMD visible in Abu Dhabi and in their policy?
- How is SBMD visible in Dubai, the precursor of Abu Dhabi, and what lessons could be learned?
- What are relevant industries or sectors for SBMD and how did they react to the financial crisis?
- What is an international shipping hub and how is this reflected in academic literature?
- How is the ISH visible in Abu Dhabi and their policy?
- What are relevant industries or sectors for ISH and how did they react to the financial crisis?
- What are the latest developments in the aviation industry?
- How performs the national airlines of Abu Dhabi (Etihad) in comparison with its competitors Dubai (Emirates) and Doha (Qatar Airways)?
- What is the sustainable shift and how is this reflected in academic literature?
- How is the sustainable shift (or Ecological Modernization) visible in Abu Dhabi and their policy?
- Why are these urban planning transformation implemented in urban planning?
- What lessons can be learned from Abu Dhabi and are relevant for the Middle East, Africa and Asia?

2 Theory: Super-Branded-Mega-Development

In the last decade, researchers and policymakers have paid greater attention to the role of famous designers' pieces of architecture. This is nowadays not limited for regenerating urban areas but increasingly for defining a positive image in the global competition among cities. When taking into account the background of economic changes this rationale assumes that the use of 'starchitects', or globally known architects, could give an advantage to the city in numerous ways. As a result cities now compete by signature architecture without, often, regard to their context, size, role in global market and urban effects. Although moderate success in urban generation, tourist attraction and economic development (examples will be given in this chapter) is visible; the high expectations of policymakers and rulers are often not met. This urban planning methodology, which Ponzini (2011) called super-branded-mega development or SBMD, is clearly the case in Abu Dhabi. In their policy, Vision 2030, a direct connection is made between this type of planning and for instance tourist attraction and economic development. The following chapter will focus on SBMD, or second phase in urban planning of Abu Dhabi, at both the positive effects and the negative effects, or pitfalls. This is necessary as this ideology is obviously not limited for Abu Dhabi or in fact the Arabian Peninsula. The chapter will give theoretical knowledge of scientific literature relating SBMD, zooming in on processes in both the region and Abu Dhabi, and finally discuss the lessons that could be learned in Dubai, United Arab Emirates.

2.1 SBMD in contemporary (urban) planning

Megaprojects as urban development and contemporary architecture became more and more significant for (regional) image creation, city branding and real estate marketing. Moreover, in the global world of the twenty-first century, this is now visible in many global, but also second and third tiers, cities. Due to innovations in communication and production technology, thus reducing delocalization and demodulation dynamics, cities created a new in integrating innovative production and in providing specialized services. This transformation is not limited to metropolitan area but also for centers of global flow of material and immaterial good, typical of post-industrial markets (Sassen, 1994). By the general background and changes in Western society (e.g., focus on leisure, culture, entertainment and tourism; open society) and global economy (e.g., knowledge-based economy; focus on services) and (Florida, 2002) policy makers started branding cities through attractive images, cultural amenities and spectacular architectural artifacts (Ashworth & Voogd, 1990). These cities compete by using urban development, or urban planning, as political and economic engines to attract ''production and workers''. Harvey (1989) noted a connection between entrepreneurial tendencies in city management and the presence of post-modern architecture, conference and retail centers, cultural and entertainment facilities and of sites for hosting sports, expos or other spectacles in potentially de-contextualized facilities. Which all could be indicated in Abu Dhabi. Moreover, the creation of such spaces and the economic appreciation of their real estate have become increasingly important (Harvey, 2002). However, large-scale projects are not a new formula for infrastructure and for developing large areas in a city (Flyvbjerg et al., 2003); the dramatic problems related to such projects due to various kinds of political and economic constraints, uncertainties and unbalanced effects have been widely acknowledged (Flyvberg, 2005). The use of cultural attractors for improving urban development is a more recent shift, and it has often been translated to spectacular artifacts and iconic buildings of star architects, or 'starchitects'.

Globally, cities apparently compete to collect new pieces of architecture as if they are pieces of art, sometimes without their meaning and function, and (as jus mentioned) even second and third tier cities have often followed this strategy as well. An international well-known, and relevant for Abu Dhabi, example is the flagship project of the Guggenheim Museum by Frank Gehry in Bilbao. As this was interpreted as the supposed trigger for a far broader process of branding and revitalizing the city, see figure 2-1. Furthermore, the number of urban and infrastructural projects appeared in later years designed by stars such as Foster (Masdar City, Abu Dhabi), Novel (Louvre, Abu Dhabi), Koolhaas (Waterfront City, Dubai) and Calatrava (Crossing Bay, Doha) appears to be rising in the Arabian Peninsula and beyond. However, a closer look at the process of economic development shows that this view is too simplistic (Ponzini, 2010). The examples of star architects designing spectacular megaprojects are countless, although not always as successful in urban regeneration, tourist attraction and economic development as policy makers tend to believe (Rybczynski, 2002). But needless to say, the Guggenheim Bilbao and the ''Bilbao effect'' had a tremendous effect on urban decision makers, see 2.2.3 ''the Bilbao-effect''.

The rising ''capital of consumerism'' could count on enormous economic resources, such as flamboyant sport stadiums and facilities, iconic office towers and hotels, various projects designed by international firms, and in the subsequent accumulation of SBMD (Adhan, 2008). In addition, also noticeable are the 'branded' Olympics, European Capital of Culture, Football World Cup (i.e. Qatar 2022) and World Expo (i.e. Dubai 2020) developments that have been built in cities around the world and tend to be affected by little limitations. Significant economic resources are available and contributions are available for development projects and master plans. Although success in urban regeneration development could be achieved, the special economic and planning power required could not be justified when taken the inadequate or even paradoxical urban effects into account (Ponzini, 2011).

Potential, perhaps negative, side effects as urban landscape homogenization could result in marginal increases in tourist attraction, relative short-term economic effects but a long-term binding of (cultural) resources. This may be not only contrary to the collective goals but also to the interests of promoters of such interventions as discussed in this chapter. The acknowledgement of such effects is however necessary for a better and more comprehensive understanding of the urban issue, and which is relevant for urban planning and that requires the avoidance (or minimizing) of use of isolated cultural artifacts (e.g. flagship projects) and require studying of urban development processes in combination with such large-scale architectural projects. The use of ''legitimizing narratives and discursive constructions'', such as the discussed Bilbao-effect, are central in modern democratics to mobilize the population and interests in urban development (Swyngedouw, 2006). Abu Dhabi is certainly, but not ''limited to'', a capital city that uses megaprojects and spectacular at the core of urban planning and on a massive scale for global marketing purposes, even when compared to the rising capitals of Asia (Kong, 2009). While in most nations the political and institutional complexity is growing, in Abu Dhabi's urban planning, decision-making and implementation is limited to a small number of policy makers. In the emirate there are enormous capitals available, which are concentrated in small and cohesive networks. Analyses of such urban projects in Abu Dhabi's rapid urban development and economic shows critical limits of megaprojects coupled with spectacularized architecture, especially in a society without feedback. Without such feedback, possible effects as homogenization and Disneyfication are not fully taken into account. In the following paragraph are the possible (side-) effects as homogenization, Disneyfication and the Bilbao-effect briefly discussed.

2.2 Large-scale development projects and star architecture

The marketing of (urban) project in Abu Dhabi and the link to Western planning and architecture is evident. Urban development decisions are almost completely done by developers or their Western consultants, proposing simplified master plans for complex development processes. The goals of economic diversification needs to establish huge capitals in the real-estate market and for future development because of the higher value of localized capital (with the help of star architecture), the higher value that the government could realize from international financial resources for future investments in urban and local development. However, this may also incorporate risks as can be seen during the real estate crisis in Dubai. An important limit is the overall credibility of such development projects, which are guaranteed by the presence of international organizations and cultural institutions. Abu Dhabi seems to be boosted by the spectacularization of star architects work, were this kind of development in a weak urban planning framework aims for an increase in the value of desert areas. Furthermore it includes long-term mechanisms of rents and the revenues for the retail, hotel and residential sector will presumably benefit from the positive effects of the cultural and entertainment amenities (Harvey, 2002).

The ''Cultural District'', as discussed in the policy chapter, and many other large-scale projects are linked to the image of the nation and strengthened by the ''artistic aura of international iconic architecture in a contradictory way'' (Sudjic, 2005). Generally, (global) cities have hierarchies and ranking resulting from the long-term accumulation of culture and their reputation. This could be, despite massive investments in cultural services and spectacularizing the urban environment, difficult to change in such as short time period. When assuming that global economic and tourist flows depend on the localization on one spectacular cultural facility it is essential to acknowledge that the creation of more of less homologous functions or designer pieces in different cities will reduce the flux at a given place (Plaza, 2000). More generally, the multiplication of more or less similar aesthetical artifacts over the world have had and will have the paradoxical effect of internationally homogenization the urban landscape, while individual cities

expect to distinguish themselves by hiring a star architect and creating a spectacular and unique place (Muñoz, 2008). This paradoxical effect could certainly be observed in the Arabian Peninsula. With the use of famous design architecture and the effect of homogenization such cities could become, as Bryman (1999) called it, disneyzated.

2.2.1 Disneyfication

In their search to become a global city, twenty-first century metropolis are often engaged in a rivalry for many different geographical scales. This is however not limited to the global scale, such rivalry is also visible on a regional level in the Arabian Peninsula. That Abu Dhabi is not immune from such endeavor is an understatement as the emirate undertook an impressive urban regeneration in the past decennia in a rather explicit to become a ''novel New York'' (Acuto, 2010). This viewpoint is clearly visible in contemporary urban planning in the present evolution of the city, indicating how a centralized and hyper-entrepreneurial approach characterized the development in an attempt to rise in the ''world urban hierarchy'' and establish itself as the image of the twenty-first global city, were iconicity is only of part of it. Such cities are nowadays far from having developed more than just an attractive technique to attract and create temporary attachment. The emphasis on symbolic power and global iconicity without taken into account the social dynamics may result in becoming a ''consumerist city'' like Las Vegas of the Middle East rather than a 'new' New York (Acuto, 2010). Instead of following the heavily cited path of Singapore, with a focus on becoming an international shipping hub, the focus on SBMD might turn the cities into immense, glittery, ''disneyzated and super-modern Potemkin villages'' (Bryman, 1999). Perhaps much closer to a theme park than a cosmopolitan hub or metropolis. With the term 'Disneyfication', Bryman points out Disney's near-universality and overwhelming influence over cultural and social landscapes. Emphasizing that different forces of power intersect in different contexts and periods of time, and also demonstrates that locals do not fall into one single category. The almost endemic search for ''super-modernity", the belief that humankind can control all the facets of social experience and overcome every environmental limitation with the application of technology, may have create negative downsides as it creates homologous spaces, which reiterate similar power structures. Especially when homogenization is combined with Disneyfication, as will be explained in the next paragraph.

2.2.2 Homogenization

Urban landscape homogenization could result in a marginal increase of tourist attraction and short term economic effects but the long term binding of (cultural) resources and are not only contrary to collective goals but also to the interests of the promoters of interventions. A better understanding of this urban issue is relevant to urban planning and policy making and it requires avoiding the consideration of isolated cultural artifacts when discussing the use of SBMD. As Muñoz (2008) discussed, ''the impressive result in contemporary cities is the homogeneity of architectural outcomes in the context of different cultural, aesthetic, urban, political, economic, social and institutional features''. However, homogeneity is not solely a result of the generic process of globalization but also the creation and circulation of actors, metaphors and narratives relating the urban impact of spectacular architecture and mega development, and their connection to financial and political mechanisms (Evans, 2001). In other words, the role of the star architect in contemporary urban planning and policy making increasingly concentrates on the designs of urban visions and architectural icons (Easterling, 2005). When assuming that tourist flows depend on the localization of such a spectacular facility, it is essential to acknowledge that the implementation of (more or less) identical, homologous pieces of development in different cities will reduces the flow in a certain place (Plaza, 2000). The paradoxical effect of the international homogenizing urban landscape all over the world results in remarkable identical urban environments while individual cities expect to distinguish themselves by hiring star architects and Western developers (Muñoz, 2008).

Sassen (Sassen, 2013) argues that these homogenized and convergent state-of-the art urban- and increasingly regional landscapes are actually functioning as an "infrastructure." As an infrastructure, these homogenized built environments guarantee the provision of all advanced systems and luxuries needed/desired by the firms and households in leading economic sectors are in place. For example office districts, high-end housing and commercial districts, conventional and digital connectivity, cultural

districts, security systems, airports are all in place and they are all state-of-the-art. Such homogenizing of the urban landscape with a growing range of its built environments mark contemporary urbanization. This is especially so in the case of global cities and global city-regions due to the intensity and rapidity of urban reconstruction in such areas. Furthermore, when acknowledging that this homogenization is a function of economic convergence it is possible to state that these future global cities are all moving in the same direction. In other words they are all moving to the same knowledge economy. Indicating that such homogenization of the urban development could have far greater influence than the urban landscape and directly impacts the economy.

2.2.3 Branding and the Bilbao-effect

In the effort to 'differentiate' themselves these cities rely to a large extent on their image and therefore they increasingly invest in the construction of flagships projects, assertive marketing campaigns and spectacular events (Hall, 2000). However, despite their attempts to differentiate themselves, the cities become less different and more homogenized (Soja, 2000) (Zukin, 1995). They copy each other's focus on branding strategies and try to put themselves on the map due to hosting large international events. This can lead to improvements in infrastructure, political governance, and management of funds and could result in a higher sense of community (Vivant, 2011). This interest in hosting prestigious events is due to the growing recognition that these are effective tools to create city images and brands, both of which are essential prerequisites for repositioning cities (Avraham, 2004). Authors, such as the previously cited Evans (Evans, 2003) consider this practice of building flagship projects (for example Olympic stadiums and museums) risky as branding strategies because of the attention, associated with a new building, seems to dissipate when a new iconic building emerges in a competing cultural capital. Florida (2002) states that "big-ticket" attractions are less effective at attracting creative workers than other kinds of cultural activities. The active intervention against homogenization tendencies and interconnection are identified as critical success factors for urban redevelopment (Hazime, 2011), were several major pioneering cultural construction projects are at the core of this 'intervention'. Therefore this paragraph will discuss the, maybe most influential flagship project of them all, the Guggenheim Bilbao.

Plans to build a stunning new cultural project using a world famous architect of international reputation is not a new phenomenon. These projects are part of a process of image building and intend to convert the capital into regional and global cultural references, to compete for tourists and international recognition. Similar, though not identical, aspirations were held by regional and municipal governments when the Guggenheim Museum Bilbao opened its doors to the public in October 1997. Note that this is not the main topic of this research but the Bilbao-effect has clearly influenced urban planning in Abu Dhabi, as can be seen in figure 2-1.

Figure 2-1 Guggenheim Bilbao by Frank Gehry (left) and Guggenheim Abu Dhabi by Frank Gehry (right)

The Guggenheim Museum Bilbao was in the initiating phase subject of an intense debate as a result of the immense costs of the project and its (presumably) ability to generate wealth in the area. As a result may author have researched the Bilbao Guggenheim and therefore this research will only indicate some of the most important properties. Authors have heavily questioned the effectiveness of such on the use of cultural artifacts based strategies to generate tourism and image branding for a city or local economy (Kunzmann, 2004). Plaza (2008) stated that the use of museums as economic catalysts is only effective under certain, specific circumstances. The city of Bilbao and the surrounding Basque region were affected during the

international crisis of the 1970s, where there was a "reduction of the national economic product, a drastic fall in investments and a significant rise in unemployment" (Zulaika, 2003). Eventually resulting in the industrial decline of the city. With the aim to make the transformation from an industrial to a post-industrial era, where tourism and creative industries may drive economic development, the city of Bilbao planned a SBMD-project as an instrument for regeneration the city. Or, a tool for tourist attraction and to boost the (negative) image of the city. Bilbao developed a cultural strategy of revitalization to achieve, retain and expand their presence in the global financial market (Zukin, 2009). When combining this, the authorities created ''the Guggenheim Bilbao Museum as a flagship for urban regeneration, a magnet for tourists and a tool to boost the image of the city''. Moreover, the massive project was characterized by the contracting of Frank Gehry as an architectural symbol. The Guggenheim Bilbao was created with the aim of contributing to urban development in the area and to provide a new tourist attraction for the city of Bilbao and was not driven by social demand nor a result of the cultural and artistic needs of the country but is was a project that reflected a strategy linked to regional development and urban regeneration.

When the Guggenheim Bilbao opened its doors the project had a huge impact on the city as the city transformed from a grey city to a tourist destination. Catapulted by the museum, Bilbao evolved from a stagnating industrial city to a modern metropolis, which (re-) gained its global recognition. The success of this urban regeneration project showed the importance of culture in the process of revitalizing the city. Were the museum became a tourist landmark (e.g. cultural artifact) and the visitor numbers surpassed the predictions on forehand, which of 80% from outside the region (Plaza, 2008). Regarding the economy of the region, the museum appears to have made a significant contribution to create new employment and media attention has given the city global visibility. As Plaza and Haarich (Plaza & Haarich, 2009) state; ''global media showed that Bilbao was invisible for the New York Times until 1997, and after 1997 Bilbao become visible for both good and bad news''. Essential to promote differentiation and uniqueness is the use of iconic architecture to promote cultural institutions, were part of the Guggenheim Bilbao's success is due to its design of Frank Gehry. The impact of its iconic architecture has become a powerful landmark that has put the city on a global map of icons (Vivant, 2011).

Bilbao is not alone in this search for global cultural recognition and nowadays also Abu Dhabi has entered the stage with its iconic architecture, and forthcoming Guggenheim and Louvre. These cultural building and institutions are brands and essential in their branding strategy. These mega projects are characterized by the ''starchitects'' with international reputations were both the design of the museum and the (Guggenheim) brand help to promote both the museum and the city. However, it is important to notice that a brand and well-known architect do not always ensure success and consistency. Furthermore, such ''starchitects'' (i.e. Gehry, Koolhaas, Foster, Nouvel, and Calatrava) create for itself outstanding developments but are insufficient to ensure success of massive investments and high risks. Several cities and museums attempted to follow the Bilbao-model and success was limited. Guggenheim branches in SOHO, New York, and Las Vegas close already after 15 months. Locating a museum seems not to be enough to create a divers environment and the museum than functions only to enhance its media image will most likely be short-lived (Hazime, 2011). Due to its success and amount of scientific research the Bilbao-effect heavily influenced contemporary (urban) planning. Especially in the future global cities as in the Arabian Peninsula the model is highly visible. Regarding the city of research, Abu Dhabi, the new Guggenheim is aiming for this Bilbao-effect and in order to do so it even contracted Frank Gehry.

2.3 Urban Planning in Abu Dhabi

As discussed before, Abu Dhabi has been recently at the center of newspapers and journals, the precise intention of the city of being the pinnacle of such branded mega projects. This paragraph will discuss this initiating phase and pre-SBMD urban planning briefly and highlight the transformations in policy, followed by an extensive analysis of the perhaps the most iconic cultural flagship project of them all; the Louvre Abu Dhabi.

The transformations in both urban and economic planning are a result of recent shifts in policy. Until 2004 Sheikh Zayed Bin Sultan Al Nahyan, the ''founding father of Abu Dhabi'', used a concrete and simple urban planning policy. Providing the emirate with basic infrastructure and facilities as streets, a stadium, an airport, and millions of palm trees to mitigate the climate conditions. When using a simple, style based classification it is possible to distinguish four trends in urban planning of Abu Dhabi, which in this research

will be grouped to ''post-oil'' or ''post-colonization''. Namely:
1. The generic ''architecture without architects'' consisting of the required office and housing buildings.
2. The 1970–1980s witnessed the interpretation of vernacular styles (for example the Cultural Center).
3. The international style by corporate firms (for example the ADIA headquarters)
4. And more recently some spectacular architectural exponents (Koolhaas, 2007).

With the succession of Sheikh Khalifa bin Zayed Al Nahyan the openness towards (Western) economies and business models dramatically accelerated. This new generation of ruling elite, which is not limited to the United Arab Emirates, had Western education and a strong focus on rapid economic diversification and growth. A series of reforms starting in 2005 implemented new rights for non-emirate individuals and businesses. This partial liberalization attracted foreign investments and resulted in a notwithstanding building urban expansion in both housing and office sectors (partly) due to its weak regulation framework.
The economy of Abu Dhabi is based on a solid oil economy and it is able to develop long-term strategies, leveraging the great amounts of liquidity. In scientific research and the public discourse its urban regeneration is often opposed to Dubai's chaotic development (Davis, 2006). However, as discussed in paragraph 2.5, their transformation occurred in a smaller timeframe. Nowadays this rhetoric is combined with its representativeness of the capitals urban environment and its care with sustainability, see chapter 4. Such as the carbon neutral Masdar City, an 18 billion dollar project financed by the government and designed by ''starchitect'' Norman Foster (Baum, 2013). Note that a clear link is visible between SBMD and this sustainable shift. Elsheshtawy (Elsheshtawy, 2008) indicated notable differences in Abu Dhabi's urban historic, territorial dimensions, population, property rights, cultural orients and pace of (post) modernization. However, strong similarities in real estate strategies with Dubai are also noticeable, despite that the city aims at keeping its traditional position as both the financial and political center of the United Arab Emirates (Acuto, 2010); see paragraph 2.5.

2.3.1 Policy and planning process

In 2008, the Abu Dhabi Council for Economic Development (ADCED), the Department of Economic Planning (DEP) and the Executive Council implemented a policy for the coordination of long-term development of the region. This Economic Vision 2030 of 2008 is highly economic driven and shared common principle relating to the institutional transparency, private sector empowerment, and the importance of sustainability, welfare and public infrastructure in future development. To put this in context, the Economic Vision / Urban Planning Vision 2030 of 2010 (its successor) is a combined policy document by both the Department of Economic Development (DED) and the Urban Planning Council (UPC). The main object is the diversification of its economy towards high added-value sectors, with clear references to the global competition rhetoric. Its dominant mining and oil industry, accountable for 59% of the GDP, should be counterbalanced by sectors as the aerospace and military, pharmaceutical and biotech, media and communication, education and tourism industries (see chapter 9). Especially the tourism sector is highly emphasized with forecasted positive trends in visitors, the airport was expected to double its passenger flow (2005-2010) and visitors should tripe between 2006 and 2013 (ADCED, 2008). This Economic Vision 2030 was an influential document regarding urban development strategies. After its 1980s urban development master plan was completed an international team, mostly Western, of planners development the Urban Structure Framework Plan 2007 in order to ''preserve the sustainable development of Abu Dhabi until 2030''.

The prince declared: ''this plan provides a strong and comprehensive foundation for the development of the city of Abu Dhabi, in a strategic and coordinated way, […] while building a global capital with his own rich cultural heritage''. The plan states: ''Abu Dhabi will manifest its role and stature as [...] a global capital city'' (UPC , 2007) and ''Abu Dhabi's urban fabric and community infrastructure will enable the values, social arrangements, culture and mores of this Arabic community'' (UPC , 2007).

These citations refer to Abu Dhabi as a (future) global city and its development policies provide a strong foundation in order to reveal its future role in a coordinated and strategic manner. Also the social arrangements are mentioned in both statements and focus on the rich cultural heritage of the city. It is disputable if SBMD is suitable with the ''cultural and mores of this Arabic Community'' but clearly this

document is the forerunner of the SBMD transition. These urban and economic visions are important when analyzing these transformations in policy, with the use of EV 2030 and EV/UPV 2030 this phase could be recognized in the policy documents. The most critical aspect of this the 2008 version seems to be the definition of legally binding planning powers, a more transparent and long-term planning process, and creation of an authoritative planning department capable of interacting with the actual urban development processes and actors (the UPC). The plan provided a forecast of population of 3 million in 2030, which strategy of urban development was supported by a public investment of over 200 billion dollars between 2008 and 2013 (Colliers, 2007). The Structure Plan of 2007 expected hotel rooms to double within the first five years and the islands surrounding the city have been assigned tourism related functions. Urban development is supposed to be guided by ten policy statements in the Abu Dhabi 2030 Urban Structure Framework Plan, some structural frameworks and a regulation hypothesis that has no legal power, explicitly waiting for a more specific-planning document, which was later provided by the Vision 2030.

The financial functions and government offices should be concentrated in the Central Business District and in the Capital District, where it is explicitly mentioned that the use of *international iconic and branded architecture* is to express local identity. These mega-development master plans are coupled according to specific interests and are contradicting the statements about new urban expansions to be gradual and continuous with existing areas and the highly valuable island-like plots will be accessible due to extensive new infrastructure. The urban implications of such a planning system are not considered or publicly discussed because, as they state, all the real estate sectors are supposedly undersupplied. However, (the fact) that Abu Dhabi has not yet a full cycle in the real-estate market is not taking in consideration and that a market slow-down phase is most likely possible, also the possibility of scheduling a measured delivery to avoid the risk of oversupply is not even taken into account. This is party because of large-scale development projects in Abu Dhabi's urban development are based on a narrow oligarch system were large-scale projects, or mega projects, are decided by a small cycle of actors. The tactic of attracting footloose investments, tourism and specialized activities in skyscraper or mega-development projects tends to increase real-estate values of other, possibly geographically distant, office, hotel and / or leisure space. In recent years this tactic has been combined with mega-development projects and the use of star architects, or starchitects (Ponzini, 2011).

2.3.2 The Louvre Abu Dhabi

Regarding the Bilbao-effect, the France followed the Guggenheim by setting up a branch of the Louvre in Abu Dhabi. The well-known French architect Jean Nouvel was assigned to design the museum, which is expected to open in 2015. In order to put this in a broader context, the Guggenheim branch is expected to open only one year later. This cultural project is even more extreme as the contract encompasses the entire museum project: from architectural design to collection, curatorship and management. Moreover, during the first 10 years of operation the French national museums will loan hundreds of artworks and organize exhibitions, French experts will help the city to purchase its own collection, train the future managers and curators. With this 30-year and 1,3 billion dollar contract the United Arab Emirates pay for its expertise, art loans and due to a franchise fee the right to use the name 'Louvre'. Furthermore, it will receive 1.3 billion USD to lend the Louvre's name and hundreds of its artworks, as well as treasures from the Picasso Museum, Pompidou Centre, Chateau de Versailles and other French museums (Moore, 2007). It cannot be overlooked that the Louvre Abu Dhabi project has been the subject of criticism, were the French art world has declared the project as an exploitation of art for money and accused the Louvre of "selling its soul" (Riding, 2007) and "renting its patrimony, legacy and heritage". However, France considers its deal with Abu Dhabi as bridging what "the world considers a clash of civilizations" (Moore, 2007) and a way to highlight and promote the image of their country, moreover that it produces a "win-win" situation because the revenue received from Abu Dhabi will be invested in French museums (Riding, 2007). This project illustrates, even more than with the Guggenheim, that enormous financial resources are available to 'copy' an entire, comprehensive cultural branding artifact to the Arabian Peninsula.

It is the goal of Abu Dhabi to become an international cultural destination as it seeks to become a cultural center and in order to reach this objective. The city has already attracted foreign universities to set up centers on Saadiyat Island. As stated by Evans (2003), the museum-name licensing practice is an effective

way for a place to enhance its image, to attract media attention, and to position itself on the global art stage. Moreover, the use of the Louvre brand may also benefit France in term of image making. The Louvre Museum is one of the predominant tourist destinations in Paris, it enjoys an international reputation due to its high level of name awareness, the quality of its collection and the international scope it has, the architecture of the building and its location in an attractive area and the profile its pyramid. All these factors make the Louvre an ambassador to the brand of France (Kotler et al., 2008).

Abu Dhabi is looking to position itself on the world cultural map thereby attracting tourists from all over the globe and enabling it to compete with cities with similar strategies. International cultural brands, when installed in other countries, create their own mutual cultural exchange through the branch network and the institution of origin. The installation of the Bilbao Guggenheim Foundation has opened a gateway for international contemporary art and at the same time has allowed a new collection of Hispanic art to be displayed abroad. The Louvre Abu Dhabi, apart from presenting the best of the French art, will facilitate the installation of a new Arab art collection in France. Thus, the branding of Abu Dhabi is not limited to the emirate itself but also focuses on Europe. In this manner the cultural branding of the new Louvre Abu Dhabi has far greater impact than on the region itself, it could brand the Arab culture in general through Europe.

2.4 Lessons learned from Dubai

The emirate of Dubai is in many ways comparable to it is neighbor Abu Dhabi. As it's precursor Dubai focused on (cultural) branding, mega projects, tourism and their search to become a global city of the twenty-first century long before Abu Dhabi. Moreover, the location of Dubai at the Arabian Peninsula and the environmental characteristics are comparable in both emirates. However, there are for this research some relevant and important dissimilarities between the cities. The emirate of Dubai has a longer trade history, more developed and diversified economy (about 5% oil driven), it witnessed the financial crisis of 2008 (resulting in a real estate market crisis) and the extremes in urban planning are even higher. While Dubai is not the main topic of this research, the lessons that could be learned are vital for the future of Abu Dhabi. Especially since the financial crisis might gave useful insights about the performing of the discussed sectors in the Gulf without the support oil. It is therefore necessary to examine the, for economic diversification relevant economy, sectors and how these industries react in financial crisis in post-oil Dubai. Note that the statistical data of Dubai is also analyzed in the empirical findings chapter.

Similar as the transformations in Abu Dhabi has the city-state of Dubai transformed from a pre-industrial status to a post-industrial society in half a century. Changes are visible in the cultural, social and especially economic characteristics and can be noticed in the pace, scale and natural op urban development (Pacione, 2005). While Abu Dhabi was the federative capital of the United Arab Emirates, the city of Dubai has emerged as both the urban growth and economic center of the UAE and the Gulf-region. Due to its, relatively, 'long' trade history the city should not be seen as a springing up, post 2000, or ''Instant City'' (Bagaeen, 2007). Note that urban developments of the city in scientific literature are often seen as a 'freeze-frame' in time. Their tradition of construction (large) infrastructure development projects started from the 1960s and is implemented in service of Dubai's (region) trading-hub role, for example projects as the large-scale port, airport, airlines, highways and telecom projects (Elsheshtawy, 2004). Notable examples are the Jebel Ali port and the formation of Emirates Airways already in 1985, note that the airline of Abu Dhabi (Etihad Airways) has just been established in 2003. Moreover, with these new infrastructural and therefore economic assets a 'new-economy' as created in the form of a knowledge-based industry, tourism and real estate sector. From the 1990s on the emirate focus, similar to Abu Dhabi, on diversifying its economy and economic activities in order to reduce its dependence on the declining oil reserves.

This result in the 1996-2010 'Dubai Strategic Development Plan' with as main goal to attain the status of a developed economy / country and huge investment were made to diversify the economy, as for example by the tourism industry (Pacione, 2005). Eventually resulting in the position of Dubai as the worlds (top) immigration hub as the city-state positioned this condition as the brand of the new Middle-Eastern metropolis (Benton-Short et al., 2005). Or in other words, the economic assents of the oil resources transformed Dubai from a traditional fishing village on the Arabian Gulf to a modern cosmopolitan city. Were the development planning of the post-oil era is implemented to continue this growth process. However, now without the backing of its petro-chemical sector.

In 2008 the worldwide crisis hit the global market and, despite the diversification strategy, effects recessions and stock markets crashes had a high impact on Dubai (Acuto, 2010). The lower demand for real estate in combination with low oil prices forced, for the first time, a "reality check" on the ambitions of the emirate as foreigners literally fled Dubai (Worth, 2009). As the real estate boom of 2003-2008 is an important of its growth strategy, as it expressed their ambitions to attain the global-city states due to enormous investments in infrastructure to serve its (regional) trading-hub function, the results of the economic crises were significant. Construction slowed down or was put on a hold and properties value dropped after a period of heavily growth by a half. When in 2010 the urban-financial systems of Dubai collapsed this influenced the nature of such (mega) projects. In the face of the global crisis and economic uncertainties the investors and firms withdraw from "the margins of the Arab world", eventual resulting in the bailout by its neighbor and case study of this research Abu Dhabi (Khalaf & Kerr, 2010). Most likely the city will now re-emphasize its (regional) trading and (service) center role based on heavy investment in the aviation, shipping and logistics sector and infrastructure. However, while its real estate developments are now an "economic priority", the city-building practices and models will continue to influence the current wave of global suburbanization in the Gulf, Middle East, Africa and Asia (Bloch, 2010), despite the lessons that have to be learned. Dubai was punished for it's, perhaps, overbold plans and the real estate bubble hides the urban and economic growth in both the emirates as the rest of the United Arab Emirates.

These developments in Dubai (planned, in progress, or abandoned) form a lesson for (global) metropolis and especially for those who focus on economic sustainability. The city is or was an example for symbolic power and global influence without acknowledging the dynamics on the ground and definitely contributed to the wave of "consumerist" or 'Disneyzated' cities (Bryman, 1999). Dubai is a, perhaps extreme, example for the debate on the right to the city (Marcuse, 2009) and will likely influence its capacity to attract international elites and re-shape (global) networks. While the city is undergoing a painful, necessary correction and 'Disneyland Dubai' is gone, its fundamentals are still broadly intact (Molavi, 2009). But it seems that the approach by its rulers is mainly unchanged. The emirate still aims to become a (global) hub and continuous mirroring the model by Singapore on maritime and aviation flows ((Acuto, 2010). As will be discussed in the following chapter, the new Al-Maktoum International Airport is designed to have a handling capacity of 160 million passengers a year, which is as much as Heathrow (London) and Atlanta combined. It national airline and 'super-connector', Emirates Airlines links Asia, Africa and Australia throughout the Middle East to Europe and the Unite Stated will continue to expand its activities (Lohmann et al., 2009). As just mentioned, the regional hub function of Dubai is indisputable and has been achieved over a long period of heavy investing in infrastructure. Trade, its related logistics services, aviation and tourism have all held up better than real estate through the global economic crisis and also the maritime sector has started to recover (Acuto, 2010). The emirate still is the hub for a large region as it is the center of business with a economic and physical environment that is unmatched in the Middle East, Africa and wider. A sustainable economic growth will most likely result in the re-emphasizing of the city's regional trading and (service) center role and will be based on heavy investments in the, previous stated, aviation, maritime and logistics sectors and its infrastructure. Or, as quoted in Khalaf and Kerr (2010): *''Ahmad al-Tayer, the new head of DIFC, argues that the reigning strategy ''is to go back to our core business […] which is that Dubai is a hub for trade, re-export and services''.*

This in contrast to Abu Dhabi that puts far more emphasis on the serving of global elites as they depend on their own financing due to its oil resources and, which partly results in, energy trading in order to learn from the lessons of Dubai (Kerr, 2009). Were Dubai continues its strategy with the focus on mobility, tourism and knowledge-based industries that are primarily established due to its financial and real estate investments. Which, as discussed above, it is questionable it this results in a sustainable economic climate. However, the bailout showed that the running elites of Abu Dhabi and Dubai are inter-linked and it became clear that Abu Dhabi, with its enormous deep oil-rich pockets (US $500 billion), would help Dubai to hold its status (The Economist, 2009). But at the same time is the influence of Abu Dhabi over Dubai growing and the focus of both urban growth and developments shift to Abu Dhabi. Its planners will not copy Dubai's global-city model or strategy, at least in a more measured fashion, but Abu Dhabi may emerge as the competitor to Dubai for its regional business hub function. Or, as stated by Bloch, Abu Dhabi, though, is unlikely to become the new Dubai. Neither will anywhere else in the region (Bloch, 2010).

Page error!

3 Theory: The International Hub

The second transformation or phase in urban planning of Abu Dhabi that is highlighted is the International Hub (IH). Hubs are strategically located airports that serve as collection-distribution centers for passengers and are generally operated by a single carrier. This chapter discusses the relation between the geographical location and the hub airport, an important parameter, and zooms in on recent developments in the Middle East and followed by the Arabian Peninsula. In the Arabian Peninsula three major air carriers, or Gulf 'super-connectors', are challenging the incumbent players on the market through massive investments in both their airports and fleet, especially relating its long-haul capacity. Regarding the main advantages of the hub systems are discussed in paragraph §3.5 and the connecting is made with recent policy and developments in the Arab Gulf.

This network structure is motivated by the economic advantages for airlines, airports and passengers. Airlines could export traffic density and the scope of economies by increasing the traffic density on each route, operating larger aircrafts and thus reducing the costs per unit (Keeler & Formby, 1994). *The travel time increase due to intermediate stops is normally compensated by higher flight frequencies on routes to and from the hub* (Butler & Huston, 1990). *At airports hub, the traffic is scheduled in 'bank' of incoming and departing flights with small time interval between connections, as this chapter will explain in further detail.*

3.1 Theory on the aviation hub

Costa, Lohmann and Oliveira (Costa et al., 2010) state that, in spite of the huge importance of hubs, there is little consensus among academics relating the exact definition of a hub. For example Burghouwt (Burghouwt, 2007) alone provides a list of fifteen definitions from different academics. Nevertheless, it is possible to identify some consensuses in these definitions. Such as the concentration, the concentration of traffic in both space and time means that airlines consolidate operations in order to distribute a traffic of a diverse range of origins to a diverse range of destinations. O'Kelly (O'Kelly, 1998) indicates that ''hub … are special nodes that are part of a network, located in such a way as to facilitate connectivity between interacting places''. Apart from this concentration-distribution characteristic is centrality another key term that is normally associated with hubs (Shaw, 1993). In their paper ''analyzing competition for hub location in intercontinental aviation markets'' Martin and Roman (Martin & Roman, 2004) analyze the competition for hub locations when airlines operate in deregulated intercontinental markets. This whole process is divided into two facets: location and competition. This means that the airline market share will depend on the location of their own hubs and their competitors. Furthermore, Martin and Roman (2004) indicate several factors that must have taken into account when the airline chooses its network structure. That are the number of hubs and where they should be located. Including the potential traffic generating at hub cities, the geographical locations in relation to the served markets (minimize flying costs), well-suited airport facilities that allow optimal coordination (minimize connecting times), good weather conditions for operating the networks, and the location of hubs and the strategic behavior of competitors.

Lohmann, Albers, Koch and Pavlovich (2009) describe in their paper ''from hub to tourist destination: an explorative study to of Singapore and Dubai's aviation-based transformation'' the advantages that Singapore and Dubai achieved in terms of their location and central position by developing a hub network to improve not only air traffic but also tourists to their destinations. Lohmann et al (2009) examined the geographical analysis of the locations of the hubs, were Singapore and Dubai are both centrally located geographically what gives both destinations a comparative advantage. But the location itself is not sufficient to succeed and both governments developed a cohesive strategy in which the importance and goal of the aviation system is clearly visible through government investments and governance. Moreover, both cities developed integrated and complex networks. Hubs were transformed into destinations by the complementary interaction of attractions, transportation and accommodation sectors. This comprehensive strategy resulted in that 'aviation hubs' became a part of modern urban planning and show clear links with 'super-branded-mega development (SBMD, chapter 2).

For airlines operating from a hub, Dennis (1994) identifies three critical operational factors: the geographical location in relations with the markets served, good airport facilities, and the coordination of

schedules; conform Martin and Roma. Both Singapore and Dubai are perfect examples and have managed to divert a significant number of passengers who stop in either of those cities on long-haul routes between Europe, Asia and the Southwest Pacific. Dubai and especially Singapore have both enjoyed first mover advantages in terms of the model they have adopted but other countries that have similar geographical features may gradually reduce this. Regional competitors as Kuala Lumpur (Malaysia) and Bangkok (Thailand) have similar location advantages and are now aiming to challenge Singapore as the premier hub of the regional, or regional hub (Bowen, 2000). Etihad (Abu Dhabi) and Qatar Airways (Doha) are heavily growing and provide competition to Emirates and Dubai (Lohmann et al, 2009). However, neither major carrier operates a pure wide-body fleet and split their operations into regional and intercontinental aircrafts. Both are early A380 adopters but their order are small in relation to Emirates, reflecting their different strategies of not aiming for 'large' numbers of passengers as their governments (Abu Dhabi and Qatar) have a stronger focus on governmental and business travel than Dubai.

To be successful, places need more than just the location, such as well-designed and well-implemented aviation policies and strategies to develop tourism. The study by Lohmann et al (2009) demonstrates how government investment and complex network infrastructure have changed hubs into (urban) destinations. Geographical locations at the crossroads of major trade flows, stability and continuity in political and administrative conditions, coherent and long-term oriented planning and first mover advantages rarely occur in these favorable combinations, but may have the potential to unfold significant economic benefits. Indicating a clear inter-linkage between the (international) shipping hub at one side, and urban planning and (diversifying) the economy on the other hand. As this chapter will discuss further.

3.2 Geographical location

When analysing both the papers of Martin and Roman (2004) and Dennis (1994) it becomes evidently that the (geographical) location is one of two essential facets in the whole process. This geographical relations can than be divided in critical operational factors as markets served, good airport facilities, and the coordination of schedules. Begging in the early 1970s, the Middle Eastern governments have been focussing on the aviation industry as a measure to diversify their industry beyond the future decline in revenues from the petroleum industry. As a result, the region is now on its way to become an international air hub, trying to redirect passenger flows between Europe, America and Asia.

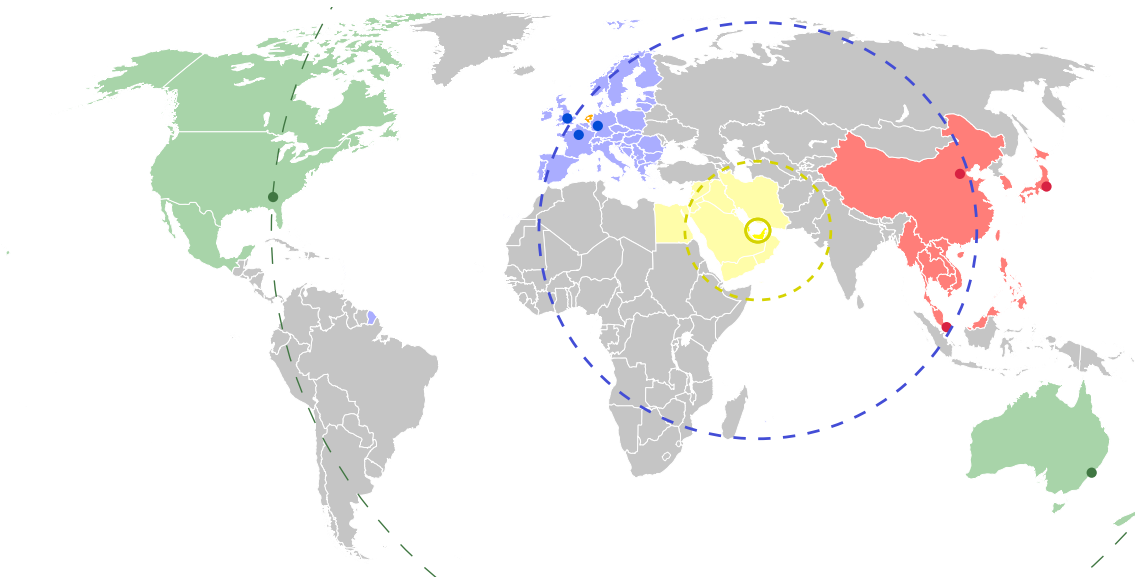


Figure 3-1 The location of the Middle East, Gulf region in particular, in relation to Europe and Asia, and North America and Oceania, and the Netherlands is marked orange. Also the first (6.000 km.) and second (12.000 km.) are highlighted. Source: author.

The Middle East is 'perfectly' located midway between Europe and Asia, and it is reshaping the competitive dynamics of the industry as it is changing the traditional traffic flows. For example 2008 was reputed to be one of the worst years in air transport over the last decade, but the region recorded passenger growth of 7.7% between 2007 and 2008 (Newhouse, 2010). Where especially the United Arab Emirates

and Qatar are particularly in the spotlight due to reinventing themselves as a tourist destination and as a shipping hub, as a strategy that allows them to diversify away from their reliance on the petrochemical industry. The figure on the previous page (see figure 3-1) indicates a few key parameters in one comprehending figure with in the centre of the map the Middle East (light yellow) and the Gulf region, with Abu Dhabi (dark yellow). The first tier (blue dots) shows that the first ring (6.000 km.) contain cities as Singapore (Singapore Airlines) and London (British Airways). The second tier (green dots) shows that the second ring (12.000 km.) contains both Atlanta (Delta Airlines) and Oceania (Qantas). Furthermore, aviation capitals as Paris (AirFrance KLM), Frankfurt (Lufthansa), Beijing (China Southern Airlines) and Tokyo (All Japan Airlines) are highlighted. It is therefore safe to conclude that the Gulf region is perfectly located midway between Europe and Asia. Also it is reshaping the competitive dynamics of the industry as it is changing the traditional traffic flows between East and West. The question is, at which scale is the process happening and how does it translates to Abu Dhabi and the urbanization of the emirate.

3.3 The Middle East

The Middle East comprises of 12 countries (highlighted in figure 3-1): Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen. Which represents about 2.5% of the world population, but has one of the world's youngest populations with a median age of 25 years compared to 42.2 in Western Europe, 35 years in China, and 36,3 in North America (CIA, 2013). Many of the inhabitants that reside in the Middle East are non-nationals; especially the United Arab Emirates that contains the most diversified population, with 85% of the population being non-national residents and the majority coming from the Indian subcontinent (CAPA, 2009). O'Connell (O'Connell, 2006) states that the region's youthful population and large expatriate community are important drivers for air transport demand. The Middle East is synonymous with its petrochemical wealth, as it contains about 65% of the world's oil reserves and 40% of natural gas (OPEC, 2013). However, the Gulf Cooperation Council (GCC) states are the engines of the Middle East and produce some of the worlds highest GDP per capita results.

The GCC has formulated a master plan to prepare for the post-oil era by diversifying the region's industrial base, with aviation being an important contributor, as also can be seen in the Abu Dhabi Strategic Vision 2030. The recent focus on aviation has positively impacted on more diversified tourism segments and, following the strategy of Dubai, cities as Abu Dhabi and Doha are also developing their tourism infrastructure by investing in major development projects. For Abu Dhabi, in line with 'super-branded-mega-development', examples are the recreation of iconic museums as the Guggenheim Art Centre and a Louvre Branch (Mortimor, 2007), and major sporting tournaments such as the annual Abu Dhabi formula one grand prix.

Figure 3-2 Global Focus Sectors (left) and Regional Focus Sectors (right) of Abu Dhabi (UAE). Data 'Strategic Vision 2030', source: author.

These events and projects are transforming the tourism landscape of the Middle East, and tourism is forecasted to be amongst the world's highest over the next 20 years. According to the half-yearly results by the United Nations World Tourism Organization (UNWTO), tourist arrivals in the Middle East increased by

13% in the first half of this year from the same period of 2012. Although air transport has always been the main method of travel among the major distant areas in the Middle East region, international tourism has been the major source of air transport growth in the last 10 years. According to the World Trade Organization (WTO), tourist arrivals in the Middle East have nearly tripled since 1995: from 14 million arrivals to more than 35 million arrivals in only 9 years. Tourism is a key driver of economic growth in the region. The recent focus on aviation has positively impacted on more diversified tourism segment, were the tourism projects has transformed the cities in the Gulf into high quality ''mega-tourism-hubs''.
In addition, cities as Abu Dhabi have attracted a large number of fortune 500 companies, from were they headquarter their Middle East operations, and these cities become are becoming the regions epicentre for conference events and key financial centres. Lohmann, Albers, Koch, and Pavlovich (2009) confirm that cities as Abu Dhabi, Doha and Dubai have become tourist and business destinations, and these entities have a strong effect on the Origin and Destinations (O&D) traffic at these locations, and have gone some towards filling the airport capacity that is being built for the future. But in order to compare the future airport capacity of Abu Dhabi, also in relation to Doha and Dubai, analyses of the demographics and socio economics; assessing the region's air transport developments; and evaluating the key advantages of the hub and spoke operation are necessary(Murel & O'Connell, 2011), as is done in the following paragraphs.

3.4 The Arabian Peninsula

In order to diversify their economies of the Arabian Peninsula, commerce, tourism and transport are used as new revenue sources. The nations of the GCC comprised in 2006 alone approximately 1400 planned infrastructure projects, of which aviation of the most important. The development of this aviation industry is a main part of the overall master plan to transform the region into a global center for commerce and trade (Khodr, 2012). As a result are the regional government strongly promoting, and investing, in the aviation industry, implement destination-marketing campaign and are highly visible at the major 'Travel and Transportation fairs'. Conform this research; the overall aviation growth in the Gulf region is concentrating on Abu Dhabi, Doha and Dubai, when looking at both the demand and supply side of Middle Eastern aviation growth.

Figure 3-3 Abu Dhabi Airport (on the left), the new Hamad Airport (in the middle) and Al Maktoum Airport (on the right)

The growth ambitions of the region are high and major air infrastructure programs (figure 3-3) are already visible. To create this growth, the leading airlines of the Middle East are heavily increasing their fleet and airports. For example, in 2011 the region has approximately 504 aircrafts and an additional 260 have already been ordered. However, at the moment of writing this is already increased (appendix 5). The airlines of Abu Dhabi, Dubai and Qatar (namely: Emirates Airlines, Etihad Airways and Qatar Airways) are responsible for the vast majority of these new ordered aircrafts. And in the coming years they have forecasted to increase its capacity at more than 15% per annum. Well ahead of the forecasted demand and bears the risk of intense competition; further driving down aircraft utilization and overall performance efficiency. Middle East airports have also committed an investment of more than USD 20 billion in airport capacity in the next 10 years and the 10 major airports in the region will receive almost 80 percent of that investment. These investment programs pose serious risks of unhealthy competition and unexpected overcapacity that the region must address. The overcapacity risk is particularly relevant for the region because government support and financing of airports and airlines would mean that normal market forces will be unable to reduce excess capacity in the market in the near term. In addition, tourism growth alone is unlikely to provide a solution in the short-term especially since a significant amount of the region's airports and airlines compete for the same international traffic because of catchment areas overlap and some similarities in the local tourism offerings, as discussed in paragraph 7.3.

3.4.1 Abu Dhabi, Doha and Dubai Airport development

As the Middle East aims to develop a high-quality and highly efficient sustainable aviation system, compared with its growth ambitions, infrastructure investments and presumably overlapping catchment areas, especially in the Gulf-region, this may result in demand cannibalization. Abu Dhabi has recognized the high growth of the airport and put two plans in practice to increase its design capacity. The addition of the new, enormous, terminal building along its second runway will result in an increases capacity by 20 million passengers in the year 2012. Moreover, when completed is the Midfield building between the two runways and two terminals, the airport of Abu Dhabi will become of the major hubs in the Middle East, capable of handling 50 million passengers in 2020 (Airport Technology, 2009). Furthermore, the new airport under construction in Qatar is entirely designed to accommodate the super jumbo, Airbus, A380 and will eventually replace Doha International Airport. However, process is delayed and the completion will not open till 2014. This New Doha International Airport, with the official name Hamid International Airport, is built on reclaimed land, only 5 kilometer of the existing one, and consists of two parallel runways that are located two kilometer of each other, which are designed for simultaneous landings and takeoffs. It was originally expected to open in 2012 and has a handling capacity of 24 million passengers per year, also an extension of the terminal building is adopted as the next developmental project and will increase its annual capacity up to 50 million passenger by 2020 (NDIA , 2010). In Dubai, the new extension of Terminal 3 of Dubai International Airport will increase the capacity to 70 million passengers in 2016 and up to 80 million by the year 2020. In addition, the Al-Maktoum (JXB), which is the future largest airport of the world, built in the region of Jebel Ali between Abu Dhabi and Dubai and will be (expected) be completed in 2015. This project alone comprises the construction of six parallel runways each spanning 4.5 km in length; six concourses and three new terminals could handle a capacity up to handle 160 million passengers (Airport Technology, 2009). This airport business model of the three Gulf airports differs definitely from other region around the world. (Murel & O'Connell, 2011). For example in Abu Dhabi and the United Arab Emirates, sheikh Khalifa bin Zayed Al Nahayan controls Etihad Airlines, the airport authority and the region's aviation policy, whereas in most Western national each is independent and separately controlled entities. The management role allows the both the airport and airline to create cost synergies and this strategy of joint airline-airport ownership results in the co-support of each other's activities. In light of the expected (future) growth in passengers and aircraft operations, the discussed Gulf airports have implemented massive expansion programs. These expansions occur in a relatively small region and in a close proximity; thus increasing the risk of demand cannibalization and overlapping catchment areas. Also, the region will most likely fall short relating the growth of the planned capacity of the Middle East and the additional passengers, even if its realizes the expected growth rate of 7 percent per year. As will be discussed in the data chapter.

3.4.2 The strategy of Emirates, Etihad and Qatar Airways and their on-going development

The ICAO (ICAO, 2013) stated that the carrier of the Middle East produced 5,3% of the global RPK (Revenue Passenger Kilometers) in the year 2007 but only accounted for 3,7% of the global passenger traffic. This numbers show, the higher share of RPK's, the importance of the long-haul operations for these airlines. Two and one of the core competences of Etihad, Emirates and Qatar airways is focusing on this transfer of long-haul to long-haul traffic through their national hubs. Similar to the Dutch KLM, these Gulf carriers lack a natural catchment area to underpin traffic volumes and are therefore forced to develop a strong hub network of connecting flights. What is unique, is that these carrier are not alliance partnership, note that they do have partnerships with KLM (Etihad) and Qantas (Emirates), and expand their own network primarily, which provides their additional traffic to feed their hubs. O'Connell (O'Connell, 2006) discussed that the long-haul capacity of European carriers is largely oriented on the lucrative North Atlantic, indicating an important and visible gap in the Asia-Europe markets, which are as a result filled by the Gulf carriers. Moreover, the regulatory framework within the region is changing quickly as Bahrain, Lebanon, Oman and UAE, for example, have inter-regional open skies policies, while Kuwait and Qatar have open skies with the US. Neighboring India is a huge catchment area for Gulf carriers, and the loosening of India's regulatory framework is providing an opportunity for Gulf based carriers to capitalize on their sixth freedom traffic rights to move additional Indian traffic through their respective hubs.

These Gulf based airlines have forecasted that traffic will surge through their hubs in the coming decades and they have invested heavily by ordering large volumes of aircrafts. For example, were Etihad Airways, Emirates and Qatar Airways have about 60% of the long-haul seat capacity on order than the big three of Europe (Air France, British Airways, Lufthansa) and the big three of Asia (Cathay Pacific, Singapore Airlines, Thai Airways). It is clear that this capacity indicates a major threat to both Asian and European airlines, as the big three Gulf carriers will use this new capacity to gain ground on the primary hubs of their competitor core cities by adding frequencies and at the same time by commencing new routes to secondary cities, but at the same time to each other. If this expansion rate continues, there will be a clear need for additional airport capacity in the Gulf. As a result airport master plans are unfolding in order to handle this surge of expected traffic at Abu Dhabi, Doha and Dubai were the rapid increase in airline seat capacity is similar to the growth in airport capacity, conform 3.4.1.

3.5 The hub and spoke system advantaged for the Gulf carriers

This paragraph discusses the hub and spoke system advantages of the airlines of the Gulf region. Moreover, what determines the success of a hub is integrated in the paragraph. These countries, such as the Abu Dhabi, desire a higher share of global connecting traffic. They want to expand global air passenger and airfreight markets to the Middle East. These goals challenge airports to widen their air transport infrastructures and demand a highly sophisticated and efficient ground infrastructure. Thus, in the figure below is discussed what determines the success of such a hub, see figure 3-4.

What Determines the success of a hub?
Quality of Airport Operations - Balanced land and airside capacity to reduce bottlenecks - Further growth potential and future capacity increase - Low connecting times for transit passengers - Minimum delays as a result of streamlined processes and applied technologies - Business/contract conditions (e.g. passengers and airline fees)
Strategic Traffic Positioning - Size of hinterland area—with intermodal connectivity to increase catchment (accessibility), driven by population and attractiveness for business & tourism - Geographical positioning within the global O&D network - Size and competitiveness of local flag carrier
Political Environment - Deregulation of air traffic (local and international) - Liberalization of traffic rights (e.g. slot allocation) - Limited ownership restrictions - Political stability/government support

Figure 3-4 Hub Airport Success Factors (Source: Booz & Company)

3.5.1 The first advantage of the Gulf's hub and spoke system — the wave configuration

The hub system allows a number of cities (spokes) to be linked to one central hub, with each additional spoke that is added increases the linkage benefits and through services. Due to the combining of spoke-to-hub traffic and transfer traffic at a central hub are these airlines able to offer a wide variety of destinations, with high frequencies, as consolidated traffic at the hub allows the airline to operate synchronized waves of flights. A core competency of these Gulf carriers is their ability to connect traffic at these respective hubs. As around 50% of Emirates traffic is presently transiting through Dubai, while approximately 70% and 80% through respectively Etihad's and Qatar Airways total traffic also transits through their national hubs (The Star Online, 2008). So arrival and departure waves must be coordinated to offer the largest choice in destinations, while ensuring the minimum connecting time for transferring passengers. For example the hub of Abu Dhabi shows waves of flight arriving from the Middle East, Europe, the Far East, Africa and the America's, connecting with the waves of flights departing to other continents. Due to their locations, this geographical orientation of the incoming and out coming flights is a mix of East-West and / or North-South traffic, see figure 3-1. This wave configuration maximized the number of destination, while it also gives the passenger flexibility of choosing their departure time, as there is a greater range of frequencies to each destination, therefore increasing the tourist arrivals (i.e. day trippers). The interplay of economies of traffic density produces lower unit costs of production and the amount of traffic increases.

3.5.2 The second advantage of the Gulf's hub and spoke system — the minimum connecting times

The configuration of Etihad Airways waves is similar to that of Emirates and Qatar Airways. These 'Gulf Big Three' carriers operate synchronized daily banks, or waves, in order to consolidate their traffic and optimize the number of connections and with minimum connecting times. These connecting times between flights are an important characteristic of the hub or airport hub and the minimum connecting times at Abu Dhabi, Doha and Dubai are marginal. For example, passengers from the Middle East have only a waiting time of about 40 minutes on average before flying onwards to Europe. Such short connecting times allow the Gulf carrier to compete with the non-stop flights.

3.5.3 The third advantage of the Gulf's hub and spoke system- the low airport charges

The airport charges in the Gulf-region are some of the lowest in the world. As for example the airport charges of an Airbus A340-600 at Abu Dhabi, Doha and Dubai are around nine time lower than those in Amsterdam, Paris of Heathrow (London) airport. There are no taxes, no environmental taxes, terminal navigational taxes or parking taxes at the Gulf airports, while the security is bundled in the passenger terminal charge. As transfer traffic is an important characteristic of the business model of airports in the Gulf and their carrier, and to support their competitiveness, these airport authorities do not levy any additional charges for connecting passengers. The IATA (IATA, 2008) have reported that airport charges at Abu Dhabi, Doha and Dubai have not increased during the past decade, while the UK witnessed a 23.5% increase in landing charges at London Heathrow airport during 2008/09, which significantly disadvantages British Airways, whose aircraft related charges are four times higher than those of the Gulf carriers.

3.6 Conclusion

When analysing the theory on the aviation hub systems of Abu Dhabi and the Gulf in general; a few important conclusions can be made. Hubs, strategically located airports that serve as collection-distribution for passengers, are mainly operated by one single air carrier, were the process is divided between location and competition. Several factors are relevant for such a hub, such as the potential traffic generating at the hub city, the geographical location in relation to the served markets, well-suited airport facilities that allow optimal coordination, the weather conditions, location of hubs and behaviour of competitors. When analysing similar processes in Singapore, this even extends the focus of the aviation based transformation as the city achieved in terms of its location and central position by developing a hub network to improve not only air traffic, but also transformed into a tourist destination.

These parameters are remarkably striking for Abu Dhabi. The geographical location is 'exactly' between Europe and Asia; the airport facilities are well suited, geographical location in relation to the served markets is good (and has growth potential), weather conditions are good, and the city tries to implement the 'Singapore-model' to improve Abu Dhabi as a tourist destination. However, so are the conditions of its regional competitors Doha and Dubai, making the 'behaviour of competitors' is perhaps the most important parameter for both the nations as its air carrier, Etihad Airways. Comparable to the previous chapter on SBMD, some connections can be made relating development in Doha and Dubai. In both counterparts the investments and extremes are more visible than in Abu Dhabi. It is safe to say that development relating the aviation industry, namely airports and air carrier, occur in a more measured fashion than with its fellow Gulf 'super-connectors'.

4 Theory: The Sustainable Shift

While the sustainable shift is not the main focus of this research this most recent shift will be concisely discussed in the following chapter. As the latest urban planning method of Abu Dhabi to diversify its economy and improve global recognition around the world, the shift connects various policy aims and topics of this research. For example: the aim for a life post-oil, the branded-mega project Masdar City, and its aim to become a global city. As it is latest (future) shift, Masdar has yet to be build, the available (statistical) data it not consistent for this research. However, when analysing the Urban Planning Vision 2030, sustainability and environmental protection are highlighted on almost every page. Moreover, the first signs of this planning shift are already visible in urban planning of the Emirate, with examples as the 22-billion Masdar City project; the establishment of the Masdar Institute of Science and Technology (MIST); the World Future Energy Summit (WFES) held in Abu Dhabi and the decision of the International Renewable Energy Agency (IRENA) to move it's headquarter to the city (Baum, 2013).

As previously discussed, Abu Dhabi's economy is based on a solid oil economy and is able to develop long term strategies, leveraging the great amounts of liquidity as well. In order to wean their economies without all focussing on the same subject, for example the aviation sector, the Gulf Cooperation Council (GCC) created a new phenomenon named 'Specialized Cities (SC). These cities, in addition to being new towns, implement innovations in selected policy areas (Khodr, 2012). Analysing policies, three main policy areas are visible: healthcare (Dubai Healthcare City), education (Qatar Education City), and energy (Abu Dhabi Masdar City). This focus on energy, in particular renewable energy (RE), highly influenced urban planning and is visible in both policy and theory, as the sustainable shift is nowadays a popular and often discussed topic in academic literature. This paragraph will briefly discuss the currently dominant environmental social science, environmental sociology or environmental policy theory: Ecological Modernization (Murphy, 2000). Which could be described as a tool for those who believe in the continuing and sustainable progress of modernity (Spaargaren, 2000).

The structure of this chapter is divided in theoretical paragraphs, policy paragraphs and a paragraph of policy in practice. The theoretical part is necessary to understand Ecological Modernization, its transformations (technological, social, institutional), connection with the environment and production, and the role of the government. Especially relevant information to indicate if the sustainable shift is in fact part of Ecological Modernization and what does it mean for Abu Dhabi. The importance of such policy is analysed for the sensitive ecosystems of the Gulf, enhancing global recognition, and a possible new role of the Emirate. Policy relating to environmental planning and drivers of the Masdar initiative are discussed in order to make a connection theory between and policy. Finally, Masdar City will be discussed to examine and to show the uniqueness of the project in the world.

4.1 Ecological Modernization

Ecological Modernization or EM has in recent year emerged as *''one of the most promising ways of understanding environment-society relationships in affluent countries''* (O'Brien et al., 2007). EM is conform the conventional economic theory of the global market economy, or as Buttel states: *''instead of seeing environmental protection as a burden on the economy, ecological modernist sees it as a potential source for future growth''* (Buttel, 2000) and as Hajer states *''EM is 'basically a modernist and technocratic approach to the environment that suggests that there is a techno-institutional fix for the present problems''* (Hajer, 1995). In other words, central in ecological modernization is the object to increase the environmental efficiency of the economy by reducing the environment damage that is a result of the output. As is shown in policy (chapter 9), a clear link is visible with the sustainable shift of Abu Dhabi.

The possibility of ecological modernization to create a relationship between environmental and economic development is considered by Revell (Revell, 2004). EM could, from this perspective, be an ethos within firms should be encouraged to accept and respond to environmental initiatives in a positive manner. In which the theory is concerned with the societal transformation via the integration of the environment into (production) practice and the relation with the role of governments (Spaargaren & Mol, 1992). These subjects (environment, production, and the role of the government are discussed in the following subparagraphs. In this manner show the social sciences that they could have a valuable contribution to understanding contemporary environmental concern or problems as well as how the could be addressed. It

are not (just) physical improvement alone, but rather social and institutional transformation that have been and still are a the core of much studies on ecological modernization (Janicke, 1990). Or, in order words, it is not only a physical or technological (innovational) transformation but also a social and institutional transformation.

According to Murphy (2000) these transformations can be grouped in five clusters (O'Brien et al., 2007):

1. Changing role of science and technology. Science and technology not only are judged according to their role in the emergence of environmental problems but also are valued for their actual and potential role in curing and preventing them.
2. Increasing importance of market dynamics and economic agents (such as producers, customers, consumers) as carriers of ecological restructuring and reform.
3. Transformations in the role of the nation-state. More decentralized, flexible and consensual styles of governance emerge, with less top-down, national command-and-control environmental regulation. Often referred to as political modernization (Janicke, 1990).
4. Modifications in the position, role and ideology of social movements. Increasingly, social movements are involved in public and private decision-making institutions regarding environmental reforms.
5. Changing discursive practices and emerging new ideologies. Complete neglect of the environment and the fundamental counter positioning of economic and environmental interests are no longer accepted as legitimate positions (Hajer, 1995) (Spaargaren & Mol, 1992).

4.1.1 Ecological Modernization and the Environment. (re-write)

This paragraph aims to determine if ecological modernization could be applied to environmental policy and economic development and to make an effective contribution to (urban) planning in the United Arab Emirates and, to be more specific, Abu Dhabi. How the environment is treated in the ecological modernization theory has been a source of criticism of ecocentrists (''ecological political philosophy to denote nature-centered, as opposed to human-centered, system of values'') that argue that contemporary environmental problems could be explained partly by the failure of modern society to acknowledge the ''intrinsic value of the natural world'' (Hanigan, 1995). Which has been further developed to what became the risk society (Davoudi, 2000). The theory of ecological modernization is vulnerable to such forms of criticism as it tends to view the environment in terms of material and energy flows through both physical and societal systems. Mol and Spaargaren (Mol & Spaargaren, 2000) argue that there are two way of approaching this problem. First, the perspectives of ecological modernization should, unlike ecocentric, not give environmental objective a higher priority than other societal objectives. Consequently, environmental reforms are not for the preservation of the ecosystem also but also on social values. And secondly, the fundamental proposals of the improvement of the environment do not necessarily results in the 'radical' societal changes that are promoted by ecocentrists. Ecological modernization suggests that this is not limited to the environmental forum but also actual social practices and institutions are transforming (Murphy, 2001), see also the five-cluster approach as described above. They argue that as the debate relating ecological modernization (theory) expands there could be new ways in which it can house aspects of ecocentrism. Which is appropriate as the theory concentrated itself in history solely on production and this result in the focus on energy and material flows. Or, *''all that is needed is to fast-forward from the polluting industrial society of the past to the new super- industrialized era of the future''*. This argument therefore simplifies, or oversimplified, ecological modernization theory by focusing on technological change rather than institutional change more generally. As, partly, is the case in Abu Dhabi.

Technology, linked with technology policy and the MIST, is only one way in which the institutions of advanced industrial society could be transformed. Criticism is even less suitable when acknowledged the inter-linkage of ideas between ecological modernization and risk society theories (Blowers, 1997). This produced a more critical approach to technology and, for example, result in discussions regarding institutional change in advanced industrial society that could help introducing a more critical approach to science and / or technology. Ecological Modernization theorist need to deal with such critic, especially now as they make increasingly use of ecological modernization outside the context of Western Europe where it originated, as for example Abu Dhabi and the United Arab Emirates.

As seen by Mol and Sonnenfield there are two, obvious, risks. First, Western academics develop an approach in the Western context that is used as a standard against to assess the relationship between the environment and society in developing countries. Secondly, the risk is associated and involved the use of a Western template to recommend changes and actions in these developing countries. Relevant as early work involving the use of ecological modernization theory outside the context of Europe and advanced industrial countries in general has acknowledged the differences and uniqueness (Mol & Sonnenfield, 2000). However, it is not clear that these studies have taking into account the important implication and that country-specific ecological modernization typologies are being developed.

4.1.2 The ecological modernization of production

In the coming decades ecological modernization will affect trade activities and therefore will also have economic relevance. One of its (future) goals is to establish a relationship with symbiotic and mutually supportive characteristics instead of the traditional relationship between economic and environmental development. The environmental transformation of production is a central part of ecological modernization theory and various comparative studies are done on industries or industrial sectors and the associated environmental problems. Research did also look at the processes of innovation, as innovation is a crucial part of ecological modernization of production, as it is innovation and change that could be integrated into production. Following Dosi ((Dosi, 1988) it is possible to give a definition of innovation as a process that involves: ''the search for and discovery, experimentation, development, imitation and adoption of new products, new processes and new organizational set-ups''. This definition could be useful as it could be applied to both the industrial process (level) and to the site (level), as it covers the implementation of an environmental management system. The difference between radical and incremental change is essential to understand of what the ecological modernization of production means in practice, as incremental changes to existing approaches will reduce the production and radical change may create the space for future (incremental) improvements. Dosi (1988) states that the ecological modernization of production will involve both incremental and radical technological, managerial and broader institutional innovation over time, and these changes could take place at different timescale, from site to national to regional level and beyond. Indicating its possible influence throughout the region, in this case the Arabian Peninsula.

4.1.3 Ecological modernization and the role of government

Research regarding the role of the government in the process of ecological modernization has widespread influenced the political modernization debates (Janicke, 1990). The urgency for governmental intervention to achieve ecological modernization of production could be easily justified, as it is clear that multiple barriers of innovation could prevent the producers of developing and implementing radical new approaches of production, even when efficiency gains could be possible. Such barriers may justify the intervention of governments in order to steer the innovation processes and change, and ensure that procedures overcome them (Spaargaren, 2000). Attempts of governments to influence industrial innovation are being criticized in the past, for both the fact that governments are (often) not in the position to decide on specific approaches and specifying in too much detail what innovations are acquired. However, in order to instigate governments to influence innovations the involved does not necessarily have to be direct (Kemp, 1997). The potential for regulation in this field is two-folded; it could establish the imperative for improvement while, in the same time, improving the capacity of the industries to respond to this imperative.

The establishment of a momentum for environmental improvement is one method how government could put pressure on producers to overcome such barriers of innovation and when necessary to change development plans in order to achieve the environmental targets. Janicke states that it involves the development of comprehensive medium-term and long-term goals for improvement in environmental performance, and this is coupled with wider ''state-of-the-environment'' indicators and assessments, this could then be devolved to the sector and business level. This target setting is important, as ecological modernization is clearly more a strategic than an operational issue (Janicke, 1990). Under such conditions the importance of traditional forms of regulation decline and new initiatives evolve.

As the importance of market-based approaches (i.e. emissions trading markets, negotiating covenants) that include long-term (binding) targets as one technique and has been used and research in Europe. Governments could also emphasize transformation using ecological modernization (theory) in several 'soft ways' via policy documents and even by addressing them in political speeches. Building this capacity to respond to the environmental challenges is a further, and future, role of the government in the process, and progress, of ecological modernization. As Murphy (2001) argues, there are various actions that governments could take at different (policy) levels. For example public investment in R&D (research and development) programs with specific environmental goals is a perfect example, such as the MIST (Masdar Institute for Science and Technology). Capacity building could also involve less tangible but not less important efforts to change the culture of the business and industries rather than management structure and technologies. In general, opening business decision making to a broader range of influence could also be understood as capacity building as it results in a broader range of perspectives to (business) problems (Murphy, 2001).

4.2 Ecological Fragile Environment

This Ecological Modernization (EM) is of importance for various reasons, besides the just mentioned transformations, for example for global recognition, its international role and for the conservation of a sensitive ecosystem as the Persian Gulf. The relatively recent economic and social prosperity that the Gulf has experienced, thanks largely to the discovery of oil and a growing tourism industry, has led to a profound transformation from impoverished small desert principalities to ultra-modern nations with expanding coastal cities. As the countries bordering the Gulf have an annual growth rate of 2.1%, nearly double the world average of 1.1%. Some of the richest countries in the world are found in this region, including the UAE and Qatar, and no other area in the world has experienced this extent of coastal manipulation in such a short time frame. Exploitation of abundant oil and gas reserves has allowed Gulf nations to undergo unprecedented economic prosperity and population growth, but at a pollution cost. The oil industry has been the primary driver of development in the Gulf region and the high concentration of offshore oil installations, tankers and terminals has made the Gulf's marine and coastal ecosystems some of the most threatened in the world by oil pollution (United Nations, 2011). The extreme oceanographic and meteorological characteristics that are found in the Gulf have created a unique marine environment with ecosystems that may be resilient to some stressors, but are low in species diversity and particularly sensitive to certain anthropogenic impacts. The unique nature of the Gulf's coastal habitats and their economic importance to communities has not been well appreciated, and coastal development combined with pollution, habitat destruction, and over exploitation of marine biological resources has contributed to their degradation and loss. For example, 70% of original reef cover in the Gulf may be considered lost and a further 27% threatened or at critical stages of degradation. This ecological problem is essential for the Gulf-region, not only for its living environment but also the (future) tourism industry as this fragile environment could be an important (and unique) driver for future tourist flows.

4.3 New Category of Nation

This research throughout this research, especially this chapter, describes a category of nation whose existence the global community recognizes exists, while opting not to actively involve it in the environmental global debate. The troubled political stability of the region has resulted in environmental issues being given a lower priority than might have happened otherwise. This is less likely to continue as the region opens up and trade sanctions are lifted, presenting commercial opportunities, and the growing influence of high-income developing countries in the Gulf. The research of O'Brien (2007) has identified the characteristics of a new category of nation that the global community, by adopting the analytical framework model, could better understand and integrate. Currently these countries are either disenfranchised or ignored by the global community. Such as Arab nations, who have little if any global recognition, outside of being a 'Middle east country', which obviously does not accurately describe them. The contribution to this process made by recognizing a new category of nation, could be fundamental in according a new global importance to the inclusion of high wealth but developing nations into the global development forum. The UAE meet the criteria of such a new category of nation and is a classic example of a high wealth but developing nations. Due to actively participation in the global development forum, on for example the environment, these countries could improve their global importance and create a renewed image that is more than an ''Arab nation''.

4.4 Eco. Trading Block

Following the previous section above, the need to develop a new trade block within the Persian Gulf region is advocated by this paragraph. The UAE is strategically well positioned to assume a leading role in the development and implementation of new trading agreements whose purpose is to provide a momentum and structure for a new group of trading partners that currently operate as the GCC. As the UAE seeks to fulfill and ratifies its WTO membership it has an opportunity to use its influence in the Gulf region to lobby the other GCC members and to create a new trading block. Within the GCC, the UAE is perceived as an early adopter and an economic success and this gives the UAE a unique chance to assume the leadership role in the creation of a new, 'EU-style', trading partnership with the other GCC members.
Such a trading block would be particularly important in devising economic development policies that address regional ecological concerns and promote regional environmental protection, particularly in the sensitive ecosystem of the Persian Gulf. This is an issue that is currently sorely lacking in frenzied competition, both within and outside the emirates, for becoming the global hub of the region (O'Brien et al., 2007). This policy would improve the global recognition of the UAE and strengthen its image as a global hub of the region, an useful policy instrument to acknowledge its character as a future global city.

4.5 Environmental Planning in Abu Dhabi

The Gulf States are largely dependent on exporting oil and national gas for their national budgets. However, they mainly use domestic fossil fuels for their own energy supply. In spite of favourable geographic conditions, especially for solar energy, renewable energies are still a niche application (Reiche, 2010). Abu Dhabi has one of the worst carbon footprints (highest per capita rates of CO2-emission) and highest water consumption rates in the world. Most of the water consumed is produced in desalination plants, which are energy intensive. Abu Dhabi has now started a process of 'transforming oil wealth into renewable energy (RE) leadership' and has set the long-term goal of a 'transition from a 20th Century carbon-based economy into a 21st Century sustainable economy'. The leadership of the emirate has made the valiant decision to establish a renewable energy (RE) sector to diversify its energy sources and the economy as a whole, were the Masdar Initiative was established to promote this objective. The government has established its first RE policy, with as set goal to have 7% of power come from RE sources and technologies by 2020 (Mezher et al., 2011).

Thus, the federal government of the UAE recognizes that diversification of its economy plays a key role in maintaining growth. According the state of the environment (SOE) report of Abu Dhabi (EAAD, 2007), the main source of air pollution in the country comes from the oil and gas industry, followed by electricity and water desalination production. More than 90% of the water consumed in the country comes from desalinated water, which shows the coupling between energy and water. Natural gas fuels more than 99% of total electricity generation, with the remainder on the basis of oil (ADWEC, 2008). It is noticeable that the percent internal consumption of natural gas is decreasing with time. This can only signal the gas reserve in the UAE is not enough to meet the future internal energy needs of the country. Therefore, the economy will depend in the future on more polluted sources of energy to make up for the gas deficit. Although Abu Dhabi has the petroleum resources necessary to sustain increased electricity production, CO2 emissions will also rise. Note that the UAE and other Gulf states already have the highest CO2 emissions per capita and the UAE has the second highest water consumption per capita after the United States (EAAD, 2007), which indicate that negative path to follow.

4.6 Masdar Initiative; Mission and Drivers

Masdar City has been established for different reasons: Firstly, the project is part of the long-term economic diversification strategy of Abu Dhabi. The economy of the emirate still largely depends on the export of fossil fuels. As fossil fuels are limited, the government of Abu Dhabi wants to prepare the emirate for the post-oil age and make other business competitive. The long term goal is the ''transition from a 20th century, carbon-based economy into a 21st century sustainable economy'' (Masdar, 2009), or in other words ''transforming oil wealth into renewable energy leadership''. Secondly, besides the finiteness of fossil resources, climate change and the growing demand for energy has created a global demand for alternative energy sources. Abu Dhabi wants to benefit from this growing global demand in 'eco-solutions' (Reiche, 2010). With the establishment of a technology industry on renewable energy the emirate indicates ''to maintain Abu Dhabi's position as a global energy leader and to develop into a global center of

excellence for renewable energy research, development and innovation'' (Masdar, 2009). This implies also ''Abu Dhabi's transition from technology consumer to technology producer'' (Masdar, 2009). Finally, from a policy innovation and diffusion perspective, the emirate has the (ambitious) goal of contributing to global policy development: ''Masdar City will provide a blueprint for future cities striving for sustainability and will serve as a model for how all future cities should be built'' (Masdar, 2009).

The Masdar Initiative, as previously mentioned, is mainly designed to pursue the vision of diversifying the economy into renewable energy (RE). The Urban Planning Council (UPC) has developed the ''Plan Abu Dhabi 2030'' (UPC, 2007), this urban structure framework plan is first and foremost grounded in the cultural and environmental identity of Abu Dhabi. The initiative is a multibillion-dollar comprehensive economic development program designed to ''leverage Abu Dhabi's considerable financial resources and energy expertise into innovative solutions for cleaner, more sustainable energy production and resources conservation'' (Masdar, 2008). Stated by Mezher (2011), the Masdar Initiative has four primary objectives):

1. To help drive the economic diversification of Abu Dhabi,
2. To maintain, and later expand, Abu Dhabi's position in evolving global energy markets,
3. To position the country as a developer of technology, and not simply an importer, and
4. To make a meaningful contribution toward sustainable human development.

The findings by Mezher (2011) and Reich (2010) correspond with each other as the different reasons are discussed above. Note the second reason of Reich, namely the ''transition from a 20th century, carbon-based economy into a 21st century sustainable economy'' is connected with the second and third 'objectives' discussed by Mezher.

4.7 In practice: Masdar City

The policy of the Masdar Initiative is by the Urban Planning Council (UPC) and the plan ''Abu Dhabi 2030' translated to Masdar City in order to promote the initiative and to, as they state, to provide a blueprint for all future cities. As Baum (2013) called it the worlds most ambitious, solar-powered eco-metropolis in the middle of the Arabian desert. This eco-city model has in the past decade become a key element of hyper capitalist development. Several recent projects are displayed as 'eco-project', including in the Middle East (such as 'eco-Algiers metropolis'). Launched in 2006, Masdar is probably the first signal of this new type of space produced by neoliberal planning. Design by well-known firm of Foster and Partners, the eco-friendly Masdar can be seen as a new manifestation of the neoliberal city (Barthel, 2010). Obviously the Masdar City project is an iconic mega-project and heavily branded, or as Ponzini (2011) states ''Abu Dhabi's environmental sustainability targets can be superficially stated in the light of the branded Masdar City project, but the pertinent questions regarding immense land consumption have never been raised in the local public debate'' and ''the future virtual city seems to be a government's commodity to be boosted by the spectacularization of star architects' work''. While these statements are valid, the Masdar City project is more than super-branded-mega development (SBMD), as examine in the paragraph.

Masdar City could be described as an emerging global clean-technology cluster and aims to be the world's most sustainable urban development powered by renewable energy (RE). As Baum (2013) stated, the city appears a mirage lying next to Abu Dhabi airport, just across the highway from the Arabian Gulf, in a deeply inhospitable stretch of desert. This intended 22-billion free zone is located approximately 17km from downtown Abu Dhabi and will eventually be home to companies, researchers, and academics across the globe, creating an international hub for companies and organizations focused on RE and clean technologies (Mezher, 2011). However, even this city of the future, backed with huge oil-reserves, was not immune for the financial crisis of 2008 and forced planner to scale back ambitions.

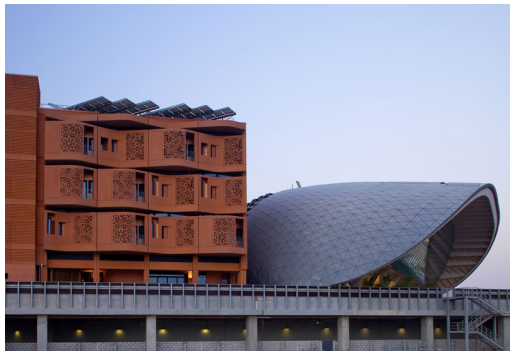



Figure 4-1 When completed in 2025, Masdar City will pack 40,000 inhabitants into two square miles of carbon-neutral buildings (left) and the Masdar Institute of Science and Technology (MIST) in Masdar City, Abu Dhabi (right). Source: Courtesy Foster + Partners

This now 18-billion dollar project (figure 4-1, on the left) will be home for residents and commuters who live the technological innovations under development in the city's laboratories, research centers, and demonstration showcases. An 'experiment' for new approaches to the planning, design, engineering, construction, and operational challenges in creating environmental sustainable cities the project is more than a branded mega-project. It aims for being a blueprint is ambitious but the project will make it at least easier and cheaper to develop sustainable cities in the future. The center will focus on promoting sustainable business solutions the development, and deployment, of new and innovative technologies. Were businesses are able to take advantage of a home- grown research and development center, the Masdar Institute of Science and Technology (figure 4-1, on the right), this 'daughter' of the MIT and a graduate-level academic institution dedicated to the research of alternative energy, environmental technologies, and sustainability (Mezher, 2011).

That Masdar City is more than a heavily branded; prestige project indicates Baum (2013) in his article ''inside the world's most ambitious eco-city''. He states ''critics can complain that Masdar's goals have been tempered, but that doesn't make them irrelevant. If designers had not scaled back during the financial crisis, it would have signalled that the project was little more than a pricy plaything for an oil-rich emir''. Instead, Masdar is bound to real-world economics, which means that it can teach real-world lessons, and the project will rather be a model for innovation than model for development. This focus on innovation of the Masdar Initiative is, when analysing the four primary objects (help to drive the economic diversification of Abu Dhabi; to maintain Abu Dhabi's position in evolving global energy markets; to position the country as a developer of technology and make a meaningful contribution toward sustainable human development), is in line with its goals and could provide useful insights for future urban planning for both Abu Dhabi and the region.

4.8 Conclusion

Various authors rank the sustainable shift, more precisely the Masdar Initiative, under the SBMD-phase. Obviously the project is heavily branded and due to its size easy to call it a mega-development but as this chapter shows, this (future) shift and project is more than that it seems at first sight. As part of the Specialized City (SC) phenomenon it is used to diversify its economy, strengthen its global recognition and improve the role of Abu Dhabi in the world. This paragraph is divided into subparagraphs to analyze Ecological Modernization (theory), the role of the nation state (theory) and policy of Abu Dhabi.

EM Theory: When analysing Ecological Modernization it is possible to state that the sustainable shift in Abu Dhabi highly influenced by this theory. Environmental planning in the emirate is line with prevailing economic growth ideology and see environmental protection as a potential source of economic growth. This is clear in its policy that directly links environmental protection with the goal of diversifying its economy. The government has a main focus on innovation (technological) that EM theory identified as crucial to the EM of production. The government took various actions as market-based approaches and massive investments in R&D programs with a particular focus on environmental goals, for example the MIST. The benefits of EM are however not limited to physical or technological (innovation) transformation and is also crucial for the social and institutional transformation. Were the theory suggests that not only the

environmental but also the actual social practices and institutions are transforming. Therefore it is wise to not solely focus on technological change but also on institutional change more generally. Furthermore, the EM of production will involve incremental and radical technological, managerial and broader institutional innovations over time and different timescales, from the site level to the national level and beyond. This indicates that EM has more benefits than the physical transformation such as political modernization, especially relevant for centralized government structure in Abu Dhabi.

While the benefits of EM are notable it is useful to acknowledge the risks of such urban planning. The way in which the environment has been treated in EM has been a source of criticism from ecocentrists that argue that environmental problems are explained in part by the failure of modern society to acknowledge the value of nature. EM is vulnerable to such criticism, as it tended to view the environmental in terms of energy and material flows through physical and societal systems. Criticism is that technology is only one way in which the institutions of advance societies can transform. Especially now EM theory is increasingly used outside of the context of Western Europe from which it emerged. Two obvious risks are that Western academics develop an approach in the Western context and that they use this to assess the relationship between environment and society in developing countries. The second risk is using this Western template to recommend changes in these developing countries as the application of EM outside advanced industrial countries has acknowledged differences and uniqueness.

Role of Government: The role of the government is in multiple manners an essential part of this process. This role extends from protecting the fragile environment of the Persian Gulf to a new role of the nation-state and a possible leading role in the GCC. As a result of the relatively economic and social prosperity that the Gulf-region experienced, due to the discovery of oil and growing tourism industry, the small desert principalities transformed to ultra-modern cities with expanding coastal cities. Resulting in coastal manipulation and destruction of coastal habitats, important for both the environment and of economic importance for the communities. The sustainable shift, or EM, has the ability to protect this reef and the government of Abu Dhabi could be the pioneer of the region to sustain this ecological fragile environment. Especially when acknowledging that this unique reef could be an important driver for future tourism growth as it a unique selling point of the region. Moreover, this research has described a category of nation whose existence the global community recognises exists, while opting not to actively involve it in the environmental debate. Currently these countries are either disfranchised or ignored by the global community. For example Arab nations have little recognition outside being a Middle Eastern country. Contribution in this environmental debate could be fundamental in according the new global importance such countries and to the inclusion of high wealth but developing nations into the global development forum. Resulting in more global recognition such nations and effectively improve their international image.

The UAE is an important member of the GCC, is well positioned, and seeks to fulfil and ratify its WTO membership it has the opportunity to use its influence in the Gulf region and to create leading role in the development of the region. For example the creation of a new trading block could be particularly important in devising the economic development policies to address regional ecological concern and promote environmental protection, particularly in the sensitive ecosystem of the Gulf. This is an issue that is currently sorely lacking in frenzied competition, both within and outside the emirates, for becoming the global hub of the region (as discussed in chapter 6). This focus on regional ecological concern and the creation of a new trading block would improve its global recognition, the role of Abu Dhabi on the world policy agenda and acknowledge its regional function.

Environmental Policy: While the economy of the Gulf States largely depends on the export of fossil fuels, they are mainly used for their own energy supply. Despite favourable geographic conditions for renewable energies, especially solar energy, Abu Dhabi has still one of the worst carbon footprints and water consumption in the world. Moreover, the SOE-report indicates that the gas reserve in the UAE is not enough to meet future internal energy needs of the country. Although Abu Dhabi has enough petroleum resources to sustain increased electricity production, even resulting in higher CO2-emissions. Abu Dhabi recognizes that diversification of its economy plays a key role in maintaining growth and has now started the process of 'transforming oil wealth into renewable energy leadership'', and has set the long-term goal of a ''transition from a 20th century carbon-based economy into a 21th century sustainable economy''.

The government has made the decision to establish this renewable energy (RE) sector to diversify its energy sources and the economy, were the Masdar Initiative was established to promote this objective. The initiative is a multibillion-dollar comprehensive economic development program designed to ''leverage Abu Dhabi's considerable financial resources and energy expertise into innovative solutions for cleaner, more sustainable energy production and resources conservation''

Masdar City has been established for various reasons. Firstly, the project is part of the long-term economic diversification strategy of Abu Dhabi. As fossil fuels are limited, the government of Abu Dhabi wants to prepare the emirate for the post-oil age and make other business competitive; or the ''transition from a 20th century carbon-based economy into a 21th century sustainable economy''. Secondly, Abu Dhabi wants benefit from the growing global demand for alternative energy sources and in 'eco-solutions'. With the establishment of a technology industry on renewable energy it aims to ''maintain Abu Dhabi's position as a global energy leader and to develop into a global centre of excellence for renewable energy research, development and innovation''. Thirdly, this also implies ''Abu Dhabi's transition from technology consumer to technology producer. Finally, from a policy innovation perspective, the emirate has the ambitious goal of contributing to global policy development. ''Masdar will provide a blueprint for future cities striving for sustainability and will serve as a model for how all future cities will be built''.

Summarizing: When analysing theory on Ecological Modernization, theory of the government and environmental policy it becomes clear that the sustainable shift is in Abu Dhabi more than 'just' a planning shift. Moreover, the Masdar Initiative is more than a branded mega-project as often stated by academic researchers. This latest shift in urban planning is for Abu Dhabi part of its long-term strategy and economic planning. It is to help drive the economic diversification, maintain and expand its position in global energy markets, become a developer of technology and make a meaningful contribution toward sustainable human development. To become ready for the post-oil age and transition from a 20th century carbon-based economy into a 21th century sustainable economy.

The Ecological Modernization theory seems to be especially relevant for urban planning in Abu Dhabi as it directly links environmental protection with economic growth. It is clear that the government focuses on technology and innovation as part of EM of production. For example the investments in R&D programs with a particular focus on environmental goals of the MIST. However, the benefits are not limited to technological transformation as EM indicates similar transformation in the social practices and institutions, and could eventually result in political modernization. While technology is only one way in which the institutions of advanced societies can transform and the application of EM outside advanced industrial countries has acknowledged differences and uniqueness, Ecological Modernization is more than a technological transformation. Moreover, this sustainable shift could strengthen its global position and recognition in the region and world. Abu Dhabi has the power and position to protect the ecological sensitive reef and sustain this (possible) important driver for future tourism growth. Contribution in this environmental debate could be fundamental in according the new global importance of the category of nation. For Arab nations, such as Abu Dhabi, who are either ignored by the global community and have little recognition outside being a Middle East country such contribution could result in more global recognition and influence. Abu Dhabi could u create a leading role in the development of the region and use a new trading block for devising the economic development policy, address regional ecological concerns and promote environmental protection. Especially relevant as this currently sorely lacking in frenzied competition for becoming a global hub of the region.

Concluding, the sustainable shift is more than just an urban planning method. Relevant for initiated effects as technology transformation, diversifying its economy, strengthen its position in the region, and could improve its global recognition of being more than an Arab country and participate in the global development forum. But could also result in positive, non-imitated, side effects as social and institutional transformations, such as political modernization.

5 Theory: Research Questions and Similarities

This chapter will give a reflection on the similarities and collective goals of the three discussed urban transformations, without drawing any conclusions on the subject. In order to do so a brief summary of the main goals of (urban) planning is given and the questions of research answered, solely on theory. The, in this paper discussed, most influential transformations of the past decades of Abu Dhabi and the connection with other high-income developing countries of the Arabian Peninsula are highlighted in the conclusion, chapter 10. It is however clear that Abu Dhabi is at the contemporary urban planning debate, with an increase in global recognition and strengthened position on the world stage, that is influenced by a rapid succession of urban planning forms and massive investments to attain the status of a develop nations with a sustainable economy and environment. As the dissimilarities of these phases or transformations and the excesses are mainly visible, the following paragraph will state the five most importance similarities. Although it is difficult and cannot seen as 'facts' these processes or facets are visible throughout all layers of research and therefore highlighted. Paragraph 5.2 will answer the research questions, as discussed in the introduction.

5.1 Reflection on the similarities

Besides the dissimilarities that are visible in the theoretical chapters, the various phases or transformation of urban planning have multiple similarities and identical aims.

Economic Diversification:
The aim to wean their economy is visible throughout all layers of policy. The goals to become less oil-dependent become a developed nation and ultimately become a global city of the twenty-first century. In order to 'help drive the economic diversification of Abu Dhabi' and gain more global importance in the highlighted sectors.

Tourism:
While not directly visible in all phases of urban planning, perhaps the most influential driver of urban transformation. With the signing of starchitects, cultural artefacts and mega development the city tries to attract large sums of visitors. Due to the focus on the hub function of Abu Dhabi, both regional and international, it tries to make its airport a destination on its own and attract more (transfer) passengers due to its air carrier Etihad Airways. Even one of the drivers of the sustainable shift, with its iconic mega 'eco-city' project, it's to attract a new category of tourists.

Global importance:
The goal of gaining global recognition is, related to economic diversification and tourism, noticeable in all chapters. With SBMD it is the aim to improve recognition due to for example heavily branded sporting and cultural institutions to move up the global ladder. ISH tries to improve global importance through the creation of an international hub a la Singapore and become a major transfer point in the region. Moreover, the sustainable shift to 'expand the position in global energy markets' and become a new category of nation.

Designer artefacts:
All three stages of urban, and economic, planning go hand in hand with the signing of starchitects and mega development. Were SBMD focuses on heavily branded mega projects as the new Louvre and sporting events as the Formula One circuit, ISH on mega projects as the new airport and port, and EM on for example Masdar City, the heavily branded mega project by starchitect Norman Foster.

More measured fashion:
All of these transformations are in the eyes of the West most likely extreme and arbitrary but the collective goals behind it are clear and far less extreme than by for instance its neighbour Dubai. This more measured fashion of urban planning is across all sectors visible. Developments relating SBMD are less extreme and less focussed on the extensive increase of real estate value, the national air carrier grows in a more measured and sustainable manner than Emirates and Qatar Airways, and the budget of Masdar city is lower as a result of the crisis. Indicating that it is not a 'toy of the Sheikh' but influenced by real market transformations.

5.2 Research questions (theory)

With this all in mind (the doubts and relevance of data) it is possible to answer multiple of my research questions, at least the theoretical (sub) questions. Firstly sub questions regarding the theory will be answered; the data analysis chapter will be discussed in chapter 8. When all these questions are answered, all full comprehensive answer could be given about urban planning in the Arabian Peninsula, and to be more specific Abu Dhabi.

1. How is urban planning used in Abu Dhabi as an instrument for economic diversification?

Examining the various planning shifts in urban planning and scientific literature of the Arab Gulf it is definitely plausible to state that urban planning is at the core of economic planning, and therefore the economic diversification, of Abu Dhabi. All transformations in urban planning, which are highlighted, in recent decades are primarily aimed to wean their economies in order to become less oil-dependent and a developed country. This is visible in all layers of planning and assembled in the policy document Urban Planning Vision / Economic Planning Vision 2030.

Many authors, for example the Oxford Handbook for Economic and Urban Planning, discuss that economic planning could be at the core of urban planning but a direct inter-linkage as in the Gulf is highly unordinary. It is, presumably, partly possible due to centralized policy making and a limited number of actors but it 'works' in these former pearl and fishing villages. Cities as Abu Dhabi and Dubai are transformed to (future) global metropolis of the twenty-first century, as is their ambition, and most definitely witnessed enormous developments in recent year, in both their (urban) environment and global recognition. This global recognition or influence in the public domain is a centrepiece of urban planning and interwoven in all three stages of 'urbanization'. SBMD focuses on starchitects, mega development and active (cultural) branding with the attraction of designer artefacts, (sporting) events, (cultural) tourists and aims attract for example Fortune 500 companies. ISH focuses mainly on the aviation sector in order to create Abu Dhabi as a regional or international hub and install their airport as a destination on its own. The sustainable shift, while slightly more concealed, has besides environmental goals sincerely the aim the make a world contribution (therefore gain global recognition) and to become less dependent on the petro-chemical sector due to investments in ecological technology in order to sustain its leadership in the energy sector, also when oil runs out. Moreover, all analysed urban planning shifts and connected industries focus (in theory) on the tourism sector; attract sporting or cultural visitors, attract visitors due to a regional or international hub function, and attract possible (future) 'environmental' tourist. Note all shifts go hand in hand with famous designers and architects.

It is most likely that the discovered urban phases in Abu Dhabi are correctly described and that the connected 'definition of the shift' describes the transformation adequately. With the analysis of such a complex subject with large volumes data this is, when answering the questions, in my opinion the 'deal breaker' but all urban phases and definitions are backed with discussion in scientific literature. As proved, at least in theory, possible to give answers about economic planning in Abu Dhabi when analysing the urban environment and infrastructure. The assumptions on forehand are backed with contribution of important authors, both on 'general' theories and specific on the subject of research, which strengthens my first main questions regarding urban planning as an instrument for economic diversification. But it is important to acknowledge that the process could also be the other way round. It is possible that the economic planning is made and urbanization or urban planning occurs. However, this is as this is explained in the theoretical literature this is not likely and it seems to be exactly the opposite.

2. Why the shift from super-branded-mega development (SBMD) to an international shipping hub (ISH)?

With the analysis of theory, especially the Bilbao-effect, it is possible to state that SBMD has positive effects on both urban and economic planning. This phase could attract (cultural) tourists, improve global recognition and most certainly highly affects the urban landscape. This urban shift is in the current climate and far reaching influence throughout the Middle East but also Africa important to research. Particularly when acknowledging that there is remarkably a big scarcity of research at this topic. SBMD has, as just mentioned, an enormous impact on the urban environment and on various levels of planning. For example on the society when 'old' districts transform in excesses affiliated to of mega projects. This form of planning has besides these effects society, as it may indicate a reducing link with 'the city', itself some

possible implications for the future, and on various scales. Effects such as homogenization or Disneyfication are very real and not only on the city level but also on a regional scale. In order to position itself in the global, consumerist, world such cities try to attract tourists and businesses by transforming their city with glittery architecture on a different scale using mega development projects. The effect of one iconic masterpiece with the addition of a cultural brand, for example the Guggenheim, could be far reaching as the Bilbao-effect has proven. However, when collecting many of these pieces, the effect of the 'first one' may devalue or even become marginal. This is definitely a possible risk for Abu Dhabi as these developments occur on a massive scale and it is not limited to the United Arab Emirates but occurs throughout the Arabian Peninsula. Resulting in the homogenization of the city but also the region, with the risk of becoming more a Vegas-like, Disney Dubai, city than the attempted goal of being like New York.

Relating this processes in Dubai, authors have analysed 'recent' processes in the emirate and indicated that this did not worked out as planned. The financial crisis of 2008 and following collapse of the real estate market had a tremendous effect, eventually leading to the bailout of the city. Note that Dubai is often seen as a recent, instant city but in fact has a relative long trade history. While this should be a major wake up call; authors indicate that this city continued largely their previous urban and economic path. The transformation of Abu Dhabi occurs in a more measured fashion and learns form the lessons of its precursor and neighbour. Studies show that the transportation, trade and to a lesser extent tourism all hold up better than real estate during the crisis in Dubai. As the economy is more diversified, and therefore developed, this could give a preview of the future of Abu Dhabi. At this moment Abu Dhabi has primarily a one-sided economy and it as a result highly influenced by fluctuations in oil prices.

There is remarkably little research done at this processes and when it's done, it is on Dubai. Therefore it is useful to examine the statistical data of Abu Dhabi to give well-funded answers. Moreover, the statistical data of Dubai is analysed to see if these allegations are true and to give an insight in the future of Abu Dhabi, when its economy is diversified but oil runs out.

3. Why the shift from international shipping hub (ISH) to the sustainable shift?

Regarding theory on ecological modernization, this policy shift could have multiple positive effects on the city. Besides ecological modernization effects may be visible in political modernization and societal modernization. The main goal of this urban planning phase is most likely, again, economic diversification. The aim to sustain its position as (future) key player in the energy market and (re) position itself in the global forum. For example the Masdar Initiative aims to help such economic diversification, maintain and expand the position in global energy markets, positions itself as a developer of technology and make a meaningful contribution towards sustainable human development. Notable is that also this shift is connected with tourism and image branding due Normal Foster as the architect. All of these recent developments are part of economic planning but have also far broader implications. Such as the protection of the ecological fragile environment of the Persian Gulf, the improvement of global recognition (outside being a 'Middle East' country) and eventually may leading to a new category of nation. Moreover, such ecological block could result in an economic trading block as the European Union did in the past decades. This gives the United Arab Emirates an unique chance to assume the leadership role.

In theory, data is unfortunately, this most recent transformation in urban planning has the possibility to implement a truly unique model in practice. While SBMD and ISH are in some excesses unique, these forms of urban (and therefore economic) planning are adjusted forms or copies of 'older' planning. The sustainable shift is still a largely undiscovered field and here lay some opportunities. The could result in a unique city (Masdar), leading role in a future technologies, protect ecological environment (possible tourist attraction), gain international recognition (for example WSEF and IRENA) and could result in positive sides effects as political modernization, society modernization and an economic union with the GCC.

This planning shift as many links with previous forms of urban planning such as the goal to become less oil dependent and tourism (''eco-tourists'' may also overnight in the hotel establishments, arrive at the airport with its national airline and visit museums) but may, perhaps the first time, truly be the unique ''selling-point' of Abu Dhabi and maybe the entire region.

6 Methodology

This chapter will discuss the systematic, theoretical analysis of the methods applied in the field of research and the principles used to acquire and analyse the information needed to give an answer about urban planning and how its used as an instrument for economic diversification in high-income developing countries, and more specifically Abu Dhabi. In order to understand these recent transformations there are three 'layers' of research, namely: theory, data and policy. Where this chapter focuses on the second one, (statistical) data. It is divided in four paragraphs that relating a comprehensive model of research, framework for the positioning of the thesis but focussed on the links between theory and data, case-study (with cases, data and analysis) and, the value and limitations of the used data. Regarding the case-study this is divided in the case Abu Dhabi, reference case Dubai and zooming in aviation / super-connectors.

6.1 Model of Research

The aim of the research is to give well-grounded and documented answer to the main questions, although divided in multiple sub questions. The transformations as analyzed in this research could be decomposed into the following three, theoretical, chapters:

- Super-branded-mega development: chapter 2, discourse analyses of this subject.
- International trading hub: chapter 3, discourse analyses of this subject.
- The Sustainable shift: chapter 4, discourse analyses of this subject.

The theory from academic literature and journals will be compared to the (statistical) data regarding super-branded-mega development and the international hub for both Abu Dhabi and Dubai. With this statistical data it is possible to give an answer relating to policy and practice, or in other words is urban planning (theory / policy) visible in the data. Due to the synthesis of these three layers, or rounds in the model below (figure 6-1) a well-funded and comprehensive answer could be given about the future of Abu Dhabi and the Arabian Peninsula. As can be seen in the model, both theory and policy are compared to the (statistical) data, the outer ring, and this indicates that theory is checked with this data. Also it is possible to connect theories with affiliated sectors due to the strong connection between urban and economic planning. This is done in order to analyze the difference between intended (policy), the motives of policy makers (theory) and practice (data). The most important step as this is conform the dynamics at the ground.

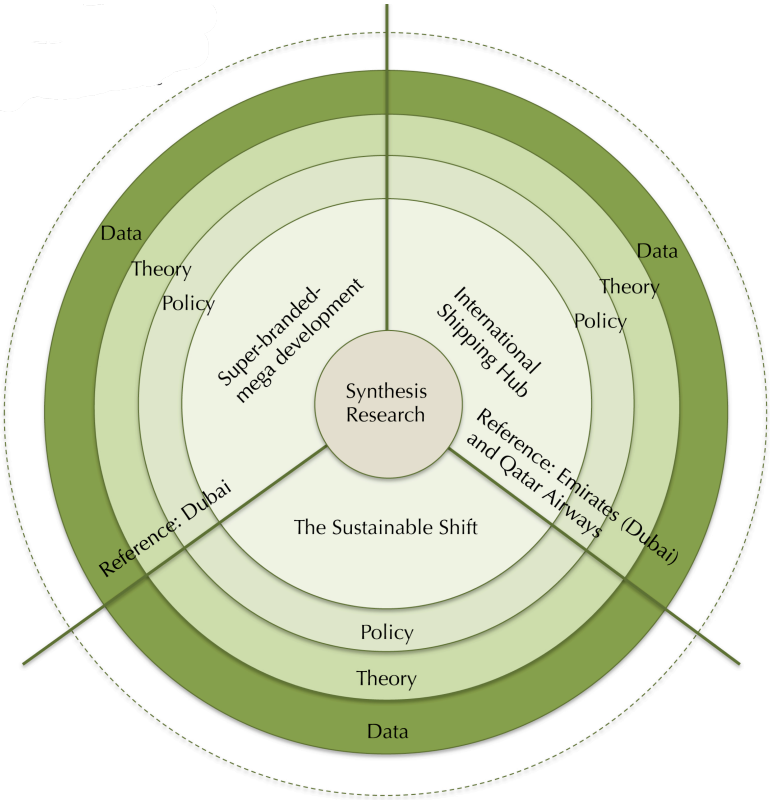


Figure 6-1 This model shows the levels of research in combination with its reference point

6.2 Framework

The framework associated with a particular set of assumptions used to conduct the research, i.e. scientific method, case study, action research. Referring to the research proposal, the most important change in this document is the use of (statistical) data instead of questionnaires (interviewing). As this gradually proved to be impossible so the shift to 'raw' data is made. Due to the link between urban planning and economic planning, and the rather extensive statistical yearbooks this is not at the expense of the end result and both policy and theory are linked to data. As can be seen in table 6-1. Also is the case of Dubai implemented as a reference case in order to broader the field of research / data and to be able to compare either the cities or emirates. Moreover, as Bloch discussed and analyzed some sectors of Dubai in his article ''Dubai's Long Goodbye'' (Bloch, 2010) the opportunity arose to compare both outcomes. However, this research was on a much smaller scale so deepening of the topic and the addition of the most recent sustainable shift was necessary. Relating the international hub, specific aviation data of airlines and investments is implemented to given an answer about the feasibility of the international hub. Besides Etihad (Abu Dhabi), this is due to the remarkable inter-connectivity between the major Gulf-airlines (or super-connectors) extended to Emirates (Dubai) and Qatar Airways (Qatar) as the mutual agreements of the GCC showed by the collective orders of aircrafts (Khodr, 2012). As there is only theoretical information of the sustainable shift, these aviation data is necessary to indicate why such a shift or transformation would be recommended, or if would be recommended at all.

Policy	*Theory (discourse analyses)*	*Data*
Planning vision 2030 Policy / Urban Structure Framework	Super-branded-mega development - Star architecture - Bilbao-effect - Homogenization Influence of the Gulf-model Lessons learned from Dubai	Statistical data Abu Dhabi: - Economy (share, trade, and investments) - Industries (construction, real-estate, and the hotel sector). Statistical data Dubai: - Economy (share, trade, and investments) - Industries (construction, real-estate, and the hotel sector). Compare data of before / after the financial crisis.
Planning vision 2030 Policy	International Shipping Hub - Aviation hub - Geographical location - Development in the M-E - Development in the Gulf - Advantages of the hub	Statistical data Abu Dhabi: - Economy (share, trade and investments) - Industries (transportation, aviation, maritime and the financial sector) Statistical data Abu Dhabi: - Economy (share, trade and investments) - Industries (transportation, aviation, maritime and the financial sector) Compare data of before / after the financial crisis. Data location (important airports east-west) Data demographics and socioeconomics Specific aviation data - Development in the Middle East - Development in the Arab Gulf - Passengers (demand side) - Fleet (supply side) - Destinations (supply side)
Planning vision 2030 Policy / GCC policy	The Sustainable shift - Ecological Modernization - Ecological fragile environment - New category of nations - Trading block - Environmental planning - The Masdar Initiative	Only theoretical research, data is not sufficient for academic research at this moment.

Table 6-1 Summary of policy, theory and data necessary for this research.

6.3 Case-study

The method of research conducted is based on a literature review (chapter 2 till 4) and further strengthened due to the combination of three case studies. Where an explanatory case study is used to explore causation in order to find underlying principles and the case studies are prospective (in which criteria are established and cases fitting the criteria are included as they come available. Or as Thomas states: ''*case studies are analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one of more methods. The case is the subject of inquiry […] provides an analytical frame – an object – within which the study is conducted […]*'' (Thomas, 2011). This protective (exploratory) case study is combined with an explanatory data analysis (EDA), an approach to analyse data sets and summarize their main characteristics, made visible through visual methods of Microsoft Excel.

Although this research does analyse the local and regional policies this is not the main focus of research. Therefore the case studies are seen as 'projects'', in the general sense of word, namely the cities (Abu Dhabi and Dubai) or aviation sector (airports and airlines) and strengthened with the urban planning transformations and phases, which can be seen as ''periods''. These case studies are translated to visual models by the use of explanatory data analysis (EDA) in order to make the explanatory case study comparable to other data and explore the causation and underlying principles. Moreover, as the data of the first two case studies is economic there are multiple parameters integrated, such as the total growth in both economic and growth terms, and the financial crisis (before and after). The cases being researched are selected by their characteristics, influence in the region and available documentation. Because Abu Dhabi is set as the example for the region, especially for the direct link between urbanization and economy, and therefore positioned as case one, or the main case. This is the (main) field of research as the city is emerges as the capital of the region, which also means that more information and documentation is available. As Arabic is the first language of the Middle East and research has to be conducted in English, one of the most important parameters is the availability of documentation and data in English. Compared to other rising capitals in both the Arabian Peninsula and the Middle East this is the case, however still marginal. The, reference, case Dubai is conducted in order to be less dependent on one source and the possibility to compare theory with a previous study, although less advanced (Bloch, 2010). Dubai is as the precursor of Abu Dhabi better documented, available in English and could indicate the influence of the sectors in a more developed economy. Moreover, the city has as its neighbour comparable dynamics on the ground and identical characteristics. The super-connectors, conform Lohmann et al (Lohmann et al., 2009), have been added because the international hub could be very promising but is highly influenced by its neighbouring Gulf-carriers and cities.

6.3.1 Cases (Abu Dhabi, Dubai and Super-Connectors)

Case Abu Dhabi
The first case is therefore Abu Dhabi, both the largest emirate and capital of the United Arab Emirates. With its immense deep pockets, regional function, excesses of urban developing, clear link between urbanization and economy throughout all layers of policy, position at the core of the contemporary debate, it is the focus of this research. Combined with an increase in documentation / information and availability in English, although still little.

Case Dubai
The second case is Dubai, the neighbour and precursor of Abu Dhabi, which results in the possibility to compare both cities with identical characteristics but has a more diversified economy (only 5% oil). Moreover, more documentation available than Abu Dhabi, available in English and could be compared to a previous study of Bloch. This means that the method of research that is conducted for this thesis could be checked or analysed. Furthermore, Dubai witnessed the financial crisis of 2008, without the backing of huge oil resources and experienced a real estate market crisis (bubble).

Case 'Aviation' or 'super-connectors'
The third case is the 'super-connectors', or Gulf-airlines, and the recent developments throughout the Arabian Peninsula. By zooming in on the topic the various investments throughout the region are analysed in order to indicate the 'weight' of such investment in the Gulf three, the cannibalization risk is analysed as

these development occur on an extremely small (regional) scale and highly influence each other. Finally, a specific focus on the Etihad, Emirates and Qatar Airway is used to analyse the ratio between planned (airport, aircraft, new routes) and demand (O&D). As the 'Specialized Cities' and the GCC indicated such clear links between airlines (as for example collective order of aircrafts), all three have to be examined in order to give an answer about Etihad, therefore also for urban development relating the international hub.

6.3.2 Data

Data Abu Dhabi
The data used for Abu Dhabi is from the statistical yearbooks 2009, 2010, 2011 and 2012. Due to a longer period of research the data of some sectors and industries is available from 2005 on. Following the conclusion of the theory, the links visible in policy and previous studies; the affiliated sectors to SBMD (real estate, construction, hotels) and IH (transportation, financial and insurance) are analysed and compared. Due to the financial crisis of 2008, visible in the data of 2009, it was possible for the first time to examine the resilience of individual sectors and industries in the financial crisis and the immediate aftermath. Moreover, other data relevant for the International Hub is also implemented; as non-oil export and re-export figurers. As the data collected is from one source, namely the Statistics Centre Abu Dhabi, the quality comes in number and as many data is collected and analysed as possible. This in order to indicate errors, as can be seen in appendix 10.

Data Dubai
The data used for Dubai is from the statistical yearbook 2008, 2009, 2010 and 2011. Noticeable difference is that the yearbook of 2011 is of 2011 in Dubai, and the yearbook 2012 is of 2011 in Abu Dhabi. Following theory and the study of Bloch, conform Abu Dhabi, the affiliated sectors to SBMD (real estate, construction, hotels) and IH (transportation, financial and insurance) are analysed and compared. Also, other data relevant for the International Hub is also implemented as non-oil export and re-export figurers. As the data collected is from one source, namely the Dubai Statistics Centre, the quality comes in numbers and as many data as possible is collected and analysed.

Data 'Aviation' or 'Super-Connectors'?
The data used for the growth region, relevant for number of passengers, is conducted by the United Nations World Trade Organization (UNWTO) and compared to the tourist arrivals and average annual growth (share). This is compared to the Middle East Airport investments to indicate planned and demand. Zooming in on these developments in Abu Dhabi, Doha and Dubai the data collected by Vespermann et al (Vespermann et al., 2008) and Murel and O'Connell (Murel & O'Connell, 2011) is implemented. Where it is important to acknowledge that Vespermann et al is conducted before the financial crisis (other perspective) and Murel and O'Connell after the collapse. While this is not the ideal situation, the costs of aviation data proved to be extremely high and this was only option to examine the data, see also 'value and limitations'. These two studies are used to broaden the data (before and after) and the Gulf three could be compared to reference case 'Frankfurt am Main' or 'Lufthansa'. Moreover, both the demand side (passengers) and supply (fleet, destinations) side of process are implemented.

6.3.3 Analysis

Analysis Abu Dhabi
The data of the affiliated sectors to SBMD (real estate, construction, and hotels) and IH (transportation, financial and insurance), but also non-oil exports and re-exports, are compared to each other and to other sectors. As the 'mining and quarrying', or oil, sector is very influential in the total GDP (around 58,5%) the economy (GDP) is analysed without this sector, both in volume and economic terms. As economic growth could be witnessed in the GDP without oil, the sectors relevant for this research could be discussed easily. Due to the financial crisis of 2008, visible in the data of 2009, it is possible to analyse the resilience of sectors and industries. This financial crisis and its influence is visible in both the total GDP and the prices (inflation), therefore compared to it. In fact, the financial crisis is visible in almost all data but these two indicate the 'total' impact. When comparing the data of before the crisis and in the immediate aftermath, with both the sector itself and the sectors affiliated to urban planning transformations, in order to indicate its performance and may give a possible insight in its (future) resilience in face of a crisis. The addition has

to be made that the construction sector reacts slowly to a crisis and is therefore further deepened as the data is not accurately (construction projects are often already under construction), therefore also the building permits are analysed.

Analysis Dubai
The data of the affiliated sectors to SBMD (real estate, construction, and hotels) and IH (transportation, financial and insurance), but also non-oil exports and re-exports, are compared to each other and to other sectors. Noticeable difference between the economy of Abu Dhabi and Dubai is that the economy of Dubai is not largely oil-driven (around 5%). Therefore it is compared to the economy as a whole and not without the ''mining and quarrying'' sector. However, the aviation industry is remarkable influential as it encompasses 25% of the GDP. Besides the importance to analyse Dubai as a reference case, the resilience of the sectors connected to SBMD and IH could be analysed in the light of the real estate market crisis that its witnessed. When comparing the data of before the crisis and in the immediate aftermath, with both the sector itself and the sectors affiliated to urban planning transformations. Furthermore, the emirate may give useful insights about the future of Abu Dhabi and its resilience of its economy is more developed, less one-sided, economy can be analysed in crisis, and before and after can could be compared. Again, the addition has to be made that the construction sector reacts slowly to a crisis and is therefore further deepened as the data is not accurate (construction projects are often already under construction), therefore also the building permits are analysed.

Analysis 'Aviation' or 'Super-Connectors'
The data of the developments in the Middle East (tourist arrivals, market share and growth) is analysed and the connection is made between actual data and projections (2020 and 2030, conform the urban planning vision / economic vision 2030, which is translated to tourism toward 2030 for the four regions of the word. Moreover, the planned additional and current capacities are compared to the current passenger demand as is measured in economic resources. With these investments in a remarkable small scale, the overlapping catchment areas in both a 2,5-hour drive and growth of the airport is discussed. When zooming in on the three Gulf airlines and airport of research, these current and planned capacities are compared to the reference case, an incumbent player. Moreover, when analysing the demand (passengers) and supply (fleet, destinations served), combining this with the investments on the regional scale, the effects of cannibalization and feasibility could be analysed. Furthermore, with the analyses of demand and supply (for example which type of aircraft) it is possible to indicate the future of the airlines, and therefore airports, as discrepancies between them can be analysed and their resilience to (future) local competitors. Also it is possible, with the help of the yearbooks of both Abu Dhabi and Dubai, to indicate if it is more likely to become a regional or international player. So, to compare the developments of airports and the 'super-connectors' of the region it is possible to give an answer about the feasibility of the international hub itself.

6.4 Value and limitations of data

The quality of this research depends to a large extent on the quality of the available data. When implementing data from a single source it is necessary to acknowledge the fact that errors or faults in the original data eventually heavily influence the outcome. Regretfully, this may be the case in this thesis, however many precautions are taken into account. Both the statistical data of Abu Dhabi and Dubai originated from one single source, namely the statistical centre and statistical yearbooks. In order to minimalize the amount of errors; the yearbooks of 2008, 2009, 2010, 2011 and 2012 (the most recent available edition) are analysed and compared. This reduces the change of eliminations of errors in the data, not that there is evidence that this has occurred. However, relative marginal errors could be found as, for example, data is in wrong columns and wrong titles are findable. When comparing the five individual yearbooks and statistical data these faults became visible and are adapted for this research. Thereby, the addition of Dubai gives (besides a look in urban planning for a more developed economy with similar characteristics) more value to the data and gives the possibility to compare the data of both cities. Finally, previous research is done at Dubai by Robin Bloch and outcomes are mostly likely similar. Or: *''trade, its related logistics services, aviation and tourism have all held up better than real estate through the global economic crisis''.*

Relating to the specific aviation data, another doubt on feasibility of the data may arise. As previously explained, a full analysis of such data is not the main priority of this research and 'raw' data is only

available at a high cost. This has the result that paragraph §7.3 partly depends on second hand data, or in other words; this data is not analysed by the author but by authors as Murel & O' Connell. After a detailed analyses of the data and the fact the authors are experts in their field the data is most likely accurate, however it is not possible to give complete certainty. Moreover, the data used by the authors was, while published in 2011, only available till 2008 and could be therefore be out-dated. However, for this research this information is essential and must be used. In order to improve the validity of the data there are large amounts of 'raw' statistical data analysed, connected with knowledge of the theory and stated in policy and compared to other authors (not on the same subject), cities and data of consultancy firm Booz&Co (hence, this is not academic data). Another difficulty is that a connection has to be made between urban planning phases or shifts and relevant industries or sectors. Theory and policy are almost certainly influenced by (personal) views and it is therefore more than wise to compare numbers, as numbers can't lie. For this research the connection is made between SBMD and the ''accommodation and food services'', ''real estate'' and ''construction'' sectors; and ISH to the ''transportation and storage'', ''financial and insurance' and data of imports and re-exports (export is highly fluctuating due to the influence of the oil-sector). In order to compare these urban planning phases, for the first time, they are analysed before and after the financial crisis of 2008 in order to analyse their resilience. To indicate the financial collapse and its influence the data economic activities are discussed in: total, and more important the economic activities without the mining and quarrying sector, the annual inflation rate (prices), both the growth rates of the GDP at current and constant prices, and the influence of outside (foreign investment) are examined in order to indicate the effect of the financial crisis on, for example, Europe and Asia.

Moreover, the construction sector is discussed in further detail as the sector slowly reacts to a crisis (construction projects take several years) and the type of permits is analysed because the influence of a permit for SBMD is different for each type, for example is the permit issued if for a new building or addition and is it a public utility or residential project. Furthermore, the hotel sector (as exists of different revues; room, food and beverages and 'other'), the establishment statistics (as activities in the data - rooms, guests and guestnights - could differ due for example a large increase in the number of rooms but a declining occupancy rate), the maritime transportation data (as the number differs for bulk or oil and containers or TEUs), the aviation data (as transfer passengers indicate to a greater extent the hub function of an airport in comparison to O&D or visitors), passengers are divided in region of embarkation (in order to indicate if Abu Dhabi is most likely to become an international or regional hub) are all discussed in further detail. This increases the validity of the data and therefore this research and is done for both Abu Dhabi and Dubai. The data chapter only used the relevant data for this thesis; the less critical data is attached in the appendixes.

The (inter-) linkage between the industries or sectors and planning shifts is not undisputed and therefore backed with numerous and various information. Firstly, the government of Abu Dhabi directly connects urban planning and economic planning with each other and in policy documents each individual phase is directly linked to ''economic diversification'', as explained in the theoretical analysis chapter. Secondly, various authors connect urban planning and economic planning (such as the Oxford Handbook), which is discussed in great detail in chapter 1. Thirdly, when discussing the theoretical data of authors as Bloch (2011) make the connection between sectors and industries with urban planning phases or transformations. For example, Bloch connects SBMD to the real estate sector and ISH to the aviation industry. And finally, also the statistical yearbook of Abu Dhabi made not only a direct connection between urban planning and affiliated industries but also indicated links between industries itself. It connects for example that the hotel and restaurant sector to the value to the attraction of a nation and it directly links the construction sector to the 'hotels and tourism industry' or as they state; the construction sector is required for new infrastructure (as hotel) and of the tourism industry as is ''directly connects value to the attraction of the nation''.

With these doubts in possible to state that the data used is most likely valid as the outcomes both cities are relatively similar and conform theoretical research. Moreover, the link between urban and economic planning, and more important different industries and sectors is backed by theory, policy and even the statistical yearbook itself. The large amounts of data may indicate that not all is evenly important and while this is true, it is all relevant. It is necessary to compare industries, indicate the financial crisis, influences from outside and to examine a 'general' sector in further detail.

7 Empirical findings

As discussed in the 'methodology chapter', this chapter will connect the raw, statistical data with the urban planning transformations, with as for this section the important parameter; the financial (or global) crisis of 2008. Besides the various negative aspects of the crisis, this is of great importance for this research. In the data of this chapter the setbacks are predominantly visible in 2009, however some sectors correspond a little later (such as the construction sector). As a result of the crisis, conclusions can be drawn of how 'solid' sectors are, how do they cope with a financial setback and which sectors are favourable on the long term. As will be analysed in in the data analyses of chapter 8. This chapter is divided in three paragraphs, namely: statistical data Abu Dhabi, statistical data Dubai (its precursor), and data with a specific focus on aviation. The statistical data may give a clear answer to the future of Abu Dhabi while Dubai, as its precursor, could give useful insights of how a more developed, but hugely similar, economy dealt with the crisis. The specific aviation data may give more detailed information of the Gulf carriers (super-connectors) and airport developments. As the aim is now primarily on aviation in the ISH-shift in Abu Dhabi and developments continue to expand.

The first two paragraphs discuss both the economy of Abu Dhabi and Dubai, such as the GDP in constant prices, important individual (economic) sectors, foreign trade (non-oil, import, re-export), prices and for Abu Dhabi the GDP in current prices (unfortunately the data of Dubai is not available). This will give an answer to the importance of individual sectors plus their influence and will determine the financial crisis and its influence on foreign 'flows'. The paragraph 'industries and business' discusses in a more detailed manner the construction, aviation, maritime and hotels sector. Note; a connection is made between 'mega development' and the construction / real estate sector (such as residential unites, retail space, office space etc.) and 'super-branded' with the hotels and restaurants sector / tourists (as tourist numbers, hotel room numbers etc.). The final paragraph specifically focuses on the aviation sector in the Middle East and zooms in on the Gulf region, more specific on the 'three super-connectors'. It is for the ISH-shift (International Shipping Hub) important to become the aviation hub but competition is tough, especially from the Gulf itself. It is therefore the focus of the paragraph is on the three incumbent carriers in order to give an answer to the feasibility of Abu Dhabi as a (future) regional and / or international shipping hub.

7.1 Statistical Data Abu Dhabi

This paragraph will discuss and analyse the statistical data of Abu Dhabi, relevant for both shifts and the possible turning point. Important parameter of this data is the financial crises of 2008, especially visible in the data of 2009. In face of the crises it is possible to see, for the first time, which sectors responded well to the crises and what sectors witnessed a decline. The 'Statistical Yearbook of Abu Dhabi 2012' is the most important source used in this paragraph but there are some difficulties. All 'raw' data had to be transferred and retyped with the possibility of possible type errors; this had to be done because no excel-data, or in fact any copyable data from the pdf-files, was available. The yearbook itself contained also some errors, for example: data on the wrong place; different titles, calculations are not correct, or calculated by a new method the following year. When this occurs, this is indicated in the table and highlighted in the text. Furthermore, because the yearbook contains max about 5 years of data and the yearbooks of 2008, 2009, 2010, 2011 and 2012 are researched. Hence; the yearbooks of Abu Dhabi and Dubai use different years for in practice the same year. For example the yearbook of Abu Dhabi 2012 discusses the year 2011, while the yearbook of Dubai 2011 discusses the year 2011 of Dubai.

The statistical yearbook of 2012, also the previous years, is directly linked to Abu Dhabi Vision 2030 and is used as a tool to study and analyse the implications to achieve sustainable development. Therefore it is possible to make the connection between statistical data and urban planning, but also economic planning and urban planning. Or, as the introduction of the statistical yearbook of 2012 states:
''*The Statistical Yearbook of Abu Dhabi 2012 consists of 650 statistical indicators, an increase of about 116 new indicators over the 2011 yearbook. The release contains new tables and updated information and figures that have been added within the context of the Centre's continuous efforts for excellence by bringing about a qualitative shift in data coverage, accuracy and presentation, in a way that will help in the study and analysis of their implications to achieve sustainable development in line with Abu Dhabi Vision 2030. The Statistical Yearbook of Abu Dhabi 2012 consists of six main chapters''.*

This paragraph (§7.1) is divided into two paragraphs: the ''economy'', ''industry and business'', and various subparagraphs. Were the economic subparagraph (§7.1.1) is essential to understand the importance of individual sectors, the influence of the mining and quarrying sector and the effects of the financial crises. This is essential to understand the sector of relevance and compare them to the overall effects. The second subparagraph (§7.1.2) will discuss the industry and business sectors of relevance for this research. The construction (real estate) and hotels (tourism) sector for the SBMD-phase, the aviation and maritime sector for the ISH-phase. Note; for the ISH-phase this is done to understand the transition, the data will be discussed in a more detailed fashion. See paragraph §7.3.

7.1.1 Economy

The economic subparagraph (§7.1.1) is essential to understand the importance of individual sectors, the influence of the mining and quarrying sector and the effects of the financial crises. This is essential to understand the sector of relevance and compare them to the overall effects.

7.1.1.1 GDP by Economic Activities at Current Prices

The GDP (Gross Domestic Product) by economic activities at current prices is useful to understand the growth rates of Abu Dhabi's economy in billion Arab Emirates Dirham (AED). As a result the (individual) growth rates can be calculated and the influence of relevant sectors for its economy. The Abu Dhabi GDP estimates in 2011 amounted to AED 806,031 million at current prices, compared with AED 620,316 million at current prices in 2010. This represents an annual growth rate of 29.9 per cent in 2011 and 15.9 per cent in 2010. Accordingly, the annual per capita gross domestic product amounted to AED 380.1 thousand in 2011.

Economic Activity	2005	2007	2008	2009-	2010*	2011*
Total	**383,430**	**454,368**	**705,159**	**535,311**	**620,316**	**806,031**
Commodities						
Agriculture, forestry and fishing	4,600	-	-	4,698	4,795	4,837
Mining and quarrying (includes crude oil and natural gas)	215,455	307,445	412,744	239,006	308,022	471,775
Manufacturing (or Manufacturing Industries)	28,584	35,270	39,211	29,990	33,323	40,499
Electricity, gas, and water supply; waste management	8,716	**	14,010	14,678	14,601	16,139
Construction	26,321	47,036	65,655	79,310	80,925	81,067
Services						
Wholesale and retail trade; repairing services	19,613	26,160	32,479	28,084	29,650	30,893
Transportation and storage	8,696	-	-	15,401	16,838	20,618
Accommodation and food services (E.g. Restaurants and Hotels)	3,602	4,864	6,762	6,283	6,572	6,799
Information and communication	15,262	-	-	24,022	22,881	22,929
Financial and insurance	17,988	27,294	29,575	30,154	34,498	39,202
Real estate	10,361	-	-	23,830	25,388	28,188
Professional, scientific and technical	10,252	-	-	17,385	18,417	18,794
Administrative and support services	5,858	-	-	9,695	10,371	10,901
Public administration and defence; Compulsory social security	10,324	11,571	18,653	20,559	23,231	25,385
Education	5,225	6,121	6,808**	7,499	8,924	9,857
Human health and social work	1,500	1,757	1,954**	3,722	4,017	4,403
Arts, recreation and other services	1,598			2,068	2,206	2,316
Activities of households as employers	0,913	1,011	1,309	1,503	1,648	1,861
Less Imputed bank services	11,436	11,436	19,815	22,575	25,990	30,431

Table 7-1 Gross Domestic Product by Economic Activity at Current Prices (Billion AED), Source: Statistics Centre - Abu Dhabi (2012). Note, Statistic Yearbook 2009 is not taken into account. * / ** Preliminary estimates yearbook 2010.

Figure 7-1 Total economic activity minus the mining and quarrying sector in billion AED (source: Statistic Yearbook).

The total economic activity shows the fast and exponential economic growth of recent years, with the exception of 2009. In light of the global crises this is most likely a result of the financial collapse of 2008, which should be visible from the year 2009 on. When the ''total economic activity'' and the ''total economic activity minus the (highly influential) mining and quarrying sector'' is analysed an important conclusion can be made, (see figure 7-1); the total economy, when excluding the oil-sector, has witnessed growth from 2008 on. With this in mind, it is therefore necessary to further examine the individual sectors.

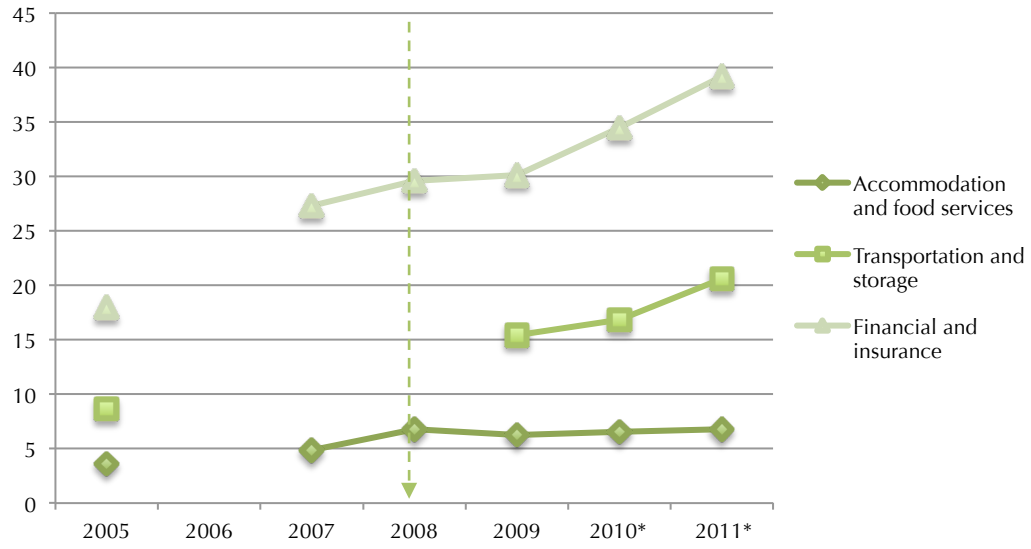


Figure 7-2 'Restaurants and hotels', 'transportation & storage', and 'financial & insurance' sector growth in Billion AED (data: Statistic Yearbook).

This figure above (figure 7-2) shows that the sectors 'financial and insurance' and 'transportation and storage' have witnessed significant growth in the aftermath of the financial crisis. However, the accommodation and food sector, or restaurants and hotels, stagnated and even saw a decline in 2009. In other words, the transportation and the financial sector (ISH) performed significantly better than the accommodation and food services sector (SBMD).

	2005	2007	2008	2009	2010*	2011*	Growth (%) 2005-2011	Growth (%) 2009-2011
Accommodation and food services	3,602	4,864	6,762	6,283	6,572	6,799	88,76%	8,21%
Transportation and storage	8,696	-	-	15,401	16,838	20,618	137,10%	33,87%
Financial and Insurance	17,988	27,294	29,575	30,154	34,498	39,202	117,93%	30,00%

Table 7-2 The data as used in the figure above and the growth percentage

Table 7-2 indicates that all sectors have witnessed sustainable growth from 2005 till 2011. Notable is that the 'transportation and storage' sector witnessed the highest growth percentage followed by respectively the 'financial and insurance' sector and 'accommodation and foodservices' sector. More remarkable is that both the transportation and the financial sector witnessed substantial economic growth from 2009-2011 (the year 2008 is not included) were the 'hotel and restaurant' sector saw a marginal growth in comparison to the period 2005-2011 and is now around its level of before the crisis.

	2005	2007	2008	2009	2010*	2011*	Growth (%) 2005-2011	Growth (%) 2009-2011
Real Estate	10,361	-	-	23,830	25,388	28,188	172,06%	11,03%
Professional, scientific And technical services	10,252	-	-	17,385	18,417	18,794	83,32%	2,04%
Administrative and support services	5,858	-	-	9,695	10,371	10,901	86,09%	5,11%
Total	**26,471**	**40,088**	**46,749**	**50,910**	**54,176**	**57,883**	**118,67%**	**6,84%**

Table 7-3 The 'real estate', 'professional, scientific and technical services' and 'administrative and support' sectors in combination with the total number. Also the growth for the period 2005-2011 and 2009-2011 is implemented.

As the ''real estate'' sector is in previous yearbooks treated as an element of a more comprehensive sector, the only available data is from the yearbook of 2012 and therefore is 'only' table implemented. This table (table 7-3) shows that the real estate sector witnessed remarkable growth number in the past seven years and saw a growth of 172% in the total period of research. However, when compared to the years before the crisis the growth of 2009-2011 was 'only marginal' with 11,03%. This is a lower rate than the just discussed transportation and financial sector; thus, in light of the financial crises, performed the real estate sector even worse than the financial sector. It is therefore safe to say that, when analysed by GDP at current prices, the relevant sectors of the SBMD-shift witnessed significant growth over the period 2005-2011 and the real estate sector performed better than the average growth. The relevant sectors for the ISH-shift performed on average (financial) and significant better (transportation) comparing to the national average. However, *after* the financial crises both the transportation and financial sector performed significant better than its SBMD counterparts ''accommodation and food services'' and ''real estate''.

7.1.1.2 Gross Domestic Product by Economic Activity at Constant Prices (2007)

GDP in constant prices shows how much goods and services were produced in volume terms and is measured by holding prices constant. GDP in constant prices has grown by 6.8 per cent in 2011, following an increase of 3.0 per cent in 2010. The main activities contributing to economic growth in 2011 were "Mining and quarrying" (including crude oil and natural gas), "Financial and insurance" and "Manufacturing": they increased 9.4 per cent, 10.5 per cent and 9.8 per cent respectively.

Economic Activity	2005	2009	2010*	2011*	'05-'09	'09-'11
Total	**491,664**	**551,525**	**567,850**	**606,626**	**12,18%**	**9,99%**
Commodity						
Agriculture, forestry and fishing	4,689	4,570	4,723	4,714	-2,54%	3,15%
Mining and quarrying (incl. oil and natural gas)	291,455	284,570	290,368	317,781	-2,36%	11,67%
Manufacturing (or Manufacturing Industries)	35,316	30,170	30,373	33,361	-14,57%	10,58%
Electricity, gas, and water supply; waste man.	10,494	14,740	14,646	15,522	40,46%	5,31%
Construction	35,129	75,903	81,397	82,080	116,07%	8,14%
Services						
Wholesale and retail trade; repairing services	21,602	23,744	24,767	25,645	9,92	8,01
Transportation and storage	9,974	13,727	13,851	15,578	37,63	13,48
Accommodation and food services	3,811	4,674	5,177	5,769	22,64	23,43
Information and communication	16,995	23,768	23,354	22,586	39,85	-4,97
Financial and insurance	21,439	27,167	30,652	33,876	26,72	24,70
Real estate	13,828	20,034	20,070	22,250	44,88	11,06
Professional, scientific and technical	12,284	15,015	15,437	15,460	22,23	2,96
Administrative and support services	7,019	8,373	8,693	8,967	19,29	7,09
Public administration and defence; social security	11,047	13,197	14,583	15,711	19,46	19,05
Education	5,690	6,628	6,926	7,287	16,49	9,94
Human health and social work	1,576	2,442	2,622	2,818	54,95	15,40
Arts, recreation and other services	1,853	1,845	1,924	1,989	-0,43	7,80
Activities of households as employers	1,093	1,298	1,381	1,530	18,76	17,87
Less Imputed bank services	13,630	20,339	23,093	26,297	49,22	29,29

Table 7-4 Gross Domestic Product by Economic Activity at Current Prices (Billion AED). Source: Statistics Centre - Abu Dhabi. *Preliminary estimates

Table 7-5 shows the difference between growth rates at current and at constant prices, resulting in different growth percentages and outcomes.

Annual Growth Rates of the GDP by Economic Activity at Current Prices of the last 3 years of data.				*Annual Growth Rates of the GDP by Economic Activity at Constant Prices (2007) of the last 3 years of data.*		
Economic Activity	**2009**	**2010***	**2011***	**2009**	**2010***	**2011***
Total	**-24,1%**	**15,9%**	**29,9%**	**-4,9%**	**3,0%**	**6,8%**
Mining and quarrying	-42,1%	28,9%	53,2%	-13,9%	2,0%	9,4%
Manufacturing Industries	-23,3%	11,1%	21,5%	-8,0%	0,7%	9,8%
Construction	20,8%	2,0%	0,2%	32,3%	7,2%	0,8%
Transportation and storage	-8,0%	9,3%	22,4%	0,9%	0,9%	12,5%
Restaurants and Hotels	-7,1%	4,6%	3,5%	-5,8%	10,8%	11,4%
Financial and insurance	2,0%	14,4%	13,6%	7,6%	12,8%	10,5%
Real estate	11,6%	6,5%	11,0%	7,3%	0,2%	10,9%

Table 7-5 The annual growth of the most relevant sectors for this research. *Preliminary estimates

Figure 7-3 The annual growth at current price rates of the most relevant sectors

The on first sight difficult figure 7-3 shows that for both construction and real estate the graduate decline is visible after the crises, see §7.1.2.1 for further explanation. Notable is that in current prices the real estate market performed much better than the construction market, however this could be a result of the declining construction market (less supply). The financial sector witnessed a significant, immediate, decline in 2009 but the transportation and financial sector performed worse. From 2010 on the transportation sector witnessed the highest growth rate followed by the financial sector (ISH), followed by the real estate market, restaurants and hotels, and the construction sector respectively.

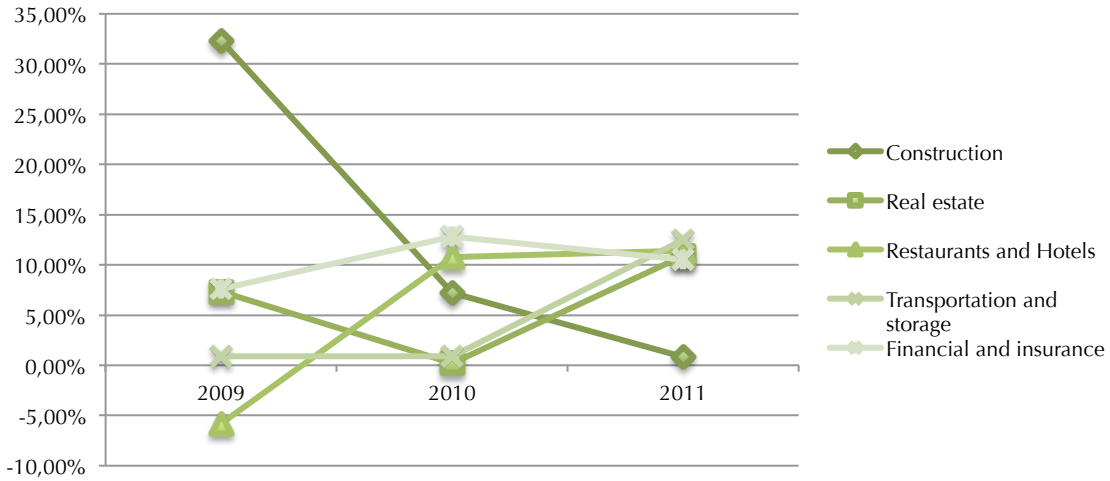


Figure 7-4 The annual growth at constant price rates of the most relevant sectors

Figure 7-4 shows that in volume terms the differences are less visible, at least in 2011, with transportation as the best performing sector and except the construction sector. Immediate after the financial collapse it is visible that the restaurant and hotels sector witnessed the highest decline of about 5.8%.

Percentage Distribution of the GDP by Economic Activity at Current Prices of the last 3 years of data.				*Percentage Distribution of the GDP by Economic Activity at Constant Prices (2007) of the last 3 years of data.*		
Economic Activity	**2009**	**2010***	**2011***	**2009**	**2010***	**2011***
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Mining and quarrying	44,6%	49,7%	58,5%	51,6%	51,1%	52,4%
Manufacturing Industries	5,6%	5,4%	5,0%	5,5%	5,3%	5,5%
Construction	14,8%	13,0%	10,1%	13,8%	14,3%	13,5%
Transportation and storage	2,9%	2,7%	2,6%	2,5%	2,4%	2,6%
Restaurants and Hotels	1,2%	1,1%	0,8%	0,8%	0,9%	1,0%
Financial and insurance	5,6%	5,6%	4,9%	4,9%	5,4%	5,6%
Real estate	4,5%	4,1%	3,5%	3,6%	3,5%	3,7%

Table 7-6 Percentage distribution of the most relevant sectors for this research. *Preliminary estimates

The percentage distribution, as shown in table 7-6, indicates that the mining and quarrying sector (oil and natural gas) is grown from 44,6% till 58,5%, this in contrast to their main goals of governmental policies.

7.1.1.3 Foreign Trade

The foreign trade in multiple ways important for this research. In the first place because it divides the total trade in imports and exports, and perhaps more important, is separates non-oil exports. It also indicates the re-exports of the Emirate of Abu Dhabi, especially important for the ISH-phase. Items as oil, gas and oil products and net trade in goods are of less importance due to the fact that they are largely driven on the mining and quarrying sector.

Item	2005	2006	2007	2008	2009	2010	2011
Total trade	226,339	-	334,693 **	463,122**	308,699	387,276*	532,858*
Total exports	191,125	-	281,050	372,845	214,827	300,702*	416,484*
Oil, gas and oil products	184,712	-	269,930	360,351	196,632	278,105*	393,439*
Non-oil exports	3,186	4,587	5,805	6,252	9,501	11,611	11,478
Re-exports	3,227	4,101	5,615	6,242	8,694	10,986	11,567
Imports	35,214	45,698	63,343	90,277	93,872	86,574	116,374
Net trade in goods	155,911	-	217,707	282,568	120,955	214,128*	300,110*

Table 7-7 Foreign trade statistics through the ports of the Emirate of Abu Dhabi (as billions AED). Data: Yearbook 2009, 2010, 2011 and 2012; Source Department of Finance - Customs Administration.
* Preliminary estimates
** Total trade = Oil, non-oil, re-exports and imports calculated by the author for 2007 and 2008.

As non-oil exports and re-exports are the most important trade statistics of this research they are implemented in the figure below.

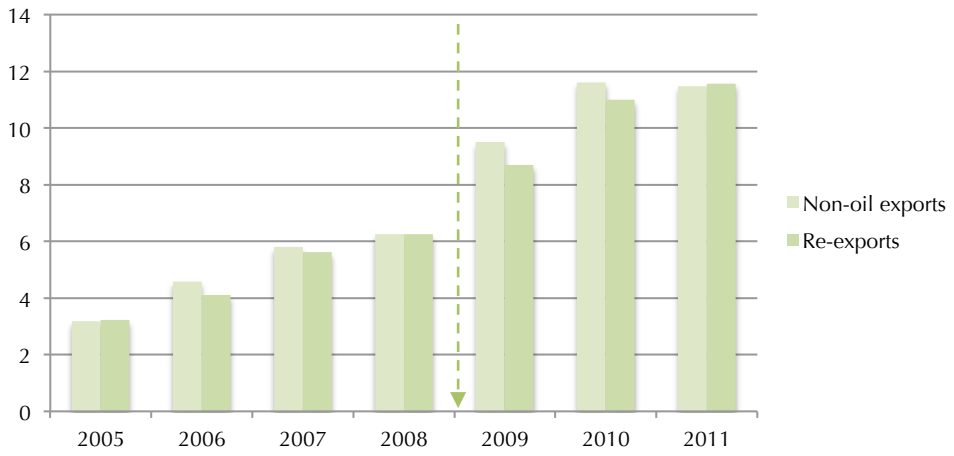


Figure 7-5 Non-oil exports and re-export statistics through the ports of the Emirate of Abu Dhabi

Figure 7-5 shows the growth both non-oil exports and re-exports witnessed in recent years and studied from 2005. Both foreign trade items saw an approximately similar growth, for re-export 358% growth and for non-oil exports 360%. While both are important for the ISH-phase, is-export in particular important as it is almost completely driven on the 'international shipping hub' view. However, as will be discussed below, this is still only a fraction of the total trade.

Item	2005	2006	2007	2008	2009	2010	2011
Total trade	100%	-	100%	100%	100%	100%	100%
Total exports	84,4%	-	81,5%	80,5%	69.6%	77.6%*	78.2%*
Oil, gas and oil products	81,6%	-	78,3%	77,8%	63.7%	71.8%*	73.8%*
Non-oil exports	1,4%	-	1,7%	1,3%	3.1%	3.0%	2.2%
Re-exports	1,4%	-	1,6%	1,3%	2.8%	2.8%	2.2%
Imports	15,6%	-	18,4%	19,5%	30.4%	22.4%	21.8%
Net trade in goods	68,9%	-	-	-	39.2%	55.3%*	56.3%*

Table 7-8 Foreign trade statistics as a percentage (%) of total trade through ports of the Emirate of Abu Dhabi. Data: Yearbook 2009, 2010, 2011 and 2012; Department of Finance - Customs Administration. *Preliminary estimates

As table 7-8 shows, the percentage of re-exports is as low as 2.2% of the total trade. But both numbers are raising steady and compared tot 2005 the number has raised by 0.6%. Moreover, in the early aftermath of the crises the number was around the 3%, which suggests that re-exports hold-up better than other items.

Mode of Shipping	2007		2008		2009		2010		2011	
	Value	%	Value	%	Value	%	Value	%	Value	%
Total	5,805	100	6,252	100	9,501	100	11,611	100	11,478	100
Marine	3,851	66,3	3,876	62	7,479	78,7	8,348	71,9	7,263	63,3
Road	1,886	32,5	2,31	37	1,923	20,2	3,124	26,9	3,915	34,1
Air	0,068	1,2	0,066	1,1	0,099	1	0,138	1,2	0,301	2,6

Table 7-9 Non-oil exports the Emirate of Abu Dhabi by mode of shipping (Billion AED) Data: Yearbook 2009, 2010, 2011 and 2012; Department of Finance - Customs Administration.

7.1.1.4 Prices

Price statistics, which include the inflation rate and price indices, are some of the most important statistical indicators produced by statistics centre and therefore discussed in the figure below (figure 7-6).

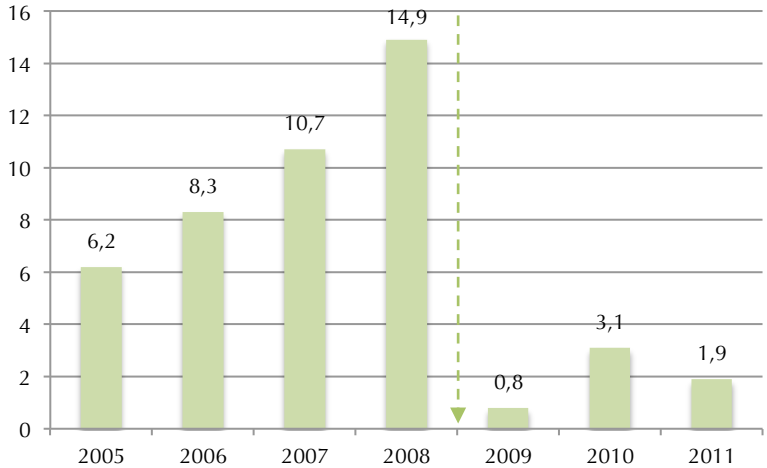


Figure 7-6 Annual rate of inflation of the Emirate of Abu Dhabi. Source: yearbook 2009, 2010, 2011 and 2012.

Notable is that the financial crises of 2008 is directly visible in the annual inflation chart. In the year 2008 the inflation rate was 14,9% (!) but dropped to 0,8% in the year 2009.

7.1.2 Industries

This subparagraph will discuss the industry and business sectors of relevance for this research. The construction (real estate) and hotels (tourism) sector for the SBMD-phase, the aviation and maritime sector for the ISH-phase.

7.1.2.1 Construction sector

Several focus sectors have been identified by the Abu Dhabi government for their potential to provide long-term, sustainable growth and diversification of the Emirate of Abu Dhabi's economy over the next two decades and beyond. New infrastructure such as hotels and resorts are required for development of the tourism industry in the Emirate of Abu Dhabi and construction, as one of the enabler industries will contribute to the development and support of the targeted future growth sectors. Construction activity contributed 10.1 per cent to the GDP in 2011 compared with 13.0 per cent in 2010.

The number of permits issued by residential, commercial and industrial increased highly in the period 2009-2011. Those numbers do affect the SBMD-shift but may not be as influential as the public utilities sector, with for instance museums and public galleries. Moreover, while the total number of permits issued increased, the number of permits for new buildings decreased. An important parameter for SBMD as it 'requires' new, iconic buildings.

Building Usage	Type of permits of 2009				Type of permits of 2010			
	New building	Permits renewal or amendments	Demo-lition	Additions and decorations	New building	Permits renewal or amendments	Demo-lition	Additions and decorations
Total *	1425	654	264	2.614	1502	611	89	3678
Residential	959	491	70	2.193	1267	520	68	2477
Commercial	78	63	69	141	105	20	11	722
Industrial	87	50	77	120	128	70	10	424
Public utilities	207	15	48	116	0	0	0	2
Residential	94	35	0	44	2	1	0	3

Building Usage	Type of permits of 2011			
	New building	Permits renewal or amendments	Demo-lition	Additions and decorations
Total *	1038	4132	125	3842
Residential	723	2949	92	2065
Commercial	217	618	24	1285
Industrial	72	548	9	447
Public utilities	0	0	0	6
Residential	26	17	0	39

Table 7-10 Number of Building Permits Issued by Type and Building Usage. Source: Municipality of Abu Dhabi.

Also table 7-10 shows that 'new type' permits for commercial and industrial building usage are far more given than public utilities, which in fact was zero in 2010 and 2011.

7.1.2.2 Aviation sector

The aviation sector is evidently of major importance for the aim to become an international shipping hub. Were especially the aviation industry, even more than maritime transport, is set as one of its main policies. With Etihad Airways as its national carrier (one of the three Gulf 'super connectors') and massive new airport investments, this subparagraph will discuss (the basics) of statistical data relating this sector in Abu Dhabi. However, relating the ISH-phase this is done to understand the transition, the aviation industry data will be discussed in a more detailed fashion in paragraph 8.3.

Abu Dhabi International Airport *	2005	2006	2007	2008	2009	2010	2011
Aircraft movement	76,633	-	82,287	93,163	102,118	135,715	142,430
Passengers:							
Arrival	2,482,092	2,419,967	3,323,346	4,456,580	4,724,183	5,419,321	6,175,221
Departure	2,458,410	2,369,569	3,242,210	4,231,132	4,650,448	5,343,809	6,083,923
Transit	537,974	498,983	360,904	329,188	297,694	272,116	290,674
Freights (tons);							
In	112,828	133,748	164,005	187,219	204,120	229,021	254,560
Out	100,896	123,875	151,313	166,601	174,626	208,790	226,984
Mail (tons):							
In	807	-	699	1,066	1,860	2,113	2,158
Out	776	-	1,189	1,096	1,923	2,411	3,241

Table 7-11 Air Transport by Airport, Passengers and Freight. Source: Abu Dhabi Airports Company plus yearbook 2009, 2010, 2011 and 2012. Due to yearbook 2009 misses 2006. * Abu Dhabi International Airport figures include Al Bateen Executive Airport data from 2010

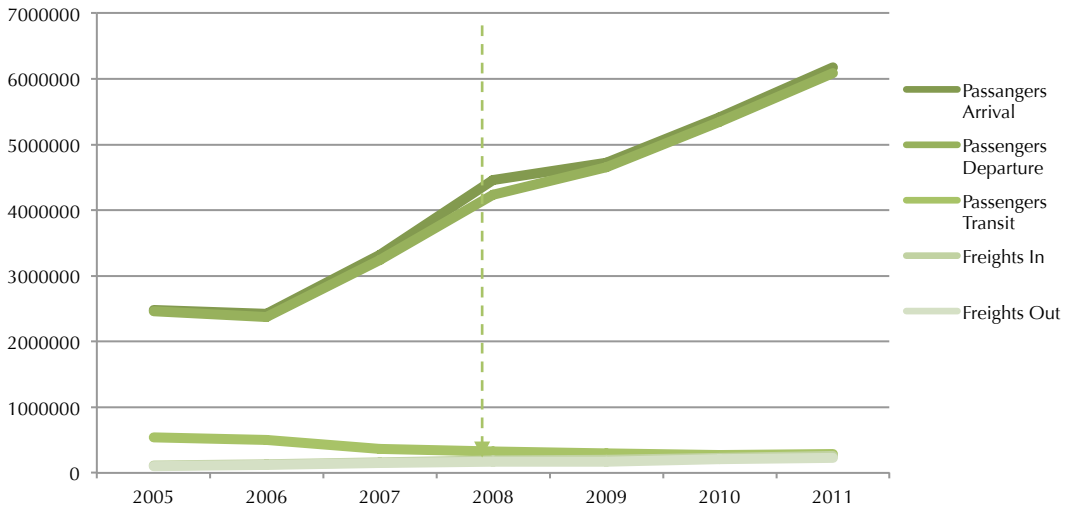


Figure 7-7 Chart of Air Transport by Airport, Passengers and Freight.

Noticeable is that the financial crises is visible in the air transport statistics but only a small period, almost immediately recovers its growth percentage of handled passengers. Furthermore, passenger arrivals and departures increase and are highly influential for hotels and restaurants sector. However, transit passengers are a key parameter for Abu Dhabi as a shipping hub, as it 'only' ships passengers to the next destination. This number witnessed an enormous decline since 2005 and recovering started not earlier than 2011. Both freights in and out Abu Dhabi witnessed growth but freight in by air is still a larger share than freight out. Table 7-12 will discuss the air passenger arrivals more detailed and by region of embarkation.

Region	2005	2006	2007	2008	2009	2010	2011
Total	**2,517,133**	**-**	**3,363,617**	**4,494,980**	**4,758,659**	**5,458,716**	**6,084,068**
GCC countries	640,458	-	756,287	997,195	1,070,197	1,117,530	1,225,519
Other Arab countries	344,287	-	471,721	518,752	520,404	595,329	607,596
Asia (except Arab)	1,094,406	-	1,389,876	1,912,292	1,802,792	2,008,785	2,305,404
Europe	432,234	-	570,645	779,499	1,001,891	1,175,683	1,398,630
North America	3,204	-	82,290	102,619	86,578	163,806	181,818
South America	51	-	111	86	18	265	0
Africa (except Arab)	2,327	-	42,563	60,502	56,085	62,398	68,225
Australia	0	-	50,121	123,839	215,003	233,215	277,086
Others	166	-	3	196	5,691	101,705	19,790

Table 7-12 Air Passengers Arrivals by Region of Embarkation. Source: Abu Dhabi Airports Company plus yearbook 2009, 2010, 2011 and 2012. Due to yearbook 2009 misses 2006. * Abu Dhabi International Airport figures include Al Bateen Executive Airport data from 2010. Note: Data exclude transit passengers who continued their journey on the same flight.

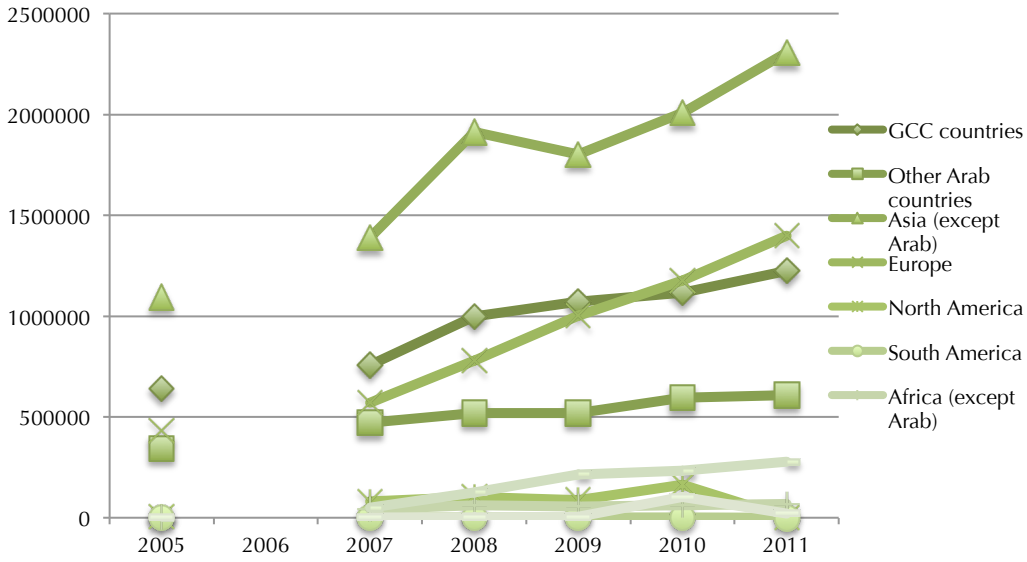


Figure 7-8 Chart of Air Passengers Arrivals by Region of Embarkation

Figure 7-8 shows that Europe and Asia (except Arab countries) are from 2010 the largest regions of embarkation, followed by the GCC countries. This figures shows the movement to an international shipping hub between ''Europe and Asia'' and the regional hub function of Abu Dhabi, for air passenger departures see table 7-13.

Region	2005	2006	2007	2008	2009	2010	2011
Total	2,501,320	-	3,281,827	4,265,255	4,684,131	5,387,127	5,990,970
GCC countries	657,257	-	698,46	905,633	991,754	963,628	1,159,642
Other Arab countries	373,511	-	483,439	540,452	555,378	603,145	587,553
Asia (except Arab)	1,048,476	-	1,327,658	1,718,655	1,745,659	2,054,660	2,282,179
Europe	418,244	-	595,046	816,169	1,033,032	1,194,648	1,421,929
North America	2,392	-	87,931	115,966	83,245	174,284	179,474
South America	0	-	31	0	32	0	0
Africa (except Arab)	1,438	-	41,795	56,686	58,678	64,909	64,014
Australia	2	-	47,467	111,684	210,772	229,049	276,344
Others	0	-	-	-	5,581	102,804	19,835

Table 7-13 Air Passengers Departures by Region Disembarkation. Source: Abu Dhabi Airports Company plus yearbook 2009, 2010, 2011 and 2012. Data of 2006 missed. * Abu Dhabi International Airport figures include Al Bateen Executive Airport data from 2010. Note: Data exclude transit passengers who continued their journey on the same flight.

7.1.2.3 Maritime sector

The maritime sector is also of major importance for the goal to be an international shipping hub. Resulting in enormous new ports to boost its economy and goal to become a (regional) hub. As part of the broader overall picture of the ISH-phase this incorporated to fully understand the transition.

Item	2005	2006	2007	2008	2009	2010	2011
Number of vessels	2,064	-	2,452	2,490	2,123	2,086	2,244
Container TEUs*							
Total TEUs	230,354	-	336,496	390,087	530,271	521,156	767,713
Discharged	113,538	-	170,160	200,342	263,648	257,302	384,394
Loaded	116,816	-	166,336	189,745	266,623	263,854	383,319
General cargo (metric tons)							
Total cargo	1,823,692	-	2,680,101	5,122,866	4,914,168	5,257,809	4,150,197
Discharged	1,803,626	-	2,642,708	5,078,297	4,801,450	5,173,363	3,971,806
Loaded	20,066	-	37,393	44,569	112,718	84,446	178,390
Vehicle unit							
Total units	48,718	-	73,430	92,944	37,951	62,352	56,510
Discharged	43,446	-	70,051	90,229	37,078	61,910	56,318
Loaded	5,272	-	3,379	2,715	873,000	442,000	192,000

Table 7-14 Main Indicators for Goods Vessels Movement in Zayed Port. Source: Abu Dhabi Terminals plus yearbook 2009, 2010, 2011 and 2012. Due to yearbook 2009 misses 2006. * Twenty- foot Equivalent Unit (TEU)

Figure 7-9 Total TEUs and total cargo movement in Zayed Port

The financial crisis is clearly visible in the total cargo of 2009 but as 2011 shows a footnote has to be made. The general cargo is highly influenced by the oil and natural gas sector; therefore the total TEUs will give a more honest answer. This number shows constant growth numbers in recent years.

Mode of transport	2008		2009	
	Weight	Value	Weight	Value
Grand total	102,780	13,172	112,088	13,643
Imports	**90,284**	**11,407**	**93,889**	**12,042**
Ships	55,638	6,330	57,372	7,336
Launches	49	43	52	72
Air	10,169	49	17,084	59
Land	24,428	4,985	19,380	4,576
Exports	**6,240**	**388**	**8,695**	**334**
Ships	2,230	194	1,888	150
Launches	14	1	16	2
Air	2,296	32	5,254	65
Land	1,700	161	1,536	117
Re-exports	**6,255**	**1,377**	**9,505**	**1,267**
Ships	3,869	815	7,477	724
Launches	7	3	2	0
Air	69	3	103	5
Land	2,311	556	1,923	537

Table 7-15 Imports, Export and Re-export by Mode of Transport (value million AED; weight: 000 Tons). Sources: Department of Customs, Department of Finance

This table (table 7-15) shows that both export and re-exports hold up better during the crisis. Especially re-exports witnessed sustainable growth, which the maritime sector is its main contributor.

Region	2009		2010		2011	
	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing
Total	**263,648**	**262,540**	**257,302**	**261,543**	**384,394**	**379,966**
United Arab Emirates*	34,908	189,318	55,296	195,730	138,691	259,913
Other GCC Countries	3,309	3,969	4,381	5,009	5,398	5,074
Total Middle East (Non- GCC)	2,084	6,545	849	5,742	589,000	5,165
Indian Sub Continent	15,003	14,354	6,098	11,058	8,413	17,220
South East Asia	13,435	5,042	13,826	8,581	13,854	19,578
Far East	32,935	13,919	31,101	16,906	32,551	36,756
North Africa	7,397	5,390	9,179	5,033	3,186	6,536
South Africa	1,896	455	1,619	667,000	1,726	916
East Africa	4,389	1,232	4,521	1,355	13,525	2,111
West Africa	199	132	208	196,000	177,000	115
Western Europe	34,540	1,561	29,338	1,280	23,654	2,034
Mediterranean	56,588	4,218	47,148	2,772	66,872	2,575
Scandinavia	865	61	916	59,000	613,000	8
Eastern Europe	2,777	44	3,996	14,000	8,181	38
North America	48,492	583	45,809	970,000	63,366	1,991
Caribbean	0	133	1	50,000	0,000	126
Central America	27	111	611	103,000	583,000	141
South America	3,016	224	1,504	141,000	1,717	207
Australasia	1,785	635	898	440,000	1,296	550
Others	3	14,617	3	5,437	2,000	18,837

Table 7-16 Distribution of Container TEUs Incoming and Outgoing In Zayed Port by Region. Source: Abu Dhabi Terminals, yearbook 2011 and 2012.*Container TEUs of UAE are from other Emirates of UAE

7.1.2.4 Hotels

The hotels and restaurant sector is an important parameter for the SBMD-phase in urban planning as it directly connects value to the 'attraction' of a nation. This subparagraph will analyse its statistics for both the region and city Abu Dhabi.

Item	2005	2006	2007	2008	2009	2010	2011
Number of hotel establishments	55	56	77	97	115	116	129
Number of rooms	7,758	7,986	10,192	12,727	17,424	18,844	21,254
Number of guests (thousand)	1,206	1,346	1,450	1,503	1,540	1,812	2,112
Number of guestnights (thousand)	3,509	3,903	4,275	4,673	4,319	5,132	6,270
Average length in stay (in days)	3.07	2.90	2.95	3.11	2.8	2.8	3.0
Occupancy rate % (hotel + hotel apartments)	68.00	85.78	81.44	83.62	72.27	64.7	68.9

Table 7-17 Key statistics of Hotel Establishments activity (region Abu Dhabi) Source: Abu Dhabi Tourism Authority plus yearbook 2009, 2010, 2011 and 2012

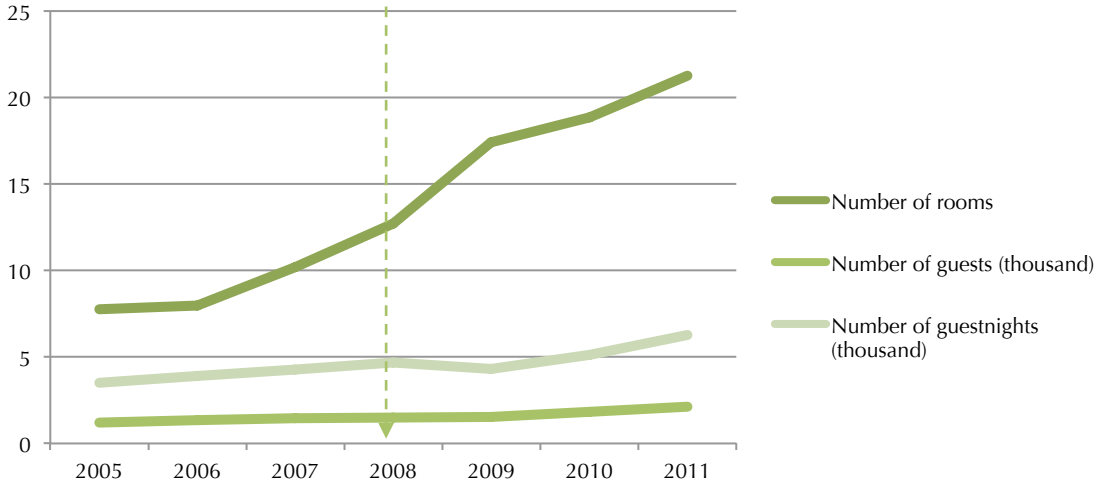


Figure 7-10 Chart of the key statistics of Hotel Establishments activity in the region Abu Dhabi

This chart (figure 7-10) indicates some key statistics relating to the number of rooms, guests and guestnights. In face of the financial crisis of 2008 the number of guestnights witnessed a decline while the number of guests witnessed a small increase (37.000). Thus, visitors cut back their night rather than their visits. However, despite the crisis the enormous investments in the sector were retained and resulting in dissimilarity between the number of rooms and the number of visits, which results in a lower occupancy rate. Since 2008 the number of guestnights increases with 34.2%, however the average stay is still lower than in 2008.

Year	2010			2011		
Item	Hotel	Hotel Apartments	*Total*	Hotel	Hotel Apartments	*Total*
Number of hotel establishments	67	48	*115*	79	50	*129*
Number of rooms	13,720	5,112	*18,832*	16,056	5,198	*21,254*
Number of guests (Thousand)	1,454	358	*1,812*	1,687	424	*2,112*
Number of guestnights (Thousand)	2,656	1,636	*5,132*	4,375	1,895	*6,27*
Average length of stay (In Days)	2.4	4.6	*2.8*	2.6	4.5	*3.0*
Occupancy rate (%)	60.7	74.9	*64.7*	65.6	77.6	*68.9*
ARR: Average revenue of hotel rooms (AED)	624.6	447.5	*567.3*	538	384	*490*
Rev PAR: Average revenue of available room (AED)	379.2	335.2	*366.9*	353	298	*338*

Table 7-18 Hotel Establishments Indicators by Type (region Abu Dhabi) Source: Abu Dhabi Tourism Authority plus yearbook 2011 and 2012, not specified in yearbook 2009 and 2010.

Item	2007	2008	2009	2010	2011
Total revenue	2,809,297	4,304,871	4,293,074	4,228,520	4,376,024
Room revenue	1,610,552	2,660,413	2,582,842	2,269,007	2,314,969
Food & beverage revenue	851,704	1,311,305	1,378,928	1,507,411	1,604,391
Other revenue	347,041	333,153	331,303	452,102	456,664

Table 7-19 Total Revenue of Hotel Establishments (Thousand AED). Source: Abu Dhabi Tourism Authority plus yearbook 2011 and 2012, not specified in yearbook 2009 and 2010.

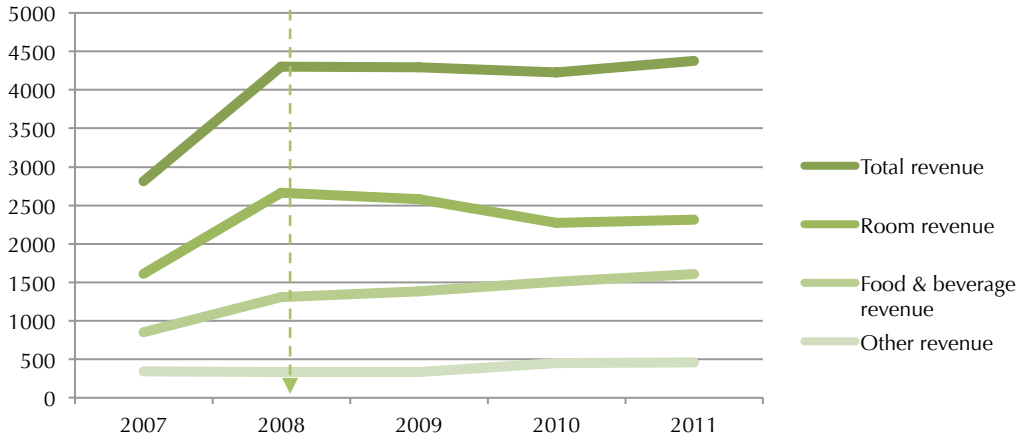


Figure 7-11 Total, room, food & beverage and other revenue of hotel establishments (million AED)

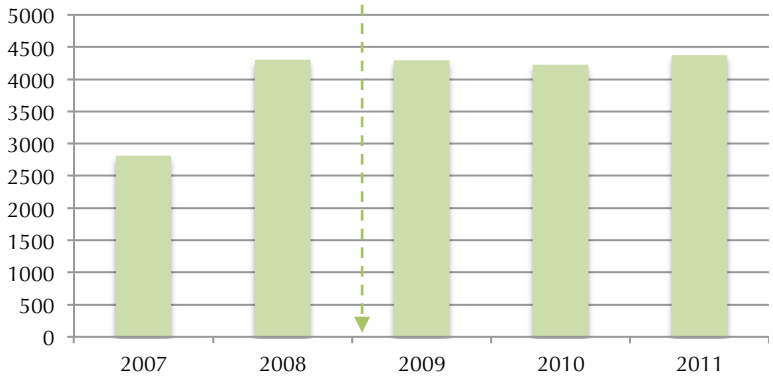


Figure 7-12 Total Revenue of Hotel Establishments (million AED), source: author.

When the financial crisis struck the total revenue of hotel establishment decrease by 0.25% and this continued in 2010 by 1.50%, as figure 7-13 shows. This is mainly contributed by the a decreasing room venue of 11.72%, food & beverage revues hold up much better and saw an increase of nearly 15% in the same period (figure 7-12). Thus, the total revenue hides the bad revenues of the hotel rooms.

Nationality	2005	2006	2007	2008	2009	2010	2011
Total	1,205,852	1,345,926	1,449,625	1,502,954	1,540,258	1,812,011	2,111,611
United Arab Emirates	374,496	515,515	479,264	516,243	650,585	752,777	824,442
Other GCC countries	57,889	126,165	108,141	96,280	85,670	102,067	133,277
Other Arab countries	174,997	155,094	154,094	155,893	158,797	206,83	252,626
Asia (except Arab)	169,946	163,358	222,634	192,369	173,921	248,273	323,094
Australia and Pacific	7,181	7,771	18,984	28,970	26,013	30,712	40,414
Africa (except Arab)	29,292	9,347	20,034	20,051	13,569	16,091	21,280
Europe	254,325	289,657	327,239	360,413	325,392	316,701	380,98
North and South America	46,738	41,149	78,770	102,137	92,696	108,303	109,327
Not Specified	90,976	36,995	40,465	30,598	13,615	30,257	26,171

Table 7-20 Guests of Hotel Establishments by Nationality (thousands). Source: Abu Dhabi Tourism Authority; yearbook 2009, 2010, 2011 and 2012.

Figure 7-10 showed some key statistics relating to the number of rooms, guests and guestnights. In face of the financial crisis of 2008 the number of guestnights witnessed a decline while the number of guests witnessed a small increase (37.000). Thus, visitors cut back their night rather than their visits. As a result of this is makes more sense to examine the guestnights rather than guests, as in table 7-20.

Nationality	2005	2006	2007	2008	2009	2010	2011
Total	3,509,064	3,902,667	4,275,063	4,673,494	4,318,504	5,132,323	6,269,682
United Arab Emirates	861,884	1,135,937	1,075,851	1,081,783	1,117,628	1,348,270	1,573,266
Other GCC countries	159,476	235,667	212,22	192,722	163,247	200,223	301,105
Other Arab countries	441,692	501,285	485,824	457,666	446,668	543,326	652,585
Asia (except Arab)	526,665	490,608	617,92	679,418	654,807	814,786	1,060,502
Australia and Pacific	37,405	31,892	66,805	104,97	119,484	107,486	143,403
Africa (except Arab)	55,328	39,845	66,699	78,830	53,233	63,974	74,533
Europe	1,109,181	1,145,344	1,301,987	1,517,132	1,272,993	1,373,467	1,716,139
North and South America	192,665	208,898	300,743	428,663	444,646	587,711	653,879
Not Specified	124,132	113,191	147,014	132,31	45,798	93,080	94,270

Table 7-21 Guestnights of Hotel Establishments by Nationality. Source: Abu Dhabi Tourism Authority; yearbook 2009, 2010, 2011 and 2012.

Therefore the guestnights of hotel establishments by nationality are transferred to the figure below (figure), the most important are shown.

Figure 7-13 Guestnights of Hotel Establishments by important regions of research.

Figure 7-13 shows that especially the amount of guestnights by Europeans witnessed a strong decline, nearly 16%. While other say only a limited decline in growth the number of guestnights of citizens of the United Arab Emirates kept exponential growing. This figure indicates not only the strengthened as Abu Dhabi as a regional hub, it also indicates its function as an international hub between Europe and Asia. Which is also confirmed by the data in table 7-21, were they have respectively the first and third position in the market.

7.2 Data Dubai

After analysing the relevant data of Abu Dhabi this paragraph will discuss those data of its precursor Dubai. Especially as neighbouring Dubai may give some clear and necessary insights for urban- and economic planning in the Gulf region. However, there are some differences between both emirates. As its precursor the economy of Dubai is better developed and less oil-dependent (diversified), previously it had relatively small oil reserves and therefore less impact on its policy, invested heavily in the booming real estate market and the city has a longer trade history. As a result Dubai could give new insights about the economy of the Gulf and the impact of the financial crisis is in a more developed economy. Comparable to data used for Abu Dhabi this paragraph; will focus on its economy, construction, aviation, maritime, and hotel sector. Unfortunately are the data of GDP by economic activities at current prices not available for Dubai; therefore are only the GDP by economic activities at constant prices given.

7.2.1 Economy

The economic subparagraph (§8.2.1) is essential to understand the importance of individual sectors, the influence of individual sectors and the effects of the financial crises. This is essential to understand the sector of relevance and compare them to the overall effects.

7.2.1.1 GDP by Economic Activities at Constant Prices (2007)

The GDP (Gross Domestic Product) by economic activities at constant prices is useful to understand the volume terms of Dubai's economy in billion Arab Emirates Dirham (AED). As a result the (individual) rates can be calculated and the influence of relevant sectors for its economy. The Dubai GDP estimates in 2011 amounted to AED 304,989 million at constant prices, compared with AED 293,601 million at current prices in 2010. This represents an annual growth rate of 3.9 per cent in 2011 and 0 per cent in 2010. Accordingly, the annual per capita gross domestic product amounted to AED 152.3 thousand in 2011.

Economic Activity	2006	2007	2008	2009 **	2010	2011
Non financial corporations sector	204,600	224,905	239,400	270,549	263,541	274,411
Agriculture, Live Stock & Fishing	1,11	1,082	1,051	418	434	437
Mining and Quarrying	7,139	5,425	5,423	5,423	5,159	4,681
Manufacturing	34,855	36,88	36,249	33,127	38,719	43,238
Electricity, Gas & Water	2,431	2,771	3,305	3,783	4,283	5,668
Construction	18,118	21,058	24,798	40,017	27,494	25,923
Wholesale, Retail Trade and Repairing	77,301	88,735	99,012	85,932	89,002	94,135
Restaurants and Hotels	6,468	6,657	6,412	9,650	10,729	12,303

Transport, Storage and Communication	19,937	22,948	21,661	35,423	41,542	42,672
Real Estate and Business Services	33,944	35,721	37,813	51,563	40,286	39,319
Social and Personal Services	3,297	3,629	3,677	5,214	5,894	6,134
Financial Corporations Sector	20,743	22,070	21,179	32,375	33,115	34,608
Government Services Sector	7,041	7,625	7,063	10,165	16,085	17,902
Non-Profit Organization	-	-	-	765	-	-
Domestic Services of Households	1,167	1,283	1,063	1,063	1,137	1,644
Less: Inputted Bank Service	-10,207	-11,886	-10,835	-21,166	-20,276	-23,577
Gross Domestic Product	*223,344*	*243,998*	*257,870*	*293,752*	*293,601*	*304,989*
Per Capita Gross Domestic Product at Constant (AED)	-	-	-	178,467	154,083	152,253

Table 7-22 Gross Domestic Product at Constant Prices - Emirate of Dubai In Million (AED) * Preliminary estimation and ** Yearbook stated 2008 but, presumably, it is 2009

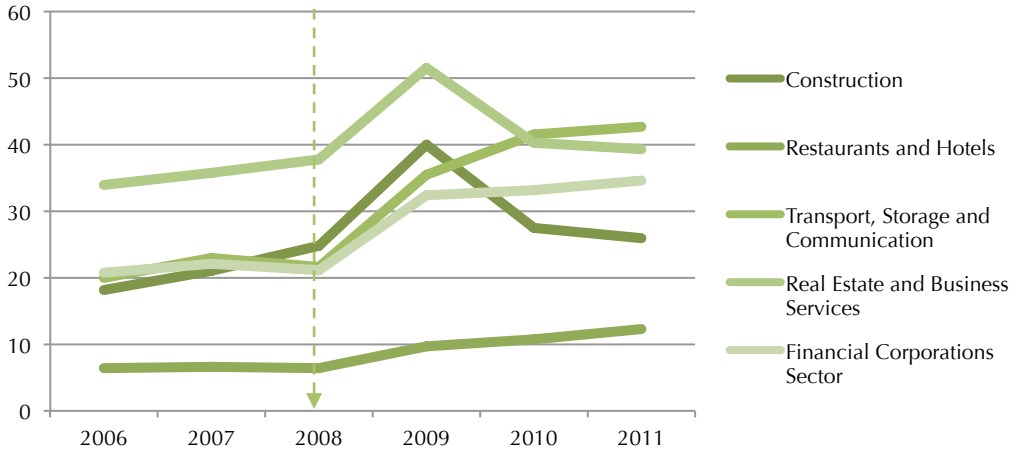


Figure 7-14 Gross Domestic Product at Constant Prices for relevant sectors of this research.

Important sectors for this research are shown in figure 7-14, which clearly identifies some important characteristics of these sectors. On first time these values seem to be odd but other sectors, foreign trade (figure 7-15) and the inflation rate (7-16) do identify the financial crisis of 2008.

It is remarkable that 'the dip' of the real estate, financial and restaurant sector was before the outbreak of the global crisis. Hence, this could be a result of the difficult real estate market. More important conclusion for this research is the difference between associated sectors to SBDM and the ISH. After the crisis, both the transportation and financial sector hold up better than construction, real estate, and restaurants and hotels. Especially the construction and real estate sectors witnessed a huge decline past 2009.

Economic Activity	2006	2007	2008	2009 **	2010	2011
Non financial corporations sector	91,61%	92,18	92,84%	92,10%	89,80%	90,00%
Agriculture, Live Stock & Fishing	0,50%	0,44	0,41%	0,1	0,1	0,1
Mining and Quarrying	3,20%	2,22	2,10%	1,8	1,8	1,5
Manufacturing	15,61%	15,11	14,06%	11,3	13,2	14,2
Electricity, Gas & Water	1,09%	1,14	1,28%	1,3	1,5	1,9
Construction	8,11%	8,63	9,62%	13,6	9,4	8,5
Wholesale, Retail Trade and Repairing	34,61%	36,37	38,40%	29,3	30,3	30,9
Restaurants and Hotels	2,90%	2,73	2,49%	3,3	3,7	4
Transport, Storage and Communication	8,93%	9,41	8,40%	12,1	14,1	14
Real Estate and Business Services	15,20%	14,64	14,66%	17,6	13,7	12,9
Social and Personal Services	1,48%	1,49	1,43%	1,8	2	2
Financial Corporations Sector	9,29%	9,05	8,21%	11	11,3	11,3
Government Services Sector	3,15%	3,13	2,74%	3,5	5,5	5,9
Domestic Services of Households	0,52%	0,53	0,41%	0,4	0,4	0,5
Less: Inputted Bank Service	-4,57%	-4,87	-4,20%	-7,2	-6,9	-7,7
Gross Domestic Product	100%	100%	100%	100%	100%	100%

Table 7-23 Gross Domestic Product at Constant Prices - Emirate of Dubai (% contribution) * Preliminary estimation

The distribution (percentage) in table 7-23 shows that relevant sectors for ISH grow, transportation by 15% since 2006 and the thereto-associated financial sector by 2%. With SBMD associated sectors as construction and real estate witnessed a decline at least from 2009 on. However, the restaurants and hotels sector (SBMD) also saw its percentage of distribution grow (by 1,1%).

7.2.1.2 Foreign Trade

The foreign trade statistics are meaningful in various ways. Table 7-24 shows that imports treated the majority of direct foreign trade. Also noticeable is that re-exports are of greater importance than exports.

	2006	2007	2008	2009	2010	2011	2012
Imports	219871	297732	441477	318520	363671	441666	501668
Exports	18258	27071	42641	52420	67962	98064	148486
Re-exports	78309	100636	128626	117559	144023	160695	157689

Table 7-24 Direct Foreign Trade (value in Million AED)

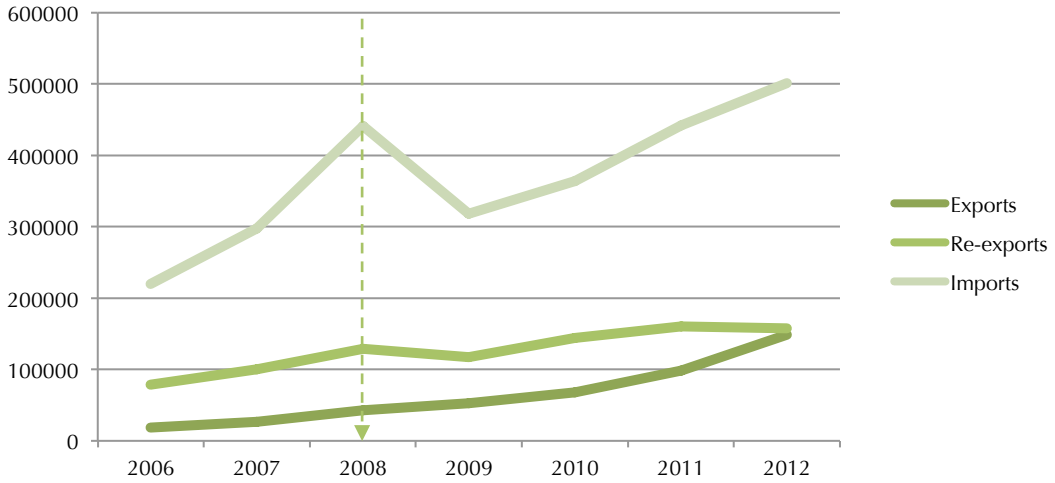


Figure 7-15 Imports, exports and re-export in Dubai → Financial crisis

Figure 7-15 shows that the financial crisis of 2008 is directly visible in the important number and to a lesser extent in the re-exports. Both exports and re-exports hold up better than important.

7.2.1.3 Prices

The annual inflation rates of the Emirate of Dubai are interesting for both its competition position and the demarcation of the global crisis. This is necessary to identify the shock resistance of individual sectors and, as was shown in figure 7-16, not all figures even clear the financial collapse.

	2005	2006	2007*	2008	2009	2010	2011	2012
Inflation	6,2	9,3	-	10,77	4,03	0,55	0,52	-1,78

Table 7-25 Annual inflation rates of Dubai in per cents (except 2007). * Not available in the yearbook 2006 – 2011.

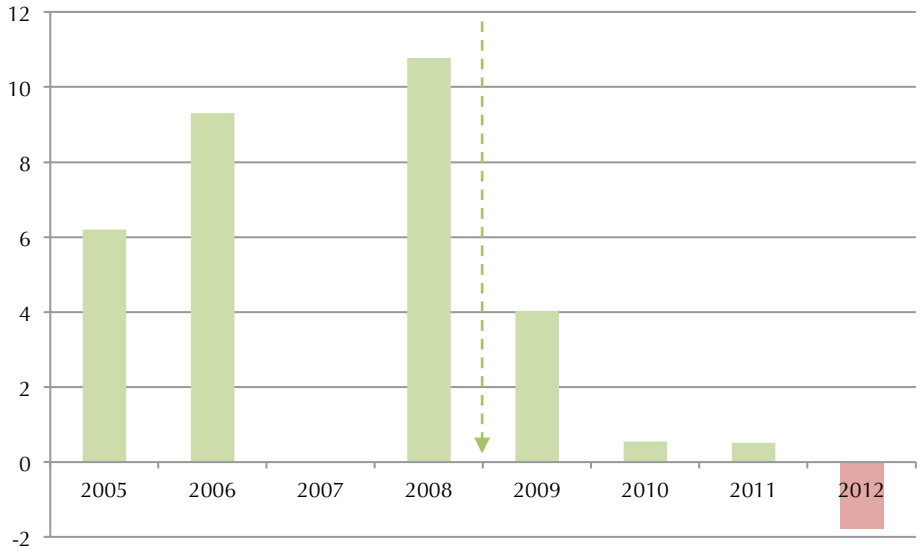


Figure 7-16 Chart of the annual inflation rates of Dubai (except 2007). * Not available in the yearbook 2006 – 2011.

Both table 7-25 and the resulting figure 7-16 clearly identify the financial crisis. From 2009 on (shown by the green arrow) the inflation rate went done and eventually result in a deflation of prices.

7.2.2 Industry and Business

This subparagraph will discuss the industry and business sectors of relevance for this research. The construction (real estate) and hotels (tourism) sector for the SBMD-phase, the aviation and maritime sector for the ISH-phase.

7.2.2.1 Construction (and Housing)

Several focus sectors have been identified by the Dubai government for their potential to provide long-term, sustainable growth and diversification of the Emirate of Dubai's economy over the next two decades and beyond. New infrastructure such as hotels and resorts are required for development of the tourism industry in the Emirate of Dubai and construction, as one of the enabler industries will contribute to the development and support of the targeted future growth sectors. Construction activity contributed 9.4 per cent to the GDP in 2011 compared with 8.5 per cent in 2010.

Type of Housing unit	2000	2005	2006 ****	2007	2008	2009	2010
Flat	95,542	141,114	-	177,136	199,136	238,621	280,626
Villa	20,846	42,561	-	47,305	56,82	59,606	65,064
Villa supplement	444	914	-	975	1096	860	896
Arabic House	13,455	15,987	-	17,476	15,987	13,99	13,766
Room/ Rooms**	6,858	2,883	-	3789	4,158	2616	2,598
Collective Residence	1,307	1,249	-	11,941	13420	5,957	2,663
Other***	2898	810	-	919	1,033	811	800
Total	*145,363*	*205,518*	-	*259,591*	*291,750*	*322,461*	*366,413*

Table 7-26 Type of housing units. Source: Dubai Statistics Centre. * Inventory of buildings and housing units and establishments, ** Includes Labours camp, *** Includes (Shed, Sandaka - Caravan), and **** Not available.

The total of housing units (table 8726) witnessed a growth of 200% in the period 2000 till 2008, so eight years. In the period 2008 – 2010 the total housing units went with 74,663, an increase of 25% in three years.

Type of Building	2005	2009 ***	2010 ***	2011
One Storey Building	4,334	4,153	4,201	2,199
Multi Storey Building	8,479	9,868	11,472	12,022
Floor Area Ratio Building	118	172	209	382
Private Villa	20,843	22,732	34,580	58,449
Investment Villa	24,415	41,019	36,654	25,621
Arabic House	11,476	11,143	10,831	8,985
Establishment Building	3,584	3,598	4,37	6,482
Industrial Building	2,997	3,379	3,498	828
Other**	1,64	1,889	2,033	5,562
Total	*77,886*	*97,953*	*107,848*	*120,53*

Table 7-27 Buildings Type * - Emirate of Dubai. Source: Dubai Statistics Centre.

However, those figures don't show the real picture because a large part of the building is or was already under construction. Therefore the buildings are partly completed. However, as stated in the Economist (source) after the crisis the construction of a large part of buildings was set on hold. As a result the number of buildings under construction (table 7-28) and real estate transactions (table 7-29) give a more realistic image.

Under Construction	2005	2006	2007	2008	2009 **	2010	2011
Private Villas	3,857	4,314	5,165	6,562	7,419	6,483	6,671
Investment Villas	899	1,301	1,673	1,586	1,401	2,256	1,448
Industrial Buildings	586	513	505	521	607	445	410
Buildings Public Facilities		-	-	-	-	705	632
Multi-storey Buildings		-	-	-	-	870	779
Building Floor Area ratios		-	-	-	-	296	258
Total	***5,342***	***6,128***	***7,343***	***8,669***	***9,427***	***11,055***	***10,198***
Number of Residential Apartments	44,329	41,566	24,285	63,431	84,106	63,99	56,965
Number of Stores	2,047	2,554	1,515	3,533	6,817	13,806	13,573

Table 7-28 Number of Buildings Under Construction by Type * Emirate of Dubai. Source: Dubai Municipality. * Buildings Under Dubai Municipality Supervision; ** 1. Villas and Residential Complexes / 2. Multi- storey Investment Buildings / 3. Industrial, Recreational and Services Buildings

Furthermore, the real estate transactions * of the emirate Dubai (in million AED) give presumably the most realistic image of the construction sector, as shown in the table below (table 7-29).

	Total		Grant		Mortgage of a land development lease		Mortgage Release		Mortgage		Sales	
	Value	Nr.	Value	Nr.	Value	Number	Va. **	Nr.	Value	Nr.	Value	Nr.
2006***	65,114	5,640	2,619	332	-	-	-	737	39,485	1,981	18,541	2,590
2007 *	115,855	11,177	7,059	332	319	12	-	798	57,949	3,083	50,529	6,952
2008	260,733	31,613	8,648	261	131	10	-	1,258	125,760	8,106	126,193	21,978
2009 ***	153,307	40,782	4,259	542	101	10	-	926	65,552	9,840	83,395	29,464
2010 ***	119,953	37,552	7,670	938	258	13	-	979	57,407	9,862	54,618	25,760
2011	143,065	36,774	2,689	909	275	23	-	1,738	86,272	9,538	53,829	24,566

Table 7-29 Real Estate Transactions for the Emirate of Dubai 2008-2011. Source: Lands Department, with 'Nr. = number'. * Excludes Land Apartments and villas, ** Transactions are not accounted for the value of mortgage redemption, and *** The Statement Has Been Modified by the Source

Table 8-29 shows that from 2008 on the total value of real estate transaction decline from 260,733 to 143,065 in 2011, a decline of 117,688 million AED (55% decline!), with a negative peak of the total value of 119,953 million AED in 2010. Remarkable is that the number of real estate transaction witnessed a small growth in 2009, even when the total value declined. However the number of real estate transactions also witnessed a negative growth of about 11% from 2009-2011. The total real estate transactions of table 7-39 are implemented in the figure below, figure 7-17.

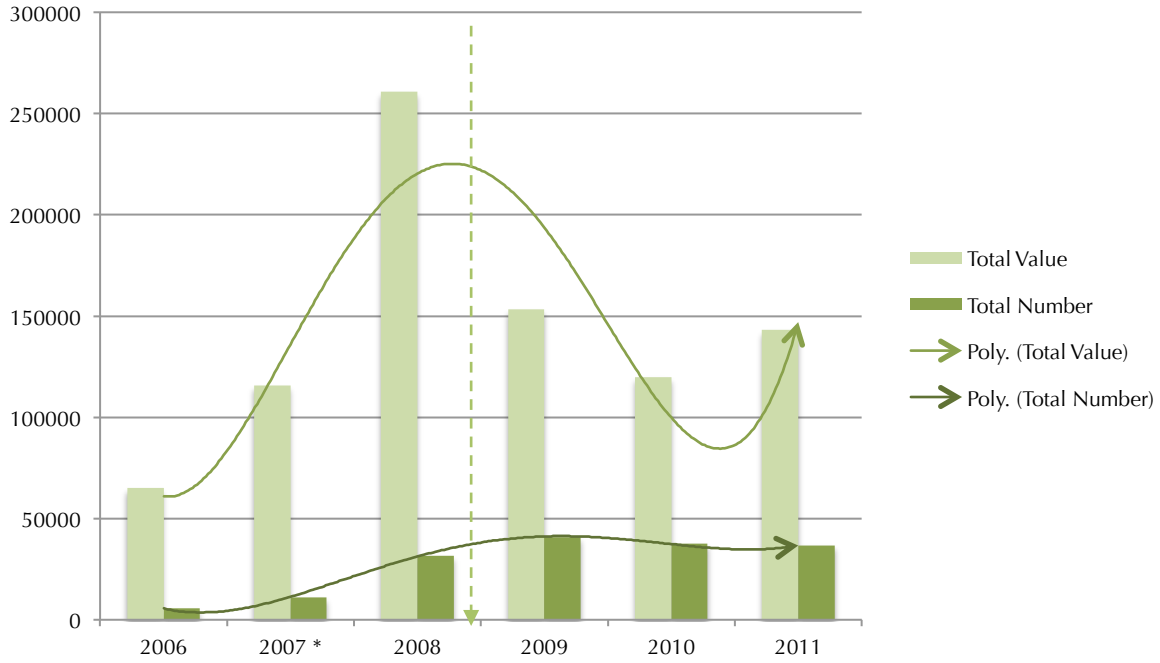


Figure 7-17 The total value and number of real estate transactions in Dubai (2006-2011). Source: Author. * Excludes Land Apartments and Villas

Thus, the financial crisis is clearly visible in the chart (figure 7-19). The total number of real estate transactions held about the number of 2009. However, total value witnessed a huge decline and it still not on its level of before the global crises. Especially striking in the figure is the correlation between real estate number and real estate total value. The number of real estate transactions is more or less stabile and the total value differs.

7.2.2.2 Aviation

The aviation sector is evidently of major importance for the goal to be an international shipping hub. Especially aviation transport, even more than maritime transport, is set as one of the important policies. With Fly Emirates as its national carrier and one of the three new 'super connectors' and massive new airport development this subparagraph will discuss (the basics) of statistical data relating this sector in Abu Dubai. However, relating the ISH-phase this is done to understand the transition, the aviation industry data will be discussed in a more detailed fashion in paragraph 7.3.

Table 7-30 and figure 7-18 will focus on the transit, departures and arrivals of passenger movement as is measured at Dubai International Airport in the period 2006-2011.

Year	Total	Transit	Departures *	Arrivals *
2006	28,788,726	863,204	13,816,223	14,109,299
2007	34,348,110	866,853	16,594,249	16,887,008
2008	37,441,440	849,133	18,003,033	18,589,274
2009	40,901,752	797,603	20,189,930	19,914,219
2010	47,180,628	866,948	23,302,820	23,010,860
2011	50,977,960	785,947	25,284,078	24,907,935

Table 7-30 Passengers' Movement at Dubai International Airport by Type (2006-2011). Source: Dubai Civil Aviation Authority. * Including transfer passengers: passengers arriving or departing from one destination and going to another destination with another airline or same airline without going through custom formalities.

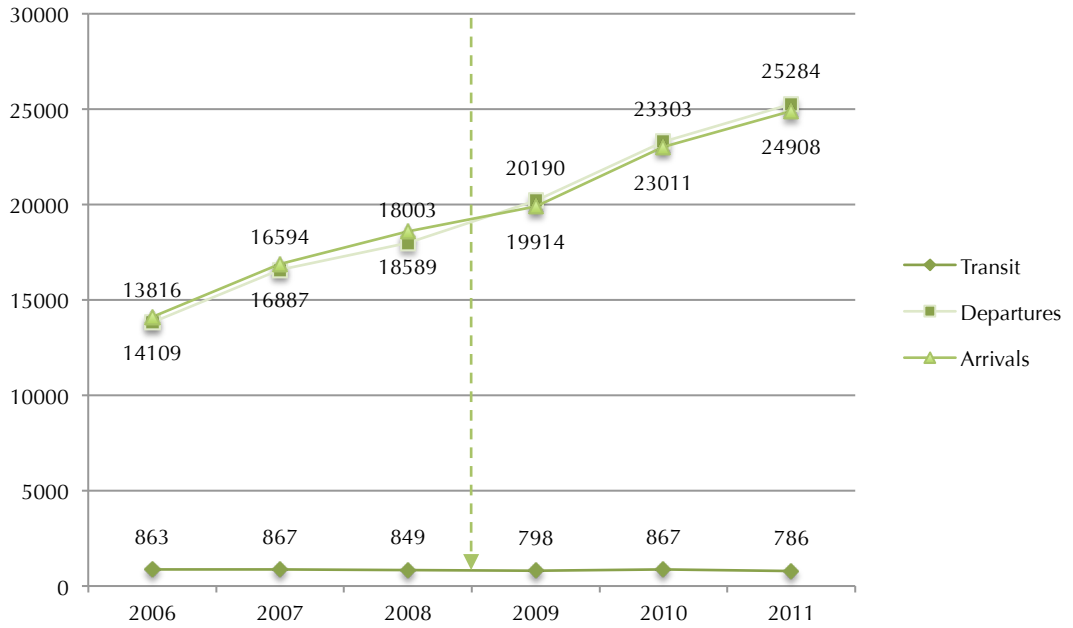


Figure 7-18 Relation types of passengers' movement at Dubai International Airport by Type (2006-2011): in millions.

This figure (8-18) shows that the financial crises of 2008 is visible in the data; a marginal decline in 2009. However, the arrivals and departure numbers are still growing. Important difference hereby is that the transit passenger number is more or less stabile, resulting in a growing difference between 'visitors' and transit passengers.

Year	Total	Quantity of Loaded Goods (in Tons)	Quantity of Discharged Goods (in Tons)
2006	1,410,963	652,279	758,684
2007	1,590,740	736,882	853,858
2008	1,731,808	770,846	960,962
2009	1,829,257	822,646	1,006,611
2010	2,070,040	947,56	1,122,480
2011	1,995,353	882,418	1,112,935

Table 7-31 Cargo Movement at Dubai International Airport (2006-2011). Source: Dubai Civil Aviation Authority

Cargo movement is an important parameter for the transportations sector and therefore the ISH-phase. In light of the crisis the quantity of goods kept (largely) stabile as can be seen in table 7-31.

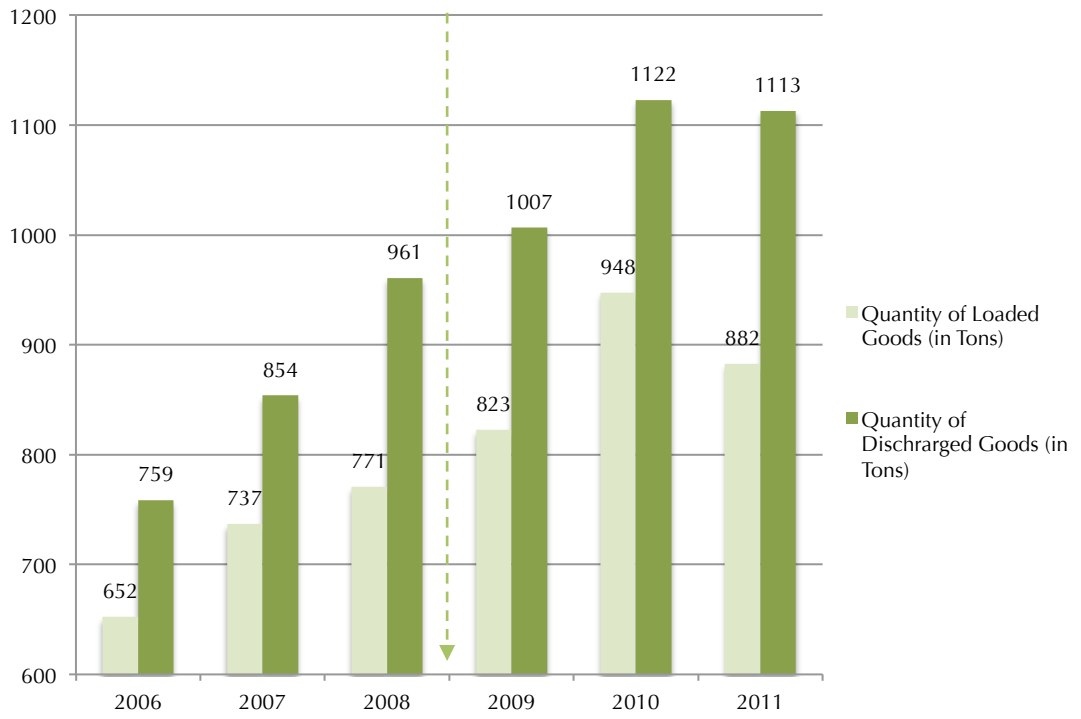


Figure 7-19 Cargo Movement at Dubai International Airport (2006-2011). Note, other chart type than previous chart but a same trend is visible.

Figure 7-19 indicates that the financial crisis of 2008 is visible in the data and resulting in a smaller growth number (fort both loaded and discharged goods). However, growth is still visible during these years and 2010 is in line with 2006-2008. An important occurrence is that the quantity of discharged goods is relatively stabile in 2010-2011, but the quantity of loaded goods witnessed a decline.

7.2.2.3 Maritime

Jebel Ali Port has an area of 134 km2 and is the largest in the Middle East, excluding the ports in the region that are almost exclusively used for the export of petroleum. In 2010 the port of Jebel Ali was the ninth largest container port in the world and ranks just before the port of Rotterdam (10). The port can handle 14 million TEUs per year and after the next expansion, completed in 2014, it could handle up to 19 million TEUs. Port Rachid provides berths for general cargo, RoRo and passenger vessels. In the early 1980s the port of Jebel Ali supplemented the port, which is further from the commercial centre of Dubai and near the Abu Dhabi border. The number of Vessels at Rashid and Jebel Ali Port are shown in table 8-32 for the period 2008-2011.

	2008	2009	2010	2011
Discharge				
Break Bulk (Metric Tons)	10,283,025	3,387,317	3,508,185	4,214,608
Bulk (Metric Tons)	7,223,230	6,514,114	5,205,013	3,970,829
Vehicles (Number)	415,847	169,403	271,484	321,209
Live Stock (Head)	161,918	120,147	101,985	46,923
Load				
Break Bulk (Metric Tons)	965,359	893,152	885,259	777,838
Bulk (Metric Tons)	-	-	-	-
Vehicles (Number)	63,965	51,725	56,092	85,890

Table 7-32 Number of Vessels Calling to Rashid and Jebel Ali Ports by Type (2008-2011*). Source: Dubai Ports World. * Only available in the yearbook of 2010 and 2011.

The table below (table 7-33) discusses the containers handled at Jebel Ali Port, the main port of Dubai. Unfortunately the source revised its data and the title 'other containers' is implemented, resulting in only one constant number, namely total containers handled.

Title	2006	2007	2008	2009*	2010*	2011
Discharged Containers	4,397,055	5,399,305	5,804,325	1,776,892	1,850,711	1,925,533
Loaded Containers	4,526,404	5,313,704	5,817,612	949,685	1,079,569	1,176,514
Other Containers**	-	-	205,354	8,397,479	8,645,495	9,911,017
Total	8,923,459	10,653,009	11,827,291	11,124,056	11,575,775	13,013,064

Table 7-33 Containers Handled at Jebel Ali Port (2006-2011); Unit: 20-Foot Equivalent Units (TEU). Source: Dubai Ports World. * Revised Data from the Source, ** Including additional containers shifting on shipboard that may occur during normal operations.

The total handled containers of table 7-33 are translated to figure 7-20; the green arrow indicates the financial crisis of 2008.

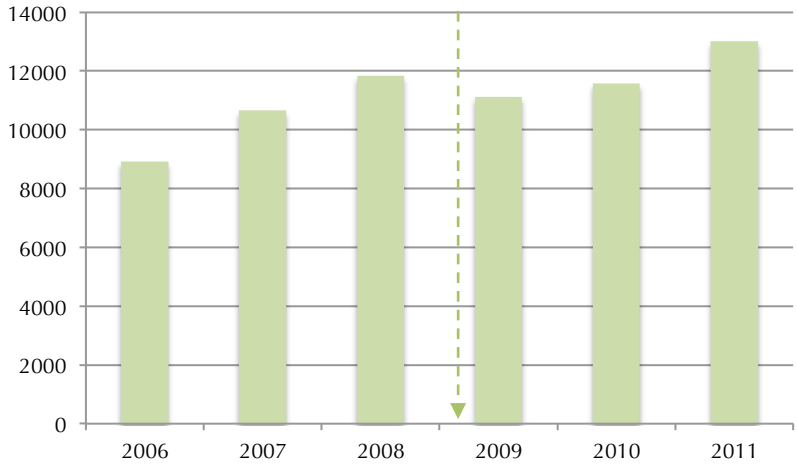


Figure 7-20 Total number of containers at Jebel Ali Port, for both discharged and loaded (in thousands).

Figure 7-20 indicates a relatively small decline in the year 2009 and shows its resilience against the crisis. Notable is that the total number of containers handled at Jebel Ali Port is now (e.g. 2011) higher than in 2008.

Vessel Type	2006	2007	2008	2009*	2010*	2011*
Containers Vessels	7,194	7,653	7,146	6,708	6,605	6,589
General Cargo Vessels	1,504	1,564	1,452	732	696	732
RORO Vessels	679	795	669	458	448	458
Tankers	1,333	1,268	1,375	-	-	-
Passengers	342	419	289	203	166	112
Other	-	-	5,532	7,218	7,534	6,917
Total	16,901	17,666	16,463	15,319	15,449	14,808

Table 7-34 Number of Vessels Calling to Rashid and Jebel Ali Ports by Type (2006-2011). * Revised Data from the Source; Source: Dubai Ports World

As just stated for table 7-33, the revised date of the source and specifically for the years 2009, 2010 and 2011 results in 'insufficient data'. Were figure 7-20 could indicate the total number of containers vessels calling at the port but it is not guaranteed that the values are valid.

Furthermore, due to the increase of ships and ports in volume the number is highly discussable. This is in contrast to, for example, the loaded containers or TEUs. The renewed port may dock bigger sized ships due to its extended mooring opportunities and therefore reducing the number of needed ships. However, for the completeness the figure is attached below (7-21).

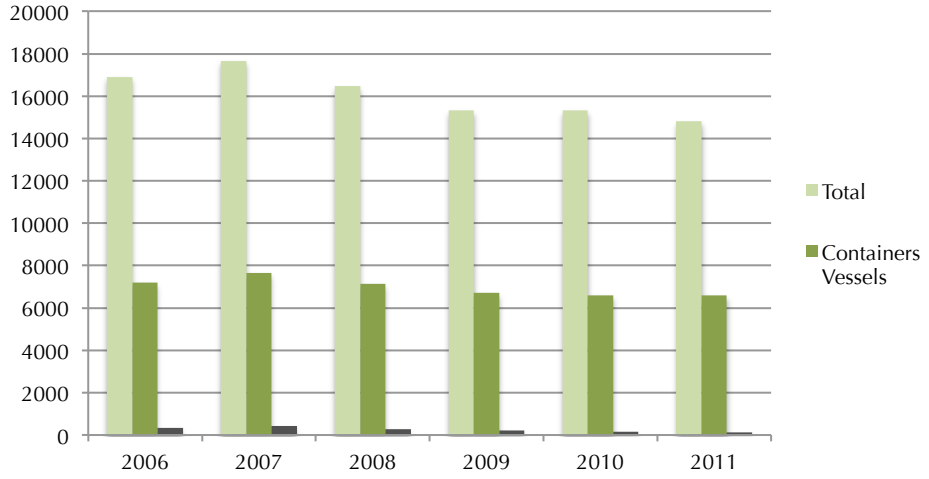


Figure 7-21 Number of total vessels, containers vessels, and passengers vessels calling to Rashid and Jebel Ali Ports

When the financial crisis struck all the types of interest showed lower values. However, containers vessels are relatively stabile after the crisis, passengers and the total of vessel not. Notable is that the source revised its data and therefore this figure is used to show the crisis in general, not in a detailed manner.

	Grand Total			Jebel Ali Port		Shandagpha Port		Hamriya Port		Rashid Port **	
Year	Total	Departure	Arrival	Dep.	Arrival	Dep.	Arrival	Dep.	Arrival	Dep.	Arrival
2006	77,838	37,913	39,925	4,246	3,873	620	385	347	202	32,700	35,465
2007	135,914	64,495	71,419	3,631	3,815	711	2,491	243	107	59,910	65,006
2008	164,898	72,105	92,793	3,536	3,424	552	517	201	122	67,816	88,730
2009	227,017	111,599	115,418	5,231	5,270	521	274	468	158	105,379	109,716
2010	308,750	150,947	157,803	6,256	4,984	503	330	91	84	144,097	152,405
2011	218,700	115,746	102,954	3,814	3,370	408	233	132	66	111,392	99,285

Table 7-35 Passengers' Movement at Dubai Sea Ports* (2006-2011). * Excluding Crew, ** Including Dry Dock Port.
Source: General Directorate of Residency and Foreigners Affairs Dubai

The passenger movement discussed in table 7-35 shows the influence of the four most important ports relating to passengers. Noticeable that the influence of the Shandagnha Port and Hamriya Port are declining, while Rashid Port and particularly Jebel Ali Port indicate growing numbers of passengers.

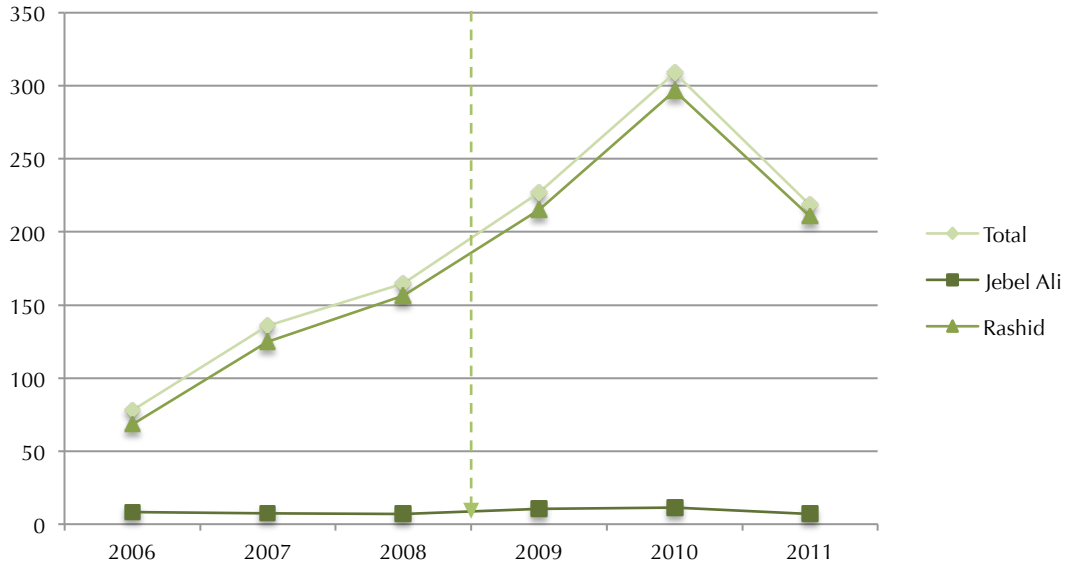


Figure 7-22 Passengers' Movement at Dubai Sea Ports in total, Jebel Ali Port and Rashid Port (2006-2011)

Figure 7-22 shows the total passenger movement at Dubai seaports in total. Noticeable is that the total is little influenced by the financial crisis and, more remarkable, the future port of Jebel Ali witnessed growing numbers. But more important is the huge decline in 2011; this may be explained by the growing importance of the aviation industry on passenger movement.

7.2.2.4 Hotels

The hotels and restaurant sector is an important parameter for the SBMD-phase in urban planning as it directly connects value to the 'attraction' of a nation. This subparagraph will analyse its statistics for the Emirate of Dubai.

Title	2007	2008	2009	2010	2011
Hotel Apartment Buildings	125	152	188	191	188
Number of Flats	10190	13196	18068	19840	21015
Flats Occupancy	8389	10438	11924	13590	15572
Flat Occupancy Rate	82,3	79,1	66	68,5	74,1

Table 7-36 Hotel Apartment Buildings and Flats Occupancy - Emirate of Dubai (2007-2011). Source: Dubai Statistics Centre - Economic Surveys 2009

Table 7-36 shows important characteristics in the immediate aftermath of the global crisis in 2008. The number of flats witnessed an increase as construction projects didn't stop but the flat occupancy lagged, resulting in a increasing difference between visitors and flat (the flat occupancy rate). However, this number is witnessed an increase in the period 2009-2011. Also noticeable is that the number of hotel apartment buildings is stagnating and even declining but the number of flats witnessed growth.

Title	2006	2007	2008	2009	2010	2011
Number of Hotels	302	319	341	352	382	387
Number of Rooms	30850	32617	37261	43419	51115	53828
Occupied Rooms	25303	27527	30368	30306	35780	39833
Room Occupancy %	82	84,4	81,5	69,8	69,8	74
Number of Beds	50999	52975	583566	67643	78617	83082
Occupied Beds	38729	43128	46918	46538	54625	63142
Bed Occupancy %	77,3	81,4	80,4	68,8	69,5	76
Number of Guests	-	-	6273291	6105813	6561999	7262730
Guests %	-	-	100	100	100	100
Residence Nights	-	-	16653704	16698406	19027498	23266874
Residence Nights %	-	-	100	100	100	100

Table 7-37 Hotels and Occupancy Average of Rooms and Beds - Emirate of Dubai (2009-2011). Source: Department of Tourism and Commerce Marketing

The most important indicators of the hotels and occupancy average of rooms and beds (table 7-37) are translated to the figures below (figure 7-23, figure 7-24 and figure 7-25).

Figure 7-23 Number of rooms and occupied rooms in Dubai (2006-2011)

Figure 7-23 shows that both the number of rooms and the room occupancy (%) grew of the total period. Notable is the number of room increased despite the financial crises and the first signs of a slowdown are only visible in 2011. This could be a result of the fact that large real estate properties (e.g. hotels) were already under construction. However, the financial crisis of 2008 is visible (as expected) in 2009 as the number of occupied rooms witnessed a decline, the ratio number of room / occupied rooms is still not the level of before the crisis.

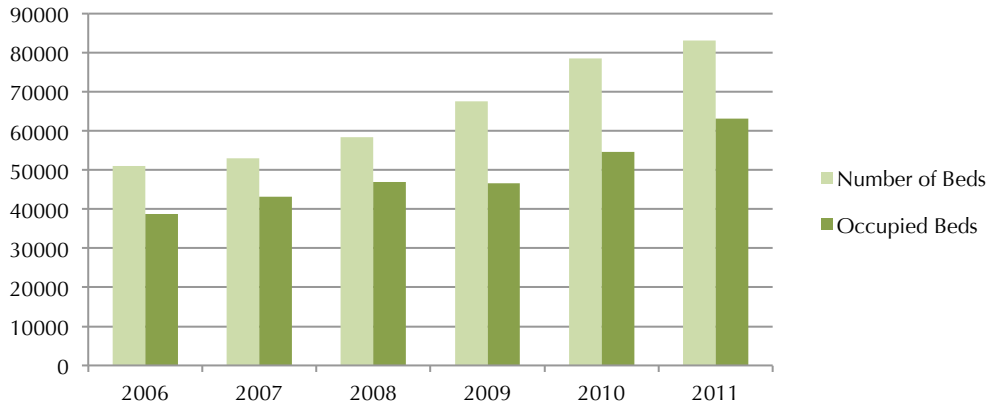


Figure 7-24 Number of beds and occupied beds in Dubai (2006-2011)

Figure 7-24 shows the relation between number of beds and occupied beds in Dubai, which is similar to the number of rooms and occupied rooms (figure 7-23).

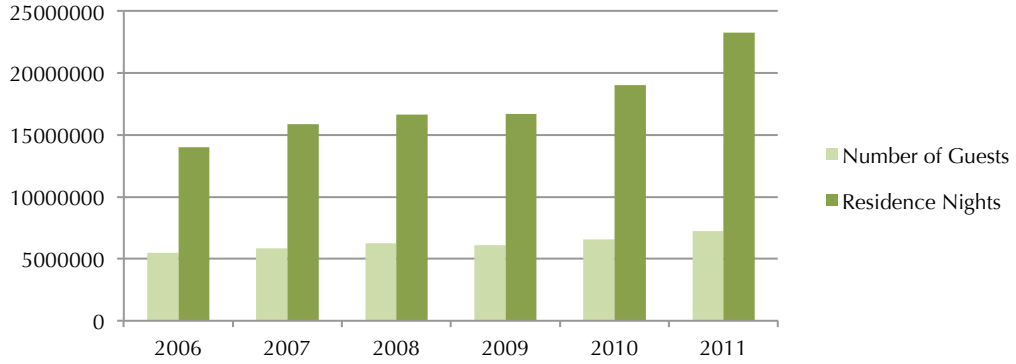


Figure 7-25 Total number of guests and total residence nights in Dubai (2006-2011)

As figure 7-25 shows, both the number of guests and the residence night witnessed a decline due to the global crises (visible in 2009). In either 2010 or 2011 the number of guest grew continual. Remarkable is that number of residence night grown exponentially, especially in comparison to the number of guests. Thus, a relatively stabile amount of visitors and the rising number of residence night indicate that visitors in Dubai stay longer in the city.

Title	2006			2007			2008		
	Residence Nights	Guests	Average Length	Residence Nights	Guests	Average Length	Residence Nights	Guests	Average Length
UAE	480555	257562	1,9	536633	297883	1,8	655468	343879	1,9
Other GCC Countries	1781034	819310	2,2	1718459	783143	2,2	1395123	645342	2,2
Other Arab Countries	1162657	483074	2,4	1165913	476246	2,5	1172396	474670	2,5
Asia and Africa	3837790	1530693	2,5	4614108	1679044	2,7	5045055	1872916	3,1
Europe	5618720	1832372	3,1	6388640	1981720	3,3	6690969	2180096	3,1
Americas	788768	388243	2	1044441	468366	2,4	1265427	558404	2,3
Oceania	350971	162255	2,2	397363	177107	2,4	429266	197984	2,2
Total	**14020495**	**5473509**	**2,6**	**15865557**	**5863509**	**2,5**	**16653704**	**6273291**	**2,5**

Table 7-38 Guests and Residence Nights at Hotels by Nationality - Emirate of Dubai (2006-2008). Source: Department of Tourism and Commerce Marketing

Table 7-38 indicates growing numbers in both guests and residence night before the crisis. Especially Europe and Asia / Africa have high average lengths and residence nights values. Moreover, table 7-39 shows the guests and residence nights at hotels by nationality after the financial crisis of 2008.

Title	2009			2010			2011		
	Residence Nights	Guests	Average Length	Residence Nights	Guests	Average Length	Residence Nights	Guests	Average Length
UAE	1128744	535661	2,1	1339928	623489	2,1	1640481	708915	2,3
Other GCC	1613182	679156	2,4	2010677	774389	2,6	3173644	1123597	2,8
Other Arab's	1195815	481129	2,5	1326148	495533	2,7	1685360	545169	3,1
Asia / Africa	4900211	1828080	2,7	5647115	2002469	2,8	6560100	2183284	3
Europe	6290602	1932087	3,3	6945120	1989754	3,5	8372595	1996446	4,2
Americas	1207268	497736	2,4	1343195	513676	2,6	1386344	516183	2,7
Oceania	362584	151964	2,4	415315	162689	2,6	448350	189136	2,4
Total	16698406	6105813	2,5	19027498	6561999	2,7	23266874	7262730	3,2

Table 7-39 Guests and Residence Nights at Hotels by Nationality - Emirate of Dubai (2006-2008). Source: Department of Tourism and Commerce Marketing

Both table 7-38 and table 7-39 are transferred to figure 7-26 (guests at hotels by nationality) and figure 7-27 (guestnights at hotel by nationality) to indicate Dubai as regional or international hub.

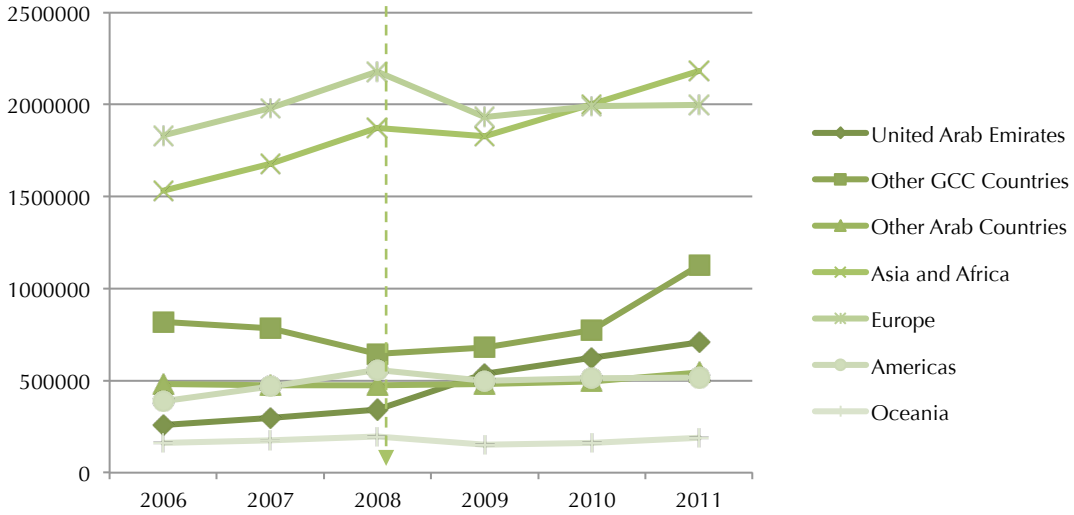


Figure 7-26 Guest at Hotels by Nationality (2006-2011)

Striking is that Europe guests declined heavily during the crisis while Asia and Africa were relatively stabile, and eventually took over the leading position in 2011. In face of the crisis both the UAE and other GCC countries witnessed a growth in guest at the hotels in Dubai.

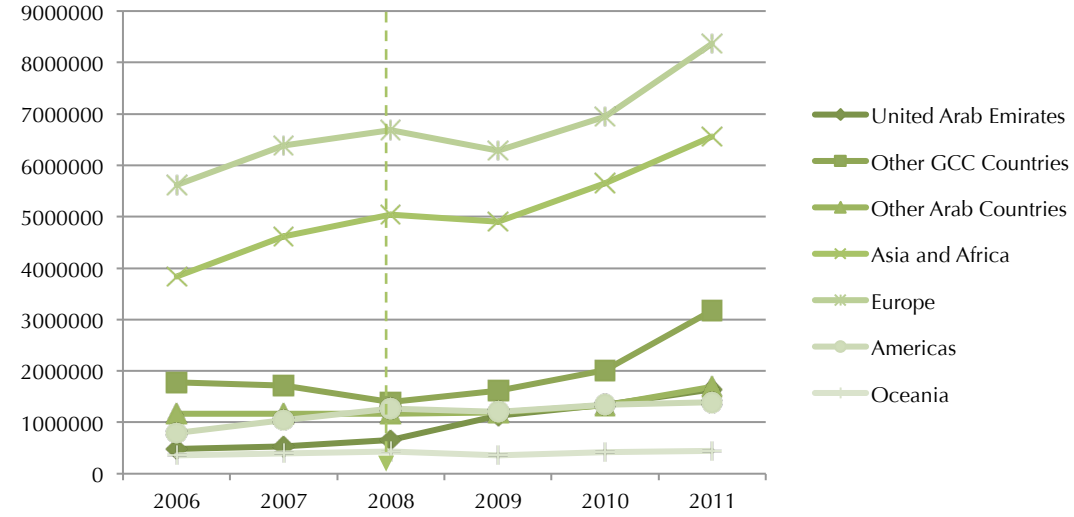


Figure 7-27 Guest Nights at Hotels by Nationality (2006-2011)

However, when analysing the guests nights at hotel in Dubai Europe is still leading and followed by Asia / Africa, suggesting its international hub function (note, average length Europe is 4.2 and Asia / Africa is 3). This figures shows the importance of Europe and Africa for hotels measured by guestnights.

7.3 The 'super-connectors': carriers and airports

In order to wean their economies away from declining oil reserves some Middle Eastern countries, such as Abu Dhabi, pursue substantial investments into their aviation and maritime sector. The bulk of these investments concentrates on the United Arab Emirates and Qatar and comprises fleet expansions by massive airport extensions, development projects and new massive maritime ports (see theory). As in theory the focus on (air) ports is the central goal of the ISH-shift, the aim of this paragraph is on the aviation sector. Due to the collaboration between the national airlines of members of the GCC, backed with enormous investments, the aim is on the so-called 'super-connectors' of the Gulf. Note, both the aviation and maritime industry are discussed for Abu Dhabi and Dubai in the previous paragraphs.

Therefore this paragraph will focus on the most important characteristics of the aviation industry and airport developments, for example the rapid transformation of the airport market in the Middle East as a result of the rapid expansion of the Emirates, Etihad and Qatar Airways and the massive expansion projects to match the future traffic forecasts of Abu Dhabi, Doha, and Dubai airports.

7.3.1 Development in the Middle East

Table 7-40 focuses on the transitions in international tourist arrivals of the UNWTO regions. Notable is that Europe still forms the majority of the market (more than 50%) but this may in the future as the annual growth of both Asia and Africa is more than double that of Europe, respectively 6,2% and 2,5%.

UNWTO Regions *	International Tourist Arrivals (million)							Market share (%)	Change (%)		Annual Growth (%)
	1990	1995	2000	2005	2010	2011	2012**	2012**	11/10	12/10	
World	**436**	**529**	**677**	**807**	**949**	**995**	**1035**	**100**	**4,8**	**4**	**3,6**
Middle East	10	14	24	36	58	55	52	5	-5,6	-5,4	5,2
Europe	263	306	388	449	486	516	534	51,6	6,4	3,4	2,5
Asia & Pacific	56	82	110	154	205	218	234	22,6	6,4	7	6,2
Americas	93	128	128	133	150	156	163	15,8	3,7	4,6	2,9
Africa	15	26	26	35	50	49	52	5,1	-0,8	5,9	6

Table 7-40 Middle East Tourism and Air Traffic Growth (UNWTO, 2012). * Region defined as shown in appendix I, notable: Russia is covered by 'Europe'; Oceania is covered by 'Asia & Pacific'.

According to the half-yearly results by the United Nations World Tourism Organization (UNWTO), tourist arrivals in the Middle East increased by 13% in the first half of this year from the same period of 2012. The same survey shows that world tourist flows grew by 5%, a higher rate than the UNWTO had forecasted. Although this data is taken intro account they are not official annual data and therefore not implemented in the world tourist arrivals per region (1990-2012*) figure below, figure 7-28.

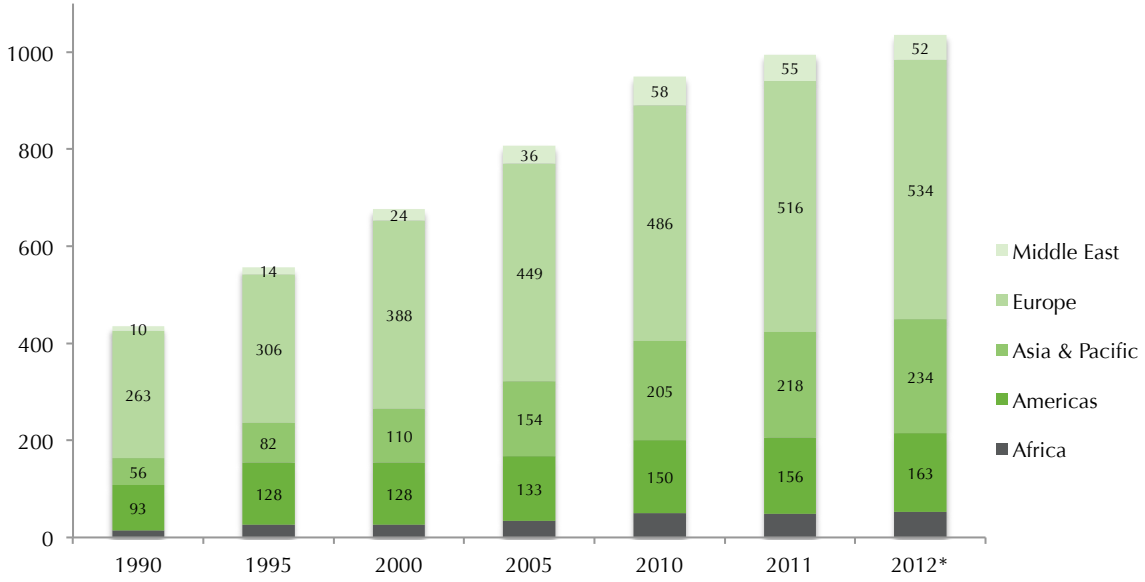


Figure 7-28 Middle East Tourism and Air Traffic Growth (Data: UN World Tourism Organization 2012).

Although air transport has always been the main method of travel among the major distant areas in the

Middle East region, international tourism has been the major source of air transport growth in the last 10 years. The period discussed in table 7-41 and figure 7-29 is till 2030, the same timespan as used by the 'Abu Dhabi Strategic Vision 2030'; the main policy document used in Abu Dhabi's planning.

UNWTO Regions *	International Tourist Arrivals Received (million)				Average annual growth (%)			Share (%)	
	Actual data		Projections		Projections	Of which		2010	2030
	2000	2010	2020	2030	2010-2030	2010-2010	2020-2030	Market share (%)	Market share (%)
World	**677**	**949**	**1360**	**1809**	**3,3**	**3,8**	**2,9**	**100,0**	**100,0**
Middle East	24	58	101	149	4,6	5,2	4,0	6,5	8,2
Europe	388	486	620	744	2,3	2,7	1,8	50,6	41,1
Asia & Pacific	110	205	355	535	4,9	5,7	4,2	21,7	29,6
Americas	128	150	199	248	2,6	2,9	2,2	15,9	13,7
Africa	26	50	85	134	5,0	5,4	4,6	5,3	7,4

Table 7-41 Tourism towards 2030: International tourism by region of destination (Source: UNWTO, 2012),

According to the World Trade Organization (WTO), tourist arrivals in the Middle East have nearly tripled since 1995—from 14 million arrivals to more than 36 million arrivals in only 10 years (table 7-41).

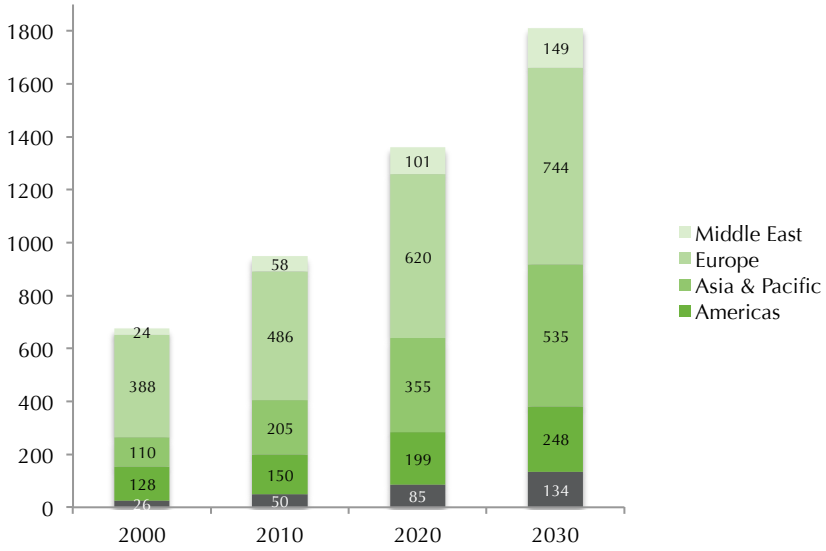


Figure 7-29 Tourism towards 2030: International tourism by region of destination (Data: UNWTO 2012, source author).

Analyzing international tourism by region of destination for the period 2000-2030 (figure 7-29) indicates that the influence of both Europe and the America's is declining, this in contrast to the Middle that witnessed a sustainable growth (from 6,5% market share to 8,2%).

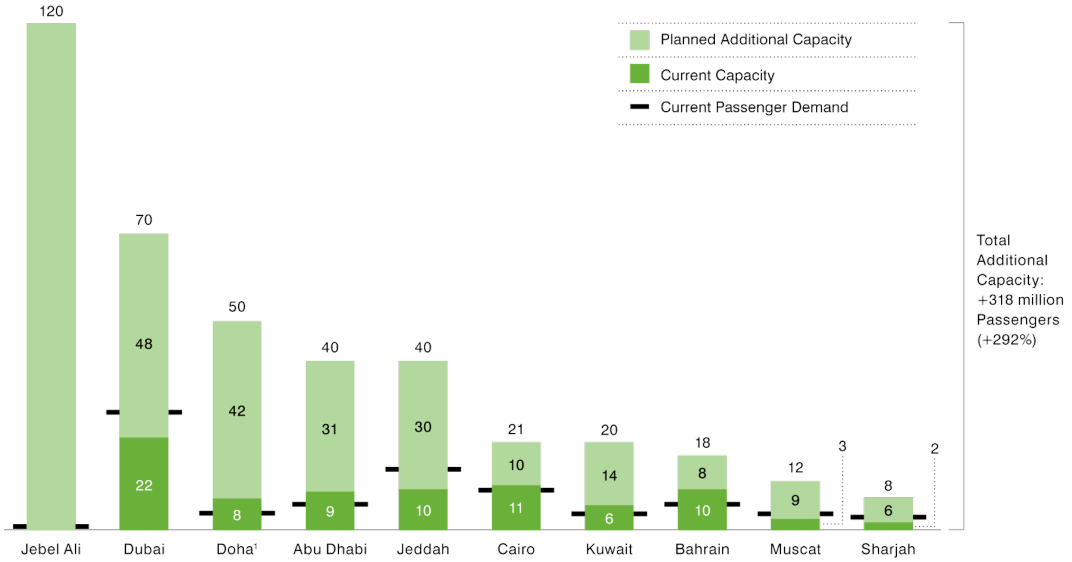
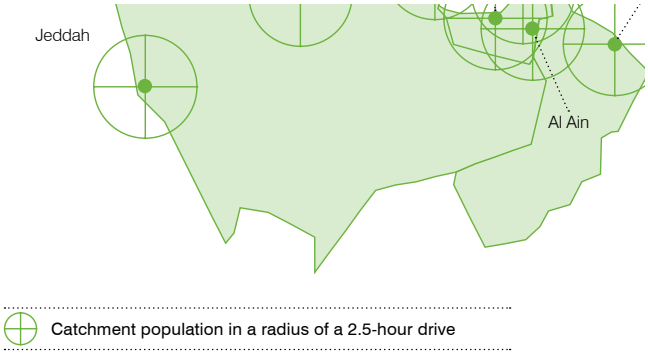


Figure 7-30 Middle East Airports Overcapacity Risk: * Qatar is building a new airport (Source: Zawya)

The figure above (figure 8-30) discusses the Middle East airports passenger capacity (2005–2012) in million passengers; in both planned and current capacity, as also the current passenger demand. This figure shows a disconnection between demand and (planned) capacity, especially in face of the new airport expansions. Thus, when analyzing the three states relevant for the research (Abu Dhabi, Doha and Dubai) some challenges come up due to this high economic growth aspirations and major infrastructure programs. Over the next five years, they are forecasted to increase capacity at more than 15% per annum, which is well ahead of demand and bears the risk of intense competition; were further driving down aircraft utilization and overall performance efficiency as Middle East airports have committed an investment of more than USD 20 billion in airport capacity in the next 10 years. The 10 major airports in the region will receive almost 80 percent of that investment, see figure 7-30 and 7-31.



Source: IATA, Booz & Company

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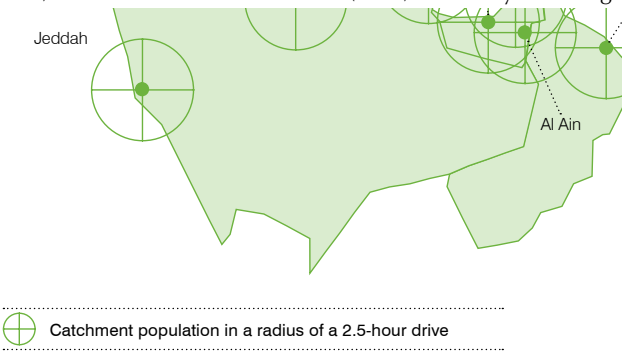
Figure 7-31 Overlapping catchment areas in a radius of a 2.5-hour drive. Source: IATA.

The figure above (figure 7-31) shows the overlapping catchment areas in the Middle East and especially the Gulf. Most of the 10 major airports lay contiguous within a 2.5-hour drive, except the Saudi airport Jeddah and Riyadh. This figure shows an important limiting parameter as enormous developments are planned (figure 7-30) in the same catchment area (7-32) and 'only' with a growth projection of 4,6% in 2010-2030.



Source: IATA, Booz & Company

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Figure 7-32 Overlapping Catchment Areas. Source: IATA.

In light of expected future growth in passengers and aircraft operations, the Gulf airports have engaged in massive expansion programs. These expansions are occurring in areas of close proximity —thus increasing the risks of overlapping catchment areas and cannibalization of demand. Moreover, the planned capacity of the Middle East in 2012 encompasses nearly 320 million additional passengers (figure 8-30) and those three Gulf cities alone encompasses approximately 114 million of it (table 7-42). However, the region will likely fall short of such growth, even if it meets its expected growth rate of about 7 percent per year.

7.3.2 Development in Abu Dhabi, Doha and Dubai

This subparagraph will focus specifically on recent developments in Abu Dhabi, Doha and Dubai. Were the planned capacity of the Middle East in 2012 encompasses nearly 320 million additional passengers, these three Gulf cities are responsible for more than a third of it.

	Present capacity	Planned capacity		
	2009	2012	2016	2020
Abu Dhabi	12	20	32	50
Dubai International Airport	60	70	70	80
Dubai Al Maktoum International Airport (Jebel Ali)	–	-	160	160
Doha International Airport (DIA)	20	Closed *	Closed	Closed
New Doha International Airport (NDIA	-	24 *	50	50
Total	*92*	*114*	*312*	*340*

Table 7-42 Current and planned capacity expansion at Abu Dhabi, Dubai and Doha Airports (millions of passengers). Sources: Airport Technology (2009), NDIA (2010) and Air Transport Intelligence (2010) *The construction of the new airport is delayed and therefore is Doha International Airport open till 2014.

Figure 7-33 shows these airport expansion plans and with as reference Frankfurt am Main (Germany), one of Europe's the leading airports. When analysing the total planned capacity from 2012-2020, the total planned capacity of those three cities (340 million) is even more than that of the planned capacity of 10 major airports of the Middle East in 2012 (320 million additional passengers) of table 7-54. Note that the period of research was here 2005-2012. When analysing figure 7-33, especially the construction of the new Dubai Jebel Ali, besides Dubai International Airport, is outstanding. Moreover, the figure shows that the airports at Abu Dhabi, Doha and Dubai will expand their capacity to nearly four times its current capacity.

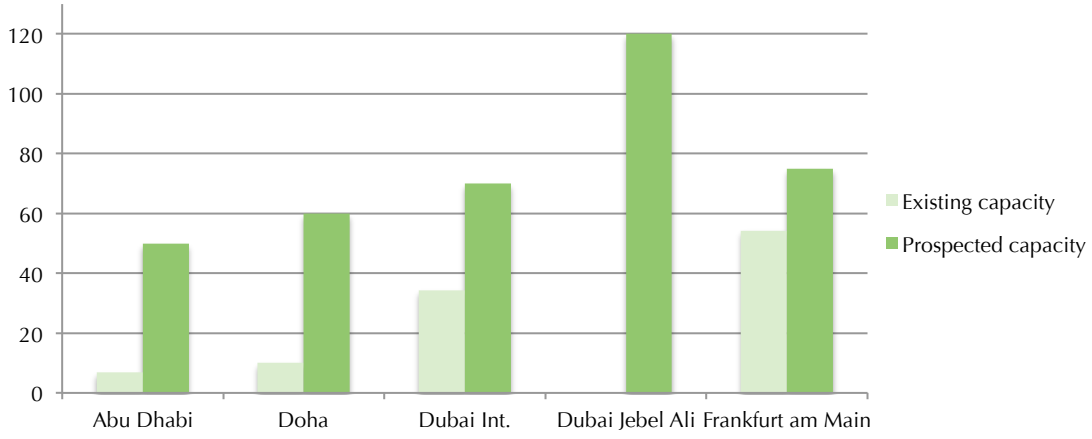


Figure 7-33 Airport expansion plans in the Middle East with as reference Frankfurt am Main*;* Passenger handling capacity per year (millions) (Vespermann et al., 2008).

But what makes them so attractive that such investments could be recouped? As discussed in §4.5, ''the hub and spoke system of the Gulf'', their may be a number of advantages, as will be now examined.

The 'Big Three' Gulf carriers operate synchronized daily banks in order to consolidate traffic and optimize the number of connections with the minimum connecting times. The connecting times between flights is an important characteristic of hub airports (see chapter 4); were figure 7-43 shows the minimum connecting times at Abu Dhabi, Doha and Dubai for Europe. Passengers originating in the Middle East, for example, have only to wait for 40 minutes, on average, before connecting onwards for a flight to Europe. These short connecting times allow the Gulf carriers to compete with non-stop flights.

Origin/destination	Abu Dhabi	Doha	Dubai
Europe – Middle East	40 min	30 min	45 min
Middle East – Europe	40 min	40 min	40 min
Europe–Far East	40 min	30 min	45 min
Far East–Europe	40 min	35 min	40 min
Europe–Australia	1 h20	–	45 min
Australia–Europe	1 h45	–	1 h15
Europe–Africa	40 min	1 h05	40 min
Africa–Europe	40 min	35 min	40 min
Europe–America	1 h10 min	1 h05	1 h05
America–Europe	40 min	30 min	40 min

Table 7-43 Minimum connecting times between regional-pairs at Abu Dhabi, Doha and Dubai airports (OAG, 2009).

Airport charges in the Gulf are some of the lowest in the world. Figure 7-34 shows that airport charges for an A340-600 at Abu Dhabi, Doha or Dubai, are 9 times lower than those encountered in Paris, Heathrow and Amsterdam airports. There are no taxes, environmental, terminal navigational and parking charges at Gulf airports, while the security is bundled into the passenger terminal charge.

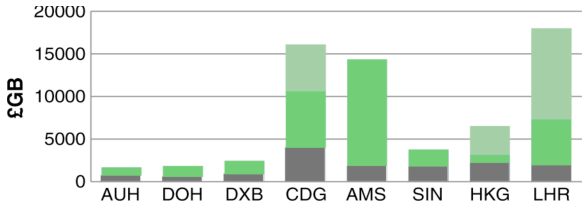


Figure 7-34 A340–600 airports charges for a 2h stay with 80% load factor. Source: IATA (2008). Note: This calculation is based on the fact that 60% of the passengers are terminating and 40% are connecting. *With AUH (Abu Dhabi), DOH (Doha), DXB (Dubai), CDG (Paris), AMS (Amsterdam), SIN (Singapore), HKG (Hong Kong) and LHR (London).*

Furthermore, the LCC or Low Cost Carrier, market share is an important parameter as those three cities compete to become the regional or international shipping hub. Figure 7-35 shows that Doha is well ahead on this mutual competition while Abu Dhabi is fallen behind, from the start in 2006 on.

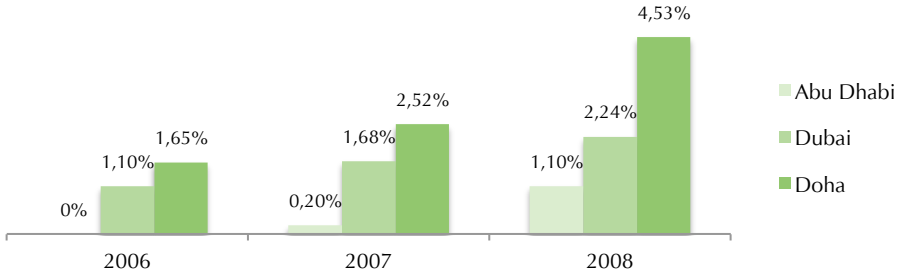


Figure 7-35 LCC*'s market share in Abu Dhabi, Doha and Dubai airport (as % of O&D traffic). Source: Airport Is (2009).

7.3.3 Passengers: Demand Side

Traffic forecasts, conducted by Murel and O'Connell (2011), are analyzed for the airport of Dubai, Abu Dhabi and Doha, to determine if the future passenger growth meets the airports' expansion programs. The data available of the United Arab Emirates – National Bureau of Statistics is only available to 2008 and other information has huge 'pay slots'. Therefore this research will primarily focus on the data as calculated by Murel & O'Connell (2011).

Their model is typically used in order to estimate middle to long-term evolutions (ICAO, 2007). Three categories of air traffic forecasts are analyzed, which included: Origin and Destination (O&D) passengers; transfer passengers; and transit passengers. These are passengers that embark the aircraft at the origin and disembark at the destination. These passengers were further divided into two subsections, namely residents and tourists. Firstly, resident passengers (or domestic demand) can be forecasted on the basis of the Gross Domestic Product (GDP) and GDP per capita. Secondly, tourists, who are mainly dependent on tourism development, were forecasted on the basis of national tourism prospects.

Dubai and Abu Dhabi resident forecasts	2004	2005	2006	2007	2008
UAE population (millions)	3.76	4.12	4.23	4.49	4.76
Abu Dhabi resident pax (millions)	0.88	0.99	1.04	1.42	1.55
Dubai resident pax (millions)	2.35	4.5	5.54	7.10	7.43

Table 7-44 Evolution of Abu Dhabi and Dubai's resident passengers from 2004 to 2008. Sources: Abu Dhabi Tourism Authorities (2009) and calculated by Murel and O'Connell (2011).

Dubai and Abu Dhabi passenger forecasts	2009	2012	2015	2020
UAE population (millions)	5.00	5.30	8.55	10.7
Abu Dhabi resident pax (millions)	1.35	1.67	2.23	4.06
Dubai resident pax (millions	6.98	8.18	9.36	10.35
UAE GDP/capita (US$)	116,443	202,658	250,220	350,342

Table 7-45 UAE resident passenger forecasts for Abu Dhabi and Dubai to 2020. Sources: Airportsls (2009) and calculated by Murel and O'Connell (2011).

Some important conclusions can be made regarding the forecasted resident passengers of table 7-44 and 7-45. The total UAE population will (most likely) grow from 3.76 to 10.7 million in the period 2004-2020, an increase of 285%. The Abu Dhabi resident tax increases by 461% and the Dubai resident tax by 440% over the same period. Furthermore, the GDP per capita may witness a growth of 300% from 2009 till 2020. Moreover, table 7-46 shows the Doha resident and tourist forecasts over the period 2004-2008. Notable is that the O&D passengers grew by 151%, note that the seat capacity grew over the same period by 212%.

Doha and resident and tourist forecasts	2004	2005	2006	2007	2008
O&D passengers	3,905,225	4,135,890	4,484,179	5,116,939	5,908,563
GDP per capita (US$)	151,137	194,132	252,259	307,613	435,077
Seat Capacity	8,714,272	10,887,910	13,186,895	15,648,969	18,392,274

Table 7-46 Origin and Destination traffic at Doha (includes the independent variables). Sources: Airportsls (2009), OAG (2010) and calculated by Murel and O'Connell (2011).

Much of the Middle East is land locked and is easily accessible by road. However, O'Connell and Williams (2010) found that 85% of the visitors to the Gulf States arrive by air. Tourism growth in Dubai and Abu Dhabi is based on the two Emirati tourist forecasts. Four million tourists are expected to visit Abu Dhabi by 2020, and tourism traffic is expected to increase by 9.5% per annum between 2008 and 2015, and 6% per annum between 2015 and 2020. Meanwhile, the average growth rate of Dubai tourists is forecast to increase at 11% per annum between 2009 and 2015, but thereafter, it decreases to 6% per annum till 2020 — this effect is expected to generate 20 million visitors by 2020 (Abu Dhabi Tourism Authorities, 2009; Dubai Department of Tourism & Commerce Marketing, 2009).

O&D	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Abu Dhabi	4,29	4,65	5,05	5,58	6,05	6,62	7,29	7,85	8,44	9,12	9,91	10,82
Doha	5,87	6,48	6,89	7,15	7,76	8,09	8,43	8,78	9,15	9,54	9,94	10,35
Dubai	22,26	24,36	26,4	29,13	31,22	33,07	34,7	36,54	38,42	40,35	42,3	44,27

Table 7-47 Most likely O&D forecasts for Abu Dhabi, Doha and Dubai (million passengers). Source: Murel & O'Connell, 2011.

Table 8-47 shows the most likely O&D forecast for Abu Dhabi, Doha and Dubai as calculated by Murel and O'Connell. When analysing this table a few important conclusions can be made. First, the expectation is that Abu Dhabi surpasses Doha in the year 2020. But, maybe more important, the lead of Dubai in O&D passengers is still more than double the amount of Abu Dhabi and Doha combined. As figure 7-36 indicates on the next page.

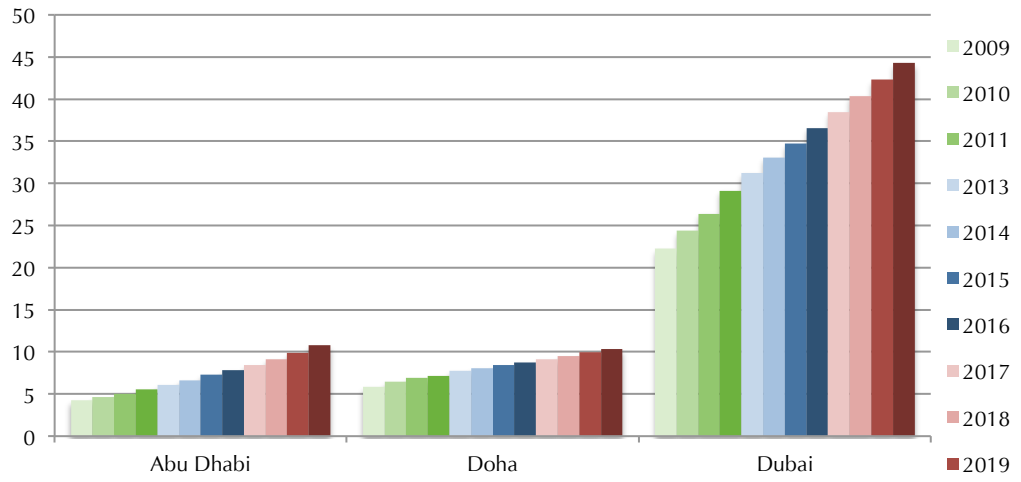


Figure 7-36 Most likely O&D forecasts for Abu Dhabi, Doha and Dubai (million passengers). Source: Murel & O'Connell, 2011. Notable: Abu Dhabi surpasses Doha in 2020.

Table 7-48 examines the number of transfer passengers at Abu Dhabi, Doha and Dubai from 2006 to 2008. Almost 13.5 million passengers transferred at Dubai in 2008, up 31% when compared to 2006. Abu Dhabi witnessed an increase of 60% during the same period, neighboring Doha 32%.

Transfer	2006	2007	2008
Abu Dhabi	2,94	4,52	4,7
Doha	5,61	6,55	7,38
Dubai	10,26	12,31	13,48

Table 7-48 Transfer passengers at Abu Dhabi, Doha and Dubai from 2006 to 2008. Source: PaxIs (2009)

This data was then further extrapolated to forecast the number of transferring passengers from 2009 to 2020. However PaxIs data only provides three years of transfer passenger data, which makes it difficult to create a reliable and robust model. The methodology used by Aéroports De Paris Ingénierie (ADPI) for traffic forecasts is also used for the three Gulf airports and applied Boeing traffic growth rates between regions until 2020 in order to evaluate the future number of transfer passengers. As Murel & O'Connell (2011) state, the financial recession is also factored in these calculations.

Calculated Transfer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Abu Dhabi	5,86	6,91	7,32	7,76	8,22	8,71	9,22	9,78	10,35	10,97	11,63	12,31
Doha	8,54	10,23	10,85	11,51	12,22	12,97	13,77	14,61	15,51	16,47	17,48	18,55
Dubai	14,9	16,55	17,58	18,67	19,84	21,07	22,38	23,78	25,27	26,84	28,52	30,31

Table 7-49 Most likely transfer forecasts for Abu Dhabi, Doha and Dubai (million passengers) from 2009 to 2020. Source: Murel & O'Connell, 2011.

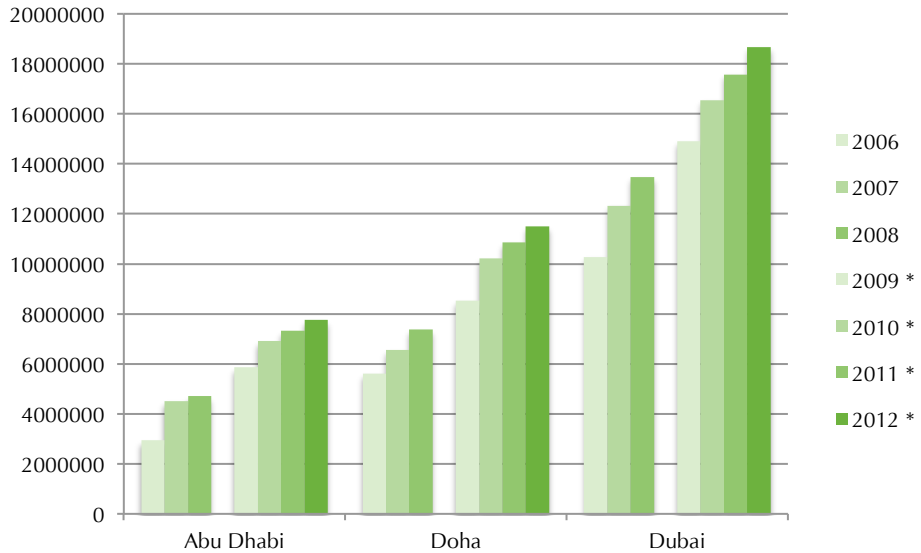


Figure 7-37 Transfer passengers at Abu Dhabi, Doha and Dubai from 2006 to 2008. Source: PaxIs (2009) *) From 2009 to 2012 as calculated by Murel & O'Connell (2011).

When the data of table 7-49 is transferred to a chart for the three cities, figure 7-37 arises for the period 2006-2008 and 2009-2020*. The most likely traffic forecasts for Abu Dhabi, Doha and Dubai as calculated by Murel and O'Connell are examined in table 7-50. Which discusses the O&D, transit and transfer passengers in one comprehensive table.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Abu Dhabi												
O&D	4,29	4,65	5,05	5,58	6,05	6,62	7,29	7,85	8,44	9,12	9,91	10,82
Transit	0,3	0,28	0,26	0,24	0,22	0,2	0,18	0,17	0,16	0,14	0,13	0,12
Transfer	5,86	6,91	7,32	7,76	8,22	8,71	9,22	9,78	10,35	10,97	11,63	12,31
Total	*10,45*	*11,84*	*12,63*	*13,58*	*14,49*	*15,53*	*16,69*	*17,8*	*18,95*	*20,23*	*21,67*	*23,25*
Doha												
O&D	5,87	6,48	6,89	7,15	7,76	8,09	8,43	8,78	9,15	9,54	9,94	10,35
Transfer	8,54	10,23	10,85	11,51	12,22	12,97	13,77	14,61	15,51	16,47	17,48	18,55
Total	*14,41*	*16,71*	*17,74*	*18,66*	*19,98*	*21,06*	*22,2*	*23,39*	*24,66*	*26,01*	*27,42*	*28,9*
Dubai												
O&D	22,26	24,36	26,4	29,13	31,22	33,07	34,7	36,54	38,42	40,35	42,3	44,27
Transit	0,83	0,81	0,79	0,77	0,75	0,73	0,71	0,69	0,67	0,66	0,64	0,63
Transfer	14,9	16,55	17,58	18,67	19,84	21,07	22,38	23,78	25,27	26,84	28,52	30,31
Total	*37,99*	*41,72*	*44,77*	*48,57*	*51,81*	*54,87*	*57,79*	*61,01*	*64,36*	*67,85*	*71,46*	*75,21*

Table 7-50 Most likely traffic forecasts for Abu Dhabi, Doha and Dubai (million passengers). Source: Murel and O'Connell (2011).

Table 7-50 is translated to the comprehensive chart of figure 7-38. Notable is that, in total passengers, Abu Dhabi in on a third position. Far behind Doha and Dubai.

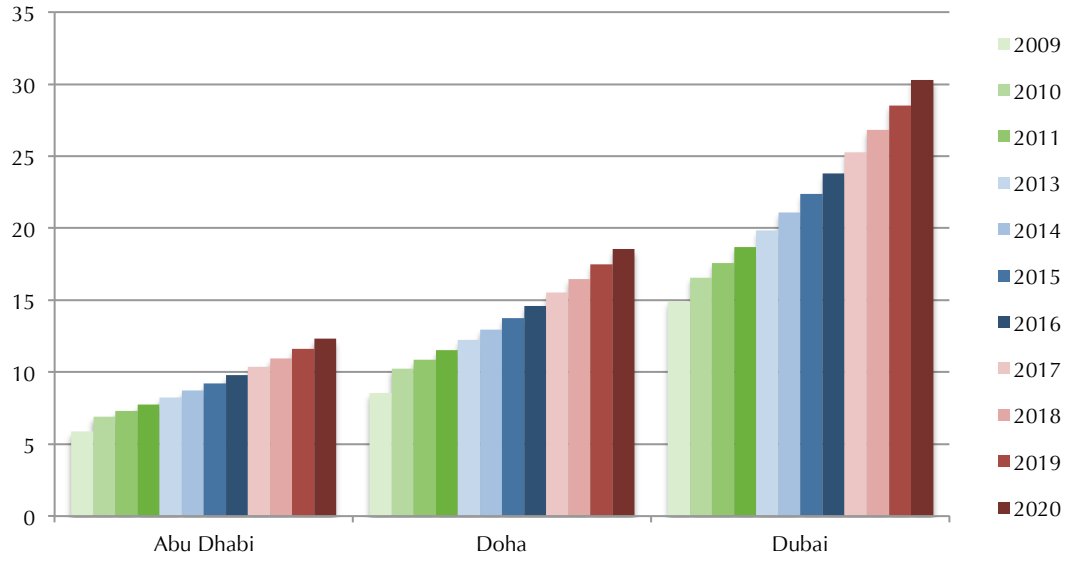


Figure 7-38 Most likely transfer forecasts for Abu Dhabi, Doha and Dubai (million passengers). Source: Murel & O'Connell, 2011. Notable: Abu Dhabi is Doha surpassed in 2020.

Over 30 million transferring passengers are expected in Dubai by 2020 and this results in an annual rate of 5.9% per annum. Meanwhile, around 18.5 million will transfer through Doha, while over 12 million will do so at Abu Dhabi by 2020. It is also possible to estimate the most likely number of passengers that will use the 3 Gulf airports by 2020. In Dubai, there will be over 75 million passengers using the airport by 2020, while almost 29 million and over 23 million will pass through Doha and Abu Dhabi airports, respectively. However, the limitation of the historical data (less that 7–10 years data) created some uncertainties for the reliability of the forecast.

7.3.4 Fleet: Supply side

Gulf based airlines have forecasted that traffic will surge through their hubs over the next few decades and invest heavy by buying large volumes of aircrafts. Figure 8-39 compares the number of widebody aircrafts on order (in terms of seats), and it illustrates that Emirates, Etihad Airways and Qatar Airways have about 60% more long-haul seat capacity on order than Europe's big three (Air France, British Airways and

Lufthansa) and Asia's big three (Cathay Pacific, Singapore Airlines and Thai Airways). Clearly, this capacity represents a major threat to both Asian and European airlines, as the big three Gulf carriers will use this new capacity to encroach on the primary hubs of their competitors core cities by adding frequencies, while, at the same time, commencing new routes to secondary cities in Asia (such as India).

New Doha International Airport (NDIA)	-
Total	92

Figure 7-39 Wide body seats capacity on order (June 2009 to 2020). Sources: OAG and ATI (2009)

Airlines in the Middle East currently account for just 9% of long-haul capacity worldwide, but are responsible for about 25% of all global long-haul aircraft deliveries over the next decade. Dubai-based Emirates Airlines is the largest buyer, with approximately 70% of all new long-haul aircraft orders in the Middle East – the airline is planning to more than double its all-wide-body fleet capacity by 2012 (Flanagan, 2006). Once all these aircrafts are in use, Emirates Airlines will be the world's largest long-haul carrier. Other airlines in the region with sizable wide-body aircraft orders include Qatar Airways with an order book of about 140 wide-body aircraft and Etihad Airways with about 20 aircrafts pending delivery *. Whilst aircraft orders of Gulf carriers represent real fleet expansions, aircraft orders placed by incumbent carriers are mainly used to replace existing capacity (figure 7-40, with Lusthansa as reference).

*) In addition: these numbers are at the moment of writing outdated, as appendix 10 indicates. Large quantities of aircraft are ordered and recently, at the Dubai airshow, these number skyrocket to inconceivable numbers. This is not the main focus of this document and therefore not further examined but may be relevant for further research. It is however important to acknowledge, especially when the 'existing orders' of this research are immense, as the text below will explain.

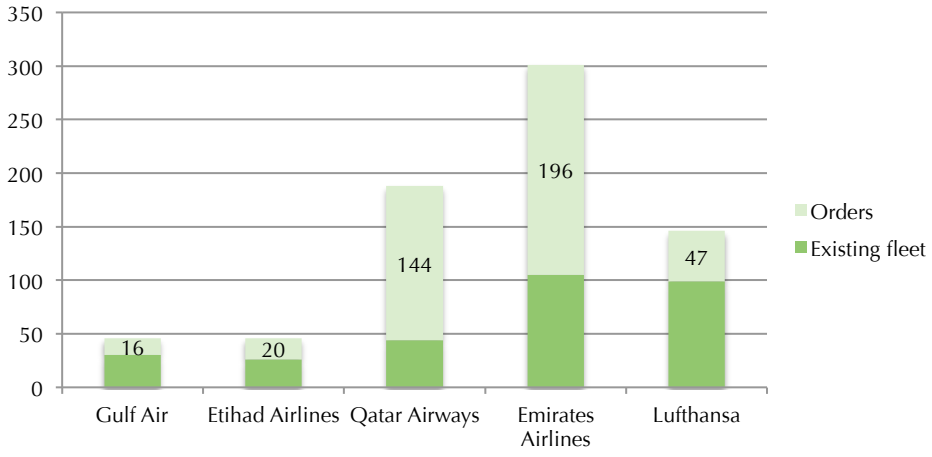


Figure 7-40 Wide body fleet [quantity] as in March 2008: Fleet expansion plans of Middle Eastern carriers; *reference Lufthansa (Vespermann et al, 2008). With as reference Lufthansa because Frankfurt au Main was used for the airports.*

Thus, the Gulf airline's network extension is also reflected in their fleet development. With regard to fleets, aviation data from 2007 and 2012 reveals that the three carriers have jointly added a total of 177 new passenger aircraft (Emirates: 83, Etihad Airways 38, Qatar Airways 56). Meanwhile the passenger fleets of their European counterparts Air France-KLM4 (from 580 to 574 aircraft) and International Airlines Group 5(IAG, the holding that owns British Airways and Iberia) (from 391 to 383) have decreased. Only Lufthansa and its subsidiaries also expanded their fleets (from 591 to 618 aircraft).

When considering recent investments, even without the Dubai airshow, the Gulf airlines are not only competitors for European and Asia airlines but also to each other.

7.3.5 Destinations: Supply side

In order to ''feed" a sufficient amount of passengers into their aircraft, the airlines are continuously expanding their networks. Emirates Airlines, for instance, is already serving over 20 cities in Europe alone. Its ambition is to connect Dubai directly to well over 100 cities around the world by 2012. When looking at the number of destinations being served, Middle Eastern carriers are already outnumbering the established carriers from Europe in some markets. A closer look at the Asian market (split up into East Asia, South Asia, South East Asia, Oceania) indicates that for every market except the East Asian one, most Middle Eastern carriers have an advantage in the number of destinations (table 7-51).

	'Incumbents'				Middle Eastern Carriers			
	British Airways	Lufthansa	Air France	*Average*	Emirates Airlines	Qatar Airlines	Etihad	*Average*
East Asia	4	11	7	*7,3*	7	6	3	*5,3*
South Asia	8	8	4	*6,7*	18	16	12	*15,3*
South East Asia	2	5	4	*3,7*	5	9	13	*9,0*
Oceania	1	0	1	*0,7*	6	0	2	*2,7*
Total	15	24	16		36	31	30	

Table 7-51 Number of Asian destinations served by incumbents and Middle Eastern carriers (as of March 2008). Note: East Asia (China, Japan, South Korea), South Asia (Bangladesh, India, Maldives, Nepal, Pakistan, Sri Lanka), South East Asia (Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam), Oceania (Australia, New Zealand, French Polynesia). *Lufthansa (Vespermann et al, 2008)*

When analyzing the new routes in operation for the years 2003, 2006 and 2009 mixed conclusion can be made. While in 2003 the Gulf carriers saw a massive improvement in new routes, the old super connectors did the same (table 7-52). In the year 2009 Eithad and British Airways integrated the most new routes (7), followed by Qatar Airways and Lufthansa.

Rank	Carriers	New routes in operation since 2003	New routes in operation since 2006	New routes in operation in 2009	Total number of routes in 2009
1	Lufthansa	89	41	5	159
2	Air France	43	20	2	155
3	British Airways	69	25	7	106
4	Emirates	41	13	4	99
5	Qatar Airways	45	19	5	79
6	Singapore Airlines	31	8	1	60
7	Etihad Airways	59	24	7	59
8	Qantas Airways	36	6	2	42

Table 7-52 The evolution of airline routes from 2003 to 2009 by various network carriers worldwide. Source: OAG, 2010.

All three carriers – Emirates (EK), Etihad (EY), and Qatar (QR) – have extended their networks, frequencies and overall capacity massively during the last five years, despite the global financial crisis and the Arab Spring at their doorsteps (Prologis, 2012). As can be seen in table 8-53 below.

	2007			2007 Total	2012			2012 Total	Change
Continent	EK	EY	QR		EK	EY	QR		+/- in %
Africa	16	4	14	34	20	8	19	47	38,20%
Asia	39	26	43	108	46	43	55	144	33,30%
Europe	22	9	17	48	32	15	31	78	62,50%
N-America	3	2	2	7	8	3	4	15	114,30%
Oceania	6	2		8	7	3	2	12	50,00%
S-America	1			1	3		2	5	400,00%
Grand Total	87	43	76	206	116	72	113	301	46,10%

Table 7-53 Destinations served, with: EK = Emirates, EY = Etihad, QR = Qatar

As expected, Asia and Europe are the two markets with the highest number of routes served by the three carriers, with Africa coming in a distant third. Europe has grown the most in terms of new routes being added (62.5% more routes being served now) among these markets. The Americas are growing much faster but from a much lower base.

The weekly capacity of seats and frequencies were also examined and are implemented in appendix 10. This information was not essential for this research and therefore not incorporated in this chapter.

8 Data Analyses

This chapter will give a comprehensive analysis of the empirical findings chapter and is divided into three paragraphs; Abu Dhabi, Dubai, and aviation or the ''super-connectors''. The focus of this analysis is on a brief covering all aspects of the research and adequately (without being to general), in order to accomplish this the conclusion focuses on a few key elements especially relevant for this research. While sectors affiliated to SBMD (real estate, construction, hotels) and IH (transportation, financial and insurance but also non-oil exports and also re-exports) are especially relevant for the transformation of SBMD to IH, and the aviation sector and developments (airlines, airports) for the feasibility of this phase, the other information is relevant to put them in a broader context. In order to analyse the (statistical) data it is necessary to indicate the impact of the financial crisis of 2008 in total economic activities (both volume and economic growth) and prices (inflation). When analysing these economic activities without the important ''mining and quarrying'' sector (accountable for 58,5 of the GDP) it becomes apparent that Abu Dhabi witnessed growth and it is therefore possible to state that poor performing sectors (either a small growth or decline) perform below the average. As the characteristics of Dubai differ, such as the importance of the oil-sector (5%) and real estate market crisis, these dynamics are (till some extent) different but outcomes remarkably similar. As a result the emirate of Dubai may give insights in the possible future of Abu Dhabi and it economy is more diversified and developed. With the data of chapter 7 and translation to figures and tables, often the crisis integrated with a green arrow, it is possible to analyse the resilience and adaptability of these sectors and industries. Regarding the aviation industry the analyses of demand, supply, investments and competitors should result in a comprehensive answer about the future of Abu Dhabi's aviation industry (airport and national airline, Etihad). As a result, both the transformation from SBMD to IH, and the feasibility of IH. As the sustainable shift has no data this has to be discussed on a wider scale.

8.1 Abu Dhabi

The yearbooks of Abu Dhabi, in contrast to Dubai, contain the GDP by economic activity at current prices, which indicates the economic growth of its economic activities. The GDP at current prices (figure 7-1) shows that, besides its exceptional growth in recent years, that its economy is still largely oil-driven, which is in contrast to its policies. However, the remarkable conclusion can be made that its total economy without the mining and quarrying sector witnessed growth during and after the financial crisis. Note that the financial crisis of 2008 is visible in the total economic activity.

When zooming in on the relevant sectors or industries of this research (accommodation and food services; transportation and storage; financial and insurance; and real estate) some key characteristics of its economy arise. In figure 7-2 the first three sectors are implemented and both ISH sectors (financial and insurance and transportation sector) witnessed economic growth, while the SBMD sector (accommodation and food service) saw a decline. Footnote; for both the transportation and real estate sector is the 'make-or-break' year 2008 not available. Therefore are table 7-2 and 7-3 integrated in this research and are the growth rates (%), for both the whole period (2005-2011) and after crisis (2009-2011), calculated, which gives some key characteristics of the industries. The difference in growth rates between 2005-2011 and 2009-2011 is the largest for accommodation and food services (respectively 88,76% and 8,21%) and real estate (respectively 172,06% and 11,03%), both industries relevant for SBMD. Note that both industries still witnessed growth after the crisis. However, the difference between the transportation and storage (respectively 137,10% and 33,87%) and the financial and insurance sector (respectively 117,93% and 30,00%) was much smaller, both relevant for the ISH-phase. Furthermore, both sectors performed much better after the crisis (2009-2011) than its counterparts, in fact about 3 times better. Note, the total growth of GDP at current prices is in the same period 6,84% The GDP at constant prices, for both Abu Dhabi and Dubai available data, shows how much goods and services were produced in volume terms and is measured by holding prices constant. Both table 7-4 and figure 7-5 show a shifting annual growth at constant prices. The construction sectors witnessed a growth of 116,07% in the period 2005-2009 and a growth of 8,14% in the period 2009-2011, which could be even a 'positive' value as the construction sector reacts slow to the crisis (as will be explained later on). Both the real estate and accommodation (relevant for SBMD) witnessed in the period after the financial crisis (2009-2011) a growth of respectively

11,06% and 23,43%. The transportation and financial sector, relevant for ISH, saw in the same period a growth of respectively 13,48% and 24,70% in volume terms.

The foreign trade statistics of the economic activities is important in multiple ways for this research. Not only separates it the oil and non-oil exports but also divided import and re-export. Especially the non-oil export and re-export are relevant for Abu Dhabi as an international shipping hub (ISH). Figure 7-5 shows the non-oil and re-export statistics through the ports of the emirate. This shows that non-oil exports did it particularly well during the financial crisis and re-exports even exceeded the non-exports in 2011, with respectively a growth of 358% and 360% over the period 2005-2011. Table 7-8 indicates that in the immediate years after the crisis (2009 and 2010) formed around the 3% of total trade, in contrast to the 1,3% in 2008. However due to its enormous oil exports, for example in 2011 of 78,2%, the number is relatively low. Table 7-9 shows that the non-oil exports for the period 2007-2011; were the maritime industry saw its exported value increased by 198% and the aviation industry by 443%. The annual rate of inflation (figure 7-6) clearly indicates the financial crisis of 2008 as the inflation dropped from 14,9% to 0,8%. As for foreign trade, also the foreign investments are an important indicator for Abu Dhabi's economy.

Construction sector

Several sectors have been identified by the Abu Dhabi government for their potential to provide long-term growth and for the diversification of their economy, which is the construction sector an important pillar of. New infrastructure such as hotels and resorts are required for development of the tourism industry in the Emirate of Abu Dhabi and indicates construction as 'one of the enable industries will contribute to the development and support of the targeted future growth sectors'. In this sentence their policy directly links the construction sector with the hotel sector, and therefore connects it also directly to the SBMD-phase.

The construction activities contributed 10,1% to the GDP in 2011 compared with 13,0% in 2010. Table 7-10 shows that, while the total number of permit issues increased, the number of permits for new building decreased, which is an important parameter for SBMD as 'new' iconic buildings are an important indicator. While the number of permits issued by residential, commercial and industrial activities witnessed a huge increase over the period 2009-2011 it is especially the public utilities sector that affects the SBMD-phase, as for instance iconic museums and public galleries are part of the public utilities sector, which saw a decrease of 424 in 2009 to 3 in 2010 and 11 in 2011. When zooming in on the number of building permits by type and building usage in table 7-10 this number is for new buildings in fact zero in either 2010 or 2011.

Hotel sector

As the construction sector is required for new infrastructure (as hotels) and the development of the tourism industry as it 'directly connects value to the attraction of a nation', the hotel and restaurant sector will be discussed in further detail. The key statistics of hotel establishments' activity are discussed in table 7-17 show an increase of 274% in the number of rooms. Figure 7-10 indicates that in face of the financial crisis of 2008 the visitors cut back their guestnights rather than their visits. Moreover, despite the crisis the enormous investments in the sector were retained and resulting in an increasing dissimilarity between the number of rooms and the number of visits, which results in a declining occupancy rate to 64,7% in 2010. Since 2008 the number of guests increased by 34,2% but the average stay is still lower than in 2005 and 2008. Table 7-19 and figure 7-11 indicate that the total revenue of hotel establishments witnessed a small growth after the financial collapse (2009-2011). However, this is primarily due to 'food and beverage' (an increase of 15%) and 'other' revenues, the room revenues witnessed a decline of nearly 12%. Note that both figure 7-10 and figure 7-11 indicate the financial collapse and the stagnating growth of the sector. Figure 7-10 showed that visitor rather cut back their guestnights than their visits, as discussed in table 7-18. Therefore the data of table 7-21, guestnights of hotel establishments, is more relevant to analyse. Figure 7-13 shows that especially the amount of guestnights by Europeans witnessed a strong decline after 2008, nearly 16%. While other regions saw a small contraction, the number of guestnights by citizens of the UAE kept exponential growing. This figure strengthened not only the regional hub function of Abu Dhabi, it also indicates its function as an international hub as Europe is still the leading region and Asia follows at the third place.

Aviation sector

The aviation industry is evidently of major importance for the goal to become an international shipping hub. Especially the aviation sector, even more than maritime transport, is set as one of the most important policies. When analysing the total number of aircraft movement and specified by type in table 7-11 some key characteristics arise. The air transport of passenger witnessed an enormous increase and the freights saw an increase 226% in the period 2005-2011. Notable in figure 7-7 is that the financial crisis is visible in the air transport statistics but only for a small period as it almost immediately recovers its growth percentage of handled passengers, an increase of 131% in the period 2009-2011. However, the transit passengers are not restored before 2011. Table 7-12 discusses the air passenger arrival more detailed and by region of embarkation. Figure 7-8 shows that Europe and Asia (apart from GCC countries), are from 2010 the biggest contributors to the air passengers. Also noticeable is that especially European passengers witnessed a decline in 2009 while the GCC and Asia saw a clear growth. These figures show the movement of Abu Dhabi as international shipping hub between Europe and Asia, and its regional hub function in the Gulf region.

Maritime sector

The maritime sector is also of importance for the goal to become an international shipping hub and results in enormous new port projects to boost its economic diversification. The financial crisis is clearly visible in the total cargo of 2009. However, a footnote has to be made. The general cargo is highly influenced by the oil and natural gas sector; therefor the total TEUs will give a more realistic image than figure 7-9. As can be seen in table 7-14 the total container TEUs witnessed an impressive growth, especially in the immediate aftermath of the financial crisis (2008-2009) were the total growth was +36% in only one year. Table 7-15 shows that both the export and re-export did well during the crisis, were especially the re-export sector witnessed a sustainable growth in 2008-2009 and 'ships' saw a growth of +103%. The distribution of container TEUs incoming and outgoing in Zayed Port by region (table 7-16) shows that especially the container TEUs from other Emirates of the UAE are of great influence, followed by the 'Far East', South East Asia and the Indian Sub Continent. Note that Europe is divided in Western Europe, Mediterranean, Scandinavia and Eastern Europe and their influence is therefor little.

8.2 Dubai

As previously discussed, the GDP by economic activities at current prices is not available for Dubai. Dubai, as the precursor of Abu Dhabi, could give some necessary and useful insights about urban planning in the Gulf region. The 'Dubai-model' is widespread and its economy is better-developed and less oil-dependent (only 5% of the GDP). Due to its less oil-driven economy and longer trade history the insights of Dubai could give an answer about future urban and economic planning in Abu Dhabi.

Table 7-22 discussed the gross domestic product, or GDP, at constant prices for the Emirate of Dubai. Notable insight are that the economy is much smaller in volume terms and annual growth (of the volume) of 3,9% in 2011 against 0% in 2010. When comparing the relevant sectors of this research in figure 7-14 the financial crisis isn't directly visible and sectors as 'real estate' and 'construction' witness a decrease from 2009 (so in the data of 2010), a year after the financial crisis of 2008, which could be explained by the real estate market crisis. However, a difference between SBMD and ISH sector is visible. After the crisis, both the transportation and financial sector hold up better and saw growth rates, while the construction, real estate, and restaurant saw declining volumes. When analysed in percentage of the distribution the relevant sectors of ISH grew, transportation in 5 years by 15% (8,93 to 14,0%) and the thereto-associate financial sector by 2% (9,29 to 11,3%). However, also the restaurant and hotels sector (SBMD) saw its percentage of distribution grow by 1,1% (table 7-23). As in these sectors the crisis is not immediately clear; the annual inflation rates of Dubai (table 7-25) are useful to analyse. Figure 7-16 clearly indicates the financial crisis of 2008 in the chart as it inflation witnessed a strong decline from 2009 on, with even a deflation in 2012. The foreign trade statistics are meaningful in multiple ways as it indicates the imports, exports and re-exports. Noticeable is that re-exports are of greater importance than exports in Dubai but come far behind the imports. Furthermore, the financial crisis is visible in the data of figure 7-15 regarding the re-exports, imports and to a lesser extent in the exports (conform the inflation rates).

Construction sector

Several sector have been identified by the Abu Dhabi government for their potential to provide long-term growth and for the diversification of their economy, which is the construction sector an important pillar of. New infrastructure such as hotels and resort are required for development of the tourism industry in the Emirate of Abu Dhabi and indicates construction, and their policy directly links the construction sector with the hotel sector, and therefore connects it also directly to the SBMD-phase.

The construction, and housing, sector contributed to 9,4% of the GPD in 2011, compared with 8,5% in 2010. The total housing units (table 7-26) witnessed a growth of +100% in the period 2000-2008 and in the period 2008-2010 with +25%. However, those figures may not show the real picture as a large part of the buildings is or was already under construction. As stated in the Economist, after the crisis a large of construction projects was set on hold. Therefor the data of building under construction (table 7-28) and real estate transaction (table 7-29) may give a more updated and realistic image. Table 7-29 shows that from 2008 on the total value of real estate transactions declined with 82%, with a negative peak in total value of 119,953 million AED in 2010. Remarkable is that the number of real estate transaction witnessed a small growth in 2009 even when the total value declined, however the total number of real estate transactions saw a negative growth of 11% in the period 2009-2011. The chart of figure 7-17 clearly indicates the financial collapse of 2008 and indicates that the total value of real estate transaction is still not on its level of before the crisis (in fact approximately 60% in 2011). While the total number of real estate transition 'fluctuates' the total number of transaction is on a relatively stable level from 2009 (note, also no growth). The ratio total value and total number of transaction therefore shifted in a 'negative' manner for real estate prices (figure 7-17).

Hotel sector

As the construction sector is required for new infrastructure (as hotels) and the development of the tourism industry as it 'directly connects value to the attraction of a nation', the hotel and restaurant sector is therefore an important parameter for the SBMD-phase in urban planning. Important characteristics in the immediate aftermath of the global crisis of 2008 are shown in table 7-36; the number of flats witnessed an increase because construction projects were not suspended (as discussed above in the construction sector subparagraph). However, the flat occupancy rate lagged and resulting in an increasing difference between visitors and the number of flats. Because the number of flats stagnated (or a small growth) and the flat occupancy grows, the flat occupancy rates rises but is still not on the level before the crisis. Also noticeable is that the number of hotel apartment buildings is declining but the number of flats witnessed a growth (table 7-37). The most important indicators of the 'hotels and occupancy average of rooms and beds' (are translated to the figures 7-23, 7-24 and 7-25. Figure 7-23 shows that both the number of rooms and the room occupancy grew in the total period of research (2006-2011). Notable is that the number of rooms increased despite the financial crisis and the first signs of a slowdown are not visible before 2011. As could be explained due to the fact that large real estate properties (e.g. hotels) were already under construction. However, the financial crisis of 2008 is visible (as expected) in 2009 as the number of occupied rooms witnessed a decline, note that the ratio number of rooms / occupied rooms is still not on the level of before the crisis. Figure 7-24 shows the relation between the number of beds and occupied beds in Dubai, which is similar to figure 7-23. The number of beds increased after the crisis, the number of occupied beds declined. As figure 7-25 shows, both the number of guests and guestnights witnessed a decline in 2009. Remarkable is that the number of residence nights grown exponentially, especially in comparison to the number of guests, which was relatively stabile. This indicates that a stabile number of visitors stay longer in Dubai in 2008-2011.

When analysing the guests and residence nights at hotel by nationality (table 7-38) is shows that both the number of guests and residence nights grew before the crisis. Especially Europe and Asia / Africa have high numbers relating to average length and nights. Either figure 7-26 (guests at hotel by nationality) or figure 7-27 (guestnights at hotel at nationality) indicates Dubai as a regional or international hub. Striking is that European guests declined heavily during the crisis while Asia and Africa were relatively stable and they even took over the leading position in 2011. In face of the crisis both the UAE and other GCC nations witnessed a growth in guests at the hotels in Dubai. However when analysing the guestnights at hotels in Dubai, Europe is still leading and followed by Asia and Africa, indicating its international hub function.

Aviation sector

The aviation sector is evidently of major importance for the international shipping hub (ISH) shift. Especially aviation transport, even more than maritime transport, is set as one of the most important policies. Table 7-30 shows that the grand total of aircraft movements at Dubai International airport is growing; also during the financial crisis of 2008. Figure 7-18 indicates that the financial crisis is visible in 2009, but the decline is only marginal. Over the period 2009-2011 the arrival and departure numbers still grew extensive. Important difference is that the number of transit passengers is more or less stable, resulting in a growing difference between 'departure / arrivals' and transit passengers'. Also cargo movement is a key parameter for the transportation sector and therefore the ISH-phase. In light of the crisis the quantity of good kept (largely) stable, as can be seen in table 7-31. Figure 7-19 shows that the financial crisis of 2008 is visible in the data and results in a small growth number for both loaded and discharged goods. However the growth is still visible during these years and 2010 is already in line with 2006-2008.

Maritime sector

The port of Dubai, Jebel Ali Port, is the largest port of the Middle East excluding ports exclusively used for petroleum export and ranks in 2010 as ninth largest container port in the world. Table 7-33 discussed the containers handled at Jebel Ali Port but unfortunately only the 'total containers handled' is useful. Figure 7-20 indicates a relatively small decline in the year 2009 and shows its resilience against the crisis. Notable is that the total number of containers handled at Jebel Ali Port is in 2011 higher than in 2008. The passenger movement discussed in table 7-35 shows the influence of the four most importance ports relating to passengers. Figure 7-22 shows the total passenger movement at Dubai seaports in total. Remarkable is that the total number is little influenced by the financial crisis and even witnessed impressive growth number from 2006-2010.

8.3 The 'super-connectors'

For the 'International Shipping Hub' phase the area of research is far more extensive as the other Gulf Cooperation Council and other nations in the Middle East focus on this shift in order to diversify their economies. An example is the collective order of Airbus aircraft by Abu Dhabi, Dubai and Qatar. In order to wean their economies away from declining oil reserves these nations pursue substantial investments in both their aviation and maritime sectors. The aviation industry can be seen as the precursor for similar development in the maritime industry and signs become more visible in the West were especially the so-called super-connecters as Etihad, Fly Emirates and Qatar Airways increase their activities.

The bulk of the just mentioned substantial investments concentrates in the UAE and Qatar and form therefore the backbone of this paragraph. Investments comprise fleet expansions, massive airport expansions and development projects to become the 'new' regional and international hub. For example Abu Dhabi, Doha and Dubai have launched expansion projects to match future traffic forecasts as high as 340 million passengers.

Development in the Middle East

Table 7-40 discussed the shift in international tourist arrivals of the UNWTO regions and indicates that Europe has still the majority of the market share (more than 50%). However this could change in the future as the annual growth of Asia and Africa is more than double that of Europe, respectively 6,2% and 2,5% (figure 7-28). According to the half-year results by the United Nations World Tourism Organisation (UNWTO) tourist arrivals in the Middle East increase by 13% in the first half of this year from the same period in 2012 and the world tourist flows grew by 5%. Although air transport has always been the main method of travel among the major distant areas in the Middle East region, international tourism has been the major source of air transport growth in the last 10 years. In figure 7-29, tourism toward 2030 is discussed, this is done as the main policy document of Abu Dhabi ('Abu Dhabi Strategic Vision 2030') covers the same timespan. According to the World Trade Organization (WTO), tourist arrivals in the Middle East have nearly tripled from 14 million in 1995 to 36 million in only 10 years (table 7-41). Analysing international tourism by region of destination for the period 2000-2030 in figure 7-29 indicates that both the influence of Europe and the America's is declining, in contrast to the Middle East whose market share may rise from 6,5% to 8,2% in 2030.

Due to the extensive airport expansion plans in the Middle East an overcapacity risk emerges. Figure 7-30 discusses the Middle Eastern airport passenger capacity (2005-2012) in million passengers and covers planned capacity, current capacity and the current passenger demand. This figure shows a disconnection between demand and (planned) capacity, especially in face of new airport extensions such as the new Jebel Ali airport in Dubai. The total additional capacity (as now planned) covers +318 million passengers, an increase of +292%. When analysing the three most relevant cities of this paragraph (Abu Dhabi, Doha and Dubai) some challenges come up to this high economic growth aspirations and major infrastructure programs (figure 7-30). Over five years, they are forecasted to increases capacity at more than 15% per annum, which is well ahead of demand and bears the risk of intense competition. Middle Eastern airports have also committed an investment of more than 20 billion USD in airport capacity in the next 10 years, were the 10 major airports discussed in figure 7-30 and 7-31 will receive almost 80% of that investments. Figure 7-31 shows the overlapping catchment areas in the Middle East and especially the Gulf region. Most of the 10 major airports, except the Saudi Arabian airports Jeddah and Ryadh, lay contiguous within a 2.5-hour drive. This figure shows an important limiting parameter as massive developments are planned (figure 7-30) in the same catchment area (figure 7-31), with a growth projection of 4,6% in 2010-2030 as stated in table 7-41. These expansions are occurring in areas of close proximity and thus increasing the risks of overlapping catchment areas and cannibalization of demand. As can be seen in figure 7-32, the size of the bubble represents the number of passengers. Moreover, the planned capacity of the Middle East in 2012 encompasses nearly 320 million additional passenger and those three Gulf cities alone encompasses approximately 114 million of it. In figure 7-32 this is especially occurring in Al Ain, Abu Dhabi, Bahrain, Dammam, Doha, and Dubai. However, the region will likely fall short of such growth, even if it meets its expected growth rate of about 7 per cent per year.

This paragraph will therefore further analyse those three Gulf cities and their development. As the region will fall short, in combination with overlapping catchment areas, cannibalization of demand, and thus a fierce competition. Analysing the strongest parties and their 'super-connector' could give useful insights about its feasibility and future.

Development in Abu Dhabi, Doha and Dubai

Table 7-42 shows the current and planned capacity at Abu Dhabi, Doha and Dubai airports for the period 2012-2020. This table indicates that the total planned capacity of the cities (340 million) is even more than that of the total planned capacity of the Middle East in 2012 (figure 7-30). Figure 7-33 analyses the passenger handling capacity and airport expansion plans of the airports in comparison with Frankfurt am Main; one of Europe's leading airports. This figure also shows that the current capacity of the three cities is 92 million passengers and will be nearly quadrupled in the year 2020. When compared to Frankfurt am Main, which handled 54,2 million passengers in 2012, is an enormous increase as this airport prospect to expands it handling capacity with 39% over the same period.

The Gulf based airlines have forecast that traffic will surge through their hub over the next few decades and, in anticipation, they invested heavily by procuring large volumes of aircrafts. Figure 7-39 compared the number of widebody aircrafts on order (in terms of seats) and it illustrates that Emirates, Etihad and Qatar Airways have about 60% more long-haul seat capacity on order than Europe's big three (namely: Air France, British Airways, and Lufthansa) and Asia big three (namely: Cathay Pacific, Singapore Airlines, and Thai Airways). This capacity represents a major threat to both European and Asia airlines, as the big three Gulf carriers will use this new capacity to encroach on primary hub of their competitors' core cities by adding frequencies and commencing new routes to secondary cities.

The 'Big Three' Gulf carriers, or super-connectors, operate synchronized daily banks in order to consolidate traffic and optimize the number of connections with the minimum of connecting times. The connecting times between flights is an important characteristic of hub airports, and table 7-43 shows the minimum connecting times at Abu Dhabi, Doha and Dubai for Europe. Passengers originating for the Middle East, for example, have only to wait 40 minutes on average before connecting onwards for a flight to Europe, these short connecting times allow the Gulf carriers to compete with non-stop flights. This shows that especially Doha performs really well on flight to Europe followed by respectively Abu Dhabi and Dubai. Moreover, airport charges in the Gulf are some of the lowest in the world. Figure 7-34 shows

that airport charges for an A340-600 at Abu Dhabi, Doha or Dubai are 9 times lower than those encountered in Amsterdam, London or Paris. There are no taxes, environmental, terminal navigational and parking charges at Gulf airports, while the security is bundled into the passenger terminal charge. Especially Abu Dhabi airport performs extraordinary on this subject, followed respectively by Doha and Dubai. The LCC, or Low Cost Carriers, market share as percentage of the O&D traffic is an important parameter as those three cities compete to become a regional or international shipping hub. Figure 7-35 shows that Doha is well ahead on this mutual competition while especially Abu Dhabi is fallen behind (with for example 0% in 2006 and only 1,10% in 2008).

Passengers – Demand Side

Traffic forecast were conducted in this paragraph for Abu Dhabi, Doha and Dubai airports to determine if the future passenger growth meets the airports expansion programs. Three categories of air traffic forecasts are analysed, which include: Origin and Destination (O&D) passengers, transfer passengers, and transit passengers. These passengers are divided in two sections, namely residents and tourists. This research has used the data as calculated by Murel and O'Connell (2011). Some important conclusions can be made regarding the forecasted resident passengers in table 7-44 and 7-45. The total population UAE will (most likely) grow from 3,76 to 10,7 million over the period 2004-2020, an increase of +185%. The Abu Dhabi resident tax increases by +361% and the Dubai resident tax by +340 over the same period. Furthermore, the GDP per capita may witness a growth of +200% from 2009 to 2020.

O'Connell and Williams (2010) found that 85% of the visitors to the Gulf States arrives by air. Tourism growth in Abu Dhabi and Dubai is based on two Emirate forecasts. Four million tourists are expected to visit Abu Dhabi by 2020, and tourism traffic is expected to increase by 9,5% per annum in 2008-2015, and 6% per annum in 2015-2020. Meanwhile, the average growth rate of Dubai is forecast to increase at 11% per annum in 2009-2015, and 6% per annum in 2015-2020. This effect is expected to generate 20 million visitors by 2020, or in other words a fivefold of Abu Dhabi. Table 7-47 shows the most likely O&D forecasts for Abu Dhabi, Doha and Dubai as calculated. When analysing this table a few important conclusion can be made. First, the expectation is that Abu Dhabi passed Doha in the year 2020 by O&D passengers. But, maybe more important, Dubai's O&D passenger forecast is more than quadrupled than that of either Abu Dhabi or Doha (figure 7-36). Table 7-48 shows the number of transfer passenger at Abu Dhabi, Doha and Dubai from 2006 to 2008. In this period Abu Dhabi witnessed a growth of 60%, followed by Doha (32%) and Dubai (31%). But in exact numbers (2008) the ratios are vice versa with 13,48 transfer passenger in Dubai, followed by Doha (7,38) and Abu Dhabi (4,7). When analysing the data of table 7-49, and transferring this to figure 7-37, the result is approximately not changed. The three cities have more or less doubled its transfer passengers; Dubai to 30,3 million, Doha to 18,6 million and Abu Dhabi to 12,3. Table 7-50 shows that transit passengers form only a small fraction with 0,12million for Abu Dhabi and 0,63 million for Dubai in 2020.As a result; over 75 million passengers are expected to travel through the Dubai airports, almost 29 million through Doha, and more than 23 million through Abu Dhabi in 2020. Which indicate that, while all three Gulf airports witnessed an extensive growth, the airport of Dubai are almost or more than triple that of Doha and Abu Dhabi.

Fleet – Supply Side

Airlines in the Middle East account in 2006 for just 9% of long-haul capacity worldwide, but are responsible for about 25% of all global long-haul aircraft deliveries to 2017. Dubai-based Emirates Airlines is the largest buyer, with approximately 70% of all new long-haul aircraft orders in the Middle East as the airline is planning to more than double its all-wide-body fleet capacity. Once all these aircrafts are in use, Emirates Airlines will be the worlds largest long-haul carrier (Flanagan, 2006). Other airlines in the region with sizable wide-body aircraft orders include Qatar Airways with an order book of about 140 wide-body aircraft and Etihad Airways with about 20 aircrafts pending delivery. Whilst aircraft orders of Gulf carriers represent real fleet expansions, aircraft orders placed by incumbent carriers are mainly used to replace existing capacity as can be seen in figure 7-40, with Lusthansa as reference. The Gulf airline's network extension is also reflected in their fleet development. With regard to fleets, aviation data from 2007 and 2012 reveals that the three carriers have jointly added a total of 177 new passenger aircraft (Emirates: 83, Etihad Airways 38, Qatar Airways 56). Meanwhile the passenger fleets of their European counterparts Air France-KLM4 (from 580 to 574 aircraft) and International Airlines Group (IAG, the holding that owns

British Airways and Iberia) (from 391 to 383) have decreased. Only Lufthansa and its subsidiaries also expanded their fleets (from 591 to 618 aircraft). When analyzing the fleet expansion plans by Etihad, Emirates and Qatar Airways for the period 2012-2017 this become even more clear (Schaal and Jager, 2012).

Destinations – Supply Side

In order to ''feed" a sufficient amount of passengers into their aircraft, the airlines are continuously expanding their networks. Emirates Airlines, for instance, is already serving over 20 cities in Europe alone. Its ambition is to connect Dubai directly to well over 100 cities around the world by 2012. When looking at the number of destinations being served, Middle Eastern carriers are already outnumbering the established carriers from Europe in some markets. A closer look at the Asian market indicates that almost every market the Middle Eastern carriers have an advantage in the number of destinations (table 7-51). When analyzing the new routes in operation for the years 2003, 2006 and 2009 mixed conclusion can be made. While in 2003 the Gulf carriers saw a massive improvement in new routes, the old super connectors did the same (table 7-52). In the year 2009 Etihad and British Airways integrated the most new routes, followed by Qatar Airways and Lufthansa. All three carriers have extended their networks, frequencies and overall capacity massively during the last five years, despite the global financial crisis and the Arab Spring at their doorsteps; as can be seen in table 7-52.

8.4 Conclusion

When analysing the data important conclusions can be made relating the economic activity of Abu Dhabi. The Emirate witnessed exceptional growth rates in recent years; the economy is largely oil-driven (60% in 2011); and without the mining and quarrying sector the economy witnessed growth during and after the crisis. Zooming in on the relevant sectors on this research, namely: real estate; construction, accommodation and foodservices; transportation and storage; and financial and insurance (the first three are connected to SBMD and the last two to ISH). The economic outcomes of those affiliated sectors are strikingly different when analysed before and after the crisis. Before the crisis the SBMD-sector witnessed huge growth rates, after the crisis the ISH-sector performed much better than its counterparts (in fact three times better). Note: also the SBMD-sectors witnessed growth, in both economic and volume terms. Foreign trade statistics show similar figures, to ISH affiliated statistics as non-oil exports and re-exports performed particularly well in the period 2005-2011 and saw its number more than tripled, were the maritime industry saw its exported value doubled and the aviation industry even quadrupled. Besides foreign trade, the foreign investments show another characteristic. While the majority of investments was expected to be done by GCC states, the majority is done by European and Asian nationalities. Suggesting that Abu Dhabi may become an international hub rather than a regional one. With such growth rates the question arises; is the financial collapse visible in Abu Dhabi. Most certainly it is, the financial crisis is clearly visible in 'total' growth rates, almost all figures and the annual inflation rates of Abu Dhabi.

Analysing the individual sectors or industries show similar statistics. The construction sector, in the statistic yearbooks directly linked to the hotels and tourism industry, witnessed a declining contribution to the GDP after the crisis. While the sector slowly reacts to a crisis, as projects are already under construction, especially the public utility sector (such as iconic museums) saw an enormous decline. The hotel sector saw a huge increase in the number of hotel rooms as investments were retained, however the number guestnights decreased and resulting in an increasing dissimilarity between hotel rooms and guests. Striking is that especially the room revenues witnessed a decline rather than beverage and 'other' revenues. Even with a declining number guestnights in the immediate aftermath of the crisis; Europeans are the leading region, followed respectively the UAE and Asia. Indicating its international and region hub function.
Examining the aviation and maritime sector show different outcomes, were especially the aviation industry is now relevant for ISH. Both the air transport of passengers and freights witnessed an impressive growth in 2005-2011 and in the global crisis of 2008 the industry almost immediately recovers to its level of before the crisis. Zooming in on the air passengers arrivals by region indicate that, apart from GCC states, both Europe and Asia are form 2010 the biggest contributors. Indicating the movement of Abu Dhabi as a hub between Europe and Asia, even more than a regional hub.

The maritime sector shows that both export and re-export did particularly well during the crisis, were especially the re-export sector witnessed sustainable growth. Therefore, when analysing the economic activities and individual industries, it is safe to say that affiliated sectors to the ISH-phase hold up better during and after the crisis than its SBMD counterparts. Furthermore, examining the statistical data it is possible to say that Abu Dhabi is more likely to become an international than a regional shipping hub.

When analysing the data, also important conclusions can be made relating the economic activity of Dubai. The Emirate witnessed exceptional growth rates in recent years; the economy is more diversified as it is marginal oil-driven (5% in 2011); and has a more developed economy because it has a longer trade history. In volume terms, in economic terms too, the economy of Dubai is much smaller than Abu Dhabi and it is annual growth in volumes terms was even zero in 2010. When comparing the relevant sectors of this research the financial crisis isn't directly visible in figures of real estate and construction. Similar to Abu Dhabi, those sectors slowly react to a crisis and a decline is from 2009 on. Note that also the real estate market crisis is a main contributor, which eventually led to a bailout by Abu Dhabi. However, a difference between SBMD and ISH sector is visible. Especially the transportation sector and to a lesser extent the financial sector witnessed growth rates, while the construction and real estate witnessed declining volumes and the hotel sector saw a small growth. The foreign trade statistics are also for Dubai meaning full in various ways as it indicates the imports, exports and re-exports. Noticeable is that re-exports are of greater importance than exports in Dubai, indicating a hub characteristic. But with such growth rates also the question for Dubai arises; is the financial collapse visible in the data. Most certainly, the financial crisis is clearly visible in 'total' growth rates, almost all figures and the annual inflation rates of Dubai. Furthermore, the financial crisis is also visible in the re-export, imports and to a lesser extent exports.

Analysing the individual sectors or industries show similar statistics as for Abu Dhabi. The influence of the construction sector on the GDP is declining when the figures of before and after the crisis are analysed. As the construction industry slowly reacts to the crisis the real estate transactions give a more up-to-date view. The real estate transaction value witnessed a decline of more than 80% after the crisis, the number of transactions more than 10%, and is still not on the level of before the financial collapse. While the number of transactions is relatively stable, the value is plummeted, indicating decreasing real estate values. The hotel sector is directly connected to the construction sector, an important parameter for SBMD and important for both work and output of Dubai. As in Abu Dhabi; construction projects were not suspended, flat occupancy rate lagged (number of bed declined) and resulting in an increasing difference between the number of flats and visitors. Note that the ratio number of beds / occupied rooms is still not on the level of before the crisis. Remarkable is that the number of residence night grew while number of guests was stable, indicating that a stable number of visitors stays longer in Dubai. When analysing the guests(nights) by nationality both Europe and Asia / Africa are leading, followed by other GCC states, indicating its international hub function. Examining the aviation and maritime sector show different outcomes, were especially the aviation industry is now relevant for ISH. The total of aircraft movements at Dubai International airport is grew extensive, with only a marginal decline during the financial crisis, were a growing difference between departures / arrivals and transit passengers is visible. Cargo movement is in the immediate aftermath stable and growth numbers are after 2010 already in line with before the crisis. The maritime sector witnessed a small decline in 2009 but shows it resilience against the crisis and the total number of containers handled at Jebel Ali port is in 2011 higher than 2008. Remarkable is that the total number of passenger movement at Dubai seaports is little influenced by the financial crisis and even witnessed an impressive growth in 2006-2010.

Although air transport has always been the main method of travel among the major distant areas in the Middle East, international tourism has been the major source of air transport growth in the last 10 years. While Europe has still the majority of the market share, tourist arrivals in the Middle East increased by 13% in the first half of this year. Tourist arrivals have tripled in only 10 years and analysing the period 2000-2030 indicates that both Europe and the America's are declining while the Middle East will rise in the same period. However, analysing the data of extensive airport plans in this region indicates emerging overcapacity risks. A disconnection arises between demand and (planned) capacity as additional capacity (as now planned) shows an increase of 318 million passengers. Especially when analysing the three most

relevant cities of this research (Abu Dhabi, Doha and Dubai) challenges come up to this high economic growth aspirations and major infrastructure programs as they forecasted to increase their capacity well ahead of demand and bears the risk of intense competition. Were Middle Eastern airports invest more than 20 billion USD in the next decade, 10 airports will receive almost 80% of it. Most of these airports lay within a 2.5-hour drive, massive new developments are planned, catchment areas overlap and all increasing the risk of demand cannibalization. This is especially relevant for those three Gulf cities as they alone encompass 114 million of the total of nearly 320 million additional passengers in the Middle East.

Further analysing the three cities show that current and planned capacity of their airports in the period 2012-2020 is even more (340 million) than the total planned capacity of the Middle East in 2012. When compared to handling capacity and airport expansion of Frank am Main the uniqueness of these plans become clear. Where Frankfurt plans to expand its capacity with nearly 40%, the three Gulf cities plan to quadruple their capacity. The Gulf based airlines have forecast that traffic will surge through their hubs over the next decades and have about 60% more long-haul seat capacity on order than Europe's and Asia's 'big three'. The 'big three' Gulf carriers, or super-connectors, operate synchronized daily banks and optimize the number of connections with minimum connecting times, which is an important characteristic of hub airports. When analysing this connecting times especially Doha performed well, followed by respectively Abu Dhabi and Dubai. Moreover, airport charges in the Gulf are some of the lowest in the world with extraordinary low rates in Abu Dhabi, followed by respectively Doha and Dubai.

In order to give a well-funded answer regarding the three Gulf carriers (Etihad, Emirates and Qatar Airways) both the demand side (passengers) and supply side (fleet and destinations) are further examined. Relating to the demand side traffic forecast was conducted for Abu Dhabi, Doha and Dubai airports to determine if future passenger growth meets the airport expansion programs. Three categories in air traffic forecasts are analysed, namely: O&D passengers, transfer passengers, and transit passengers. These passengers are divided in two subsections, namely residents and tourists. About 85% of the visitors to the Gulf States arrive by air and tourism growth in Abu Dhabi and Dubai is based on two Emirati forecasts. Four million tourists are expected to visit Abu Dhabi by 2020 and Dubai is expected to generate twenty million, a fivefold, by 2020. As calculated by Murel & O'Connell (2011) the expectation is that Abu Dhabi passed Doha in 2020 by O&D passengers, however Dubai more than quadruples that of either Abu Dhabi or Doha. Another important parameter, the LCC market share (as percentage of O&D) indicates that Doha is well ahead of respectively Dubai and Abu Dhabi. Relating to transfer passengers the three cities will more or less double their transfer passengers: Dubai to 30,3 million, Doha to 18,6 million, and Abu Dhabi to 12,3 million. Furthermore the data indicated that transit passengers form only a marginal fraction. Thus combined over 75 million passengers are expected to travel through Dubai, almost 29 million through Doha and over 23 million through Abu Dhabi in 2020.

Relating the fleet (supply side) the airlines in the Middle East account in 2006 for just 9% of the long-haul capacity worldwide but are responsible for 25% of all global aircraft deliveries to 2017. Dubai-based Emirates is the largest buyer with 70% of all new long-haul order in the Middle East and will become the world largest long-haul carrier. Emirates' has mainly focussed on widebodies and will continue to increase its fleet extensively, Etihad has more than doubled its fleet over the last five years and plans to do so in the next five years. However, unlike Emirates, about half of this growth is from narrowbodies as they are better suited in the regional network (regional hub function), given the fact that Abu Dhabi is still a smaller O&D market than Dubai. Etihad will, however, have to significantly increase its growth rates as it plans to go ahead with its planned deliveries. Qatar Airways has grown in a comparable fashion to Etihad but is used its narrowbodies for its expansion to Eastern Europe. Notable is that aircraft orders of the Gulf carriers represent real fleet expansions, aircraft orders by incumbent carriers is mainly used for replacing existing capacity. Regarding the destinations (supply side), the airlines must continuously expand their networks in order to 'feed' a sufficient amount of passengers into their aircrafts. As expected, Asia and Europe are the two markets with the highest number of routes served by the three carriers, were in Europe 62,5% more routes are now being served. The three carriers increased their number of routes served by more than 46% over the last five years and frequencies have actually increased by more than 80%. Emirates Airways has essentially doubled its capacity in only five years time, with Qatar Airways not far behind. Etihad Airways has grown more slowly during the same timeframe.

8.5 Research Questions

The three main questions of this research are answered with the (statistical) data of chapter 8. With the answers of the paragraph and the theoretical analysis it is possible to give a well-funded answer about urban and economic planning in Abu Dhabi and gives perhaps an insight in is future.

1. How is urban planning used in Abu Dhabi as an instrument for economic diversification?

This question is difficult to answer with the data alone, as it is presumably more a theoretical question. However, when analyzing the data there are a few insights visible. Examining the GDP (Gross Domestic Product) at constant prices and in percentages (% contribution) or the charts of relevant sectors (such as table 7-4, figure 7-4, table 7-32, and figure 7-16) the shift in policy is visible in the statistical data. In the year 2009, in the immediate aftermath of the financial crisis, the construction and (to a lesser extent) the real estate sector declined, while the transportation and (to a lesser extent) the financial sector grew. This moment in time embarks the shift in policy; note that this is the first time the shift in policy is visible in the data, the policy itself could be older.

A similar analysis of the data is unfortunately not possible for the sustainable shift as it is predominantly a future policy. On the moment of policy writing and the Masdar Initiative a preview of the policy was visible in the data. Not in the actually data itself, but in the structure and chapter of the statistical yearbook. The economic activity ''Electricity, gas, and water supply'' was updated in the data of 2011 (statistical yearbook 2012) to ''Electricity, gas, and water supply; waste management''. This is only an example; this trend was visible throughout the yearbook. When analyzing these data apart from theory the shift from SBMD to ISH would be around the financial collapse (2008-2009) and the first herald of the sustainable shift is visible in recent years (2011-2012). Comparing this with both theory and policy this roughly conform previous (theoretical) conclusions.

2. Why the shift from super-brand-mega development (SBMD) to an international shipping hub (ISH)?

In order to analyze the shift or transformation from SBMD to the ISH both global metropolis of the UAE, Abu Dhabi and Dubai, are examined. Abu Dhabi and its precursor share a lot of similarities in both urban planning and economic climate but Dubai also has, for this research, some relevant differences regarding its more developed economy, less one-sided eco-structure (oil), experienced a real estate crisis, an influential airline (25% of the economy) and is sometimes refereed as the player ground of Abu Dhabi. This, in combination with the financial crisis of 2008, gives the opportunity to analyze the resilience of individual sector or industries that are used by urban planning in order to diversify the economy.

When analyzing both Abu Dhabi and Dubai it can be stated the economic industries and sectors affiliated with the ISH-phase (as transportation and financial) performed significant better during and in the aftermath of the financial crisis than its SBMD counterparts (as real-estate, construction and the hotel sector). Moreover, the characteristics of both cities indicate that they increasingly become a regional and maybe even more an international hub. Both the aviation and maritime sector was relatively marginal influenced and witnessed impressive growth rates in recent years, as also the (non-oil) export and especially the re-exports sector. As the aviation sector is of major importance to become an international shipping hub (ISH) and eventually and destination on its own, its an important factor for (future) global cities.

However, this urban shift is far more extensive as other GCC states, and other nations in the Middle East, focus on this urban planning ''method'' to diversify its economies. In order to wean their economies away from declining oil reserves these nations pursue substantial investments in both their aviation and maritime sectors were the bulk of the just mentioned investments concentrates in the UAE. Thus after concluding that ISH sectors performed better than SBMD sectors, it is necessary to analyse the aviation industry and (regional) competitors in further detail to give a comprehensive answer about the feasibility of ISH.

3. Why the shift from an international shipping hub (ISH) to the sustainable shift?

When analysing the aviation sector in Arabian Peninsula challenges arise for Abu Dhabi to become 'the' international hub (ISH). Due to massive new planned development projects within a 2,5-hour drive and, more importantly, with overlapping catchment areas the risk of demand cannibalization is very real throughout the region. The share of (wealthy) young population is growing, tourist arrivals in in the Middle East have tripled in the past decade and increased in the first half year of 2013 alone with 13% but this it is

questionable if this is enough to commensurate such enormous investments. With their location (between Europe and Asia), minimum connecting times and extraordinary low airport rates Abu Dhabi meet the hub system success factors (§4.5) and could compete with its Gulf counterparts and Western airlines.
However, when investigating the investments in planned capacity (2005-2012) the three cities of research (Abu Dhabi, Doha and Dubai) alone are accountable for 114 million additional passengers of the total of 320 million (+292%) and zooming in on the planned capacity (2012-2020) this number exceeds to 340 million in total, well over the current demand and most likely traffic forecasts calculated by Murel and O'Connell of 127 million (Abu Dhabi 23, Doha 29, and Dubai 75). Thus a dissimilarity between demand (passengers) and planned is clearly visible. It is especially Dubai with its passenger handling capacity and fleet expansion of Emirates that is perhaps the main competitor for an identical market share. In order to 'feet' their aircrafts with sufficient amounts of passengers the national airlines must contiguously expand their networks and will Emirates alone will directly connect over 100 cities to Dubai. Given the fact that Abu Dhabi has still a smaller O&D market than its neighbour, about half the growth of Etihad is narrowbodies (better suited in the regional network), and focus on the business segment; the city is more likely to become a regional hub than an international hub. Etihad has, comparable to urban planning and economic planning, grown in grown more slowly than its Gulf counterparts, showing its more conservative and collaboration-drive approach and indicating that it develops in a more measured fashion. However, the air carrier and therefore Abu Dhabi has to increase its growth rates significantly as it plans to go ahead with its ordered deliveries.

Note that data on the sustainable shift is not available as the urban planning method is still in infancy. However, when analysing the first part of this research question the aim to become an international shipping hub (ISH) could be difficult given the lead of Doha and in particular Dubai in both current and prospected passenger demand (apart from its immense deep oil-rich pockets that could be invested). Thus the sustainable shift (ecological modernization) has in theory perhaps some advantages over ISH.

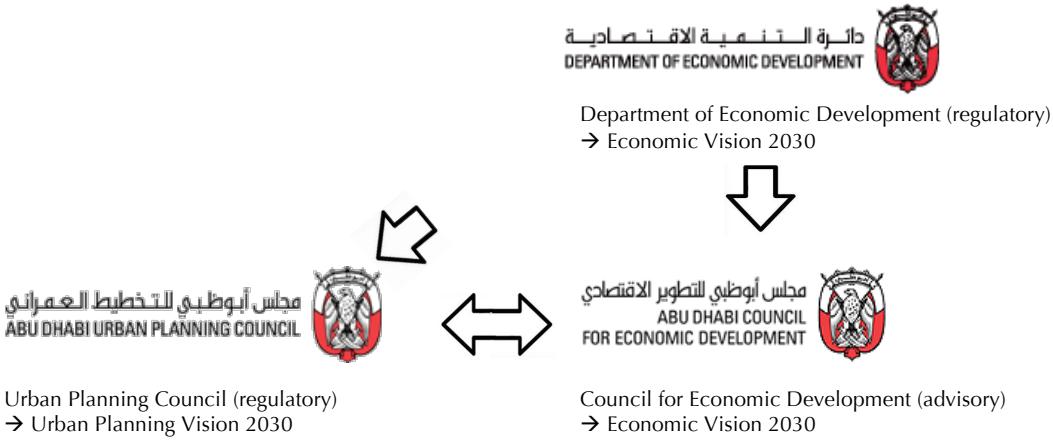
Due to the fact that the sustainable shift is a future shift, data analysis is primarily on SBMD and ISH and its transition. However, as this research specially focuses on the aviation industry and feasibility it is possible to give an answer about this shift. As a result, an answer could be given about the continuation of this phase and if it is necessary to change the policy in urban planning. This doesn't indicate solely that it has to be the sustainable shift that is wise to implement, but may indicate that is could be wise to change policy in order to diversify the economy. Of which the sustainable shift, as a result of theoretical analyses, could be a logical urban planning method to continue.

9 Policy

As examined when discussing the scientific literature, there are multiple phases of urban planning in Abu Dhabi visible and this chapter will focus on policy part this research. The aim is to see if there is a correlation between theory (articles), policy and statistical data (practise). Furthermore, this chapter will also analyse the correlation between economic planning and urban planning in the emirate. This is from major importance as it is possibly a clear link to the results and conclusions, and therefore its economy and future. In order to do so the Abu Dhabi Economic Vision 2030 / Urban Planning Vision 2030 (2010), the Economic Vision 2030 (2008) and the Urban Structure Framework Plan (paragraph Policy Statements) will be discussed and analysed.

The Abu Dhabi Urban Planning Vision 2030 or Abu Dhabi Economic Vision 2030 focuses on the city as a new global city of the twenty-first century. While acknowledging the impact of the oil on the Emirate's wealth, this vision aims to diversify the economy to make it less oil-dependent and develops plans to become a 'sustainable world-class capital city' (ADUPC, 2010). This document has by created by both the Abu Dhabi Urban Planning Council (or UPC) and the Abu Dhabi Council for Economic Development (or CED), and as a result the document gives both a vision on urban planning and the economic goals for the coming decades. Even more than the ratio between urbanization and economic growth, and the quantity of skyscrapers, this document shows a clear link between the urban planning and economic planning to become a global city. This strengthens the assumption that a full understanding of the urbanization in the past fifty years will give a better understanding of its economic prospects and its future. However, this also means that it is necessary to understand the economy and goals of Abu Dhabi as the city in order to draw conclusions on urban planning.

As appendix 8 shows, policy is made by the central government, which is directly controlled the executive council. Between government agencies, but also government enterprises, a strong inter-linkage is visible. For instance many executive boards and boards of directors share the same members, often the royal family. The Abu Dhabi Economic Vision 2030 is a result of the collaboration between a number of public sector and joint public-private sector entities. The most vital are the Department of Economic Development (a regulatory organ), the Council of Economic Development (an advisory organ) and the General Secretariat of the Executive Council (directly under the central government). It draws up the framework and contents for the process of the development envisage for the coming decades and represent a roadmap for economic development of the Emirate. It's the Department of Economic Development (DED) that is charged with the implementation of the Economic Vision 2030 and which has, as a result, a significant influence in the Urban Planning Vision 2030. As is visible in the schema figure below.



Moreover, the Department of Economic Development is a stakeholder in the UPC, along with Department of Transport, the Environment Agency (EAD), the Abu Dhabi Water and Electricity Authority (ADWEA), the Department of Municipal Affairs (DMA) and Abu Dhabi City Municipality (ADM). The result is a comprehensive, highly detailed planning policy, which focuses on urban planning as the tool for economic development. This inter-linkage between the DED / CED and the UPC therefore results in a strong correlation between urbanization and the economy. As seen in figure 9-1 the focus of the policy is on both the 'Economic Vision 2030' (on the left) and 'Urban Planning Vision 2030' (on the right). In the

chapter 'Policy and Plan History' there are several pillars established. Four key priority areas were stated as the focus of the Policy Agenda:

- Economic development;
- Infrastructure development and environmental sustainability;
- Social and human resources development; and
- Optimization of Government operations.
-

When understanding urban planning in Abu Dhabi it is possible to draw conclusions on the future and economy of not only the city, but also the emirate and perhaps the UAE. Or, as stated: 'Furthermore, the interweaving of planning and economics highlights the logical interdependency between the two elements' (UPC, 2010).

Figure 9-1 This chart shows the overall vision for Abu Dhabi, the individual vision of ADCED and the UPC and the overarching principles and objective that crystallize these visions. The principles and objectives can be used as a 'checklist' to ensure that any new plans and initiatives across the realms of both planning and economics fit with the overall vision for the Emirate.

9.1 Abu Dhabi Economic Vision / Urban Planning Vision 2030 (2010)

This document, envisioned by the Council of Economic Development (CED) and the Urban Planning Council (UPC), is at the moment of written the most influential policy document for the research. As discussed on the previous page ''developing appropriate infrastructure'' (first priority), ''while preserving the environment'', which forms the second priority area. Because the subject is cited on numerous pages in the document this thesis will treat the most important statements of the field of research.

9.1.1 Post oil

The oil sector and related activities have historically formed the bulk of Abu Dhabi's economic activity. While Abu Dhabi has a trade surplus, the Emirate has a ''deep' non-oil trade deficit of about USD 21 billion in 2006. Economic diversification is a key pillar of the Economic Vision 2030, therefore also for the Urban Planning Vision 2030, and the Emirate is setting ambitious targets for the performance of the non-oil sector. The oil sector will continue to grow to meet international demand (figure 7-2) and will continue to be a major element of Abu Dhabi's economy. In parallel, Abu Dhabi will focus on developing other sectors that, combined, are expected to grow to an aggregate annual rate exceeding 7.5%. The ambition is that this growth should help the Emirate to achieve a neutral non-oil trade balance. Moreover, economic development will involve the averaging of growth at 7% through to 2015 and thereafter at 6%.

(*) T, here in after, refers to targeted years that fall within the scope of the Abu Dhabi Economic Vision 2030
Source: Abu Dhabi Statistical Year Book 2005; Abu Dhabi Economic Vision 2030 Team Analysis

Figure 9-2 Target Abu Dhabi Real GDP - In 'real' 2005 USD Billion (2005-2030T (*).

(*) T, here in after, refers to targeted years that fall within the scope of the Abu Dhabi Economic Vision 2030
Source: Abu Dhabi Statistical Year Book 2005; Abu Dhabi Economic Vision 2030 Team Analysis

9.1.2 Super-Branded-Mega Development

It is difficult to find traces of 'super-branded-mega development' in the policy, which directly connects this phase with urban planning. Primarily due to the wide concept and its decreasing influence in contemporary urban policy of Abu Dhabi. Therefore it's less appealing than for example ecology. In the charts below the suggested hotel rooms and golf courses in Abu Dhabi are taken in account. Hotels and golf courses play a central role in mega development of the Gulf region in the past decades. Star architects design new mega hotels and star landscape architects new, often huge, golf courses. Although those charts do not necessarily indicate that super branding is an element of it, it implies that tourism is still a major growth market.

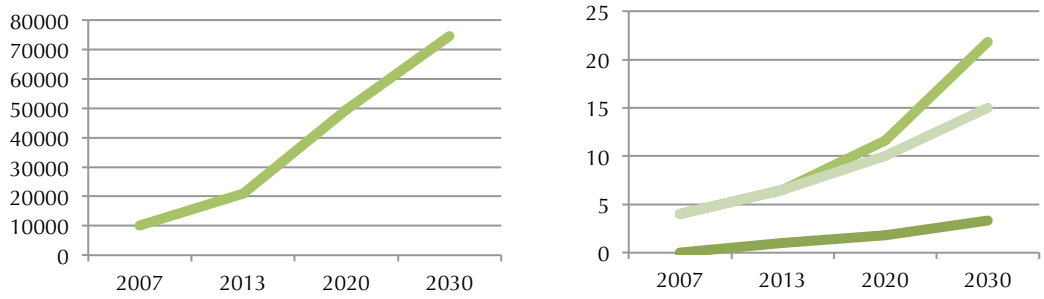


Figure 9-3 Suggested hotel rooms in Abu Dhabi (on the left), Golf courses (on the right)

Super-branded-mega development projects, such as the new Guggenheim and Louvre, are not highlighted in the document. But some examples of mega development projects are individually discussed in the policy. For instance: the Grand Mosque District, the Hotel District, and the construction of an entirely new Capital District. The second, new, urban core is located south of Abu Dhabi Island between Mohamed bin Zayed City and Abu Dhabi International Airport.

> *Positioned where the desert meets the sea, and shaped by a rich heritage, the Capital District will serve as a second downtown for Abu Dhabi and be a sustainable, authentic and modern Arab city.*

9.1.3 International Shipping hub

Reference made to the third phase of urban planning, the international hub, is remarkably for this first time on page 98 in the policy document ''EV 2030 / UPV 2030''. With enormous investments in the pipeline for the new airport, the Midfield Terminal Building of 2.9 billion USD (figure 7-4, on the left), and the proposed new port, the Khalifa Port of 7.2 billion USD (figure 7-4, on the right), this is highly underexposed in the document.

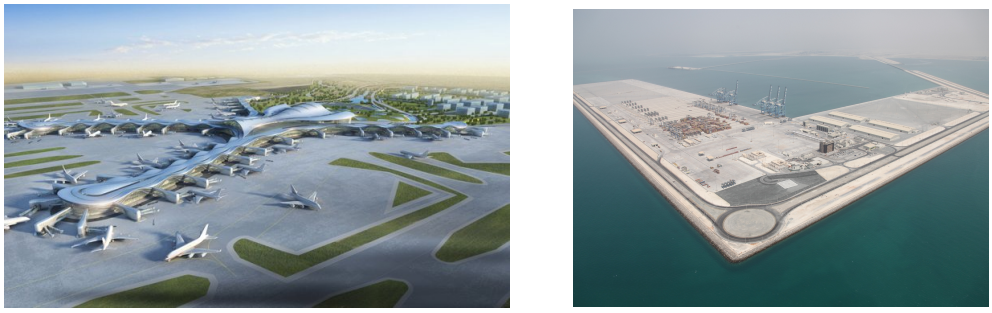


Figure 9-4 Midfield Terminal Building open from 2017 (on the right), Khalifa Port (partly) open from 2013 (on the right)

In the chapter 'Economics' are the economic industries of Abu Dhabi is discussed. These industrial sectors sincerely improve with the expansion and relocation of the port area, combined with the development of a significant industrial zone in close proximity to the new port. Moreover, in the chapter 'Transportation' this new port is also briefly discussed mentioned.

> *''Located at the apex of the 'golden triangle' between Abu Dhabi, Al Ain and Dubai, the sub-region includes the region's greatest access to various modes of transportation including regional and international airports and ports''.*

These mega infrastructure projects are largely omitted in the policy and it's striking that the new port is primarily mentioned in relation to the major coastal basin.

> *''The guidelines cover the major coastal basin from the Bul Syayeef lagoon, immediately south of Abu Dhabi Island, which include the Mussafah channel area, extending northwards to the Ra's Ghanada lagoon – between the proposed Khalifa Port location and Ghantoot''.*

The construction and implementation regarding these (air)ports are not explicitly mentioned in the policy document but some references are made to it. Especially in relation to the, potentially, top sectors of the economy, such as both the hotel and industry sector.

Increases in the supply of hotel rooms will be essential to accommodate the anticipated growth in both business and leisure guests to Abu Dhabi. The ''islands'' of Abu Dhabi will be the primary location for leisure hotel development, while new business hotels will be needed close to the business centers and the airport. Note that a difference is made between SBMD and ISH. The industrial sector will grow with the development of the new High Tech Business Park at the airport, focusing on clean light manufacturing sectors such as computer software and hardware development. Figure 9-5 shows the (suggested) annual tourist visits in millions, which shows an extensive rises of visits to the Emirate. However, the policy doesn't divide 'visits' in O&D, transit or transfer passengers.

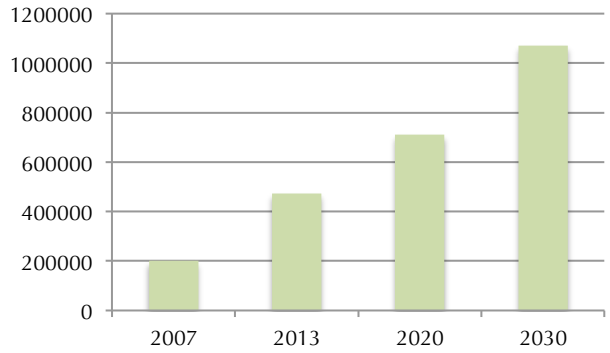


Figure 9-5 Annual tourist visits in millions as states in the Vision 2030.

While Figure 7-6 (on the left) indicates the increase of industry space of Abu Dhabi in the coming years and on the right the increase in office space is shown. This information is relevant for ISH as new business visits and new business centers are linked with the airport in the policy document.

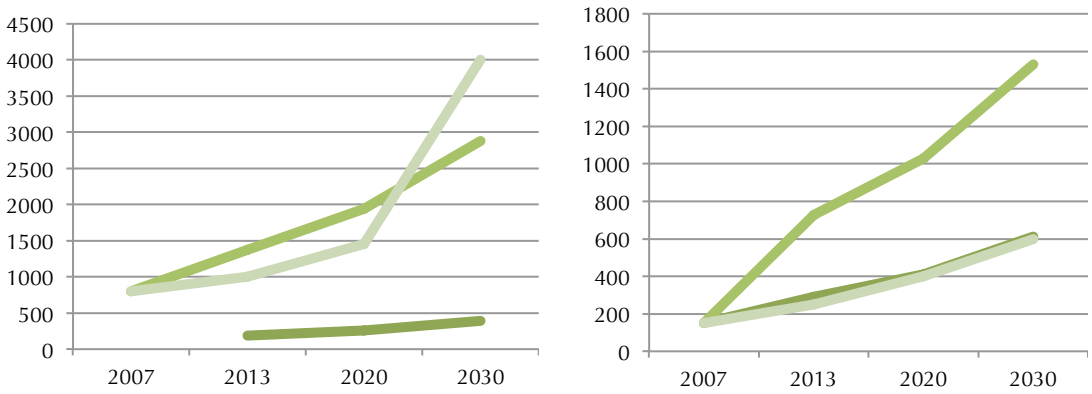


Figure 9-6 On the left the industry space in million, on the right the office space in millions. Dark green is emerging, green is growing, and light green is suggested demand.

9.1.4 Sustainability, or Ecology

Ecology, or similar definitions, is the most important and a highly visible concept in the EV/UPV 2030. But one important footnote has to be made; in their policy sustainability is both used for economic sustainability and for environmental sustainability. While economic sustainability is undoubtedly of great importance this research will focus primarily on environmental sustainability relating urban planning. As previously discussed in this chapter, the second priority of Abu Dhabi is 'infrastructure development and environmental sustainability (page 12)'. Abu Dhabi's government will ensure the ''development of a professionally designed and well-managed urban environment in the Emirate's towns and cities, complete with world-class transport and infrastructure systems''. In order to ensure that the urban infrastructure is able to cope with the envisioned growth without stresses, the UPC has developed and published comprehensive framework plans for the Emirate. The document states: ''sustainability is essential for tomorrows cities'' (page 19), or:

> *''Governments and industries and we have no choice but to address sustainability at the city scale to meet the needs of a growing population within the available resource capacity'' and ''Cities around the world are dealing with urban growth issues related to achieving economic stability, environmental preservation, social equality and cultural development. It is clear that a city's development cannot simply be steered by market forces; sustainability and its resulting effects on quality of life is now a driving factor in creating successful cities''.*

Through the UPC's program of Estidama, which means 'sustainability' in Arabic, Abu Dhabi is making urban planning decisions and policies that favor sustainable economic growth. Furthermore, Estidama embodies the wider aspects of urban life to develop sustainable cities and communities across the Emirate

that enhance the economic, social, environmental and cultural well being of current and future generations.

Environmental sustainability (page 24) is the most widely known and researched aspect of sustainability, focuses on the overall viability and health of living systems. Living systems provide ecological resources that fully support the social, cultural and economic systems that coexist with the natural environment. In the sentence below the recognition of the importance of sustainability in relating with the difficult conditions (water, food) of the Middle East is visible.

> *Sustainability requires an understanding of the evolution of the city's living systems, ideally from pre-industrial conditions, to give a clear indication of the past, present and future capacity and the potential for stability, to yield resources and to collect and recycle waste. From this foundation, the approach to water use and recycling (a key factor for Middle Eastern countries), food production and materials must be facilitated through sustainable practices and efficient infrastructure.*

Therefore is environmental sustainability is at the forefront of the UPC's projects and initiatives. Estidama encourages developers to look at the 'whole of lifecycle' costs throughout the entire design, development, construction and operation of their projects in addition to using an integrated design process. This translates to the strategic collaboration with the World Sustainable Capitals Initiative (page 45). The UPC and ADCED entered into a strategic partnership with the World Economic Forum (WEF) in September 2009 with the creation of the World Sustainable Capitals (WSC) Initiative. The initiative consists of a global and regional alliance of World Sustainable Capitals and a network of leading experts, economists and industry representatives in the field of urban planning and sustainability. A number of capital cities are carefully planning for sustainable development in strategic policy plans for the future. By collaborating with sustainable cities that share the same vision as the UPC, the ADCED and the WEF seek to galvanize global capital cities in the adoption of successful urban planning decisions that favor sustainable economic growth. Joining Abu Dhabi are Barcelona and Grand Paris project, with additional cities set to link with in the future (such as…).

> *It is very difficult to reclaim damaged resources or natural environments or reinstate forgotten cultural legacies. Oil has brought considerable wealth to Abu Dhabi, but it is a finite resource that needs to be carefully utilized. Abu Dhabi's future lies in the ability to prudently use its existing wealth to actively explore renewable energy production, reduce the consumption of non-renewable resources and educate future generations. Resource efficiency is vital and the implementation of Estidama will support Abu Dhabi's move to become a truly sustainable Emirate.*

In order to make this information more manageable in terms of the usage of, or reference to, terms, the accordance of the topics is calculated. While there are some footnotes to make this will give an insight in the focus of the policy document. Therefore this model, table 9-1, is only used for the improvement of the overall picture.

EM	Environment *	139
	Eco- / Ecological	16
	Sustainable / Sustainability **	208
ISH	Airport	8
	Port	8
SBMD	Mega development ***	36
	Capital District / Business District ****	48

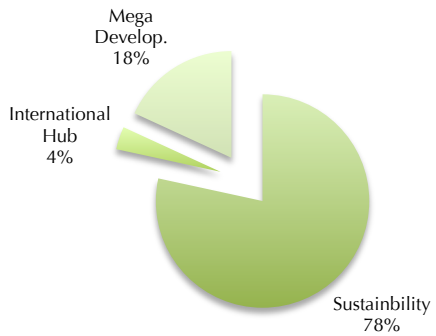


Table 9-1 Table and chart with number of references to the various phases.

*) Economic, social and natural environment
**) Economic, social and environmental
***) References *relating: Architecture, tourism, high- rise, high policy, top profile building.*
*****) Examples of high profile development, however not limited to mega development phase.*

Due to the mixed use of definitions, such as the use of 'environment', and various references to mega-development this chart cannot draw solid conclusion. However, it is possible to conclude that all phases of urban planning, as discussed in this research, are visible in the Vision 2030 (EV/UPV 2030). Furthermore, references to the environment and sustainability are remarkably often used, especially when compared to ports and airports.

9.2 Urban Structure Framework Plan - Policy Statements

The chapter 'Policy Statements' is part of the Plan Abu Dhabi 2030 – Urban Structure Framework Plan. This principle guide is the formulation of this framework and is for each policy a directive to guide actions. The 2030 Vision has a strong focus on economic development but the Policy Statement show a shift towards the focus on environmental policy, as agreed by the GCC. The first paragraph (§8.2) of those statements covers the environmental framework policies of the plan with eleven guidelines for environmental policy. With a focus on coastal environment management and, as stated, ''the development of a set of sustainability principles applied to all future development''.

The next paragraph (§8.3) covers land use framework policies and only the second part (L-14 till L-19) is primarily on previous phases of urban policy. On Yas Island there will be a special district for entertainment and tourism, which is an example of super-branded-mega development, including the Formula One racing track and Ferrari-world. Other examples are the City Center District, the Capital District and the Grand Mosque but they are located at appropriate intervals and spaced geographically (L-17). This presumption is strengthened by Capital City framework policies (§8.6), which clearly shows some characteristics of mega development. This new district is connected by fast train links between Abu Dhabi City, Abu Dhabi Airport, and Dubai. Alongside this, the first signs of the second phase of urban planning, the international shipping hub, are visible in L-15 and L-16 of the land use framework policies.

> *L–15 Undertake an industrial study to confirm appropriate relocation to the new Port area, provision of adequate land capacity for close in city-serving industries and warehousing for goods storage and transfer in industrial areas and in small pockets within residential areas, and other industrial and infrastructure installations germane to the development of Abu Dhabi.*
>
> *L–16 Complete a Comprehensive Development Plan for the districts around Abu Dhabi International Airport, and manage development until the plan is complete, so that: New uses will be airport-supporting or -supported (industry and commerce); uses that would be impacted by the airport, particularly regarding noise, will be avoided, such as residential; lower building heights will prevail and towers along the flight path will generally not be allowed; and uses that generate disruptions to traffic for airport access will be avoided.*

As a priority, channel new university and hospital development (L-18) to the Capital District, in particularly if they have a significant research component, to maximize synergies with high-tech activities that will also be concentrated is this district. This sentence shows a break with the policies relating specialized cities made by Abu Dhabi, Dubai and Qatar.

In the paragraph urban design policies (§8.7) buildings heights and character are explicitly discussed. All building heights are discretionary and heights above 25 storeys may garner special requirements. Moreover, generally heights above 75 storeys will not be entertained. Or ''avoidance of a random pattern of tall buildings, whether individually or in clusters, but with several nodes of higher buildings for the emphasis of important places and creation of landmark orientation''.

> *U-17 / U-18 Identify key existing or potential character areas throughout the city and develop urban design and architectural guidelines to maximize such character and henceforth manage development to provide character enhancement. This includes: Lulu Island, the Corniche Special District, the Grand Mosque District, Al Mina Fisherman's Harbor Area, Saadiyat Island Cultural District, the Palace Row on Abu Dhabi Island, and the New Capital District.*
>
> *U-19 Include consideration of building top profile for taller buildings.*

In these 'building block'' policies the priority of sustainability and breaking with older phases is again visible. With the focus on 'Model Desert Eco-Village', 'Model Island Eco-Village', and the focus on mixed use low-rise and high-rise structures in the central business district. Furthermore, in paragraph 9.1 (infrastructure implications) the title is: a sustainable approach to the future. In the last paragraph of the chapter (§8.10) the economic development policies are discussed. Here are two important statements made relating to Abu Dhabi as an international shipping hub and their key growth sectors.

> *D–3 In releasing land for development and in approving development, give priority to key growth sectors identified as essential for Abu Dhabi's economic vitality, including the health and education sectors and value-added manufacturing.*
>
> *D–4 Support growth of the Abu Dhabi International Airport and review existing expansion plans as soon as possible to confirm the appropriate area for airport expansion, including for direct airport needs and for airport servicing or airport-serving functions, and to minimize airport impacts such as noise and pollution.*

In order to make this information more manageable in terms of the usage of, or reference to, terms, the accordance of the topics is calculated. While there are some footnotes to make this will give an insight in the focus of the policy document. Therefore this model, table 9-2, is only used for the improvement of the overall picture.

EM	Environment	22
	Eco- / Ecological	25
	Sustainable / Sustainability	8
ISH	Airport	13
	Port	2
SBMD	Mega development *	6
	Capital District / Business District / Palace District **	16

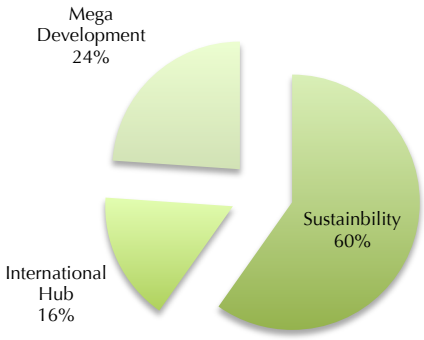


Table 9-2 Table and chart with number of references to the various phases.

** References relating: Architecture, tourism, high- rise, high policy, top profile building.*
*** Examples of high profile development but not limited to mega development.*

This chart gives a more striking image of the policy, especially as it is an analysis of the policy statement of the urban structure framework (written by the UPC alone). It is possible to conclude that the sustainable shift is the most visible in the Policy Statement, more than double that of SBMD and ISH. Hence that Mega Development is not discussed in the exact words and therefore some examples of mega development are implemented. Thus, the most highlighted policy statements of this document are:

- Focus on environmental policy; major part of the policy is on sustainability.
- The (air)port function is still a priority, maybe not the most important one, but influential.
- Regulations for mega-development and the acknowledgement mixed use, but mega development remains highly visible in policy.
- The health and education sectors are key priority sectors even if agreements are made in the GCC and it is sporadic spoken in the policy statements.

10 Conclusion

This paper discusses the most influential (urban) transformations of the past decades in the Emirate of Abu Dhabi and uses the city as an example for the latest developments in the Arabian Peninsula. It covers the period after the 'footloose' planning of urban development and starts roughly around the millennium. Abu Dhabi is at the core of contemporary urban planning and positions itself, especially after the bailout of Dubai, as the (business) capital of both the United Arab Emirates and the Gulf-region. Due to this shift, the attracting of (regional) headquarters of large firms and agencies, its increasing influence on the world stage, and its leading regional position, the city may have the largest potential of the region to become a post-oil metropolis of the twenty-first century. These aspirations represented by cities in the Arabian Peninsula are important to understand and should not be discounted. Especially as their practices have made a significant contribution to the template for the current wave of global suburbanization and the (rapid) transformations mean that these cities will remain important for research, particularly those concerned with the (re-) building of global or transnational cities after the crisis (Elsheshtawy, 2008). Also because these cities and countries position itself increasingly on the foreground as they try to diversify their one-sided, oil-driven economies in order to make the transformation from the high-income developing to developed status. This is even more important as the influence of the practices and models of the Arabian Peninsula are as far reaching as the Middle East, Africa and the rising cities of Asia but are at the same time heavily understudied as most researchers focus on Anglo-Saxon forms or (urban) planning (Bloch, 2010). These Western models, often compared with Western consultants, are almost directly copied in the Gulf and without taking much care to the characteristics on the ground (society). However, this is also an advantage for this thesis, as there is a big scarcity of studies in this undiscovered field of (urban) planning as qualitative research is lacking but these Anglo-Saxon forms or urban planning could be analysed with Western scientific literature.

Abu Dhabi is relevant to research as the emirate, besides the immense ambitions and regional function, is certainly at the core of contemporary (urban) planning, definitely uses urban planning as an instrument for economic diversification and houses some of the best examples of excesses of urban development. What is interesting about these developments is the extremely fast pace of the evolution of the city (even more than neighbouring cities), its tubule rasa desert landscape ('empty blanket') (Acuto, 2010), enormous deep oil-rich pockets, remarkably direct link between urban and economic planning in policy documents and aim to wean their economy, or in other words to diversify their one-sided economy. This direct connection between urban and economic planning is extraordinary, as urbanization is primarily used for economic goals alone, and this in combination with the financial crisis of 2008 resulted in the unique opportunity to analyse the sectors affiliated to urban planning phases and analyse their resilience in face of this crisis. This is possible as urban planning and economic planning are interwoven in policy (urban planning vision / economic vision 2030), the statistical yearbook connects sectors to policy shifts and to other sectors, and various authors and studies indicated the link. Moreover, the neighbouring city-state Dubai witnessed a similar transformation in the past decade and their 'experiments' resulted in, besides the real estate crisis, a better documentation of on-going development in the Gulf, possible lessons for Abu Dhabi, and an additional 'case study' with largely the same (urban) characteristics but a better developed economy and, as a result, a more diversified economy that witnessed the global collapse. This also provides an extra check on the data as the research is extended to two cities. Furthermore, the pace of evolution in Abu Dhabi is relevant as it implemented a more measured fashion of development and collaboration-based approach that echoed through all layers of policy and urban methods that could result in a more sustainable 'future'. Which is in fact their main ambition as they aim for a sustainable economy and a sustainable environment.

The findings of this research discovered three recent shifts or transformations of urban planning in Abu Dhabi, namely: super-branded-mega-development, international hub and the sustainable shift (or Ecological Modernization). These shifts are recognizable in policy, theory and data, and discussed separately because they could be seen as individual trends and be positioned in different timeframes. However, it is important to acknowledge that these development are continuously and do interfere with each other (see infographic, appendix 4). All three stages of urbanization indicate similarities, of which the most important are the aim for economic diversification but also tourism and global recognition show identical characteristics. Moreover, as the data shows, the different industries and sectors related to

methods of urban planning have connections, for example eco-tourists that overnight in hotels establishments and arrive by air. In order make the subject more manageable and to compare the individual planning methods these transformations are first analysed as 'solid' phases or periods.

The first phase of urban planning, super-branded-mega-development, is highly visible throughout the Arabian Peninsula in the form of high-rise mega projects, often together with the signing of starchitects, which showcase hypermodernity (Ponzini, 2011). The mega-development projects go hand in hand with active forms of cultural branding (global-known museums as the Louvre and Guggenheim in Abu Dhabi, the Dubai Expo 2020) and the branding through sporting events (Formula One Grandprix Abu Dhabi, WC 2022 in Qatar). As the Bilbao-narrative showed with the Guggenheim Bilbao, such excesses of urban planning may have enormous effects on the revitalization and regeneration of the city, and could even transform a city from pre-industrial to post-industrial status in a short period of time, as is the ambition of Abu Dhabi. However, as research showed, these projects do not guarantee success but do guarantee a long-term binding and massive investments. Moreover, as multiple of these developments occur in the city this could result in negative implications as homogeneity and eventually even Disneyfication, as authors distinguished in Dubai. This process may also pose a risk to the region as it could result in the paradoxical effect of a homogenised Arabian Gulf due to the signing of the same starchitects and Western consultants, with identical designs and urban planning forms. Furthermore, analyses of (statistical) data showed that the affiliated sectors to SBMD (such as the real estate, construction, and hotel sector) have performed significantly less than other industries during and in the immediate aftermath of the financial crisis, in both Abu Dhabi and Dubai (conform the study of Bloch). As Abu Dhabi acknowledges the lessons learned in Dubai, and more importantly, put them into practice, it develops in a more measured fashion and is therefore unlikely to become a new Dubai. Neither will anywhere else in the region (Bloch, 2010).

The second phase of urban planning, the international hub, could also be observed throughout the Gulf but the majority of investments occur in the United Arab Emirates and Qatar (Murel & O'Connell, 2011). As Singapore showed in the recent past, urban planning in the form of the international hub could have an enormous influence on a city, and could eventually even transform the hub into a destination of its own. Due to its geographical location the Arabian Peninsula meets one or the most important success factor of the hub as its 'perfectly' located between the East and West and positions itself as the gateway between Asia and Europe. It also meets success factors as minimum connecting times or low airport rates and the share of the wealthy (young) population and tourist arrivals has grown extensively in the last decade. As the findings of this research indicated, the affiliated sectors to IH (transportation, financial and insurance) performed significantly better than its SBMD counterparts and zooming in on the export data this image is strengthened as both the non-oil exports and re-export have grown exponentially. However, these characteristics are not unique for Abu Dhabi when compared to other cities in the Gulf. Further analyses of the aviation data indicated that the majority of these massive investments for new planned development projects are within a 2,5-hour drive and more importantly with overlapping catchments area, indicating the risk of demand cannibalization. It could therefore be questioned if such massive investments are appropriate and while both the O&D market of Abu Dhabi and fleet of Etihad presumably will witness impressive growth, this may be not sufficient as this dissimilarity between planned and (future) demand is clearly visible in policy and data. So, in order to 'feet' their aircrafts they much contagiously expand their networks. However, due its regional focus and fleet of narrowbodies and slower growth, both Abu Dhabi and Etihad show their more conservative and collaboration-based approach. As is visible in the data and by the extension of new routes on a regional scale, such as the Indian subcontinent.

The third, and most recent, phase of urban planning that is analysed is the sustainable shift, or Ecological Modernization. As its, presumably, future method of planning there is no data available and the findings of this research are therefore solely based on policy and theory. Ecological Modernization could be the most promising transformation in (urban) planning for both Abu Dhabi and the sensitive ecosystem of the Persian Gulf (O'Brien et al., 2007). Besides the in policy discussed aspired goals of economic diversification, expanding the position on the global energy market, the positioning as a developer of technology, and to make a meaningful contribution to sustainable human development; this process could result in multiple positive side effects. These recent developments are definitely part of economic planning but may have far broader consequences. Such as the ecological protection of the fragile Gulf (possible tourism attraction), improvement of global recognition (outside being 'just' an Arab nation) and eventually

may even result in a new category of nation. Moreover, they ecological-block could transform in the future to an economic-block (a la the European Union) and as Abu Dhabi already has a leading role in the UAE and GCC it gives the unique opportunity to assume a leading role in this process. But, as research indicated, perhaps the most important side effects are political and societal modernization.

However, these massive developments in urban planning and rapid transition come at a cost, for both the local and foreign population. While this is not the main focus of this research, it is necessary to acknowledge that this path to (hyper) modernity and ambition to become a developed nation cannot be achieved solely with urban planning, as modernity is more than urban development alone. In order to give an answer to the question how urban planning is used as an instrument for economic diversification these subjects are positioned at the centre of attention and seen as a 'solid matter' but there are certainly far more processes that influence this path to modernity. And these are not unique for Abu Dhabi but are relevant for the entire Arabian Peninsula. It is therefore that Ecological Modernization could be the most promising transformation as societal and political modernization could also be achieved in the process. One should not forget that this rapid transition resulted in the segregation between generations as this process occurred in barely sixty years and a discrepancy in traditions and values could be noticed. Again, urban planning can be used as an example. Where the previous generation of rulers were much more conservative (i.e. ''desert warriors''), the new generation of is educated in the West and the new rulers implemented hyper modern forms of urban planning. This comes at a cost as, for example, the old market district is demolished and replaced by a new 'cultural district'. Moreover, such large-scale development projects occur largely in the absence of democratics. The local economic and institutional conditions of Abu Dhabi are not common elsewhere, but the city is a significant case of political, economic and urban criticalities of planning large-scale development projects and of collecting pieces of branded architecture in a democratic vacuum (Ponzini, 2011). These processes most certainly affect society.

Also, as a result of the improvement of global recognition and active branding of the cities in the Arabian Peninsula, the media attention for the region increases rapidly. Media as the Economist and CNN write extensively about the region and even discuss projects as Masdar City in remarkably high detail. Besides these intended effects, this has much wider reaching implications as attention for the poor working conditions of migrant workers are on the increase, as in Dubai and Qatar. This increased attention occurs even more rapidly due to the heavily branded (sporting) events as the Expo 2020 in Dubai and especially World Cup 2022 in Qatar, which enhanced global recognition but also placed the countries even more under a magnifying glass. As the native population of the Gulf forms nowadays only a fraction of the total population, in Abu Dhabi for example 20%, where the fast majority of foreigners come from the countries of the Indian subcontinent as India or Bangladesh and often work these, poor, conditions. This results in a paradoxical effect: branded mega projects use migrant workers, which is often coupled with poor work conditions, and these same branded projects increase media attention. Moreover, as the real estate collapse in Dubai showed, this also resulted in a poor relationship between migrant workers and the 'home' nation as they quite literally fled the country and construction projects were put on a hold. It bares the risk of a possible uprising too, indicating also the rise of private contactors throughout the region. Furthermore, in their aim to become a regional hub the national airline Etihad expands extensively to the Indian subcontinent and an improved relationship between migrant workers, in this case Abu Dhabi, may have a positive influence on its (future) regional hub function. It is therefore evident that far more processes and side effects can be noticed throughout urban planning and development projects, which are all inter-linked with each other. Even with the specific focus on urban planning of this research it is clear that urban planning does have an impact on society (both positive and negative) and could result in a broader form of modernization (societal and political), and eventually even better work conditions and democratics. Due to a limited timeframe this is not the (main) focus of the research but needs further research. Such as the paradoxical effect of SBMD that is affiliated to migrant workers but at the same time creates global recognition for both the region and its poor working conditions.

Besides these concerns and the impact of global recognition, it is also the scope of research that needs further deepening. As previously mentioned, the aspirations by the cities in the Arabian Peninsula are important to understand and should not be discounted as they made a significant contribution to global suburbanization but are at the same time heavily understudied and often falsely seen as a 'freeze-frame' in time (Koolhaas et al., 2010). These rapid transformations or shifts mean that the cities of the Gulf will

remain important for researchers, especially those concerned with (re-) building of global and transnational cities after the crisis. Moreover, as the construction and real estate development sectors remain strangely understudied in general, the great concentration of this industries development in the Arabian Peninsula over the past years has resulted in refinement and innovation in, for example, big-site master planning, mega development, infrastructure, construction, engineering and transportation. These subjects all need further scrutiny, as does the issue of the real impact of the Gulf-model, which has proven to be highly contiguous throughout the region and is as far reaching as the Middle East, Africa and Asia. While the excesses of large-scale development are mainly in the Arabian Peninsula even cities as Khartoum and Nouakchott take inspiration of this hypermodern form of urbanization. Due to these similarities and the seamless rapid passing of urban planning models, it would be useful to do a comprehensive research on the entire region. Especially now also the 'International Hub' spreads throughout the Middle East resulting in enormous investments on a small (regional) scale and with a huge impact on the global aviation industry. Not only for the new 'super-connectors' (appendix 5) or the incumbent players, but also now new (future) competitors emerge in the region, as perhaps Turkish Airlines is the best example, appendix 6.

Regarding the main arguments why researching of the region is important, it is possible to say that the region is still heavily understudied and this research is 'only' a start. When researchers and scholars keep their focus solely on Anglo-Saxons forms of urban planning and cities the big scarcity of non-Western developments will be retained. In the globalized world of today and with an increasingly influential region and its goal of economic diversification it is wise to research these possible future metropolis, especially seen the unmatched scale of progress and ambition to attain the developed status. However, as this research also showed, in order to solve this underrepresentation of the Middle East progress has to come from two sides. Doing research has proven to be more difficult than expected on forehand and even resulted in adjusting the method of research. After countless mails to the MIST and meeting all requirements it was not possible to study a semester in Abu Dhabi, which would have improved the understanding of the culture and gave the possibility to study the link between tradition and (hyper-) modernity. Moreover, after contacting dozens of policy makers, agencies, companies and governmental bodies, the response to the questionnaires was none. Even with the help of the embassy of the Kingdom of the Netherlands and Dr. J. Beaumont (formal letter of the university, appendix 3), and responding on time with an almost impossible deadline, it was not possible to get personal contact with the governmental portal. While this heavily delayed the progress this also gave one of, or perhaps the, biggest insight of the entire research. It is my personal belief that all that could possibly be done was done and that all the requirements were met. Although it is impossible to say this with complete certainty, the most logical explanation is that an academic research by a (Western) student was not appreciated or wanted. This is regretful as it would strengthen the outcome and lessons could be learned from the recommendations, of which its relevance is not limited to Abu Dhabi alone. However, due to the direct links in urban and economic planning (in policy, theory and statistical yearbooks) it was fortunately possible to discus and analyse recent developments on the basis of the available data.

While the trend that (urban) planning is used for economic planning is visible throughout policy, therefore also urban cases (economic terms) in relation to urban policy, these connections (interrelation) between the two disciplines and order could not given with complete certainty. Effects as spontaneous market processes and changes, even in the highly centralized Gulf, and influences from outside (globalization) are left out of the debate but do occur. This indicates that not all the processes could be defined in planning policy and the process may even be reversed; as not one party is dominating. Or in other words, (urban) transformations could be described by, and not a result of, (urban) policy. Policy and change (or transformation) do interrelate as policy may result in (urban) change, and (urban) change may result in adapted policy, which could implement further change and so on. Resulting in the causality dilemma of the chicken-and-the-egg, indicating a virtuous circle. It is, however, clear that the economic vision (policy) was created first and followed by the urban planning / economic vision (policy) to support the economic policies, and indicating that (urban) policy is used for the transformations of urban cases (economics). But, as this rhetoric proves, it is not a fact.

When acknowledging the limits and value of this research, multiple recommendations could be made regarding urban planning in Abu Dhabi. Analyses of the three most recent transformations in urbanization

indicated that these forms of urban planning have many similarities and links with each other. Besides the indented goals of economic diversification and the aim for a sustainable economy they share the ability to attract or redirect tourist flows, improve global recognition and position the city or country on the global stage (by sporting events, museums, aviation hub, or the eco-city) with as the ultimate goal to become the next global metropolis and a developed nation. What is unique for Abu Dhabi, although the excesses of urban planning are primarily highlighted, is the pace of evolution and, compared to its neighbours, its more conservative or measured fashion of development. This is visible in all layers of documentation (policy and theory), in all forms of planning (less extreme and measured SBMD, collaboration-based and conservative policy for IH and Etihad, and EM and Masdar witnessed real market fluctuations), and in the statistical data (economic growth, inflation). Abu Dhabi sets less ambitious, more realistic, goals for itself, and learned from the lessons of its neighbours and the financial crisis. And more important, it also implements them. As result these transformations in the emirate are most likely more sustainable and more resilient against (future) fluctuations.

Recommendations

- Regional hub: the findings of this research indicated that the 'international hub' and its affiliated sectors are more resilient during the financial crisis and performed significantly better than its SBMD counterparts. Moreover, the city meets all the success factors of the hub (location, connecting times, low fees etc.) plus a growing O&D and young (wealthy) population percentage. The risk of demand cannibalization is real due to its neighbours and possible future competitors, therefore the continuation of their conservative approach, with the emphasis on serving global elites, and become a business hub and regional hub is recommended. Such as the focus on the Middle East and Asia.
- Ecological Modernization: the sustainable shift or ecological modernization is an unique and perhaps the most promising form of urban planning to diversify the economy. The various intended and possible side effects could have a positive impact on the economy, ecology, global recognition, and eventually even on political modernization, societal modernization and its position as the capital of the region. It is therefore plausible that this the most auspicious form of urban planning in Abu Dhabi and possibly the Arabian Peninsula.

While doing research on such an undiscovered field of urban planning is time consuming and a slow process, it is highly rewarding to examine subjects that are largely unmentioned or even left out the global debate. These transformations are widespread and understudied but its influence increases in cities around the globe, both in first and second tier cities, and they are definitely at the core of contemporary urban planning. With these massive investments in order to diversify their one sided, oil driven economies and the aim for a sustainable economy they most likely will have affect not only the region but also the traditional Western metropolis and sectors as the aviation industry. Especially cities as Abu Dhabi position itself more and more on the global stage and assume a leading role in the Arabian Peninsula. Both recommendations could strengthen its global position and assume a leading role in the formation of an 'eco-block' as it performed in either the UAE or GCC. With the focus shifting from Dubai to Abu Dhabi and the performance of the transportation and finance sector during crisis, the emirate could become the (new) gateway to the Arabian Peninsula and Middle East, as is for example Singapore to South-East Asia. This strategy combined with its growing influence, (ecological) modernization and limited military power may result in the position of capital of the region. Whether the aim for a diversified economy, aspiration to become a global metropolis, attain the status of a developed nation, and goal to have both a sustainable economy and environment will be met is difficult to predict but, as the findings of this research show, Abu Dhabi may have the largest potential of them all. At least the transformation to a regional metropolis is realistic and, as the economy and influence of the region grow, the status of ''global metropolis of twenty-first century'' may also be feasible.

The path to a developed economy and modernity is however still long and modernity is much more than urbanization alone but the transition from a pre-industrial city to (post-) industrial occurred in a remarkable small time-frame. Their most recent transformations are promising and as a possible regional hub / capital it could assume a leading role in the Arabian Peninsula. Whether this transition is a success and if it becomes regional or global metropolis should, and hopefully will, be further researched by scholars but the first signs are positive. At least far more positive than expected on forehand.

10.1 Answering the Research Questions

For the completeness, discusses this paragraph the findings of this research and translates it to one comprehensive conclusion answering the three main questions and gives an answer to the feasibility and future of Abu Dhabi, and in the second part of this chapter are the various sub questions answered. Analyzing theory, data and policy strengthens the hypothesis that urban planning is at the core of contemporary planning in Abu Dhabi and the Arabian Peninsula.

1. How is urban planning used in Abu Dhabi as an instrument for economic diversification?

Relating the three planning shifts and their motives, as discussed by this research (SBMD, IH and EM), the policy documents of the emirate indicate remarkably clear that urban planning is used for economic diversification, as they state in the ''Urban Planning / Economic Planning Vision 2030''. Note that the name of the document itself if also in favor of this statement. Many authors discuss that economic planning could be at the core of (contemporary) urban planning but such a direct link is highly unordinary. In order to transform cities as Abu Dhabi to post-oil metropolises of the twenty-first century these forms of (urban) planning are used to wean their economies and (re-) gain global recognition. Such processes are visible throughout all layers of policy and interwoven in all three stages of 'urbanization'. This economic diversification has various motives of which all are, till some level, implemented for creation of a sustainable economy. In order to do so they seek to become developed nations and to do so they have to diversify their one-sided, oil-driven economies. The findings of this research indicate a strong link between implemented policy, theory and the statistical data (affiliated sectors). This data shows that the affiliated sectors, especially in volume growth terms, witnessed impressive growth rates in the past decade. When taking the financial crisis of 2008 into account, which itself had an enormous influence on multiple sectors, the transformations in economic and urban planning are visible. As a result it is possible to determine which sectors performed well during the crisis and how the importance of industries shifted, conform the conclusions in policy and scientific literature. With the possibility in mind that this process (urban planning as a tool for economic planning) could be theoretically also the other way round, however highly unlikely, it is safe to say the urban planning and its three main transitions (SBMD, IH, and EM) are at the center of contemporary planning and till a large extent solely used for economic diversification. As a result urban planning is used to reduce the influence of the petrochemical sector on the total economic activities, enhance global recognition, and attract (cultural) tourists rather than for societal reasons.

2. Why the shift from super-branded-mega-development to an international hub?

Regarding the shift from super-branded-mega-development to an international (shipping) hub, it is possible to indicate positive (side-) effects of SBMD on both urban and economic planning, especially the effects as the Bilbao-effect. This form of urban planning may attract (cultural) tourists, improve global recognition but heavily affects the urban landscape. Besides this these possible effects regarding the regeneration of the city, various downsides of this urban transformation are noticeable. The risk of effects as homogeneity and Disneyfication are very real at the city scale and, due to the influence of this model, this is not limited to the Arabian Peninsula or Middle East but is as far reaching as Africa and even Asia. Throughout the region are similar processes visible and a paradoxical effect may arise as the region become increasingly homogenized region in their search to become more unique due the signing of starchitects and attracting (cultural) brands. Moreover, recent processes in neighboring Dubai and the financial crisis of 2008 showed that the model was less sustainable than expected on forehand, resulting in important insights as the emirates show many similarities in the urban and economic climate but differ in their pace of evolution and their economic structure (Dubai is more diversified than Abu Dhabi). The findings of this research indicated that in both cities the affiliated sectors to IH performed much better during the global collapse than its SBMD counterparts. This crisis, clearly visible in the statistical data, gave the opportunity to analyze the resilience of individual sectors and industries that are connected to urban planning phases to diversify the economy. The performance of affiliated sectors to IH (transportation, financial) was significantly better than the relevant sectors for SBMD (real estate, construction, hotel). Moreover, the numbers of the non-oil export and especially re-export strengthened this image. Furthermore, these characteristics show that the city of Abu Dhabi increasingly becomes a regional hub, even more than an international hub. This is important as the aviation sector is of major importance to transform the hub in a destination on its own. The shift from super-branded-mega-development to an international hub is therefore (in both theory and data) not difficult to explain. While this form of planning could have positive

effects there are important downsides, as the financial crisis clarified. The theory and practice, in both Abu Dhabi and Dubai, showed that IH performed significant better than SBMD and in economic terms (as this research identified as the main goal of urban planning) it is therefore wise to change policy and position Abu Dhabi as a hub. However, as discussed in the theoretical and data analyses, it is possible state that these planning forms show many similarities and are in fact interlinked. Moreover, the bulk of these investments are in the UAE but also the other GCC and Middle Eastern nations focus on this urban planning ''method'' to diversify their economies, as is the case for SBMD.

3. Why the shift from an international shipping hub to the sustainable shift?

Due to these massive new planned development projects within a 2,5-hour drive and, more importantly, with overlapping catchment areas, the risk of demand cannibalization is very real throughout the region. The share of the (wealthy) young population is growing and tourist arrivals have tripled in the past decade but it is questionable if this is sufficient to commensurate such investments. Regardless the hub system ''success factors'' as its geographical location (between East and West), minimum connecting times and extraordinary low airport rates. The dissimilarity between planned and (future) demand is clearly visible in the data and in order to ''feet'' their aircrafts the national airlines must contiguously expand their networks. Given the fact that the growth of the O&D market of Abu Dhabi and the fleet expansion plans of Etihad (about half of narrow bodies) are smaller, in combination the focus on the business segment, Abu Dhabi is more likely to become a regional hub rather than an international hub. Note that Etihad, comparable to urban and economic planning, grown more slowly than its Gulf counterparts showing its more conservative and collaboration-driven approach, again indicating that Abu Dhabi develops in a more measured fashion. Relating the sustainable shift there is no statistical data available for this (future) phase, therefore is theory on ecological modernization (EM) examined and this policy could have multiple positive effects on Abu Dhabi. Besides side effects as political and societal modernization, this may sustain its position as (future) key player in the energy market and (re-) position itself in the global forum. Such as Masdar which aims to help economic diversification, expand the position in the global energy markets, position itself as a developer of technology and make a meaningful contribution to sustainable human development. Note that this project is also connected to tourism and branding due to the signing of the architect. Moreover, all of these recent developments are part of economic planning but have far broader implications. For example ecological protection of the fragile Gulf, improvement of global recognition (outside being an Arab nation) and eventually may lead to a new category of nation. Furthermore, the ecological block could result in an economic block (a la the European Union) and gives the United Arab Emirates an unique chance to assume the leadership role.

4. What is the future of Abu Dhabi?

The future and feasibility of these three forms of urban planning is difficult to predict. Especially as, in order to make the topic manageable, urban planning is analyzed as 'solid' phases and periods. Needless to say this is in reality not always the case; for example the sustainable shift has direct links with the main goal of economic diversification and tourism (as SBMD and IH). For example 'eco-tourist' may also visit cultural artifacts as the Louvre and transfer at the hub airport). However, this urban planning method is still missing on the world stage and could be unique selling point for Abu Dhabi instigating new opportunities. This sustainable shift; in combination with this in all layers of research visible (more) measured pace of evolution and the focus on a regional hub rather than an international hub, besides of course its immense deep oil-pockets, that are their main assets. But also the lessons learned by Dubai, its young population and its growth rates (one of the highest growth rates of GDP per capita in the world). The focus on the region Abu Dhabi, both as regional hub (IH) and 'eco-capital' (EM), may strengthen the image as capital of the Arabian Peninsula, which is already (partly) acknowledged due to its instigating role for the UAE and GCC, and the attraction of the regional headquarters of many Fortune500 companies and the international headquarter of IRENA. There are some adjustments to make and the transformations are far from complete but the city is on the right way. When aiming at its (regional) hub function (e.g. trade hold up better, the vacant position), when acknowledging the downsides as the risk of cannibalization and the enormous investments, these sectors has proven to perform better in a crisis (or post-oil era) and has the potential to make the next step. But it could be the sustainable shift or ecological modernization (e.g. ecological protection, global importance and 'modernization' itself) that has the greatest potential of them all as future research may reveal. There are, however, more candidate cities.

These main research questions could be separated in multiple sub questions:
For the completeness of this research are below the thirteen sub questions briefly answered. Most of the sub questions are already answered during the analysis of theory and data but the direct link to the actual question is still missing.

What is super-branded-development and how is this reflected in academic literature?
SBMD is derived from the article ''Large-scale development projects and star architecture in the absence of democratic politics: The case of Abu Dhabi, UAE'' were he refers to ''super-branded-mega-development projects in contemporary cities''. Authors as Acuto, Bloch and Koolhaas made references to this urban planning method or used similar definitions. Moreover, authors as Evans (branding), Sassen (homogenization), Bryman (Disneyfication), and Plaza (Bilbao-effect) discussed aspects of this shift.

How is SBMD visible in Abu Dhabi and in their policy?
SBMD is visible in both the Urban Planning Vision of 2007, the plan states *''Abu Dhabi will manifest its role and stature as […] a global capital city''*, and the Urban Planning / Economic Vision of 2010. This document refers explicitly that the use of *''international iconic and branded architecture''* to express local identity. Moreover, the mega development plans are accessible due to extensive infrastructure, were all such project are coupled with starchitects.

How is SBMD visible in Dubai, the precursor of Abu Dhabi, and what lessons could be learned?
Dubai created new infrastructure and economic assets in what was then known as 'new economy' sectors of knowledge-based, tourism and real estate. The city grew became the worlds immigration hub and the rulers sought to make of this condition a brand. When to global crisis hit, the real estate market crashed and eventually the Dubai urban-financial system collapsed leading and real estate development is denoted no only as ''an economic priority''. Dubai's developments represent an important lesson as it emphasized on symbolic power and global reach without much care could make the cities 'consumerist-cities' or 'Disneyzated' (Bryman 1999). Moreover, trade (related logistics) and aviation have all held up better than real estate through the crisis and have already started to recover (Bloch, 2010).

What are relevant industries or sectors for SBMD and how did they react to the financial crisis?
Conform authors as Bloch (2010), policy and the statistical yearbooks relevant sectors or industries for SBMD are ''real estate'', ''construction'' and the ''hotel and leisure''. Note that tourism is in fact affiliated with all sectors but tourism due to (cultural) branding is a main goal of SBMD, and more a positive side effect of ISH as the hub may become a destination on its own. The (statistical) data of chapter 8 indicates that to SBMD affiliated sectors performed significantly worse during and after the crisis than its ISH counterparts. As is visible for both Abu Dhabi and Dubai.

What is an international shipping hub and how is this reflected in academic literature?
Hubs are strategically located airports that serve as collection-distribution centers for passengers and are generally operated by a single carrier. Moreover, Lohmann et al (2009) describe in their paper ''from hub to a tourist destination: an explorative study of Singapore and Dubai's aviation-based transformation'' that the cities achieved in terms of their location and central position by developing a hub network to improve not only air traffic but also tourists to their destinations, which eventually became destinations on itself. Were Dennis (1994) and Martin and Roman (2004) identified the critical operational factors as the (geographical) location, Murel and O' Connell (2011) identified the success factors of the hub and spoke system and as Vespermann et al (2008) state ''to diversify their traditional oil- and gas-dependent economies they are they are heavily investing in aviation infrastructure, both on the ground and in the air''.

How is the ISH visible in Abu Dhabi and their policy?
In the Abu Dhabi Economic Vision of 2008 aviation is expected to be *''an engine of economic growth and diversification''* and the Urban Structure Framework refers to ISH with *''support growth of the Abu Dhabi International Airport […] conform the appropriate area of airport expansion, including for direct needs and for airport-servicing functions''*. Moreover, in the Strategic Vision 2030 regarding the global focus sectors aviation is on the fourth position (behind energy, chemicals, and metals and mining but for 'hotel and restaurant') and as regional focus on the first position (as transport, trade and logistics).

Furthermore, the GCC sets the aviation industry as an important part of the overall master plan to develop the region (as can be seen in the collective order of aircrafts) into a global center for commerce and trade and in that regard the regional governments are strongly promoting their aviation sector. Examples for Etihad Airways are for example lucrative sponsor deals with the football club Manchester City and the Formula One circuit.

What are relevant industries or sectors for ISH and how did they react to the financial crisis?
Conform authors as Bloch (2010), policy and the statistical yearbooks relevant sectors or industries for ISH are transportation (or transport, trade and logistics) and financial services and all performed significant better during and in the aftermath of the financial crisis than its SBMD counterparts. Both the aviation and maritime sector was relatively marginal influenced and witnessed impressive growth rates in recent years, as also the (non-oil) export and especially the re-exports sector. As the aviation sector is of major importance to become an international shipping hub (ISH) and eventually and destination on its own, its an important factor for (future) global cities.

What are the latest developments in the aviation industry?
Analyzing the investments in planned capacity (2005-2012) the three cities of research (Abu Dhabi, Doha and Dubai) alone are accountable for 114 million additional passengers of the total of 320 million (+292%) and zooming in on the planned capacity (2012-2020) this number exceeds to 340 million in total, well over the current demand and most likely traffic forecasts calculated by Murel and O'Connell of 127 million (Abu Dhabi 23, Doha 29, and Dubai 75). Moreover, the aviation industry in the Arabian Peninsula (collectively) orders extremely large expansion of the fleet, for example the new Airbus is primarily sold to them. Furthermore, in order to 'feet' their aircrafts with sufficient amounts of passengers the national airlines must contiguously expand their networks and will Emirates alone will directly connect over 100 cities to Dubai.

How performs the airline Etihad in comparison with its competitors Emirates) and Qatar Airways)?
Given the fact that Abu Dhabi has still a smaller O&D market than its neighbour, about half the growth of Etihad is narrowbodies (better suited in the regional network), and focus on the business segment; the city is more likely to become a regional hub than an international hub. Etihad has, comparable to urban planning and economic planning, grown more slowly than its Gulf counterparts, showing its more conservative and collaboration-drive approach and indicating that it develops in a more measured fashion. However, the air carrier and therefore Abu Dhabi has to increase its growth rates significantly as it plans to go ahead with its ordered deliveries.

What is the sustainable shift and how is this reflected in academic literature?
The sustainable shift in, or ecological modernization of, urban planning of Abu Dhabi is in literature predominantly discussed relating some extreme outcomes of this transformation but, for example, the possible impacts on both the environment and government are not specified or only partly. Noticeable is that in recent years the ideology of Ecological Modernization has emerged as one of the most promising ways of understanding environment society and clear references to its are visible in Masdar. Authors as Spaargaren, Mol and Murphy made a huge contribution to the topic of EM, essential for understanding this form of sustainable development. Positive effects of this shift are the protection of the ecological fragile environment of the Gulf (important for future tourism), global recognition, and perhaps a future establishment of economic trading block through ecological partnership (a la the European Union). Were O'Brien et al (2007) provided a direct link between sustainable development and their opportunities and gave the essential link needed to connect the various theoretical paragraphs.

How is the sustainable shift (or Ecological Modernization) visible in Abu Dhabi and their policy?
Environmental sustainability is one of the most used words in the Urban Planning / Economic Vision and in the chapter ''Policy and Plan History'' secondly discussed, after economic development. Policy discusses infrastructure development and environmental sustainability in the same chapter and it is definitely at the core of contemporary urban planning in Abu Dhabi. Moreover, through the Masdar Initiative the following primary objectives: help drive the economic diversification, maintain and later expand the position in evolving global energy markets, position the country as a developer of technology, and make a meaningful contribution toward sustainable human development.

Why are these urban planning transformations implemented and what are the goals?
The main goal, visible through all layers of policy, is economic diversification. Urban planning is in the Arabian Peninsula at the core of contemporary planning and certainly used as an economic instrument. It is therefore perhaps the best example in world. Policy documents as the Urban Planning / Economic Vision 2030 directly link urban and economic planning, the international shipping hub massively boosted by massive (air) port developments with even the establishment of airport cities (a new city build around an airport) and the Masdar Initiative is directly connected to all economic drivers, besides ''making a meaningful contribution toward sustainable human development'' but even this is linked to global recognition due to WFES and IRENA.
When analyzing the goal of economic diversification some general conclusion can be made. Figure 10-2 ''target Abu Dhabi Real GDP'' of the statistical yearbook of 2005 indicates that the target of influence of oil was 56% in 2010 and 53% in 2012 and indeed the ''mining and quarrying'' was accountable for 52,3% of the GDP at constant prices (table 8-4) but is on the meantime is still accountable for 58,5% of the GDP at current prices (table 8-1). However, figure 8-1 indicates that the total economy without the mining and quarrying sector witnessed sustainable growth since 2007, so also during the financial crisis.

What lessons can be learned from Abu Dhabi and are relevant for the Middle East, Africa and Asia?
Lessons of both SBMD and ISH are essential to acknowledge through the region were especially the 'Gulf-model' heavily influences urban planning in the Middle East, Africa and even Asia, and the 'Singapore-model' heavily influences cities as Kuala Lumpur and Bangkok. It is remarkable how little research is done at the degree of which non-Western and developing countries and cities take part in this global transformation (Berry-Chikhaoui et al 2007) and especially in the Arab world the manifestation of the prestige urban project is widespread, were cities as Khartoum and Nouakchott take inspiration of this hypermodern form of urbanism (Elsheshtawy, 2010).

The risks of SBMD for those regions is that the multiplication of more or less similar aesthetical artifacts over the world have had and will have the paradoxical effect of internationally homogenization the urban landscape, while individual cities expect to distinguish themselves by hiring a star architect and creating a spectacular and unique place (Muñoz, 2008). The major threats to ISH in the Middle East come from with in, as investments in planning capacity in the region have a total of 320 million (2005-2012) were the three Gulf carriers extend their capacity to 340 to 2020 alone. Compared to the most likely traffic forecasts calculated by Murel and O'Connell (2011) a strong dissimilarity arises only solvable by adding new route, appendixes 7 and 8.

What is the future of Abu Dhabi as a global city of the twenty-first century?
The future of Abu Dhabi is difficult to predict but multiple advantages and possibilities are noticeable for the emirate. Of which, of course, its immense deep oil-rich pockets are the most important one and the city progressed from a pre-industrial to industrial to post-industrial in over a period of half a century. Urban planning in the emirate is highly centralized with a few actors and the absence of democratics. This brings advantages as well as disadvantages in the form of policy; new policy can be made and improved in an extraordinary pace but there is little care of the dynamic on the ground (Bryman 1999).

The financial crisis of 2008 has proven that ISH is significantly more 'economic sustainable' than SBMD as trade, its related logistics services and aviation all have held better than real estate. Abu Dhabi, in comparison to Dubai, has put far more emphasis on explicitly servicing global elites by relying on its own financing as derived from both vast oil resources and energy trading, in order to ''refrain from Dubai's mistakes'' (Kerr 2009). Its influence appears to have grown as the focus of urban growth and development shifts southwards to Abu Dhabi for now, and developers emulate Dubai's global-city strategy, albeit in a more measured fashion, the city-state may emerge as a competitor to Dubai as regional business hub (Bloch 2010). This is also noticeable in the aviation sector, in such a competing field (both incumbent and 'new' super-connectors) with enormous investments (on the ground and in the air) the risks due to a small home market, overlapping catchment areas, and cannibalization is very real. However, development in Abu Dhabi occur and Etihad Airways has grown more slowly than its Gulf counterparts, showing its more conservative and collaboration-drive approach, which indicates that its develops in a more measured fashion. So, this research indicates (theory, data, and policy) that Abu Dhabi is more likely to become a regional hub and may eventually become an international hub or global city.

This more realistic, measured fashion throughout urban planning is in my opinion along with the sustainable shift the major asset of Abu Dhabi. Ecological Modernization is on of the most promising ways of understanding environment society and advantages could be the set goals economic diversification, expand the position in global energy markets, become a developer of technology, and make a meaningful contribution toward sustainable human development but may also have positive side effects as political / societal modernization, global recognition and the protection of the sensitive ecosystem and the formation of an eco-block. And, as the Masdar Initiative proved, this shift is also subject of market forces.

However, the path to economic diversification and a developed economy is still long but in my view Abu Dhabi on the right way to become a twenty-first century global metropolis as it proved to be more realistic than its neighbors and the goals of being the hub of region is very real. Being the hub of region, with such vast oil reserves, its central (geographical) location and perhaps a future economic-block, may result on the long term in a diversified economy, status of developed country and possibly in becoming a global city.

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12 Abbreviations

ADCED - Abu Dhabi Council for Economic Development
ADIA - Abu Dhabi Investment Agency
ADM - Abu Dhabi Municipality
ADWEA - Abu Dhabi Water and Electricity Authority
AED - United Arab Emirates Dirham
ATI - Air Transport International
DSC - Dubai Statistics Centre
DED – Department of Economic Development
DIFC - Dubai International Finance Centre
DMA - Department of Municipal Affairs
EM – Ecological Modernization
EK - Emirates (code)
EY - Etihad (code)
GCC – Gulf Cooperation Council
GDP – Gross Domestic Product
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IRENA – International Renewable Energy Agency
IH / ISH – International Shipping Hub
JXB - Al-Maktoum International Airport
LCC - Low Cost Carrier
MIST – Masdar Institute for Science and Technology
MIT – Massachusetts Institute of Technology
NDIA - New Doha International Airport
O&D - Origin and Destination (passengers)
OAG - Official Airline Guide
RE – Renewable Energy
RPK - Revenue Passenger Kilometre
SBMD – Super-Branded-Mega Development
SCAD - Statistics Centre Abu Dhabi
SC – Specialized City
SOE – State of Environment
TEU - Twenty feet Equivalent Unit
UAE – United Arab Emirates
UNWTO – United Nations World Trade Organization
UPC – Urban Planning Council
UPV/EV - Urban Planning Vision / Economic Vision 2030
USD – United States Dollar
USFP – Urban Structure Framework Plan
WEF - World Economic Forum
WFES – World Future Energy Summit
WSC - World Sustainable Capitals
QR - Qatar Airways (code)

13 Appendices

Appendix 1 - Questionnaire Abu Dhabi (Dutch)
Appendix 2 - Questionnaire Abu Dhabi (English
Appendix 3 - Formal Letter University of Groningen
Appendix 4 - Infographic Abu Dhabi
Appendix 5 - Infographic CNN: Aviation ambitions in the Middle East
Appendix 6 - Infographic CNN: New airline routes, what do they main?
Appendix 7 – Maps
Appendix 8 – Abu Dhabi's Government Structure
Appendix 9 – Population and Economic Projections
Appendix 10 – Deleted data of the empirical findings section

Appendix 1 – Questionnaire Abu Dhabi (Dutch)

'Urbanization in Abu Dhabi, the life post-oil; the transition from super-branded-mega development to an international shipping hub and the sustainable shift'.

Om eventuele misvattingen te voorkomen zal ik eerst een korte uitleg geven over de vragenlijst. Het onderzoek wordt gedaan voor de master 'Environmental and Infrastructure Planning' van de Rijksuniversiteit Groningen, Nederland. Alle informatie wordt vertrouwelijk behandeld en indien het onderzoek, of een deel ervan, wordt gepubliceerd zal op voorhand toestemming gevraagd worden. Uiteraard kan de vragenlijst ook anoniem beantwoord worden. Gekozen is voor een korte vragenlijst met open vragen om ongestuurde informatie te verkrijgen en hierom wordt de steekproef klein gehouden. Mocht u een vraag niet kunnen of willen beantwoorden kan deze open gelaten worden, deze zal dan niet behandeld worden.

Deze vragenlijst is ook beschikbaar in de Engelse taal.

Introductie

Voor mijn master scriptie doe ik onderzoek naar 'Urbanization in Abu Dhabi', ofwel de verstedelijking van de stad Abu Dhabi. In recente decennia is er volop onderzoek gedaan naar Angelsaksische vormen van stedelijke ontwikkeling maar bestaat er een grote schaarste van onderzoek naar niet-Westerse landen. Het verstedelijkingsproces kan een belangrijke graadmeter zijn van het ontwikkelingsproces en economische groei van een stad of land, voorbeelden zijn een toenemende verstedelijking en het type verstedelijking. Hiernaast komt de focus van de overheid door middel van beleid terug in de structuur van de stad. Hierdoor is het mogelijk om uitspraken te kunnen doen over deze processen, het beleid en de toekomst van de stad. In de literatuur en het beleid stel ik vast dat er drie belangrijke stromingen zijn voor 'post-oil' Abu Dhabi. Te weten:

1. Super-branded-mega development; toenemende mate van hoogbouw en het aantrekken van iconische merken zoals het Louvre, Guggenheim en de Formula 1. Casestudy: Dubai.
2. International shipping hub; de focus van Abu Dhabi om een belangrijke hub, ofwel aansluiting op het netwerk, tussen Azië en Europe te worden; zowel als maritieme en luchtvaart hub. Casestudy: Etihad (Dubai) and Qatar Airways (Doha).
3. The Sustainable Shift; de huidige stroming in het beleid dat uniek is voor Abu Dhabi, voorbeelden zijn 'Masdar City en het recent georganiseerde 'World Future Energy Summit'.

Door deze processen te begrijpen en te analyseren kan er een uitspraak gedaan worden over de toekomst van Abu Dhabi. De processen worden in de literatuur onafhankelijk van elkaar (enigszins) besproken maar er is geen integraal onderzoek naar gedaan. Daarnaast kijk ik of theorie en praktijk met elkaar overeenkomen en koppel ik dit aan vergelijkbare eerdere processen in Dubai en Qatar. Ook wordt gekeken of de processen daadwerkelijk na elkaar komen of dat overlap waarneembaar is en wat hiervan de invloed op de stad is. Abu Dhabi is uniek wat de betreft de schaal, de mogelijkheden, de beschikbare ruimte, de financiën en haar visie om een toekomstige metropool in een internationaal steeds globaliserende wereld te worden. Aan de hand van dit onderzoek kan gekeken worden naar de haalbaarheid hiervan en of zij, ook wanneer de olie op is, een internationaal belangrijke speler blijft. Vandaar de titel: ': ''Abu Dhabi; a life post-oil, the transition from super-branded-mega development to an international shipping hub and the sustainable shift''. Bij voorbaat dank voor het beantwoorden van de vragenlijst.

Met vriendelijke groet,

Roland Dijkhuizen

Research supervisor: Dr. J.R. Beaumont, specialized in urban geographies and spatial planning. Your support and information will be of great value for both my research and the University of Groningen. Information will be used with care and conform the protocol of the university and all information shared will be treated with the stricted confidentiality.

Vragenlijst

I. Algemeen

Vraag 1: Wat is uw naam? (Indien u anoniem wilt blijven kan dit open gelaten worden).
Antwoord:……
……
……

Vraag 2: Wat is uw relatie met de stad Abu Dhabi, VAE?
Antwoord:……
……
……

Vraag 3: Wat is uw functie met betrekking tot de stedelijke ontwikkeling in Abu Dhabi, VAE?
Antwoord:……
……
……

Vraag 4: Hoe zou u uw kennis hiervan inschatten? (Bijvoorbeeld: goed, voldoende, matig, slecht).
Antwoord:……
……
……

Vraag 5: Hoe lang bent u al actief in Abu Dhabi, VAE?
Antwoord:……
……
……

II. Verdieping

Vraag 6: In de introductie van deze vragenlijst specificeer ik drie stromingen die in mijn optiek terug komen in de stedelijke ontwikkeling van de afgelopen jaren. Zijn deze fases voor u waarneembaar in uw dagelijks leven? Indien ja, hoe komt dit naar voren?
Antwoord:……
……
……

Vraag 7: De eerste fase in de verstedelijking die ik onderscheid benoem ik 'super-branded-mega development' (star architectuur, veelal hoogbouw, iconische projecten, binnenhalen internationale merken) en heeft een grote invloed op het straatbeeld. Neemt u dit in de praktijk ook waar? Indien ja, zou u de invloed omschrijven, wanneer is het hoogtepunt en in welke periode is het waarneembaar?
Antwoord:……
……
……

Vraag 8: Een effect in stedelijke ontwikkeling, genaamd 'homogenization', zorgt ervoor dat de invloed van een iconisch project minder wordt naarmate er meer vergelijkbare bij komen. Een typerend probleem voor 'super-branded-mega development'. Bijvoorbeeld; de Eifel-toren is uniek maar bij meerdere vergelijkbare vermindert het effect van de eerste. Kunt u dit effect waarnemen in Abu Dhabi? Indien ja, hoe komt dit naar voren?
Antwoord:……
……
……

Vraag 9 : Uit onderzoek blijkt dat er een correlatie is tussen economische groei en een toename van stedelijke ontwikkeling, maar ook tussen economische groei en een toename van hoogbouw. In Abu Dhabi is hoogbouw ook een middel voor economische groei wat kan leiden tot een bubbel-effect (te veel nieuwbouw in verhouding met inwoners), zoals in Dubai. Hoe schat u dit proces in voor Abu Dhabi?
Antwoord:……
……
……

Vraag 10 : Het hierboven besproken effect kan ook op een grotere schaal worden bekeken. Hiermee refereer ik aan vergelijkbare processen in bijvoorbeeld Dubai en Qatar. Kunt u dit effect waarnemen in de Golf-regio? Indien ja, hoe komt dit naar voren?

Antwoord:……
……
……

Vraag 11: De tweede fase in de verstedelijking die ik onderscheid benoem ik 'international shipping hub' (de focus op Abu Dhabi als een maritieme en luchtvaart hub) met Etihad Airways als de 'super connector'. Neemt u dit in de praktijk ook waar? Indien ja, zou u de invloed omschrijven, wanneer het hoogtepunt is / was en welke periode het waarneembaar is?
Antwoord:……
……
……

Vraag 12: Van deze tweede fase is vooral de luchtvaart hub tussen Azië en Europa waarneembaar. Er is echter concurrentie van oude 'superconnectors' als bijv. Singapore Airways maar ook van regionale nieuwe 'superconnectors' als FLy Emirates en Qatar Airways. Hoe beoordeelt u dit beleid (focus op Abu Dhabi als hub) en hoe schat u haar kansen in?
Antwoord:……
……
……

Vraag 13: De derde (deels toekomstige) fase in de verstedelijking die ik onderscheid benoem ik de 'sustainable shift' (de focus op duurzaamheid in plaats van een olie afhankelijke economie). Neemt u dit in de praktijk ook waar? Indien ja, zou u de invloed kunnen omschrijven, wanneer het hoogtepunt is / was en welke periode het waarneembaar is?
Antwoord:……
……
……

Vraag 14: Naast de intense ontwikkeling van Abu Dhabi maken ook Dubai en Qatar grote economische groei door (binnen de GCC). Besloten is dat Dubai inzet op de gezondheidszorg, Qatar op kennis en Abu Dhabi op duurzaamheid (ofwel, de derde fase). Wat vindt u van deze keuze? Is dit een speerpunt voor planning en politiek in de emiraat?
Antwoord:……
……
……

Vraag 15: Om deze differentiatie, besproken in vraag 14, te realiseren moet ieder zich specialiseren. Echter heeft ook Abu Dhabi potentiele topuniversiteiten (Masdar Institute of Science and Technology) en goede ziekenhuizen. Is deze specialisatie (specifieke focus op duurzaamheid) in de praktijk en / of beleid waarneembaar? Dat wil zeggen: dat de focus hier meer op ligt dan gezondheidszorg en kennis.
Antwoord:……
……
……

Vraag 16: Wanneer u als beleidsbepaler een keuze zou moeten maken tussen deze stromingen, welke heeft volgens u de meeste potentie voor Abu Dhabi als toekomstig metropool?
Antwoord:……
……
……

Vraag 17: Waar Westerse steden eeuwen nodig hadden om te transformeren naar de steden die het nu zijn doet Abu Dhabi dit in ongeveer 50 jaar. Wat zou u als belangrijkste transitie tussen nu en toe bestempelen? En hoe denkt u dat haar cultuur terugkomt in stedelijke planning van de 21ste eeuw?
Antwoord:……
……
……

Vraag 18: De stad Abu Dhabi is haar economie, afgeleid uit de recente stedelijke planning, aan het differentiëren. Een focus op andere sectoren dan op de inkomsten uit olie. Hoe schat u de kansen van Abu Dhabi in om over 50 jaar nog steeds een belangrijke metropool te zijn? En waarom?
Antwoord:……
……
……

Vraag 19: Abu Dhabi is momenteel de voorloper van het 'nieuwe-Arabië' en hierdoor een voorbeeld voor de regio. Neemt u in de regio vergelijkbare processen, die afgeleid zijn planning van Abu Dhabi, waar? Indien ja, welke zijn dit en hoe komt dit naar voren?
Antwoord:……
……
……

III. Afronding
Vraag 20: Ter afronding van deze vragenlijst, hoe ziet u uw rol in het geheel?
Antwoord:……
……
……

Vraag 21: Wanneer ik deze stromingen en processen zo benoem, herkent u dit in de praktijk? Of is deze correlatie alleen in literatuur en beleid waarneembaar?
Antwoord:……
……
……

Vraag 22: Is er een, of zijn er meerdere vragen, die u als belangrijk / belangrijkste ziet in deze vragenlijst?
Antwoord:……
……
……

Vraag 23: Heb ik in uw optiek een belangrijke vraag niet gesteld of proces niet waargenomen?
Antwoord:……
……
……

Vraag 24: Kunt u zich vinden in mijn bevindingen?
Antwoord:……
……
……

Vraag 25: Tot slot, hoe zou u deze vragenlijst beoordelen? (Bijvoorbeeld goed, voldoende, matig, slecht of geen mening).
Antwoord:……
……
……

Appendix 2 – Questionnaire Abu Dhabi (English)

'Urbanization in Abu Dhabi, the life post-oil; the transition from super-branded-mega development to an international shipping hub and the sustainable shift'.

To avoid any misunderstandings I will give a brief explanation about the questionnaire firstly. This research is done for the master (MSc.) 'Environmental and Infrastructure Planning' of the University of Groningen (top 100 university), the Netherlands. All information is confidential and when this thesis, either entirely or partially, will be published permission shall be requested in advance. Of course, the questionnaire can be answered anonymously but preferably not. I have opted for a short relatively short questionnaire with open questions in order to obtain undirected information and the sample will be kept small. If there are questions that you are unable or unwilling to answer they may be left blank, those questions will be untreated.

This questionnaire is also available in the Dutch language.

Introduction

For my master thesis I'm doing research on 'Urbanization in Abu Dhabi', with the working title: 'a life post-oil; the transition from super-branded-mega development to an international shipping hub and the sustainable shift. In recent decades numerous research is done on Anglo-Saxon forms of urban planning but there is a great scarcity of research relating to non-Westerns countries. The process of urbanization is an important indicator of the evolution and economic growth of either a city or a country, for instance an increasing urbanization and the type of urbanization. In addition, the focus of governmental policy is visible in the structure of the city. This makes it possible that, when understanding urban planning, answers can be given about growth processes, policies and eventually the future of the city. In both literature and policy I determine three important shifts in (urban) planning for post-oil Abu Dhabi. Namely:

1. Super-branded-mega development: an increasing use of high-rise development (skyscrapers), star architecture and attracting iconic brands as the Louvre, Guggenheim and the Formula One. Reference case study: Dubai.
2. The international shipping hub: the focus of Abu Dhabi to become an important regional and international hub (connection to the global network) between Europe and Asia, in both the aviation and maritime sector. Reference case study: Etihad (Dubai) and Qatar Airways (Doha).
3. The sustainable shift: the current shift in policy that is unique for Abu Dhabi, example are Masdar City and the organization of the 'World Future Energy Summit'.

By understanding these processes, and to analyse them in a comprehensive matter, an answer can be given about the future of Abu Dhabi. The question: could Abu Dhabi be a global metropolis of the twenty-first century. These processes are, at a small scale, independently discussed in literature but one comprehensive research is lacking. Furthermore, the connection between theory and practise will be examined, and will be linked to similar (previous) processes in Dubai and Qatar. Than it is possible to give an answer about the transitions (shifts) in urban planning, do they come on after one or is their overlap observable, and what is its influence on the city. Abu Dhabi is unique in terms of the scale, the opportunities, the available space, its finances and its vision to become a future metropolis in an increasingly globalized world. On the basis of this study can be looked at the feasibility of this goal and when, even if the oil runs out, it is still an important world player. Hence the title: 'Urbanization in Abu Dhabi, a life post-oil: the transition from super-branded-mega development to an international shipping hub and the sustainable shift'. Thanks in advance for answer this questionnaire.

Kindest regards,

Roland Dijkhuizen

Research supervisor: Dr. J.R. Beaumont, specialized in urban geographies and spatial planning. Your support and information will be of great value for both my research and the University of Groningen. Information will be used with care and conform the protocol of the university and all information shared will be treated with the stricted confidentiality.

Questionnaire

I. General questions

Question 1: What is your name? (If you wish to remain anonymous this question can be left open).
Answer: ……
……
……

Question 2: What is your relationship / function with the city of Abu Dhabi, UAE?
Answer: ……
……
……

Question 3: What is your position in relation to the urban planning in Abu Dhabi, UAE?
Answer: ……
……
……

Question 4: How would you rate your knowledge about this topic? (For example: excellent, good, sufficient, poor).
Answer: ……
……
……

Question 5: How long have you been active in Abu Dhabi or the United Arab Emirates?
Answer: ……
……
……

II . Depth questions

Question 6: In the introduction of this questionnaire I specify three shifts in urban planning that, in my view, come back in the urban development of the past years. Are these shifts noticeable in your daily life? If so, how is this visible?
Answer: ……
……
……

Question 7: The first stage of urbanization that I distinguish is ‘super-branded-mega development’ (star architecture, numerous high-rise buildings, iconic projects, bringing in international brands), which has clearly enormous impact on the streetscape. Do you preserve this in practice? If so, how would you describe its impact, when is / was its peak and what is / was the period of observation?
Answer: ……
……
……

Question 8: An effect in urban development, called 'homogenization', ensures that the impact of an iconic project reduces when a similar project is build, a typical pitfall of 'super-branded-mega development’. For instance, the Eiffel Tower is unique but several Eifel Towers reduces the effect of the first one. Do you observe this effect in Abu Dhabi? If so, how is it this visible?
Answer: ……
……
……

Question 9: Research shows that there is a correlation between economic growth and an increase in urban development, but also between economic growth and an increase in high-rise buildings. In Abu Dhabi are high-rise buildings also a mean for economic growth, which eventually could lead to a bubble (to many new, empty buildings in relation to its population), as previously in Dubai. How do you assess this process in Abu Dhabi?
Answer: ……
……
……

Question 10: The effect as discussed above could also be determined on a larger scale; I refer to similar processes in neighbouring nations as Dubai and Qatar. Do you can observe this effect in the Gulf region? If so, how is this visible?
Answer: ……
……
……

Question 11: The second phase of urbanization that I distinguish is the 'international shipping hub'; the focus on Abu Dhabi as a maritime and aviation hub and with Etihad Airways as the new 'super connector'. Is this process observable in practice? If so, how would you describe the impact, when is / was its peak and when is / was this shift observable?
Answer: ……
……
……

Question 12: Relating the second shift particularly the focus on an aviation hub between Asia and Europe observable. However, there is competition from both old 'super connectors' (such as Singapore Airlines) and regional new 'super connectors' as Fly Emirates and Qatar Airways. How do you assess this policy (focus on Abu Dhabi as a hub) and how would you estimate its opportunities?
Answer: ……
……
……

Question 13: The third (future) shift in the urbanization that I distinguish is the sustainable shift (focus on sustainability instead of the petrochemical sector). Is this process observable in practice? If so, how would you describe its impact, when is / was its peak of influence and in what period is / was this shift visible?
Answer: ……
……
……

Question 14: Besides the intense development of Abu Dhabi, within the GCC also Dubai and Qatar experience fast economic growth. They decided that Dubai would focus on healthcare, Qatar on knowledge (education) and Abu Dhabi on sustainability (i.e., the third shift). How do you feel about this policy differentiation for Abu Dhabi? Is this process visible in planning and politics of the emirate?
Answer: ……
……
……

Question 15: In order to realize this differentiation, discussed in question 14, each city has to specialize itself. However, Abu Dhabi also has potential top universities as Masdar Institute of Science and Technology and excellent hospitals. How is this specialization (specific focus on sustainability) in practice and / or policy observable? Namely, the focus is more sustainability than healthcare and education.
Answer: ……
……
……

Question 16: When you as a policymaker would have to make a choice between these shifts, which shift do you think has the most potential for Abu Dhabi to become a future metropolis?
Answer: ……
……
……

Question 17: Western countries needed centuries to transform its cities to what they now are but a similar process is done by Abu Dhabi in nearly 50 years. What would you distinguish as most important difference / transition between now and then for you? And how do you think the culture emerges in its urban planning of the 21st century?
Answer: ……
……
……

Question 18: Abu Dhabi, derived from recent urban planning, differentiates and diversifies is its economy. A focus on other sectors instead of mainly the oil and natural gas sector. How do you assess the chance of Abu Dhabi, when oil runs out, to be in 50 years still a major metropolis? And why?

Answer: ……
……
……

Question 19: Abu Dhabi is currently the frontrunner of the 'new Arabia' and thus an example for the region. Do you observe similar processes, derived planning of Abu Dhabi, in the region? If so, what are they and how is this visible?
Answer: ……
……
……

III. Concluding questions

Question 20: In order to conclude this questionnaire, how do you see your role now in this whole?
Answer: ……
……
……

Question 21: When I distinguish and name these processes, do you recognize these in practice? Or is the correlation only visible in literature and policy?
Answer: ……
……
……

Question 22: Is there one, or are there multiple, question(s) that you especially see as important in this questionnaire?
Answer: ……
……
……

Question 23: Are there important questions that I didn't ask or processes that I didn't observe?
Answer: ……
……
……

Question 24: Would you accept or agree with my findings?
Answer: ……
……
……

Question 25: Finally, how would you rate this questionnaire? (For example: excellent, good, sufficient, poor, or no opinion)
Answer: ……
……
……

Appendix 3 – Formal Letter University of Groningen

university of groningen / faculty of spatial sciences / planning

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Date
30 October 2013

Our reference

Subject
Request case, number 100-855166: Roland Dijkhuizen

To whom it may concern,

I would like to confirm that Roland Dijkhuizen is a Masters student in the Department of Spatial Planning and Environment, Faculty of Spatial Sciences, University of Groningen in The Netherlands.

He is currently undertaking research for his Master thesis entitled URBANIZATION IN ABU DHABI: THE LIFE POST-OIL; SUPER-BRANDED-MEGA DEVELOPMENT TO AN INTERNATIONAL SHIPPING HUB AND THE SUSTAINABLE SHIFT under my supervision.

As the data he collects is vital to the successful completion of his thesis, I would be extremely grateful if you could honour Roland's request.

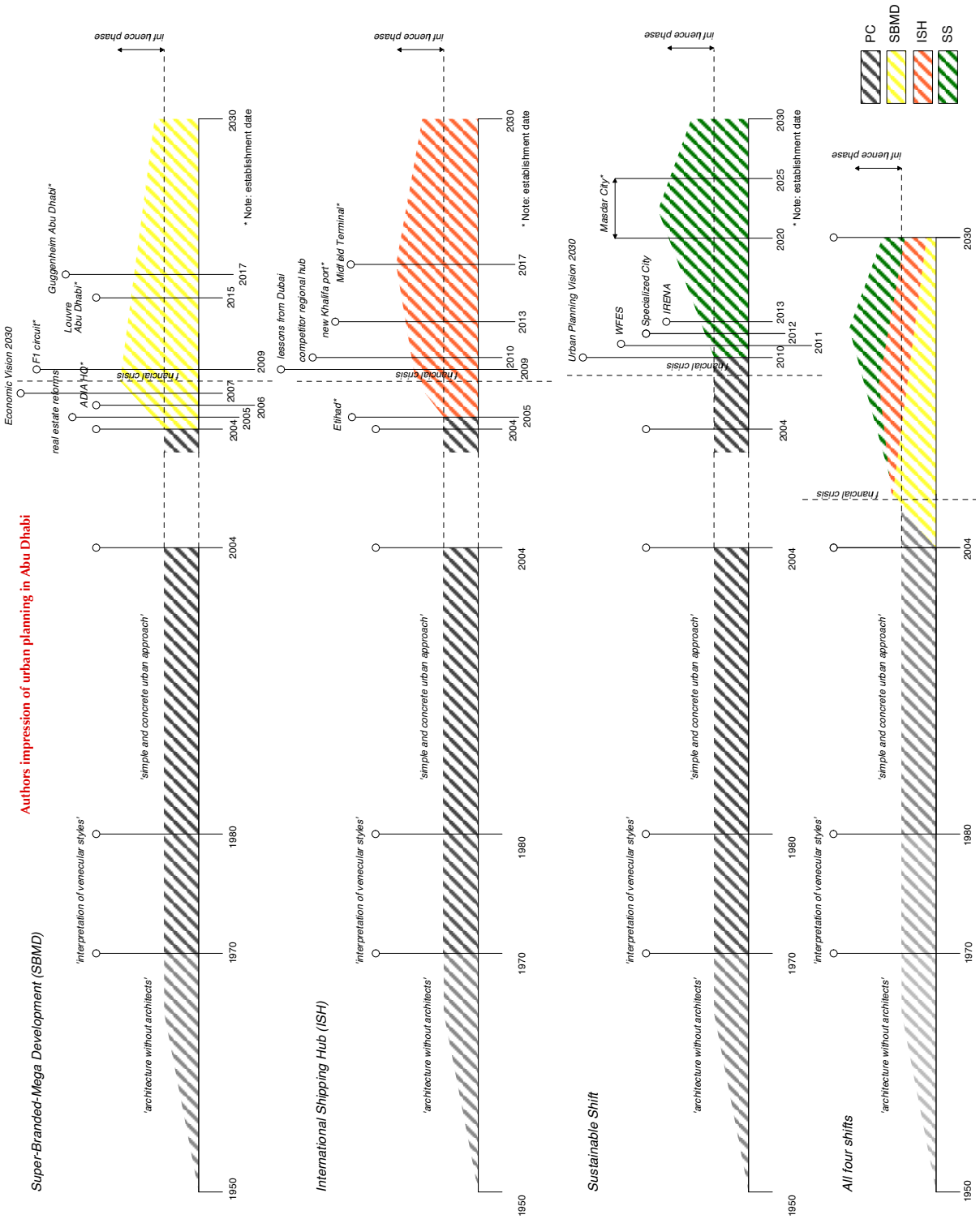
Needless to say any information you offer will be treated in the strictest confidence as befitting of all academic research. It will moreover contribute to the highest level of attainment that we value within our postgraduate community.

If you have any further questions do not hesitate to contact me directly.

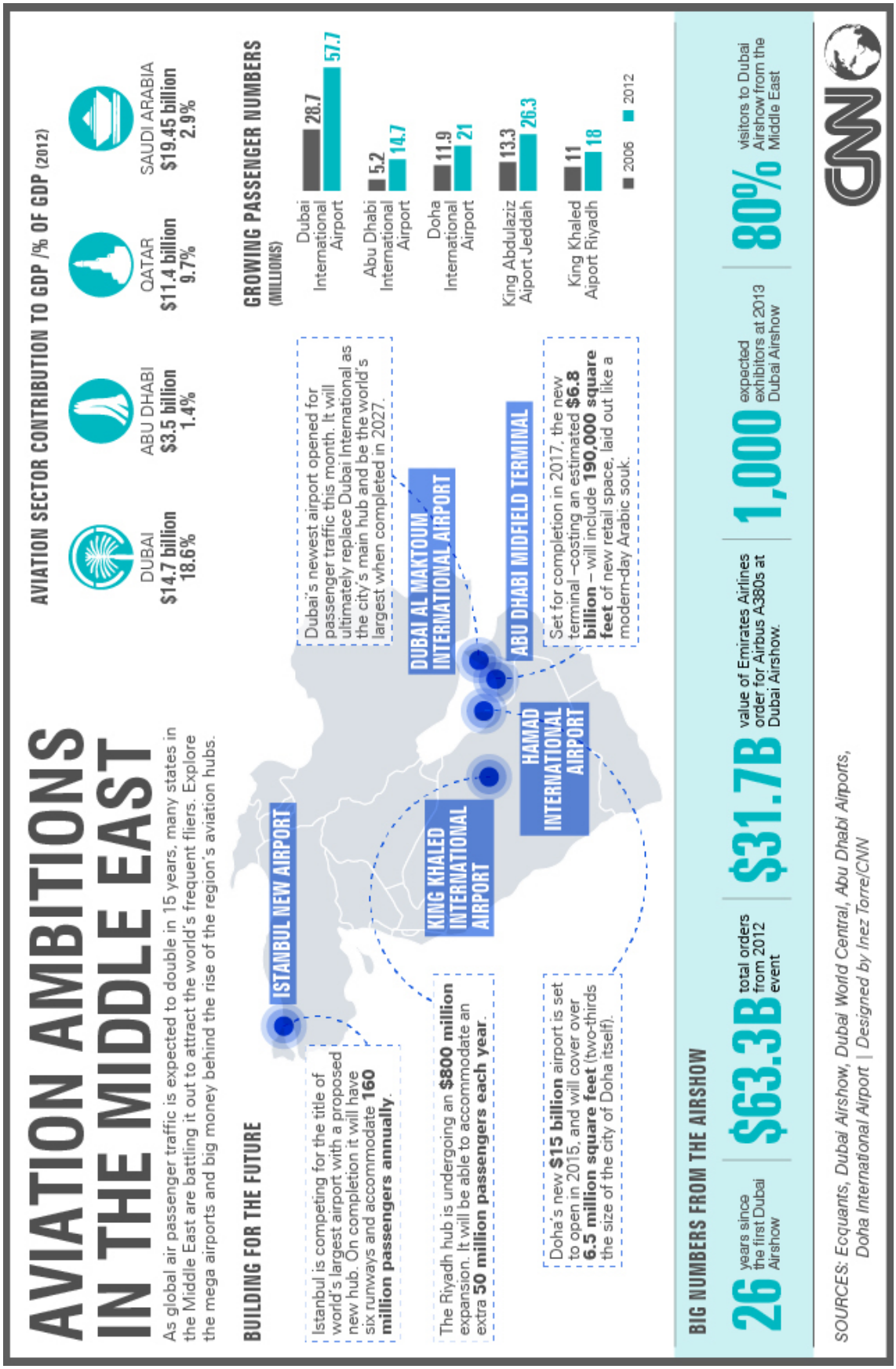
Yours faithfully,

Justin Beaumont (Dr.)
Lecturer, Spatial Planning & Environment
University of Groningen
The Netherlands
Website/ Blog

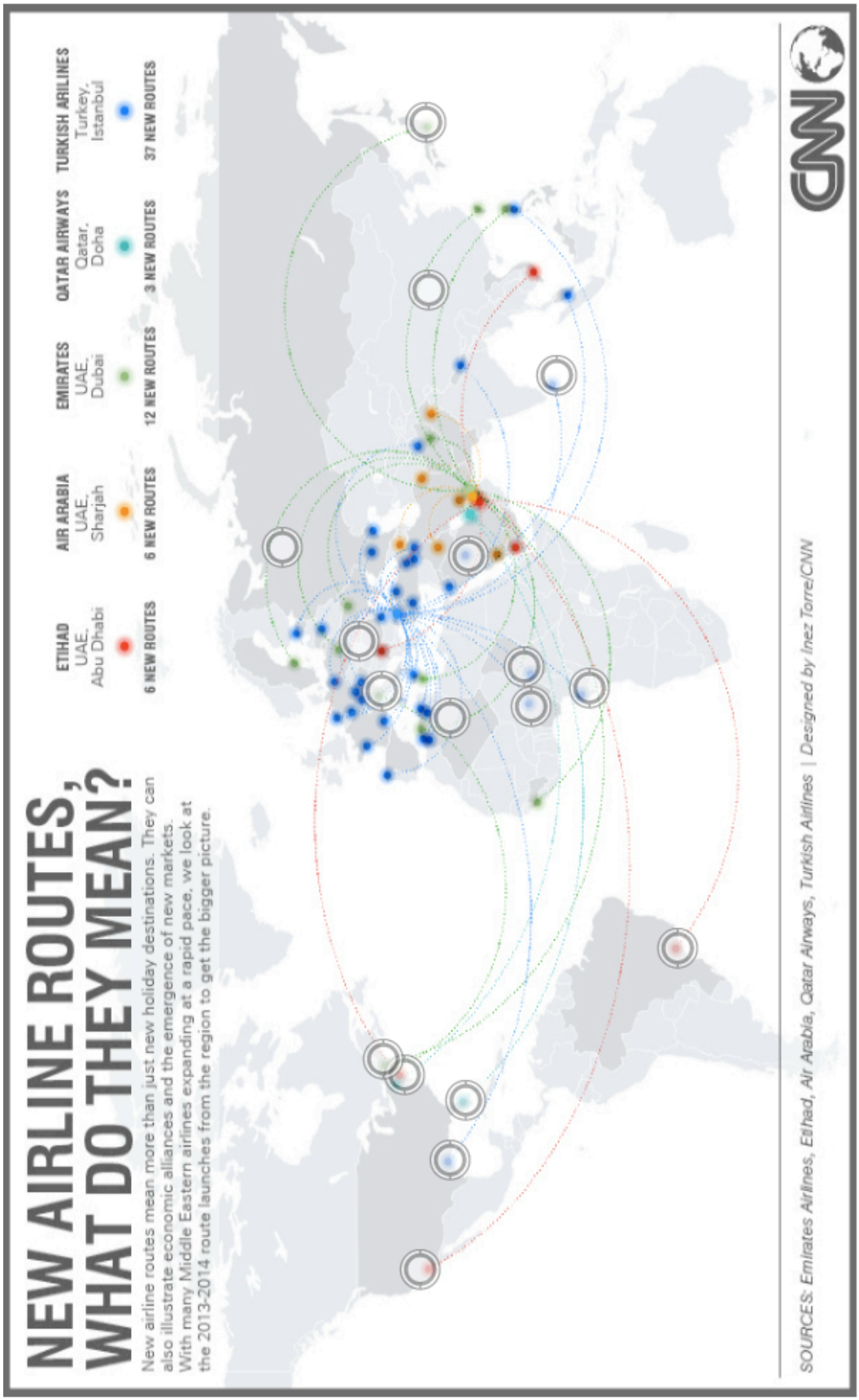
Appendix 4 - Infographic Abu Dhabi (authors impression)
Soucre: author.



Appendix 5 – Infographic CNN: Aviation ambitions in the Middle East



Appendix 6 – Infographic CNN: New airline routes, what do they main?



Appendix 7 – Maps

Map of the United Arab Emirates

Land Use framework

Appendix 8 – Abu Dhabi's Government Structure