



**Analyzing the Impact of
Global Financial and Economic Crises on
the Tourism Sector in Egypt**
Nermmen Nasr

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Suez Canal University, Faculty of Tourism and Hotels

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Abstract :

This paper examines the impact of the global financial and economic crisis (GFEC) on the Egyptian tourism demand for the period (2008-2015). To capture the influence of this crisis, a dynamic stimulation model is used to calculate the demand elasticities, and four scenarios (ranging from the most pessimistic to the most optimistic) are created to examine the possible impacts of changes in the sector.

It is presented to model the international tourism demand to Egypt. The model allows for structure instability and therefore is more adaptable in dealing with structural changes especially that tourism demand in Egypt is volatile and sensitive. Due to the difficulty of finding appropriate measures for the explanatory variables in Egypt, most of the variables are used as proxies.

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Key Words: Financial , Economic crisis , Tourism demand.

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Introduction

The tourism sector is a highly visible part of our post millennium global world, and has unarguably become one of the biggest economic drivers of this process.

The 21st century witnessed a steady increase in the tourism demand all over the world. In 2006, global international tourism receipts totaled US\$ 733 billion or 2 US billion a day and international tourist arrivals reached 898 million in 2007 (6.5% growth per year between 1950-2007). Moreover, the international tourist arrivals worldwide are forecasted to reach 1.6 billion by the year 2020. (UNWTO, June 2008)

American Chamber of Commerce in Egypt, tourism sector development in Egypt, Business studies, March 2008.

According to the World Travel and Tourism Council, tourism contributed 12 percent to the gross domestic product and generated 3 million jobs directly and indirectly (10.9% of national employment) in 2008. (WTTC, 2009)

According to the World Tourism Organization (UNWTO), international tourist arrivals grew at around 5% between January and April 2008, compared with the same period in 2007. World tourism demand remained robust in the first months of 2008 and witnessed a decline in the last months of 2008. According to the UNWTO World Tourism Barometer, the negative trend in international tourism that emerged during the second half of 2008 intensified in 2009. International tourist arrivals have suffered a sharp drop between January and April 2009 (about -8.0 percent) overall for the first four months of the year. That is accounted for a drop in the international tourist arrivals to about 247 million, between January and April, down from 269 million in 2008. International tourism is expected to decline between -6% and -4 % during 2009. Sub-Saharan Africa is the only bright spot on the horizon with arrivals forecast to grow by 1-5 percent. For all regions, growth is projected to be negative: Asia and the Pacific (4-1%), Americas (6-3%) Europe (8-5%) and the Middle East (10-5%). ((UNWTO, June 2009)

The government of Egypt (GOE) assign a high priority to the tourism sector, however, its market share of the tourism market worldwide is very low (1.4 percent) ranked 64th out of 133 country. (WEF, 2009)



Whether such forecast are possible and what the challenges for Egypt in tourism industry are, we could conclude if we knew a little more about the scale of economic crisis in the World, crisis influence on developing countries such as Egypt .

Objectives of the study

First, to analyze the impacts of the GFC through understanding the dynamical behavioral relations between variables. Second, to simulate these effects through carrying out scenarios for the impact of global crisis on tourism . Therefore The paper uses the system tourist model to investigate the impacts of (GFEC) on Egyptian tourism development to maintain a competitive edge in a shrinking market.

The dynamic stimulation tourism model is calibrated based on the historical time series of the key variables in the tourism sector during the period between 1995 and 2007. The model is then used to assess the effects of the GFC and to test different mitigation policies over the period(2008-2015).

The analysis will mainly be through examining the internal structure of the tourism sector in Egypt and the relationship between key variables based on The Travel and Tourism Competitiveness Index (TTCI), 2009 published by the World Economic Forum that determines the competitiveness position of the Egyptian tourism among different countries in the world. The paper will focus on some vital TTCI sub-indexes to analyze their effects on the Egyptian market share.

The model evaluates the ranking of the competitive performance of 133 countries. The TTCI is composed of 14 pillars grouped into three groups, mainly, the travel and tourism regulatory framework, business environment and infrastructure and human, cultural and natural resources. Each pillar is also composed of several indicator variables. TTCI provides a comprehensive tool for measuring the factors and policies that make the Travel and Tourism sector attractive(WEF, 2009).

The paper is divided into the following four sections. The **first** underlines the main features and developments of the Egyptian tourism sector particularly during the few years preceding the crisis (2004-2008). In the **second** section the impact of the (GFEC) on the tourism sector in Egypt will be investigated using secondary data and assembling the information available so far on the



impact of the crisis. The **third** section describes the TTCI which represents the core foundation of the model, focusing on previous work about tourism in Egypt and how system dynamics can be useful in representing tourism dynamics. The **Fourth** Section describes the system dynamics model, and illustrates the model behavior in the different runs and presents the comparative analysis of the selected four scenarios. The study ends with **fifth** section which provides some insights on the resistance of the crisis impacts on Egyptian tourism and the concluding remarks and future work are presented.

1- Tourism Demand In Egypt

Tourism is one of the major contributing sectors for Egypt's economic growth for several years. Year by year, number of international tourist arrivals to Egypt showing an upward trend and this supported with the country's political stability, besides several program and package introduced by The government of Egypt (GOE) to encourage international tourist visit Egypt.

- the Egyptian Tourism Industry Prior to the (GFEC)

The overview covers three main components of the Egyptian tourism industry which are directly related to the purpose of the present study, namely: Tourist demand, tourism capacity and tourism employment. The analysis will focus on the period 2004-2008, but developments since the beginning of the decade will occasionally be reviewed. The Tourism sector in Egypt has witnessed significant developments in the last decade.

- International Tourist Arrivals

The growth potential of the international tourism demand over the period 2004-2008 was greatly promising.

A steady increase has been occurring over the period compared with the 1999-2003 period where the number of international tourist arrivals (ITAs) was erratic due to several occurrences such as: September 11, 2001 events, Iraq war and some extremists' attacks on tourists. Inflow of ITAs to Egypt is demonstrated in figure. (Ach, Selim and Brian Pearce, 2009)



The number of tourists has increased from 8.1 million in 2004 to 12.8 million in 2008, making an average over the period of about 10 million tourists, representing almost double the average achieved during the previous period (1999-2003). The development of ITAs flow to Egypt and its increasing importance worldwide and regionally can be viewed from the information given in table (1).

Table (1) Development of International Tourist Arrivals (ITAs) and Egypt's Share (in million)

2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	
922	904	847	804	765	695	707	687	687	640	World
55.6	47	41.4	37.9	36.3	29.5	28.5	24.5	24.2	21.5	Middle East
12.8	11.1	9.1	8.6	8.1	6	5.2	4.6	5.5	4.8	Egypt
1.39	1.23	1.07	1.07	1.05	0.86	0.74	0.67	0.8	0.75	Egypt/ World (%)
23	23.6	22	22.7	22.3	20.3	18.2	18.8	22.7	22.3	Egypt/ Middle East (%)

Sources: UNWTO, World Tourism Barometer, Vol. 6, No. 3, October 2008.

In addition to the above, the number of tourist nights spent over the same period manifests an impressive increase from 31 million in 1999 to 129 million in 2008, achieving an annual compound rate of growth as high as 17.2%. During 2004-2008 the rate of growth of tourist nights remained high (12.1%), yet lower than the average for the whole period. (UNWTO, October 2008)

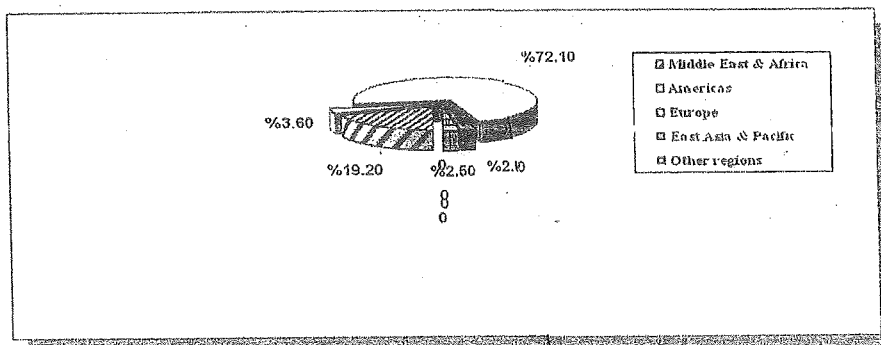
- Generating Regions

Egyptian tourist demand in 2008 can be segmented by generating regions. Western Europe is the major generating sub-region accounting for 46% of ITAs to Egypt. Eastern Europe is the second major sub-region (29%). The European region (West and East) supply the great majority of tourists (75%), far exceeding the share of the Middle East and Africa region (16%) which occupies the second place after Europe. The average relative share of each region for



the complete period 2004-2008 is given in figure (1). The figure confirms almost the same pattern of distribution given for the year 2008.

Figure (1) International Tourist Arrivals by Generating Regions (Average 2004-2008)



Source: CAPMAS, Annual Bulletin of Tourism Statistics, Different Issues, (2008).

It should be noted, however, that between 2004 and 2008, Eastern Europe has greatly substantiated its position as a generating sub-region for Egypt by increasing its relative share from 16.6 % in 2004 to 29.2 % in 2008. This is a continuation of the trend prevailed in the previous period where the share of Eastern European tourists in 2000 was 6.1 % only. The increase has taken place at the expense of the decline in the relative share of Western Europe and to some extent the Middle East region.

Furthermore, in two consecutive years: 2006 and 2007 Russian tourists advanced to the first position in the ranking of top tourist nationalities visiting Egypt. Achieving 1.6 million visitors in 2007, they replaced German, UK, and Italian visitors who used to occupy the top ranks in previous years. (UNWTO, Jan. 2009)

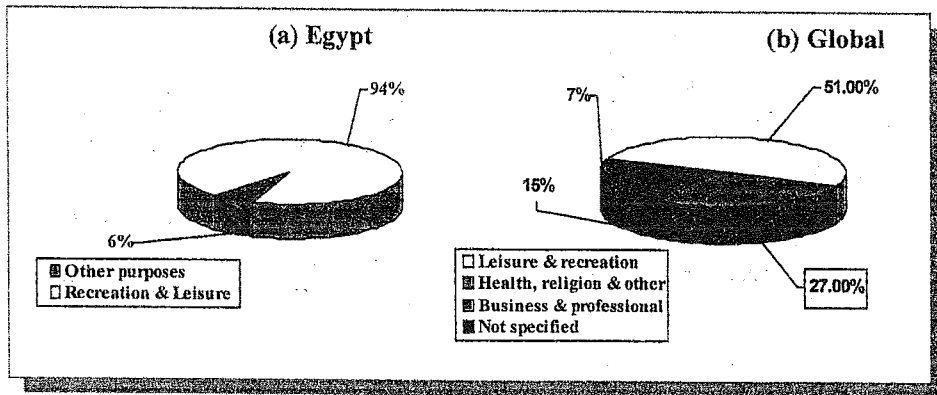


Purpose of Visit

Traditionally, tourism in Egypt has focused on the Egyptian cultural heritage. However, since the rapid development of South Sinai and the Red Sea tourist destinations, recreation and leisure activities became gradually the major reason for visit figure (2), capturing in 2007 more than 10 million out of a total 11 million ITAs. From the same figure it can be noted that the relative share of all other purposes of visit do not exceed 6.0%. Besides, among the other purposes same-day visits represent the major purpose (66%), whereas education and health treatment stand for almost negligible shares. Compared with the corresponding world pattern illustrated in figure (2), it is obvious that the Egyptian pattern of the purpose of visit is quite dissimilar.

Worldwide leisure activities and recreation exemplify a much lower percentage (51%), while business and health motivations account for a much higher percentage than Egypt.

Figure (2) Tourism by purpose of visit, Egypt and the world 2007



Source: UNWTO, Tourism Highlights, Oct. 2008.

Descriptive analysis of the Egyptian tourism sector

The Tourism sector in Egypt has witnessed significant developments in the last decade. A review of the evolution of the tourism sector since 1995 provides a background to the assessment of the sector's prospects in future.

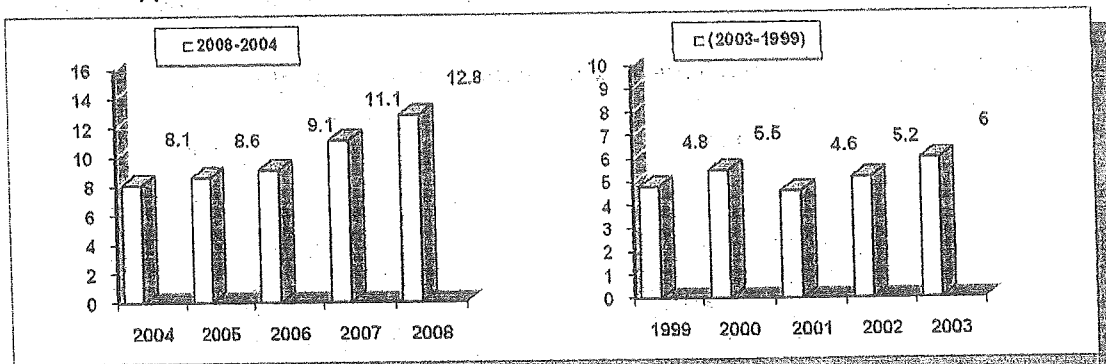


In the last thirteen years, tourism arrivals increased more than three-fold from 3.1 million in 1995 to 11.1 million in 2007 recording an average annual growth about 12.3%. The average duration of stay of visitors increased from 6 nights to 10 nights over the same period.

The tourism nights grew rapidly between 2004 and 2008 reaching 129 million nights in 2008, a 4.4% increase over 2004.

It is worth mentioning that the tourist arrivals that Egypt could potentially attract accounted for 20-28% more tourists over the period 1995-2007. Egypt's International Tourist Arrivals (ITAs) in millions can be viewed from the information given in figure (3).

Figure (3) Egypt's International Tourist Arrivals (ITAs) (mn) (1999-2003)(2004-2008)



Source: World Tourism Organization (WTO), 2008

Tourism Capacity

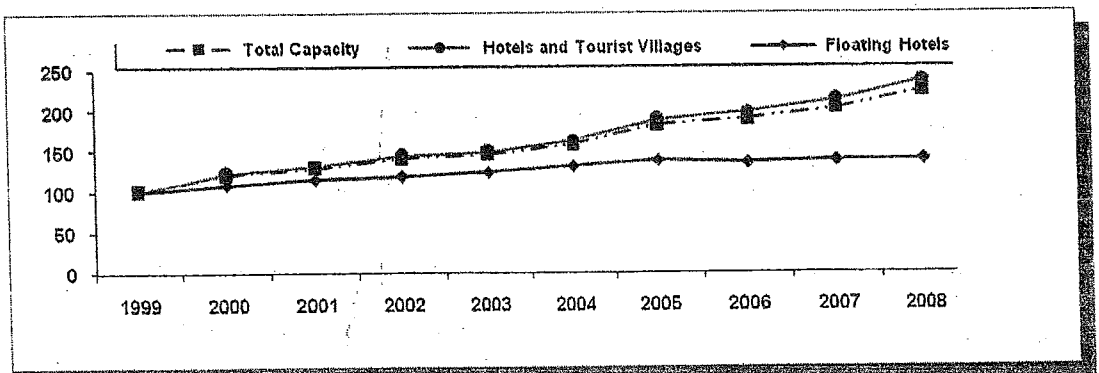
The high rate of growth of ITAs to Egypt has been accompanied by a rapid expansion of hotel capacity during the present decade. The total number of hotels reached 1490 in 2008 rising from 914 units in 1999 and from 1207 in 2004.



The number of hotel rooms reached 211 thousand in 2008 up from 94 thousand in 1999 and from 148 thousand in 2004. Total capacity grew at an average annual compound rate of 9.4 % during 1999-2008.

The growth is concentrated mainly, as shown in figure (4), in hotels and tourist-villages which have increased by an annual average rate of 9.9%.

Figure (4) Index Numbers of Hotel Capacity by Type of Accommodation (1999-2008)



Source :Ministry of Tourism, Tourism in Figures, 2007.

- Development of Tourism Employment

Despite the above assessment, consistent comparative overtime data are available on employment in hotels and tourist villages collected annually by (CAPMAS). The data are based on comprehensive coverage of all hotel categories existing in Egypt. In spite of any deficiencies, they may be considered the most likely reliable annual data on hotel employment.

In addition, CAPMAS collects annual data on employment in the overall economy based on the labour Force Sample Survey (LFSS). The hotel and restaurant activity represents tourism in such surveys, which have the additional advantage of providing a full image of employment in the tourism and other economic sectors of the economy. Information from the latter source is displayed in table (2).



Table (2) Employment in Hotels and Restaurants (2004-2008) (Hundred Workers)

	2004	2005	2006	2007	2008
Hotel and Restaurants	3344	3664	4114	3708	4623
Total Employment	187175	193417	204436	217239	225073
(1)/(2)%	1.8	1.9	2.0	1.7	2.1

Source: CAPMAS, Labour Force Sample Survey, Different Issues.

1- DIMENSION OF ECONOMIC CRISIS IN THE 'WORLD

The financial and economic crisis that hit the global economy has been unfolding since the end of 2007, and its ramifications are yet to be understood. The genesis of the crisis and its dimensions are fairly well-known, and therefore will not be discussed in detail in this paper. The objective is rather to gauge the impact of the crisis on the Egyptian economy with particular focus on the labor scene.

The crisis began with the sub-prime mortgage problem in the United States and culminated in the financial crunch, caused mainly by the accumulation of toxic debts, and which threatened the banking system in the whole world. By the beginning of 2008, the repercussions extended to the real economy. The crisis was reflected in successive waves of decline in the growth of developed economies, reaching the level of recession by the end of 2008.

Meanwhile, the robust growth in emerging markets was an important factor in achieving positive growth rates at the level of the global economy. Various projections of the prospects of growth have been continually revised downward suggesting that the year 2009 as the most difficult period facing the world. According to the latest update by the World Bank's Global Economic Prospects 2009 "What began six months ago with a massive deleveraging in financial markets has turned into one of the sharpest global economic contractions in modern history" The crisis can be viewed against the backdrop of the strong economic performance that resulted from the reform drive which began in 2004 and resulted in an upsurge in almost all macroeconomic indicators, notably high rate of GDP growth of 7.2% in 2007/08. (Cali, M., Massa I., and Willem, 2008)



Moreover there has been an impressive progress in improving the investment climate which was reflected in the positive rating of the economy. However, three structural problems continued to vex the economy: high budget deficit; rapid inflation and a constraining quality of the labor force. (World Bank, Dec, 2008)

Impact of (EFGC) is on Egypt

The global financial and economic crisis (EFGC) has negatively been transmitted to the Egyptian economy particularly since mid-2008. The impact has been more pronounced on the realeconomy rather than the banking sector. This was due to a number of factors most prominent of which is the limited integration of the Egyptian banking sector in the global financial market. Moreover, the Central Bank of Egypt had succeeded in reforming the sector since 2004 by consolidating the banks into larger conglomerates; restructuring bank management; and getting rid of toxic debts. The Central Bank also introduced stringent rules of governance to guarantee the disciplined functioning of the system.

Finally, the banking system has not been short of liquidity with the lending-to-deposit ratio not exceeding 53%, which is well within the safe boundaries compared to the rest of the world.

The impact on the real economy has been reflected in the following indicators: (World Bank, 2009)

- Decline of GDP growth from 7.2% in 2006/07 to around 4% in 2007/08.
- Reduced flow of FDI and a decline in domestic investment -
- Increase in return migration and expected drop in remittance.
- Increased strain on the balance of payments. -
- Capital market collapse.
- Decelerating sectoral growth especially for tourism, manufacturing and Suez Canal

The prolonged labor market recession and the consequent social deterioration are the most serious aspects of the global financial and economic crisis as it reflects on Egypt. The most immediate impact of the crisis has been the inability of the labor market to adjust, thus exacerbating the problem of unemployment,



and accentuating the position of different groups particularly women and youth. Unemployment, which has been a chronic problem even with the rapid growth of the pre-crisis period, is on the rise. Open unemployment increased from 8.4% to 8.8% over the last year, and expected to reach 10% by the end of this year.

(ILO,2008)

- IMPACT OF THE GLOBAL ECONOMIC CRISIS

Since October 2008, the global economy has experienced substantial economic turmoil, occasioned by the failure of the international financial system to fulfill its role of efficient credit allocation. The impact of this failure has negatively affected developed and emerging economies alike, and governments have responded with haste to shore up both national and international financial markets as a means of reenergizing struggling economies. The tourism sector within the Caribbean has also been impacted and governments have also sought to provide broad based stimulus interventions in order to minimize the impact of the crisis.

According to UNWTO (2009e), international tourist arrivals grew at a sustained rate of 7% on average between 2004 and 2007 with a peak in global arrivals of 924 million in 2008. Such spectacular growth rates were severely curtailed with the onset of the global economic crisis from the final quarter of

2008. This crisis resulted in a fall in international tourist arrivals by 7% during the first eight months of 2009, with preliminary figures suggesting a slowing of the decline towards the end of the year. On that basis, UNWTO projected an overall annual decline of 4% for 2009. Alongside declines in arrivals,

international tourism receipts are also estimated to decline by 6% in 2009, from a high of US\$ 944 billion in 2008.

The contraction in the global tourism market has its genesis in the financial crisis which first began to manifest itself as a credit crunch in United States financial markets in 2007. Through the mechanism of the United States housing and asset markets, this credit squeeze spread to Europe, Asia and the Pacific, and eventually the wider global market. These developments, coupled with rising global commodity prices, particularly energy and food, as well as the



failure of many major financial institutions, triggered rising unemployment, and a deterioration of business and consumer confidence.

Ultimately, increasing job losses as well as uncertainty about future incomes resulted in a dramatic fall off in international travel and related tourism activities. While the impact of the decline in international tourist arrivals was felt worldwide, it was most severe in the Middle East, the Americas, and Asia and Pacific Regions. In the Middle East, previously high growth

rates of 18.2% over the 2007-2008 period fell away sharply to a negative growth rate of 7.6% by August, 2009. At the same time, the Americas Region¹³ also experienced a sharp drop in arrivals, from a growth rate of 2.9% in the previous fiscal period, to -6.7% by the end of August 2009. The Asia and Pacific Region also recorded negative growth in arrivals of 5.3% up to August 2009, compared to an overall growth rate of 1.2% for the 2007-2008 period. This decline was also apparent for Europe, where the growth rate in arrivals as at August 2009 was -8.0% compared to a positive rate of 0.4% in the previous period. Only in case of the Africa Region, was the growth rate of international arrivals largely sustained, with figures of 3.6% in 2007-2008, compared to 3.8% in the first eight months of 2009. (UNWTO, 2009)

The impact of (EFGC) on tourism sector in Egypt

The tourism industry is arguably one of the most important sources of income and foreign exchange, and is growing rapidly. However, the global financial crisis has huge negative economic consequences.

The global financial and economic crisis (GFEC) presents significant challenges for world tourism growth and has its repercussions on the tourism sector worldwide and Egypt is not an exception, that the global financial meltdown has posed a particular challenge to the tourism industry.

During current financial crisis, the question that arises is how will the financial crisis reflect on the demand for tourism industry services ?

-Global Trends Under the Crisis (Aggregate Level Analysis)

- Tourism GDP and employment for Egypt

Global GDP, according to the IMF, was estimated to decline in 2009 between -0.5 to -1 %, which is considered the deepest global recession in the past fifty years. Contraction hitting the advanced economies, especially Europe and



Japan, is the most severe ranging between -3.0 to -3.5% . A more mild contraction is estimated, however, for emerging and developing economies ranging between -1.5 to -2.5% .

Such gloomy outlook of the advanced economies under the GFEC, should also has its reflections on global tourism. According to the World Tourism Organization (UNWTO), international tourist demand exhibited a significant deterioration under the impact of the (GFEC).

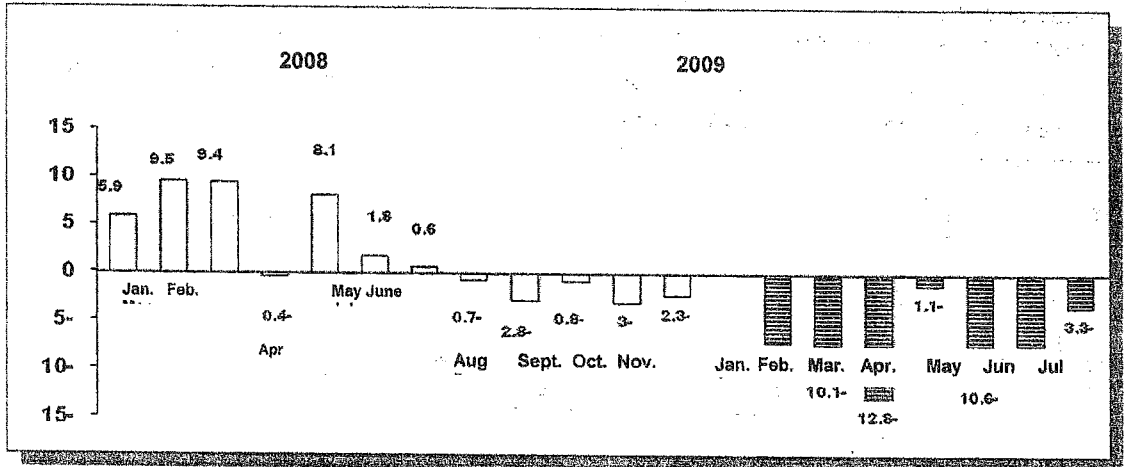
UNWTO, Barometer revealed continuation of a declining trend by the same percentage 8% for the first four months of 2009 and expected a continued decline through to the end of June 2009. Besides, although WHO did not, so far, place any restrictions on travel, additional uncertainty seems to be added by the influenza A (H1N1) outbreak. UNWTO, Barometer observes that the decline in ITAs flow may be exacerbated in some regions due to concerns about the virus. However, a brighter image is revealed from more recent information given in the latest edition of the UNWTO Barometer. It was expected that the decline in ITAs may have bottomed out, on account of the two high season months of July and August 2009 which have witnessed a decline by only 3% , following decreases of 10.6 and 7.3% in May and June respectively. Data available so far for September seem to confirm a continuation of this trend. Moreover, the Barometer demonstrates that regions of Asia, Europe and the Middle East, show a similar pattern of gradual pick-up. (UNWTO, April 2009)

Figure (5) demonstrates the reversal trend of ITAs between the first and second half of 2008, together with the more severe decline observed for the first eight months of 2009.

UNWTO prospects for the full year 2009, nevertheless, still verify the organization's previous forecast of a decrease in ITAs by around 5% . Regarding ITAs motivations, UNWTO finds out from the preliminary results that costs tend to be the main driver of trends in all regions. Business travelers are likely to enter a new age of austerity making fewer, shorter and cheaper business trips in 2009. As to leisure travel, secondary short breaks appear to have been hit more than main vacations, and long-haul travel has fallen more than short-haul trips (UNWTO, October 2009).



Figure (5) Monthly Change in Global(ITAs)During the Crisis Period



Source: UNWTO, World Tourism Barometer(2009)

The slowdown of international tourist flow in the first 3 months of 2009 is backed up by the air transport data reported by IATA and various regions of air transport associations. IATA's new forecast is US \$ 9 billion losses in 2009. Hotel performance data for the first four months of 2009 further support these trends. As reported by Deloitte overall occupancy was down in all regions and particularly in Asia

- Tourism GDP for Egypt

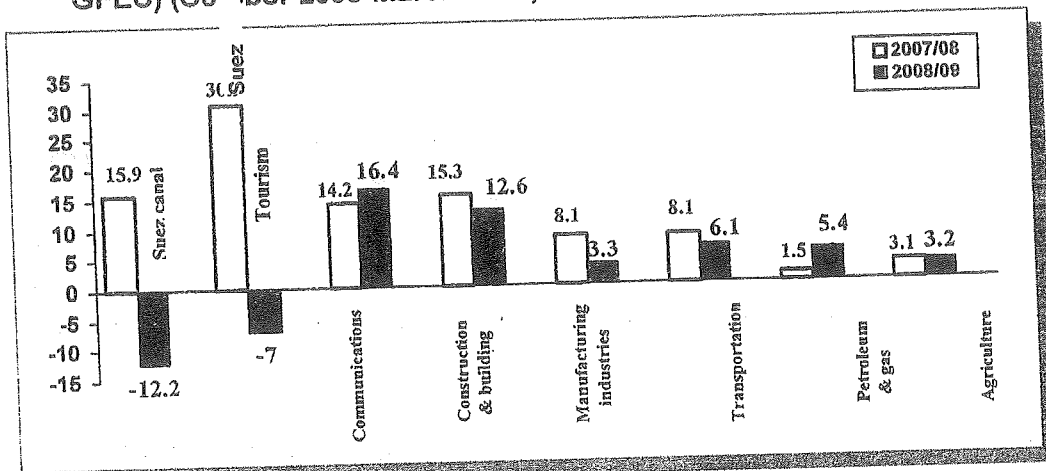
Figure (6) illustrates the rate of growth of real (GDP) for several sectors of the Egyptian economy during October 2008-March 2009, the period witnessing the most severe impact of the crisis on economic growth. Hotels and restaurants and the Suez Canal are the only activities displaying negative growth.

Other activities continue growing but some of them at a slower pace compared with the same period of the previous year. It can be also noticed that the



activities that display positive growing trends, irrespective of the (GFEC), are mostly those correlated with local market demand such as communications.

Figure (6) Real GDP growth rates for tourism and other activities during (GFEC) (October 2008-March 2009)



Source : UNWTO, World Tourism Barometer(2009)

- The Impact of the (GFEC) on Tourism Demand

In line with the above mentioned fall in the global tourist movement under the crisis, tourist demand in Egypt exhibited a significant setback. From table (3), it is obvious that the burden of the crisis fell heavily on ITAs and tourist nights (-9.5%) during the second half of the year 2008/2009.

However, the positive rate of growth achieved in the first half of the year (July/December) counterbalanced the sharp negative impact leading to a zero and a moderate negative rate of growth for the whole FY July-June 2009 (0.0%, -3.1% respectively).



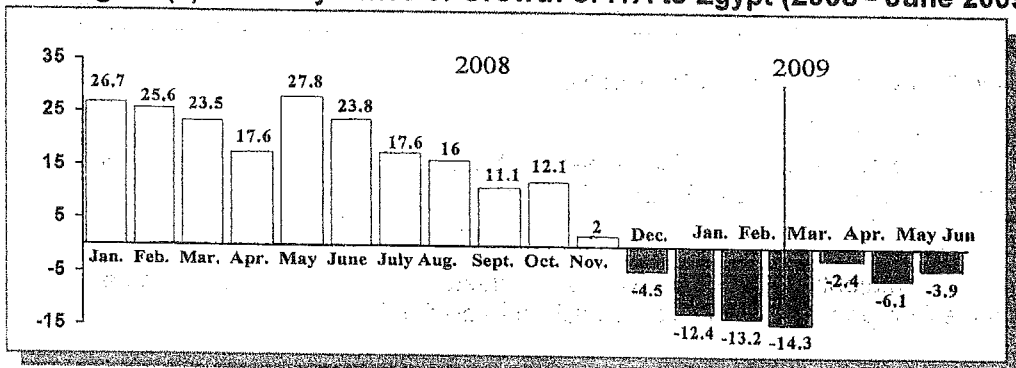
Table (3) Number of Tourists and tourist Nights (mn) under the (GFEC)

January – June		July-December		FY July-June		
TNs	ITAs	TNs	ITAs	TNs	ITAs	
61.8	6.3	65.6	6.0	127.4	12.3	2007/2008
55.9	5.7	67.5	6.6	123.4	12.3	2008/2009
-9.5	-9.5	+2.9	+10.0	-3.1	0.0	% Change

Source : Ministry of Economic Development(2009).

The crisis' impact on(ITA) appears clearer from the monthly rates of growth given in figure (7). The slowdown of the tourist movement began to take place during the second half of 2008. However, the negative impact of the crisis did not materialize until December 2008, and continued-more severely-through the first 3 months of 2009. The June month on the other hand witnessed a significant retreated in the rate of decline even in relation to the previous May month.

Figure (7): Monthly Rates of Growth of ITA to Egypt (2008 - June 2009)



Source: Calculated from Ministry of Tourism, Unpublished Monthly Statistics(2009)



It is also appealing to compare the impact of the crisis on (ITA) to Egypt with the corresponding impact globally. The comparative data are given in table (4).

They reveal that Egyptian tourism resisted the crisis for a longer period during which positive growth has continued -until November 2008. The negative trend in the rate of growth, however, turned out to be sharper than the global movement since December 2008, and lasted during the first quarter of 2009.

April - as it appears from the table - is a month of low rate of decline both globally and domestically because it is the Easter vacation month where the number of international tourists shows unusual increase. In June 2009 on the other hand, an evidence of partial recovery appears for both Egypt & the world tourist movement. Summing up, the consequence for the whole FY 2008/2009 is a zero rate of growth representing a more satisfying outcome for Egypt compared to the expected global rate-5% for 2009.(25) (UNWTO ,June2009)

Table (4) Monthly Rate of Change of ITAs during the Crisis Period in Egypt and the World

The full year	2009						2008						
	June	May	April	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	Sep.	Aug.	July	
-5.0%(2009 Expected)	-7.3	-10.6	-1.1	-12.8	-10.1	-7.1	-2.3	-3.0	-0.8	-2.8	-0.7	0.6	World
0.0% (2008/2009 actual)	-3.9	-6.1	-2.4	-14.3	-13.2	-12.4	-4.5	2.0	12.1	11.1	16.0	17.6	Egypt

Source :Tourist figures, Ministry of Tourism,2009.

- Some of the factors which lie behind the decline in ITAs to Egypt during the crisis period include(28): 27)UNWTO, June 2009, Op
- The majority of ITAs to Egypt as manifested in section above originates from the European region where the crisis impacted quite harshly.



▪ Russian tourists who became the top tourist nationality, witnessed a substantial decline in 2008/2009, estimated by the MED to be 195 thousand tourists and 3.2 million tourist nights, i.e. a decline by 10 % and 19 % respectively.

▪ The great majority of tourists visiting Egypt are package tourists motivated by leisure and recreation. This group is thought to be the most severely hit by the GFEC. From the UNWTO Barometer it is observed that sun and beach is the Egyptian tourism segment that has been the hardest affected by the crisis. Sharm El-Sheikh, the most famous destination in South Sinai which used to enjoy peak rates of occupancy before the crisis, suffered according to the Barometer a decline in occupancy rate by 10 percentage points. On the other hand, however, according to a specialized travel agent in Egypt, "high end" tourism has been mostly unimpaired during the crisis period.

- The Impact of the (GFEC) on Tourism Foreign Exchange Receipts (FER)

Egyptian tourism in addition of being an activity closely related to the world market and one of the most sensitive activities to the crises generally, it is moreover one of a few dynamic economic sectors in Egypt. The importance of the tourism industry can be further revealed from the size of foreign exchange receipts (FER) it produces. Actually, tourism can be considered a major source of foreign exchange provision for the Egyptian economy. As indicated in table (5), before the unusual rise in the world prices of petroleum, tourism receipts represented 54.4% of export proceeds in 2003/2004. In spite of the falling rate afterwards, tourism remained a major foreign exchange earner (at least in gross terms), producing in 2007/2008 a sum equals to 40 % of export proceeds, 75 % of petroleum exports proceeds and more than twice the Suez Canal dues.



Table (5): The Contribution of Tourism to Foreign Exchange Receipts (2003/2004 – 2008/2009) (US \$ million)

2008/09	2007/08	2006/07	2005/06	2004/05	2003/04	
10487.6	10826.5	8183.0	7234.6	6429.8	5475.1	Tourism Receipts
25168.9	29355.8	22017.5	18455.1	13833.4	10452.5	Export Proceeds
41.7	36.9	37.2	39.2	46.5	54.4	Tourism% Export Proceeds
95.3	7408	81	70.8	121.3	140.0	Tourism% Petroleum Exports
222.2	210	196.3		194.4	192.2	Tourism% Suez canal Dues

Source: Central Bank of Egypt (CBE), Monthly Statistical Bulletin, 2009

The rate of growth of tourism FER during the few years immediately preceding the crisis (2003/04-2007/08) was very high (18.6%). As a result of the crisis however, FER have declined from US \$ 10826.5 million in 2007/2008 to \$ 10 487.6 mn in 2008/2009, i.e. by US \$ 338.9 million (-3%). Besides, table (6) provides further evidence of the quarterly rate of growth of FER during the crisis period. The first quarter of 2008/2009 displays a relatively high positive rate of growth (15.2%), whereas the third quarter (January/ March) shows the highest rate of decline (-17.2%). It matches the period witnessing the most severe decline in ITAs to Egypt given in figure (6) above.

Table (6) Quarterly Tourism FER under the GFEC (\$million) (2007/2008, 2008/2009)

Whole year	Q ₄ April - June	Q ₃ Jan. - Mar.	Q ₂ Oct. - Dec.	Q ₁ July-Sep.	
10826.5	2603.0	2643.1	2732.0	2844.4	2007/2008
10487.6	2561.3	2187.5	2457.8	3281.0	2008/2009
-3.1	-1.6	-17.2	-10.0	+15.2	Rate of Growth%

Source : CBE(www.cbe.org.eg) (28)



In the fourth quarter (April–June), the rate of decline has greatly diminished reaching -1.6 %, influenced probably by some financial supports initiated by the government to ease the impact of the crisis, and partly by the fact that this quarter includes the April month showing the least rate of decline in ITAs as mentioned above. Generally speaking, the average rate of decline for the whole FY (2008/2009) turns up to be rather mild, especially when compared with the impact of the (GFEC) on other sources of foreign exchange in Egypt, as given in table.

Table (7) The Impact of the GFEC on FER from Tourism and Other Foreign Exchange Sources (2008/2009)

Suez Canal	Petroleum Exports	Exports	Tourism	
5155.2	14472.6	29355.8	10826.5	2007/2008
4720.6	11004.5	25168.9	10487.6	2008/2009
-8.4	-24.0	-14.3	-3.1	Rate of Growth%

Source: CBE(www.cbe.org.eg)

-Tourism Contribution to GDP

Another indicator related to tourism contribution to the economy and the likely influence of the GFEC, concerns tourism's share in GDP. From table (8) this share exhibits a steady rise (except in 2005/2006 where a slight decline is observed). The average contribution for the period 2004-2008 is higher (3.4%) than the average for the previous period 2000/2001-2003/2004. Nonetheless, when compared with other economic activities direct contribution to GDP, such as agriculture (13.2%), manufacturing (16.3%) and trade (10.9%), tourism's contribution appears to be fairly moderate (3.8% in 2007/2008). The implication of the GFEC impact on income from tourism can be watched from the same table. Between 2007/2008 and 2008/2009 a positive but small increase in tourism GDP is noticeable. Instead, when the change is depicted in terms of the rate of growth, a considerable decline emerges from 32.0 % in 2007/2008 to 6 % only in 2008/2009.



Table (8) Development of Tourism Share in GDP (LE million)

2008/ 2009	2007/ 2008	2006/ 2007	2005/ 2006	2004/ 2005	2003/ 2004	2002/ 2003	2001/ 2002	2000/ 2001	
34381.9	32423.6	24565.4	18797.9	16712.8	12461.6	7704.1	6457.0	5357.0	Tourism GDP
3.5	3.8	3.4	3.2	3.3	2.8	2.0	1.6	1.6	Tourism/ Total GDP%

* GDP at factor cost and current prices.

Source: MED Time Series Statistics (www.mop.gov.eg)

Concluding from the above analysis a brief summary of the indicators showing the impact of the GFEC on Egyptian tourism is displayed in table (9).

Table (9) Summary Indicators of the Impact of GFEC on Egyptian Tourism (2007/2008, 2008/2009)

Tourism contribution to overall RG	Tourism GDP ⁽²⁾		Tourism FER		TNs		ITAs		
	RG (%)	GDP (LE mn)	RG (%)	\$ mn	RG (%)	No. (million)	RG (%)	No. (million)	
0.85	+32.0	32423.6	+32.3	10826.5	+32.3	127.4	+25.6	12.3	2007/2008
0.05	+6.0	34381.9	-3.1	10487.6	-3.1	123.4	0.00	12.3	2008/2009

(FER) = Foreign Exchange Receipts-* RG = Rate of growth

Source : From previous tables .

- The Crisis Impact in Terms of Foregone Opportunity

The impact of the GFEC on Egyptian tourism revealed above may be viewed as yet incomplete. Opportunity foregone whether in terms of ITAs, tourist nights, tourism FER, and income may highlight the impact of the crisis beyond what is



implied by the plain figures. The opportunity foregone uncovers the impact based on a most likely realistic assumption that without the crisis existence, the rates of growth of tourism variables achieved previously would have more or less continued to materialize. For instance, it has been observed that the decline in ITAs to Egypt in 2008/2009 was (0.00 %), which was considered a much less severe impact than the anticipated negative rate of decline in ITAs globally (-5%). But since the rate of growth of ITAs to Egypt before the crisis was considerably higher than the corresponding global rate, losses to the Egyptian inbound tourism are likely to become much greater than previously anticipated. Given the fluctuation in the rates of growth of tourism variables from one year to the next, it may be more realistic also to calculate the opportunity foregone using the average rate of growth over the four years preceding the crisis (2004-2008). Table (7) demonstrates the outcome of these calculations:

-The Impact of the (GFEC) on Employment

Employment is one aspect of the present study to which a particular attention is given. Unfortunately however, up to now statistics available are not adequate enough to cover the crisis period and make possible analysis similar to the one applied above to other tourism variables. Time series data derived from CAPMAS Hotel Statistics and LFSS which the study used extensively to draw a profile of the Egyptian tourism industry still far from covering the 2008/2009 year which is considered in the present analysis equivalent the crisis period.

Table (10) The Impact of the GFEC on Egyptian Tourism (The Opportunity Foregone)

The Opportunity Foregone during 2008/2009	Average RG* 04-08 (%)	Tourism Indicators
1685 thousand visitors	12.2	ITAs
19383 thousand nights	12.1	Tourist Nights
2373 (US \$ mn)	18.6	Tourism FER**
4583 (LE mn)	22.0	Tourism Income

*RG = rate of growth

**FER = Foreign Exchange Receipts

Source: Calculated from previous statistics



Compared with the expansion in both tourist demand and hotel capacity, the growth in hotel employment seems to be more moderate table (11). This implies that the increase in international tourist demand (and capacity), may not necessarily create a corresponding increase in tourism employment. Underemployment which can be considered a typical feature of the Egyptian labour market and certainly of tourism employment, offers one explanation. Another may be productivity changes particularly in 4- and 5- star hotels which may tend to reduce employment growth. The automation of kitchens and other secondary activities and the shift from serviced meals to self catering are some examples.

Table (11) ITAs, Tourism Capacity and Tourism Employment

Employment* (:,000)	Hotel Capacity	ITAs (:,000)	
210	93822	4796	1999
217	113611	5506	2000
217	120720	4646	2001
239	132109	5192	2002
260	136510	6045	2003
285	148039	8104	2004
315	170776	8608	2005
345	177613	9083	2006
380	190191	11091	2007
(..)	210800	12835	2008
8.1%	9.4%	11.9%	Growth Rate

* Employment data given for FY (1999/2000-2007/2008).

Source : Ministry of Economic Development. (MED)

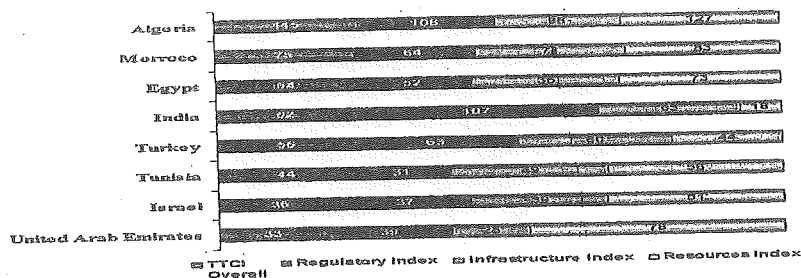


2- Descriptive of the Travel and Tourism Competitiveness Index (TTCI)

It used the most recent Travel and Tourism Competitiveness Index (TTCI) that evaluates the ranking of the competitive performance of 133 countries and suggests the way forward for decision makers wishing to improve their travel and tourism sectors. The TTCI is composed of 14 pillars grouped into three groups, mainly, the travel and tourism regulatory framework, business environment and infrastructure and Human, cultural and natural resources. Each pillar is also composed of several indicator variables. For example, pillar one- policy rules and regulations- includes eight components; namely, prevalence of foreign ownership, property rights, business impact of rules on FDI, visa requirement, openness of bilateral air service agreements, transparency of government policy making, time required to start a business and cost to start a business. TTCI provides a comprehensive tool for measuring the factors and policies that make the Travel and Tourism sector attractive. TTCI is quite highly correlated with both the number of tourists actually traveling to various countries and the annual income generated from Travel and Tourism, with few notable outliers². This supports the idea that the TTCI captures factors that are important for developing the Travel and Tourism (TandT) industry. The model relies heavily on the different pillars constituting the TTCI that can help policy makers identify the weak and strong areas related to the competitiveness of the sector and hence identify the necessary needed adjustments. Analyzing the impact of the GFC can be established through exploring the dynamic behavioral relationships between the main variables used in computing TTCI. Figure 7 demonstrates the competitive position of Egypt relative to its competitors in the MENA region. Egypt occupies the 64th position among 133 countries according to the overall TTCI. In terms of the regulatory index, it is ranked 52nd and in the business environment and infrastructure index it is ranked 65th. Finally according to the resources index it is ranked 73rd. (WEF, 200)



Figure (8)



Source: WEF (2009).

Literature and the Model

There are two main groups of literature on the tourism industry. The first is international trade, which according to Eilat and Einav (2004) is a starting point because tourism is part of international trade. The second group is the empirical tourism literature. The general starting point for theoretical and empirical literature on international trade is the Heckscher-Ohlin theory or pattern. It states that international trade depends on the relative factor endowments. This is important when factors of production are capital and labour as this makes it less necessary for tourism analysis. In the case of tourism, the most important factors of production are unique to the specific country and not easy to measure, evaluate or compute. Eilat and Einav (2004) gave examples of the Eiffel Tower, Pyramids and nice beaches.

An investigation of the variables that have an impact on the demand for tourism is very important when dealing with this sector of the economy. The variables that have an effect on tourism will be discussed later in this paper. There are two groups in the empirical literature of tourism. The first group comprises of studies that use time series and cointegration econometric techniques to investigate the determinants of tourism demand and forecast the future tourist arrivals (among others: Katafono and Gounder, 2004; Narajan, 2005; Durbarry, 2002; Divisekera, 2003; Cheung and Law, 2001). The second group involves studies that deal with determinants of tourism using panel data econometric techniques (such as Sakr et al., 2009, Eilat and Einav, 2004; Luzzi and



Flückiger, 2003; Walsh, 1997; Roselló et al. 2005; Naude and Saayman, 2004). This current study falls within the second group of the empirical tourism literature.

Sakr estimated a demand function for Egypt based on Giacomelli (2006a) using panel data utilizing price and non price determinants such as income, cost of living, nominal exchange rate, transport cost, a measure of infrastructure and other factors that determine the arrivals of tourists

(Crouch, 1995; Eugenio, 2002; Hellstrom, 2002). Following Eilat and Einav (2004) three-stage estimation procedure, the estimates of the tourism demand function for Egypt revealed that the rule of law tended to be the most important factor that positively affects tourism demand. The price of tourism is the most significant factor that negatively impacts tourist arrivals.

Another study by Sakr and Masoud (2003) regarding the determinants of volatility of tourism sector in Egypt found out that not all shocks exert the same effect on the tourism sector or last for the same period of time based on estimation of tourism demand function for Egypt for the period (1986-2001).

Tourist's responsiveness to different events is examined. Both tourism arrivals and receipts have a positive relation with the GDP in the source countries, as well as with the depreciation in the real effective exchange rate. The most important factor determining the demand for tourism in Egypt is the extent of international competitiveness as expressed by the real effective exchange rate. The study highlighted the importance of developing international competitiveness to broaden Egypt's tourism market. The study also revealed that the fall in tourism flows and receipts in the aftermath of domestic shocks were more severe compared to the corresponding fall resulting from external crises.

Methodology

The Methodology used in this paper to simulate and model international tourism demand to Egypt, began with activities such as collection of primary information about (Annual Arrivals, Tourism Revenue, Hotel Rooms Capacity, etc.) Analyze the relationship between different variables problems affecting the tourism sector in Egypt , implementation of the causal diagram, operating assumptions and model scenarios, the simulation model using Vensim ® software.



Finally, the interpretation of the results of the simulation. System Dynamics is a Methodology for modeling, simulation and analysis of complex systems, originally made by Jay Forrester, to understand how systems change over time .(Badajoz, July 2009) System Dynamics is the best approach to address the complexity and dynamic nature of the problem, as it accounts for feedback loops, time delays between causes and consequences and nonlinear relationships between variables (Sterman 2000).

The model contains twelve sub-models, eight stocks, eleven balancing and five reinforcing feedback loops. The model has also elaborated a comprehensive analysis in order to derive a Tourism Competitive Index (TCI).

The dynamic structure of the model

This section focuses on presenting the dynamic structure of the model. The main sub-models are as follows

Annual Arrivals -

Tourism Revenue-

The Global Financial and economic crisis GFEC-

Employment-

-Hotel Rooms Capacity

-Tourism Competitive Index (TCI).

Security and Safety Index

Price competitiveness advantages

Air Transport Infrastructure Index-

Ground Transport Infrastructure Index-

Health care Index-

-Tourism Infrastructure Index



Annual Arrivals

This sub-model depicts the flow of international tourists to Egypt each year and illustrates its determinants. As Egypt receives a significant share from international tourists, Egypt annual arrivals (an inflow to the Egyptian stock and at the same time outflow of worldwide stock) are defined as the Egyptian market share of the worldwide annual arrivals. The Egyptian market share is mainly determined by the current value of the Egyptian TTCI. A stock of world tourists represents all international tourists worldwide. This stock is increased by the accumulation of newly attracted tourists according to a growth rate that assumed to be a constant (without any external effects that can hit the tourism sector). Tourist inter-travel period is the average duration between two consecutive visits for a tourist. Moreover a tourist who visits Egypt this year is assumed to have a probability to revisit it after a specific period (re-potential period), a tourist who visits Egypt in 2009 will be back again to the world tourists stock and has a probability to visit Egypt again in 2011. Recent tourists that visit Egypt are accumulated in a stock which increases by the inflow of Egypt annual arrivals and decreases by re-potential rate.

- The Global Financial and economic crisis GFEC

Since October 2007, the global economy has experienced substantial economic turmoil, occasioned by the failure of the international financial system to fulfill its role of efficient credit allocation. The impact of this failure has negatively affected developed and emerging economies alike, and governments have responded with haste to shore up both national and international financial markets as a means of reenergizing struggling economies. The Global Financial and economic crisis hit the tourism sector in Egypt has also has a significant effect through different variables. This sub-model describes these variables affected by the crisis. GFEC is expected to have effect on world tourism growth and hence the Egyptian tourism growth as well. Average nights per tourist, average tourism expenditure and inter-travel period are also among the key variables that will be affected by GFEC. To incorporate these effects we use four multiplier values that are multiplied by the reference values. The analysis of the effects of GFEC on the mentioned variables will be presented in the next section.

-Travel and Tourism Competitive Index (TTCI).



The TCII is the first tourism index dedicated exclusively for the measurement of tourism performance. It is decomposed of 14 important pillars. It focused on the most important six pillars only out of fourteen that we expect they will change during the study period (2008 to 2015). Those basic components include price competitiveness index, tourism infrastructure index, security index, health index, air infrastructure index and ground infrastructure index. The remaining 8 pillars are treated within the model as constants values. A simple average formula of the 14 variables (pillars) is used to calculate the Egyptian competitiveness index. (WEF, 2009)

The research philosophy behind utilizing the different components of TPCI is mainly driven by a large number of empirical studies that have investigated the determinants of a country's competitiveness and attractiveness to tourists (Giacomelli, 2006a). TPCI proves to be suitable for measuring and capturing most of the determinants of tourism and travel Competitiveness.

Tourism Infrastructure Index

One of the key building blocks in the tourism sector dynamics is tourism infrastructure that represents the supply side of the model. This sub-model describes tourism infrastructure index and its determinants that incorporate the effect of occupancy ratio, the effect of car rental companies and the effect of ATMs availability and accessibility. We use the elasticity concept to model the effect of occupancy ratio on the infrastructure index. Occupancy ratio represents the balance between supply (i.e. room capacity) and demand (i.e. tourism nights) through room capacity and tourism nights, respectively. Increasing the demand of tourism nights requires a higher occupancy ratio that is considered a good indicator. On the other hand, increasing capacity given a fixed demand is a bad indicator due to the over-supply without any consideration to demand.

Air Transport Infrastructure Index

This sub-model is inspired by the generic model described by Sterman (Sterman 2000) where the stock values exhibits a goal seeking behavior to reduce the gap between its value and a certain desired value. Air index represents one of the main policy intervention points in the model. First in the base case scenario (flags are off) the air index is constant. However during policy analysis (flags are on), the air index is assumed to exhibit a goal seeking



behavior in order to reduce the gap between its value and the desired value which is set by the policy maker. The enhancement of the index can be achieved via different ways for example enhancing quality of existing airports, building new airports, spreading out international air transport network and increasing number of operating airlines, etc.

Ground Transport Infrastructure Index

Similar to the air index we use the same sub-model for ground infrastructure index except that the enhancement of the index will be through increasing number of roads, spreading out ground infrastructure network and enhancing quality of roads, bridges.

- **Health Care Index**

Health care is one of the critical factors upon which tourists make their decisions for visiting a specific destination. The same sub-model structure used in air and ground indexes will be customized to represent the dynamics of the health care index structure. The change will be through intervention from both public and private sector by increasing physician density per population, facilitating access to improved drinking water and increasing available beds for people.

- **Security and Safety index**

One of the crucial factors contributing to the drivers for tourism arrivals is the security and safety index. Tourists' personal safety is a function of the ability to travel without threats, therefore, stimulating inbound tourism is determined by tourists confidence in Egypt as a safe and secure tourist destination. The index is simply decomposed of four indexes capturing the effect of crime, terrorism, road accidents and police services.

- **Price Competitiveness**

This sub-model describes how the Tourism and Travel price been constructed. Price competitiveness is determined through five main sub-indexes, which are ticket taxes and airport charges, purchasing power parity, taxation, fuel price levels and hotel prices. Average formula of the five sub-indexes is used to calculate price index. It is worth mentioning that occupancy ratio is one of the determinants of hotel price. Hotel price is being determined through a ratio between supply (i.e. room capacity) and demand (i.e. tourism nights). The



relevance of measures of price competitiveness is being recognized in studies of tourism industry.

Demand studies go beyond using the nominal exchange rate as a crude measure of price competitiveness and beyond the use of real exchange rates (nominal rates adjusted for changes in the general level of prices). Thus studies have attempted to determine exchange rate adjusted for changes in the prices that identifies tourist bundles of goods and services (Martin and Witt, 1987). However, these do not go beyond trends and do not determine whether a country is more or less competitive than another at a particular point of time. To measure the level, as opposed to simply trends in tourism prices, cross-sectional studies using the prices paid by tourists in different countries are needed.

Annual Tourism Revenues

Tourism receipt is one of the control variables used to judge the improvement or recession of the tourism industry. Only foreign tourism nights are used to calculate Egypt annual tourism revenues. Foreign tourism nights are the multiplication of the average nights a tourist spent in Egypt and the number of international tourists that visit Egypt annually. Egypt annual tourism revenues are then calculated by multiplying foreign tourism nights by average tourist expenditure per day.

Tourism Employment

The labor force for the tourism sector is aggregated into a single stock. Tourism employment is capturing the labor dynamics surrounding the tourism sector that is increased by the hiring rate and decreased by the attrition rate. Because of the seasonality of the tourism industry, the hotel managers are willing to eliminate surplus 'temporary' employees when not needed and that decreases the labor stock by the firing rate (negative inflow). The attrition rate (outflow) is used to represent voluntary quits and normal retirements and is modeled as a first-order process in which employees remain with the tourism industry for the average duration of employment. Desired labor is the number of employees hotel managers are willing to employ to service the expected number of tourists. Labor stock is adjusted by the extra employees needed. Hotel managers can't adjust current labor to the desired one without a delay to announce vacancies, interviews and select appropriate candidates in order to fill these positions, etc.



We directly used annual arrivals instead of delayed annual arrivals because the employment sector usually responds quickly to any changes or fluctuations in the tourism sector .

Egypt's Hotel Rooms Supply Chain

This sub-model is based on a generic supply chain model representing the hotels capacities in Egypt. Like all countries Egypt hotels and tourism villages comprise a set of processes that are order fulfillment requesting new hotel rooms and capacity adjusting. The full hotel rooms supply chain is simulated by the following sub-model starting with ordering a new hotel rooms from suppliers that are requested by tourists

The sub-model contains two stocks. The first stock represents the supply chain governing the provision of hotel rooms for the tourism sector and comprised of the stock of unfulfilled orders for new hotel rooms, i.e. orders that have been placed with manufactures but not yet received. This stock is increased by the accumulation of yet more orders for rooms (inflow), represented by the start construction rate and depleted inter-temporally by an outflow (finished rooms ready for service). Note that the MAX function is used for both start and finish construction rate to ensure the nonnegative values for them .

Another stock constructs of all Egypt's hotel rooms is used to represent the capacity of them. This stock is growing by receiving new rooms from suppliers that are ready for service (outflow from construction stock and inflow to capacity stock) and diminishing by depreciated rooms that no longer available for use. This stock is also assumed to depreciate at a constant rate and the depreciation rate is then calculated by dividing the number of rooms by the average lifetime of room

Results of Using Scenarios

The impact of the GFC on the Egyptian tourism sector can be analyzed using the system dynamics model that basically help improving the decision maker understanding of the dynamics within the tourism sector and simulating the likely repercussions and impacts of the GFC on the tourism sector. Different simulation runs can be implemented to test the behavior of the key tourism indicators and interactions of the variables within the suggested framework for achieving the objective of this study. Demonstrated four different policy scenarios for the decision maker to carry out the simulation for the impact of



GFC on tourism sector, these four scenarios are base scenario, pessimistic scenario; mitigate scenario and optimistic scenario as illustrated (Figure 9). The policy scenarios depend mainly on the extreme values of two major uncertainties that are the severity of the impact of GFC from one hand and the change of the enabling environment from the other hand. Below we will briefly explain each scenario then we will perform comparative analysis of all scenarios. Each scenario is introduced through a movement along the scale for the severity of GFC owing to the change in world growth rate of tourism arrivals, tourist spending in Egypt, average tourist nights and finally the change in inter-travel period.

Figure 9: Scenario Cross Analysis

**High Impact Of
Crisis**

**S2:
Pessimistic**

**S3:
Mitigate**

**No change in
Enabling
Environment**

**Enhance
Enabling
Environment**

**S1:
Base**

**S4:
Optimistic**



Low Impact Of Crisis

Source: Pharr, (2009)

Base Scenario

In the base scenario it assume, other things being equal, the same current policies will remain in the future. Low impact and no significant change will take place. The main purpose of this run is to evaluate model behavior and outputs under the normal state during the study period (2008-2015).

Pessimistic Scenario

In contrast to the base scenario, the pessimistic scenario, presumes a severe impact of the GFEC owing to a sharp decline in the world growth rate of international tourists, the average tourist expenditure, the average length of stay and a significant increase in the inter-travel period of international tourists. Therefore, further investment or refreshment will be enhanced through intervening in one or more areas of tourism competitiveness sub-indexes to mitigate the effect of GFEC.

Mitigate Scenario

A third scenario can be envisaged in the wake of GFEC. The severe impact of GFC would induce the Government of Egypt (GOE) to intervene with a set of stimulating policies that could enhance the enabling environment for the tourism and travel sector. The GOE efforts may include encouraging and accelerating the investment in specific areas that could result in a major improvement in the sector. The system dynamics model introduced the simulation of such policies by turning on the flags for air infrastructure index, ground infrastructure index as well as the health care index.

Optimistic Scenario

Finally, an optimistic scenario representing a low impact of the GFC associated with a significant intervention from the GOE will be considered. In this regard,



the optimistic scenario presumes a small decline in the world growth rate of international tourists, a small decrease in the average tourist spending, a small decrease in the average length of days spent in Egypt and a slight increase in the inter-travel period of international tourists.

Figure 10: Decision Maker's Simulation for Scenario Crisis effects

Global Financial Crisis Controls

Effect on World Growth Rate <input type="text"/>	Default <input type="checkbox"/> Switch Off Effect on World Growth <input type="checkbox"/> Switch Off Effect on Tourist Expenditure <input type="checkbox"/> Switch Off Effect on Tourist Nights <input type="checkbox"/> Switch Off Effect on Inter-Travel Period
Effect on Tourist Expenditure <input type="text"/>	
Effect on Tourist Nights <input type="text"/>	
Effect on Intertravel Period <input type="text"/>	

Source: Generated from the model.

Comparative Analysis of the Scenarios for the Global Financial Crisis

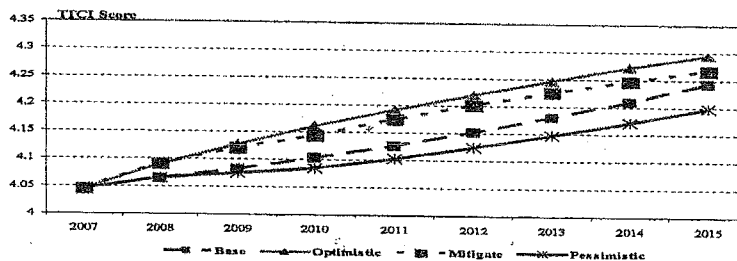
Based on the model described in the previous section, we simulate the four main scenarios illustrated above to explore different types of tourism policies and conditions for the period 2008-2014 that is sufficient for the adjustments to take place given the dynamics of the tourism sector. Four main variables have been run under the four scenarios and the results are shown in (Figures 7, 8, 9 and 10). The four variables

TTCI, market share, annual arrivals and employment. Below we will describe the behavior of each of them under the four scenarios. According to the optimistic scenario, the travel and tourism competitive position of the Egyptian tourism sector can be dramatically increased by 15 positions to occupy a ranking like 49th instead of 64th out of 133 countries. This position will make the tourism sector in Egypt more competitive than other competitors in the Middle



East and North Africa (MENA) region such as Turkey (56) and Jordan (54). This is mainly achieved as a matter of changing the basic blocks of the tourism dynamics to restore the enabling environment for the development of the tourism sector. While the pessimistic scenario can contribute to shifting Egypt ranking by 8 places to occupy the 56th position as well as Turkey's. The mitigate scenario leads the base scenario in TTCI (Figure 11) based on our assumption that the improvement will target and enhance the Egyptian competitiveness index during a period of five years

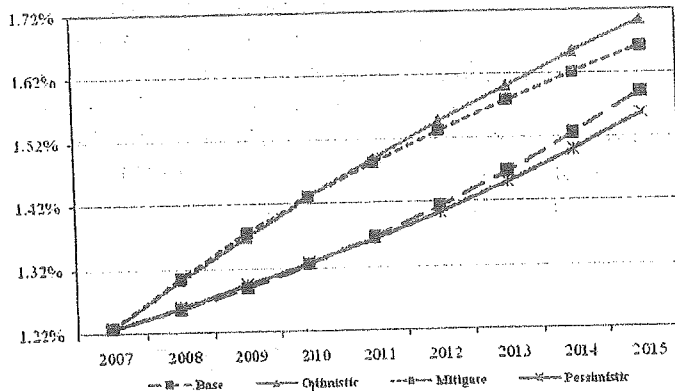
Figure11: TTCI



Source: Generated from the model.

With regard to the Egyptian market share of international tourists (Figure 12), the results reveal that market share will reach an unprecedented level by 2015 according to the optimistic scenario (1.7%)¹. As per our assumption that the market share is determined using the Egyptian TTCI, the behavior of the market share follows the behavior of the TTCI. It is worth noting that enhancing enabling environment in the tourism sector will increase the distance between the optimistic scenario (Low GFC effect) or the mitigate scenario (Significant GFC effect) and the base scenario (No significant change) .

Figure 12: Egyptian Market Share



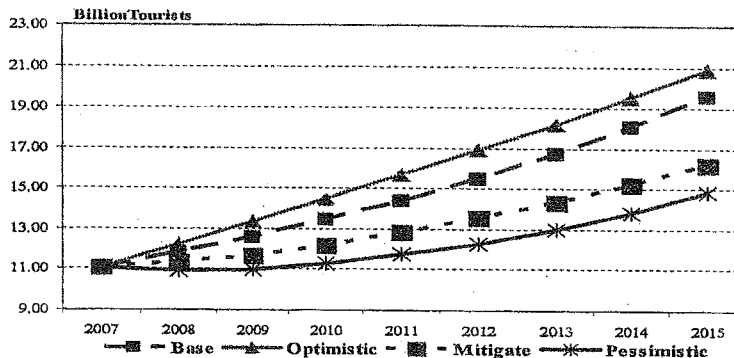
Source: Generated from the model.

Compared to the market share, tourism annual arrivals are behaving in a different across scenarios. However, Egypt achieve a higher market share values in the mitigate scenario (Figure 12) than the base one; annual arrivals values record a lower values in the mitigate scenario than the base (Figure 14). This is due to the effect of GFC that hit the arrivals of tourists worldwide and hence the Egyptian tourist arrivals as well. The

highest average growth rate of tourism arrivals will be 8.2 percent compared with 4.8 percent in the mitigate scenario and 3.8 percent in the pessimistic scenario. The corresponding increase in the level of tourist arrivals from 11.1 in the base year to reach 16.9 in 2012 and 20.8 million tourists by 2015, while the lowest level of tourist arrivals will be achieved in the pessimistic scenario to account for 14.8 million in the same period. The mitigate scenario lies in between but still less than the level achieved by 2012 compared with the optimistic scenario. Because of external shocks that hit tourism sectors; annual arrivals behavior in the mitigate scenario lags the base scenario of the same period Figure 13.

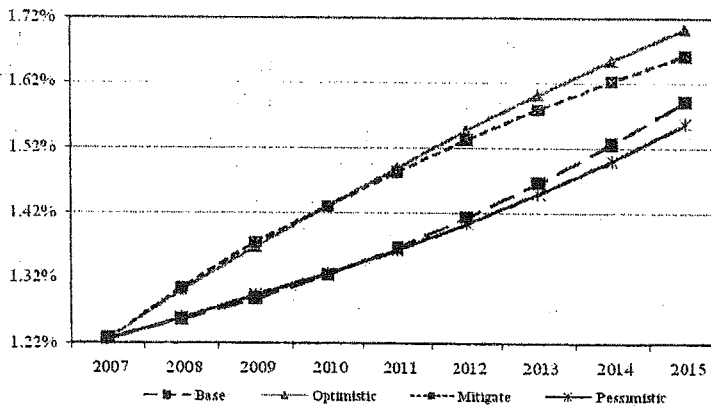


Figure 13: Annual Arrivals



Source: Generated from the model.

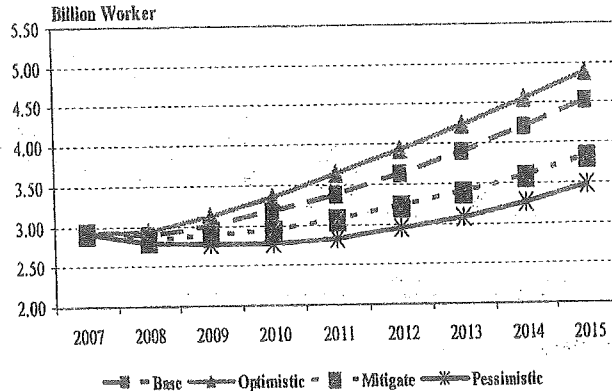
Figure 14:



Source: Generated from the model.



Figure 15: Employment



Source: Generated from the model.

Tourism employment will achieve rapid growth on average to reach 6.7 percent during the medium term 2008-2015 according to the optimistic scenario (Fig. 9). While the average growth rate of employment is modest in the mitigate scenario. The least average growth rate could be achieved under the pessimistic scenario. It is worth noting that employment follows arrivals behavior (Figures 8,9) because tourism labor is much correlated to the number of tourists. Finally and following the previous cycle, increasing the Egyptian TTCl would be a matter of interest in order to enhance the tourism sector, attract more tourists, increase market share and increase the labor force.

Conclusion

The paper has used a system dynamics model to modeling the effect of GFEC on the Egyptian Tourism sector.

The power of System Dynamics is that different scenarios can be obtained using different input value for tourist expenditure annual arrivals ,etc. This can usually be achieved in a regression study. Hence the model developed has the potential to assist (a) teaching and learning strategies in economics (b) professional decision making in Egypt within the tourism sector. In this traditional econometric methods and powerful systems methodologies are



complementary rather than competitive tools of analysis (Moscardini *et al.*, 1998).

Constructing a system dynamics model to achieve the objective of this study has many advantages. First, regarding the competitive position of the Egyptian tourism sector, the formal model and simulation runs performed on it enhances our mental model about the interactions of both supply and demand factors driving the competitive position of the tourism sector. Second, the model can be used to assess the impacts of external shocks such as GFEC as well as domestic shocks (terrorism attacks and political instability), though the former is the focus of the paper and the latter is out of scope of this study. Third, the model provide the decision maker with a policy framework that is capable of introducing specific interventions in the areas that are crucial to the tourism sector corresponding to the different levels of the severity of the shock (GFEC).

At the same time the decision maker can easily monitor the behavior of the key indicator variables in the tourism sector and design targeted policies to influence the specific needs and areas. Fourth, the results of the simulation exercise are useful in suggesting recovery strategies to enhance the sustainability of the tourism sector as well as its contribution to the growth and development of the economy. Finally, the model captures both demand and supply determinants of tourism and travel that gives more space for policy makers to choose which area that could be enhanced in the planning for the future of the sector development. Among the areas that can be influenced is the safety and security index where sustainable efforts should be directed towards image building and restoring confidence in Egypt as a tourist destination. Another promising area is to improve tourist health security and tourism infrastructure for both air and ground facilities. Should Egypt strive for a significant market share of world tourism it has to exert much effort to improve the score and ranking of TTCI among competitors especially in the Middle East and North Africa (MENA) region. As a possible future research the model can be expanded to distinguish between domestic and foreign inbound tourism. Moreover the model can be designed to distinguish between both domestic and external shocks. Furthermore the model can be extended to include the competitors of Egypt as well as the countries of origin of tourists.



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المخلص العربي

واجه الاقتصاد العالمي واحد من أصعب الأزمات في تاريخه الحديث، إذ يتعين عليه أن يتحمل في آن واحد التداخيات المتنامية للأزمة المالية العالمية، والتي سرعان ما تحولت إلى أزمة اقتصادية كان لها ارتداداتها السلبية على مختلف دول العالم وقطاعاته الاقتصادية، ومن هذه القطاعات القطاع السياحي .

وتهدف الدراسة إلى التعرف على التأثير المحتمل للأزمة على قطاع السياحة في مصر من الفترة من ٢٠٠٨ إلى ٢٠١٥، ويتناول التحليل في هذه الدراسة فحص الهيكل الداخلي لهذا القطاع ودراسة العلاقة بين المتغيرات المؤثرة عليه بناء على مؤشر تنافسية السياحة والسفر لعام ٢٠٠٩، كما تستعرض الدراسة أربعة سيناريوهات مختلفة تبين الآثار المحتملة للتغيرات في القطاع السياحي جراء تلك الأزمة . وتختتم الدراسة ببعض التوصيات والمقترحات لمواجهة التأثيرات السلبية المحتملة للأزمة المالية على القطاع السياحي المصري .

