

**ARAB REPUBLIC OF EGYPT**

**EGYPT AND THE GLOBAL ECONOMIC CRISIS: A PRELIMINARY  
ASSESSMENT OF MACROECONOMIC IMPACT AND RESPONSE**

**(In Two Volumes)  
Volume II: Annexes**

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Social and Economic Development Group  
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The World Bank



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## **Currency Equivalents**

(Exchange Rate as of June 9, 2009)

Currency Unit	=	Egyptian Pound (LE)
LE 1	=	0.1779
US\$ 1	=	5.6203

## **Fiscal Year**

July 1- June 30

VICE PRESIDENT:	DANIELA GRESSANI
COUNTRY DIRECTOR:	EMMANUEL MBI
SECTOR DIRECTOR:	RITVA REINIKKA
SECTOR MANAGER:	FARRUKH IQBAL
TASK TEAM LEADER:	SANTIAGO HERRERA
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## ANNEX 1: THE GLOBAL CRISIS AND THE EGYPTIAN ECONOMY

*Prepared by Edgardo Favaro, Leonardo Garrido and Tihomir Stucka (PRMED)*

### Introduction

The global financial crisis will affect Egypt through a fall in external demand for goods and services and lower capital inflows; however, the economy is relatively isolated from the international financial turmoil.

Lower external demand will imply lower: prices of oil and gas, tourism activity, Suez Canal services, remittances and international capital inflows. The likely effects of these shocks are:

- *A slowdown in the rate of growth of GDP to 3-4 percent in 2009.* The impact of the fall in external prices and demand will be direct and significant in Suez Canal services (-8.0 percent), hotel and restaurants (-4.0 percent), and manufactured exports. In addition, a possible fall in remittances and a fall in capital inflows will reduce the rate of growth of domestic consumption and investment. Oil and natural gas are price inelastic and governed by medium-term contracts hence the impact of the fall in external demand on output may be less severe; however, the effects on income generated in these sectors and on fiscal revenue will be important. Manufactured exports and tourism are labor intensive and price elastic; in these activities the impact of a drop in prices on output may be large, especially if wages measured in international currency are sticky.
- *A slowdown in the rate of growth of employment to 2.3 percent.* Employment grew at a 4.6 percent annual rate between 1998 and 2006 (more than the population, 2 percent). This rate of growth of employment will slow considerably as a result of slower economic growth and of uncertainty about the course of the world economy. Data from labor surveys shows that only one-fifth of the working age population is in the formal sector of the economy (of which three-fourths are employed in the public sector). This may be ground to argue that nominal wage rigidity may only be an important policy problem for the public sector and for budget balance considerations; however, wages and salaries in the informal sector may also be slow to adjust in the context of current uncertainty.
- *A shift from surplus to deficit on the current account of the balance of payments and pressure toward a real depreciation of the exchange rate.* The immediate impact of the financial crisis was felt mostly in August to December 2008 as international portfolio investors reduced their positions in Egyptian stocks and bonds and the government reduced its position on foreign exchange assets. There will be a second round effect as lower exports of goods and services, possible lower private remittances, lower foreign direct investment, and greater uncertainty result in slower growth in 2008/09 and 2009/10.
- *An increase in the fiscal deficit* caused by: a drop in revenue from oil, natural gas and subsequently of transfers from the Economic Institutions (Suez Canal oil and gas) to the budget; augmented government spending; smaller proceeds from seigniorage, and higher real cost of the public debt (as inflation decelerates).

Even so, the slowdown of the Egyptian economy will be less severe than that projected in countries suffering financial system disruptions (for instance, several countries in Eastern Europe) or countries suffering deep recession in their labor intensive export oriented sector (for instance, several countries in East Asia).

The consequences of the international slowdown should be thought of against the background of major strides towards modernization of the Egyptian economy achieved during the past fifteen years. The Egyptian economy made remarkable progress in the recent past, economic policy has slowly but steadily moved in the direction of developing a market economy and improvements in productivity have been steady. The slowdown of the global economy will affect growth but the effect will be transitory; the most likely scenario is that Egypt will recover much faster than the world economy.

This paper discusses the effects of the global economic slowdown and financial crisis on Egypt's economy. The first section characterizes the performance of the economy and the current account over 2005/06 to 2007/08 as a springboard to gauge the possible response of the economy in 2008/09 and 2009/2010 as external conditions worsen (this is done in section two). The third section discusses short- and medium-term prospects. The paper includes five appendices on: export analysis and export diversification (appendix 1); a simple model of the Egyptian economy (appendix 2); real effective exchange rate (appendix 3); tourism (appendix 4); and growth potential (appendix 5).

### **The economy in 2005/06 to 2007/08.**

In 2005/06 to 2007/8 there was an increase in the rate of economic growth, a surplus in the balance of payments, and an increase in the rate of inflation.

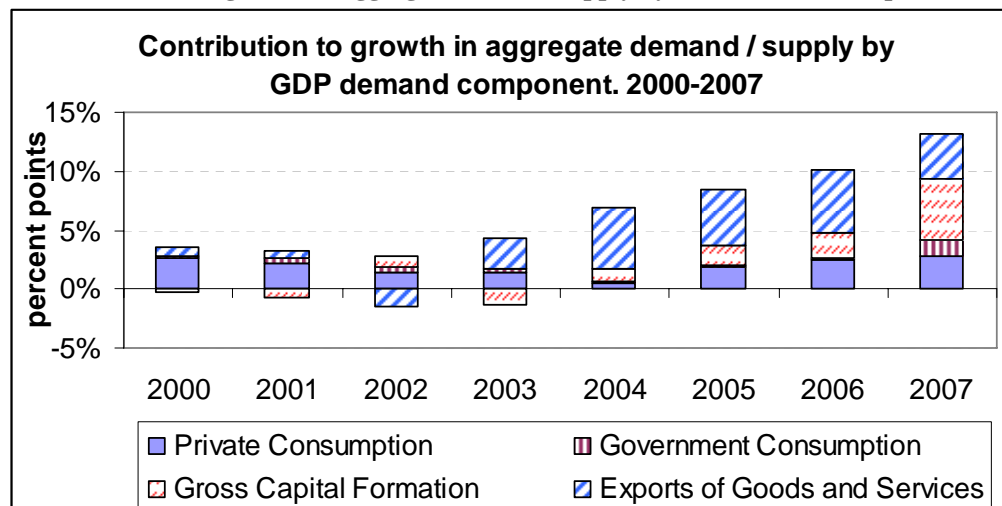
### **Economic growth**

Real output growth increased from an average of 3.8 percent in 2001/02-2003/2004 to an average of 7.0 percent in 2004/05-2006/07. Exports and imports grew faster than the GDP, continuing with the trend towards the opening of the economy initiated a decade before.

To explain the 3.2 percentage point increase in the rate of growth this section decomposes it by sources of aggregate demand, sector of origin (production side), and factor of origin (labor, capital and total factor productivity).

***Decomposition by sources of aggregate demand.*** The fastest growing components of aggregate demand between 2001/02-2003/04 and 2004/05-2006/07 were investment and exports (see Figure 1). Between those periods, the average rate of growth of investment increased by 3.5 percentage points and the rate of growth of exports increased by 5.0 percentage points.

**Figure 1: Contribution to growth in aggregate demand/supply by GDP demand component 2000-2007**



Source : Appendix 1.

The acceleration of the rate of economic growth was prompted by the increase in the price of oil and natural gas in the world market. Higher international prices drove exports upward and encouraged a major increase in investment (see Figure 1).

**Table 1: Investment by sector of destiny**

Sector	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Agriculture	6403.6	7559.0	7420.2	8043.8	7791.2	8072.5
Oil&Gas	10089.2	14715.7	24327.3	31325.9	30620.6	43497.7
Other Manufacturing.	5763.1	3979.9	5606.6	9434.3	38300.7	35348
Construction	1907.1	1089.2	1189.3	4135.6	2477.5	3314.6
Transportation	9801.5	12628.2	12550.2	15210.7	15621.1	24919
Communication	3177.2	4880.0	6310.2	7603.3	9621.4	13340.4
Restaurants & Hotels	2153.2	2501.9	2740.2	3245.4	3824.2	5301.9
Real state	7220.5	7358.4	9735.6	10609.5	11584.7	12998.2
Health & educ. & other serv.	14989.9	14548.5	14860.6	14835.8	20652.1	28796.3
Percentage	90.3	87.1	87.9	90.2	90.4	88.0
Total	68103.1	79556	96456.4	115741	155342	199535

Source: World Bank based on www.mop.gov.eg.

The investment boom was led by private sector investment and included most sectors of the economy (see Table 1). At current prices the rate of growth of private sector investment was 149 percent while the rate of growth of public sector investment was 40 percent.

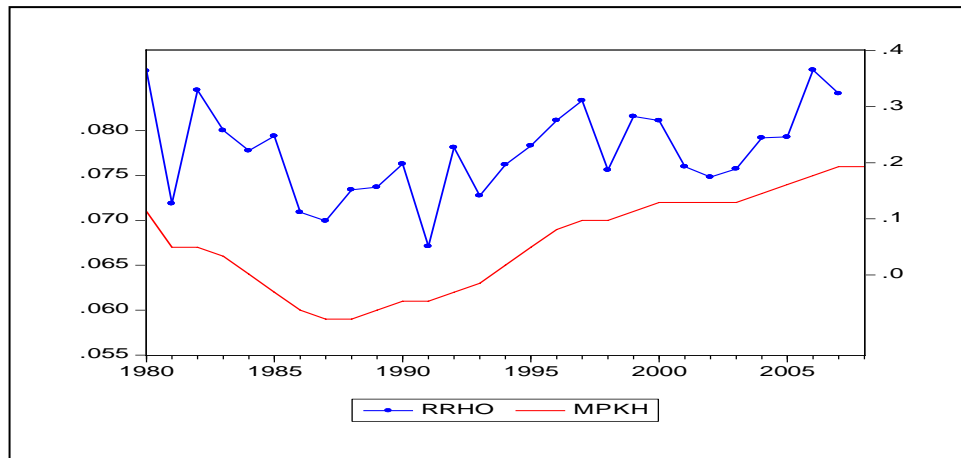


Second, at 441 percent Other Manufacturing had the fastest rate of growth of investment, followed by Construction (137 percent), Oil and Natural Gas (115.0 percent) and Communications (113.0 percent).<sup>1</sup>

Third, the fact that private investors perceived favorable investment opportunities is also consistent with the pattern of international capital flows in those years. For instance, foreign direct- and portfolio-investment increased from 7.5 percent of GDP in 2005/06 to 10.9 percent in 2006/07 and declined to 6 percent in 2007/2008. About three-fourths of net international capital flows were direct investments.

Private investment was encouraged by the increase in the rate of return on capital. The rate of return on capital (RORK) had been steadily increasing since the early 1990s, in parallel to reforms in the economy that increased productivity across most sectors. However, the RORK, approximated by the ratio between the rate of growth of GDP and the investment share in GDP (RRHO in Figure 2 illustrates this approximation),<sup>2</sup> or, alternatively, approximated by the ratio between the income accruing to capital in total GDP and the value of the capital stock (MPKH in Figure 2 presents this estimate),<sup>3</sup> had a spike after 2000.<sup>4</sup>

**Figure 2: Rate of Return on Capital**



Source: Authors

The rise of the RORK since the early 1990s, and especially in the 2000s is consistent with the conjecture that the expansion of the market economy and the contraction of the command and control economy increased productivity across most sectors of the economy. The transformations

<sup>1</sup> Price deflators to calculate rates of growth of investment across sectors were not available at the time of preparation of the note.

<sup>2</sup> The assumption underlying this calculation is that the underlying production function is of the AK type (see “Long Run Policy Analysis and Long Run Growth,” *Journal of Political Economy*, June 1991, 99: 500-521.

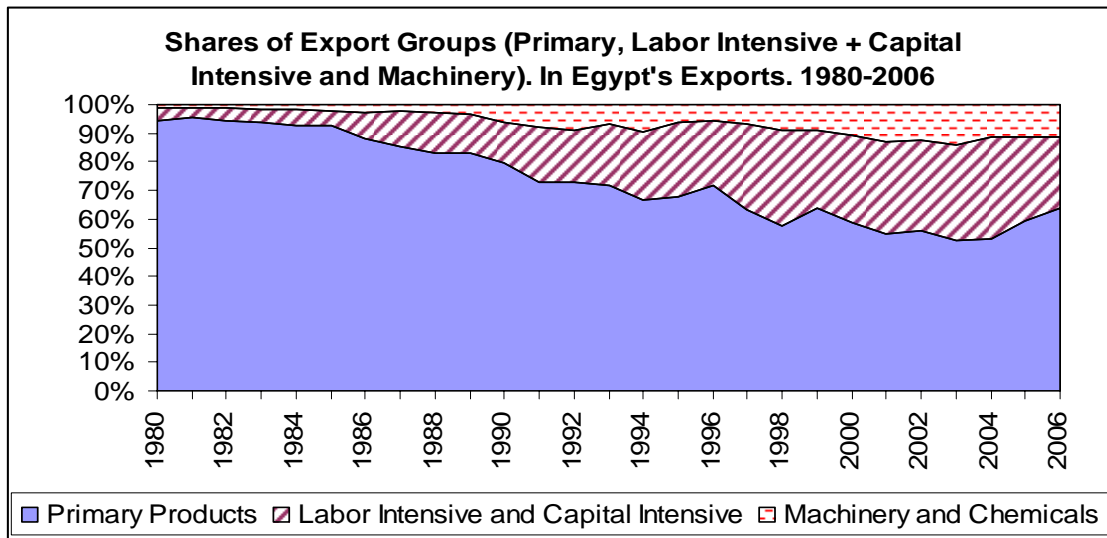
<sup>3</sup> The estimate is based on a Cobb-Douglas specification of the production function.

<sup>4</sup> The trend followed by each of these estimates is similar. However, the level of the estimates differs significantly. Some of the reasons explaining the differences are: (a) Data on income accruing to capital in the national accounts is weak. (b) To bypass this difficulty MPKH is based on assuming a constant unchanged capital share in GDP during all the period. (c) The value of the capital stock was calculated using the perpetual inventory method which is likely to lead to mistakes when there are major changes in relative prices of capital goods over the period (as was the case in Egypt).

are visible in the composition of investment across sectors (described above), in changes in the composition of exports, and in differences in growth trends across sectors of the economy.

Figure 3 illustrates a steady increase in export diversification especially since 1990s, notwithstanding a noticeable kink after 2003.<sup>5</sup> The share of primary- (oil and natural gas) in total exports fell steadily (until 2003) and the share of labor and capital intensive exports in total exports increased. The same conclusion is supported by the evolution of the shares of the main five exports in the total (see Figure 4), by comparing the rate of growth of Egypt's exports against that of countries such as Brazil, China, India, Mexico and South Africa, see Figure 5, and by more disaggregated analysis of the composition of exports.

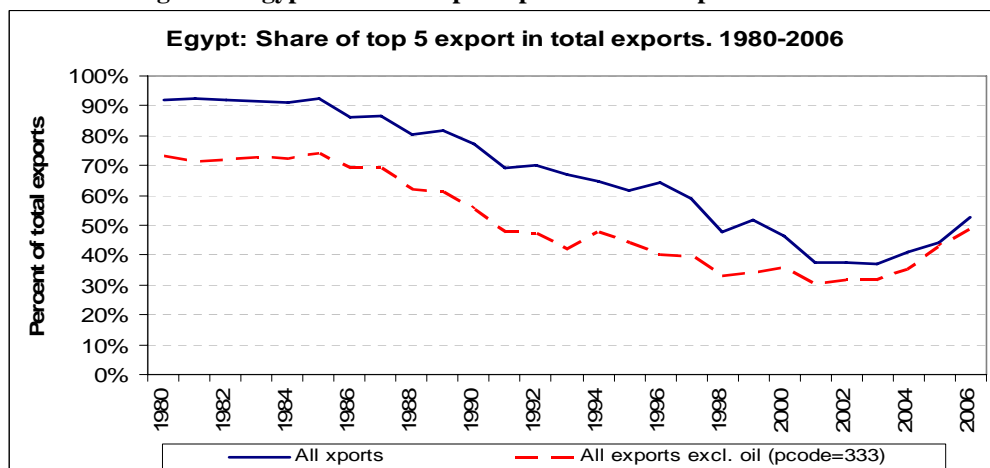
**Figure 3: Shares of Export Groups (Primary, Labor Intensive+Capital Intensive and Machinery)**



Note: Primary products include Animal Products, Cereals, Tropical Agriculture, Forest Products, Raw Materials and Petroleum and Petroleum Products.

Source: Authors.

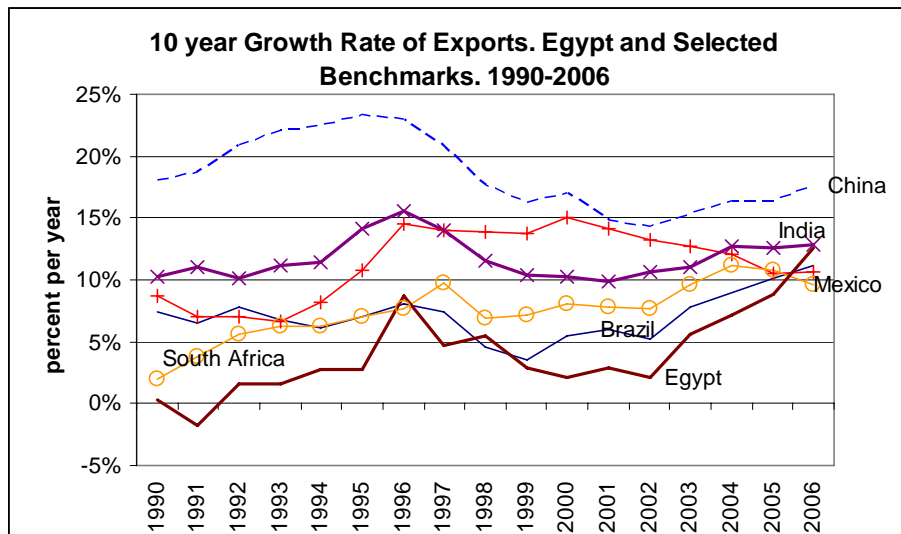
**Figure 4: Egypt: Share of top 5 export in totals exports 1980-2006**



Source: Authors: Appendix 1.

<sup>5</sup> Figure 3 follows the methodology used by Ed Leamer in E. Leamer, *Sources of Comparative Advantage: Theory and Evidence* (MIT Press, Cambridge MA, 1984).

**Figure 5: 10 year Growth Rate of Exports. Egypt and Selected Benchmarks 1990-2006**



Source: Authors: Appendix 1.

For instance, study of the state of export diversification (see Appendix 1) reveals that 21 groups of non-natural resource based items (based on the Standard International Trade Classification, SITC, at 3 digits), representing an 11 percent share in total exports emerged as products with Relative Comparative Advantages (RCA) in the world market during the 2000s<sup>6</sup>. Other 32 group of products with an export share of 34 percent maintained their already observed RCA during the period (see Appendix 1, Annex 2).<sup>7</sup>

The reason to underscore this aspect of Egypt's economic growth in recent years is that non-NRB based exports and sectors create jobs, NRB based activities, by and large do not. In the medium-term the broadening in the range of products the economy produces is particularly important to support an increase in the demand for employment that meets the rapidly increasing supply of labor.<sup>8</sup>

But how about the kink observed after 2002? Is that indication of a reversal in the transformation of the Egyptian economy? The reversal observed circa 2002 is mainly the result of a rapid increase in international prices of petroleum products and natural gas. This explanation is consistent with the rates of growth of primary versus all other exports.

At 181 percent the rate of growth of oil exports (average of 2004/05-2006/07 compared to 2001/02-2003/04) led all other exports of goods and services. However, notice that non-oil (at 74 percent) and service sector (at 69 percent) exports, mainly Suez Canal and tourism services, also increased

<sup>6</sup> RCA indicator for a product "j" exported by country "i" during period "t" ( $X_{i,j,t}$ ) is computed as the ratio of country's export of "j" to total exports of country "i", divided by the ratio of world (W) exports of "j" to world exports in year "t". If this ratio is higher than 1, it is said that the product has RCA in the world market.

$$RCA_{j,i,t} = \frac{X_{j,i,t}}{\sum_j X_{j,i,t}} \bigg/ \frac{X_{w,i,t}}{\sum_j X_{w,i,t}}$$

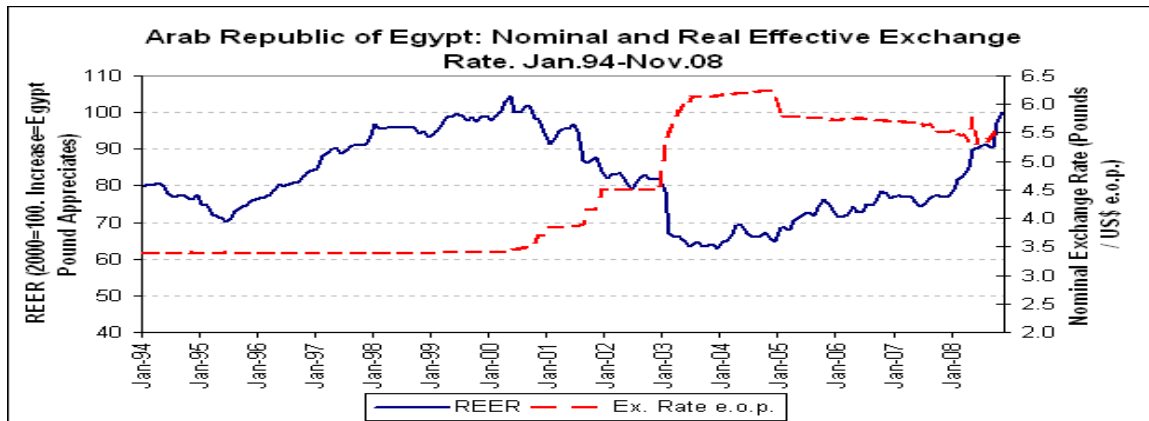
<sup>7</sup> See Hausmann, Hwang and Rodrik (2005)

<sup>8</sup> The annual rate of growth of growth of employment in 1996-2006, 4.6 percent, reflects the rapid increase in the labor force resulting from demographic trends

rapidly. The rapid expansion of oil and natural gas exports did not come at the expense of a decline in production in other capital and labor intensive goods and services. How was that possible?

Figure 6 and Table 2 provide evidence that the *abundance* of foreign exchange during the period did not have a significant negative impact on production of other tradable goods in the context of a high level of the real exchange rate (RER), following the depreciation of the nominal exchange rate in 2003, a Government of Egypt effort to built up foreign exchange reserves rather than spend the windfall to finance domestic expansionary programs and, a sustained, high, household savings rate (see current account surpluses .in 2003-2006).

**Figure 6: Nominal and Real Effective Exchange Rate Jan. 94-Nov. 08**



Source: Authors

**Table 2: Arab Republic of Egypt: Current Account, Investment and Savings 1990-2007**

year	Current Account (billions of US\$)	Current Account (percent of GDP)	Gross Capital Formation*	Gross National Savings** (percent of GDP)	Statistical discrepancy***
1990	2.33	5.4	28.8	21.4	12.8
1991	3.37	9.1	21.2	33.1	-2.9
1992	3.27	7.8	19.5	26.6	0.6
1993	2.54	5.4	19.8	27.3	-2.0
1994	0.03	0.1	20.6	21.9	-1.2
1995	-0.25	-0.4	20.1	21.8	-2.1
1996	-0.19	-0.3	18.1	18.1	-0.2
1997	-0.71	-0.9	17.6	17.3	-0.7
1998	-2.57	-3.0	21.5	18.6	-0.1
1999	-1.63	-1.8	21.6	20.1	-0.3
2000	-0.97	-1.0	19.6	18.7	-0.1
2001	-0.39	-0.4	18.3	18.4	-0.8
2002	0.62	0.7	18.3	20.0	-1.0
2003	3.74	4.5	16.9	19.5	1.9
2004	3.92	5.0	16.9	20.5	1.4
2005	2.10	2.3	18.0	21.3	-1.0
2006	2.64	2.5	18.7	22.0	-0.8
2007	1.40	1.1	21.9	24.3	-1.3

Source: World Bank, World Development Indicators. Current Account Balance 2007 data from Staff Report for the 2008 Article IV Consultation (Nov. 25th, 2008)

(\*) Gross Capital Formation = Gross Fixed Capital Formation + Change in Inventories.

(\*\*) Gross National Savings = GDP + Net Income from Abroad + Net Transfers from Abroad - Total Consumption.

(\*\*\*) Statistical Discrepancy = Current Account Balance - (Gross National Savings - Gross Capital Formation)

In summary, it is true that the rapid growth of oil and natural gas exports following the international price hike after 2002 partially reversed the trend towards higher diversification of the export base but it is also true that the reversal is not an indication of collapse of the production of other tradable goods. As a matter of fact the opposite occurred as shown by the analysis of growth by sector of origin.

**Growth by sector of origin.** Table 3 presents the rate of growth of GDP by sector of origin for the period 2001/02 to 2006/07. From 2001/02-2003/04 to 2004/05-2006/07 growth accelerated the most in Natural gas, Construction and Building and Services (wholesale and retail trade, financial and supporting services). Natural gas, Communications, Suez Canal Services, Restaurants and Hotels, Construction and Building and Suez Canal Services grew all above the GDP average rate.

**Table 3: GDP at Factor Cost-by Economic Sectors**  
**GDP at Factor Cost - by Economic Sectors**  
**(Growth Rates %)**

<b>SECTORS</b>	<b>2002/2003</b>	<b>2003/2004</b>	<b>2004/2005</b>	<b>2005/2006</b>	<b>2006/2007</b>
<b>Total GDP</b>	<b>3.1</b>	<b>4.2</b>	<b>4.6</b>	<b>6.9</b>	<b>7.1</b>
Agriculture, Irrigation & Fishery	2.8	3.4	3.3	3.2	3.7
Extractions	2.9	2.4	0.6	20.8	3.9
Oil	-0.4	-2.9	-4.9	-2.1	-0.7
Natural gas	8.7	10.8	8.2	50.2	7.5
Others	2.1	2.1	2.2	4.9	4.7
Manufacturing Industries	2.3	1.8	4.4	5.8	7.3
Oil refining	3.0	-6.7	3.6	2.2	-1.8
Others	2.3	2.2	4.5	5.9	7.6
Electricity	7.8	5.6	6.8	8.7	6.3
Water	5.0	4.9	4.0	6.0	7.2
Construction & Building	-4.8	4.2	5.0	14.0	15.8
Transportation & Storage	2.9	5.0	6.0	7.5	8.0
Communications	10.1	11.1	9.4	10.3	14.1
Suez Canal	23.1	11.3	16.0	9.4	14.9
Wholesale & Retail Trade	1.9	2.1	3.1	6.5	8.3
Financial Intermediaries & Supporting Services	2.3	3.0	4.1	5.3	7.1
Insurance	3.0	2.6	4.0	5.3	6.5
Social Solidarity	0.0	0.0	0.0	5.2	6.7
Restaurants & Hotels	18.8	46.2	21.1	4.3	13.2
Real Estate	0.8	3.9	3.0	3.8	4.3
Real Estate Ownership	0.1	1.7	2.0	3.7	4.1
Business Services	1.5	6.5	4.0	3.8	4.6
General Government	2.4	2.7	3.0	3.4	3.4
Education, Health & Personal activities	3.1	4.7	3.5	4.9	6.8
Education	5.9	5.7	5.6	4.5	5.4
Health	3.8	6.5	3.5	4.5	5.1
Others	0.9	2.2	2.3	5.5	9.4

Source : The Ministry of Planning.  
 .. Not available

Notice the contrast between the rapid growth of investment in Natural Gas and Oil Extraction sectors in Table 1 and the fall in the level of activity in oil extraction in Table 3. A current increase in investment indicates that future production will probably increase but is consistent also with a fall in current production; instead, in Natural Gas both investment and output are expanding rapidly and in phase.

This pattern also suggests that caution is necessary when projecting the response to prices of sectors characterized by large investment in physical infrastructure. Higher prices do not imply higher production if production takes place at full capacity; by the same token, lower demand does not necessarily imply lower production. The same observation is relevant for Suez Canal Services and

possibly for hotels that did not have a significant increase in investment over the past five years but had very high rates of economic growth.

Low economic growth and low growth of investment in agriculture is noticeable in the context of high prices of agricultural commodities during the period. The sluggish response of agricultural output may be indicative of constraints to expansion of the sector.

Growth in communications was supported by rapid technological change in the sector worldwide and policy changes in Egypt that facilitated the introduction of these technological improvements into Egypt. The importance of these changes for future economic growth prospects cannot be overstated. Worldwide the rate of growth of per capita GDP increased by 0.95 percentage points after 1995. About fifty percent of this increase is explained by productivity improvements.<sup>9</sup> The jump in the growth rate of the communications sector in Egypt is part of the same set. During the next decade these improvements in communications technology will spill over into productivity improvements across all sectors of the economy.<sup>10</sup>

By the end of the period growth of Construction and Building increased, which is likely to have been prompted by the aforementioned surge in average incomes and demographic changes. But the acceleration is mild against the background of growth in construction in G20- and several emerging market-economies.

**Growth accounting decomposition.** A *back-of-the-envelope* growth decomposition suggests that most of the increase in the rate of economic growth ( $g$ ) is explained by improvements in total factor productivity rather than by factor accumulation.

The rate of growth ( $g$ ) may be decomposed into the rates of growth of human capital  $g_L$  and physical capital  $g_K$  times their shares in GDP ( $\alpha_L$  and  $\alpha_K$  respectively), plus a residual ( $a$ ) usually identified with total factor productivity change.

$$g = a + \alpha_L g_L + \alpha_K g_K$$

In a three-year period (2005-2008) neither the factor shares, the rate of growth of human capital or the capital output ratio are likely to have changed significantly so:

$$\Delta g \approx \Delta a + \alpha_K \Delta g_K \text{ and since } \Delta g_K \approx (Y/K)\Delta(I/Y), \Delta g \approx \Delta a + \rho \Delta(I/Y)$$

$\Delta g = 3.2$ ;  $\Delta(I/Y) = 3.1$ . Even if the rate of return on capital  $\rho$  is as high as 20 percent productivity change explains about 80 percent of growth acceleration:

$$\Delta a \approx 3.2 - (0.2)(3.1) = 2.58 .$$

---

<sup>9</sup> “The contribution of capital input explained 0.38 percent of this increase, while productivity accounted for 0.46 percent. Labor input contributed a relatively modest 0.10 percent. The jump of information technology investment of 0.26 percent was the most important source of the increase in capital input. This can be traced to the stepped-up rate of decline in IT prices after 1995...” see Jorgenson, Dale W. and Khuong Vu (2005), *Scandinavian Journal of Economics* 107(4), 631-650.

<sup>10</sup> A jump in imports of hardware and expansion of the information technology software sector would be evidence in favor of this hypothesis.

According to this simplified calculation four-fifths of the increase in the rate of economic growth during the period is the result of total factor productivity change.

### **The Balance of Payments**

The surplus on the current account fell from US\$2.8 billion in 2001/02-2003/04 to US\$1.6 billion in 2004/05-2006/07.<sup>11</sup> This path was the result of a large increase in the deficit in net trade in goods and services (from US\$1.6 billion to US\$5.7 billion) and a large compensating increase in net transfers. In turn, the main source of the change in net transfers was private transfers which increased from an annual average of US\$3.5 in 2001/02-2003/04 to US\$6.5 billion in 2004/05-2006/07.

Seen from the savings-investment balance perspective the fall in the current account surplus was the result of an increase in the rate of investment, an increase in private savings (1.5 percentage points of GDP) and a fall in the public savings investment gap (1.4 percentage points of GDP).<sup>12</sup>

The balance on the capital account of the balance of payments shifted from an average deficit of US\$3.9 billion in 2001/02-2003/04 to a surplus of US\$3.7 billion in 2004/05-2006/07. The main sources of this change were foreign direct investment (FDI) and portfolio investments (which rose sharply from 7.5 percent of GDP in 2005/06 to 10.9 percent of GDP in 2006/07 and fell to 6 percent of GDP in 2007/08).

The combined effect of the current and capital accounts of the balance of payments was a rapid increase in the overall balance (from a small surplus of US\$0.2 billion in 2001/02-2003/04 to a large surplus of US\$4.6 billion in 2004/05-2006/07) and in foreign exchange reserves of the government and of the monetary authority.

### **Money, the exchange rate and government finances**

Same as in Brazil, Hungary, Pakistan, Ukraine, Vietnam and other emerging economies the inflow of foreign exchange resulted in a rapid increase in the gross international reserves of the Central Bank of Egypt (from US\$22.9 in 2005/06 to US\$33.8 billion in 2007/08).

The Central Bank of Egypt was reluctant to allow the Egyptian pound (LE) to appreciate nominally as a result of the capital inflow and the terms of trade windfall. The result was a rapid increase in monetization of the economy: 13.5 percent rate of growth of M2 in 2005/06, 17.1 percent in 2006/07 and 15.8 percent in 2007/08; a surge in the rate of inflation, from 7.2 percent in 2005/06 to 20.2 percent in 2007/08, and, especially in 2008 a significant real appreciation of the Egyptian pound (see Figure 6).

However, the impact of the foreign capital inflows on the rate of growth of credit to the private sector, on monetary aggregates and on inflation was much more moderate than in other emerging economies (for instance, Brazil, Eastern Europe or Pakistan).

In turn the fiscal impact of the unexpected increase in inflation was substantial. The unexpected increase in inflation implied a windfall in fiscal revenue. Figure 7 shows the ratio of the increase in the monetary base and GDP, and the ratio of the increase in money supply and GDP. In addition the unexpected increase in domestic inflation implied a fall in interest spending of the government, as interest rates did not incorporate the increase in inflation, and a depreciation of the real value of public debt.

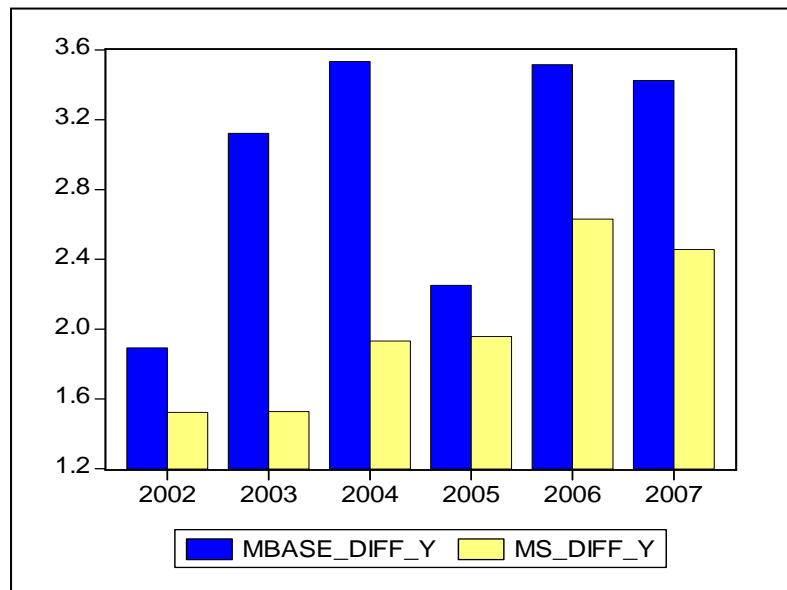
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<sup>11</sup> These are averages for each period. Estimates are based on information from Table (38) BOP-Current Account, Central Bank of Egypt.

<sup>12</sup> See Table 6, IMF, Arab Republic of Egypt: 2008 Article IV Consultation—Staff Report, January, 2009.

The result of all these changes was a fall in gross external debt as a percentage of GDP from 28.8 percent in 2005/06 to 20.9 percent in 2007/8. The short-term external debt fell likewise from 6.8 percent of the GDP in 2005/06 to 5.1 percent in 2007/08.<sup>13 14</sup>

**Figure 7: Seigniorage: Base Money vs. Money Supply (as defined by CBE)**



Note: Money supply is the sum of currency outside the banking system plus demand deposits in local currency  
Source: Authors.

### Summary of 2005/06 to 2007/08

- The period was dominated by factors external to Egypt's economy, namely favorable terms of trade, rapid growth of external demand and abundant international capital flows.
- However, domestic factors played an important role. Had the reforms adopted in the past decade not been enacted Egypt would not have benefitted from the expansion of external demand as it did.
- Similar to several emerging economies (Brazil, Eastern Europe, Pakistan Vietnam) Egypt attracted significant capital inflows.
- In contrast to Brazil, Bulgaria or Ukraine (to name a few) credit to the private sector did not grow explosively and there was no boom in domestic consumption.
- Rather than a consumption boom, Egypt had an investment-cum-exports boom.

<sup>13</sup> See IMF op. cit.

<sup>14</sup> Historically seigniorage has been a very important source of fiscal revenue in Egypt. There are two reasons for this: the Egyptian economy has a high level of monetization compared to other emerging economies (the median of the ratio M2 to the GDP during 1980-2007 was 80 percent and the minimum was 52 percent). Secondly, the median rate of inflation during 1980-2007 was 11.7 percent. However, in the past fifteen years the relevance of seigniorage as a source of government revenue declined as a result of government's efforts to build tax revenue collection capacity and to control public spending; in parallel, average inflation fell steadily since the early 1990s reaching a trough of 2.7 percent per annum in 2001-2002. It is against this background that the increase in average inflation in 2005-2008 stands out.



- The path of domestic investment and FDI indicate that perceptions about future returns on investment were favorable at the time. Whether these perceptions will be borne by results or not depends on the quality of the investment projects.
- In contrast to Brazil or Turkey Egyptian corporations did not leverage their operations through recourse to international financial credit.
- In principle the allocation of new investment across sectors does not suggest that new projects were driven by *irrational exuberance*.<sup>15</sup>

## **The global crisis and the Egyptian economy**

This section analyzes the impact of the global crisis on the Egyptian economy. It starts with a simplified, tractable description of the Egyptian economy that helps highlight the role of the RER in allocating resources between the non-NRB tradable and the non-tradable good sectors. Second, it briefs on the current state of the global. Finally, it presents quantitative projections. The impact of the adverse external shocks on the economy is analyzed through (a) the projected evolution of components of aggregate demand and (b) by sector of origin of the GDP. The section also provides (c) an estimate of the projected change in total employment.

### **A simple model of the Egyptian economy**

The Egyptian economy can be thought of as consisting of three sectors: the NRB sector (oil, natural gas), the non-NRB sector producer of tradable goods and a sector that produces non-tradable goods. Each of these sectors encompasses a great deal of diversity; however, for the purpose of this section it is useful to ignore these differences and consider each aggregate as a well defined and homogeneous sector.

The rationale underlying this stylized description is that non-NRB production of tradable goods and the production of non-tradable goods are substitutes in production in a one to two year term horizon. By substitutes we mean that these sectors compete for labor and capital so that expansion of one activity implies a tradeoff in terms of decline in production in the other activity. Instead, substitution between NRB based oil and gas and the other sectors is very limited within that time horizon; once capital investment is incurred the decision to extract oil or natural gas or not is de facto independent from the level of wages and the rental cost of capital.

To further simplify the discussion we aggregate the production of Suez Canal Services (SCS) and the work of Egyptians residing abroad to the NRB based sector. The reason for aggregating SCS to NRB is also technical characteristics of supply.<sup>16</sup> The reason to aggregate the activity of migrant workers to NRB and SCZ is that the decision to migrate or not depends on a stream of expected future earnings rather than on current real wages or current relative prices. The value of income generated by this *sector* is given by remittances.<sup>17</sup>

NRB activities, Suez Canal services and worker remittances provide most of the foreign exchange used to finance imports of goods and services. Changes in the external circumstances affecting the NRB sector, Suez Canal services or remittances amount to a shift of the budget constraint facing the Egyptian society.

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<sup>15</sup> See Shiller, Robert (2008, *Irrational Exuberance*, Princeton University Press, 2<sup>nd</sup> edition.

<sup>16</sup> Capital investment is irreversible; once it is incurred the decision to produce services is de facto independent from the level of wages and the rental cost of capital.

<sup>17</sup> See Appendix 2 for a more formal description of the economy.

The model helps isolate that the global crisis:

- Negatively affects the budget constraint facing the non-NRB tradable and non-tradable goods sectors. A fall in remittances and/or in the value of natural gas and oil exported and/or in Suez Canal lowers income and reduces consumption possibilities.
- Second, the effect of the shift of the budget constraint on consumption and production of non-NRB tradable goods and non-tradable goods is different if the income change is accompanied by a change in the relative price of tradable to non-tradable goods (the real exchange rate, RER)) compared to a counterfactual when there is no change in the RER. This distinction provides the rationale for developing, in what follows, a more in depth analysis of the response of the economy under two scenarios: one scenario assumes an unchanged RER the second scenario assumes a real depreciation of the exchange rate.
- Third, pressures towards a real depreciation of the exchange rate may be faced through changes in the nominal exchange rate or through domestic deflation under a fixed exchange rate.

### State of the global economy

According to IMF recent estimates global GDP will decline by 0.5 to 1 percent and growth in advanced economies will decline by 3-3.5 percent in 2009, the deepest global recession in the past fifty years (see Table 4). The expected decline in world trade is even more pronounced: the value of global trade fell at a 13 percent rate between November 2007 and November 2008. As of end of March 2009 the World Trade Organization forecasts that the volume of world trade will drop by 9 percent in 2009.

**Table 4: Contraction in World Growth in 2009**

<b>Hard times</b>			
The IMF's March 2009 projections show a contraction in world growth this year, followed by a small recovery. (percent change, unless otherwise noted)			
		<b>Proj.</b>	
	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>World output</b>	3.2	<b>-1.0 to -0.5</b>	<b>1.5 to 2.5</b>
Advanced economies	0.8	-3.5 to -3.0	0.0 to 0.5
United States	1.1	-2.6	0.2
Euro area	0.9	-3.2	0.1
Japan	-0.7	-5.8	-0.2
Emerging and developing economies	6.1	<b>1.5 to 2.5</b>	<b>3.5 to 4.5</b>

Source: IMF.

The global economic slowdown may be seen as a reversal of the favorable events of 2005/06-2007/08: international prices of oil and natural gas and prices and quantity of Suez Canal services demanded have fallen; demand for tourism services and manufactured exports have sharply diminished or collapsed; and worker's remittances and capital inflows have fallen. Contrary to other emerging economies, like Bulgaria, Brazil or Turkey, Egypt's relatively low external public and private debt makes it unlikely it may suffer from a brusque shift in foreign investor's sentiment.

While there are parallels between portfolio outflows in Egypt during October-December 2008 and those in Brazil during the same period there are also marked differences. In September-October 2008 Brazil's stock market fell 33 percent and the exchange rate depreciated by 31 percent despite central bank intervention in the spot and future foreign exchange markets. These phenomena were prompted by a steep increase in demand for US\$ caused by portfolio equity outflows, carry trade unwinding and corporate losses originated in exchange rate derivatives.<sup>18</sup> In contrast Egyptian public and private corporations did not borrow in US\$ to the extent that their pairs in Brazil did over 2006-2008 and therefore did not experience the same pressures to find alternative sources of credit as external funding dried up in the first-half of 2008/09.

### **Quantitative projections**

*Impact of the crisis on aggregate demand.* This part considers growth prospects based on projected behavior of components of aggregate demand. The two scenarios studied are identical as to (a) the change projected in exports, constant marginal propensity to consume and private investment share in GDP and (b) the projected fiscal stimulus; but different as to (c) the projected change in non-oil imports (they decline at a faster rate in scenario 2 as a result of changes in the RER).

Attention towards studying the impact of the crisis on exports and on investment is warranted given the fall in external demand and greater uncertainty about the state of the world economy. The scenarios incorporate analysis of the main government policy adopted in 2009, a fiscal stimulus package of about LE\$ 15 billion (about 10 percent of the sum of government consumption plus government investment).<sup>19</sup>

Table 5 describes the response of GDP under the two scenarios and Box 1 describes assumptions used in the calculation.

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<sup>18</sup> Several Brazilian large corporations experimented losses in foreign exchange options during Sept-Oct 2008. For instance, Aracruz, a large pulp paper maker, suffered losses of about US\$1.0 billion by holding forward contracts with an average price of R\$1.76 per dollar and average maturity of 12 months. Under the contracts Aracruz agreed to pay double the difference between the strike price and the exchange rate when it traded weaker than the strike price. As the real plunged against the US\$ the company's losses mounted.

<sup>19</sup> The relevant concept of government spending for the purpose of the exercise is government consumption of goods and services and government investment as defined in the national accounts. Total government spending as defined in the fiscal accounts would also include transfers such as interest payments and subsidies.

**Table 5: Growth Forecast (Based on aggregate demand scenarios)**

Concept	FY08	FY09 – scenario 1	FY09 – scenario 2
Household Consumption	711.0	730.2	760.8
Government Consumption	106.0	116.6	116.6
Private Investment	185.5	157.3	163.9
Public investment	39.5	43.5	43.5
Investment	225.0	200.8	200.8
Exports of oil	108.4	81.5	81.5
Exports non-oil	223.6	184.2	184.2
Tourism	54.4	35.2	35.2
Suez canal	26.2	23.3	23.3
Other	143.0	125.7	125.7
Exports total	332.0	265.7	265.7
Imports oil	66.5	38.1	38.1
Imports non-oil	299.5	246.8	241.9
Imports total	366.0	284.9	279.0
Net exports	-34.0	-19.2	-11.8
GDP	1008.0	1028.5	1071.5

Note: In billions of Egyptian pounds at constant prices of FY08

.Source: Authors

### Box 1: Two Aggregate Demand Scenarios

**Scenario 1** is built as follows. The starting point is GDP, household consumption, government consumption, private and public investment, exports and imports at market prices for FY08 as reported in <http://www.mop.gov.eg/English/Resources%20and%20uses.htm>. The composition of exports and imports is from Table 5 of the IMF Article IV.

**Non-oil exports** : Exports of Suez Canal Services are assumed to fall at an 11 percent rate –the same as the predicted fall in volume of world trade as reported in Table 1.1 of WEO, IMF of April 2009. Exports of other goods are assumed to fall at the same rate as imports of advanced economies (12.1 percent), same source. Exports of tourism are taken from Appendix 3 to this paper.

**Oil Exports and imports**: The IMF estimates that the value of exports of oil and gas will fall by 24.8 percent (IMF projections Table 5 Art IV). Imports of oil are assumed to fall at the same rate as exports of oil.

**Non-oil imports** are highly correlated with non-oil exports:  $\text{Log}(M) = 1.08 * \text{Log}(x)$ . We used a unitary elasticity.

**Private investment**: This section assumes the share of private investment in GDP falls to 15.3 percent of GDP (the level it had in 2005/06 before the boom).

**Public investment and government consumption**: Increase 10 percent, approximately the amount of the fiscal stimulus program (15.0 billion LE).

**Household consumption**: The marginal propensity to consume remains at 0.71, the level of 2007.

**Scenario 2** is identical to scenario 1 except for a real depreciation of the exchange rate of 10 percent. I assume the elasticity of non-oil imports vis-à-vis the real exchange rate is 0.2.<sup>20</sup> This affects non-oil imports and reduces the current account deficit. Private investment increases and household consumption increase due to the multiplier effect.

<sup>20</sup> The assumption of a 0.2 percent elasticity of non-oil imports to the real exchange rate is arbitrary and is made explicit so that the exercise can be modified if more detailed information is made available. The 10 percent depreciation of the real exchange rate is the result of rounding upwards the misalignment estimated under the Macroeconomic balance approach reported by the IMF (8.4 percent).

Economic growth falls to 2 percent in scenario 1 and to 6.3 percent in Scenario 2; the broad difference between the two estimates illustrates the high sensitivity of estimates based on stable spending multipliers.<sup>21</sup>

The non-NRB current account deficit falls from 3.4 percent in FY08 to 1.9 percent in Scenario 1 and 1.1 percent in Scenario 2. The difference between the two scenarios is the result of a change in the composition of tradable and non-tradable goods in the final private demand.

The total effect on the current account of the balance of payments is the sum of the non-NRB current account, the NRB current account and remittances.<sup>22</sup> The change in the NRB current account and in remittances is US\$2.9 billion, or 1.8 percent of the GDP of 2007/08.<sup>23</sup>

Under scenario 1 the loss in the NRB current account plus remittances is compensated by the gain (decline in deficit) in the non-NRB current account. Under scenario 2 the loss in the NRB plus remittances current account is fully compensated by the gain (decline in deficit) in the non-NRB current account.

Clearly there is room for a more expansionary policy financed via external savings. The alternative could be to finance a higher current account deficit via running down foreign exchange reserves. The question is: Does it make sense? The issue is discussed below under Prospects, Policies and Strategic Issues.

Notice that despite the sharp drop in the price of oil in the spot market the impact on the current account is small. Three reasons underlie this non-intuitive result: first, Egypt exports and imports oil, the net effect of a change in oil price is given by the fall in price times net exports of oil; second, the actual decline in the price of oil is probably lower than the decline in the spot market, the reason is that the commercial practice is to trade oil under medium-term contracts.

***Impact of the external shock on output by sector***<sup>24</sup>. Table 6 describes a forecast scenario by sector.<sup>25</sup>

Two sectors suffer the most from the fall in external demand: Suez Canal Services and Restaurants and Hotels. Suez Canal Services are projected to fall at a 8 percent rate, while Restaurant and Hotels Services are projected to fall at a 4 percent rate

Agriculture is forecasted to grow at a 3.2 percent rate, Manufacturing Industries are projected to grow at 3.7 percent, Retail and Wholesale Trade, as well as Brokerage and Subsidiary Activities are projected to grow at 4.0 percent, and Insurance and Social Insurance are projected to grow at 3.5 percent. Careful analysis of developments in these sectors is important to sharpen the overall estimate.

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<sup>21</sup> All growth projections are based on models assumed to remain stable in the context of external (to the model) shocks. When the external shocks are small the assumption of stable parameters is usually innocuous; however, when external shocks are large stable parameter models may yield very unreliable estimates. The recipe in this case is to analyze the qualitative predictions of simplified and more abstract models as we do in Appendix 2.

<sup>22</sup> The number of Egyptian workers in the Emirates, Qatar and Kuwait is expected to decline by about 30 percent in 2009. Remittances from the Gulf are expected to decline from their current level in 2007/08, US\$8.4 billion to the level of 2005/06, US\$ 5.0 billion (see Table 5, Art IV, IMF).

<sup>23</sup> The decline in the NRB current account and in remittances is the result of a fall in oil exports of US\$3.6, a fall in oil imports of US\$4.1 (this is a gain) (see Table 5, Art IV, IMF).

<sup>24</sup> This section was edited by Santiago Herrera and Maria Foumelis from the World Bank Cairo Office

<sup>25</sup> The sector shares in total output correspond to 2007/08, Table (2/3), published by the Ministry of Economic Development. The note aggregates several of the sectors.

Water is projected to grow at 6 percent, Electricity is projected to grow at 4.5 percent and Communications is projected to grow at 10 percent on grounds of a high income elasticity of demand and deregulation in telecommunications

Building and Construction are projected to grow at 10 percent. A more detailed analysis should break the sector in several subsectors; namely, construction associated with: (a) the tourism sector (that will fall abruptly), (b) investments in oil and natural gas (also expected to fall or remain stagnated); (c) household building industry (expected to grow as a result of steady increase in demand for housing).

Real State is projected to grow at 4 percent, Education, Health and Other Social Services and Government are projected to grow at a 5 percent rate.

Under these assumptions GDP will grow at 3.9 percent.

**Table 6: Growth Forecast (Based on sector performance)**

<b>Sector</b>	<b>Share</b>	<b>Rate of growth</b>	<b>Contribution</b>
Agriculture, Irrigation & Fishery	14.5%	3.2%	0.46%
Extractions	8.3%	6.0%	0.50%
Petroleum	3.4%		
Gas	4.7%		
Others	0.2%		
Manufacturing Industries	19.1%	3.7%	0.71%
Oil Refining	0.7%		
Others	18.5%		
Electricity	1.8%	4.5%	0.08%
Water	0.4%	6.0%	0.03%
Construction & Building	5.4%	10.0%	0.54%
Transportation & Storage	5.1%	6.0%	0.31%
Communication	2.5%	10.0%	0.25%
Suez Canal	4.0%	-8.0%	-0.32%
Wholesale & Retail Trade	11.6%	4.0%	0.47%
Brokerage & Subsidiary Activities	5.8%	4.0%	0.23%
Insurance & Social Insurance	2.5%	3.5%	0.09%
Restaurants & Hotels	4.1%	-4.0%	-0.16%
Real Estate Activities	3.4%	4.0%	0.14%
Leases	1.8%		
Business Services	1.6%		
General Government	8.5%	5.0%	0.43%
Education, Health & Personal Services	3.0%	5.0%	0.15%
<b>Total GDP</b>	<b>100.0%</b>		<b>3.9%</b>

Source: Authors.

**Impact of the external shock on employment by sector.** Table 7 describes an employment forecast scenario based on the growth forecast described in Table 6.

Employment in agriculture is projected to grow at 1.0 percent, the result of a forecasted rate of growth of GDP of 3.2 percent and a 0.32 elasticity of demand for labor --the employment share of agriculture is 27 percent.<sup>26</sup>

Employment in petrol and mining is projected to grow by 3.7 percent,<sup>27</sup> the result of a forecasted rate of growth of GDP of 6.0 percent and a 0.61 elasticity of demand for labor.

**Table 7: Employment Forecast(Based on Table 6)**

Sector	Share	Economic growth	Elasticity	Employment growth	Contribution
Agriculture, Irrigation & Fishery	0.270	0.032	0.32	0.010	0.003
<u>Extractions</u>	0.005	0.060	0.61	0.037	0.00019
a-Petroleum and gas	0.004				
b-others	0.002				
<u>Manufacturing industries</u>	0.132	0.037	0.61	0.023	0.003
a-Oil refining	0.002				
b-others	0.130				
Electricity	0.008	0.045	0.32	0.014	0.00011
Water	0.006	0.060	0.32	0.019	0.00012
Construction and building	0.079	0.100	0.53	0.053	0.004
Transportation and storage	0.040	0.060	0.48	0.029	0.001
Communication	0.008	0.100	0.32	0.032	0.00025
Suez Canal	0.001	-0.080	0.32	-0.026	-0.00002
Wholesale & Retail Trade	0.091	0.040	0.48	0.019	0.002
Subsidiary Activities & Brokerage	0.008	0.040	0.48	0.019	0.00015
Insurance and Social insurance	0.003	0.035	0.48	0.017	0.00006
Restaurants & Hotels	0.017	-0.040	0.61	-0.024	-0.00042
<u>Real Estate Activities</u>	0.033	0.040	0.58	0.023	0.001
a-Real Estate	0.014				
b-Other real estate activities and business services	0.019				
Government General	0.235	0.050	0.58	0.029	0.007
Education, Health & Personal Services	0.065	0.050	0.58	0.029	0.002
<b>Total</b>	<b>1.0</b>	<b>0.039</b>			<b>0.023</b>

Source: Authors

However, there is no reason for complacency: first, the effect of postponing or delaying investments in these sectors on the Construction and Building sector may be significant.<sup>28</sup> Secondly, while the natural gas and oil sectors have a very low share in total employment,

<sup>26</sup> Employment-output elasticities used in this section are average employment-elasticities for the value added in the sector during 1980/81-2004/05.

<sup>27</sup> To maintain consistency this section uses a 0.61 labor-output elasticity resulting from employment-value added changes in 1980/81-2004/05.

<sup>28</sup> According to the Ministry of Oil, as of the time of preparation of this note there were no cancellations of scheduled investment projects in the natural gas and oil sectors. A similar assessment was provided by the authorities in an interview with management of the Suez Canal Authority. However, it is likely that the global economic circumstances will delay implementation of new investment projects.

employment in the sector grew 114.5 percent between 2001/02 to 2006/07. Unquestionably the crisis will slow significantly the modernization of the sector.

Employment in manufacturing industries is projected to grow by 2.3 percent, the result of a projected rate of economic growth of 3.7 percent and an elasticity of demand for labor of 0.61.

Employment in Water is forecasted to grow at 1.9 percent, in Electricity is forecasted to grow at 1.4 percent, in Communications is forecasted to grow at 3.2 percent and in Suez Canal services is forecasted to fall at 2.6 percent, the result of a projected rate of economic growth of 6 percent in water, 4.5 percent in electricity and 10 percent in communications and a decline in growth of 8 percent in Suez Canal Services and a 0.32 elasticity of demand for labor.<sup>29</sup>

Employment in Trade and in Brokerage and Subsidiary Activities is projected to grow by 1.9 percent, in Transport is projected to grow by 2.9 percent, and in Insurance and Social Insurance is projected to grow at 1.7 percent on grounds of a projected rate of growth of 4.0 percent in Trade, and Brokerage and Social Activities, 6.0 percent in Transport, and 3.5 percent in Insurance and Social Insurance, and a 0.48 elasticity of demand for labor

Employment in Restaurants and Hotels is projected to fall at a 2.4 percent rate, the result of a 4 percent decline in GDP and a 0.61 elasticity of demand for labor in the sector.<sup>30</sup>

Employment in Building and Construction is forecasted to increase 5.3 percent, the result of a 10 percent rate of growth and a 0.53 elasticity of demand for labor.<sup>31</sup> Further analysis is necessary to separate the situation of the sub-sector oriented to support housing construction and public works (which are assumed to expand) and the situation of the sector supporting construction work in oil and natural gas and tourism (which are expected to remain stagnated or to contract).

Employment in Real State is forecasted to grow at 2.3 percent and in Education, health and other social services is forecasted to grow at 2.9 percent, the result of a 4 percent rate of growth of the GDP in Real State Activities, and 5 percent rate in Education, health and other social services and a 0.58 elasticity of demand for labor for both sectors.

Employment in the Government is projected to grow at a rate of 2.9 percent the result of a 5 percent rate of growth and of using the same elasticity of demand for labor as in other social services.<sup>32</sup>

Overall the rate of growth of employment is projected to be 2.3 percent, slightly below that observed in recent years. The estimate is slightly above what would be predicted by a back of the envelope calculation based on a 0.60 share of labor in total GDP.<sup>33</sup>

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<sup>29</sup> The elasticity of demand for labor in Suez Canal Services is likely to be smaller than 0.32 (the result of technical characteristics such as the low labor share in total cost and the history of labor management by the Suez Canal Authority that never shed labor during past downturns of the economy). Even so, the section uses the elasticity estimate available for water etc. so as to preserve consistency.

<sup>30</sup> At the time this note was prepared the authors did not have available an estimate of labor demand elasticity for the sector. To get around the obstacle the section uses a 0.61 elasticity estimate (the same as the manufacturing industry).

<sup>31</sup> The estimate seems low. Again the section keeps it to maintain consistency with the treatment of other sectors.

<sup>32</sup> The estimate is probably high against the background of 1.8 percent of employment growth in government during the past six years compared to 20 percent employment growth in the private sector.

<sup>33</sup> This is the labor share is suggested as a reasonable estimate by Gollin, Douglas, *Getting Income Shares Right*, Journal of Political Economy, No. 110, April 2002. Assuming the estimate is credible would impose a restriction on the elasticity of demand for labor in a residual sector.



## Prospects, Policies and Strategic Issues

### Prospects

*The GDP will significantly decelerate as a result of the fall in external demand and in capital inflows.* The rate of growth of the GDP will fall to 3-4 percent during 2009 but a mild recovery is feasible in 2010 even under weak external circumstances;<sup>34</sup> the rate of growth of employment is estimated to slow to about 2.3 percent in 2008/09.

*Most directly affected sectors are NRB or capital intensive.* With the exception of tourism and fledgling labor intensive manufactured export activities, the sectors directly affected by the global crisis are capital intensive (Suez Canal Services) and Tourism.

*This characteristic implies that the impact of the crisis on aggregate employment is smaller compared to East Asian countries,* where the crisis has resulted in virtual collapse of labor intensive manufacturing exports, and to several Eastern European countries, where credit disruption is severe and unemployment widespread. Labor earnings are buffered by the low labor share in value added in these activities; in contrast, profits and rents are expected to suffer disproportionately.

*However, the adverse external shock will have a very damaging impact on the modern private sector of the economy.* In that respect the impact of the crisis is large; it falls squarely in the activities which grew fast in recent years.

*From an employment perspective the sectors that require closer follow up are the Manufactured Industry and Building and Construction.*<sup>35</sup> The share of Manufactured Industry in GDP is 19.1 percent and in employment is 13.2 percent. In turn, the share of Building and Construction in GDP is 5.4 percent and in employment is 7.9 percent. Both sectors include a broad range of activities that are likely to go from the severely affected by the adverse external shock to the relatively unaffected; and from sunset to sunrise sub-sectors. More disaggregated analysis of these activities is important to anticipate avoidable problems.<sup>36</sup>

*The global crisis will imply a shift of the current account balance of about US\$2.9 billion, or about 1.9 percent of GDP at 2007 prices.* The shift from a surplus current account to a deficit will, most likely, be transitory, especially if a sustained effort is maintained to reduce the current negative public savings-investment balance.

### Policies

Against this background: What is the role of a fiscal stimulus program (FSP)? And what is the role of policies that affect the real exchange rate?

***Fiscal stimulus program.*** Most FSPs imply increasing government consumption of goods and services, government transfers and/or public investment so as to offset a fall in other components of aggregate demand. They are effective if they result in production of goods and services valuable to the consumer via employing labor and capital idle as a result of the recession. At the other extreme, FSPs may be ineffective if the increase in government spending results in an identical increase in imports, if they produce goods and services of zero value to the consumer and do not affect net employment or if they are not timely implemented.

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<sup>34</sup> See Favero, Carlo et. Al, (2009), *Egypt and the Crisis*, World Bank.

<sup>35</sup> Preliminary business surveys indicate that Building and Construction have been resilient to the crisis (see World Bank Rapid Assessment Survey).

<sup>36</sup> Further study along the lines of the World Bank Rapid Assessment Survey would be useful to this effect.

The spending component of Egypt's FSP consists of transfers to supplement local government budgets and new investment projects in water and sewerage. Against this background and the projections in Tables 5,6, and 7, the program may be successful regarding the Building and Construction sector but will have little traction in reducing unemployment in Hotel and Restaurants and in labor intensive manufactured exports. Direct unemployment transfers or minimum employment programs may be more effective to that end.

The non-spending part of the FSP consists of transitory exemptions of labor tax obligations in some activities (for instance hotels) and delays in implementing the phase out of the subsidy on oil and natural gas used in several industrial sectors. In the short term the direction of these changes is correct (even if they are totally wrong moves from a medium-term perspective). These programs may be as important or more than the spending programs but are more ad hoc, difficult to assess and imply high governance costs.

***Real exchange rate policy issues.*** Is the real exchange rate currently in equilibrium or overvalued? The usual empirical methods to address this question (for instance, those described in Box 2 of the IMF Art IV Consultation, Staff Report of January, 2009 and those included in the Appendix 3 of this paper) render a mixed picture. The *macroeconomic balance approach* (the second approach described in Box 2 of the aforementioned report) suggests that as of end 2007 there was an 8.9 percent overvaluation; however the *external sustainability* method (the third method reported) suggests a 4.3 percent overvaluation. The Art. IV and Appendix 3 indicate that the real exchange rate has been appreciating steadily since December 2005 (see Figure 6). Part of this appreciation may be interpreted as the result of an initial overshooting following the devaluation of the Egyptian Pound in 2004. Even so, the real appreciation, in 2007 and the first-half of calendar year 2008 was mostly caused by transitory increases in international capital inflows and in domestic inflation<sup>37</sup> and coincided with a period when external conditions considerably worsened.

The RER may be currently overvalued and, at the same time, above or at its medium-term equilibrium. The reason for this is largely external to Egypt, the fall in external demand and the collapse of international capital flows put pressure towards a real depreciation of the exchange rate. In the medium-term the current external conditions are an anomaly but in the short-term they are highly relevant for policy purposes.<sup>38</sup>

Two caveats are important: first, the estimates presented in the IMF Art. IV of January 2009 are point estimates; it would be useful to base policy conclusions also in information about confidence intervals around these point estimates; if the confidence interval is narrow the point estimate is more credible, if it is wide the point estimate is less credible.

This brings up the second point: the cost of mistakes is asymmetric. The consequence of maintaining a RER above equilibrium would be to expand the export sector at a faster pace than otherwise, run a current account surplus and accumulate foreign exchange assets above what would be necessary. But it is hard to argue that expanding Egypt's export sector at a faster pace would be wrong; and while accumulating foreign exchange reserves may be non-optimal at a certain juncture (for instance currently in China) Egypt is currently far from there.

Moreover, high foreign exchange reserves may help attract the foreign direct investment Egypt needs to accelerate the modernization of the economy and to buffer possible vulnerabilities associated with its geographical location. In turn, the cost of maintaining an overvalued exchange rate under current external circumstances is to risk a tight external financing situation.

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<sup>37</sup> In 2008 inflation accelerated above the country's main trading partners while the exchange rate remained stable until December.

<sup>38</sup> Appendix 3 on the real exchange rate gauges whether the real exchange rate in Egypt reflects long run factors such as differences in productivity levels.

The correction of the possible misalignment of the RER may occur also a result of domestic deflation. The experience of Egypt in the past and from several emerging market economies in the Americas (for instance Argentina, Brazil, Chile, Mexico, and Uruguay) suggests that deflationary adjustments are costly in terms of unemployment and usually fail. If external conditions were expected to be reversed in the short run, the cost of a transitory misalignment would be low; but if external conditions remain depressed for the next 18-24 months (as the World Economic Outlook of the IMF projects) the cost of not intervening in terms of unemployment will be high and the signal to private investors interested in developing the tradable good sector discouraging.

In the medium-term, the baseline rate of output growth is 5.5 percent;<sup>39</sup> even so, the actual rate may be significantly higher if Egypt meets the following three challenges: developing a labor intensive export sector, sustaining its domestic savings rate and improving the level of health and education of the labor force.

### **Strategic issues**

***Developing a labor intensive export sector.*** Making most of the population share the benefits of medium-term economic growth depends on continuous expansion of exports. Reforms in Natural Gas and Oil sectors have already had a major impact on investment and employment growth in these activities; but NRB sectors will not provide new jobs at the scale required to accommodate future rapid growth of the labor force. Meeting the challenge will depend on maintaining attractive conditions for investment in agriculture, labor intensive manufacturing, tourism and other services. A fledgling sector of labor intensive manufactured exports started to develop recently but it is still too small and will be hard hit by the global downturn.

Further development of the sector depends on maintaining an inviting environment for new investment. To this effect the role of the real exchange rate and of policies that affect its level and volatility cannot be overstated.

***Sustaining the savings rate.*** Meeting the challenge will also depend on maintaining a high domestic savings base. Household savings are currently adequate against the benchmark of per capita income; however, public savings are inadequate and a sustained effort is necessary to maintain, and increase, the savings base.

There is no magic solution to generate higher savings; even so, the impact on savings of each policy or institutional reform proposal can be assessed. Against this background government spending programs should be carefully scrutinized: they have a direct negative impact on savings and, in general, contribute to a real appreciation of the exchange rate.

***Health and education of the labor force.*** A sustained effort is required to continue improving the level of health and education of the labor force. A country with the level of income and sophistication of Egypt cannot tolerate illiteracy in new worker cohorts and should make a sustained effort at reducing adult illiteracy. The alternative is to widen the gap between educated Egyptians, integrated to the modern economy, and the rest of the society.

In the past fifteen years Egyptian governments have taken slow but steady steps towards strengthening the role of markets in the allocation of resources. These policy changes have yielded a high return in terms of growth and employment. Time is necessary to allow for new technology currently available in the international market to be incorporated by Egyptian businesses but modernization of the economy is visible and solid. Against this background the current slowdown should be thought of as a transitory rather than a permanent event.

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<sup>39</sup> See Appendix 5: Growth Potential.

## APPENDIX 1

### EXPORT ANALYSIS AND EXPORT DIVERSIFICATION

This appendix presents an overview of the export structure and behavior in recent years. It presents a set of indicators that allows for ascertaining the degree of export diversification registered by the Arab economy in recent years.

#### **Export Diversification:**

Product-year export value's figures used in Egypt's export diversification analysis have been obtained from the World Integrated Trade Solutions (WITS) – COMTRADE database<sup>40</sup>. WITS database contains information on commodity trade by countries and regions (maintained by U.N. Statistical Division UNSD), tariffs, para-tariffs and non tariffs (TRAINS, maintained by U.N. Conference on Trade and Development, UNCTAD) and the World Trade Organization data on tariffs and imports (IDB) plus trade commitments (CTS).

COMTRADE data comprises imports, exports and re-exports by countries and regions for available years, from 1980 onwards. Various classifications are available, including the International Standard Industrial classification (ISIC), the Harmonized System (HS) and the Standard International Trade Classification (SITC). This analysis uses SITC Revision 3 at 3 digit level, which yields the longest time series data for products and countries (from 1975 up to 2006). SITC most aggregated level (1 digit) includes 10 main "sections":

- 0 - Food and live animals
- 1 - Beverages and tobacco
- 2 - Crude materials, inedible, except fuels
- 3 - Mineral fuels, lubricants and related materials
- 4 - Animal and vegetable oils, fats and waxes
- 5 - Chemicals and related products, n.e.s.
- 6 - Manufactured goods classified chiefly by material
- 7 - Machinery and transport equipment
- 8 - Miscellaneous manufactured articles
- 9 - Commodities and transactions not classified elsewhere in the SITC

Sections are broken down into 68 divisions (See Annex 1). Divisions are, in turn, distributed in 237 groups. Groups are further distributed in 4 digit sub-groups, 5 digit subsidiary sub-headings and products. At 5 digit level there are over 3,800 products included.

The 3 digit level chosen for analytical purposes provides a balanced database, in terms of diversity of groups included, without being unnecessarily specific. For instance, the chosen database specifies exports of "Milk and cream and their products" (code 022) and "Cheese and curd" (code 024), more specific than the 2 digit "Dairy products and bird eggs" (code 02), but less than, for instance the "Milk and cream, concentrated or sweetened" (code 022.2) or "Blue veined cheese" (code 024.3).

For analytical purposes mirror data is used, this is, exports of a product from a country are calculated as the sum of imports of the rest of the world from the same product, coming from the analyzed country.

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<sup>40</sup> Information on WITS can be obtained at <http://wits.worldbank.org/witsweb/FAQ/Basics.aspx>

### Check up of Export Data:

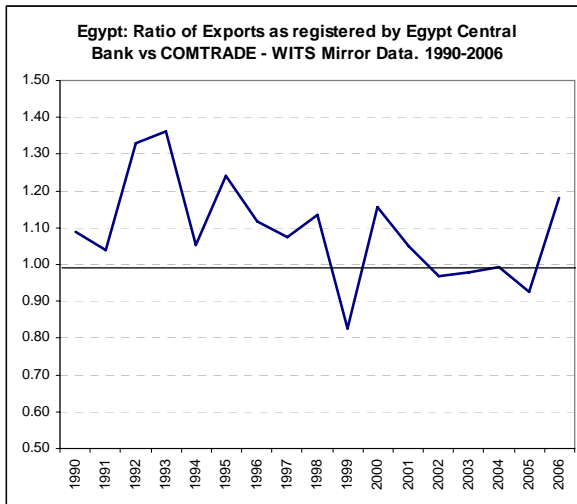
Table 1.1 and Figures 1.1 and 1.2 provide a comparison of export total values for Egypt, between 1990 and 2006, by year, using data from WITS-COMTRADE (mirror) versus that registered by Egypt's Central Bank. Data trends from both sources are comparable but not quite so. For the period 1990-2006, COMTRADE Export data for Egypt is, in average, 9 percent higher than that registered by Egypt Central Bank. The ratio of Exports from COMTRADE to those from Central Bank has a standard deviation of 12.7 percent of the mean. The correlation coefficient for the export values is 0.98 while that for annual growth rate of exports is 0.47.

**Table 1. 1: Egypt Ratio of Exports as registered by Egypt Central Bank vs COMTRADE –WITS Mirror Data. 1990-2006**

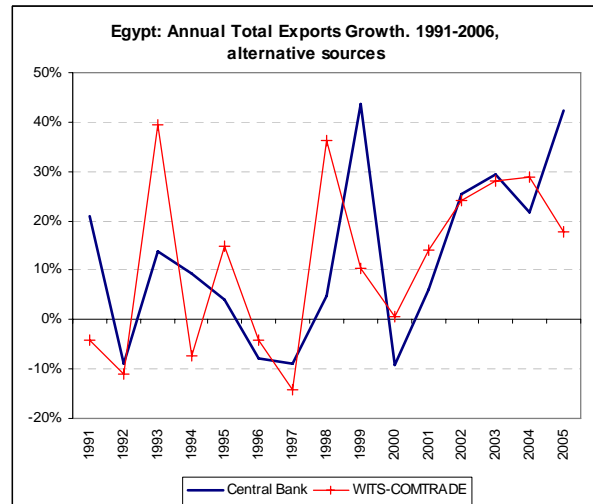
year	Export Value COMTRADE Mill US\$.	Export Values Egypt Central Bank. Mill US\$	Ratio xv
1990	4,626	4,250	1.09
1991	4,028	3,880	1.04
1992	4,960	3,725	1.33
1993	4,540	3,337	1.36
1994	5,215	4,957	1.05
1995	5,722	4,609	1.24
1996	5,964	5,345	1.12
1997	5,510	5,128	1.07
1998	5,040	4,445	1.13
1999	5,289	6,388	0.83
2000	8,190	7,078	1.16
2001	7,478	7,121	1.05
2002	7,953	8,205	0.97
2003	10,246	10,453	0.98
2004	13,737	13,833	0.99
2005	17,065	18,455	0.92
2006	26,036	22,018	1.18

Source: UN WITS- COMTRADE, Egypt Central Bank

**Figure 1. 2: Egypt Ratio of Exports as registered by Egypt Central Bank vs COMTRADE-WITS Mirror Data 1990-2006**



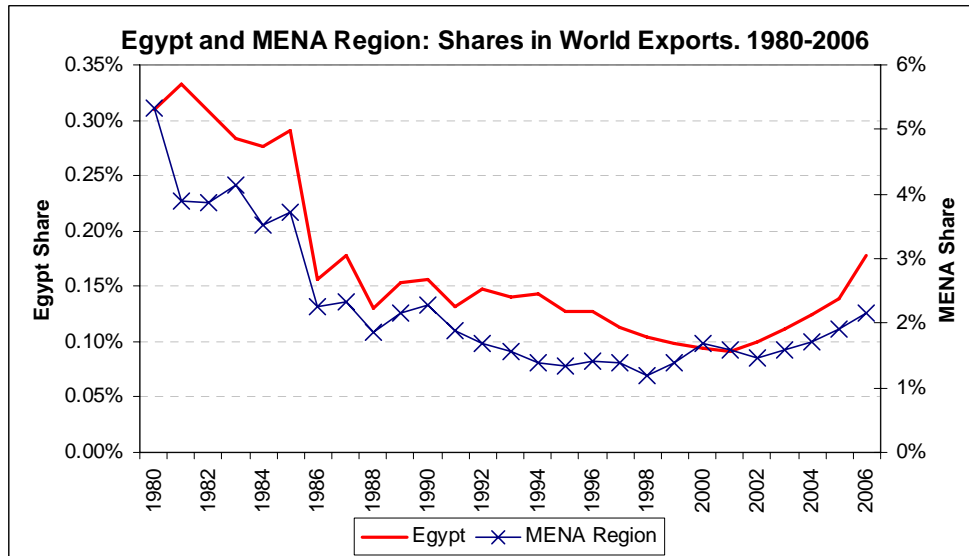
**Figure 1. 1: Egypt Annual Total Exports Growth.**



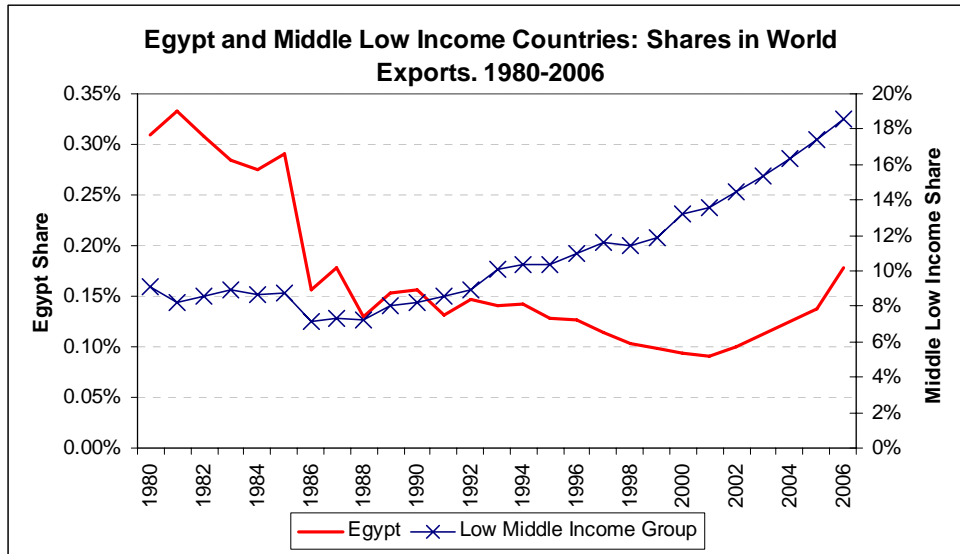
**Shares in World Exports**

Figure 1.3 shows Egypt keeping up with region’s growth of share in world exports. Egypt’s and MENA’s export share plunged up to the end of the 1990s but have firmly recouped ever since. However, it still trails the much higher pick up in exports observed in Egypt’s peer middle low income countries such as China and India (Figure 1.4 and 1.5).

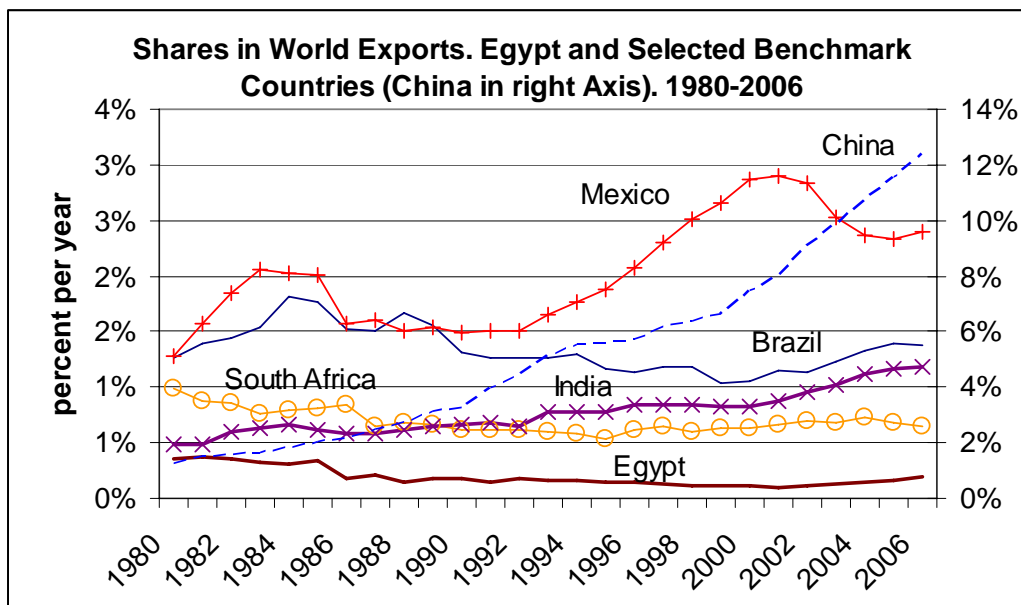
**Figure 1. 3: Egypt and MNA Region: Shares in World Export 1980-2006**



**Figure 1. 4: Egypt and Middle Low Income Countries: Shares in World Exports 1980-2006**



**Figure 1. 5: Shares in World Export-Egypt and Selected Benchmark Countries**



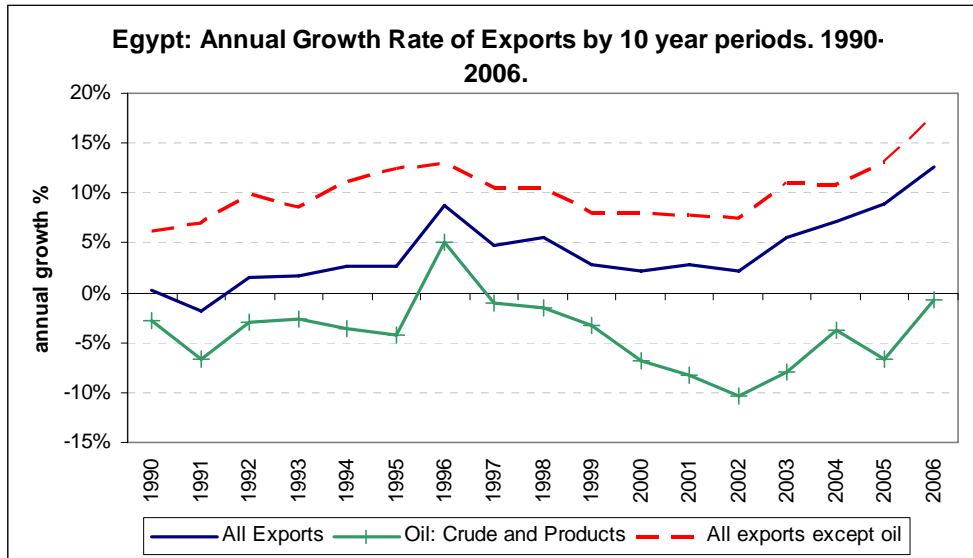
**Export Growth Rates**

Figure 1.6 shows Egypt’s total, oil and non-oil growth rate of exports (valued at current US\$) based on 10 year’s periods. This is, the growth rate of exports in year “t” is calculated as follows:

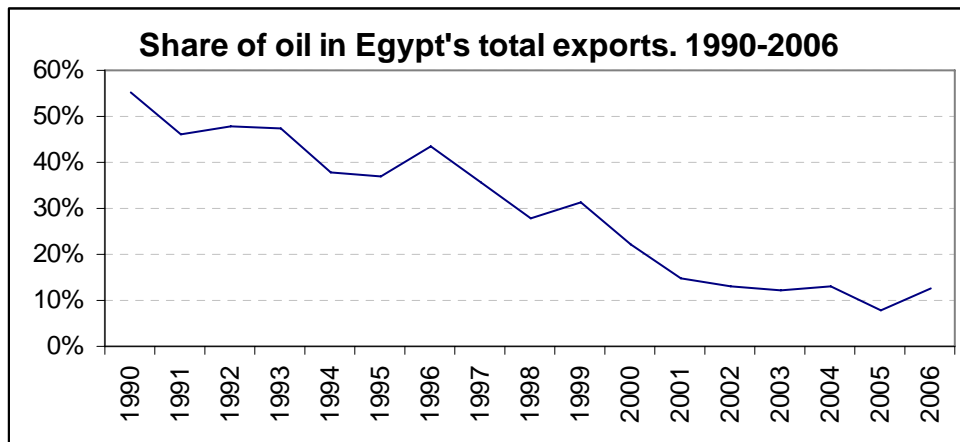
$$GE_t = \exp^{[\ln(X_t) - \ln(X_{t-10})]/n} - 1$$

Figures 1.6 and 1.7 point toward a reduced share of oil in Egypt’s total export basket, while Figure 1.8 indicates that Egypt’s exports in the 2000s tended to close the gap with selected benchmark economies.

**Figure 1. 6: Annual Growth Rate of Exports by 10 year periods**

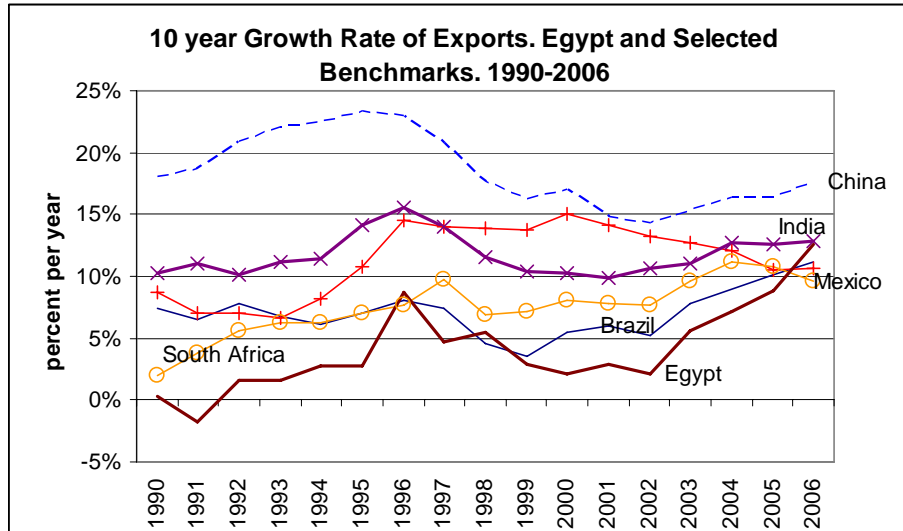


**Figure 1. 7: Share of Oil in Egypt's total exports**





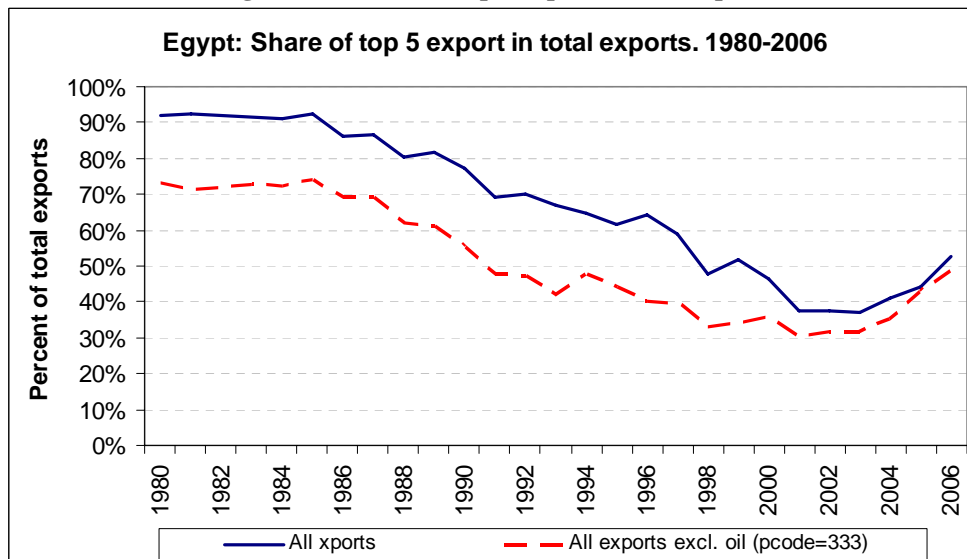
**Figure 1. 8: 10 Year Growth Rate of Exports. Egypt and Selected Benchmarks**



**Export Concentration in Top 5 Exported Products**

Egypt had observed an increasingly diversified export basket up to the beginnings of the 2000s, as judged by the share of top 5 products in the country’s total exports (figure 1.9). This indicator reversed since circa 2002, mainly as a result of increased exports of petroleum products and natural gas (Table 1.2)

**Figure 1. 9: Share of top 5 export in total exports**



**Table 1. 2: The top 5 non oil export ratio to total exports has increased up to 2006**

**Egypt: Top Five Exported Products, by selected years**

<b>Values of Exports (Thousands of US\$)</b>									
<b>SITC 2 3 Digit Classification</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Aircraft & associated equipment and	.	.	.	.	.	.	.	.	.
Aluminium	136,052	120,551	188,067	184,789	.	.	.	.	.
Cotton	262,362	280,302	182,914	.	204,288	263,551	.	.	.
Fertilizers,manufactured	.	.	.	.	.	252,348	.	.	.
Gas,natural and manufactured	.	.	.	.	.	.	.	1,852,492	4,297,748
Ingots and other primary forms,of i	.	.	.	.	.	.	529,985	514,127	718,648
Iron and steel bars,rods,angles,sha	.	.	.	.	.	.	312,480	.	.
Lime,cement,and fabricated construc	.	.	.	.	.	281,051	604,708	596,547	540,758
Petrol.oils,crude,& c.o.obtain.from	3,461,508	3,364,433	2,615,479	2,195,020	1,281,102	979,398	1,427,267	1,098,973	2,527,551
Petroleum products,refined	276,625	270,546	403,197	676,417	797,217	1,238,461	1,629,434	2,056,149	2,597,874
Textile yarn	104,198	131,984	257,023	345,796	200,284	.	.	.	.
Under garments,knitted or crocheted	.	.	.	.	223,640	.	.	.	.
Vegetab.,fresh,chilled,frozen/pres.	.	.	.	246,165	.	.	.	.	.
<b>Value of Exports Top 5 products</b>	<b>4,240,744</b>	<b>4,167,815</b>	<b>3,646,680</b>	<b>3,648,187</b>	<b>2,706,530</b>	<b>3,014,810</b>	<b>4,503,874</b>	<b>6,118,288</b>	<b>10,682,579</b>
<b>Value of Total Exports in Year</b>	<b>4,620,279</b>	<b>4,513,284</b>	<b>4,733,440</b>	<b>5,906,382</b>	<b>5,827,725</b>	<b>8,105,107</b>	<b>11,018,546</b>	<b>13,792,413</b>	<b>20,328,138</b>
<b>Share Value of top 5 products in total</b>	<b>0.918</b>	<b>0.923</b>	<b>0.770</b>	<b>0.618</b>	<b>0.464</b>	<b>0.372</b>	<b>0.409</b>	<b>0.444</b>	<b>0.526</b>
<b>Shares in Total Exports (percent)</b>									
<b>SITC 2 3 Digit Classification</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Aircraft & associated equipment and	.	.	.	.	.	.	.	.	.
Aluminium	2.9%	2.7%	4.0%	3.1%	.	.	.	.	.
Cotton	5.7%	6.2%	3.9%	.	3.5%	3.3%	.	.	.
Fertilizers,manufactured	.	.	.	.	.	3.1%	.	.	.
Gas,natural and manufactured	.	.	.	.	.	.	.	13.4%	21.1%
Ingots and other primary forms,of i	.	.	.	.	.	.	4.8%	3.7%	3.5%
Iron and steel bars,rods,angles,sha	.	.	.	.	.	.	2.8%	.	.
Lime,cement,and fabricated construc	.	.	.	.	.	3.5%	5.5%	4.3%	2.7%
Petrol.oils,crude,& c.o.obtain.from	74.9%	74.5%	55.3%	37.2%	22.0%	12.1%	13.0%	8.0%	12.4%
Petroleum products,refined	6.0%	6.0%	8.5%	11.5%	13.7%	15.3%	14.8%	14.9%	12.8%
Textile yarn	2.3%	2.9%	5.4%	5.9%	3.4%	.	.	.	.
Under garments,knitted or crocheted	.	.	.	.	3.8%	.	.	.	.
Vegetab.,fresh,chilled,frozen/pres.	.	.	.	4.2%	.	.	.	.	.

Source: Staff Calculations, based on COMTRADE (mirror) data

**Table 1. 3: Top Five Exported Products, by selected years, excluding oil**

**Egypt: Top Five Exported Products, by selected years. Excludes Oil (pcode=333)**

Values of Exports, excluding oil (Thousands of US\$)									
SITC 2 3 Digit Classification	1980	1985	1990	1995	2000	2003	2004	2005	2006
Aircraft & associated equipment and	.	.	138,148	.	.	.	.	.	.
Aluminium	136,052	120,551	188,067	184,789	191,487	.	.	.	474,993
Cotton	262,362	280,302	182,914	181,228	204,288	263,551	.	.	.
Cotton fabrics,woven	.	.	.	.	.	.	.	.	.
Fertilizers,manufactured	.	.	.	.	.	252,348	.	.	.
Fruit & nuts(not includ. oil nuts),	.	.	.	.	.	.	.	414,522	.
Gas,natural and manufactured	.	.	.	.	.	.	.	1,852,492	4,297,748
Ingots and other primary forms,of i	.	.	.	.	.	.	529,985	514,127	718,648
Iron and steel bars,rods,angles,sha	.	.	.	.	.	.	312,480	.	.
Lime,cement,and fabricated construc	.	.	.	.	.	281,051	604,708	596,547	540,758
Petroleum products,refined	276,625	270,546	403,197	676,417	797,217	1,238,461	1,629,434	2,056,149	2,597,874
Textile yarn	104,198	131,984	257,023	345,796	200,284	.	.	.	.
Under garments,knitted or crocheted	.	.	.	.	223,640	230,723	299,511	.	.
Vegetab.,fresh,chilled,frozen/pres.	67,573	46,034	.	246,165	.	.	.	.	.
<b>Value of Exports Top 5 products, exc</b>	<b>846,809</b>	<b>849,416</b>	<b>1,169,349</b>	<b>1,634,395</b>	<b>1,616,915</b>	<b>2,266,135</b>	<b>3,376,118</b>	<b>5,433,837</b>	<b>8,630,021</b>
<b>Value of Total Exports in Year, excluc</b>	<b>1,158,771</b>	<b>1,148,851</b>	<b>2,117,962</b>	<b>3,711,362</b>	<b>4,546,623</b>	<b>7,125,707</b>	<b>9,591,276</b>	<b>12,693,440</b>	<b>17,800,585</b>
<b>Share Value of top 5 products in total</b>	<b>0.7307817</b>	<b>0.7393612</b>	<b>0.5521106</b>	<b>0.440376</b>	<b>0.35563</b>	<b>0.3180224</b>	<b>0.3519988</b>	<b>0.4280823</b>	<b>0.4848167</b>
Share Values of Exports, excluding oil (Thousands of US\$)									
SITC 2 3 Digit Classification	1980	1985	1990	1995	2000	2003	2004	2005	2006
Aircraft & associated equipment and	.	.	6.5%	.	.	.	.	.	.
Aluminium	11.7%	10.5%	8.9%	5.0%	4.2%	.	.	.	2.7%
Cotton	22.6%	24.4%	8.6%	4.9%	4.5%	3.7%	.	.	.
Cotton fabrics,woven	.	.	.	.	.	.	.	.	.
Fertilizers,manufactured	.	.	.	.	.	3.5%	.	.	.
Fruit & nuts(not includ. oil nuts),	.	.	.	.	.	.	.	3.3%	.
Gas,natural and manufactured	.	.	.	.	.	.	.	14.6%	24.1%
Ingots and other primary forms,of i	.	.	.	.	.	.	5.5%	4.1%	4.0%
Iron and steel bars,rods,angles,sha	.	.	.	.	.	.	3.3%	.	.
Lime,cement,and fabricated construc	.	.	.	.	.	3.9%	6.3%	4.7%	3.0%
Petroleum products,refined	23.9%	23.5%	19.0%	18.2%	17.5%	17.4%	17.0%	16.2%	14.6%
Textile yarn	9.0%	11.5%	12.1%	9.3%	4.4%	.	.	.	.
Under garments,knitted or crocheted	.	.	.	.	4.9%	3.2%	3.1%	.	.
Vegetab.,fresh,chilled,frozen/pres.	5.8%	4.0%	.	6.6%	.	.	.	.	.

Source: Staff Calculations, based on COMTRADE (mirror) data

### Herfindhal Index of Exports Diversification

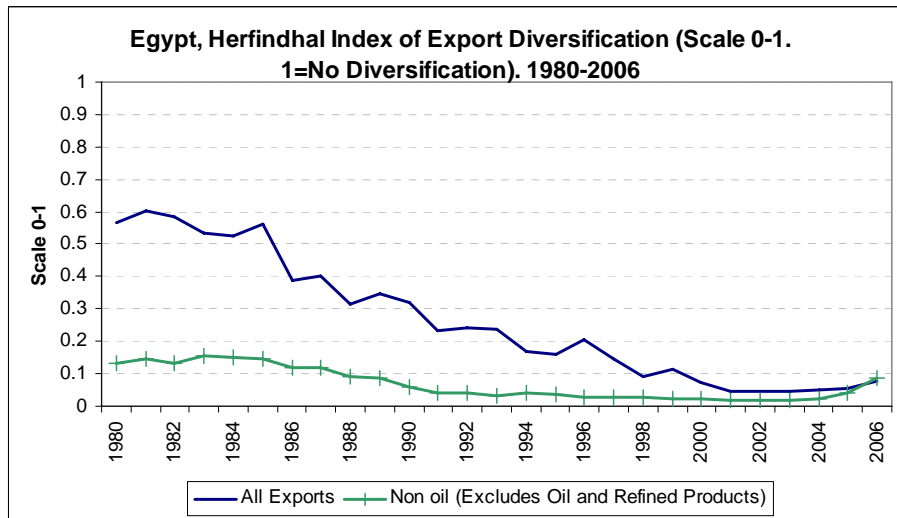
A more precise indicator of export diversification is the so-called Herfindhal- Hirschmann index. It is calculated for country “i” as the sum of squared values of product “j” shares in total country export (Xsh), minus 1, adjusted by the number of products exported by the country in year “t”, as follows:

$$HH_{i,t} = \left[ \frac{\left( \sum_j Xsh_{i,t}^2 \right)}{\left( \sum_j j_{i,t} \right)} \right] / \left( 1 - \frac{1}{\sum_j j_{i,t}} \right)$$

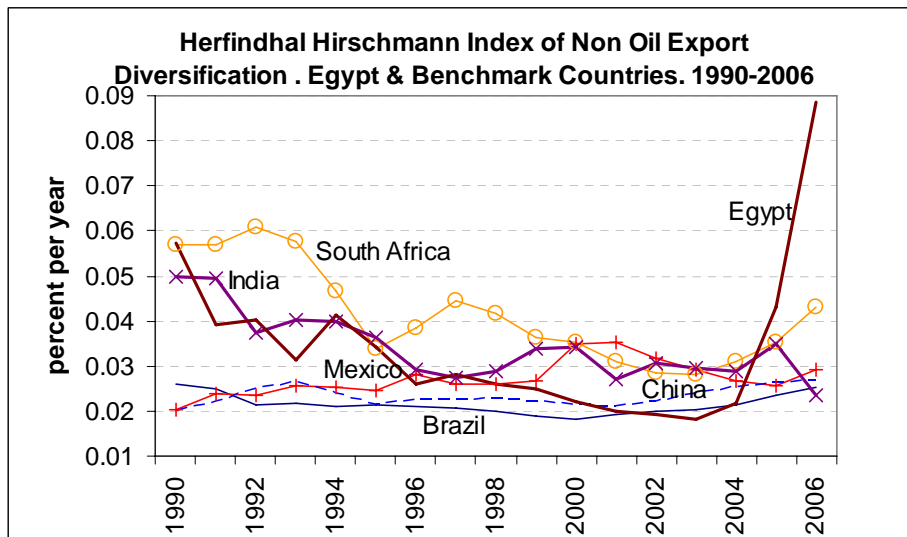
Where the adjustment 1 minus sum of exported products “j” is intended to scale the HH index to the ratio 0 to 1, with zero meaning full diversification and 1 meaning a concentration of exports in just one product.

Figure 1.10 shows the evolution of the Herfindhal-Hirschmann (HH) index of export and non-oil export diversification. Results are aligned with those derived from the top 5 export ratio to total exports. Overall, increased exports of natural gas and petroleum products led to a higher concentration of exports in the Arab Republic. Together, these 2 groups represented 40 percent of Egypt exports in 2006. Figure 1.11 compares the HH index with that for selected benchmark economies.

**Figure 1. 10: Egypt, Herfindhal Index of Export Diversification**



**Figure 1. 11: Herfindhal Hirschmann Index of Non Oil Export Diversification**



### Revealed Comparative Advantage in Egypt

RCA indicator for a product “j” exported by country “i” during period “t” ( $X_{i,j,t}$ ) is computed as the ratio of country’s export of “j” to total exports of country “i”, divided by the ratio of world (W) exports of “j” to world exports in year “t”

$$RCA_{j,i,t} = \frac{X_{j,i,t}}{\sum_j X_{j,i,t}} \bigg/ \frac{X_{w,i,t}}{\sum_j X_{w,i,t}}$$

A dummy variable  $DRCA_{j,i,t}$  is generated if the ratio of  $RCA_{j,i,t}$  is higher than 1. The indicator is constructed for all years from 1980 to 2006. Also, dummy variables for RCA are constructed for

periods 1990 to 1996 and 2000 to 2006. The information is organized in a table that classifies products in 4 groups:

1. The Marginals: Products that did not have RCA neither in 1990-2006 nor in 2000-2006.
2. The Classics: Products that had RCA in 1990-1996 and also in 2000-2006.
3. Disappearances: Products that had RCA in 1990-1996, but did not have RCA in 2000-2006
4. Emerging Products: Products that did not have RCA in 1990-1996, but had RCA in 2000-2006.

Annex Table 1 presents this information. Only products with export share higher than 0.1% for 2000-2006 in Egypt are explicitly included. The table also presents growth rate of exports of the products in Egypt and in the World. It also presents the share of exports of the included products in Egypt total exports. Each classification is sorted by product's share in Egypt's exports.

### **Income Value of a Country's Export Basket, per year**

This indicator, called EXPY is constructed in 2 steps. First, the income value of each product "j" is generated by year, using the export (x) share of a country in world exports of product "j" divided by the sum of shares of "j" in world exports of "j" across all countries exporting the product. These ratios are multiplied by the exporting country's per capita income level (Ypc) and the result summed up across all countries:

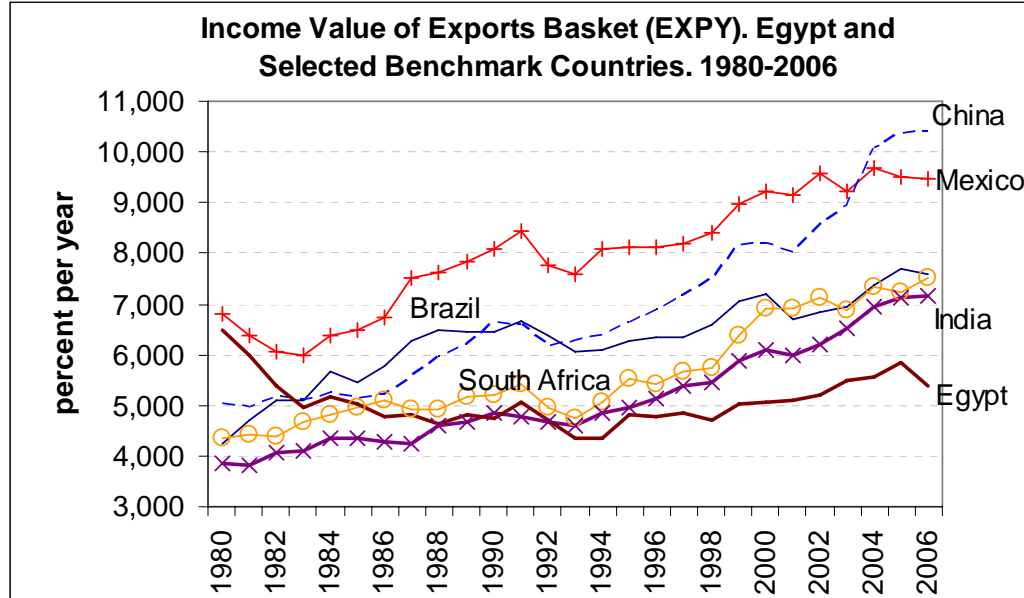
$$PRODY_{j,i,t} = \sum_i \left[ \left( \frac{x_{j,i,t}}{\sum_i x_{j,i,t}} \right) \times Ypc_{i,t} \right]$$

EXPY is a weighted income value of products exported by a country. It is computed as the weighted sum of PRODY by country, using as weight the share of exports on the country's total exports:

$$EXPY_{i,t} = \sum_j \left[ \left( \frac{x_{j,i,t}}{\sum_j x_{j,i,t}} \right) \times PRODY_{j,i,y} \right]$$

EXPY is said to be an indicator of export sophistication of a country (Hausmann and Klinger, 2006). Higher EXPY –authors hypothesize- allows countries to move in the "product space" towards their "technology frontier".

Figure 1. 12: Income Value of Exports Basket



Egypt's income value of exports has tended to increase over the 2000s indicating, if the indicator is to be believed, a moving of Egypt's exportable sector towards its technology frontier.

#### Export Distribution by Main Exporting Categories (Leamer Classification)<sup>41</sup>

Leamer's classification (See annex 3) allows for a broad classification of exports in primary, labor intensive, capital intensive products, and machinery and equipment, which helps to visualize the degree of export sophistication on a country. Primary products include Leamer's groups 1-6, namely: Animal Products, Cereals, etc., Tropical Agriculture, Forest Products, Raw Materials and Petroleum and Petroleum Products. This classification indicates (Table 1.4 and figure 1.13) a lower sophistication of the Arab Republic's exports in the 2000s, again, resulting from the increasing share values of natural gas and petroleum products, which, in turn, drive up the share of primary products in total exports.

<sup>41</sup> E. Leamer, Sources of Comparative Advantage: Theory and Evidence (MIT Press, Cambridge MA, 1984).

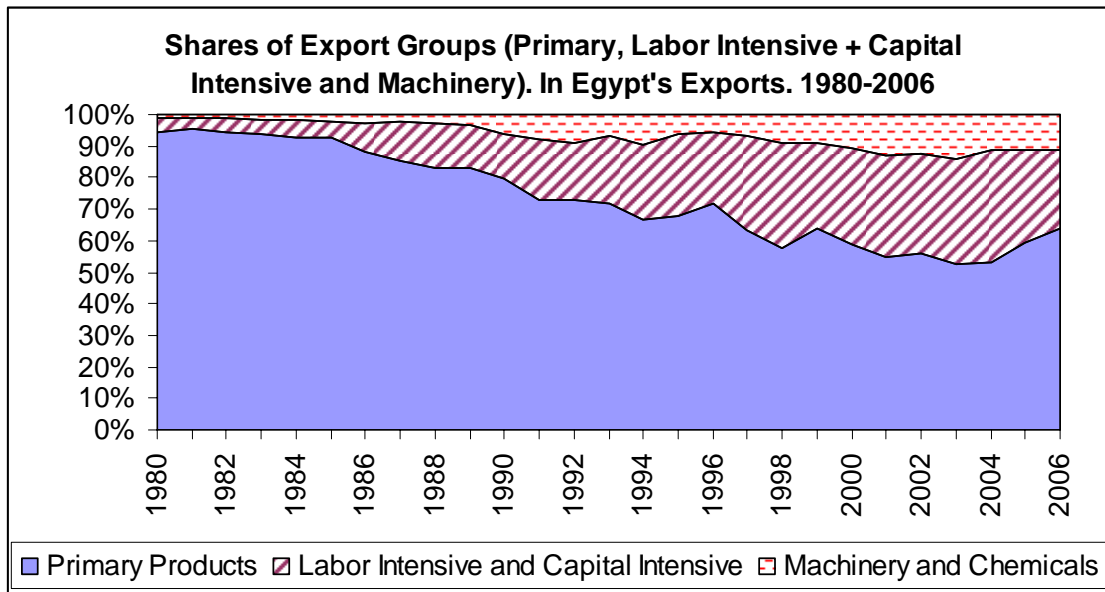
**Table 1. 4: Share in Egypt Total Export**

Share in Egypt Total Exports of Export Groups, using Leamer's Classification.

Leamer Classification	1980s	1990s	2000s	2000	2001	2002	2003	2004	2005	2006
Animal Products	0.8	1.4	1.4	1.3	1.4	1.5	1.6	1.9	1.4	1.0
Cereals, etc.	7.5	5.1	6.0	7.5	8.5	7.6	7.6	6.1	5.8	3.9
Tropical Agriculture	3.1	5.6	6.4	6.0	7.2	7.6	6.8	6.7	7.0	5.2
Forest Products	0.0	0.4	0.9	0.6	0.6	0.7	1.0	1.0	1.2	1.0
Raw Materials	3.9	4.8	15.9	7.6	8.0	7.9	7.4	9.0	20.3	27.2
Petroleum and Pet. Products	75.4	51.3	27.4	35.8	28.9	30.6	28.0	28.4	23.6	25.6
Labor Intensive	1.4	10.7	15.1	16.1	16.9	16.1	17.3	17.5	14.8	12.0
Capital Intensive	5.9	13.1	15.0	14.2	15.7	15.5	16.3	18.0	14.9	12.9
Machinery	1.2	4.2	4.8	5.1	4.4	4.2	5.2	4.9	4.7	4.7
Chemicals	0.7	3.3	7.0	5.9	8.4	8.2	8.8	6.5	6.4	6.4
Total Exports	100	100	100	100	100	100	100	100	100	100

Source: Staff Calculations, based on COMTRADE data

**Figure 1. 13: Shares of Export Groups**



**Table 1. 5: SITC Classification**

**ANNEX 1: SITC Classification, Revision 3 - 2 Digit level**

<p><b>0 - Food and live animals</b>  00 - Live animals other than animals of division 03  01 - Meat and meat preparations  02 - Dairy products and birds' eggs  03 - Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof  04 - Cereals and cereal preparations  05 - Vegetables and fruit  06 - Sugars, sugar preparations and honey  07 - Coffee, tea, cocoa, spices, and manufactures thereof  08 - Feeding stuff for animals (not including unmilled cereals)  09 - Miscellaneous edible products and preparations</p> <p><b>1 - Beverages and tobacco</b>  11 - Beverages  12 - Tobacco and tobacco manufactures</p> <p><b>2 - Crude materials, inedible, except fuels</b>  21 - Hides, skins and furskins, raw  22 - Oil-seeds and oleaginous fruits  23 - Crude rubber (including synthetic and reclaimed)  24 - Cork and wood  25 - Pulp and waste paper  26 - Textile fibres (other than wool tops and other combed wool) and their wastes (not manufactured into yarn or fabric)  27 - Crude fertilizers, other than those of division 56, and crude minerals (excluding coal, petroleum and precious stones)  28 - Metalliferous ores and metal scrap  29 - Crude animal and vegetable materials, n.e.s.</p> <p><b>3 - Mineral fuels, lubricants and related materials</b>  32 - Coal, coke and briquettes  33 - Petroleum, petroleum products and related materials  34 - Gas, natural and manufactured  35 - Electric current</p> <p><b>4 - Animal and vegetable oils, fats and waxes</b>  41 - Animal oils and fats  42 - Fixed vegetable fats and oils, crude, refined or fractionated  43 - Animal or vegetable fats and oils, processed; waxes of animal or vegetable origin; inedible mixtures or preparations thereof</p> <p><b>5 - Chemicals and related products, n.e.s.</b>  51 - Organic chemicals  52 - Inorganic chemicals  53 - Dyeing, tanning and colouring materials  54 - Medicinal and pharmaceutical products  55 - Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations  56 - Fertilizers (other than those of group 272)  57 - Plastics in primary forms  58 - Plastics in non-primary forms  59 - Chemical materials and products, n.e.s.</p> <p><b>6 - Manufactured goods classified chiefly by material</b>  61 - Leather, leather manufactures, n.e.s., and dressed furskins  62 - Rubber manufactures, n.e.s.  63 - Cork and wood manufactures (excluding furniture)  64 - Paper, paperboard and articles of paper pulp, of paper or of paperboard  65 - Textile yarn, fabrics, made-up articles, n.e.s., and related products  66 - Non-metallic mineral manufactures, n.e.s.  67 - Iron and steel  68 - Non-ferrous metals  69 - Manufactures of metals, n.e.s.</p> <p><b>7 - Machinery and transport equipment</b>  71 - Power-generating machinery and equipment  72 - Machinery specialized for particular industries  73 - Metalworking machinery  74 - General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.  75 - Office machines and automatic data-processing machines  76 - Telecommunications and sound-recording and reproducing apparatus and equipment  77 - Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical components)  78 - Road vehicles (including air-cushion vehicles)  79 - Other transport equipment</p> <p><b>8 - Miscellaneous manufactured articles</b>  81 - Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.  82 - Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings  83 - Travel goods, handbags and similar containers  84 - Articles of apparel and clothing accessories  85 - Footwear  87 - Professional, scientific and controlling instruments and apparatus, n.e.s.  88 - Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks  89 - Miscellaneous manufactured articles, n.e.s.</p> <p><b>9 - Commodities and transactions not classified elsewhere in the SITC</b>  91 - Postal packages not classified according to kind  93 - Special transactions and commodities not classified according to kind  96 - Coin (other than gold coin), not being legal tender  97 - Gold, non-monetary (excluding gold ores and concentrates)  I - Gold, monetary  II - Gold coin and current coin</p>
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Source: UN, at <http://unstats.un.org/unsd/cr/registry/regcst.asp?CI=14&Lg=1>



**Table 1. 6: Revealed Comparative Advantage of Products**

**Annex 2. SORTED TABLE (values)**

**EGYPT. Revealed Comparative Advantage of Products. 1990-1996 vs 2000-2006.**

"The Marginals" No RCA in either 1990-1996 or 2000-2006				"The Classics" RCA in both 1990-2006 & 2000-2006					
Code	Classification: SITC2-3 Digits Product Name	Growth 2000/06		Share 00/06 in Egypt's X	Code	Classification: SITC2-3 Digits Product Name	Growth 2000/06		Share 00/06 in Egypt's X
		Egypt	World				Egypt	World	
583	Polymerization and copolymerization	42.5%	13.3%	1.2%	334	Petroleum products,refined	22.3%	18.8%	14.1%
541	Medicinal and pharmaceutical product	14.3%	17.7%	1.0%	333	Petrol.oils,crude,& c.o.obtain.from	11.5%	18.2%	12.6%
893	Articles of materials described in	19.6%	10.7%	0.7%	661	Lime,cement,and fabricated construc	74.9%	11.5%	3.0%
674	Universals,plates and sheets,of iro	57.1%	16.2%	0.7%	846	Under garments,knitted or crocheted	10.9%	8.4%	2.6%
821	Furniture and parts thereof	10.8%	11.2%	0.6%	684	Aluminium	16.1%	12.2%	2.6%
741	Heating & cooling equipment and par	21.4%	11.6%	0.5%	54	Vegetab.,fresh,chilled,frozen/pres.	17.0%	9.6%	2.5%
642	Paper and paperboard,cut to size or	32.7%	6.6%	0.4%	57	Fruit & nuts(not includ. oil nuts),	27.7%	10.7%	2.2%
714	Engines & motors,non-electric	-33.9%	5.9%	0.4%	562	Fertilizers,manufactured	19.4%	12.6%	2.2%
625	Rubber tyres,tyre cases,etc.for whe	19.8%	12.2%	0.4%	263	Cotton	2.7%	7.4%	2.1%
653	Fabrics,woven,of man-made fibres	0.0%	0.4%	0.3%	673	Iron and steel bars,rods,angles,sha	38.5%	18.1%	1.9%
971	Gold,non-monetary	116.9%	16.5%	0.3%	845	Outer garments and other articles,k	6.7%	7.1%	1.9%
641	Paper and paperboard	30.4%	7.4%	0.3%	842	Outer garments,men's,of textile fab	13.9%	5.5%	1.8%
81	Feed.stuff for animals(not incl.unm	13.1%	8.5%	0.3%	843	Outer garments,women's,of textile f	7.7%	8.3%	1.8%
728	Mach.& equipment specialized for pa	47.6%	9.2%	0.2%	651	Textile yarn	-1.8%	3.6%	1.7%
553	Perfumery,cosmetics and toilet prep	29.7%	12.9%	0.2%	42	Rice	28.9%	7.2%	1.7%
222	Oil seeds and oleaginous fruit,whol	29.1%	9.6%	0.2%	659	Floor coverings,etc.	15.4%	6.9%	1.6%
598	Miscellaneous chemical products,n.e	27.9%	11.7%	0.2%	658	Made-up articles,wholly/chiefly of	13.0%	11.9%	1.5%
282	Waste and scrap metal of iron or st	29.3%	25.7%	0.2%	273	Stone,sand and gravel	13.7%	9.8%	1.2%
743	Pumps & compressors,fans & blowers,	5.9%	11.4%	0.2%	335	Residual petroleum products,nes.& f	25.4%	18.6%	0.8%
892	Printed matter	6.5%	8.6%	0.2%	323	Briquettes,coke and semi-coke of co	1.5%	20.6%	0.6%
783	Road motor vehicles,n.e.s.	64.4%	13.5%	0.2%	611	Sugar and honey	11.0%	10.4%	0.5%
288	Non-ferrous base metal waste and sc	12.1%	17.6%	0.2%	292	Crude vegetable materials, n.e.s.	9.5%	8.5%	0.4%
778	Electrical machinery and apparatus,	42.1%	9.1%	0.2%	844	Under garments of textile fabrics	0.0%	3.1%	0.4%
351	Electric current	163.8%	21.3%	0.2%	56	Vegetab.,roots & tubers,prepared/pr	15.8%	9.3%	0.4%
764	Telecommunications equipment and pa	17.1%	11.5%	0.2%	271	Fertilizers,crude	33.3%	5.6%	0.3%
635	Wood manufactures,n.e.s.	49.0%	10.0%	0.2%	652	Cotton fabrics,woven	-3.9%	3.4%	0.3%
122	Tobacco manufactured	12.1%	7.4%	0.2%	671	Pig iron,spiegeleisen,sponge iron,i	28.0%	21.7%	0.3%
699	Manufactures of base metal,n.e.s.	30.1%	11.2%	0.2%	291	Crude animal materials,n.e.s.	19.4%	5.8%	0.2%
851	Footwear	21.2%	8.0%	0.2%	265	Vegetable textile fibres and waste	5.5%	4.8%	0.2%
772	Elect.app.such as switches,relays,f	23.3%	10.4%	0.1%	551	Essential oils,perfume and flavour	12.5%	13.2%	0.2%
899	Other miscellaneous manufactured ar	18.4%	12.1%	0.1%	896	Works of art,collectors pieces & an	-8.5%	5.2%	0.2%
784	Parts & accessories of 722--,781--,	70.4%	10.5%	0.1%	289	Ores & concentrates of precious met	-1.2%	7.7%	0.1%
723	Civil engineering & contractors pla	20.3%	18.1%	0.1%	75	Spices	2.8%	2.5%	0.1%
664	Glass	30.6%	9.9%	0.1%		Sub-total, Classics --->			64.2%
582	Condensation,polycondensation & pol	32.1%	13.2%	0.1%		3 Products, each with share in Country's export under 0.1%			0.2%
749	Non-electric parts and accessories	27.7%	11.7%	0.1%		<b>Classics Share ---&gt;</b>			<b>64.3%</b>
775	Household type,elect.& non-electric	53.8%	11.8%	0.1%		<b>"Emerging Products" No RCA in 1990-1996 &amp; RCA in 2000-2006</b>			
71	Coffee and coffee substitutes	30.9%	9.0%	0.1%		<b>Classification: SITC2-3 Digits</b>			
872	Medical instruments and appliances	18.4%	13.8%	0.1%	<b>Code</b>	<b>Product Name</b>	<b>Egypt</b>	<b>World</b>	<b>Share 00/06</b>
874	Measuring,checking,analysing instru	13.8%	9.4%	0.1%	341	Gas,natural and manufactured	82.2%	17.3%	9.3%
793	Ships,boats and floating structures	7.5%	16.9%	0.1%	672	Ingots and other primary forms,of i	39.4%	19.3%	3.3%
657	Special textile fabrics and related	18.1%	8.0%	0.1%	522	Inorganic chemical elements,oxides	6.9%	12.5%	1.0%
	Sub-total, marginals --->			11.5%	98	Edible products and preparations n.	4.3%	12.2%	0.9%
	130 Products, each with share in Country's export under 0.1%			3.0%	773	Equipment for distributing electric	33.9%	10.1%	0.9%
	<b>Marginals share ---&gt;</b>			<b>14.5%</b>	682	Copper	72.8%	19.6%	0.8%
	<b>"Disappearances" RCA in 1990-1996 &amp; No RCA in 2000-2006</b>				611	Leather	14.0%	5.7%	0.8%
792	Aircraft & associated equipment and	26.8%	7.5%	0.1%	812	Sanitary,plumbing,heating,lighting	16.4%	11.0%	0.6%
	4 Products, each with share in Country's export under 0.1%			0.1%	665	Glassware	31.7%	9.7%	0.5%
	<b>Disappearances Share ---&gt;</b>			<b>0.2%</b>	554	Soap,cleansing and polishing prepar	16.1%	11.4%	0.4%
					662	Clay construct.materials & refracto	31.4%	10.8%	0.4%
					278	Other crude minerals	25.4%	8.6%	0.4%
					691	Structures & parts of struc.,iron,s	29.9%	15.2%	0.4%
					24	Cheese and curd	49.1%	10.8%	0.3%
					697	Household equipment of base metal,n	34.5%	10.7%	0.3%
					58	Fruit,preserved,and fruit preparati	13.0%	10.1%	0.3%
						Sub-totals --->			20.6%
						7 Products, each with share in Country's export under 0.1%			0.4%
						<b>Emerging products Share ---&gt;</b>			<b>21.0%</b>

Source: Staff calculations, based on COMTRADE data

**Table.:7:Leamer Product Classification**

Annex 3: Leamer Product Classification, based on SITC3 3 Digit.

Animal Products	Cereals, etc.	Tropical Agriculture	Forest Products	Raw Materials	Petroleum and Pet. Products	Labor Intensive	Capital Intensive	Machinery	Chemicals
	41	54	244	271	333	661	611	711	511
1	42	56	245	273	334	662	612	712	512
11	43	57	246	274	335	663	613	713	513
12	44	58	247	277		664	621	714	514
14	45	61	248	278		665	625	716	515
22	46	62	251	281		666	628	718	516
23	47	71	633	282		667	651	721	522
24	48	72	634	286		821	652	722	523
25	81	73	635	287		831	653	723	524
34	91	74	641	288		842	654	724	531
35	98	75	642	289		843	655	725	532
36	121	111		322		844	656	726	533
37	122	112		323		845	657	727	541
211	222	232		341		846	658	728	551
212	223	233		351		847	659	736	553
291	261			681		848	671	737	554
292	263			682		851	672	741	562
431	264			683		892	673	742	572
941	265			684		893	674	743	582
	266			685		894	675	744	583
	267			686		895	676	745	584
	268			687		896	677	749	585
	269			688		897	678	751	591
	411			689		898	679	752	592
	423					899	691	759	598
	424					961	692	761	
						971	693	762	
							694	763	
							695	764	
							696	771	
							697	772	
							699	773	
							812	774	
								775	
								776	
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								951	

## APPENDIX 2

### A SIMPLE MODEL OF THE EGYPTIAN ECONOMY

First the appendix presents a stylized description of the structure of production in Egypt as a prologue to the discussion of the impact of the crisis.

The Egyptian economy produces two broad categories of goods and services: goods that can be traded internationally and goods that cannot be traded internationally. Tradable goods include labor-intensive tradable goods (for instance, Transport, Hotels, Fertilizers, Food, Metal Engineering and Machinery),  $Q_T$ , and natural resource based (NRB) exportable goods such as Oil and Natural Gas,  $Q_O$ . Non-tradable goods include private sector produced non-tradable goods,  $Q_N$ , for instance, Services and Construction and Government production of goods and services  $Q_G$ . To simplify the analysis  $Q_G$  is embedded in  $Q_N$ .<sup>42</sup>

The rationale underlying this stylized characterization of the Egyptian economy is given by the importance of labor in production in each sector of the economy. For instance, the share of wages directly paid in total value added in the Oil Extraction and Natural Gas sectors is 4 percent;<sup>43</sup> the share of labor in value added in the remainder tradable sectors is 26 percent.<sup>44</sup> In turn, the share of wages directly paid in the production of non-tradable goods (roughly Construction, Electricity and Other Services) is 44 percent.

A stylized description of the Egyptian economy is that of one sector whose output is a function of natural resources and capital (excluded here for simplicity) and two other sectors: production of non-tradable goods and non-NRB tradable goods that compete for the use of labor. The allocation of labor to these two sectors determines the value of the non-NRB GDP, ( $GDP_{NO}$ ).

The price of tradable goods is determined by the world market, tariffs on imports and taxes or subsidies on exports. The price of non-tradable goods is determined in the domestic market so as to eliminate the excess demand for non-tradable goods.

Equation (1) defines the GDP measured at non-tradable good prices ( $P_N$ ):

$$(1) \quad GDP = p_o Q_o + e Q_T + Q_N$$

Where  $p_o = \frac{E p_o^*}{P_N}$  and  $e = \frac{E P_T^*}{P_N}$  and

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<sup>42</sup> The non-NRB tradable sector is far from being homogeneous. In fact it includes sectors that are predominantly producers of importable goods, like Food, sectors that are producers of exportable services as Hotels, and sectors derived from oil like Fertilizer.

<sup>43</sup> This is the ratio of wages paid in Oil Extraction, Natural Gas, Fuel Oil, Gas Oil, LPG and Gasoline sectors. See the input output table 2006/2007.

<sup>44</sup> Other tradable sectors are Food, Textile, Fertilizer Other Chemicals, Cement, Non Metal Industries, Iron, Aluminum, Metal Industries, Engineering and Machinery, Other Industries, Transportation and Hotels. See input output table 2006/2007.

$p_o^*$  is the price of the natural resource based good (NRB) measured in foreign exchange units;  $E$  is the exchange rate and  $p_T^*$  is the price of the non-NRB tradable good measured in foreign exchange units.

Equation (2) defines the non-NRB GDP as:

$$(2) \text{GDP}_{NO} \equiv \text{GDP} - p_o Q_o = e Q_T + Q_N$$

The non-NRB economy is further constrained by the production possibility frontier defined by:

$$(3) F(Q_T, Q_N, L) = 0$$

Where ( $L$ ) is the endowment of labor in the economy.

The production possibility frontier is portrayed in Graph 1.

The maximum value of  $\text{GDP}_{NO}$  is given at the point where the slope of the production possibility frontier  $\frac{dQ_T}{dQ_N}$  equals the real exchange rate  $e$ .

Gross national income ( $\text{GNI}$ ) is equal to the  $\text{GDP}$  plus remittances ( $R$ ):

$$(4) \text{GNI} = \text{GDP} + R.$$

And non-oil Gross National Income  $\text{GNI}_{NO}$  is equal to:

$$(5) \text{GNI}_{NO} = \text{GDP}_{NO} + R$$

Domestic demand or absorption ( $A$ ) is generated by consumption and investment by the private and public sector in tradable and non-tradable goods. It is the sum of domestic consumption of the NRB good ( $C_o$ ); domestic consumption and investment of other tradable goods ( $C_T$  and  $I_T$  respectively); and domestic consumption and investment of non-tradable goods and services ( $C_N$  and  $I_N$  respectively).

$$(6) A = p_o C_o + e(C_T + I_T) + (C_N + I_N)$$

The balance on current account ( $CA$ ) is:

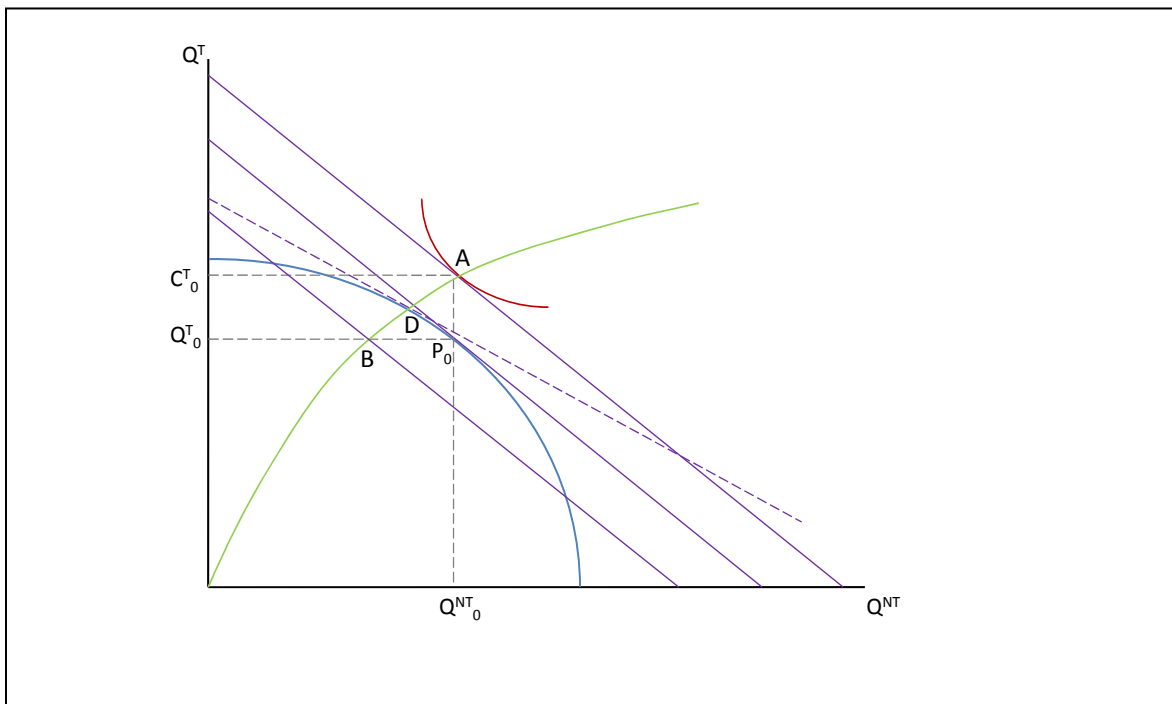
$$(7) CA = p_o(Q_o - C_o) + e(Q_T - C_T - I_T) + (Q_N - C_N - I_N) + R$$

And the current account net of the NRB sector is:

$$(7') CA_{NO} \equiv CA - p_o(Q_o - C_o) = e(Q_T - C_T - I_T) + (Q_N - C_N - I_N) + R$$

Before the crisis there was a deficit in the non-NRB current account. The deficit was financed roughly by remittances and by  $p_o(Q_o - C_o)$ . The *Salter diagram* in Graph 1 describes the situation of the economy before and after the crisis.<sup>45</sup> The TT curve illustrates the production possibility frontier between  $Q_T$  and  $Q_N$ .<sup>46</sup> The slope of TT is the relative price of the tradable good measured in units of the non-tradable good (the real exchange rate). At the real exchange rate prevailing before the crisis,  $e_o$ , production equilibrium is at  $P_0$ . The quantity of the tradable good produced  $Q_T^0$  can be read in the vertical axis; the quantity of the non-tradable good produced,  $Q_N^0$  can be read in the horizontal axis. The value of the non-NRB GDP is given by the intersection of the line EE with the horizontal axis.

**Graph 1: Salter Diagram**



The consumption possibilities of Egyptians are described through indifference curves and consumption equilibrium is determined by the tangency between the budget line with slope  $e_o$  intersecting the horizontal axis at  $GNI_{NO}^0$ . The consumption equilibrium point is  $A$ . At  $A$  the quantity of the non-tradable good consumed is equal to the quantity of the non-tradable good produced (there is equilibrium in the non-tradable good market). The vertical distance between  $A$  and  $P_0$  is the non-NRB current account deficit (financed before 2009 with the oil natural gas surplus, remittances and capital inflows).

<sup>45</sup> Salter, W.E.G., 1959, Internal and External Balance: The Role of Price and Expenditure Effects, *Economic Record*, 35:226-238.

<sup>46</sup> The production possibility frontier is convex to the origin to indicate increasing marginal cost of producing one more unit of one good measured in terms of the sacrifice incurred in the other good.

The crisis is prompted by a fall in  $p_o(Q_o - C_o)$ , in exports of non-NRB tradable goods and in remittances. It implies, at a constant real exchange rate, a parallel and downward displacement of the budget line. Given  $e_o$  production equilibrium remains at  $P_o$  but consumption of tradable and non-tradable goods moves south west of the original along the expenditure-income line (connecting the origin with B, D and A).

At a new equilibrium, like B, there is excess demand for the tradable good (a current account deficit), excess supply of the non-tradable good and unemployment of labor. In short a rigid real exchange rate leads to unemployment and a non-NRB current account deficit limited by the financing possibilities facing Egypt.

If one would assume Egypt's capacity to finance a current account deficit to be zero then adjustment would depend entirely on a decline in imports of consumption and investment goods, an expansion of exportable goods and pressure towards a real depreciation of the exchange rate.

Graphically there would be a further parallel downward displacement of the budget line until a point B is reached at which demand for tradable goods  $C_T^0$  equals supply of tradable goods  $Q_T^0$ . At a point like B there is still an excess supply of non-tradable goods and there is unemployment (the economy operates inside the production possibility frontier TT).

Full employment equilibrium requires a real depreciation of the exchange rate and a fall in spending in tradable goods. The size of the depreciation depends on the slope of the production possibility frontier (which illustrates the substitution possibilities in the economy), and on the substitution possibilities in consumption (the slope of consumption indifference curves).

The policy instruments the government of Egypt has to accelerate adjustment are exchange rate policy, temporary tariffs and subsidies on tradable goods and domestic spending policies.

This characterization of the Egyptian economy is admittedly simplistic in that it considers equilibrium at one point in time rather than over a longer time period. By doing so it sweeps under the rug the role of inter-temporal substitution in adjustment to the new equilibrium.

## APPENDIX 3

### REAL EFFECTIVE EXCHANGE RATE

Nominal and Real Effective Exchange Rate (REER) data has been obtained from the Global Economic Monitoring (GEM) database from World Bank DEC. Nominal exchange rate expressed in LCU per US\$. REER is an index with base in year 2000 (Average REER in 2000 = 100. This, however, constitutes a convention as to have all countries REER expressed in a common base, and does not mean that REER in Egypt, or any other country, was, in fact, in equilibrium in year 2000).

In addition, a REER has been computed, using the Balassa Samuelson relationship, based on Frankel (2004) and Rodrik (2007). These approaches use cross country data to estimate, year by year, the valuation percentage of the RER, considering countries nominal exchange rates (E) in LCU/\$, Parity Purchasing Power Exchange rates (PPP) in LCU/\$ and real per capita GDP in PPP (y) in \$ of 2005.

Real Exchange Rates are computed using the formula:

$$RER = E / PPP$$

Following Frankel's specification, the RER valuation percentage for a country "i" in year "t" ( $RERV_{i,t}$ ) is calculated from an OLS regression of RER on a constant and per capita GDP at PPP:

$$RERV_{i,t} = a + by_{i,t} + u_{i,t}$$

Under Rodrik's approach, the  $RERV_{i,t}$  is calculated using the multi year full sample, with a fixed effect OLS specification:

$$RERV_{i,t} = a + by_{i,t} + c_{i,t} + u_{i,t}$$

Figure 3. 1: Nominal and Real Effective Exchange Rate

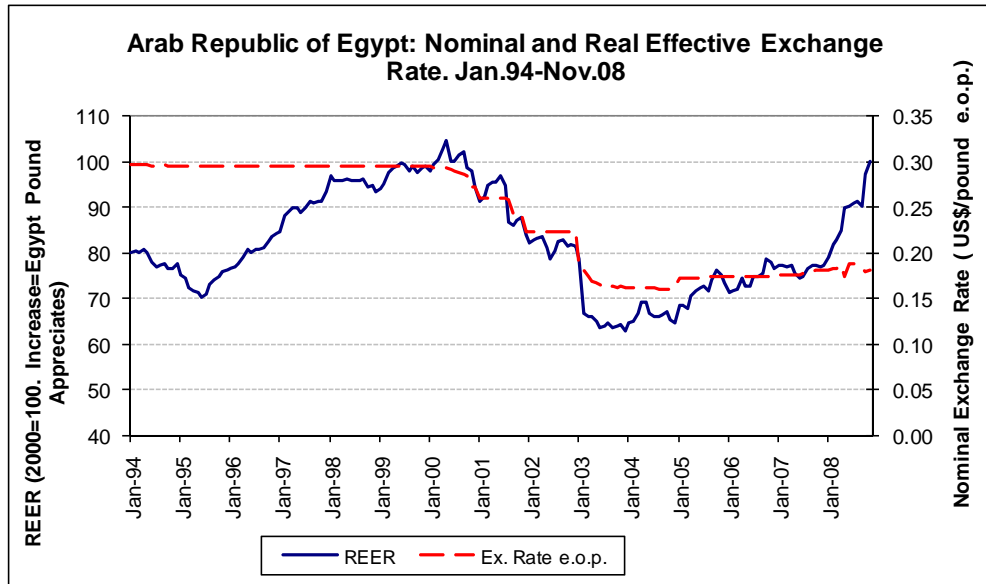
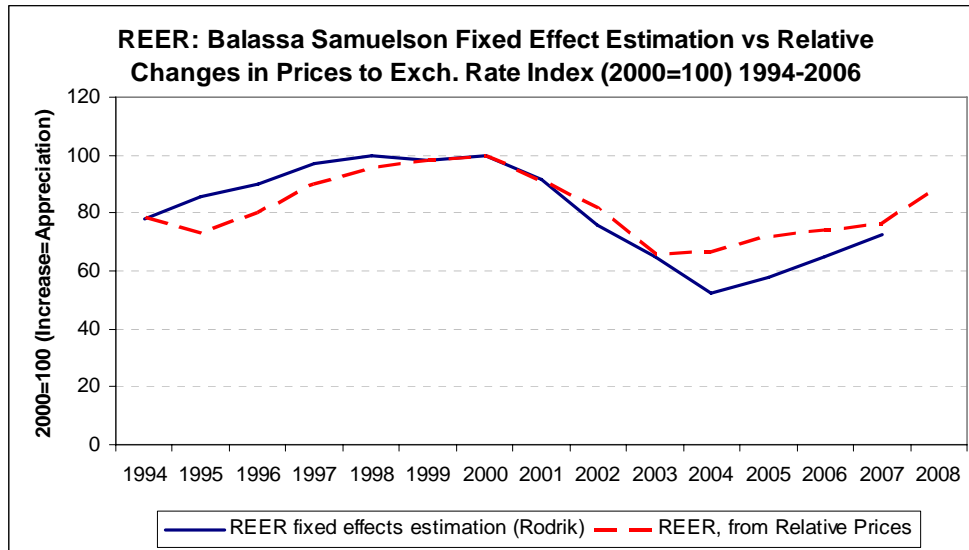


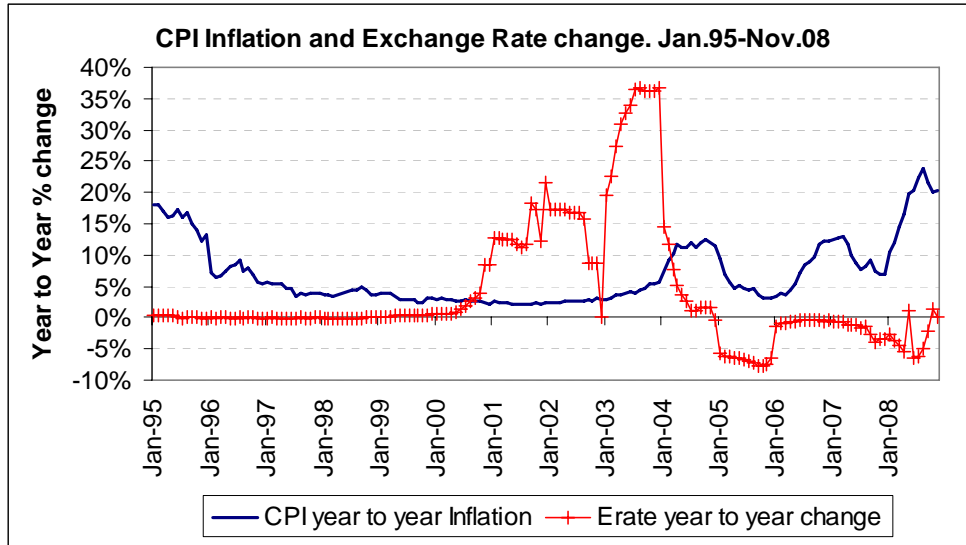
Figure 3. 2: REER: Balassa Samuels on Fixed Effect



As observed in Figure 3.2, Egypt's RER depreciated between 2000 and 2004, followed by a continued appreciation until the end of 2008. Inflation in Egypt has accelerated much above that in country's main trading partners and exchange rate has remained largely stable since 2004 (Figure 3.3).



Figure 3. 3: CPI Inflation and Exchange Rate



## APPENDIX 4

### TOURISM

#### Introduction

In FY 07/08, tourism revenues in Egypt amounted to US\$ 10.8 billion<sup>47</sup> and financed almost 50 percent of the trade deficit. When compared to other balance of payments inflows, tourism revenues were double the size compared to revenues from the Suez Canal, exceeded private remittances by a sizeable margin, and represented 90 percent of FDI inflows in 2007/08.

While Egypt appears well positioned to withstand the impact of the financial crises, estimates of tourism revenues for the next two fiscal years (2008/09 and 2009/10) may provide additional insights into possible growth developments, depreciation pressures, foreign exchange reserve movements, and tax revenue developments.

#### Model description

A structural tourism demand model is used to forecast physical tourism flows to Egypt (Roget and Gonzales, 2006; Sakai et al, 2000):

$$Q_{ij} = f(P_i, P_s, Y_j, \varepsilon_{ij})$$

-   +   +

where  $Q_{ij}$  represents the quantity of the tourism product demanded by tourists from country  $i$  (the usual proxies for this measure are tourism arrivals and overnights),  $P_i$  is the price of tourism in the inbound destination  $i$  (own price effect: CPI-based bilateral real exchange rate acts as proxy for cost of tourism),  $P_s$  is the substitute price of a competing destination,  $Y_j$  is the level of income in origin country  $j$  (real income per capita, PPP based), while  $Q_{i,t-1}$  is assumed to capture habit persistence.

The demand equation is estimated using panel data analysis, which utilizes tourism demand from individual origin countries. Specifically, from each region (Western Europe, Eastern Europe, North America, Middle East, Africa, Latin America, South Asia, East Asia and Pacific<sup>48</sup>) a representative sample of several countries is chosen to proxy total flows. In total, 22 countries account for three fourths of total tourism flows in 2007.

The physical proxies for tourism demand are then utilized to forecast total tourism receipts as represented in the balance of payments.

#### Estimation procedure

We were provided with FY annual data from 1989/90 until 2006/07 and with monthly data spanning from January 1999 until November 2007. Thus, given the data limitations, we proceeded as follows. First, we estimated an AR(1) model to forecast tourism arrivals in December 2007. Second, we obtained forecasts on the country's expected real growth rates and nominal exchange rates for 2009 and 2010. The former forecast was used to project the per capita real income on a PPP basis obtained from the World Bank database. To ensure consistent projections, we drew on forecasts from the Economist Intelligence Unit (EIU) for both variables.

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<sup>47</sup> See IMF Country Report No. 09/25, previous years follow receipts from Central Bank of Egypt website

<sup>48</sup> Individual countries for each region are listed in the Appendix

Once we prepared the time series on arrivals, projected real exchange rates, and real per capita income, we estimated the following two models on a calendar year (CY)<sup>49</sup> basis:

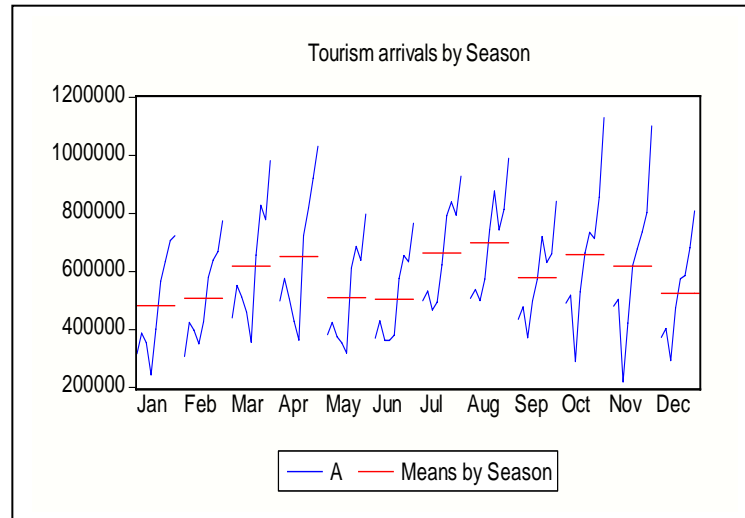
$$1) \ln A_{it} = \alpha_0 + \alpha_1 \ln Y_t^r + \alpha_2 \ln RER_t + \varepsilon_t$$

$$2) \ln A_{it} = \alpha_0 + \alpha_1 \ln Y_t^r + \alpha_2 \ln RER_t + \alpha_3 \ln A_{i,t-1} + \varepsilon_t$$

where  $RER_t = \frac{(CPI^{Egypt}_t / e_t^{Egypt})}{(CPI^i_t / e^i_t)}$  and the nominal exchange rate is expressed as national

currency per US\$. Thus, an increase in the real exchange rate reflects a real appreciation, which in turn should be negatively correlated with arrivals. After obtaining calendar year projections of total arrivals<sup>50</sup>, we used the mean seasonal distribution over the nine years to break down arrivals on a monthly basis. This allows us to calculate fiscal year revenues under various assumptions of spending per arrival. In other words, we explicitly assume that tourism receipts over the year can be represented by the same distribution as total monthly tourism arrivals.

**Figure 4. 1: Tourism Arrivals by Season**



## Results

The two fixed effect models tell a different story, which we label pessimistic and optimistic scenario (see Appendix for full representation). The leaner model places more weight on the real exchange development, while the model including the habit persistence term places more weight on past arrivals:

$$1) \ln A_t = -13 - 0.31 \ln RER + 1.94 Y_t^r + \varepsilon_t; R^2 = 0.971$$

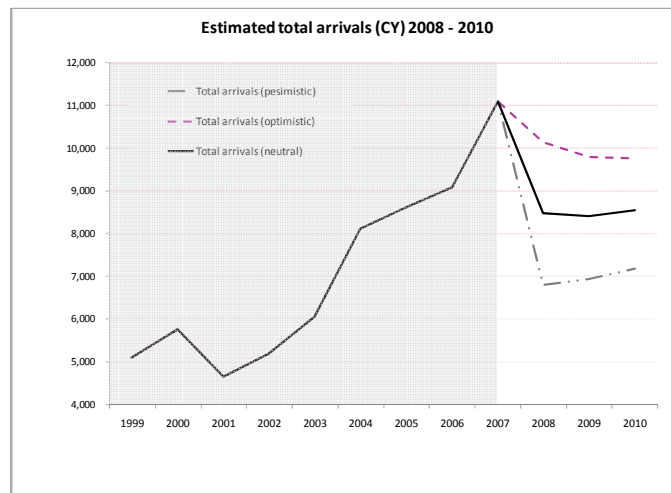
$$2) \ln A_t = -5.8 - 0.1 \ln RER + 0.8 Y_t^r + 0.6 \ln A_{t-1} + \varepsilon_t; R^2 = 0.985$$

<sup>49</sup> This was necessary given the forecasts for all markets on a CY basis

<sup>50</sup> We do not present I(1) and CI tests as these are irrelevant for the forecast exercise at hand. Also, the substitute price describing the real cost of tourism in Morocco and Tunisia turned out to be insignificant.

Under the pessimistic scenario, the much larger negative effect of the real exchange rate on arrivals results in a projected drop in arrivals at the order of close to 40 percent in CY 2008, with a subsequent increase of 2 percent and 4 percent in CY 2009 and 2010, respectively. If we believe that the persistence effect is relevant for the current circumstances, then a measured reduction in arrivals amounting to close to 9 percent takes place. Under this more optimistic scenario, arrivals continue declining by 3.5 percent and bottoming out in 2010. From both scenarios, we construct a neutral scenario depicted in Figure 4.2. The neutral scenario projects a reduction in arrivals of more than 20 percent, which bottoms out in 2009, and with a mild recovery in 2010 of close to 2 percent.

**Figure 4. 2: Estimated Total Arrivals**



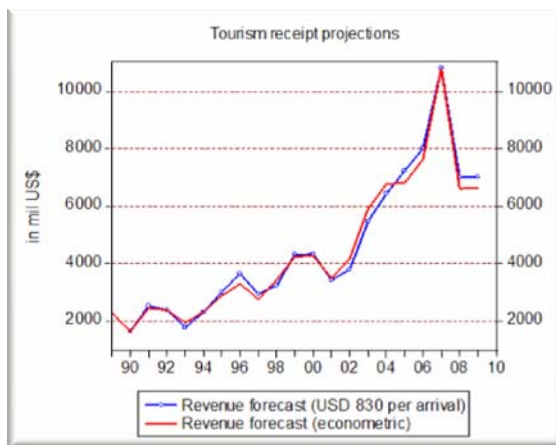
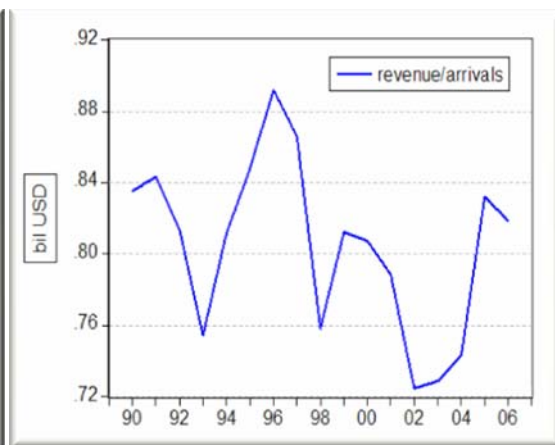
We apply two approaches to estimating the FY tourism revenues. In the first approach, we use the revenue per arrival from FY 2006/07 depicted in Figure 4. The second approach involves estimating a simple regression using arrivals as the independent variable and defining a dummy variable for revenues in 2007, which appear to represent an outlier compared to other years. The projections are compared in Figure 4.3<sup>51</sup>.

<sup>51</sup> See also Appendix for more details on forecasts

**Table 4. 1**

Dependent Variable: LOG(TR)  
 Method: Least Squares  
 Sample (adjusted): 1990 2007  
 Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D2007	0.33	0.066	5.00	0.00
LOG(ARR)	0.96	0.031	30.48	6.5e-15
C	0.10	0.26	0.38	0.70
R-squared	0.988	Mean dependent var		8.232
Adjusted R-squared	0.986	S.D. dependent var		0.518
S.E. of regression	0.0599	Akaike info criterion		-2.638
Sum squared resid	0.0539	Schwarz criterion		-2.490
Log likelihood	26.748	F-statistic		628.586
Durbin-Watson stat	1.249	Prob(F-statistic)		3.44e-15

**Figure 4. 3: Revenue comparison****Figure 4. 4: Tourism revenues per arrival**

### Summary

For FY 2008/09 and 2009/10, tourism receipts are projected to amount between US\$ 6.6 and 7.0 billion. This range of forecasts was obtained using a tourism demand model for arrivals, which was estimated by a fixed effect panel analysis. The real growth and nominal exchange rates projections were taken from the EIU.

Uncertainties in estimating the impact of the financial crises are associated with a myriad of issues. First, the largest origin markets for Egypt are Western and Eastern Europe (primarily Russia). These markets have been severely hit by the crises, especially Germany, Britain, and Italy, which together with Russia accounted for over 3 million arrivals or roughly half of total arrivals in CY

2007. The composition of arrivals would help assess the likely impact of the economic crises felt throughout this region.

Second, the series contains a structural break with average overnights per arrival as it increases to almost 10 days in 2007 from 6.3 days in 2003; one possible impact of the economic crises is the decline in the length of overnight stays for tourists, who decide to travel.

Third, between FY 1990 and 2006, average spending has varied between USD 720 and 890 per arrival. Assuming that a large share of tourists does not go to all inclusive resorts, average spending per arrival (restaurants, shopping) could suffer from the overall uncertainty in the origin markets and smaller disposable income of tourists.

Finally, crises of this magnitude can be associated with nonlinear responses, which could render the historical estimated elasticities unreliable.

**Table 8: Assumptions for the real growth rate, inflation, and nominal exchange rate in origin countries and Egypt:**

	real GDP			CPI % change			LC per USD		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Australia	2.10	-1.20	0.50	4.40	1.20	2.00	1.19	1.60	1.62
Canada	0.50	-1.50	1.70	2.40	0.50	1.00	1.07	1.20	1.12
China	9.00	6.00	7.00	5.90	-0.20	2.00	6.95	6.84	6.66
France	0.70	-1.90	0.70	3.20	0.40	2.00	0.68	0.79	0.79
Germany	1.30	-3.20	0.80	2.70	0.00	0.70	0.68	0.79	0.79
India	6.00	5.00	6.50	8.30	5.40	5.00	43.51	50.38	49.60
Israel	4.00	0.40	2.60	4.60	1.80	2.00	3.59	4.18	4.12
Italy	-1.00	-2.70	0.50	3.50	1.00	2.00	0.68	0.79	0.79
Japan	-0.70	-5.30	0.50	1.40	-0.80	1.00	103.36	92.50	92.00
Jordan	5.80	3.50	3.00	14.90	3.80	5.50	0.71	0.71	0.71
Korea, Rep.	2.60	-5.90	0.30	4.70	-0.60	-0.20	1102.00	1501.00	1461.00
Kuwait	8.50	0.70	4.30	10.80	7.00	5.60	0.27	0.27	0.27
Libya	6.30	3.50	5.20	10.40	8.50	8.70	1.22	1.27	1.25
Poland	4.80	0.70	2.20	4.20	3.00	3.00	2.41	3.22	2.95
Russian Federation	5.60	-2.00	3.00	14.10	13.00	13.00	24.85	36.00	36.40
Saudi Arabia	4.20	0.40	3.30	9.90	1.30	3.00	3.75	3.75	3.75
South Africa	3.10	-0.80	3.10	11.30	9.30	6.00	8.26	10.50	11.60
Sudan	6.50	3.20	4.50	17.80	11.10	8.10	2.09	2.30	2.42
Syrian Arab Republic	4.80	2.60	3.60	15.30	7.10	8.30	46.58	47.56	48.54
Tunisia	4.90	2.40	3.70	5.00	2.40	2.20	1.23	1.44	1.37
United Kingdom	0.70	-3.10	-1.10	3.60	1.00	1.00	0.54	0.68	0.63
United States	1.10	-2.20	1.90	3.80	-0.60	2.00	1.00	1.00	1.00
Egypt	7.20	4.00	4.00	18.30	7.80	7.50	5.43	5.65	5.73

source: The Economist poll or EIU forecast, March 2009

**Model 1 (pessimistic version)**

Variable	Coefficien			
	t	Std. Error	t-Statistic	Prob.
C	-13.61018	2.635791	-5.163602	0.0000
LRER?	-0.315646	0.126645	-2.492364	0.0137
LYRPC?	1.949038	0.276639	7.045415	0.0000
R-squared	0.971			
Adjusted R-squared	0.965	Akaike info criterion	0.05006	
		Schwarz criterion	0.48137	

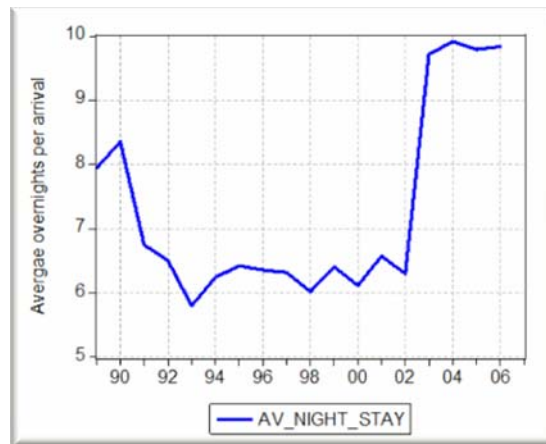
**Model 2(with AR(1) term)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.859813	2.308295	-2.538589	0.0122
LRER?	-0.068554	0.109253	-0.627476	0.5313
LYRPC?	0.825044	0.253261	3.257681	0.0014
LA?(-1)	0.607980	0.061809	9.836504	0.0000

R-squared 0.985  
Adjusted R-squared 0.981

Akaike info criterion 0.67132  
Schwarz criterion 0.09487

**Figure 8: Structural break in average overnights per arrival**



**Table 9: Projections of arrivals and revenues, FY basis**

arrivals, 000 (FY)	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2007/08	928	990	841	1,130	1,102	1,018	570	608	744	778	609	606	9,924
2008/09	805	853	705	781	724	682	565	604	738	772	604	601	8,434
2009/10	798	847	700	775	718	676	574	613	750	784	614	611	8,461

**Monthly tourism receipts under various per arrival average spending assumptions (in mil US\$)**

830 (fy)	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Total
2008/09	668	708	585	648	601	566	469	501	613	641	502	499	7,000
2009/10	663	703	581	643	596	561	477	509	623	651	510	507	7,023

800 (fy)	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Total
2008/09	644	683	564	625	579	545	452	483	591	618	484	481	6,747
2009/10	639	677	560	620	575	541	459	491	600	627	491	488	6,769



## APPENDIX 5

### GROWTH POTENTIAL

(BASED ON ACCOUNTING DECOMPOSITION OF GROWTH. 2009-2020)

Egypt's growth potential can be assessed by means of an accounting decomposition model that takes into account the evolution of proxy determinants of growth, namely, the accumulation of physical capital and human capital, under historic-trend based assumptions of changes in Total Factor Productivity.

The potential growth production function that relates real output (Y) to physical (K) and Human (H) capital inputs is assumed to be a Constant Returns to Scale Cobb Douglas. It is constructed for the period (t) 1980-2008.

$$Y_t = A_t \times K_t^\alpha \times H_t^{(1-\alpha)} \times D0608$$

Where  $A_t$  is TFP,  $\alpha$  is the share of capital in total output, and D0608 is a shift parameter that attempts to capture the temporary impact on output of the above normal capital inflows to Egypt during the period 2006-2008. This factor is incorporated in the analysis through a Cobb Douglas specification with shift parameter =1 for the full sample period except for the years 2006-2008, when it takes values of 1.0333, 1.0333<sup>2</sup> and 1.0333<sup>3</sup>, respectively.

Capital stocks are estimated following the perpetual inventory method:

$$K_t = K_{t-1} \times (1 - \delta) + I_t$$

Where  $I_t$  is the gross fixed capital formation in period t, and  $\delta$  is the depreciation rate. The model uses estimations on the real values of capital stocks and gross capital formation from Nehru and Dahreshwar (2003) for the period 1950-1990. Data on gross capital formation from WDI (1980-2006) and IMF (2005-2009) was used to get up to date values of the capital stocks. Historic (1980-2008) depreciation rate averages of 3.7% were used as assumptions in 2009-2020 forecasts.

Human capital stocks were constructed based on Ghosh and Kraay (2000) specification:

$$H_t = POP_t \times WAPR_t \times LFR_t \times e^{ROE \times SCH_t}$$

Where  $POP_t$  is total population in year "t",  $WAPR_t$  is the ratio of Working Age Population (15-64 years) to total population in "t",  $LFR_t$  is the ratio of labor force to working age population (this is, the participation rate), ROE is a measure of Returns to Education in Egypt, based on Psacharopoulos and Patrinos (2002), and  $SCH_t$  is the average years of schooling, obtained from Lutz. Et al. (2007)

Shares of capital in total output were obtained from Bernanke and Gurkaynak (2001).

Results for the Growth Accounting decomposition are shown in figure 5.1 and table 5.1.

Figure 5. 1: Growth Accounting Decomposition

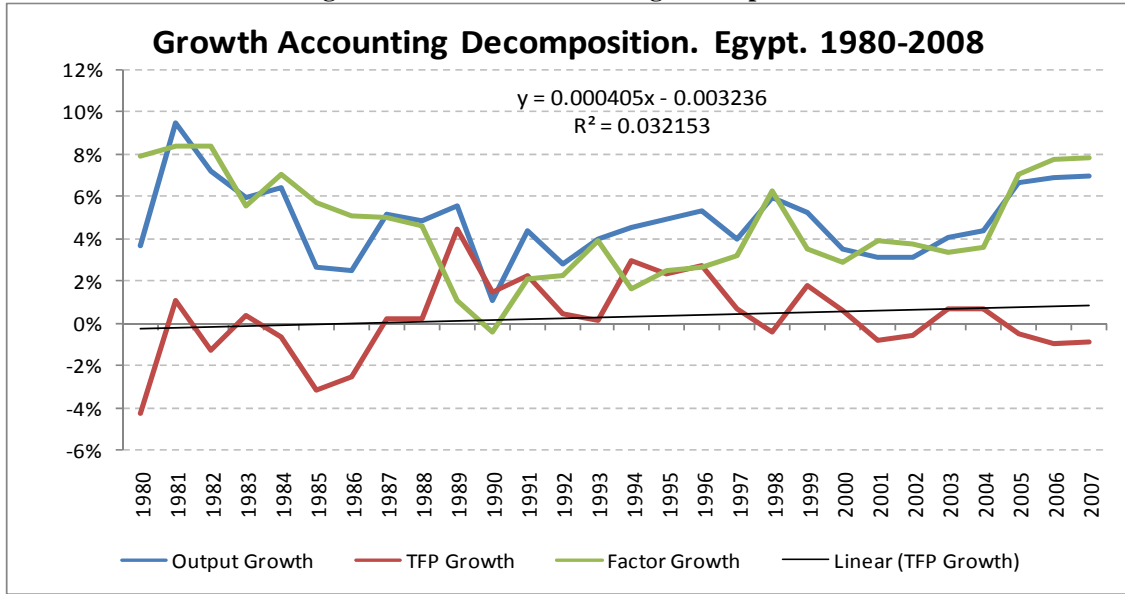


Table 5. 1: Contributions of Production Factors and TFP to Output Growth. 1990-2008

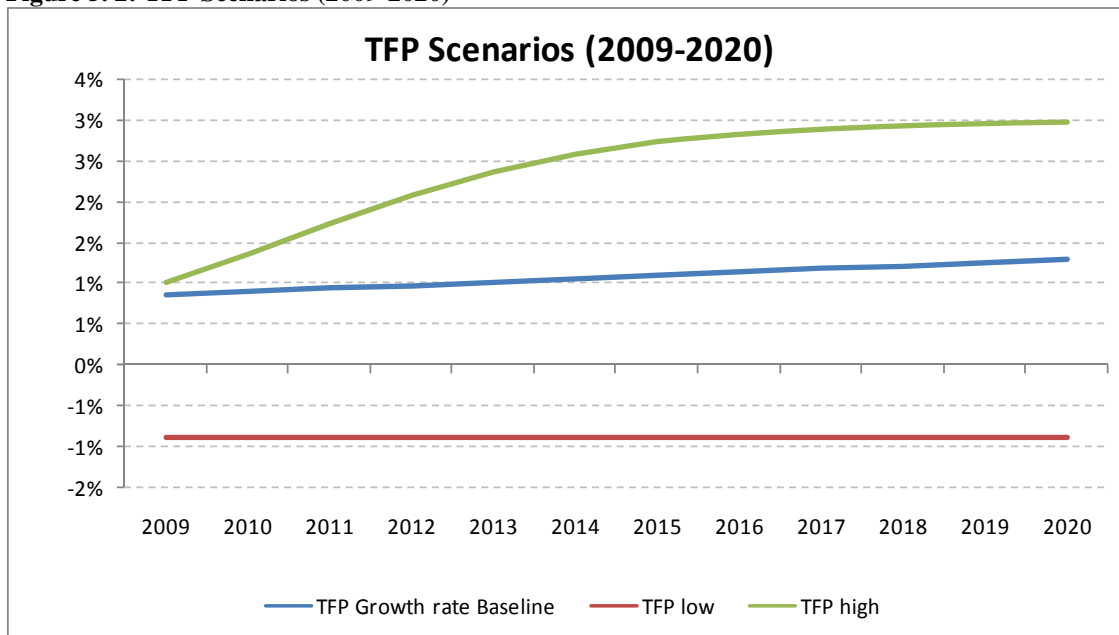
Year	Growth GDP	Capital	Human Capital	TFP	D0608
1990	5.5%	1.8%	-0.7%	4.5%	
1991	1.1%	1.1%	-1.5%	1.5%	
1992	4.3%	1.0%	1.1%	2.3%	
1993	2.8%	0.6%	1.6%	0.5%	
1994	4.0%	0.8%	3.1%	0.1%	
1995	4.5%	1.0%	0.5%	3.0%	
1996	4.9%	1.2%	1.3%	2.4%	
1997	5.3%	1.4%	1.2%	2.7%	
1998	3.9%	2.0%	1.2%	0.7%	
1999	5.9%	2.1%	4.2%	-0.4%	
2000	5.2%	1.9%	1.6%	1.8%	
2001	3.5%	1.6%	1.3%	0.6%	
2002	3.1%	1.6%	2.3%	-0.8%	
2003	3.1%	1.3%	2.4%	-0.6%	
2004	4.1%	1.3%	2.0%	0.7%	
2005	4.3%	1.5%	2.1%	0.7%	
2006	6.6%	1.8%	2.0%	-0.5%	3.3%
2007	6.8%	2.6%	1.9%	-1.0%	3.3%
2008	7.0%	2.9%	1.7%	-0.9%	3.3%

Source: Authors Calculations.

### **Estimations of growth rate of GDP for the period 2009-2020**

Growth rate estimates in Egypt for the period 2009-2020 are based in historical observed trends of productive inputs and assumptions on the behavior of TFP. Three scenarios for TFP are proposed: 1) A baseline, in which TFP growth rates follows historical observed trends. Under this scenario, TFP grows from 0.9 percent in 2009 up to 1.3 percent in 2020; 2) A low, fixed TFP growth rate one, based on most recent historical value of the variable equal to -0.9 percent; and, 3) A high TFP growth scenario in which the rate of growth of the residual moves from the 2009 linear trend estimation (“clean” of the effect of 2006-2008 capital inflows on output growth) calculated at 1 percent, towards a 3 percent target following a logistic approximation. (Figure 5.2).

**Figure 5. 2: TFP Scenarios (2009-2020)**



Source: Authors

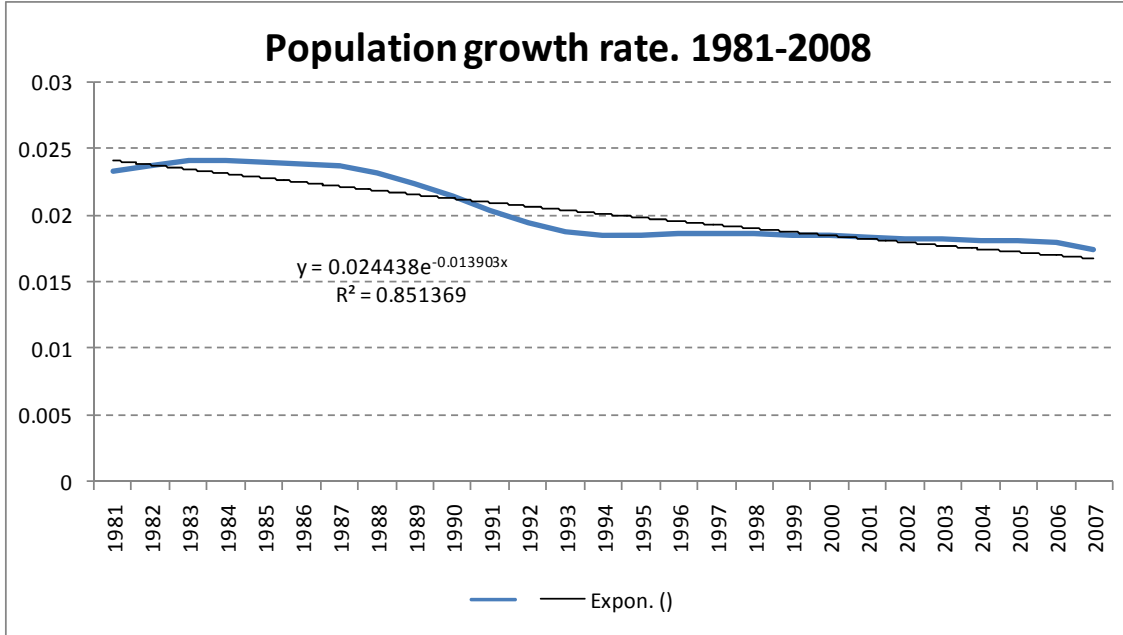
Human Capital estimations for 2009-2020 are based on historical trends of its components, namely: Population, the ratio of working age population to total population, participation rates, returns to education and the average years of schooling of population aged 15 and above.

Egypt is experiencing a demographic transition which has led to a decrease in the population growth rate from 2.3 per cent per year in 1980 down to 1.7 percent in 2008. In parallel, the fraction of working age population to total population has increased from 54.6 percent in 1980 up to 62.4 percent in 2008, leading to a period decrease in the age dependency ratio from 0.83 down to 0.60<sup>52</sup>. Egypt has also shown a recent, albeit small, increase in participation rates (fraction of labor force, working or not, to working age population) from 48.3 percent in 1998 up to 50.4 percent in 2008.

Population growth rate for the period 2009-2020 was estimated based on an exponential function that mostly picks up the observed demographic transition in Egypt (Figure 5.3). It should be acknowledged the simplistic representation of this demographic phenomenon. A more elaborated model that considers dynamics of fertility, mortality, patterns of migration and the age structure of population (such as the cohort demographic model) would better represent population changes over the analyzed period. Based on the exponential approach, population growth rate steadily decreases to a +1.4 percent in 2020. In the meantime, participation rate and the age dependency ratio use logistic approximations in which the variables move from 2008 observed ratios (50.4 percent and 62.4 percent, respectively) up to 52.1 percent and 65.1 percent each in 2020.

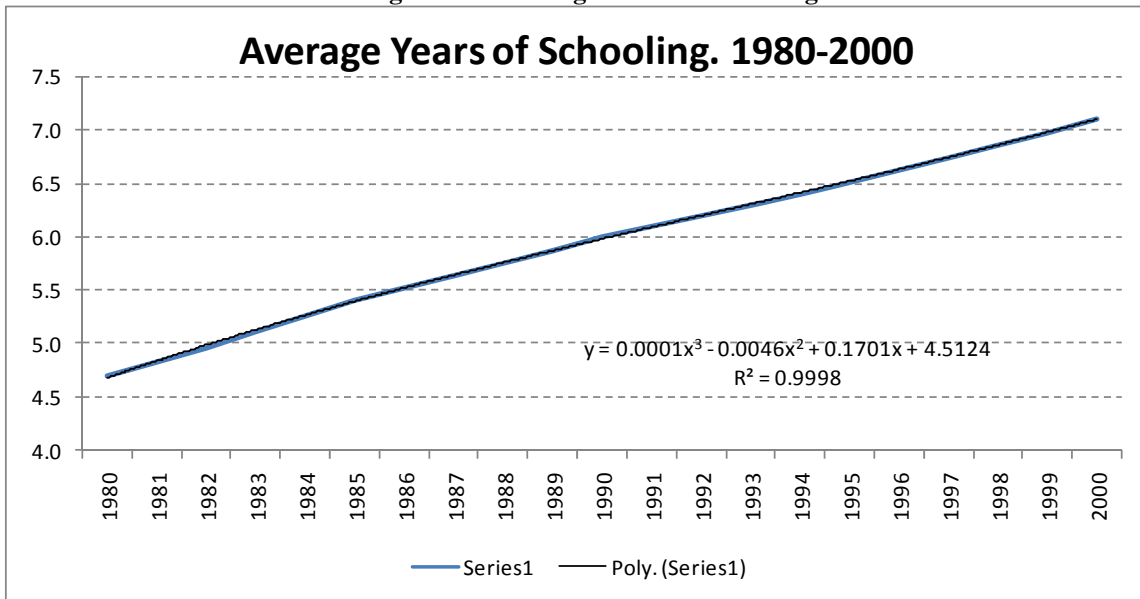
<sup>52</sup> The age dependency ratio is obtained as the ratio of child and old population (aged under 15 and above 64) to working age population.

Figure 5. 3: Population Growth Rate



Average years of schooling have been estimated following a linear trend, as observed in Figure 5.4. Constant returns to schooling are assumed throughout the period. Psacharopoulos and Patrinos (2002), based on Lambropoulos and Karadjia (1999) register an increase in the average number of year of education from 4.7 in 1980 up to 7.1 years in 2000. A linear approximation for the growth in the variable yields 8.3 years of education in 2008, and 10.5 years in 2020.

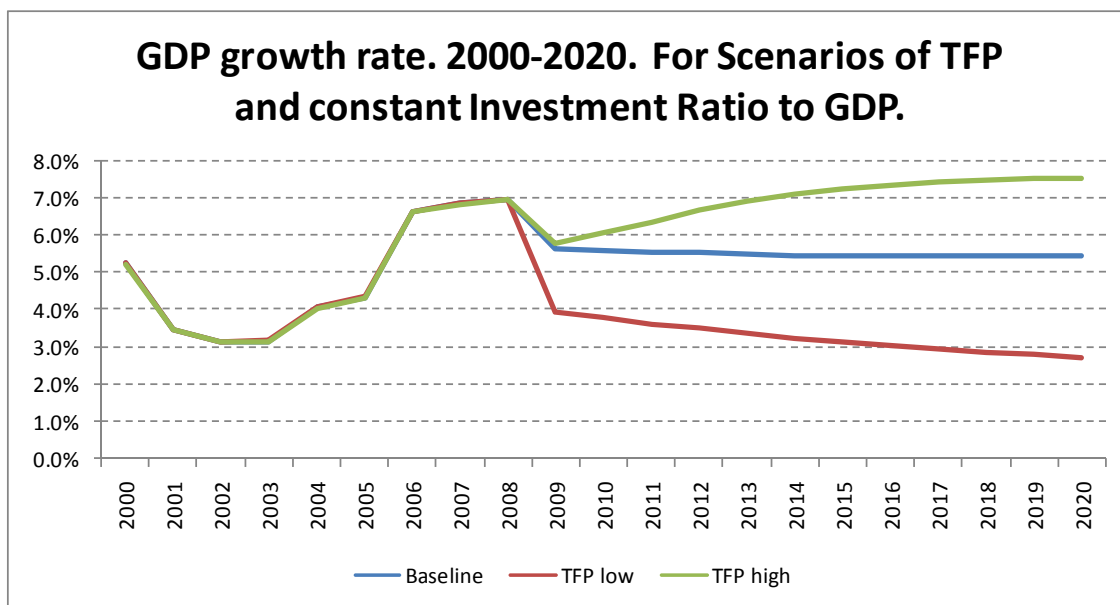
Figure 5. 4: Average Years of Schooling



It is assumed that the fraction of gross capital formation (investment) to GDP is constant throughout the period. This allows for estimating values of capital stock for the period 2009-2020, using the perpetual inventory method, under assumptions of depreciation rate equal to historical values (3.7 percent per year). This ratio of capital formation to GDP uses data in constant LCU, for current values of investment and 1 year lagged values of GDP, so the model can be solved in a recursive fashion. The ratio of current year's investment to last year's GDP was measured at 32.37 percent in 2008<sup>53</sup>.

Resulting estimates of the growth rate of GDP, for a Constant Returns to Scale production function are shown in Figure 5.5. It can be observed that, in a baseline scenario where TFP grows following historical (linear) trends, and the investment ratio to GDP is constant at observed 2008's, real GDP in Local Currency Units grows at a rate of around 5.5 per year during the period 2009-2020. A low TFP scenario yields a decreasing growth rate in total GDP to under 3 percent in 2020, whereas an increasing TFP scenario produces an output growth rate moving over 7 percent by the end of the next decade.

**Figure 5. 5: GDP Growth Rate 2000-2020 For Scenarios of TFP and Constant Investment**



<sup>53</sup> The ratio of current gross capital formation to current GDP was 30.20 percent in 2008. Notice that this ratio differs from the one calculated in current US\$. It has been observed across developing economies that the values of investments in local currency units tend to be higher than those measured in US\$.

## ANNEX 2: EGYPT AND THE CRISIS

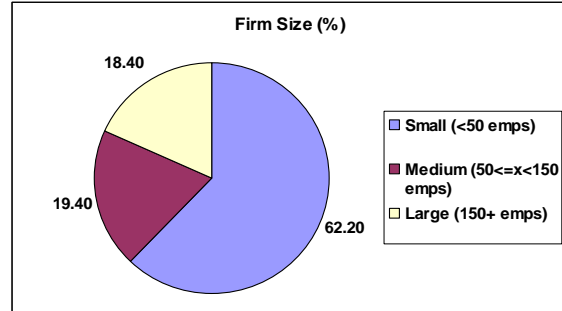


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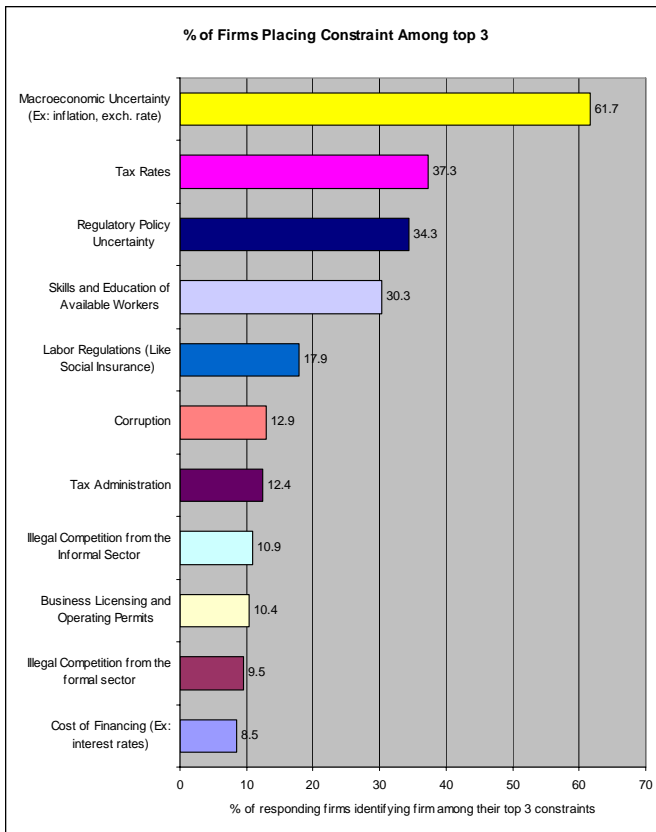
### ANNEX 3: IMPACT OF GLOBAL ECONOMIC DOWNTURN ON EGYPTIAN ENTERPRISES – RESULTS OF A WORLD BANK RAPID ASSESSMENT SURVEY<sup>54</sup>

A World Bank survey of 200 Egyptian enterprises in February 2009 suggests that the global economic downturn is already affecting the sales and decisions of Egyptian firms. As part of ongoing work for the Ministry of Investment to assess the investment climate, a brief, rapid survey was conducted in February 2009 to understand the recent experience and expectations of Egyptian firms in the context of the current global financial crisis and economic downturn. The sample included 101 manufacturing firms and 100 service sector firms, all of which had earlier been surveyed for the investment climate assessment (ICA) survey. The manufacturing sample is broadly representative of Egypt’s economy. However, the services sample is concentrated in tourism and construction, two sectors especially vulnerable to the economic downturn. Many domestic retail service sectors may be less affected by global conditions than these sectors. By size, the majority of enterprises were small, while around a fifth were medium-sized and another fifth large. The sample covered 15 sectors and seven governorates.

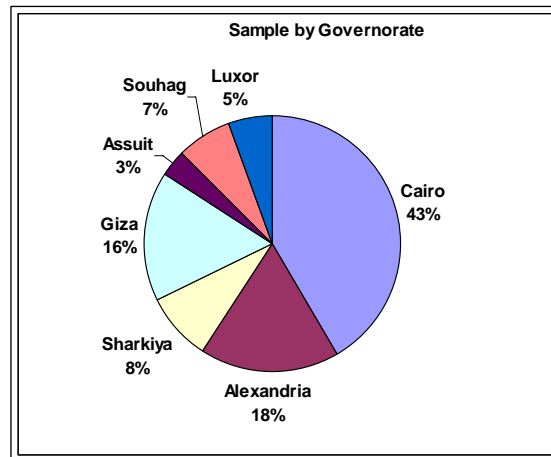
**Figure 9: Size distribution of Sample**



**Figure 10: Frequency of identification of constraints among top 3**



**Figure 11: Sample Distribution by Governorate**



<sup>54</sup> Prepared by Andrew Stone, [astone@worldbank.org](mailto:astone@worldbank.org).



**Figure 12: Leading Macroeconomic Constraint**

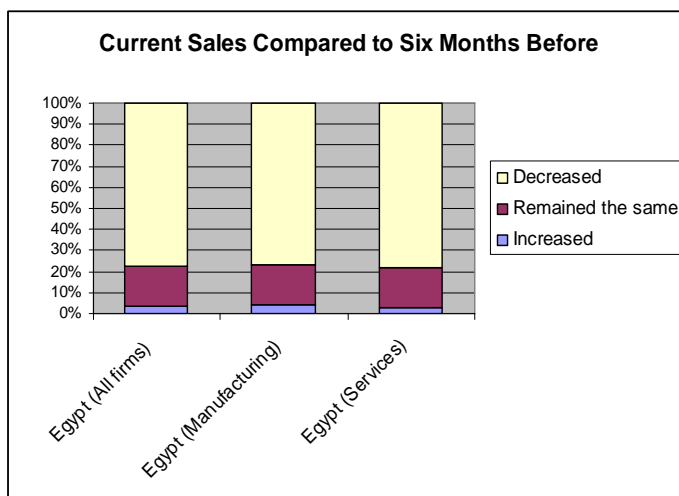
More than 4 in 5 of the enterprise managers interviewed say their firm has been directly affected by the global downturn. In this update survey, macroeconomic uncertainty figures as a top concern of 62% of surveyed firms. Firms split evenly over whether, within this constraint, inflation or reduced demand was the more serious problem. Other leading constraints included tax rates, regulatory policy uncertainty, and worker skills. By sector, manufacturing firms placed a higher priority on skills and illegal competition than services firms, while services firms emphasized macroeconomic uncertainty, tax rates, labor regulations and corruption more heavily than did manufacturing firms.

**Sales** Overall, 81% of firms report having been negatively affected by the global economic downturn. Small and medium firms (83% and 82% respectively) feel more negatively affected than large ones (72%). Building and construction (50%) is the sector that reports having been least affected so far. By governorate, firms in Souhag, Alexandria and Assiut report less impact than firms elsewhere.

**Table 10: Impact of the Crisis by Sector and Regionally**

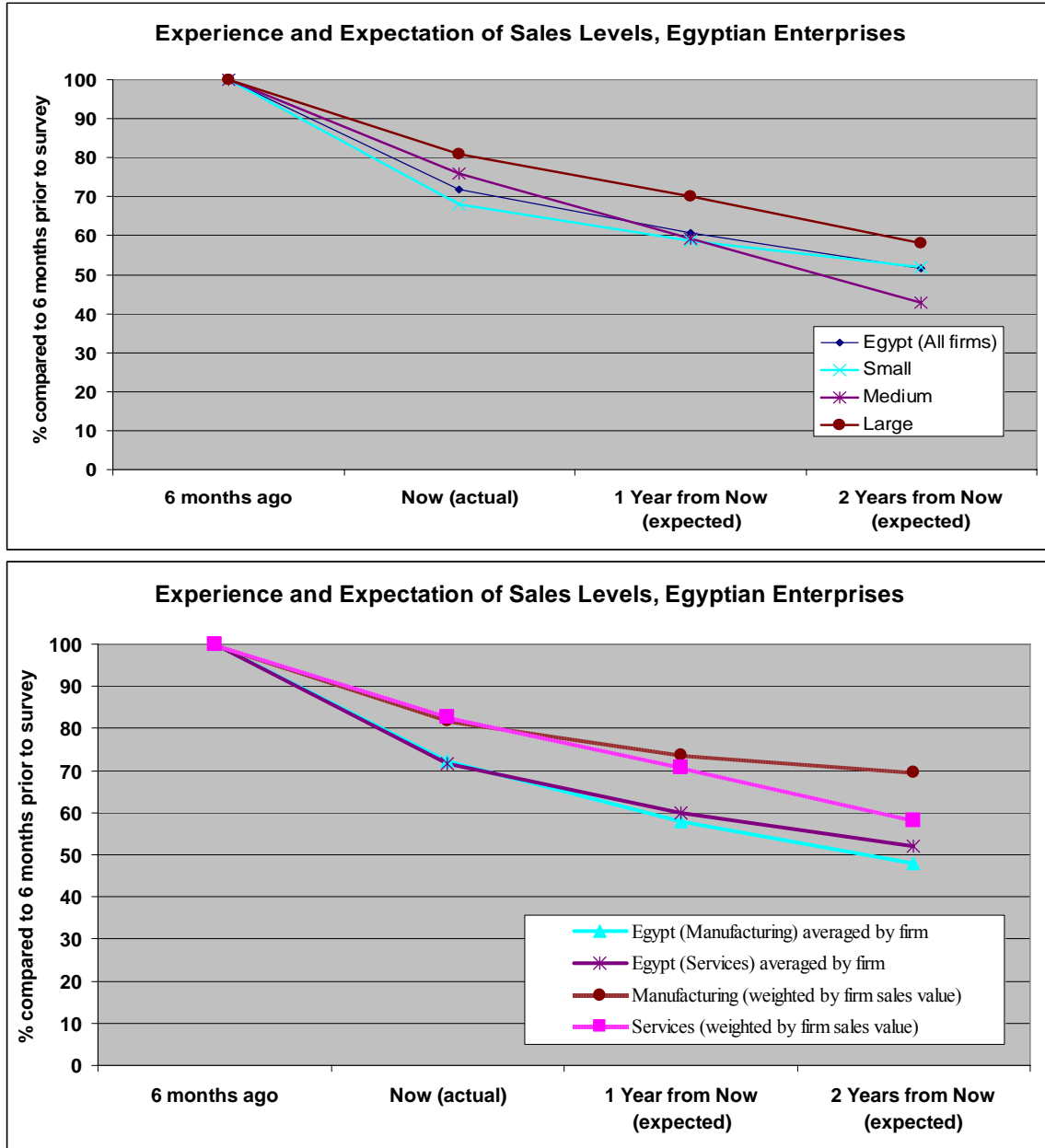
Table 1: Has your firm has experienced a direct impact from the global financial crisis or economic downturn? (%)	Garments	Textiles	Chemicals	Metal industries	Non metal industries	Building and constructions	Hotels	Tourism services	Restaurants	Cairo	Alexandria	Sharkiya	Giza	Assiut	Souhag	Luxor
	85.7	80.0	82.4	77.8	86.7	50.0	88.0	95.0	77.3	85.7	57.1	94.1	97.0	71.4	57.1	90.9

**Figure 13: Percent of Firms with Changes in Sales in Past 6 months**



Seventy-eight percent of firms reported that sales had fallen over the last six months. For the whole sample (accounting for the firms with stable or increased sales), the sales of an average firm fell 29% from six months ago. However, sales declined more for small firms, which suffered a 32% decline, compared to medium-sized firms, which experienced a 24% decline, and large firms, which reported a 19% decline. By sector, manufacturing firms experienced an average decline of 25.6% in sales, while service sector firms reported a decline of 26.1%.

Figure 14: Experience and Expectation of Sales Level, by size, sector, and sales-weighted



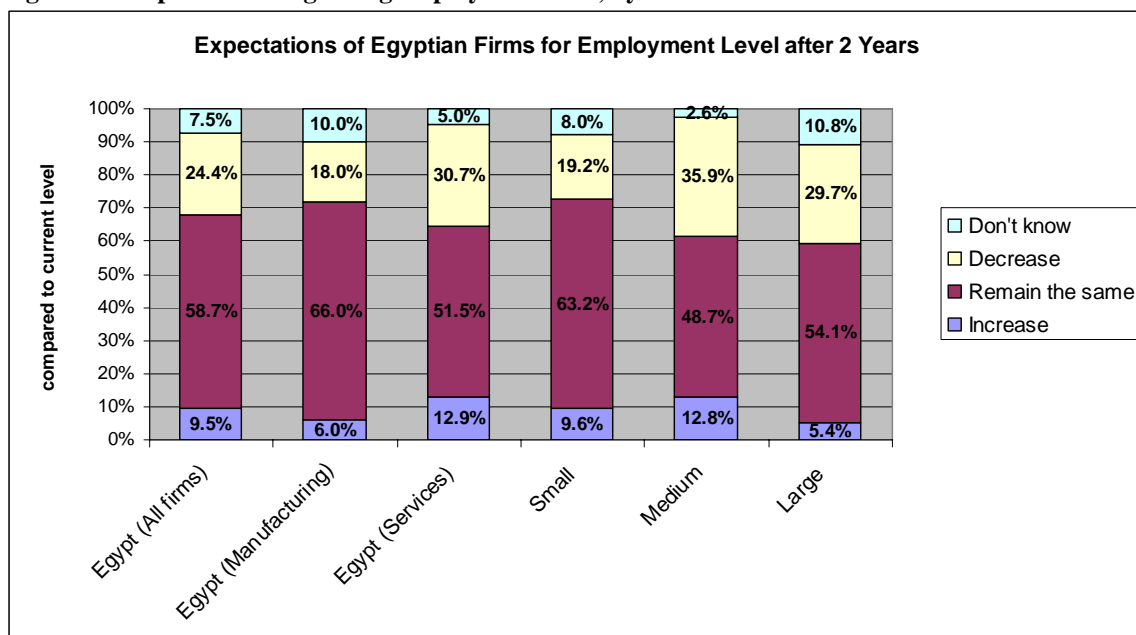
Expectations for future sales are also negative, with the average firm expecting a decline in sales of 15% for the coming year. The average manufacturing firm expected a 17% decline, the average service firm a 16% decline. Expectations for the next two years predict a continued fall, with a second year sales decline averaging 15% in the second year. Medium-sized firms are the most pessimistic. Two factors moderate this negative view. First, in terms of actual economic impact, the sales-weighted average of decline is less than the unweighted average – that is, in general, larger firms are more optimistic and have experienced a lower reduction in sales than smaller ones. Nonetheless, the magnitude of decline from six months ago to two years from now remains a drop of 30% for manufacturing firms and 40% for service firms. The second moderating factor is the fact, noted above, that much of the economy is not included in this estimate. Service sectors

outside of tourism, such as domestic retail trade, are likely to hold steadier than demand for tourism and construction. Government spending, as well, is likely to hold steady or increase.

Among 47 firms that export, 62% report that their exports have declined over the past six months, while only one firm (2%) reports an increase in exports. The average exporting firm experienced a 21% fall in exports. A majority of firms anticipate a further decline over the coming year. Accounting for both anticipated increases and declines, the average firm expects exports to fall 16% over the next year. Over the next two years, there is more uncertainty. Four of the 47 exporters expect an increase in exports, 12 expect sales to remain the same, 20 expect a decline, and 11 simply don't know. Weighting expectations about change for those who have a view, exports over two years are expected to decline by a net rate of 15%.

Six months ago, average capacity utilization among the firms surveyed was reportedly 70.5%. It was higher for large firms (77%) and lower for small and medium ones (67% and 70% respectively). By late February, average capacity utilization had declined overall to an average of 55% (58% for manufacturing firms). Respondents expect it to further decline over the next year to an average of 40%. For small firms, the average expectation is 34%, for medium 42% and for large 51%. In the last six months, inventories have remained the same for roughly half the sample, but have increased for roughly twice as many firms as those whose inventories have declined.

**Figure 15: Expectations regarding employment level, by sector and size**



## Employment

Employment has thus far declined for 23% of sampled enterprise over the past 6 months. Averaged over all enterprises, the typical firm has reduced employment by 5.6%. However, almost three quarters of firms have not changed their employment level. Over the next year, 22% of firms expect to decrease employment, 8% expect to increase employment and 66% expect it to remain the same (the rest don't know). Spread over the sample, this represents an average expected reduction in employment of 2.8%. Unfortunately, because larger manufacturing firms report having laid off more workers than small firms, if the average is weighted by the number of employees each firm has, then the employment picture is somewhat more negative (figure 9) However, for services, weighting by employment suggests a more positive employment outlook.

Figure 16: Employment Experience and Expectation, Average and Weighted by Firm Employment

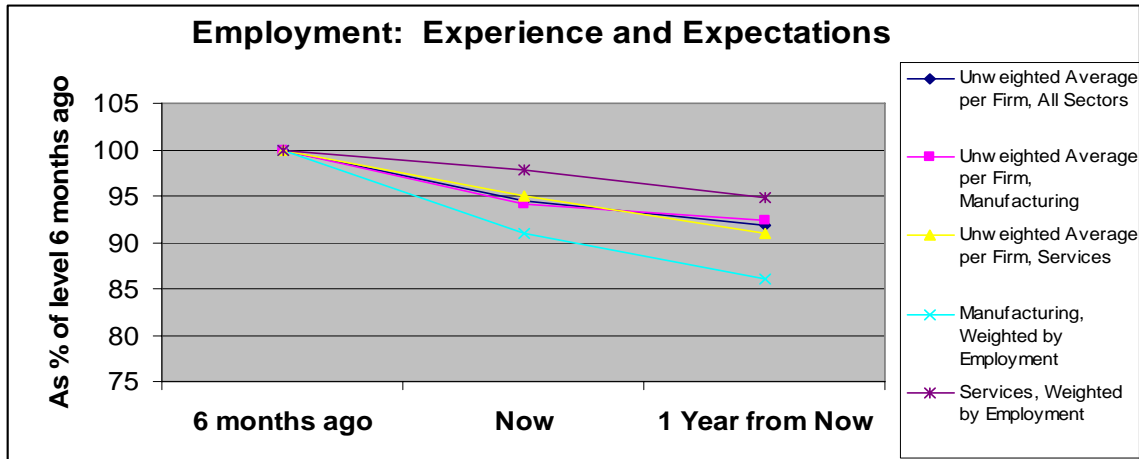


Figure 17: Investment Experience and Expectations, Manufacturing Firms.

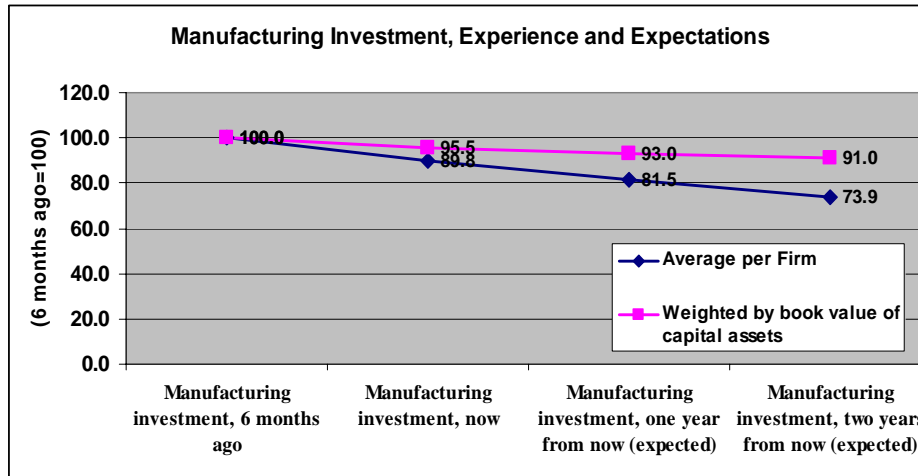
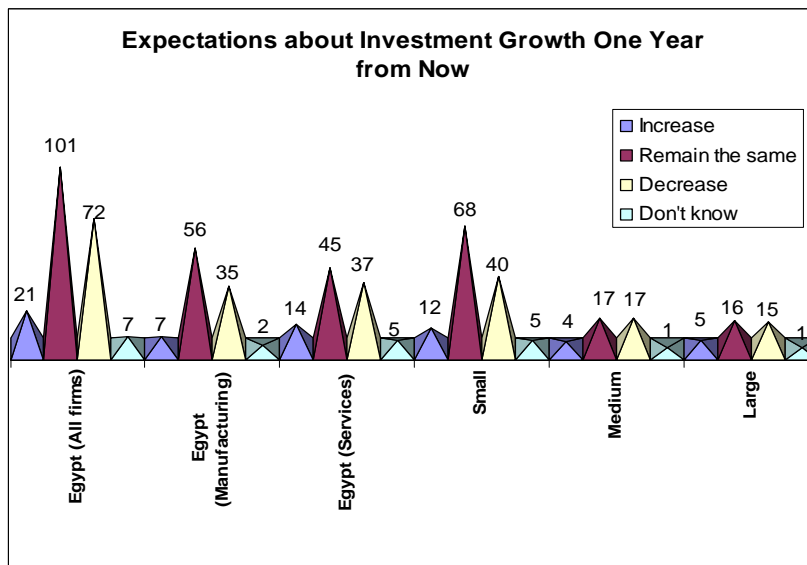


Figure 18: Expectations about Investment Growth after 1 Year



Among firms that expect to reduce employment, 68% believe that unskilled workers will be hardest hit, while 18% expect it will be skilled workers and 14% expect it to be management. 61% expect temporary and seasonal workers will be most affected, while 39% believe it will be permanent employees. Over the next two years, 9% of firms expect their employment to increase, 59% to stay the same, and 24% to decrease. A further 7% don't know

what to expect. Among the firms with expectations, the average expectation is for a decline in employment of 8%.

### **Investment and Finance**

Over the last 6 months, investment has held steady for the majority of the surveyed firms (59%), increased for 6% and declined for 35%. For the average firm, investment has declined by 8.6%. Over the next year, half of firms expect investment to hold steady, 10% expect an increase, and 36% expect a decline. (The rest don't know.) Averaging over all firms with an expectation, firm's collectively expect a decline of 8% in investment over the next year. Over the next two years, 48% expect their investment level to hold steady, 9% expect an increase, and 31% expect a decline (the rest don't know). However, if weighted by the book value of capital, the expected decline in investment is much smaller, about 9% in all.(figure 11)

About 7% of interviewed firms currently have a bank loan. This includes 4% of small firms, 8% of medium-sized firms and 19% of large firms. This low rate will surely mitigate the potential impact of a contraction of credit. 60% of all firms expect that getting a loan will become more difficult over the next year due to the global financial crisis. Financial volatility in the Gulf region is regarded as slightly less important, with 53% of firms regarding it as having a negative influence on their ability to get a loan over the next year.

### **Conclusions**

The great majority of surveyed Egyptian firms are already adversely affected by the global economic downturn and their expectations for sales; employment, exports and investment are overwhelmingly for no growth or decline over the next two years. As sales have on average declined, spending on labor and capital has declined relatively less, squeezing profits. This may explain why relatively fixed costs faced by firms, including payroll taxes for social security and other taxes, have elevated in importance as constraints. Two of the top three constraints (macroeconomic policy uncertainty and regulatory policy uncertainty) indicate a high sensitivity of enterprises to variation in or lack of clarity in public policy. Finally, the continued emphasis placed on labor skills suggests a long-term issue of importance that may be central to Egypt's future economic growth. Taken together this suggests a three part approach to supporting private sector development and recovery, which will be developed further in a later policy paper:

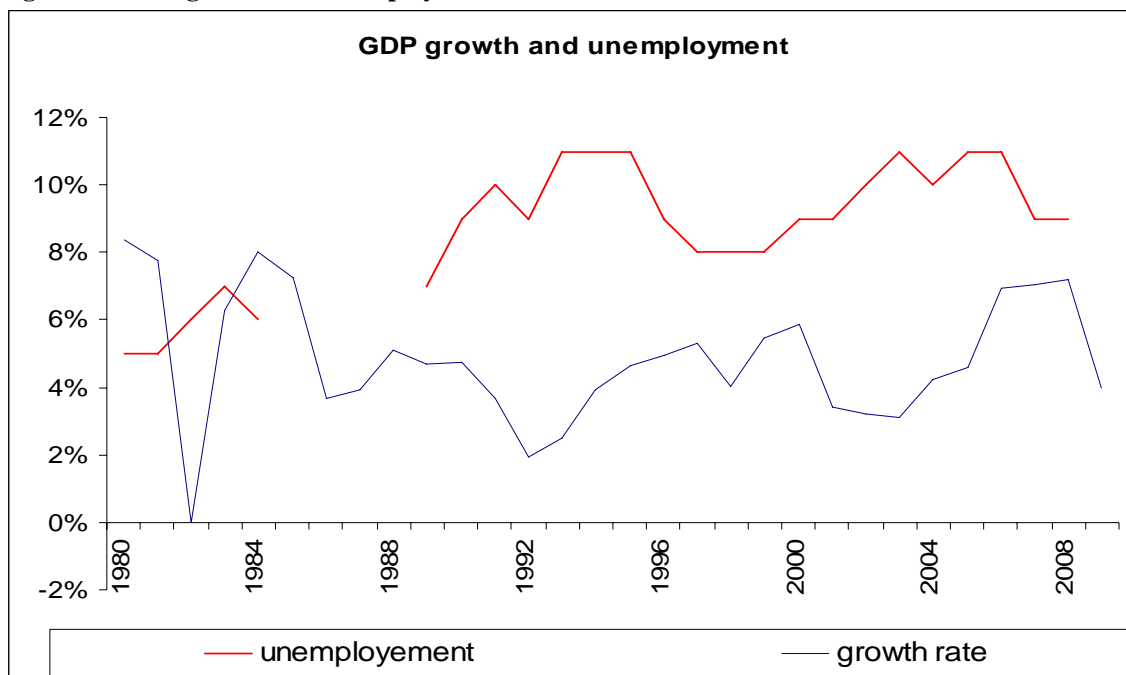
- Reduce policy uncertainty and improve predictability through a clearly announced, well-discussed strategy for macroeconomic and microeconomic policy reforms.
- Reduce fixed costs and regulatory rigidities where possible (e.g. through reduction of payroll taxes and labor market rigidities) to allow a more flexible response of firms to the downturn. International evidence strongly indicates that greater flexibility will actually help to better preserve employment and investment.
- Continue to work to reduce long-term bottlenecks in the economy, including worker skills and regulatory burden, and public sector governance.

## ANNEX 4

### PRELIMINARY ESTIMATES OF THE DYNAMIC RELATIONSHIP BETWEEN UNEMPLOYMENT AND GROWTH IN EGYPT

Figure 19 A1 shows the evolution of GDP growth and unemployment in Egypt for the period 1980-2008. It shows a rising trend in unemployment during the eighties that coincides with a downward trend in growth. After that period, the series stabilize but with clear negative associations, especially in the early and mid-nineties, as well as in early and mid-2000s.

**Figure 19: GDP growth and unemployment**



To estimate the relationship allowing for a dynamic interaction between both variables, regardless of the order of integration of the two series, we estimated an Autoregressive Distributed Lag (ARDL) model. Initially lags of up to 3 years were considered, but different model selection tests (Akaike, Schwartz, R-Bar squared) indicated a (1,0) model was preferred.

Table A1 summarizes the error correction model (short run dynamics), and Table A2 presents the long run estimates.

**Table 11: Short Run Dynamics of the relationship between Unemployment and Growth**

```

Error Correction Representation for the Selected ARDL Model
  ARDL(1,0) selected based on Schwarz Bayesian Criterion
*****
Dependent variable is dUNEMPLOY
22 observations used for estimation from 4 to 25
*****

Regressor      Coefficient    Standard Error   T-Ratio[Prob]
dGROWTH        -.29586        .12765           -2.3178[.032]
dC              .050390       .014076          3.5798[.002]
ecm(-1)        -.38263       .12537           -3.0520[.007]
*****

List of additional temporary variables created:
dUNEMPLOY = UNEMPLOY-UNEMPLOY(-1)
dGROWTH = GROWTH-GROWTH(-1)
dC = C-C(-1)
ecm = UNEMPLOY + .77322*GROWTH -.13169*C
*****

R-Squared          .39579          R-Bar-Squared    .33219
S.E. of Regression .0091957       F-stat. F( 2, 19) 6.2231[.008]
Mean of Dep. Variable .0013636     S.D. of Dependent Variable .011253
Residual Sum of Squares .0016066     Equation Log-likelihood 73.5545
Akaike Info. Criterion 70.5545      Schwarz Bayesian Criterion 68.9180
DW-statistic       2.1983
*****

```

**Table 12: Estimated Long Run Coefficients using the ARDL Approach**

```

ARDL(1,0) selected based on Schwarz Bayesian Criterion
*****
Dependent variable is UNEMPLOY
22 observations used for estimation from 4 to 25
*****

Regressor      Coefficient    Standard Error   T-Ratio[Prob]
GROWTH         -.77322        .37858           -2.0424[.055]
C              .13169        .019521          6.7462[.000]
*****

```