EGYPTIAN
NATIONAL
COMPETITIVENESS
COUNCIL

THE EGYPTIAN COMPETITIVENESS REPORT 2005-2006

CAIRO May 2006

ACKNOWLEDGMENT OF ERF AND DONORS

PREPARED BY:

The *Egyptian Competitiveness Report 2005-2006* was prepared under the auspices of the Economic Research Forum, which provided overall coordination as well as technical and administrative oversight for the preparation of the *Report.*

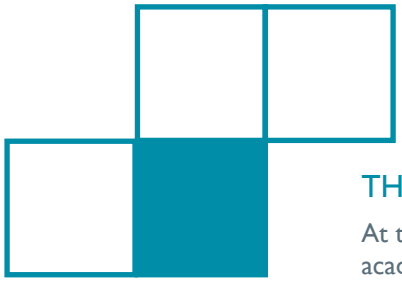
The Industrial Modernization Center provided funding for the technical writing of the *Report.*

The *Report* was printed through support provided by the Technical Assistance for Policy Reform II, a project of the U.S. Agency for International Development, under the terms of Contract No. 263-M-00-03-00006-00. and do not necessary reflect the views of the U.S. Agency for International Development.

The *Report* has been prepared in advance of the World Economic Forum on the Middle East, convened in Sharm El-Sheikh in May 2006, with the intent of stimulating discussion among policy-makers and leaders about the issues it raises and the policies it recommends.policy-makers and leaders about the issues it raises and the policies it recommends.

THE EGYPTIAN COMPETITIVENESS REPORT

2004-2005



THE EGYPTIAN NATIONAL COMPETITIVENESS COUNCIL

At the Egyptian National Competitiveness Council, leaders from business, academia, civil society and government collaborate to increase awareness of competitiveness and its economic implications for industry.

MISSION STATEMENT

The mission of the Egyptian National Competitiveness Council is to spur efforts to improve the competitiveness of Egypt and to incite the public opinion and the business sector to give priority to such efforts in all domains.

EXECUTIVE COMMITTEE

Hossam Badrawi	Dr. Hossam Badrawi Professor, Kasr El Aini Medical School, Cairo University Member of Supreme Council for Human Rights in Egypt	Chair
Helmy Abouleish	Executive Director, IMC	Vice Chair
Seifallah Fahmy	Chair, Al Mona	General Secretary
Aladdin Saba	Chair, Beltone	Treasurer
Shafik Gabr	Chair, Artoc	Member
Alaa Hashim	Chief Operating Officer, MAC	Member
Taher Helmy	Managing Partner of Helmy, Hamza & Partners (Baker & McKenzie)	Member
Iman El Kaffass	Associate Dean and Director Equal Opportunity and Student Leadership Development Program, AUC	Member
Nehad Ragab	Chair, Siac	Member

CONTRIBUTIONS

DIRECTOR AND LEAD AUTHOR

Samir Radwan,
Managing Director, ERF

EDITORIAL COMMITTEE

Amina Ghanem, Advisor to the Minister of Finance
Nihal El-Megharbel, Studies and Policy Support Unit Manager, IMC
Omneya Ramadan, ERF
Christine Shenouda, ERF
Ghada Nadi, ERF

AUTHORS

Chapter 1	Samir Radwan
	Omneya Ramadan
	Christine Shenouda
	Ghada Nadi
Chapter 2	Amina Ghanem
Chapter 3	Diaa Noureldin, Lecturer, American University in Cairo
	Manuel Albaladejo, International Consultant
	Nihal El Megharbel
Chapter 4	Manuel Albaladejo
Chapter 5	Ismail Serageldin, Director, Bibliotheca Alexandrina

TECHNICAL ADVISOR

Kevin X. Murphy, President & CEO, J.E. Austin Associates

STYLISTIC EDITOR

Carol Walker

DESIGNER

Corrie Blankenbeckler

TABLE OF CONTENTS

TABLE OF CONTENTS

CHAPTER 5 NURTURING INNOVATION: IMPROVING EGYPT'S CAPACITIES IN SCIENCE AND TECHNOLOGY

CONCLUSIONS: INSTITUTIONALIZING COMPETITIVENESS

LIST OF FIGURES

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TEXT BOXES

Executive Summary

The most urgent policy objective in Egypt today is to give citizens hope for their future and the future of their children. This requires reducing poverty, improving standards of living and creating better livelihoods for people. Achieving competitiveness is a prerequisite for meeting these objectives.

The *Egyptian Competitiveness Report* (ECR) is emerging as a regular publication that provides a comprehensive assessment of the competitiveness of the Egyptian economy. It monitors the annual changes in Egypt's ranking using many global indicators. It tracks ongoing reforms and provides recommendations to guide the policy-making process in light of the observed strengths and weaknesses. This year's ECR analyzes the change in rankings, presents an overview of government policy reforms and their impacts and focuses on a few major issues crucial to competitiveness, such as the role of industry and the importance of innovation.

The *Report* is divided into three parts: Part I presents multiple sets of competitiveness indicators that provide an overview of Egypt's competitiveness in many different dimensions (Chapter 1). This is followed by an attempt (in Chapter 2) to analyze the impact of ongoing reforms. Part II focuses on industry as a locomotive for growth. It begins in Chapter 3 with an analysis of industrial competitiveness, with special emphasis on manufacturing exports, while Chapter 4 examines the threat posed to Egypt in EU and MENA markets by China and Turkey. Part III looks to the future. In Chapter 5, a leading thinker, Ismail Serageldin, provides an assessment of Egypt's technological achievements and proposes a national innovation system. Chapter 6 cites the need to "institutionalize competitiveness" and

proposes restructuring the Egyptian National Competitiveness Council (ENCC) as a body that could monitor Egypt's competitiveness and engage broad sections of Egyptian society in a productive dialogue that would lead to a consensus on priorities for economic reform and a comprehensive approach to achieving sustainable economic growth and poverty reduction.

Egypt Competitiveness Rankings Reflect the Governments Macroeconomic Success

This year's ECR records notable improvements in Egypt's competitiveness rankings, which reflect the impact of significant economic reforms. The Government of Egypt should be commended for the very strong showing in Pillar 3 of the Global Competitiveness Index, "macroeconomy index," which made an impressive leap from 81st to 50th place. The Government's economic management team lowered inflation, lowered taxes and lowered tariffs. The ranking would have been even higher except for the low ranking related to the continued large government debt as a percentage of GDP, an issue the Government recognizes as an area of continued concern.

With regard to the other indexes, Egypt seems to be a typical example of a country at the first stages of development: it does well on the more basic requirements of institutions, infrastructure and the macroeconomy, whereas the scores worsen as one progresses to the more advanced pillars such as technological readiness, business sophistication and innovation. Egypt was especially weak in indicators related to basic human resources, where there is continued high adult illiteracy and where the productive sector reports that the educational system is not meeting the needs of the economy.

Egypt does not perform as well on Michael Porter's Business Competitiveness Indicator (BCI) which focuses on the "micro foundations of competitiveness." These include the sophistication of company strategy and operations and the quality of the business environment. The results indicate that major work must be done at the microeconomic level to improve the business environment if growth is to be sustainable. Indeed, the latest figures available indicate that Egyptian productivity has stagnated, suggesting that recent improvement in economic growth may not be sustainable without microeconomic reforms.

Egypt Has to Reverse Loss of Competitiveness in the Manufacturing Sector

Using the UNIDO Competitive Industrial Performance (CIP) Index, the *Report* also benchmarks the competitiveness of the Egyptian industrial sector. After growing in the 1980s and 1990s, Egyptian manufacturing exports have failed to drive the economy in terms of manufacturing value added and exports. Egypt's manufactured exports per capita remain quite low and these manufactured exports are largely resource-based or have a relatively low technology content. Egypt underperforms in medium- and high-tech exports which now account for more than 55 percent of world's trade and which are growing faster than low-technology exports.

The *Report* also explores the market and product diversification of Egyptian manufactured exports. Egypt managed to diversity its markets geographically, reducing its dependence on the EU while increasing its export presence in the MENA region and Sub-Saharan Africa, and continuing to export to the USA. This market diversification strategy may reduce Egypt's exposure to possible demand slowdowns in specific regions.

However, Egypt has not achieved product diversification and Egypt manufactured export concentration remains worrisome compared to many other countries. Egypt's top five manufactured exports accounted for 66.6 percent of total manufactured exports in 2004. What is more striking is that Egypt's product concentration has increased over time—in 1990 its top five manufactured exports accounted for 60 percent of the total. Furthermore, this product dependency is concentrated in resource-based products with petroleum-based clearly dominating the scene. Refined petroleum is Egypt's single major export to the US, the EU and the Middle East and North African region. Analysis included in this report shows that Egypt is vulnerable to export displacement by countries such as Turkey and China. If Egypt is to avoid losing ground, an appropriate industrial strategy is urgently needed. Such an industrial strategy, implemented through a comprehensive set of policies, must avoid the mistakes of failed industrial policies tried by other countries and focus on the approaches that have been successful among countries that achieved rapid industrialization and successful export development. The new focus of industrial policy will improve productivity while increasing employment. This will require a focus on improving the productivity of Egypt's human resources as well as its business environment. It will require attention to boosting private investment, both foreign and domestic.

Egypt Should Develop a "National Innovation System" That Bolsters Capacity in Science and Technology

Innovation has become a key driver of the competitiveness of nations. Innovation includes the ability to adopt and adapt imported technology to the development of new technologies, products and processes. Fostering innovation goes beyond simply boosting

Egypt's very low level of R&D compared to other countries. It requires a rich set of human resource systems. In his insightful contribution, Ismail Serageldin puts together a coherent vision for a "National Innovation System." This vision leads to a comprehensive framework beginning with the inception of ideas, translating ideas into reality and then moving them to markets.

The *Report* highlights the imperative of creating open tolerant societies, conducive to the nurture of questioning and critical thinking. Yet, he argues that this requires no less than a major revolution in the education system, for which curriculum reform is only a partial solution. Overall school atmosphere and teacher attitudes are just as important.

Having a climate that allows young people to generate ideas is a necessary but not sufficient condition for innovation. Egypt needs a solid base in science and technology (S&T). The development of an indigenous capacity in S&T is not a luxury, but an absolute necessity if Egypt is to realize its potential in the coming decades. This would include a variety of initiatives including human resources, centers of excellence, sources of technology finance and creating the digital libraries of tomorrow. It would focus geographically on industrial and high-technology hubs centered around Cairo and Alexandria. These could better attract both domestic and foreign investment. These hubs would become clusters including campuses, industrial parks and business incubators.

For the hubs to actually attract multinationals and allow for the effective technology transfer that Egypt needs, it is essential that they have a supply chain of young talent to draw on and to train, and that some of the alumni of such training – the more ambitious among them – would be encouraged to initiate their own start-up activities. Technological

incubators would support them with initial start-up loans, with the possibility of setting up their labs in a close-by campus atmosphere. Common services such as the legal, administrative, financial and auditing services could be shared in a way that would minimize the cost to young entrepreneurs and allow them to focus on their own technological businesses.

Institutionalizing Competitiveness: A Concrete Proposal for the Next Year

This year's ECR ends with a practical recommendation. Egypt needs to build consensus around a common vision. Therefore it is proposed that the **Egyptian National Competitiveness Council** bring together Egypt's private sector, public sector and civil society leaders to form a common vision and to unify action. The Council would advise the Government on competitiveness-related initiatives. It would set priorities, provide advice to the Government and monitor progress. It would make recommendations based on the latest data, the best expertise, and the insights among Egyptian experts from many parts of society, developing a set of measurable goals and a manageable set of priorities. Over the course of the next 12 months, a set of 8-10 key priorities for competitiveness would be addressed. Recommendations would be assembled over the next 12 months to form a comprehensive Egyptian national competitiveness strategy which would be included in next year's ECR.

During the year, the **Egyptian National Competitiveness Council** would foster dialogue among many groups in society and between these groups and government leaders who are equally committed to improving Egypt's competitiveness, productivity and living standards. The Council would also improve broader public understanding and support for

competitiveness-related reforms. It would also challenge the private sector to improve its competitiveness, recognizing that the private sector also needs reform and that many Egyptian companies and industries hold the key to prosperity and can reposition themselves in world markets. The Council would be open, inclusive and transparent, and would maintain a website useful to many.

Egypt's economic growth and competitiveness rankings have both improved thanks to bold macroeconomic and trade reforms recently implemented by the Government. However, it will only be sustained if these macroeconomic reforms are extended to focus on *microeconomic* reforms in the business environment. Piecemeal and incremental reforms will not be sufficient. There is a need for a comprehensive approach, informed by good data, inspired by best practices and supported by broad consensus. This in turn can be monitored annually by those who know that the real challenge comes with implementation.

ACRONYMS

BCI	Business Competitiveness Index
CAP	Capitalization
CASE	Cairo and Alexandria Stock Exchanges
CEO	Chief Executive Officer
CIP	Competitive Industrial Performance
DB2006	Doing Business 2006 (World Bank/IFC Report)
ECR	Egyptian Competitiveness Report
ENCC	Egyptian National Competitiveness Council
EOS	Executive Opinion Survey, conducted by the World Economic Forum
FDI	Foreign Direct Investment
FY	Fiscal Year. The Egyptian fiscal year starts July and ends June.
GAFI	General Authority for Investment and Free Zones (sic)
GCI	Growth Competitiveness Index
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
GFS	Government Finance Statistics
GIobal CI	Global Competitiveness Index
IAC	InterAcademy Council
ICT	Information and Communication Technology
IMF	International Monetary Fund
IPR	Intellectual Property Rights
L.E.	Egyptian Pound (Livre Egyptien)
MENA	Middle East and North Africa
MHT	Medium- and High-Tech
MNC	Multinational Corporation

MPU	Monetary Policy Unit
MVA	Manufacturing Value Added
n.e.s.	Not Elsewhere Specified
NIRs	Net International Reserves
PER	Public Expenditure Review
QIZs	Qualified Industrial Zones
R&D	Research and Development
ROSC	Report on the Observance of Standards and Codes
S&T	Science and Technology
SDDS	Special Data Dissemination Standards
SITC	Standard Industrial Trade Classification
SME	Small and Medium Enterprises
UNIDO	United Nations Industrial Development Organization
VNEs	Virtual Networks of Excellence
WEO	World Economic Outlook
WTO	World Trade Organization

COVER PAGE WITH DATE AND PLACE OF ISSUE

THE NATIONAL COMPETITIVENESS COUNCIL

CONTRIBUTIONS

Director and Lead Author	Samir Radwan, Managing Director , ERF
Editorial Committee	Amina Ghanem, Advisor to the Minister of Finance Nihal El-Megharbel, Studies and Policy Support Unit Manager,(IMC) Omneya Ramadan, ERF Christine Shenouda, ERF Ghada Nadi, ERF
Authors	Chapter 1 Samir Radwan Omneya Ramadan Christine Shenouda Ghada Nadi Chapter 2 Amina Ghanem Chapter 3 Diaa Noureldin Manuel Albaladejo Nihal El Megharbel Chapter 4 Manuel Albaladejo Chapter 5 Ismail Serageldin
Technical Advisor	Kevin X. Murphy, President & CEO, J.E. Austin Associates
Stylistic Editor	Carol Walker
Designer	Corrie Blankenbeckler

FORWARD

Dr. Youssef Botrous Ghaly
Eng. Rachid Rachid
Dr. Mahmoud Moheildin
Dr. Hossam Badrawy
Mr. Helmy Abouleish

Executive Summary

TABLE OF CONTENTS

ACRONYMS

INTRODUCTION

PART I: EXPLAINING EGYPT'S RANKINGS

PART II: INDUSTRIAL PERFORMANCE, DRIVER FOR COMPETITIVENESS

PART III: LOOKING TO THE FUTURE—BUILDING AN INNOVATION SYSTEM

CHAPTER 1
EGYPT'S COMPETITIVENESS RANKINGS

CHAPTER 1
BENCHMARKING EGYPTIAN COMPETITIVENESS[1]

1.1 Egypt's performance on the measures of competitiveness

This year's competitiveness rankings for Egypt reveal important recent trends in the economy and pinpoint strengths and weaknesses. Egypt's score on the Growth Competitiveness Index (GCI) improved from 62nd to 53rd place. Its ranking on the new Global Competitiveness Index (Global CI), which will soon replace the Growth Competitiveness Index, was similar, actually slightly higher at 52nd place.[2] The most impressive improvement was in the macroeconomic indicators, which advanced an amazing 31 points, from 81st to 50th place. Indeed, most of Egypt's rise in rankings came from this macroeconomic improvement. The Government of Egypt should be commended for its performance over the last 18 months for these impressive achievements that have been duly captured and registered in these competitiveness rankings. Unfortunately, Egypt still lags on the structural and microeconomic reforms related to improving the business environment, and the nation ranks only 71st on the Business Competitiveness Index (BCI). This Index, created and managed by Harvard University's Dr. Michael Porter, reveals that Egyptian companies rank 58th in terms of strategy and operations but that their competitiveness is inhibited by the quality of the business environment, which ranks only 74th. Finally, the report pinpoints specific problems with human resources related to education and training, as well as the lack of capacity for innovation-led growth.

1.1.1 Objective of competitiveness rankings: benchmark progress and inform dialogue

The Egyptian National Competitiveness Council (ENCC) presents this third annual Egyptian Competitiveness Report 2006 to benchmark Egypt's progress and performance. Just as a mirror shows the image of a person, these rankings reflect the image of a country over time. The report also seeks to inform government leaders as well as private sector, religious and civil society leaders by providing comprehensive and annually revised data and survey results that shed light on the many challenges facing the Egyptian economy. By doing so, it is hoped that this will stimulate the quality of private-public dialogue both by providing sound data and by highlighting priorities. Armed with better information, Government and private sector leaders can then explore the best ways to address the very complex challenges facing Egyptian society and build consensus around possible approaches to addressing these challenges.

[1] Samir Radwan, Omneya Ramadan, Christine Shenouda, and Ghada Nadi.
[2] This increase was captured in the Global Competitiveness Index more so than in the Growth Competitiveness Index. As the former will replace the latter, it is the more relevant.

1.1.2 Competitiveness: a priority for Egypt

Competitiveness can be defined as the productivity with which a country utilizes its human, natural and financial resources.[3] Leaders of the Arab world and the Government of Egypt have been focusing on competitiveness in recent years because it is now recognized that increased productivity and competitiveness are central to creating more jobs, enhancing the quality of jobs, achieving sustainable economic growth and improving the standards of living of a nation's citizens. Productivity is the key to growth in per-capita income and is the only long-term guarantee of improved livelihoods.

.

1.1.3 Limitations of the rankings

Competitiveness is a complex phenomenon that includes sensible macroeconomic management, sound public institutions, good infrastructure, trained human resources, functioning markets, reliable financial services, efficient government services, the capacity for innovation and even workplace ethics and cultural values. As a result, it is difficult for any one ranking alone to provide the complete picture. Furthermore, competitiveness rankings are not a precise measurement. They are indicators of relative magnitude and direction of progress.

Despite these limitations, the rankings are important. They give a rough indication of a country's competitiveness relative to other nations. They also indicate trends. The sub-indexes can point to weak points and strong points. The rankings provide qualitative feedback from surveys that supplement the quantitative data used by policy makers. For example, while governments have quantitative data on school enrollments, these rankings also provide qualitative data on how well educational institutions are producing the kinds of people needed in a rapidly changing economy.

1.1.4 A balanced picture through multiple competitiveness indexes

The World Economic Forum has for many years been presenting its Global Competitiveness Report (GCR). The most recent publication, for 2005-2006, presents three competitiveness indexes. The Global Competitiveness Index was developed two years ago and will replace the Growth Competitiveness Index, which has been a mainstay of earlier reports. Both will be featured below. They are supplemented by Michael Porter's Business Competitiveness Index. Michael Porter, who was recently voted the most influential business thinker in the world, has done the most to advance the understanding and measurement of competitiveness at the firm, regional, and national levels. As a double check and cross reference, other more limited indexes are also used for particular areas to either confirm or provide a second opinion in areas such as IT readiness or transparency. While any one index or ranking does not reveal the full story, taken together they can provide a complete picture, much as the many tiles on an Egyptian mosaic come together to form an overall picture which can then be observed and contemplated.

[3] Michael Porter, "Building the Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index" in the World Economic Forum, *Global Competitiveness Report 2005-2006,* page 69.

1.2 The Global Competitiveness Index

The Global Competitiveness Index is a newly improved aggregate measure that provides a comprehensive overview of nine competitiveness-related rankings. The nine sub-indexes or "pillars" of competitiveness are grouped into three categories that roughly relate to the major challenges facing countries at different levels of development. The **basic requirements** category refers to institutions, infrastructure, the macroeconomy and basic human resources (health and primary education). The **efficiency enhancer** category refers to higher education and training, market efficiency and technological readiness. The **innovation enhancer** category refers to business sophistication and innovation. The Global CI recognizes that constraints may differ for countries depending on their level of development. For example, basic infrastructure may be more important for countries at lower income levels than for countries already possessing advanced infrastructure. The 2005 Global CI includes 117 countries. As the Global CI was only instituted in 2004 and has undergone some change this year, the year-to-year results are not fully comparable. (See Table 1.1.)

Egypt ranks 52nd among 117 countries, with a very respectable score of 4.10, compared to a high of 5.85 for the USA and a low of 2.65 for Chad. The highest ranking Arab country was the UAR at 32nd place, with Tunisia the next highest at 37th. Jordan Qatar, Kuwait and Bahrain all ranked modestly higher than Egypt, while Morocco lagged at 76th place.

Egypt ranks fourth among economies with less than US$ 2,000 income per capita, adjusted for purchasing power parity. Among these countries, Egypt is preceded by China, India and Jordan. The three low-income East Asian economies scored relatively better on the innovation factors. India scored particularly well in this regard, ranking 26th out of all the ranked countries. This suggests that innovation factors, despite the minor weight accorded to them in the overall Global CI, feature significantly in shaping the competitiveness of the East Asian economies. Other East Asian countries also ranked favorably on innovation enhancers.

Table 1.1: The Growth Competitiveness Index

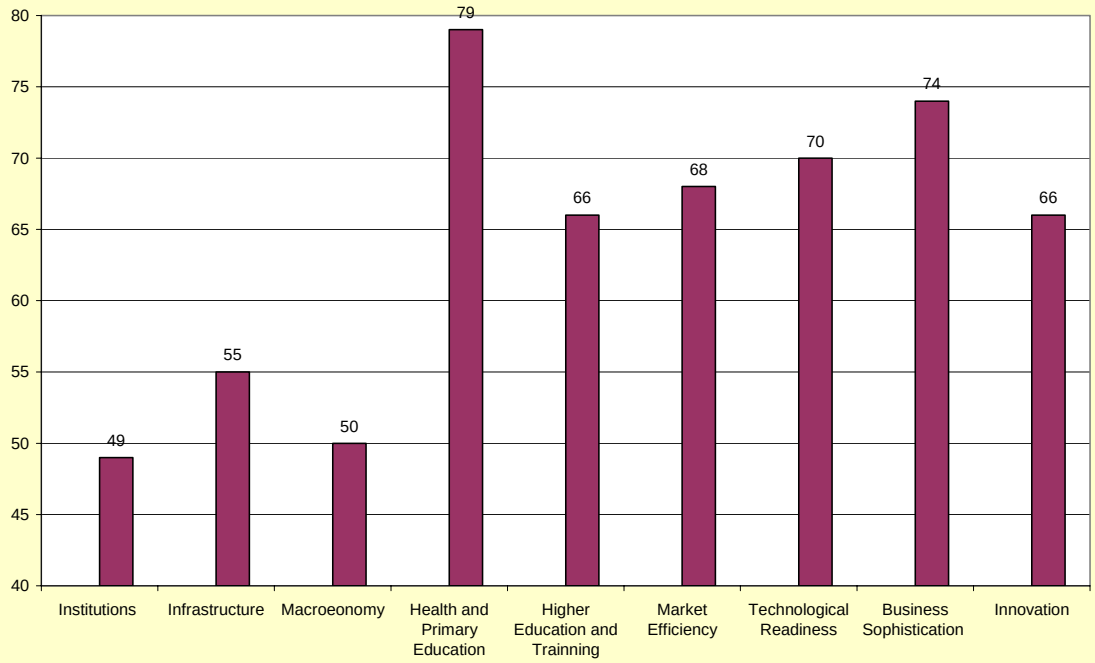
The Growth Competitiveness Index	**2005**	**2004**
Technology Index	***58***	***65***
Innovation	64	38
ICT	68	73
Technology Transfer	14	32
Public Institutions Index	***53***	***70***
Contracts and Law	45	57
Corruption	67	79
Macroeconomic Environment Index	***55***	***57***

Macroeconomic Stability	59	59
Government Waste	34	41
Country Credit Rating	64	63

1.2.1 Overview of Egypt's rankings on the nine pillars of competitiveness

Egypt's rankings on the nine pillars of competitiveness are shown in Figure 1.1 below. Lower numbers are desirable as they reflect Egypt's ranking among all countries listed. Egypt does well on the more basic requirements of institutions, infrastructure and the macroeconomy. Overall, the scores worsen as one progresses to the more advanced pillars such as technological readiness, business sophistication and innovation. Pillar number 4, health and primary education, is strikingly high, indicating that Egypt has a severe problem with its basic human resources that requires immediate attention. The educational system is not meeting the needs of the economy. This deficiency will be further addressed in Chapter 4.

Figure (--): Egypt's Ranking on the Nine Pillars of the Globlal Competitiveness Index

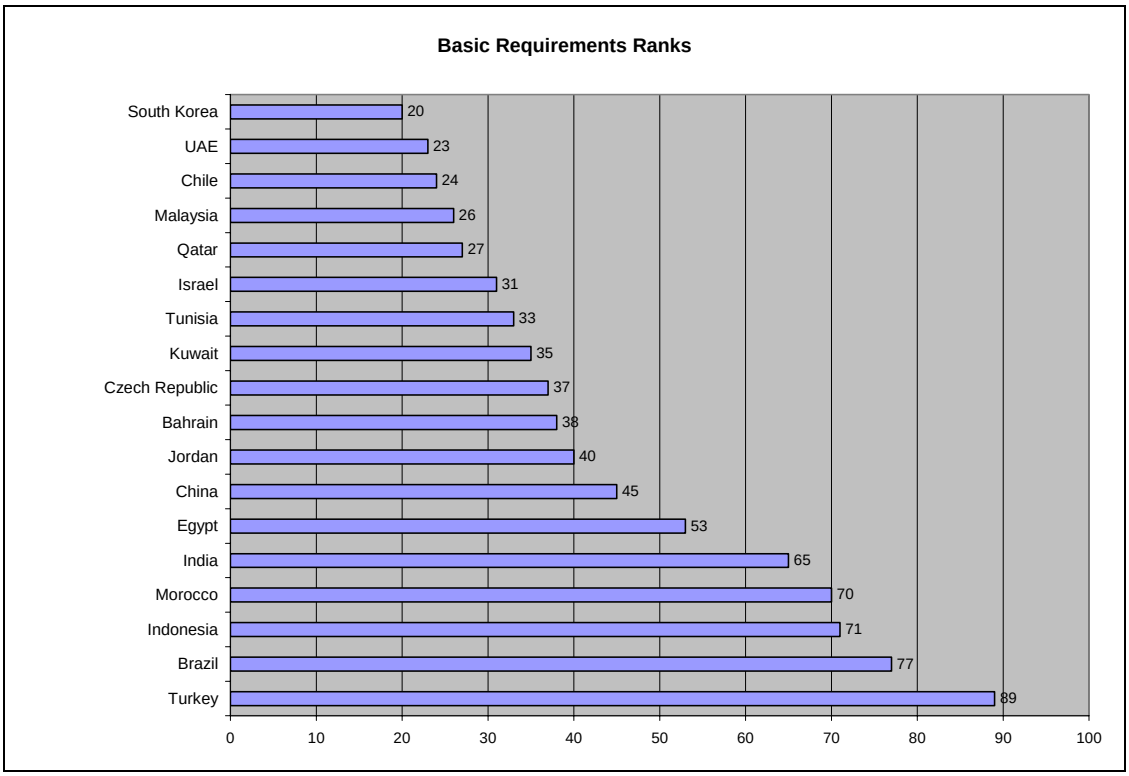


Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.

1.2.2 Basic requirements sub-index: Pillars 1-4

The Government of Egypt should be commended for the very strong showing in Pillar 3, "macroeconomy index," which improved impressively from 81st place to 50th. The Government's economic management team has introduced macroeconomic improvements that were instituted over the last 18 months and which have registered strongly in this index. However, among the components of this macroeconomic score, Egypt scored particularly low on government debt as percentage of GDP, and the fiscal deficit remains one of the macroeconomic areas of concern. Chapter 2 of this report will describe recent reforms in more detail and discuss the remaining challenges.

Although Egypt scored well on institutions (49th) and infrastructure (55th), it received a low score for health and human resources at 79th place. This low ranking suggests that human resources must be a priority if Egypt is to improve its productivity and competitiveness. This was the worst ranking among the four components included in the "basic requirements" pillar. It was also the worst ranking for any of the nine pillars. In Figure 1.2, Egypt's performance on "basic requirements" (Pillars 1-4) is presented compared to selected other countries.

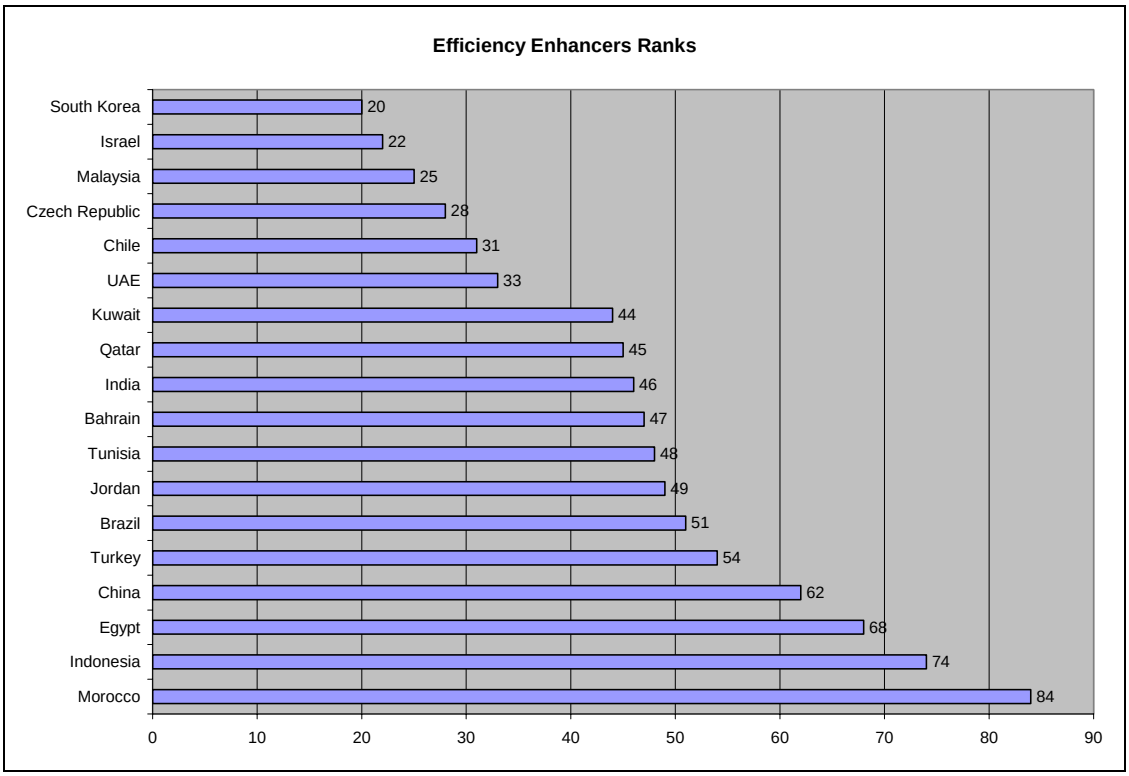


Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.

1.2.3 Efficiency enhancers sub-index: Pillars 5-7

Among the "efficiency enhancers," Egypt scored 66th for higher education, 69th for market efficiency, and 70th for technological readiness. 1.3 below shows the relative performance of Egypt in this category.

In the market efficiency pillar, Egypt ranks 84th on the number of procedures required to start a business. There are still some 13 procedures required. Egypt needs to work on facilitating the procedures required from and services available to entrepreneurs. Despite tariff reductions and financial reforms, the rank is still low regarding prevalence of trade barriers (105th), and soundness of banks (98th). The rankings may not have been able to show the impacts of recent tariff reforms. Egypt ranks 92nd on brain drain, which is part of the labor market efficiency (Pillar 6). There was major improvement in the indicator on "extent and effect of taxation" from 78th to 59th, which reflects the active role of the Ministry of Finance in lowering tax rates, expanding the base and facilitating compliance. Turning to the technological readiness pillar, Egypt's rank on FDI and technology transfer is 22nd, an improvement of 22 ranks.

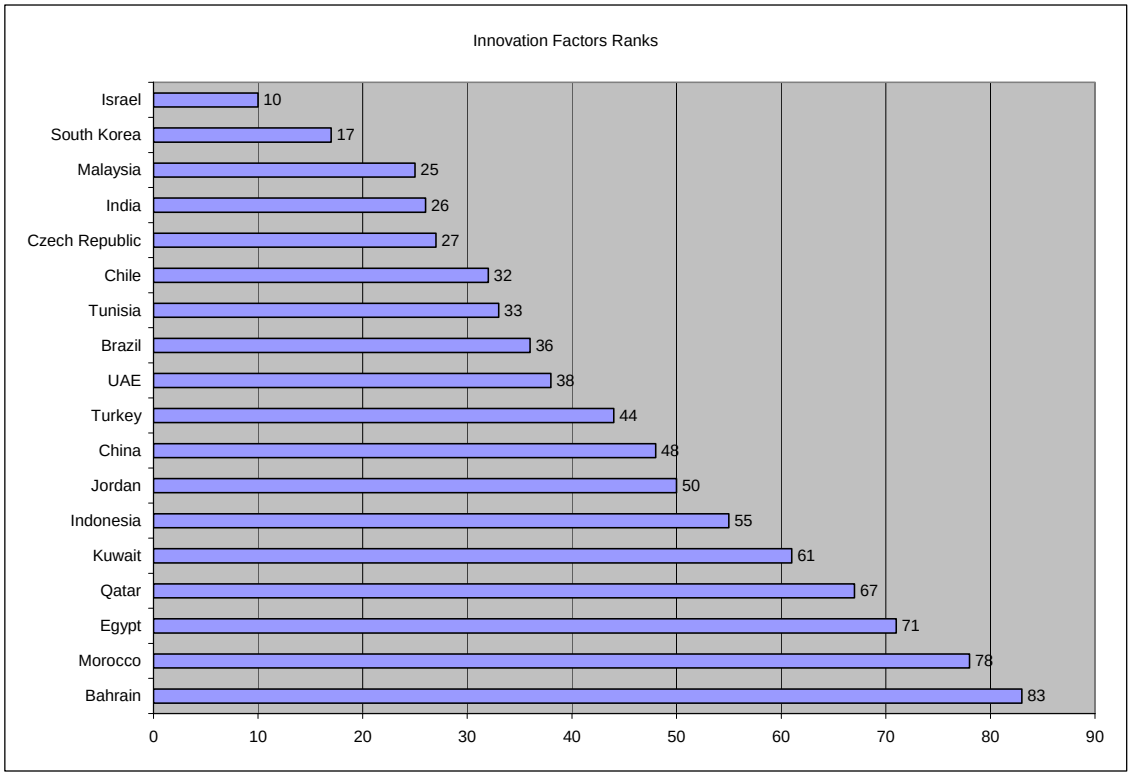


Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.

1.2.4 Innovation factors: Pillars 8-9

Although the third sub-index accounts for only 10 percent of Egypt's Global CI score, innovation factors are critical for leapfrogging at this stage.

Egypt ranked 71st in "innovation enhancers," reflecting relatively low scores on business sophistication and innovation. Dragging down the business sophistication score in the eighth pillar was the low score given to local supplier quality. The score for marketing was also remarkably low (83rd). Looking at the innovation pillar, Egypt ranks particularly low on government procurement of advanced technology products (93rd), despite the Government focus on the IT sector in recent years. In addition, although Egypt has an abundance of scientists and engineers (32nd), the quality of research institutions, spending on research and development (R&D), research collaboration between industry and universities, and capacity for innovation scored remarkably low. Egypt's ranking on the "innovation enhancer" pillar compared to select other countries is shown in 1.4 below.



Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.

Box 1.1: The Egyptian Digital Access Index

The Egyptian Digital Access Index reports on five sub-indexes: infrastructure, financial capability, knowledge, quality, and usage. The infrastructure index has experienced a remarkable rise, due to the increase in both landlines and mobile phone subscribers, where both exceeded 14 subscribers per 100 inhabitants. The number of internet users per 100 inhabitants has also increased from 1.59 in the first quarter of 2002 to 6.4 in the second quarter of 2005. In this regard, the “PC for every home” is an especially notable initiative: the number of PCs sold through that project reached nearly 109,000 in the second quarter of 2005.

Box 1.2: The 2005 E-Readiness Rankings Confirm These Findings

Egypt ranks 53rd out of 65 countries in the 2005 Economist Intelligence Unit e-readiness rankings.[4] (Table 1.2 shows Egypt's rank and score relative to select other countries.) The Middle East and Africa ranked last among six large regions of the world. Asia has 53 million broadband subscribers, the Americas 42 million and the Middle East and Africa region only one million. Egypt's score was actually lower than the Middle East and North Africa average, despite a common belief in Egypt's regional leadership.

Table 1.2: 2005 E-Readiness Rankings

	Rank	Score
South Korea	18	7.66
Israel	20	7.45
Czech Republic	29	6.09
Chile	31	5.97
Malaysia	35	5.43
Brazil	38	5.07
Turkey	43	4.58
Egypt	**53**	**3.90**
China	54	3.85
Indonesia	60	3.07

Source : Economist Intelligence Unit and IBM Institute for Business Value, *The 2005 e-readiness rankings: A White Paper from the Economist Intelligence Unit.*

Table 1.3 shows the scores of Egypt for the six different sub-categories. These scores reveal that Egypt's performance is mixed. Although the business environment score is remarkably high, Egypt's connectivity is very low and both consumers and businesses have been slow adopters. Meanwhile, in Korea, 75 percent of South Korean households subscribe to broadband services, and online shopping constitutes 12 percent of the country's total retail sales.

Table 1.3: Egypt's Scores for Subcategories of E-Readiness

Category	Score
Overall score	**3.90**
Connectivity (25%)	2.20
Business environment (20%)	5.48
Consumer and business adoption (20%)	3.65
Legal and policy environment (15%)	4.74
Social and cultural environment (15%)	4.00
Supporting e-services (5%)	4.25

Source: Economist Intelligence Unit and IBM Institute for Business Value, *The 2005 e-readiness rankings: A White Paper from the Economist Intelligence Unit.*

[4] Economist Intelligence Unit and IBM Institution for Business Value, *The 2005 e-readiness rankings: A White Paper from the Economist Intelligence Unit*

1.3 The Business Competitiveness Index

Despite its strong global and macroeconomic performance, Egypt ranks much lower (71st place) on the Business Competitiveness Index, indicating continued serious problems and constraints in the business environment at the structural and microeconomic level. The BCI is an index developed by the world's leading authority on the subject, Dr. Michael Porter. It has featured prominently the World Economic Forum's *Global Competitiveness Report.* Taking as a point of departure that productivity gains come from private sector companies and entrepreneurs, he measures the quality and sophistication of company strategy and operations and the quality of the national business environment. After years of research using sophisticated econometric tools and regression analyses, he has determined a weight of 20 percent on company strategies and operations and 80 percent on the quality of the national business environment.

At 71st place, Egypt ranks low on the BCI relative to other Arab countries. Egypt is placed well behind several comparable countries, such as the United Arab Emirates (UAE), which ranked 33rd; Tunisia (35th); Jordan (43rd); Qatar (44th); and Kuwait (47th). Among countries of the region, only Morocco placed lower, at 79th.

Why does Egypt perform worse on the BCI? There are two sub-parts of the BCI. It turns out that while Egypt ranks 58th on "company operations and strategy," it falls far behind on "the quality of the national business environment," at 71st place.

Much can be done by companies to improve the sophistication of their business strategies and the efficiency of their operations. The index focuses on a number of aspects of business operations, such as sophistication of production, regional sales, innovation, branding, marketing, and training. Egyptian firms can reposition themselves in world markets by extending their participation in the value chain, by identifying new market opportunities, by developing innovation-intensive products, adopting technology, harnessing R&D and strengthening the technical and managerial skill of their human resources.

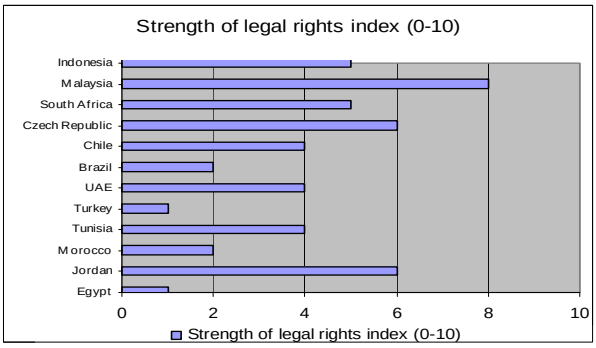
Urgent attention must now be focused on the structural and microeconomic reforms to improve the national business environment. As noted by Michael Porter in the *Global Competitiveness Report 2005-06*:

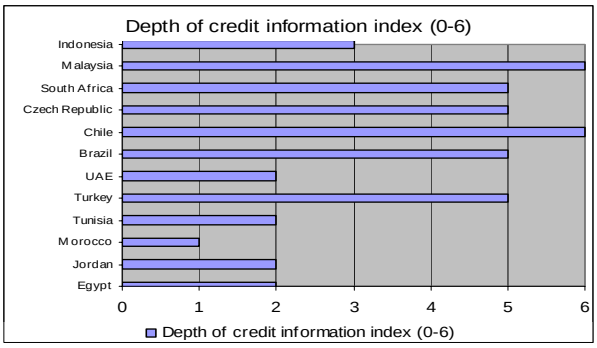
> Without micro reforms, growth in GDP induced by sound macro policies, market opening and privatization will be unsustainable or will not translate into improvements in GDP per capita. Conversely, appropriate micro reforms, which boost productivity and productivity growth, can greatly ease the challenge of meeting government's fiscal obligations and reducing macroeconomic distortions. Microeconomic reforms can also reduce the political pressure on governments trying to defend macroeconomic stabilization and market opening against vested interests.

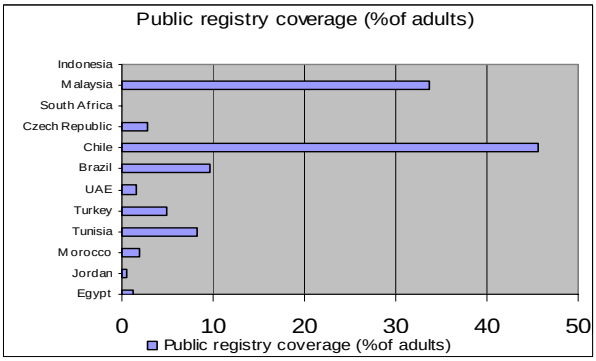
The microeconomic business environment level problems were documented by the World Bank, which ranked Egypt 141st out of 155 countries in the *Doing Business 2006 Report* (DB2006). The DB2006 surveys focused specifically on the *microeconomic* constraints to growth, such as starting a business, dealing with licenses, registering property, getting credit, corporate governance, commercial law enforcement and similar issues.

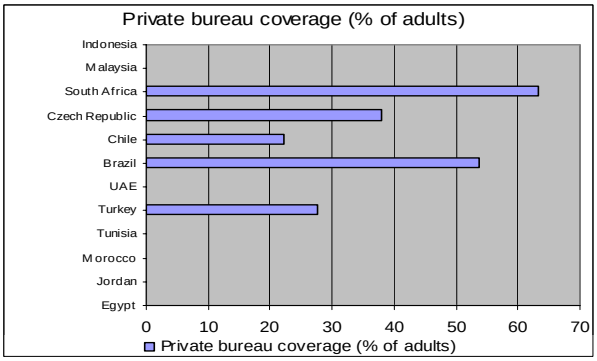
Although Egypt was one of the "top 6 reformers of 2004," the low scores indicate that much remains to be done. Reforms were made in simplifying business start-up procedures, registering property, financial access and reducing paperwork related to exports and imports. The Government cut the number of tariff bands from 27 to 6, triggered other improvements in customs procedures. Egypt established a single stop for trade documentation and merged 26 approvals into 5. Passage through customs procedures is now limited to 2 days, while inspection procedures at the border are now simplified. However, these reforms have been partial and there are major areas of structural and microeconomic reform that remain to be addressed.

Comparing the most severe microeconomic constraints from Egypt's *Competitiveness Report 2004/2005* with the DB2006 results, one finds much correlation, although the DB2006 relied on older data and may not have fully taken into account the reforms implemented in the last 18 months.









Source: World Bank, *Doing Business 2006*,

Indicators of access to financing or credit were taken to be represented by strength of the legal rights index, which measures the degree to which collateral and bankruptcy laws facilitate lending, and the depth of credit information index, which measures rules affecting the scope, accessibility and quality of credit information available through public and private bureaus. (See Figures 1.5 through 1.8.) Consistent with the findings of *Egypt's Competitiveness Report 2004-2005*, Egypt seems to be performing weakly in terms of access to finance, as it scored the lowest among comparison countries.

In terms of bureaucratic procedures (the fourth most problematic factor for doing business in Egypt, according to the Executive Opinion Survey used in the GCI), Egypt did not perform favorably by comparison to other countries in the number of procedures and the number of days to obtain a license, and it scored worst in the number of days to register property (see Table 1.4 below).

Indicators of the most problematic factors of Doing Business in Egypt

		Egypt	Jordan	Morocco	Tunisia	Turkey	UAE	Brazil	Chile	Czech Republic	South Africa	Malaysia	Indonesia
Access to Financing	Strengths of legal right index (0-10)	1	6	2	4	1	4	2	4	6	5	8	5
	Depth of credit information index (0-6)	2	2	1	2	5	2	5	6	5	5	6	3
Tax Regulations	Payments (number)	39	10	28	31	18	15	23	8	14	32	28	52
	Time (hours per year)	504	101	690	112	254	12	2600	432	930	350	--	560
Tax Rates	Total Tax Payable (% of gross profit)	32.1	39.8	54.8	52.7	51.1	8.9	147.9	46.7	40.1	43.8	11.6	38.8
Inefficient bureacracy	Procedures to start a business (number)	10	11	5	9	8	12	17	9	10	9	9	12
	Time to start a business (	34	36	11	14	9	54	152	27	40	38	30	151
	Procedures to obtain a license (number)	30	17	21	21	32	21	19	12	31	18	25	19
	Time to obtain a license (days)	263	122	217	154	232	125	460	191	245	176	226	224
	Procedures to register property (number)	7	8	3	5	8	3	15	6	4	6	4	7
	Time to register property (days)	193	22	82	57	9	9	47	31	123	23	143	42

* All data are as of January 2005. **The cells highlighted in pink indicate where Egypt scored lowest among comparators

Source: *Doing Business Indicators 2006*

1.4 The Growth Competitiveness Index

The Growth Competitiveness Index (GCI), although superseded by the Global CI, provides useful historical trend data that is especially relevant to technology and innovation. A few highlights will suffice. Egypt's score improved from 62nd to 53rd on the overall index. The three sub-indexes on technology, public institutions and macroeconomic environment all fell within a similar range, scoring 58, 53 and 55 respectively. The higher scores reflect the strong macroeconomic picture, confidence in institutions and strength in technology transfer.

1.4.1 The technology sub-index

Egypt ranked 14th in technology transfer among countries not considered to be "core innovators." The rank would be equivalent to 29th for rankings that include all countries. The technology transfer sub-index is an unweighted average of two survey questions investigating the role of foreign direct investment and foreign technology licensing as sources of new technology in the country.

On the ICT front, Egypt has advanced by five ranks from 73rd to 68th. Yet, given the sensitivity of the indicators, a movement of five places up or down is not considered to be significant, and Egypt was ranked 69th the year before. The constant ranking around the 70th position can be justified by the large weights given to the indicators based on hard data.

On the innovation sub-index, Egypt has plummeted twenty-four places, from 38th to 64th. The index is a weighted average of survey data (given a weight of 1/4) and hard data (given a weight of 3/4). Two of the survey data investigate the extent to which companies expend money and collaborate with universities on R&D activities. On both survey questions, Egypt's position is quite unfavorable (73rd on R&D expenditure and 81st on university/ industry research collaboration). Egypt ranked 50th in the ability of firms to absorb foreign technology. This indicates that while Egypt has been good at licensing technology, it has not been as good at developing home-grown technology and lacks the potential to innovate. Egypt still has a lot to do beyond technology transfer if it is to develop a robust competitive edge. A more in-depth analysis of the prospects for innovation in Egypt is in Chapter 4. Also, Dr. Ismail Serageldin, a noted Egyptian expert whose work has been influential worldwide, has presented a separate article proposing a framework for an Egyptian innovation system that would strengthen capacities for science and technology.

1.4.2 The public institutions sub-index

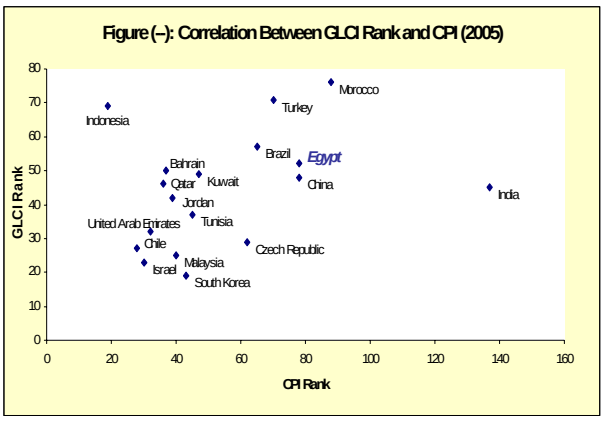
Institutions are believed to play a significant role in driving the competitiveness of a country. The public institutions index was thus placed as one of the determinants of growth competitiveness in the GCI. The index is comprised of two sub-indexes, namely the contracts and law sub-index and the corruption sub-index, which are assigned equal weights.

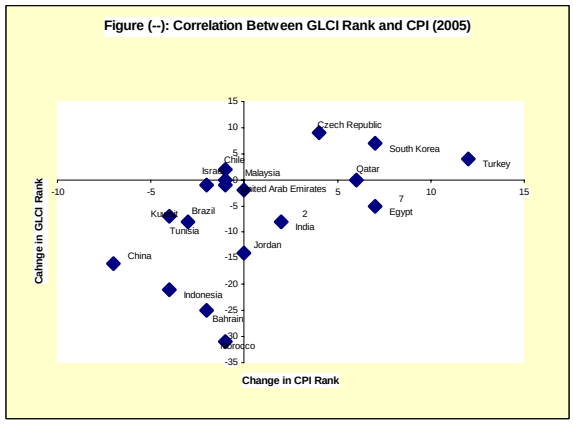
Box 1.3: Corruption Perceptions Index

First issued 1995 by Transparency International, the Corruption Perceptions Index (CPI) is a survey-based indicator that attempts to measure the extent to which corruption is believed to exist among politicians and public officials. The index defines corruption as "the abuse of public office for private gain." Surveys are conducted by a number of prominent international institutions, such as the Economist Intelligence Unit, Columbia University, and the International Institute for Management Development. The CPI includes views of country analysts and business leaders (residents and non-residents). The index assigns scores from 0 to 10, where 0 is "highly corrupt" and 10 is "highly clean."

The 2005 CPI ranks 159 countries (up from 146 in 2004). Egypt's rank improved from 77 in 2004 to 70 in 2005, while its score improved from 3.2 to 3.4. Since 1998, Egypt's score has fluctuated, but since 2001, it has been declining, with the exception of 2005. It is anticipated that the score will improve in the coming years, provided that institutional measures are taken to support the fight against corruption.

As revealed in Figure 1.9, it seems that countries with higher ranks on the CPI usually also rank high on the Global CI, which might be an indicator of a negative correlation between a country's competitiveness and its perceived level of corruption. Moreover, a closer look at the change of ranks of these countries from 2004 to 2005 on both the CPI and Global CI (See Figure 1.10) shows that in most cases (with some exceptions, including Egypt), a positive rank change in one indicator comes with a positive change in the other.





Sources: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.

Egypt performance on institutions rose from 70th to 53rd place, however this was due in part to the absence of the "judicial independence" sub-index where Egypt scored poorly last year at 98th place. On the contracts and law index, Egypt advanced from the 57th to the 45th rank. The sub-index depends on four survey data that inquire on judiciary independence, clear delineation and protection of property rights over financial (and other) assets, neutrality of selection in public biddings, and the effect of organized crime on businesses. Egypt has retreated by 17 places on the property rights index (now ranking 57th) and 10 places on the organized crime index (ranking 42nd). However, there

was a 13-place improvement in "favoritism in selection of government officials." All survey questions are assigned equal weights.

On the corruption index, Egypt has restored its 2003 position, by moving from the 79th to the 67th rank. This can be attributed to the improvement witnessed on the survey question related to irregular payments to public utilities, where Egypt moved from the 93rd to the 70th position. The Corruption Perceptions Index, released by Transparency International, indicates a similar improvement in corruption perceptions in Egypt (see Box 1.3). This result would seem to be at variance with low scores on other indexes related to the quality of the business environment such as the BCI and DB 2006 report, in part because they may be measuring different things in slightly different ways.

1.4.3 The macroeconomic environment sub-index

Egypt has been ranked as 55th up from the 57th last year on the macroeconomic environment. This index comprises a set of hard and survey data within three sub-indexes: the macroeconomic stability index, the government waste index, and country credit rating index. The two survey data included in the macroeconomic stability sub-index examine recession expectations and access to credit. There has been a remarkable reversal in businessmen's expectations of recession, with Egypt advancing from 86th to 40th place. This is also confirmed by other surveys such as the Egypt "Business Barometer" (see Box 1.4). Economic growth has in fact been gaining momentum recently.

Access to credit still features high among constraints to business growth. This year, Egypt's rank has deteriorated from the 66th to the 95th position. This may reflect increased wariness on the part of banks after episodes of non-performing loans or the transition taking place in the financial sector. The lack of universal credit risk reporting on all companies and individuals means that collateral and good family connections are often more important than one's credit history when seeking to secure credit. This in turn limits access to finance for small- and medium-sized enterprises and new or young borrowers.

The other sub-index relies on hard data related to government deficits, the national savings rate, inflation, the real effective exchange rate and the interest rate spread. All pertain to 2004 and do not reflect recent macroeconomic improvements.

For example, the inflation indicator deteriorated forty-two places (from 52nd to 94th), although inflation has since gone down in Egypt. Egypt scored high on the real effective exchange rate index, coming out in 4th place. The index measures the real effective exchange rate in 2004 relative to the 1997-2003 average. Finally, Egypt's rank on interest rate spread declined from 51st to 57th, where spread in 2004 was estimated to be 5.7 as opposed to 5.3 in 2003. The interest rate spread is an indicator of the difference between deposit rates and loan rates and is also an indicator of financial sector efficiency. The institutional investor country credit rating, based on hard data, remained more or less the same at 64th place. The survey question on whether the composition of public

spending in a country provides necessary goods and services not provided by the market reflects a positive business perception; Egypt moved up from 41st to 34th place.

Box 1.4: The Business Barometer: Growth Expectations on the Rise

The Business Barometer is a biannual monitor of the state of economic activity in Egypt, published by the Egyptian Center for Economic Studies (ECES). The periodical draws on a biannual survey of 210 large firms from the manufacturing, construction, and tourism sectors, revealing their views with regard to the overall performance of the economy, as well as their own activities during the elapsed half and expectations for the following six months. In the most recent edition (January 2006), the Barometer covered evaluations of July to December 2005, and expectations from January to June 2006.

The majority of respondents reported higher or stable economic growth during the second half of 2005. Moreover, expectations of further revitalization of economic activity during the next six months are rising. This would seem to confirm the results of the GCR indicator on the expectations of recession, where Egypt leapfrogged from 86th to 40th place as sentiment improved. Businesses cited the access to finance, lack of a skilled workforce, the need for better labor productivity and the need to develop a technology capacity by encouraging R&D.

Source: Business Barometer, January 2006, Issue No.16, Egyptian Center for Economic Studies.

1.5 Conclusion

The Egypt Competitiveness Report, using multiple indexes based on hard data and survey data, has provided data that support an overall picture of the economy. The macroeconomic environment, with the exception of the government budget deficit, has greatly improved. This has had an effect on business confidence and on the perceptions of future growth. However, there seem to be very real structural problems with labor markets and financial markets. There are severe problems related to many of the microeconomic aspects of the business environment. Both the Business Competitiveness Index and the DB2006 reveal this as a priority. Unless these structural and microeconomic constraints can be addressed, Egypt's recent improvement in the competitiveness indicators may either stagnate or even be reversed. Some of these challenges, like improving the educational system or implementing legislative reforms at the ground level, are more difficult and take longer than lowering tariffs and tax rates. Addressing these issues will require a team effort on the part of government leaders and the full support of business and civic leaders. The improved rankings for Egypt should be an encouragement to further reform while the specific sub-indexes should focus attention on improving human resources, expanding access to credit, improving business services, reducing red tape, easing the environment for starting and growing new businesses, ensuring a fair commercial law system and encouraging science, technology, R&D and innovation.

Guide to figures and tables in Chapter 1

Number	Name	Special Notes for Designer	Source (If in red, Carol guessed; it should be verified)
Figure 1.1	Egypt's Ranking on the Nine Pillars of the Global Competitiveness Index	correct the typo in "Global"	Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.
Figure 1.2	Basic Requirements Ranks	Egypt's rank should be in a different color from the others	Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.
Figure 1.3	Efficiency Enhancers Ranks	Egypt's rank should be in a different color from the others	Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.
Figure 1.4	Innovation Factors Ranks	Egypt's rank should be in a different color from the others	Source: World Economic Forum, *Global Competitiveness Report, 2005-2006.* Analysis by Economic Research Forum.
Figure 1.5	Strength of Legal Rights Index		Source: Doing Business Indicators 2006
Figure 1.6	Depth of Credit Information Index		Source: Doing Business Indicators 2006
Figure 1.7	Public Registry Coverage		Source: Doing Business Indicators 2006
Figure 1.8	Private Bureau Coverage		Source: Doing Business Indicators 2006
Figure 1.9	Correlation Between Global CI Rank and CPI (2005)	change the title and change "CLCI" to "Global CI" on the y axis	Source: World Economic Forum, *Global Competitiveness Report 2005-2006*, and Transparency International, *Corruption Perceptions Index 2005*. Analysis by Economic Research Forum.

Number	Name	Special Notes for Designer	Source (If in red, Carol guessed; it should be verified)
Figure 1.10	Correlation Between Changes in Global CI Rank and Changes in CPI (2005)	Change the title and change "CLCI" to "Global CI" on the y axis	Source: World Economic Forum, *Global Competitiveness Report 2005-2006*, and Transparency International, *Corruption Perceptions Index 2005*. Analysis by Economic Research Forum.
Table 1.1	The Growth Competitiveness Index		
Table 1.2	2005 E-readiness Rankings		Source: Economist Intelligence Unit and IBM Institute for Business Value, *The 2005 e-readiness rankings: A White Paper from the Economist Intelligence Unit*
Table 1.3	Egypt's Scores for Subcategories of E-Readiness		Source: Economist Intelligence Unit and IBM Institute for Business Value, *The 2005 e-readiness rankings: A White Paper from the Economist Intelligence Unit*
Table 1.4	Indicators of the Most Problematic Factors of Doing Business in Egypt		Source: Doing Business Indicators 2006

CHAPTER 2
AN ASSESSMENT OF POLICIES AND REFORMS SINCE JULY 2004

CHAPTER 2
AN ASSESSMENT OF POLICIES AND REFORMS SINCE JULY 2004[1]

This chapter presents a survey of government reforms over the last 18 months, commends the Government of Egypt for its impressive recent record, presents the economic results and identifies specific problems and priorities that must still be addressed. The Government's excellent recent record at the macroeconomic level provides momentum to address the remaining issues, such as reduction of the fiscal deficit and increasing the currently low levels of investment. Low levels of productivity growth are worrisome as only productivity growth can ensure sustainable increases in standards of living. Increasing investment and improving productivity are issues that will require the Government to turn its attention to the structural and microeconomic impediments to growth—a task that is more complex yet extremely urgent.

The Government is aware of the impediments to productivity and investment growth, and there is serious progress in addressing these barriers. In order to follow up on that progress in the next issue of the Egyptian Competitiveness Report, we would like to outline, in this chapter, the challenges that constrain higher quality, job-creating growth.

2.1 The Government of Egypt Has Embarked on a Comprehensive Program of Reforms

After eight years of stumbling reform, the Egyptian Cabinet has since July 2004 tackled significant economic problems, putting economic growth at the center-stage. The renewed focus is not accidental. It was widely acknowledged that regaining growth momentum was absolutely essential to meeting the needs of a rapidly growing population and rising unemployment. It has also become clear that the past several decades of globalization, technological change and deregulation in international transportation, communications, financial services and utilities had placed Egypt at a disadvantage relative to many of its neighboring Arab countries, an impression that seems to be supported by the data in the Global Competitiveness Report presented in Chapter 1.

Thus, over the last 18 months the new government has embarked on a comprehensive program for economic transformation that addresses macroeconomic areas of fiscal policy, monetary policy, trade policy, and privatization and modernization of the financial sector, among others. Specific reforms have been implemented in the areas of tax, customs and trade.

2.1.1 Tax rates were reduced by 50 percent and compliance has been simplified

A new tax code passed in June 2005 reduced the tax burden by 50 percent effective July 2005. This measure will increase disposable income at the same time it will increase fiscal revenues by

[1] Amina Ghanem.

widening the taxable base and making tax collections more efficient. The virtual elimination of exceptions, exemptions and tax benefits, along with the simplification of the tax structure to three brackets, has made the system transparent, simple and predictable. The new tax law and administration will bring in significant revenues to the budget not only through the widened tax base but also through any positive tax impacts related to boosting economic growth.

Regarding the strengthening of the institutional framework, aggressive efforts are underway to modernize tax administration with a view to increasing the efficiency of collection. The new administration will abide by the spirit of the law, which relies on the principles of self-assessment and risk audits. It shifts the burden of proof to the tax authority. As a step in this direction, a large taxpayer center applying these principles was launched in Cairo in September 2005. The overall transformation of the rest of the tax administration along the same principles is planned for implementation over the next two years.

The new tax reforms emphasize:

a. the taxation of consumption as opposed to income;
b. rates that are consistent with a stable and adequate revenue stream;
c. rates that are balanced across a range of tax sources without over-reliance on a particular source, such as income tax;
d. a fair system which shields low income groups from high levels of taxation;
e. an efficient system with minimum compliance costs and simple administration;
f. predictability, accountability, equity and efficiency of the tax system.

The 2005 Executive Opinion Survey of the World Economic Forum[2] indicates that as a result of these reforms, tax regulations and tax rates are no longer among the top three most problematic factors for doing business in Egypt, as they were in 2004. Both factors showed small but consistent improvement in both the percentage of those surveyed who identified them as problems and in their overall rank among problems identified. Subsequent surveys can be expected to show further and more dramatic gains, once the tax reforms have been instituted for a longer period of time.

2.1.2 Tariffs have been reduced and efforts are underway for trade expansion

Tariffs have been reduced significantly with a view to increasing the competitiveness of Egypt's exports. At the same time, customs administration is being improved. A large importers' center was launched in October 2005 as part of ongoing efforts to increase trade facilitation. These tax and trade reforms will in the short run be financed by privatization proceeds which have totaled L.E. 22 billion from 2000 to 2005, of which 65 percent is attributable to the period from July 2004-December 2005. As part of ongoing efforts to increase Egypt's participation in the global economy, a number of new trade agreements have been signed, notably the Qualified Industrial Zones (QIZs) agreement with the US, and the free trade agreement with Turkey.

[2] *Global Competitiveness Report.* The Most Problematic Factors for Doing Business in Egypt. 2003, 2004 and 2005.

2.1.3 In the external sector, monetary policy is supporting stable exchange rates and manageable international balances

The strengthened framework for the conduct of monetary policy has helped support the establishment of a floating exchange rate, which has in turn allowed the market to function more efficiently. The elimination of foreign currency surrender requirements and the establishment of a foreign exchange inter-bank market have also served to stabilize the currency. After losing some 50 percent of its value between January 2003 and December 2004, the pound appreciated by 8 percent during 2005.

These changes have also brought about a decline in interest and inflation rates. In response to these reforms, the current account witnessed a surplus of US$ 2.9 billion by end-June 2005. The overall balance shows a surplus of some US$ 4.5 billion compared to a deficit of US$ 158 in June 2004. First quarter data for 2005/2006 show a continuation of the trend with a current account surplus of US$ 327 million and an overall surplus of US$ 1.8 billion.

Egypt's external debt level continues to be safe by international standards, stabilizing relative to GDP in recent years. This is the result of prudent public sector debt management along with recent real exchange rate appreciation. The share of foreign-currency-denominated debt out of total public debt is expected to be some 35 percent at end-June 2006, which helps reduced external vulnerability. Debt service as a percent of current account receipts is 7.9 percent in June 2005, down from 9.2 percent a year earlier, and is considered to be manageable and consistent with peer countries. More importantly, the maturity structure of external debt is favorable, with short-term debt constituting less than 5.9 percent of total external debt.

2.1.4 The financial sector has been modernized

Considerable progress has been made in addressing weaknesses in the banking sector during the past year, and this progress has helped put the economy in a better position to sustain the economic expansion. As a follow-through to legislation in 2002 that included an Anti-Money-Laundering Law, various reforms have been instituted. Regulatory pressure has been increased on banks to deal more forcefully with their problem borrowers, including smaller ones. Government shares in joint venture banks are being divested to reduce government participation in the banking sector. Public sector banks are being restructured in order to privatize them, with the Bank of Alexandria being the first to go. The merger of small banks is encouraged to create stronger private banks. A Monetary Policy Unit (MPU) independent of the Central Bank was established in 2005.

In the spirit of the increased transparency and improved communication with the Government that now prevails, the rationale underlying decisions made by the MPU is made public. Other steps taken to promote transparency include the publication of the Article IV Consultation Report with the IMF and the Report on the Observance of Standards and Codes (ROSC). Egypt has also subscribed to the IMF's Special Data Dissemination Standards (SDDS).

2.1.5 Macroeconomic reforms have produced quick gains for the economy

As a result of these reforms, Egypt is experiencing its strongest growth for the last two decades, accompanied by a marked opening to the global economy. Gross Domestic Product (GDP) expanded by over 5 percent at an annual rate through fiscal year 2004/2005, compared to 4.1 percent in 2003/2004 and 3.1 percent in 2002/2003. New data for the second quarter of 2005/2006 (October-December 2005) are consistent with the strengthening of economic activity and show GDP growth of 6.4 percent compared to 4.7 percent during the corresponding quarter of last year. The increase in growth rates has caused a slight fall in the unemployment rate, from 11.1 percent in June of 2004 to an estimated 10.5 percent in June of 2005.[3]

Egypt's economy remains well diversified, contributing to the current recovery. In 2004/2005, manufacturing industries contributed 19 percent of total GDP, followed by agriculture at 15 percent, mining and hydrocarbon extractions at 12 percent, and transportation, communications and Suez Canal at 10 percent. (See Figure 2.1 below, Sectoral Output as a Percentage of GDP, 2004/2005). Some of the recent economic gains may be due to increased energy prices.

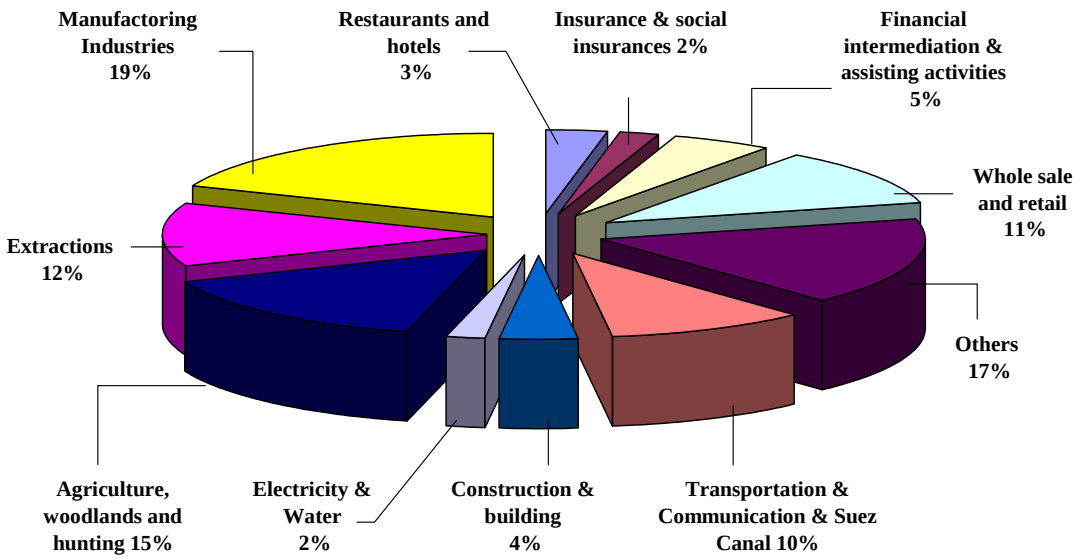
Until 2003/2004, growth was largely stimulated by external demand, led by an upturn in tourism and Suez Canal receipts. Between June 2004 and June 2005 the contribution of domestic demand to GDP growth doubled from 2.3 percent to 5.1 percent. More recently, growth in external demand slowed down, due to the appreciation of the pound and possibly competition and export displacement from China, Turkey and others (see Chapter 3). During the same period, the share of external demand to GDP expansion saw a relatively small growth from 4.2 to 5.0 percent. Domestic demand gained momentum in response to economic reforms[4] and a relatively accommodative monetary stance encouraged by low inflation and a strong pound. Broad money has been growing at an annual rate of 14 percent[5], although it has recently slowed down. As a result, economic growth was led by equal contributions of domestic and external demand. Very high growth was experienced in the hotels and restaurant industry (24.2 percent), the Suez Canal (17.3 percent) and gas extraction (8.1 percent). Manufacturing industries grew more slowly at 5 percent.

On the domestic demand side, buoyant private consumption growth was the main driving force during the past two years, supported by the strong growth in real incomes. The share of private consumption in the expansion of consumption demand growth more than doubled, from 1.8 percent to 4.8 percent. Public consumption contributed less than half a percent to the growth of consumption over the same period. Investment demand is sluggish, with an insignificant contribution to the growth of domestic demand of 1.4 and 1.9 percent in June 2004 and June 2005 respectively. [6]

---

[3] Ministry of Planning.
[4] Ministry of Finance. *Egyptian Economic Monito*r. Various Issues.
[5] Ministry of Finance. February 2006. *The Financial Monthly*. Volume 1, No. 4.
[6] Ministry of Finance. *Egyptian Economic Monitor*. Various Issues.

Sectoral Output % of Total GDP, 2004/2005



2.1.6 The growth of exports in nominal terms continues to be robust

The depreciation of the Egyptian pound by 35-40 percent between 2003 and 2004 spurred a nominal increase in total export values of 21.5 percent, with merchandize exports growing by almost 23 percent, compared to 20 percent total imports. The real growth in exports of goods and services is also solid. The share of exports as a percent of GDP has increased from less than 2 percent of GDP in 2002/2003 to 2.6 percent in 2004/2005.

2.1.7 Inflation has slowed markedly despite the earlier devaluation

Despite robust growth, inflation has slowed markedly, from 18.4 percent in October 2004 to 9.6 percent in 2005 to only 3.4 percent in January 2006. The inflationary upsurge in 2004 was due to a lagged response to the transition to a floating exchange rate in 2003. Economic factors contributing to the decelerating pace of price increases, despite higher energy prices, include a 40 percent cut in tariff rates on imports in September 2004 and a relatively stronger pound which appreciated 8 percent since December 2004 and reduced the cost of imports.

2.1.8 Net international reserves have increased

Finally, optimism and restored confidence in the economy have served to spur net international reserves, which reached US$ 21.9 at end-December 2005, and climbed further to US$ 22.4 billion by end-February 2006, surpassing the record high figure of US$ 20 billion in 1997/1998. In addition, FDI flows to Egypt report a record high of US$ 3.9 billion in June 2005. Foreign direct investment net of oil transfers was US$ 1.3 billion, compared to a mere US$ 419 million in June 2004. The momentum is

carried into the first quarter of 2005/2006, where non-FDI flows reached US$ 1.95 billion compared to US$ 775 million in the corresponding quarter of last year.

The prevalence of a positive sentiment has also pushed the stock market up. In the first quarter of 2006, immediately before the Gulf crash, the CASE-30 index had reached 8,140 compared to 3,475 a year ago. Market capitalization as a percent of GDP was 75.6 percent at the end of March 2006 compared to 54.6 percent last year. Egypt's stock market quickly recovered after the Gulf incident, with the CASE-30 index subsequently achieving a 7 percent net increase.

Overall, the foundations for positive growth are in place, supported by relatively low levels of interest rates and inflation, and high levels of consumer confidence as reflected in a bullish stock market and massive FDI flows.

Looking forward, two risks need to be addressed expeditiously. The first is reduction of the fiscal deficit and public debt. The stabilization of macroeconomic indicators and the solid expansion have created a positive environment for the addressing the second priority: long delayed budget and structural reforms that directly impact the quality of growth.

2.2 Further reform efforts are critical

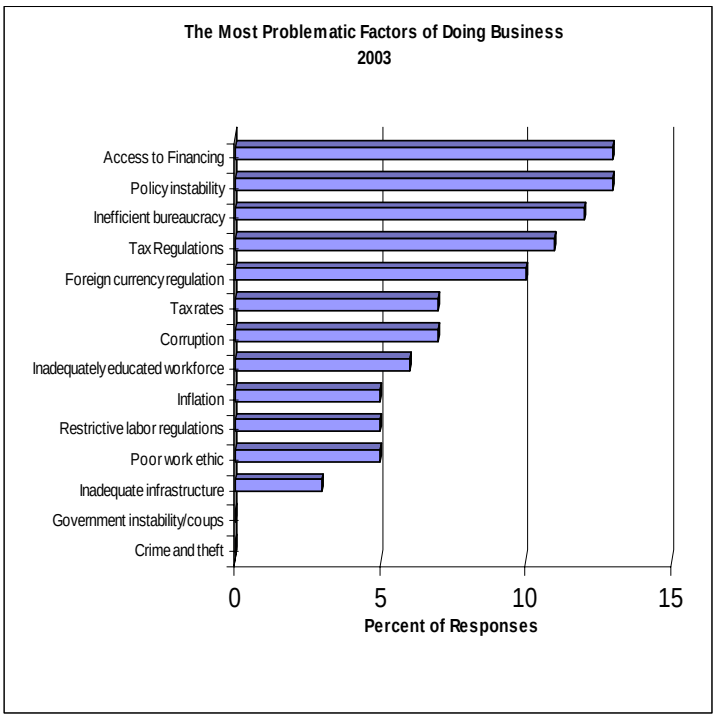
Despite positive and effective steps that have been take by the Government today, a number of problems that undermine Egypt's competitiveness remain, and the importance of further efforts to address them cannot be overstated.

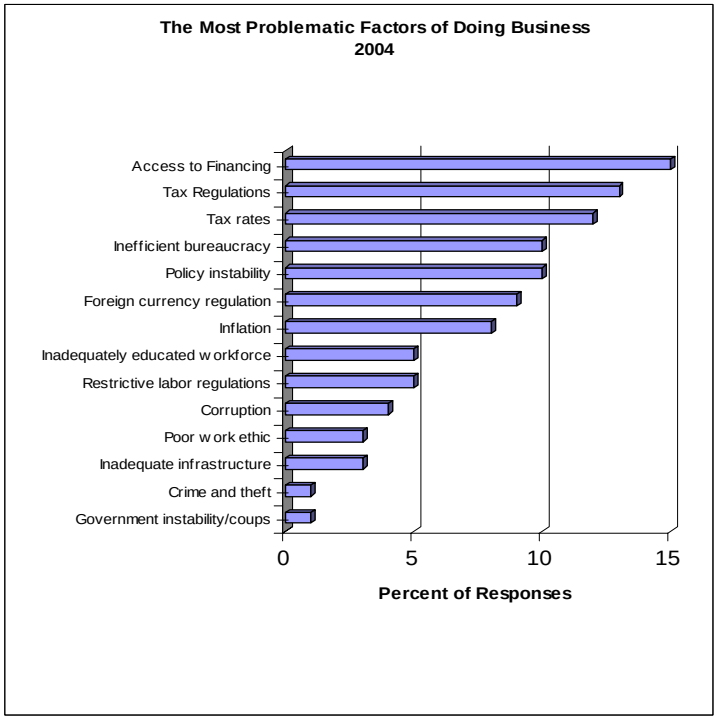
2.2.1 Investment remains low at 16 percent of GDP

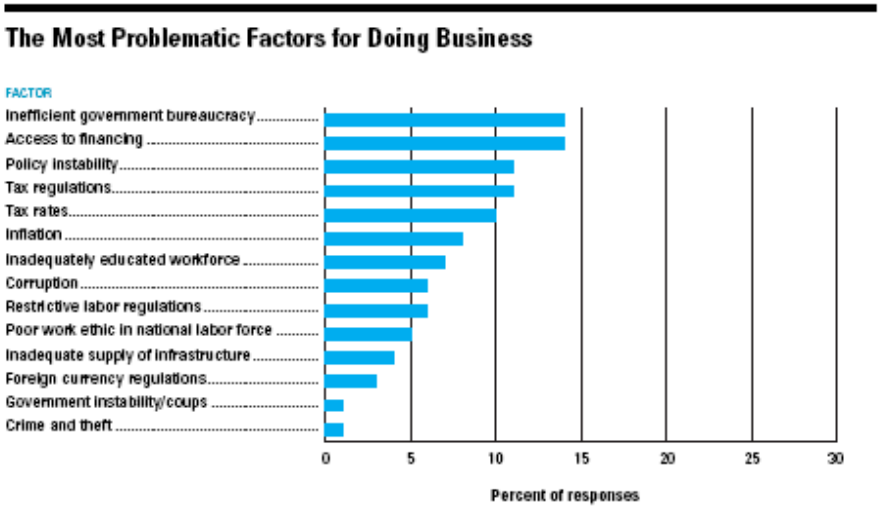
In addition to the low contribution of investment to the growth of domestic demand, investment levels are still low, at 16 percent in 2004/05, down from 16.6 percent a year earlier.[7] Moreover, investment growth has been catatonic, contributing miniscule amounts to the growth of domestic demand, as explained earlier. Such low levels of investment may curtail future growth and indicate weakness in the investment climate, including that due to invasive government practices. Findings of the World Economic Forum's Executive Opinion Survey (2005)[8] indicate over the past three years that access to financing, inefficient bureaucracy, policy instability, an inadequately educated work force, restrictive labor regulations, and poor work ethics were consistently among the most significant deterrents to investment. Interestingly, access to financing remains the top impediment in 2003 and 2004, although it took second place in 2005, with inefficient government bureaucracy becoming the number one impediment. Tax rates and regulations took fourth and fifth positions in 2005, after being ranked second and third a year earlier. This improvement is consistent with the tax policy reforms that are now taking place. (See Figures 2.2, 2.3, and 2.4 for results of the EOS over the past three years.)

[7] Ministry of Planning. March 2006. *Macroeconomic Indicators.*

[8] *Global Competitiveness Report*. The Most Problematic Factors for Doing Business in Egypt. 2003, 2004 and 2005.







Note: From a list of 14 factors, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

Source: World Economic Forum, Executive Opinion Survey (2005)

There is no information about the contribution of private investment to investment growth. The continued low levels of overall investment underscore the need to complete the unfinished reform agenda in financial and corporate sector restructuring, including improvements in governance, creating a friendlier business environment with a more efficient government bureaucracy, and more flexible labor regulations. A shift in the composition of growth toward investment demand, as opposed to consumption demand, will need to be accompanied by a corresponding reduction in interest rates and might require further appreciation of the exchange rate over the medium term. It also remains to be seen whether the increase in incomes following the tax reductions will lead to an increase in savings that would lead to an increase in investment spending.

2.2.2 Private sector credit growth rates are sluggish

Going hand-in-hand with low investment rates are anemic credit growth rates. These have improved somewhat, from 3.7 percent in 2004 to 5.5 percent as of November 2005. Egyptian banking laws have created an environment that makes investment difficult. Both lenders and borrowers are reluctant to engage in credit-related activities, given that criminal penalties can result from bankruptcies even in the absence of fraud or other criminal behavior. Recent high-profile cases in which both bank officers and entrepreneurs who defaulted for market reasons were imprisoned have underscored the riskiness of private sector borrowing and doubtless contributed to poor growth in private sector credit. The World Economic Forum's Executive Opinion Survey of the "Most Problematic Factors for Doing Business in Egypt" confirms this story. Access to finance is the top impediment to doing business in Egypt.

2.2.3 The fiscal deficit must still be urgently addressed

Progress in boosting investment is constrained by the persistent large fiscal deficit which has increased since 2002/2003, and remains over 9.5 percent of GDP. (The adoption of a new GFS budget classification[9] last year by the Ministry of Finance, which has improved accounting and provided greater transparency, partially explains nominal increases in the budget deficit. The projected slight increase in the deficit to 9.7[10] percent in 2005/2006 is primarily due to the explicit treatment of petroleum subsidies as expenditure items.)

The deficit can be addressed in the context of a healthy near-term outlook for economic growth. Bolder progress in reducing the budget deficit and public debt is warranted. The reforms should include stringent spending discipline and revenue-generating measures to address the deficit and structural reforms to sustain growth.

The bold fiscal and trade reforms[11] implemented in 2004/2005 did not cause as large a fiscal loss as initially feared, but still contributed to the deficit. In June 2005, customs revenues declined by

[9] IMF 2001 Government Finance Statistics Classification, modified according to cash principles.
[10] Ministry of Finance. *Egyptian Economic Monitor.* March 2006.
[11] Referred to in this chapter and discussed in detail in the Ministry of Finance's *Egyptian Economic Monitor*, various issues (www.mof.gov.eg); and Volume II of *The Egyptian Competitiveness Report* (www.encc.org).

16 percent (L.E. 1.5 billion) as opposed to a projected L.E. 3-4 billion, thanks to higher import volumes that yielded higher than projected customs revenues.

Preliminary data from the Ministry of Finance indicate a similar story with the tax cuts. Despite the 50 percent cut, increased compliance and a widening of the tax base mitigated losses in revenue. Available data for the first nine months of the fiscal year show that the number of submitted tax returns has more than doubled, from 1.1 million statements last year to 2.3 million statements by March 2006.[12] This year, income, profit and capital gains tax collections are expected to grow by 10 percent over 2004/2005, indicating, in addition to increased compliance, a widening of the tax base as previously non-taxable incomes have become taxable.

Other reasons are higher growth in the capital gains and corporate profits (due to improved economic activity and confidence in the business environment), and settlement of arrears in line with the new spirit and direction of the law.

Fiscal and trade policy reforms are expected to yield significant long-term fiscal benefits and so short-term trade-offs and fiscal adjustment should be understood and accepted. The Egyptian Ministry of Finance has made this argument and it does appear that longer term revenue prospects are more positive. Reductions in tax and tariff rates will increase disposable income and spur economic growth in the medium term, thus widening the tax base and increasing tax revenues to make up in part for the current loss in tax receipts. In the long term the reductions will make it easier to lower the total deficit. Thus tax reforms are expected to yield long-run gains in terms of revenue, efficiency and transparency.[13]

In addition to short-term revenue pressures, the steady increase in public debt has taken net budget sector debt levels from 54.3 percent of GDP to 65 percent between 2000/2001 and 2005/2005. Similarly, the net general government debt has increased by 10 percentage points over the same period, reaching 51.8 percent of GDP in June 2005.

Nevertheless, the concern remains that if the budget deficit continues to be large, and the deep structural imbalances and debt related vulnerabilities remain, government debt may increase beyond already high levels. This would then jeopardize the currently favorable debt maturity structure towards short term maturities.[14] Ambitious reforms must start without delay.

2.2.4 More importantly, the government must pursue a mixture of revenue-generating measures and stringent spending discipline

The Government has not yet addressed expenditure-reducing reforms. Plans for wider population health coverage and a currently unsustainable pensions system[15] all put pressures on the budget. Spending increases on subsidies, particularly energy subsidies following the global increase in oil prices, are worrisome. Although Egypt exports oil, a shortage of refining capacity means that it

[12] Speech by the Egyptian Minister of Finance.
[13] Ministry of Finance. *Egyptian Economic Monitor*. Various Issues.
[14] Meeting with Hanan Salem and Dave Larson of PFC Energy (credit rating advisors to the Government of Egypt), who explained that Colombia's public debt turned from long to short term to cover its increasingly large deficit.
[15] Refer to Volume II of *The Egyptian Competitiveness Report* (www.encc.org).

imports half of its liquefied petroleum gas needs and one third of its gas oil needs. Subsidies have always been a drain on Egypt's finances, but the sustained rise in energy prices has rendered these subsidies particularly expensive. At present, fuel subsidies represent some 62.4 percent of the total subsidy bill of L.E. 35.4 billion. Previously these subsidies did not show in the budget because they were treated under the old budget classification as indirect subsidies to the Egyptian General Petroleum Company (EGPC). Dealing with subsidies requires that they be more efficiently targeted rather than phased out, and rely more on cash transfers to the poor rather than the current system of price subsidies which benefits all income groups equally. Prudent fiscal management should include private sector participation in the provision of public services (in the form of private-public partnership initiatives). This will make room for essential and more effective social spending, particularly on education, which is crucial for skills development, over the next few years.

On the revenue side, the Ministry of Finance is adjusting its taxation system to generate more revenues by emphasizing taxation of consumption as opposed to income. The Ministry of Finance has announced plans to issue by July 2006 a new property and agriculture tax law that implements new valuation procedures. The Stamp Duties Law will be revised to significantly reduce the number of duties and simplify those which remain, while the Sales Tax will be revised into a value added tax. These changes will bring in significant revenues to the budget by widening the tax base.

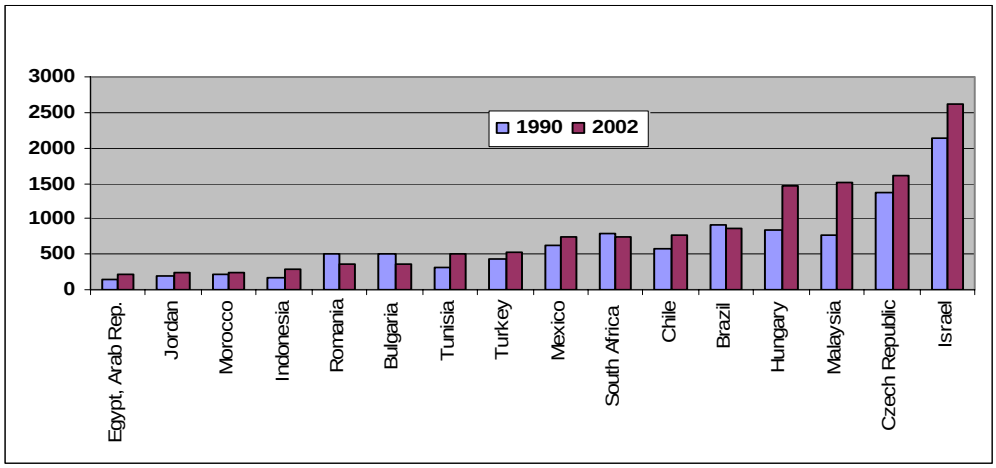
In this respect the government will need to deliver an ambitious fiscal consolidation plan based on the two objectives of public finance reform discussed above. The plan, which should be announced and published, would include a program of reductions to reach a target budget deficit over a number of years. It is important that the government remain committed to the broad parameters of expenditure restraint set out in the program. The early publication of a concrete deficit reduction strategy would enhance the credibility of fiscal policy. Such fiscal consolidation will be more easily maintained in an environment of broad public confidence and sustained solid growth.

2.2.5 Real exports have stagnated and labor productivity is low

Despite the macroeconomic gains, there are some very worrisome trends. We saw earlier in the chapter that the real growth in exports of goods and services has decreased in 2004/2005 compared to the previous year, suggesting declining competitiveness. Egypt's share in global exports remains very modest, as will be shown in Chapter 3.

Productivity growth of labor has also been low in recent years, despite low labor costs. At US$ 1,863, the labor cost per worker in manufacturing is the lowest in the MENA region, with the exception of Yemen. But these low costs in Egypt become insignificant when one adjusts for productivity. The manufacturing value added per capita is very low even relative to neighboring countries and has not grown much between 1990 and 2004 (see Figure 2.5).

Figure (2.5) : Manufacturing value added per capita (1995 US$)



Source: UNIDO, 2005.

The mean value added per capita in Egypt is 26.5 percent of the mean value added per capita in the MENA countries (US$ 232 as opposed to US$ 876 in 2001). So labor costs per hour may be only 23 percent of the MENA average, but unit labor cost (what gets produced by a unit of labor) is 96 percent of the MENA average. Jordanian labor may cost 1.5 times that of Egyptian labor, but Jordanian labor is more productive and so unit labor cost in Jordan is 55 percent that of Egypt. [16]

Furthermore, real wages decreased during the past decade by as much as 69 percent for male and 88 percent for female workers. Focusing on productivity will be the only way that the Government of Egypt will be able to provide for sustainable increases in real wages and improvements in living standards. Lack of productivity growth also threatens Egypt with displacement in its existing markets by countries such as Turkey and China where productivity has improved. Competing on the basis of natural resources and low wages will not be a sustainable strategy for Egypt. But repositioning Egypt in the world economy will require a focus on improving basic education, creating a responsive workforce with relevant skills and fostering innovation and R&D, which can lead to higher value-added products.[17]

2.2.6 The focus must turn to structural and microeconomic reforms

There are many issues that must be addressed and this will require that the Government of Egypt focus the relevant ministries on the more difficult microeconomic reforms. The indexes in the last chapter provided some insight into areas that need to be addressed. Listening to the voices of business leaders provides insight on a more anecdotal level: “There is over-regulation and a lot of paper burden.” “There is a culture of control.” Government officials are “controlling, unresponsive and unskilled,” and “there is a lack of cooperation between government departments.”

[16] Heba Nassar and Somaya Samour. *The Competitiveness of Egyptian Human Resources: A Regional View*. Paper presented in the Conference on Reviewing Egypt’s Competitiveness: The Road Ahead for Building Sectors. Center for Economic and Financial Research Studies, Faculty of Economics and Political Science.

[17] Ibid.

Overall, there is an urgent need to confront deficiencies in the quality of the business environment and the desirability of the country as a place for private business creation, expansion or relocation[18] through microeconomic reforms. Aside from obvious measures such as removing bureaucratic barriers to investment, reform is essential across many spheres, including but not limited to banking, the legal arena (encompassing commercial and labor law, judicial recourse, and the availability of arbitration and mediation), good governance issues (such as civil service reform and anti-corruption measures), continuation of privatization efforts, ICT (for example, the creation of industrial and knowledge parks and the development of telecommunications infrastructure), and workforce development through means such as improving education.

Moreover, the Government must engage the business community in determining priorities for these reforms and seek private sector advice and feedback on their implementation. This holds particularly true with regard to sector-specific reforms tailored to the unique needs of particular industries. As an example, the agricultural sector must have a voice in determining standards and grading, as well as policies relevant to the cold sector.

On the other hand, certain crucial policies are relevant across all sectors: those that develop the workforce and encourage investment in research, innovation and human capital. These have a central role to play in sustainable long-term growth and employment and competitiveness.[19] Labor market issues and the need for R&D are discussed more in-depth below.

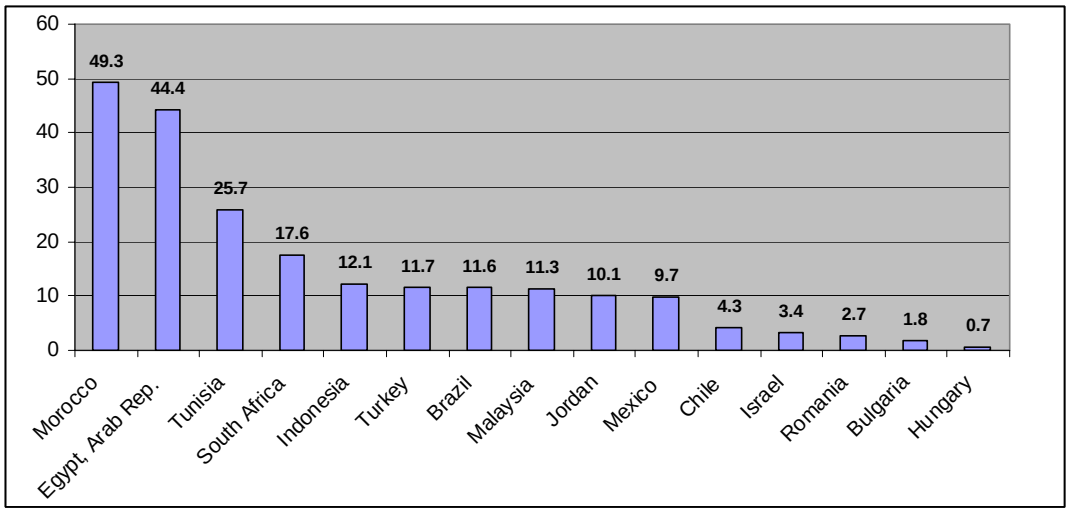
2.2.6.1 Addressing labor market efficiencies

An inadequately skilled workforce continues to be an impediment to improving the competitiveness of the Egyptian economy. According to a recent study, more than 40 percent of the Egyptian labor force is either illiterate or can hardly read and write (see Figure 2.6 below).

[18] Wim Kok, *Facing the Challenge: The Lisbon Strategy for Growth and Jobs*. 3 November 2004.

[19] Council of the European Union, *Press Release: 2694th Council Meeting – Competitiveness, Internal Market, Industry and Research*. Brussels, 28-29 November 2005.

Figure 2.6: Adult Illiteracy Rate (ages 15 and above)



Source: WHDR (2005).

Unemployment remained at 10.5 percent in June 2005. The problems of unemployment of the Egyptian labor force are structural in nature. When labor is in demand, the supply of needed skills is often not sufficient. In other words, in many cases the obstacle to increased employment is not the shortage of jobs but a lack of appropriate qualifications and skills needed by the market. The Minister of Trade and Industry, Engineer Rachid Mohamed Rachid, recently stated that although the QIZs have created some 12,000 jobs in the textiles sector, the available supply of labor does not posses the appropriate skills needed by the market.

Simply spending money on education, without considering the needs of businesses and individuals in a changing global context, is inadequate. Although expenditure on education in Egypt ranks high among other countries[20] (4.7 percent of the budget in 2000 compared to 3 percent in East Asian and Pacific, 4.4 percent in Europe and East Asia, and 4.1 percent for Low and Middle Income Countries), qualitative indicators show deterioration relative to other countries. The ratio of primary pupils to teachers is 22.2 compared to 17.5 in Europe and Central Asia. Repeaters as a percentage of total students enrolled in primary grades are 4.5 percent, compared to 1.4 and 0.8 percent for East Asia and Europe and Central Asia respectively.

Relevant investment in basic and specialized education—guided by the needs voiced by the private sector—are a must for improving the productivity of labor, increasing employment opportunities, and ensuring greater participation of the workforce. As investments in human capital take on new importance, it will be essential to change the structure of budgetary expenses so that more resources can be spent on education and physical capital in order to achieve greater output and increased quality.

[20] Edstats: http/devdata.worldbank.org/edstats/summaryeducationprofles/comparativeP

The high-quality education system that should result from such changes is an essential component of the transition to a knowledge-based society that facilitates knowledge and innovation.[21] A knowledge-based society does not mean that the society is exclusively based on hi-tech activities. It is a society that can produce high value goods and services using up-to-date technologies.

Creating this society means directing efforts towards[22]:

a. improving the adaptability of workers and enterprises, and ensuring that reforms help to equip them with the skills needed throughout their lives.
b. Maintaining flexible and competitive labor markets to help Egypt adjust to market changes; and
c. Investing more in human capital through better education and skills.

2.2.6.2 Stimulating R&D

Expenditures on R&D were 0.19 percent of GDP in 1999/2000, the latest years for which figures are available. This compares to 1.23 percent in China, 1.53 percent in Slovenia 2.64 percent in Korea and 4.2 percent in Israel in 2002/2003.[23] The countries that spend least on R&D all spend more than Egypt: Malaysia (0.22 percent), Mexico (0.34 percent), Argentina (0.41 percent), Tunisia (0.62 percent), Turkey (0.72 percent), and Brazil (0.91 percent). R&D expenditure in the EU is 1.91 percent, with a target of 3 percent to be reached by 2010[24]. An increase in the share of R&D expenditures in GDP from 1.9 percent to 3 percent is projected to result in an increase of 1.7 percent in the level of GDP for these countries.

The private sector should play the main role in increasing R&D expenditures. More than two thirds of the R&D expenditure in the EU and the US is financed by the business enterprise sector.[25] The small size of the R&D system in Egypt lags behind the world and has prompted interest in developing a tailored Innovation System for Egypt. R&D that does exist often fails to respond to needs and priorities and is thus connected neither to socioeconomic objectives nor to business needs.

Although Egypt has recently been very successful in attracting foreign direct investment, this should not cause complacency with respect to the country's R&D expenditures. It is true that FDI figures more than doubled in 2005, reaching US$ 1.3 billion from non-oil sectors only, compared to a mere US$ 0.5 billion in 2004. Nevertheless, it is too soon to assess the impact of the privatization program on sectors that are knowledge or skill intensive and on R&D. In this context special attention must be paid to increasing the competitiveness of small businesses and providing adequate support for their participation in research projects.[26] Egyptian small businesses employ around 80 percent of

[21] Wim Kok, *Facing the Challenge: The Lisbon Strategy for Growth and Jobs*. 3 November 2004.
[22] ibid.
[23] CIA Factbook: www.cia.gov/ciapublications/factbook and Eurostat
[24] Council of the European Union,. *Press Release: 2694th Council Meeting – Competitiveness, Internal Market, Industry and Research*. Brussels, 28-29 November 2005.
[25] Eurostat.
[26] Council of the European Union, *Press Release: 2694th Council Meeting – Competitiveness, Internal Market, Industry and Research*. Brussels, 28-29 November 2005.

the labor force in the non-agriculture private sector. In addition to being an important source of new jobs, small enterprises are considered to be the engine of growth and should therefore be a focal point in any labor reform program.

Together with improving the skills of the labor force, stronger investments in human resources and the development of R&D would help Egypt become a knowledge-based society and would create a healthy competitive environment. A more detailed discussion of this will follow in Chapter 4.

2.3 Conclusions

During the past eighteen months, specific reform implementations focused on lowering taxes, reducing tariffs, addressing external imbalances and modernizing the banking sector. The Government has also brought down inflation very significantly. The fiscal deficit remains to be addressed. More importantly, low levels of investment, the lack of competitiveness in exports (to be discussed in Chapter 3) and the lack of growth in labor productivity (to be discussed in Chapter 4) have not mirrored the rosier macroeconomic picture. Therefore, it is absolutely essential that the entire government, including all ministries working together as a team, turn their attention to the structural reforms and the practical microeconomic constraints that comprise them. These reforms may take longer and be more difficult. But they must be implemented or else the danger is that current levels of growth may not be sustainable. Without such growth, Egypt will be unable to generate the jobs needed by a growing work force and the population that depends on them.

CHAPTER 2 – NOTES ON FIGURES & TABLES

Number	**Name**	**Special Notes for Designer**	**Source** (If in red, Carol guessed)
Figure 2.1	Sectoral Output as a Percentage of GDP, 2004/2005	Correct label	???
Figure 2.2	The Most Problematic Factors of Doing Business, 2003	Figures 2.2, 2.3 and 2.4 should have a consistent appearance.	World Economic Forum, Executive Opinion Survey, 2003
Figure 2.3	The Most Problematic Factors of Doing Business, 2004	Figures 2.2, 2.3 and 2.4 should have a consistent appearance.	World Economic Forum, Executive Opinion Survey, 2004
Figure 2.4	The Most Problematic Factors of Doing Business, 2005	Current version is pasted in from a pdf document; a "real" version needs to be created that is consistent in look with figures 2.2 and 2.3	World Economic Forum, Executive Opinion Survey, 2005
Figure 2.5	Manufacturing value added per capita (1995US $)		UNIDO, 2005
Figure 2.6	Adult Illiteracy Rate (ages 15 and above)		*WHDR (2005)*

CHAPTER 3
INDUSTRIAL COMPETITIVENESS: ENGINE OF GROWTH?

List of Figures and Tables

List of Appendices

CHAPTER 3

INDUSTRIAL COMPETITIVENESS: ENGINE OF GROWTH?[1,2]

Egyptian industrial growth has lagged behind the progress of the economy in recent years. Industrial growth has hovered at 4 percent, making up 18 percent of the Egyptian GDP in 2005. Yet the manufacturing sector should be critical to the economic development of a country at Egypt's stage of development. The sector is essential to job creation and can also contribute to export revenues. The manufacturing sector has important backward and forward linkages with agriculture and the services sector. It can be key to improving productivity. Finally, it can help Egypt advance in its efforts to integrate with the global economy through the insertion of competitive domestic enterprises into global value chains and the opening up of new export markets.

This chapter benchmarks Egyptian industrial competitiveness against a selected set of comparison countries ("comparators"), including direct competitors, countries ahead (that should be role models), and countries behind (which may pose future competitive threats). The analysis, using hard quantitative data, reveals that while Egypt's industrial performance was good in the late 1980s and 1990s, a significant competitiveness gap now shows between Egypt and the selected comparators. Egypt's level of manufactured exports per capita remains quite low, and Egypt's manufactured exports are largely dominated by commodities that are mainly resource-based or characterized by a low-technology content.

This chapter is divided into three parts. The first sheds light on the importance of the manufacturing sector as an engine for growth and for integration with the global economy. The second benchmarks Egypt with comparators using the new Competitive Industrial Performance (CIP) Index, which combines several structural indicators of competitiveness. This part also examines Egypt's performance in the individual indexes that make up the CIP; that is, manufacturing value added (MVA), manufactured exports, and their evolving structure, and explores as well Egypt's performance in terms of the world's most dynamic manufactured exports, to shed light on the country's ability to "hear" and serve market demands. Part three analyzes Egypt's product and market diversification pattern against that of the country comparators, including a vulnerability matrix in which all countries analyzed are positioned.

3.1 Why manufacturing?

Manufacturing is one of the most powerful engines of growth. It acts as a catalyst to transform the economic structure of countries from simple, slow-growing and low-value activities to more productive activities that enjoy greater margins. It helps a country compete in medium- and high-tech industries that have higher growth prospects.

[1] Diaa Noureldin, Manuel Albaladejo, and Nihal El Megharbel.
[2] The word "industrial" in this chapter will be used in its more limited sense, referring only to the manufacturing sector.

Manufacturing has become the main means for developing countries to benefit from globalization and to bridge the income gap with the industrialized world.

Aided by new technologies in transportation and communications and by international trade agreements such as WTO, global industries are in the process of internationalizing their value chains. Manufactured trade accounts for 82 percent of world's total trade, and medium- and high-technology manufactured products alone account for 52 percent. Many developing countries are benefiting from globalization through their insertion into global value chains, in many cases operated by MNCs.

Resource-dependent countries have often overlooked the potential of their manufacturing sectors. Today they are aware of the benefits that manufacturing brings to the economy in terms of sustainable economic growth, technological development and employment generation.

Yet all manufacturing sectors are not equally beneficial to industrial growth and competitiveness. Evidence from the literature illustrates the benefits of technology-intensive activities within manufacturing. They have proved to be more desirable for economic growth for the following reasons:

- *Within manufacturing, complex activities are growing faster and have a higher share in world trade than simple activities.* Between 1990 and 2004, high-technology trade grew by 10.3 percent per annum, outpacing the growth rates experienced by other manufacturing sectors. High-technology exports accounted for 22 percent of world trade in 2004, up from 14.7 percent in 1990. By contrast, resource-based manufacturing only grew by 6.2 percent for the period and its share in world trade has declined from 17.1 percent in 1990 to 15.2 percent in 2004.

- *Technology-intensive sectors are less vulnerable to entry by competitors, and therefore enjoy higher and more sustainable margins.* Resource-based and low-technology activities are more exposed to competitive pressures, as the overall capabilities needed to enter the industry are relatively lower and can be met by newcomers. Competitive advantages in these sectors often come from price rather than quality or brand names. In contrast, technology-intensive activities call for more complex capabilities and processes that impose greater barriers to entry. Developing countries often specialize in labor-intensive sectors where labor cost is the predominant competitive factor. The ability of countries to climb the technology ladder will determine their capacity to sustain margins.

- *Technology-intensive activities often offer greater learning prospects and spillover benefits to other sectors*. For instance, the skills developed in high technology sectors have more applicability to other sectors than those skills learned, say, in resource-based industries. Capabilities in technology-intensive industries are grounded in shared disciplines, notably mathematics, physics, engineering, and computing. Strong capabilities based on scientific knowledge can be adapted to the particular demands of industries at a faster pace. As technology in these sectors changes rapidly, the learning

component is very high. By contrast, in sectors where technology hardly changes the learning process is rather limited.

As competition to attract export-oriented FDI increases, developing countries that want to retain MNC operations must offer not only low wages but also strong human and technological capabilities. This provides a constant incentive for upgrading human resources.

3.2 Egypt in the new Competitive Industrial Performance Index

UNIDO's *Industrial Development Reports* has introduced a scoreboard for industrial performance. At its core is a Competitive Industrial Performance (CIP) index, which benchmarks all economies for which data could be obtained. The CIP index covers a few key structural indicators of industrial activity. It uses only "hard" quantitative data rather than "soft" qualitative or survey information; in this it differs from other indexes that mix both. Appendix 3.1 provides information on the dimensions, indicators and calculations of the CIP.

In this analysis we apply UNIDO's CIP index methodology to assess Egypt's competitive industrial performance compared to other countries in and outside the MENA region. Table 3.1 shows the CIP rankings for all countries between 1995 and 2004.

Table 3.1. Rankings in the CIP Index, 1995-2004

Ranking			Country	CIP value		
2004	2000	1995		2004	2000	1995
1	1	1	Korea, Rep.	0.882	0.931	0.897
2	3	3	Czech Republic	0.706	0.633	0.597
3	2	2	Malaysia	0.655	0.798	0.764
4	4	4	China	0.479	0.437	0.409
5	7	7	Turkey	0.272	0.220	0.232
6	8	6	India	0.235	0.204	0.250
7	9	8	Tunisia	0.230	0.204	0.231
8	6	9	Indonesia	0.213	0.232	0.205
9	5	5	Brazil	0.211	0.253	0.322
10	11	10	Jordan	0.187	0.188	0.181
11	13	12	Morocco	0.155	0.133	0.126
12	12	11	Chile	0.152	0.140	0.166
13	**10**	**13**	**Egypt**	**0.141**	**0.202**	**0.115**

Note: 2004 or latest year (for details see the individual indexes)
Source: UN Comtrade, UNIDO's Indstat

The ranking positions are very stable over time, which confirms that structural indicators are path-dependent and difficult to change. South Korea leads the ranking, followed by the Czech Republic and Malaysia. Turkey, the role model in the MENA region, ranks fifth and is sandwiched by the two giant economies of China and India. Tunisia has leaped two places between 2000 and 2004 and positions itself seventh, ahead of Indonesia and Brazil. Egypt ranks last in the group, having lost three places to Jordan, Morocco and Chile between 2000 and 2004. However, the index value difference

between these four countries is very small, which means for Egypt that slight industrial adjustments could return it to the 10th place it held in 2000. But which dimensions need to be improved to reduce the competitiveness gap and climb higher in the ranking? The next sections provide details on Egypt's performance on the main indicators of industrial competitiveness.

3.2.1 Manufacturing value added

Egyptian manufacturing value added grew from US$ 9.7 billion in 1990 to US$ 19.6 in 2002 (see Table 3.2). The greatest expansion in Egyptian manufacturing value added was during the second half of the 1990s, during which time it outpaced the growth in Turkey, Tunisia and Morocco. Yet the first few years of this decade saw a significant slowdown in Egypt's manufacturing value added growth. But taking the whole period and a comparative perspective, Egypt's manufacturing value added growth has been solid, showing the country's strong industrial potential.

Table 3.2. Manufacturing Value Added for Egypt and Comparators, 1990-2004

	Manufacturing value added (constant 2000 US$, billion)				Annual growth rate		
	1990	**1995**	**2000**	**2004**	**1990-1995**	**1995-2000**	**2000-2004**
Brazil	73.2	75.9	80.3	87.1	0.7%	1.1%	2.0%
Chile	6.8	9.6	10.7	11.9	7.1%	2.1%	2.8%
China	114.2	238.2	375.5	570.2	15.8%	9.5%	11.0%
Czech Republic	-	10.5	13.5	16.7	-	5.0%	5.6%
Egypt	**9.7**	**12.1**	**18.0**	**19.6***	**4.4%**	**8.2%**	**4.3%***
India	36.9	51.7	66.0	84.9	7.0%	5.0%	6.5%
Indonesia	24.2	40.0	45.8	55.7	10.6%	2.8%	5.0%
Jordan	0.7	0.9	1.1	1.4	6.4%	4.3%	5.8%
Korea, Rep.	61.5	91.4	133.8	154.1*	8.2%	7.9%	4.8%*
Malaysia	11.4	19.8	29.4	34.5	11.6%	8.3%	4.1%
Morocco	4.5	5.1	5.9	6.8	2.5%	2.9%	3.7%
Tunisia	2.1	2.7	3.5	4.1	5.7%	5.3%	3.5%
Turkey	17.5	22.3	27.0	32.8	5.0%	3.9%	5.0%

* Note: 2003 data for Korea, and 2002 data for Egypt
Source: World Development Indicators

Among the country comparators, China is by far the largest contributor to global manufacturing value added, with US$ 570 billion in 2004 and impressive annual growth rates in all periods, followed by South Korea with US$ 154 billion in 2003. Manufacturing value added growth in the MENA countries has been moderate—Jordan has the smallest MVA base with only US$ 1.4 billion in 2004, but growing slightly faster than Morocco and Tunisia. Turkey has the biggest industrial base in the region, with manufacturing value added reaching nearly US$ 33 billion in 2004, and firmly growing during the early 1990s.

Industrial capacity, taking into account the country's size, is best measured with the MVA per capita indicator. Table 3.3 shows the ranking for Egypt and country comparators and the changes between 1995 and 2004.

Table 3.3. Manufacturing Value Added Per Capita for Egypt and Comparators, 1995-2004

Ranking			Country	Constant 2000 US$ per capita		
2004	2000	1995		2004	2000	1995
1	1	1	Korea, Rep.	3,216.6*	2,846.3	2,026.2
2	2	2	Czech Republic	1,643.7	1,309.5	1,018.6
3	3	3	Malaysia	1,369.2	1,265.5	959.8
4	4	4	Chile	745.5	700.5	676.8
5	5	5	Brazil	487.1	472.0	476.0
6	6	6	Turkey	457.8	400.4	361.6
7	8	11	China	439.8	297.4	197.7
8	7	7	Tunisia	405.1	369.8	304.5
9	**9**	**9**	**Egypt**	**294.7***	**280.9**	**207.8**
10	10	8	Jordan	259.2	230.3	217.3
11	11	10	Indonesia	256.0	222.0	207.3
12	12	12	Morocco	221.4	204.1	192.3
13	13	13	India	78.6	65.0	55.5

* Note: 2003 data for Korea, and 2002 data for Egypt
Source: World Development Indicators

South Korea leads the rank by far, with US$ 3,216 in 2003, followed by the Czech Republic and Malaysia. Chile and Brazil, the two Latin American economies with a strong resource base, also appear high in the ranking. China is the main winner of the sample, leapfrogging four positions between 1995 and 2004. Egypt positions ninth in the 2004 ranking, below Turkey and Tunisia but above Jordan and Morocco. Interestingly, Egypt had a higher MVA capacity than China in 1995, but lost its industrial competitive edge shortly after that. Egyptian manufacturing value added capacity is the third in the region after Turkey and Tunisia, and it will continue to be for the next few years, as Tunisian MVA per capita is nearly US$ 100 more than that of Egypt. Indonesia and India are the only two countries outside the MENA region with an MVA capacity inferior to Turkey.

Table 3.4 shows the impact that countries are having on global manufacturing value added. Data is provided only until 2001, because aggregated manufacturing value added figures for the world are not yet available.

Table 3.4. Share in World's Manufacturing Value Added for Egypt and Comparators, 1995-2001

Ranking			Country	Share in world's manufacturing value added		
2001	2000	1995		2001	2000	1995
1	1	1	China	7.21%	6.53%	4.98%
2	2	2	Korea, Rep.	2.42%	2.33%	1.91%
3	3	3	Brazil	1.44%	1.40%	1.59%
4	4	4	India	1.21%	1.15%	1.08%
5	5	5	Indonesia	0.84%	0.80%	0.84%
6	6	7	Malaysia	0.49%	0.51%	0.41%
7	7	6	Turkey	0.44%	0.47%	0.47%
8	**8**	**8**	**Egypt**	**0.33%**	**0.31%**	**0.25%**

9	9	9	Czech Republic	0.23%	0.23%	0.22%
10	10	10	Chile	0.19%	0.19%	0.20%
11	11	11	Morocco	0.11%	0.10%	0.11%
12	12	12	Tunisia	0.07%	0.06%	0.06%
13	13	13	Jordan	0.02%	0.02%	0.02%

Note: Share of world's manufacturing value added could not be calculated for any later year due to lack of data on world's total manufacturing value added.
Source: World Development Indicators

Note by the static rankings that the impact of each country in global manufacturing value added has not changed over the period. However, the intensity has changed; China accounted for 7.2 percent of world's manufacturing value added in 2001, up from 4.9 percent in 1995—this share may have risen to nearly 10 percent by 2005. Egypt is eighth in the impact ranking, with 0.3 percent of global MVA, up from 0.25 percent in 1995. Turkey is ahead of Egypt, but has seen its contribution contract from 0.47 percent to 0.44 percent in six years. The Czech Republic, with only 10 million inhabitants, accounted for 0.23 percent of global MVA, and it is a clear industrial threat to Egypt. Tunisia and Jordan—far smaller countries—are at the bottom in the impact ranking, with global MVA shares below 0.1 percent.

3.2.2 Manufactured trade

Global trade has grown faster than global industrial production. This is the result of greater integration, erosion of trade barriers and the internationalization of manufacturing activities around the world. MNCs have played a major role in global trade, particularly in the outsourcing of production facilities to developing countries. Table 3.5 shows the manufactured export trends of Egypt and country comparators. As noted, manufactured trade has grown faster than MVA in most cases.

Table 3.5. Manufactured Exports for Egypt and Country Comparators, 1990-2004

	Manufactured exports (current US$, billion)				**Annual growth rate (constant prices)**		
	1990	**1995**	**2000**	**2004**	**1990-1995**	**1995-2000**	**2000-2004**
Brazil	23.4	35.3	42.4	68.2	8.6%	3.7%	12.6%
Chile	2.7	7.2	8.8	15.3	21.6%	4.1%	14.8%
China	48.0	132.9	229.3	562.4	22.6%	11.5%	25.2%
Czech Republic	-	19.4	27.2	62.1	-	7.0%	22.9%
Egypt	**1.4**	**2.0**	**3.5**	**5.4**	**7.2%**	**11.8%**	**11.4%**
India	14.0	25.0	37.7	69.4	12.3%	8.5%	16.5%
Indonesia	11.9	29.0	42.5	47.0	19.5%	7.9%	2.6%
Jordan	0.6	1.2	1.0	3.1	14.9%	-3.7%	32.2%
Korea, Rep.	62.4	119.1	166.4	245.0	13.8%	6.9%	10.2%
Malaysia	21.8	64.8	86.9	108.6	24.4%	6.0%	5.7%
Morocco	2.9	3.2	5.6	8.1	1.9%	12.1%	9.5%
Tunisia	2.7	4.8	5.0	8.5	12.3%	0.8%	14.1%
Turkey	8.2	15.0	21.0	50.0	12.8%	6.9%	24.2%

Source: UNComtrade

Egypt's manufactured exports grew from US$ 1.4 billion in 1990 to US$ 5.4 billion in 2004. Despite the impressive growth over the period—with double figures since 1995—Egypt's manufactured export base is still very small compared to other countries. Morocco and Tunisia are well ahead of Egypt in manufactured exports, and Turkey exports 10 times more manufactured goods than Egypt. Chile, with 16 million inhabitants and an industrial sector highly dependent upon resource-based activities, exported nearly three times more than Egypt in 2004.

Table 3.6 shows Egypt's weak manufactured export capacity. Egypt only exported US$ 79 of manufactured goods per capita in 2004, which puts it second to last in the ranking below, with India (which is dead last) only US$ 15 per capita behind.

Table 3.6. Manufactured Exports Per Capita for Egypt and Comparators, 1995-2004

Ranking			Country	Current US$ per capita		
2004	2000	1995		2004	2000	1995
1	3	3	Czech Republic	6,096.1	2,648.7	1,878.5
2	2	2	Korea, Rep.	5,088.2	3,539.4	2,641.5
3	1	1	Malaysia	4,306.1	3,735.9	3,145.0
4	4	5	Chile	956.7	577.7	506.2
5	5	4	Tunisia	849.6	523.9	538.4
6	6	7	Turkey	696.8	311.3	243.2
7	8	6	Jordan	571.9	208.2	292.7
8	11	11	China	433.8	181.6	110.3
9	7	8	Brazil	381.9	249.2	221.6
10	10	10	Morocco	264.8	196.4	120.9
11	9	9	Indonesia	216.0	206.0	150.5
12	**12**	**12**	**Egypt**	**79.2**	**55.2**	**34.8**
13	13	13	India	64.3	37.1	26.9

Source: UN Comtrade

The Czech Republic leads the manufactured export per capita ranking with US$ 6,096 in 2004, followed by South Korea and Malaysia. China has gained three positions in the ranking and is now eighth, well ahead of Brazil. But perhaps these countries are not realistic role models for Egypt, given their sophisticated industrial structures and export orientation. Tunisia and Turkey—fifth and sixth in the ranking respectively—are the best examples in the region of enhanced manufactured export competitiveness through macroeconomic stability, an improved business environment and openness (though Tunisia's export sector is highly vulnerable given its high dependency on EU markets and its limited export product range; see section 3.3.3 for details). Turkey is the main reference for Egypt, not only for its similar population, but also for its industrial structure and aspirations to serve the EU market. Turkey has doubled its manufactured exports per capita in only four years—from US$ 311 in 2000 to US$ 697 in 2004—and is clearly threatening Egypt's manufacturing presence in EU markets (see Chapter 4 for details).

Table 3.7 presents the world market share in manufactured trade for Egypt and comparators. China is first in the ranking for the selected countries, accounting for 7.8 percent of global manufactured trade, up from 3.3 percent in 1995. South Korea and

Malaysia are second and third respectively, but while the former has increased its market share in the period, the latter has reduced it. India is fourth, with nearly 1 percent of the world market in manufactured goods in 2004, overtaking Brazil and Indonesia.

Table 3.7. World Market Share in Manufactured Trade for Egypt and Comparators, 1995-2004

Ranking			Country	World market share		
2004	2000	1995		2004	2000	1995
1	1	1	China	7.83%	4.40%	3.30%
2	2	2	Korea, Rep.	3.41%	3.19%	2.96%
3	3	3	Malaysia	1.51%	1.67%	1.61%
4	6	6	India	0.97%	0.72%	0.62%
5	5	4	Brazil	0.95%	0.81%	0.88%
6	7	7	Czech Republic	0.86%	0.52%	0.48%
7	8	8	Turkey	0.70%	0.40%	0.37%
8	4	5	Indonesia	0.65%	0.82%	0.72%
9	9	9	Chile	0.21%	0.17%	0.18%
10	11	10	Tunisia	0.12%	0.10%	0.12%
11	10	11	Morocco	0.11%	0.11%	0.08%
12	**12**	**12**	**Egypt**	**0.08%**	**0.07%**	**0.05%**
13	13	13	Jordan	0.04%	0.02%	0.03%

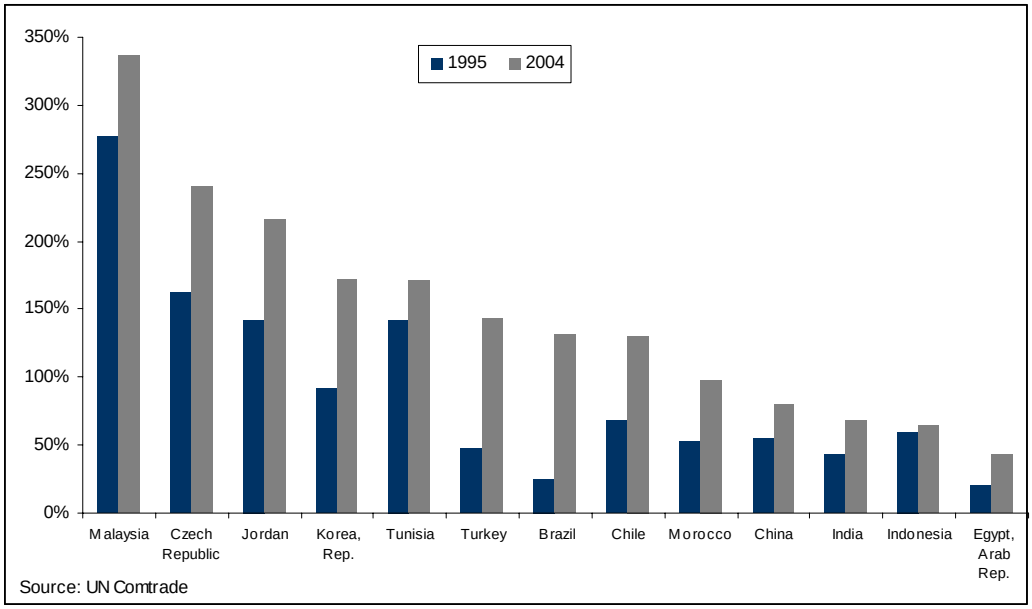
Source: UN Comtrade

MENA has a marginal presence in global manufactured trade—all MENA countries in the sample, excluding Turkey, are at the bottom of the ranking. This is partly due to strong competitive pressures on the international scene. Egypt only accounted for 0.08 percent of global manufactured trade in 2004, up from 0.05 percent in 1995. Tunisia and Morocco are ahead of Egypt but with similarly scant figures, and Jordan is last but with a respectable figure given that it is the smallest country of the sample. Turkey is clearly the reference in the region, as it has 0.7 percent of the world's share in manufactured trade, overtaking Indonesia and clearly ahead of Chile.

Figure 3.1 shows the manufactured export propensity of Egypt compared to other countries[3]. Note that all countries have increased their export propensity during the period analyzed. Most comparators used for the analysis are highly export-oriented, with manufactured export shares over manufacturing value added above 100 percent, excepting China, India, Indonesia and Egypt. This is understandable given their domestic market sizes.

Figure 3.1. Export Propensity for Egypt and Comparators: Manufactured Exports as Percentage of total MVA, 1995-2004

3 The values can be over 100 because the numerator (manufactured exports) is in total terms while the denominator (MVA) is only the value added and not the industrial output.



Malaysia is the most export-oriented economy of the country comparators, followed by the Czech Republic and South Korea. In the case of Brazil, enhanced manufactured export propensity has been caused by the slow growth of MVA relative to manufactured trade. Within the MENA region, Jordan has the strongest manufactured export orientation, ahead of Tunisia and Turkey. Egypt is by far the least export-oriented economy among the sampled countries, which confirms that most of its industry is not yet exposed to international competition. Although it is the case that Egyptian domestic demand is very strong, which is a major factor in determining the selling orientation of local firms, this does not make it any less true that most Egyptian firms are ill-equipped to meet international standards and serve global markets with highly competitive manufactured goods.

3.2.3 Industrial intensity and structure for competitiveness

This section uses UNIDO's technological classifications to shed light on the evolution of production and export structures in Egypt and comparators. It distinguishes between resource-based, low-technology, medium-technology and high-technology products, both in manufacturing value added and manufactured exports. [4] The technology classification, albeit with significant caveats, provides interesting insights on industrial

[4] **Examples of resource-based manufactured products** include prepared meats/fruits, beverages, wood products, vegetable oils; and ore concentrates, petroleum/rubber products, cement, cut gems, glass. **Examples of low-tech manufactured products** include textile fabrics, clothing, headgear, footwear, leather manufactures, and travel goods; as well as pottery, simple metal parts/structures, furniture, jewelry, toys, and plastic products. **Examples of medium-tech manufactured products** are passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibers, chemicals and paints, fertilizers, plastics, iron, and pipes/tubes; as well as engines, motors, industrial machinery, pumps, switchgear, ships, and watches. **Examples of high-tech manufactured products** include office/data processing/telecom equipment, TVs, transistors, turbines, and power-generating equipment; as well as pharmaceuticals, aerospace, optical/measuring instruments, and cameras. For a detailed SITC rev 2, 3-digit level classification, see UNIDO 2003 and UNIDO 2004.

transformation.[5] A shift of the production and export structure towards "complex" activities could be an indication of domestic technological deepening and upgrading.

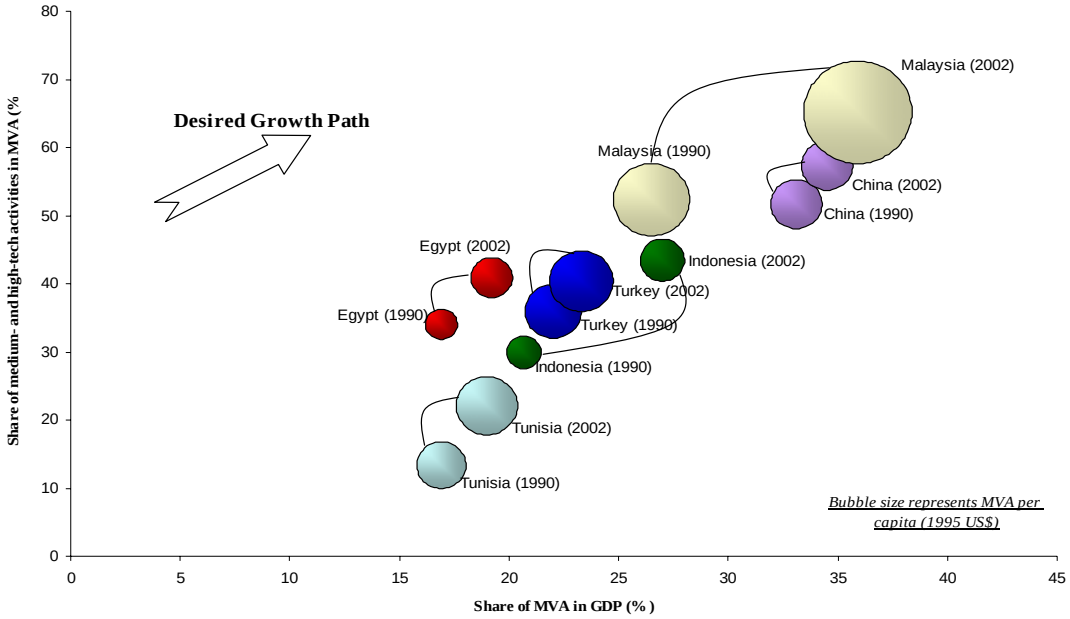
Despite the comparatively favorable ratio of manufactured exports to total exports, which reached 77.5 percent in 2002, Egypt's export structure remains heavily dominated by resource-based and low-tech exports, which account for nearly 90 percent of Egypt's manufactured exports. The share of medium- and high-tech (MHT) exports in total exports ranged from a low of 18.7 percent in the oil-dependent economy of Saudi Arabia to a high of 76.2 percent in the Malaysian economy, which enjoys a large export base of MHT exports.

Despite Egypt's favorable movement down the path of industrial deepening, as evidenced from the developments in MVA indicators, there are concerns as to the translation of this industrial deepening into export dynamism. As shown in Figure 3.2, Egypt's comparison with Turkey, Malaysia, and China suggests that Egypt's current competitive disadvantage pertains primarily to the low share of MHT exports in manufactured exports. With regard to industrial deepening (measured by the share of MVA in GDP) and the technological sophistication of current industrial activities (measured by the share of MHT activities in MVA), the gap between Egypt and its comparators is within striking distance.

On the other hand, a competitive industrial sector is able to penetrate export markets and enable the economy's export structure to move away from traditional exports into higher-value added exports with higher technological sophistication. This means a gradual increase in the share of manufactured exports in total exports (that is, a gradual decline in dependence on the export of primary products), and also an enhanced export structure via an increase in the share of MHT exports in total exports.

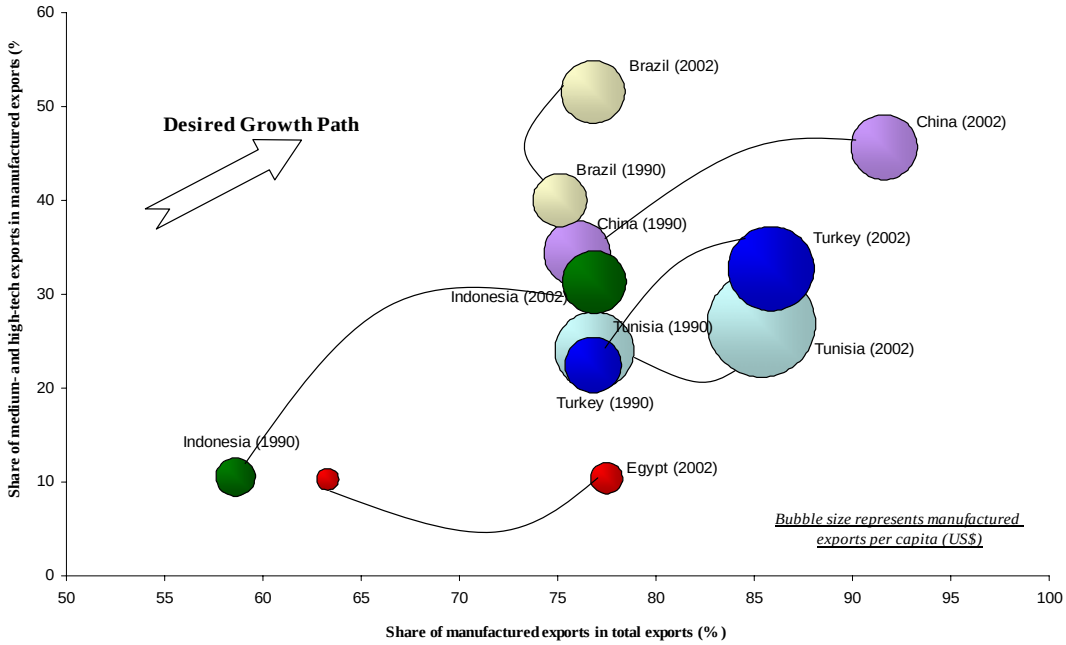
[5] This technology classification and its assumptions present caveats that need mention. First, there are sophisticated processes and products in "simple" sectors, and similarly cheap, labor-intensive activities in "complex" sectors. For instance, this is the case with computer-aided design in the clothing industry, and the assembly process in the semiconductor industry. Can we say, for example, that Italy has a less sophisticated industry than the Philippines just because it specializes in top-end clothing design while the latter assembles chips? This methodology aggregates sectors to the extent that it sometimes overlooks these significant differences. Second, the technology classification fails to pick up upgrading within sectors—technology upgrading only happens when a country shifts from one industry to another. This is a major limitation that can only be overcome through value chain analysis. It is therefore important to take these limitations into account when providing policy recommendations.

Figure (---): Industrial Deepning in Egypt and Selected Comparators (1990-2002)



As shown in Figure 3.3, Egypt is not able to replicate the movement of its comparators on the desired growth path with regard to manufactured exports performance, and this is the main reason behind the stagnation of Egypt's rank on the overall CIP index. Comparators such as Turkey, Indonesia and China were able to achieve remarkable leapfrogging during the 1990s which helped those economies reap the fruits of deeper integration into the global economy.

Figure (---): Technological Deepening in the Structure of Manufactured Exports for Egypt and Selected Comparators (1990-2002)



As this analysis indicates, the technological structure of Egypt's manufactured exports represent a competitiveness drain on Egypt's industrial performance due to dominance of resource-based and low-tech exports; both are the slowest growing categories in world trade. The slow pace of diversifying Egypt's export structure into medium- and high-tech activities signal a risk of a gradual diminishing of its international market share, with a gradual displacement by other low-cost competitors upgrading their industrial activities on the technological ladder.

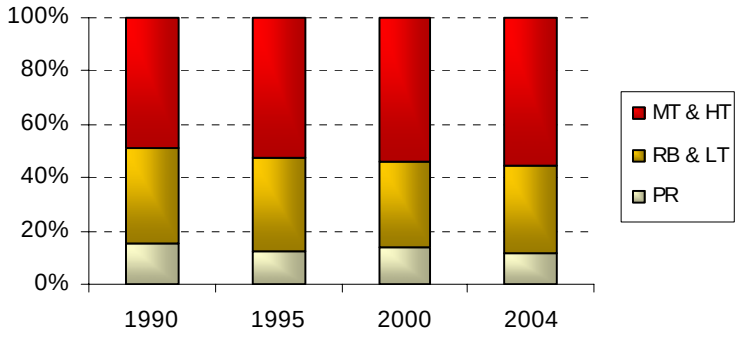
Table (--): Evolution of the Technological Structure of Exports
(share of each group in total exports, %)

	1990					2004				
	PR	RB	LT	MT	HT	PR	RB	LT	MT	HT
Egypt	41.1	13.9	37.7	6.1	1.2	24.5	44.4	20.1	10.1	0.9
Jordan	38.7	11.3	15.0	23.4	11.6	17.8	15.8	38.4	17.1	10.9
Morocco	25.1	31.0	29.6	11.4	2.8	15.4	27.8	38.7	11.5	6.5
Saudi Arabia /1	79.0	14.5	1.5	4.9	0.1	76.2	15.6	1.9	5.7	0.6
Tunisia	21.4	20.1	40.7	15.2	2.5	11.5	16.6	46.5	20.7	4.6
Turkey	20.3	11.7	51.5	13.6	3.0	7.3	11.4	43.9	30.5	6.9
Brazil	21.8	25.3	16.9	32.3	3.7	28.7	22.4	11.3	31.1	6.5
Chile	54.5	26.7	11.5	6.7	0.5	43.1	42.2	8.2	5.7	0.8
China	20.2	12.3	40.7	21.7	5.1	4.8	9.0	32.9	21.4	31.8
Indonesia	49.1	26.7	14.8	8.5	0.9	25.3	29.1	20.0	15.4	10.3
India	18.1	27.0	36.1	14.8	4.1	11.4	33.8	33.0	16.6	5.1
Malaysia	24.8	23.7	11.3	14.7	25.4	12.5	14.7	9.0	17.9	45.9
South Korea	3.4	8.7	37.8	29.9	20.3	2.1	10.6	12.0	38.8	36.4
World	15.3	17.2	18.7	33.5	15.3	12.0	15.9	16.7	33.1	22.3

Source: Calculated from UN Comtrade data.
Note: PR stands for 'primary exports', RB for 'resource-based', LT for 'low-tech', MT for 'medium-tech', and HT for 'high-tech'.
1/ Data for Saudi Arabia for the year 2004 refers to 2002 data.

As shown in Table 3.8, between 1990 and 2004 the technological composition of Egypt's exports indicates less dependence on primary exports and an increase in the share of manufactured exports that comprises the four main groups: resource-based, low-tech, medium-tech, and high-tech products.[6] However, manufactured exports remain dominated by resource-based and low-tech exports, which represent, respectively, 44.4 percent and 20.1 percent of total exports in 2004. The share of MHT exports in total exports stood at only 11 percent. In the diversified regional comparators, the share of MHT exports ranged

Figure (--): Shares of Technolgy Categories in World Exports



[6] For details on the product groups falling under each category, see Appendix 3.2.

from 18 percent in Morocco to 37.4 percent in Turkey.

Source:

As the world export structure indicates, the bulk of international export activity today is in medium- and high-tech products, standing at about 55.4 percent of total world exports in 2004 compared to 48.7 percent in 1990. The upward trend in the share of MHT exports in world exports is noticeable in Figure 3.4 and is likely to continue in the near future as the dynamism of innovation continues to shape global demand patterns.

Among the group of comparators, countries with successful industrialization experiences have a technological structure of exports that is rather similar to the world's. Those are precisely the economies that were able to secure increasing shares in international export markets as they aligned their industrial development path with evolving demand patterns that favor more and more products that are technology- and innovation- intensive.

Table (--): Growth in Exports by Main Technological Groups (%)

	Average 1990-1995						Average 2000-2004					
	PR	RB	LT	MT	HT	Total Exports	PR	RB	LT	MT	HT	Total Exports
Egypt	4.2	12.8	4.9	6.8	7.6	5.9	17.7	17.7	8.2	3.9	0.0	13.8
Jordan	2.9	25.5	7.8	11.9	12.5	10.7	29.9	33.7	38.9	20.1	24.7	31.7
Morocco	2.8	6.2	2.1	1.2	-21.2	2.2	0.2	6.8	7.6	14.9	6.8	7.5
Tunisia	-4.0	5.9	15.1	7.6	14.1	9.4	8.6	14.4	11.7	19.0	21.5	13.4
Turkey	-0.2	15.8	10.9	17.1	9.9	10.8	14.9	22.4	18.2	34.4	19.0	23.1
Brazil	6.9	9.3	5.2	9.7	3.9	8.2	24.9	13.7	11.5	16.6	0.1	14.5
Chile	8.0	21.5	10.6	15.4	33.6	13.3	15.4	15.2	7.7	9.6	3.8	14.1
China	3.6	18.7	21.6	15.0	41.8	19.1	10.9	21.1	16.7	27.0	36.1	24.2
Indonesia	3.7	13.3	20.3	22.3	49.4	12.1	-2.7	6.0	-0.5	4.4	-1.8	0.9
India	11.5	11.7	14.1	12.5	12.3	12.1	9.7	19.8	10.2	20.1	15.4	15.3
Malaysia	1.0	13.1	17.6	27.0	31.5	20.2	11.1	12.0	6.9	9.2	2.9	6.5
South Korea	7.8	13.9	1.1	17.9	23.3	14.0	7.5	6.5	1.5	14.3	10.4	10.2
World	4.3	7.4	8.4	8.1	13.7	8.5	3.7	8.9	8.0	9.8	6.5	7.8

Source: Calculated from UN Comtrade data.

Note: PR stands for 'primary exports', RB for 'resource-based', LT for 'low-tech', MT for 'medium-tech', and HT for 'high-tech'.

This is more evident when comparing the growth rates of the different export groups (see Table 3.9). During 1990-1995, Egypt enjoyed decent growth rates in the medium- and high-tech groups, which also experienced higher-than-average growth in total exports. During the period 2000-2004, driven partially by the surge in international oil prices, it appears that growth rates were highest in primary and resource-based exports, followed by low-tech exports. Medium-tech exports grew by 3.9 percent. whereas high-tech exports remained stagnant. For comparators, growth rates in the different groups were more in line with the respective world growth rates, and hence more conducive to the evolution of a more favorable export structure.

3.2.3 Industrial intensity and structure for competitiveness

Out of Egypt's most important 20 export groups (those with the highest average export value during the period 1990-2004), 8 product groups are primary exports. These include

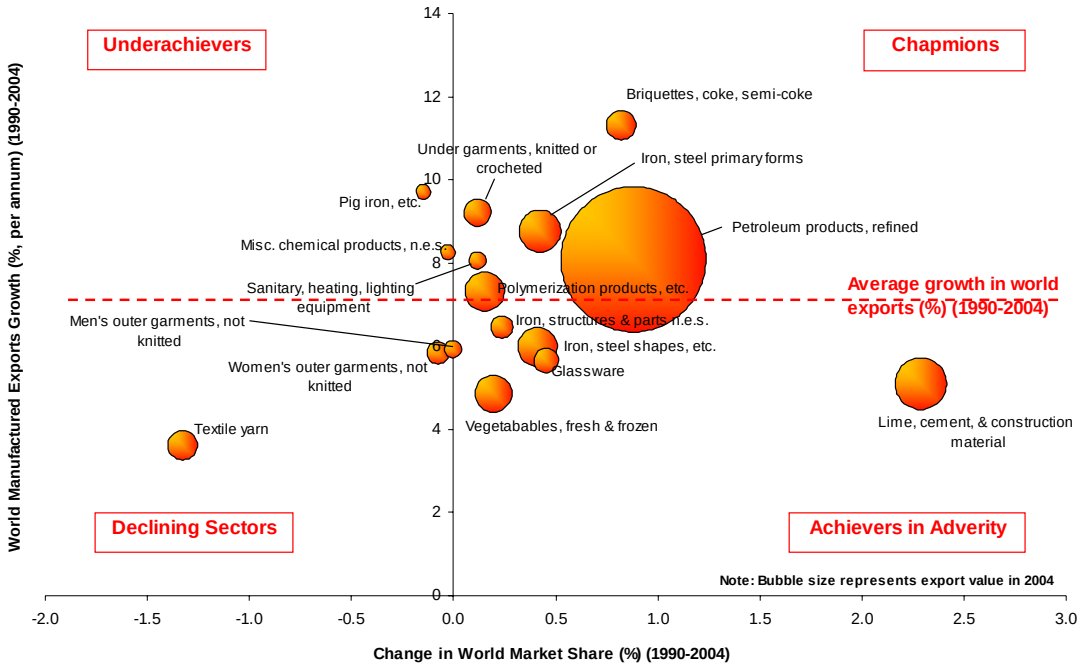
crude petroleum and natural gas, cotton, rice, aluminum, unprocessed vegetables and fruits, as well as stone, sand and gravel.

The other 12 export groups are concentrated in the resource-based and low-tech export categories. A few exceptions are in the medium-tech export category, such as further-processed iron and steel; sanitary, heating, and lighting equipment (due to sizable exports of ceramics and sanitary ware); and polymerization products (such as polyethylene, polypropylene, and polystyrene, which are used in the manufacturing of plastics, packaging material, automotive components, and some household appliances).

A closer look at the dynamic performance of Egypt's top manufactured exports is facilitated by classifying them into four categories. As shown in Table 3.10, products can be classified as *underachievers*, *champions*, *declining sectors*, or *achievers in adversity* depending on whether their share in total world exports is rising or falling, and simultaneously whether Egypt's world market share is expanding or shrinking.

	Egypt's World Market Share	
Product Share in World Exports	Shrinking (Non-competitive)	Expanding (Competitive)
Rising (Dynamic)	Weakness *"Underachievers"*	Optimal *"Champions"*
Falling (Stagnant)	Restructuring *"Declining sectors"*	Vulnerable *"Achievers in adversity"*

Figure (--): Performance of Egypt's Key Manufactured Exports



Source:

As shown in Figure 3.5, most of Egypt's exports can be classified as either champions or achievers in adversity. Between 1990 and 2004, there has been an increase in Egypt's world market share for these products, though the increases are rather modest with the exceptions of lime, cement and construction material; for these three products Egypt's world market share increased by nearly 2.3 percentage points; however, this is a product group whose global demand is relatively declining.

The champion products include refined petroleum products (whose recent growth was fueled by increasing international oil prices); further-processed iron and steel; briquettes, coke, and semi-coke; polymerization products; knitted or crocheted undergarments; and sanitary, heating, and lighting equipment.

For Egypt to substantially increase its world market share for these products, it must increase its export growth rates relative to its competitors in the international markets for such products. More critically, with a few exceptions, MHT products seem to be absent from the picture. As indicated above, the continued specialization into resource-based and low-tech exports entails a gradual marginalization from the most dynamic segment of global trade.

Table 3.11 displays the world most dynamic exports, or the products for which world demand is growing at the highest pace. The data show that Egypt was able to increase its market share in a few of the 40 product groups; the shaded rows highlight product groups where Egypt displayed favorable performance. However, Egypt's world market share appears dismal if compared to that of China and Turkey, with the latter of course being a more relevant comparator.

Performance in the World's 40 Most Dynamic Exports (1990-2004): Egypt, China, and Turkey

Rank	SITC Code	SITC Group Name	World		Egypt		China		Turkey	
			A.A.G.R. (90-04)	Group Share in Total World Exports in 2004 (%)	A.A.G.R. (90-04)	Egypt's Share in World Exports in 2004 (%)	A.A.G.R. (90-04)	China's Share in World Exports in 2004 (%)	A.A.G.R. (90-04)	Turkey's Share in World Exports in 2004 (%)
1	871	Optical instruments	17.2	0.39	7.9	0.0	49.7	21.9	56.6	0.0
2	541	Medicinal and pharmaceutical products	14.5	2.91	9.6	0.0	12.2	1.3	10.2	0.1
3	776	Transistors, valves, etc.	12.5	3.93	19.7	0.0	41.3	4.9	23.9	0.0
4	884	Optical goods, n.e.s.	12.4	0.33	-15.2	0.0	39.9	8.6	25.9	0.1
5	764	Telecommunications equipment and parts	12.0	3.44	50.2	0.0	37.3	15.2	13.3	0.0
6	515	Organo-inorganic compounds	11.2	0.67	-7.5	0.0	14.4	2.9	8.6	0.0
7	872	Medical instruments and appliances	11.0	0.53	-6.5	0.0	29.9	2.6	11.1	0.1
8	783	Road motor vehicles, n.e.s.	10.7	0.32	48.4	0.1	18.6	0.4	27.3	2.2
9	773	Equipment for distributing electricity	9.9	0.60	-3.9	0.0	29.8	7.6	12.8	1.1
10	553	Perfumery, cosmetics, etc.	9.9	0.46	-8.7	0.0	12.6	2.0	31.4	0.5
11	771	Electric power machinery and parts	9.8	0.48	-4.4	0.0	32.1	17.3	17.5	0.6
12	759	Office machines, parts and accessories	9.4	2.08	37.6	0.0	46.6	14.2	30.5	0.0
13	098	Edible products and preparations, n.e.s.	9.4	0.32	-5.4	0.0	17.6	3.9	23.6	0.8
14	752	Automatic data processing machines	9.4	2.91	5.9	0.0	58.3	24.5	4.0	0.0
15	778	Electrical machinery and apparatus, n.e.s.	9.3	1.55	3.3	0.0	29.9	10.4	16.8	0.1
16	582	Products of condensation, etc.	9.3	0.71	12.1	0.0	37.1	2.1	10.5	0.3
17	772	Switch-gear etc., parts, n.e.s.	9.2	1.47	16.1	0.0	32.2	6.6	25.7	0.3
18	846	Under garments, knitted or crocheted	9.2	0.52	14.8	0.2	16.9	17.7	13.0	7.2
19	763	Sound records, phonograph	9.2	0.66	3.6	0.0	42.0	28.5	47.0	0.1
20	899	Other manufactured goods	8.8	0.46	2.3	0.0	15.0	14.1	16.8	0.2
21	672	Iron, steel primary forms	8.8	0.64	36.7	0.4	27.5	7.2	10.2	2.8
22	716	Rotating electric plant and parts	8.6	0.51	20.3	0.0	24.5	9.3	22.4	0.4
23	658	Textile articles, n.e.s.	8.4	0.31	10.3	0.5	13.1	29.8	14.9	7.1
24	821	Furniture and parts thereof	8.3	1.06	-6.9	0.0	30.0	14.2	27.2	0.7
25	743	Pumps and compressors, fans, etc.	8.3	0.72	77.5	0.0	34.6	2.8	17.5	0.3
26	598	Miscellaneous chemical products, n.e.s.	8.3	0.77	5.4	0.1	18.1	2.4	12.5	0.1
27	699	Manufactures of base metal, n.e.s.	8.2	0.87	12.7	0.0	20.9	9.1	24.2	0.6
28	334	Petroleum products, refined	8.1	2.55	18.1	1.2	11.4	1.9	10.8	0.5
29	812	Sanitary, heating, lighting equipment	8.0	0.32	17.6	0.2	29.4	17.5	20.4	2.2
30	533	Pigments, paints, etc.	7.9	0.41	-0.5	0.0	13.0	2.0	20.3	0.4
31	048	Cereal etc. preparations	7.8	0.32	-2.7	0.0	10.2	1.0	16.1	1.1
32	893	Articles of plastics, n.e.s.	7.8	0.96	14.1	0.0	27.3	11.6	28.5	0.8
33	874	Measuring, checking, analyzing instruments	7.7	1.24	17.0	0.0	23.3	2.4	22.8	0.1
34	514	Nitrogen-function compounds	7.7	0.54	-5.0	0.0	21.1	4.0	3.4	0.1
35	775	Household equipment, n.e.s.	7.7	0.71	5.1	0.0	29.5	19.9	27.3	2.4
36	723	Civil engineering equipments, n.e.s.	7.7	0.69	78.3	0.0	26.2	2.6	21.9	0.3
37	785	Motorcycles, motor scooters, etc.	7.6	0.34	4.6	0.0	25.5	18.1	28.7	0.2
38	513	Carboxylic acids, etc.	7.6	0.33	-4.0	0.0	17.6	5.0	-0.5	0.1
39	761	Television receivers	7.6	0.56	42.5	0.0	17.8	11.7	20.5	5.7
40	713	Internal combustion piston engines	7.5	1.19	3.8	0.0	23.3	1.3	22.5	0.7
World Total			**7.1**	**100.0**	**8.3**	**0.1**	**17.5**	**7.0**	**12.0**	**0.7**

Source: Calculated from UN Comtrade Data.

Notes: 1) The table includes only export groups whose share in world exports in 2004 was 0.3% or more.

2) Shaded rows highlight product groups where Egypt's world market share in 2004 was 0.1% or more, and also its average annual growth rate exceeded that of total world exports for the same groups.

Egypt recorded a growth rate that exceeded that of total world exports (implying an increasing world market share) in 18 out of the 40 top dynamic world exports, but this outcome is primarily due to the fact that Egypt's export base from these products was very low in 1990. With the exception of medicinal and pharmaceutical products, China is scoring growth rates higher than the respective world exports growth virtually across the board. Turkey increased its world market share in 35 out of the top 40 dynamic products. Turkey's presence is also more visible in world markets as evidenced from its decent market shares.

3.3 Product and market diversification

Market and product diversification is another key factor in industrial competitiveness. Countries exporting a wider range of manufactured goods show their ability to compete internationally throughout the whole manufacturing spectrum. Market diversification makes countries less vulnerable to external shocks and demand slowdowns. The externalities of accessing new markets with new products are at the core of a country's path to industrial competitiveness. Technologies need to be mastered and marketing channels created to open up potential selling outlets. Specialized skills need to be developed and institutions shaped to support firms engaged in new product lines. However, trade diversification, both in products and markets, is a very costly, risky and long-term process. But the benefits in terms of learning prospects, technology upgrading, and spillover effects make it worth the effort.

This section deals with product and market diversification separately and presents a plausible vulnerability scenario for all countries.

3.3.1 Manufactured product diversification

Appendix 3.3 gives the methodologies used to derive the manufactured product diversification index and the market diversification index that are at the core of the analysis in the section.

South Korea leads the ranks in manufactured product diversification, followed by the Czech Republic and China (See Table 3.12). Turkey is the regional leader, gaining two positions and overtaking Jordan and India between 2000 and 2004.

Table 3.12. Manufactured Product Diversification Index for Egypt and Comparators, 1995-2004

Ranking			Country	Index value		
2004	**2000**	**1995**		**2004**	**2000**	**1995**
1	1	1	Korea, Rep.	1	1	1
2	3	2	Czech Republic	0.96	0.73	1.00
3	2	4	China	0.75	0.82	0.67
4	5	3	Malaysia	0.73	0.68	0.67
5	6	5	Brazil	0.65	0.54	0.66
6	4	8	Indonesia	0.64	0.69	0.22
7	9	7	Turkey	0.51	0.44	0.23
8	7	6	India	0.39	0.47	0.33
9	10	13	Morocco	0.17	0.29	0
10	12	10	Tunisia	0.16	0.14	0.10
11	8	9	Jordan	0.14	0.46	0.14
12	13	12	Chile	0.04	0	0.02
13	**11**	**11**	**Egypt**	**0**	**0.16**	**0.07**

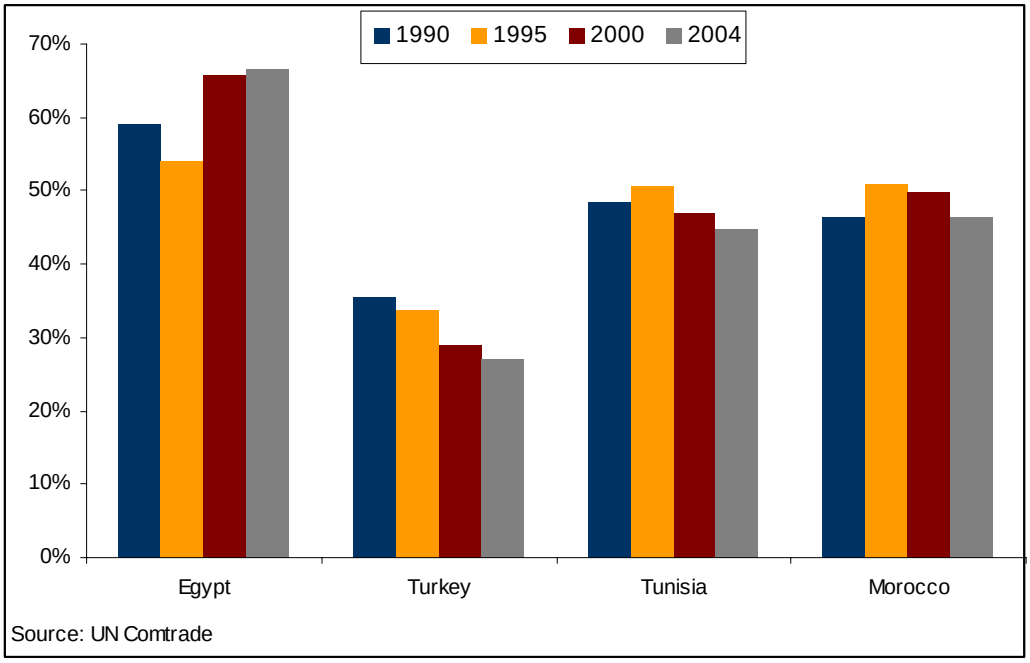
Source: UN Comtrade

Egypt ranks last in the manufactured product diversification index, which depicts its very high concentration in a limited product range for export. This is a severe concern for

Egypt's export sector, as it makes the sector highly exposed and vulnerable to changing world demands.

Egypt's top five manufactured exports accounted for 66.6 percent of total manufactured exports in 2004 (see Figure 3.6). In fact, refined petroleum products alone, Egypt's top export product, represented 49 percent of the country's total manufactured exports to global markets. Moreover, Egypt's product concentration has increased over time—in 1990 its top five manufactured exports accounted for 60 percent of the total.

Figure 3.6. Share of Top Five Manufactured Exports in Total Manufactured Exports for Egypt, Turkey, Tunisia and Morocco, in Percent, 1990-2004



The regional comparators—Turkey, Tunisia and Morocco—have taken a different path and have substantially reduced the extent of their export dependency on only a few products. Turkey's top five manufactured exports only accounted for 27 percent of the country's total manufactured exports in 2004. Turkey has managed to diversify its manufactured exports away from low-technology garments, which represented more than 40 percent of the country's manufactured exports in 1990, hence increasing the participation of a wider variety of medium- and high-technology products, such as automobiles and TV receivers. Tunisia's and Morocco's top five manufactured exports accounted for around 45 percent of their total manufactured exports in 2004, down from 48.5 percent and 46.3 percent in 1990 respectively.

But what sort of manufactured goods is Egypt exporting to the world? Resource-based products, mainly petroleum-based clearly dominate the scene (see Table 3.13). Refined petroleum is Egypt's single major export to the US, the EU and the Middle East and North African region.

Table 3.13. Egypt's Top 5 Manufactured Exports to the US, Middle East and North Africa, and the European Union, 2004

Destination	Technical Classification	SITC 3 digit, rev 2	Product	Value 2004 (US$ thousand)	Share in total manufactured exports
United States	RB	334	Petroleum products, refined	146,211.2	69.30%
	MT	672	Ingots and other primary forms of iron	81,489.4	
	LT	846	Undergarments, knitted or crocheted	51,219.0	
	RB	663	Mineral manufactures, n.e.s.	48,735.8	
	LT	842	Outer garments, men's, of textile fabric	48,420.5	
Middle East and North Africa	RB	334	Petroleum products, refined	362,353.4	55.6%
	RB	673	Iron and steel bars, rods, angles, shapes	84,021.5	
	RB	661	Lime, cement, and fabricated construction products	77,740.5	
	RB	341	Gas, natural and manufactured	77,338.3	
	RB	691	Structures and parts of iron	53,940.6	
European Union	RB	334	Petroleum products, refined	830,609.0	68.9%
	RB	661	Lime, cement, and fabricated construction products	146,452.7	
	MT	583	Polymerization and copolymerization	123,077.6	
	RB	341	Gas, natural and manufactured	105,500.7	
	LT	658	Made-up articles, wholly/chiefly of textile materials	91,113.1	

Source: UN Comtrade

Egypt's manufactured export concentration in markets outlets is worrying, and so is the nature of the products exported—they are mainly low value-added, resource-based products. Take for instance the Middle East and North African region, where competition may be lower and Egypt has an industrial edge. Egypt's top five manufactured exports to the region are resource-based and include refined petroleum, iron and steel, construction products and manufactured gas. The nature of these products says little about Egypt's manufacturing presence in the region. In the EU and the US, Egypt's trade concentration is much more acute and the share of refined petroleum is even greater, particularly in the EU. This massive concentration of low value-added, resource-based products in main markets calls for urgent action if Egypt is to raise its industrial competitiveness bar in the near future.

3.3.2 Market diversification

India leads the ranking of the market diversification index, followed by the East Asian economies, China, South Korea and Indonesia (see Table 3.14). The case of India is particularly interesting as it spreads its manufactured exports to many regions but has a relatively low presence in its own—24 percent of its manufactured trade goes to the EU; 20.4 percent to the US; 19.8 percent to East Asia; and 16 percent to the Middle East and North Africa. China and South Korea have a stronger presence in East Asia, though they are slowly increasing their market share in other regions, particularly the US and the EU.

Table 3.14. Market Diversification Index for Egypt and Comparators, 1995-2004

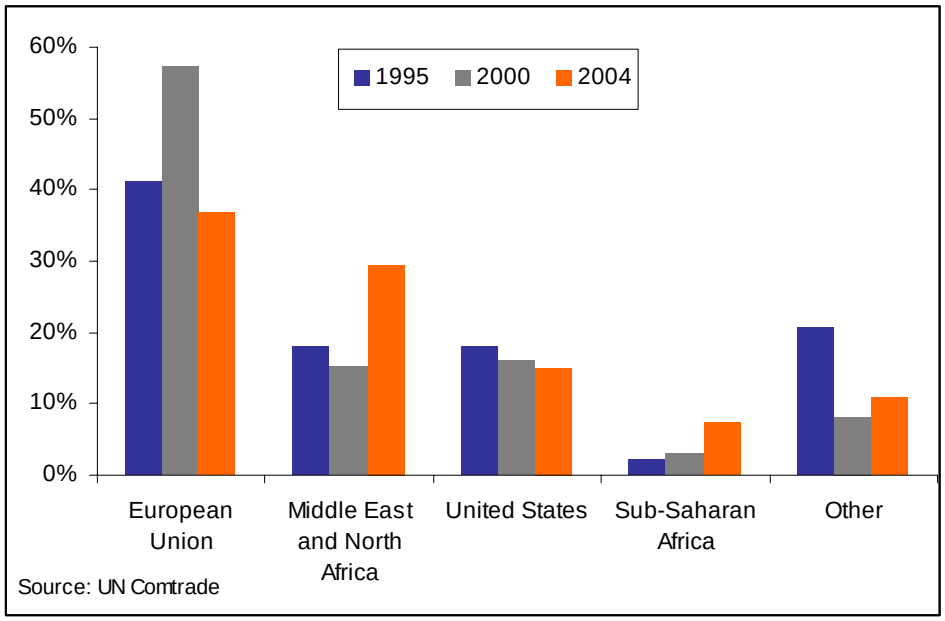
Ranking			Country	Index value		
2004	2000	1995		2004	2000	1995

1	1	1	India	1	1	1
2	3	6	China	0.88	0.82	0.61
3	2	4	Korea, Rep.	0.84	0.84	0.71
4	4	3	Indonesia	0.77	0.81	0.71
5	**7**	**2**	**Egypt**	**0.76**	**0.66**	**0.80**
6	5	5	Turkey	0.75	0.75	0.68
7	6	7	Malaysia	0.60	0.68	0.54
8	9	8	Czech Republic	0.52	0.52	0.50
9	8	9	Brazil	0.42	0.53	0.49
10	10	12	Chile	0.32	0.36	0.16
11	12	11	Morocco	0.31	0.30	0.29
12	11	10	Tunisia	0.26	0.32	0.38
13	13	13	Jordan	0	0	0

Source: UN Comtrade

Egypt ranks fifth in the market diversification index and is positioned ahead of its regional neighbors, including Turkey. Egypt has reduced its dependency on the EU—unlike Morocco, Tunisia and Turkey—while increasing its presence in the MENA region and Sub-Saharan Africa, and keeping its share in the US (see Figure 3.7). This market diversification strategy reduces Egypt's global vulnerability to possible demand slowdowns in specific regions.

Figure 3.7. Egypt's Manufactured Trade Concentration in Main Markets, in Percent, 1995-2004

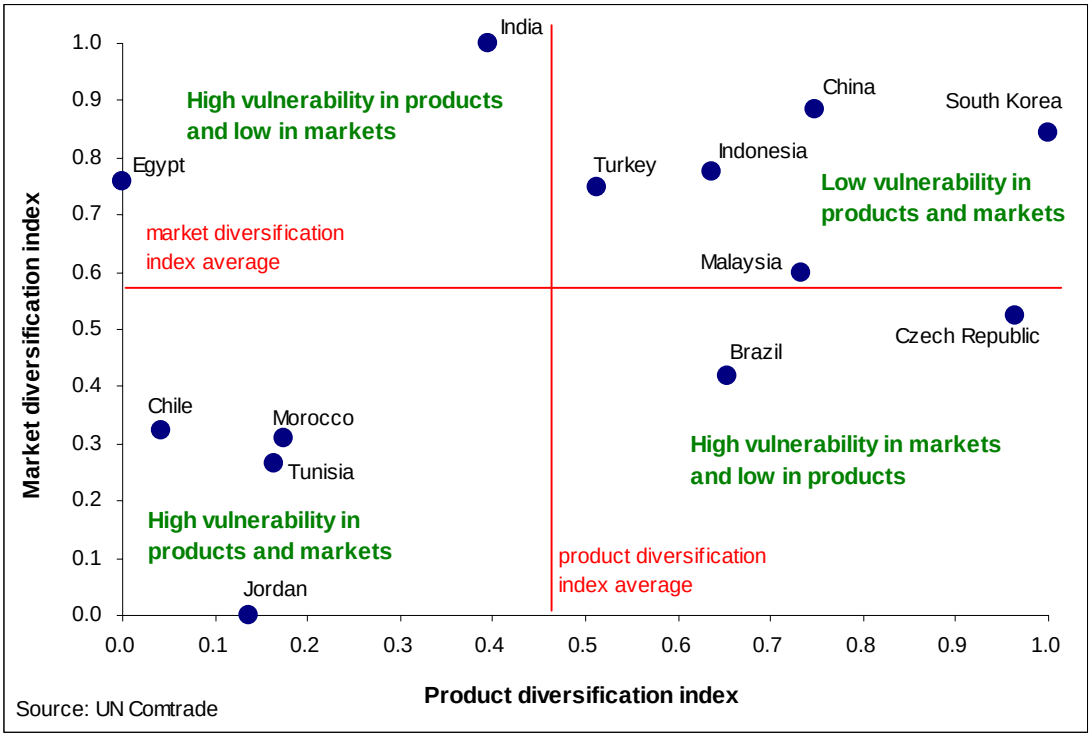


3.3.3 Vulnerability matrix

Figure 3.8 combines the manufactured product diversification index and the diversification market index to produce a vulnerability matrix in which countries can be placed according to their index values. Four vulnerability quadrants are created using the

index value averages. The rationale is that the higher the diversification in products and markets, the lower the vulnerability.

Figure 3.8. Product and Market Vulnerability Matrix for Egypt and Comparators, 2004



China, South Korea, Indonesia, Malaysia and Turkey have a low vulnerability in products and markets thanks to their diversification patterns. Interestingly, all East Asian economies in the sample are placed in the low vulnerability quadrant. The case of Turkey confirms that it is clearly the regional "role model" and performs strongly on most indicators. Brazil and the Czech Republic are highly vulnerable in markets, due to their dependence on Latin America and the EU respectively, but have a wide range of manufactured products for export. Egypt and India are located in the quadrant of high vulnerability in products but low in markets. Morocco, Tunisia, Jordan and Chile are highly vulnerable in products and markets due to their high concentration in few markets and limited manufactured export range.

Appendix 3.1 Dimensions, Indicators and Calculation of the CIP index

The CIP index covers the four main dimensions of industrial competitiveness:

- ***Industrial capacity***. *Manufacturing value added (MVA) per capita* is the basic indicator of a country's level of industrialization adjusted for the size of the economy. It shows a country's capacity to add value in the manufacturing process. Yet MVA is not always exposed to international competition—inward-oriented polices and trade barriers can indeed limit the exposure of domestic industries to global competition. MVA analysis can throw distorting results for countries that have gone through a long period a protectionism and import substitution, such as Egypt. Thus the importance of combining MVA with export orientation, which places the competitiveness of industrial activity in the international scene.
- ***Manufactured export capacity.*** In a globalizing world, the capacity to export is the key ingredient for economic growth and competitiveness. *Manufactured exports per capita* is the basic indicator of trade competitiveness: it shows the capacity of countries to meet global demands for manufactured goods in a highly competitive and changing environment. Manufactured exports show if national MVA is really competitive internationally. MVA also adds to trade analysis as it shows the extent of value that domestic companies add to exports—trade analysis on its own can cause distortion in the case of countries with low domestic capabilities but used by Multinational Corporations (MNCs) as export platforms.
- ***Industrialization intensity.*** The intensity of industrialization is measured by the simple average of the *share of MVA in GDP* and the *share of medium and high technology activities in MVA*. The former captures the role of manufacturing in the economy and the latter the technological complexity of manufacturing. The latter variable gives a positive weight to complex activities on the ground that are desirable for competitive performance: a more complex structure denotes industrial maturity, flexibility and the ability to move into faster growing activities. However, the measure only captures shifts *across* activities and not upgrading within them, and misses an important aspect of technological improvement. It is also fairly aggregate and cannot capture fine technological differences within the categories (some low technology activities may have segments of high technology and vice versa). These deficiencies reflect the nature of the data, but the broad findings appear to be sound and plausible.
- ***Export quality.*** The quality of exports is measured by the simple average of the *share of manufactured exports in total exports* and the *share of medium and high technology products in total exports*. The reasoning is similar to that of industrialization intensity. The share of manufactures in total exports captures the role of manufacturing in export activity, its technological complexity, and the ability to make more advanced products and move into more dynamic areas of export growth.

The four dimensions are given equal weight – therefore in the latter two dimensions each indicator gets a weight of ½ in the CIP. All indicators are standardized according to the formula:

$$I_{i,j} = \frac{X_{i,j} - Min(X_{i,j})}{Max(X_{i,j}) - Min(X_{i,j})}$$

where $X_{i,j}$ is the value *i* of the country *j*, Min is the smallest value in the sample and Max the largest. The top country in the sample gets a 1 while the worst performing country gets a 0. The combined indices are simply calculated with the arithmetic mean of the standardized values.

Appendix 3.2

Technological Classification of Exports

Primary exports are those shipped as raw material or with little or no value-added processing operations. These include crude petroleum and natural gas, agricultural products (vegetables and fruits), farm products (live cattle, fresh meat, milk, etc.), minerals and the like.

Resource-Based (RB) products include food, agro-based products (e.g. wood manufactures), refined petroleum and rubber products, ore and metal concentrates, cement, cut gems, glass and the like.

- **RB1** includes processed agricultural and farm products (frozen and prepared vegetable and fruits, meat and dairy products, confectionary), tobacco, wood manufactures, and rubber products.
- **RB2** includes refined petroleum products, iron and steel scrap, basic metal ores, cement, glass, mineral manufactures, etc.

Low-Tech (LT) products include the textile, apparel and footwear (fashion) sub-group, pottery, simple metal parts and structures, furniture, jewelry, toys, plastic products and the like.

- **LT1** includes the textile, apparel and footwear sub-group.
- **LT2** includes further processed iron and steel products, paper products, tools and wires, furniture, office supplies, jewelry, and musical instruments.

Medium-Tech (MT) goods comprise the bulk of skill- and scale-intensive technologies in the production of capital goods and intermediate products. They include automotive products, processed industry products (such as synthetic fibers, chemicals and paints, fertilizers, and plastics), and engineering products such as engines and industrial machinery.

- **MT1** includes passenger motor vehicles, trucks, and automotive components.
- **MT2** includes synthetic fibers, chemicals, cosmetics, fertilizers, plastic materials, and high-end iron and steel products.
- **MT3** includes engines and motors, engineering equipment, different types of manufacturing machinery, ships and boats, radio and sound equipment, etc.

High-Tech (HT) products come from industrial sectors that are intensely innovation-driven and where R&D activities are key inputs in the process. These include office and telecom equipment, optical instruments, precision instruments, pharmaceuticals and the like.

- **HT1** includes office and telecom equipment, power-generation machinery, and electric machinery.
- **HT2** includes pharmaceuticals, optical instruments, aircraft, and precision instruments.

Appendix 3.3

Methodology of the manufactured product diversification index

This methodology draws from UNCTAD in the elaboration of a product diversification index. However there are two major differences: it only looks at diversification within manufactured exports, excluding primary exports and other transactions (it is then a manufactured product diversification index); and it considers only manufactured exports that account for or more than 0.5 per cent of the country's total manufactured exports.

The manufactured product diversification index shows the extent to which a country depends on particular products relative to world exports. In other words, it compares a country's export structure with the world's export structure, penalizing countries for which product concentration does not correspond to world trade.

The formula used is the following:

$$DX_j = \frac{\sum \left[h_{ij} - h_i\right]}{2}$$

Where DX is the manufactured diversification index value of country $_j$,
$\sum$ is the sum of all values in brackets
h_{ij} is the share of product $_i$ in total manufactured exports of country $_j$
h_i is the share of product $_i$ in total world manufactured exports

As indicated above we only consider those manufactured products whose share in a country's total manufactured exports is 0.5 per cent or above.

Once the manufactured diversification index values have been obtained, values are standardized following the formula given in Appendix 3.1. Yet to obtain a ranking where 1 is best (more diversified), and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardized manufactured product diversification index value)

Methodology of the market diversification index

The methodology of the market diversification index follows the logic of the manufactured product diversification index explained above. It shows the extent to which a country depends on particular markets for its manufactured exports relative to how important those markets are in world manufactured imports.

For this exercise we consider eight markets: the EU, the US, Sub-Saharan Africa, Latin America, East Asia, South Asia, Middle East and North Africa, and the 'rest' category; and we only take the manufactured export category aggregated as if it was only one product.

The formula used is the following:

$$DM_j = \frac{\sum \left[h_{ij} - h_i\right]}{2}$$

where DM is the market diversification index value of country $_j$,
$\sum$ is the sum of all values in brackets
h_{ij} is the country's market share of manufactured products $_i$ in the country's total manufactured exports to the world $_j$
h_i is the market's import share of all manufactured products $_i$ in total world manufactured imports

Once the market diversification index values have been obtained, values are standardized following accordinging to the formula in Appendix 3.1. Yet to obtain a ranking where 1 is best (more diversified), and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardized market diversification index value)

Guide to Figures/Tables for Chapter 3

Fig/ Table Number	Name	Special Notes for Designer	Source
Table 3.1	Rankings in the CIP Index, 1995-2004		UN Comtrade, UNIDO's Indstat
Table 3.1	Manufacturing value Added for Egypt and Comparators, 1990-2004		World Development Indicators
Table 3.3	Manufacturing Value Added Per Capita for Egypt and Comparators, 1995-2004		World Development Indicators
Table 3.4	Share in World's Manufacturing Value Added for Egypt and Comparators, 1995-2001		World Development Indicators
Table 3.5	Manufactured Exports for Egypt and Country Comparators, 1990-2004		UNComtrade
Table 3.6	Manufactured Exports Per Capita for Egypt and Comparators, 1995-2004		UN Comtrade
Table 3.7	World Market Share in Manufactured Trade for Egypt and Comparators, 1995-2004		UN Comtrade
Table 3.8	Evolution of the Technological Structure of Exports	Americanize the punctuation in the note: use double quotes, not single, and place punctuation inside quotations. For example: WRONG: 'primary Exports', RIGHT: "primary Exports,"	Calculated from UN Comtrade data
Table 3.9	Growth in Exports by Main Technological Groups (%)	Americanize the punctuation in the note: use double quotes, not single, and place punctuation inside quotations. For example: WRONG: 'primary Exports', RIGHT: "primary Exports,"	Calculated from UN Comtrade data

Fig/ Table Number	Name	Special Notes for Designer	Source
Table 3.10	Classification of the Performance of Egypt's Manufactured Exports	Add title	No source needed
Table 3.11	Performance of the World's 40 Most Dynamic Exports (1990-2004): Egypt, China, and Turkey	Add label; correct "in" to "of" Correct typo in Source info: small "d" on "data." Correct 2 typos in the Notes: there should be a space in "%or" in both notes 1 and 2. "A.A.G.R." should be spelled out in the headings – it presumably stands for Average Annual Growth Rate, but that should be confirmed. Correct typo in #36 – "equipment" not "equipments"	Calculated from UN Comtrade data
Table 3.12	Manufactured Product Diversification Index for Egypt and Comparators, 1995-2004		UN Comtrade
Table 3.13	Egypt's Top 5 Manufactured Exports to the US, Middle East and North Africa, and the European Union, 2004		UN Comtrade
Table 3.14	Egypt's Top 5 Manufactured Exports to the US, Middle East and North Africa, and the European Union, 2004		UN Comtrade
Table 3.15	Market Diversification Index for Egypt and Comparators, 1995-2004		UN Comtrade
Table 3.16	Matrix of Competitive Interactions Between Egypt and Turkey and China in EU and MENA Markets		Adapted from Lall and Albaladejo(2004).
Figure 3.1	Export Propensity for Egypt and Comparators: Manufactured Exports as Percentage of total MVA, 1995-2004	Change "Egypt, Arab Rep." to simply read "Egypt."	UN Comtrade

Fig/ Table Number	Name	Special Notes for Designer	Source
Figure 3.2	Industrial Deepening in Egypt and Selected Comparators	Fix the typo in the label (Deepning). Remove underline beneath "Bubble size indicates…." sentence. Add the source. Fix the typo in the x axis (%)– delete the extra space before the right parenthesis. Fix the typo in the y axis – should read (%)	???
Figure 3.3	Technological Deepening in the Structure of Manufactured Exports for Egypt and Selected Comparators 1990-2002	Remove underline beneath "Bubble size indicates…." sentence. Add the source. Fix the typo in the x axis (%) – delete the extra space before the right parenthesis Fix the typo in the y axis – should read (%)	???
Figure 3.4	Shares of Technology Categories in World Exports	Fix typo in label (Technolgy) and be sure source is added.	???
Figure 3.5	Performance of Egypt's Key Manufactured Exports	Fix typos: Chamions should be Champions; Vegetabables should be Vegetables; Adverity should be Adversity; Undergarments should be one word. The comma should be deleted in the y axis label (% per annum). Add the source.	???
Figure 3.6	Share of Top Five Manufactured Exports in Total Manufactured Exports for Egypt, Turkey, Tunisia and Morocco, in Percent, 1990-2004		UN Comtrade
Figure 3.7	Egypt's Manufactured Trade Concentration in Main Markets, in Percent, 1995-2004		UN Comtrade

Fig/ Table Number	Name	Special Notes for Designer	Source
Figure 3.8	Product and Market Vulnerability Matrix for Egypt and Comparators, 2004		UN Comtrade

CHAPTER 4
THREAT ANALYSIS

4.1 Competitive threat of China and Turkey to Egypt's manufactured trade in the EU and MENA markets

4.1.1 Relative market share and export growth rates

4.1.2 Matrix of competitive effects

4.1.2.1 Competitive threat in the EU

4.1.2.2 Competitive threat in MENA

4.2 Conclusions

List of Figures and Tables

List of Appendices

CHAPTER 4
THREAT ANALYSIS[1]

The share of Egypt's exports in international markets depends partly on the country's utilization of its comparative advantage, but is also determined by the threat posed by its competitors. To illustrate the seriousness of the latter factor, an analysis will be made of the threat posed by two major competitors, China and Turkey, to Egypt's manufactured exports to two principal markets, the EU and MENA.

4.1 Competitive threat of China and Turkey to Egypt's manufactured trade in the EU and MENA markets

As trade liberalization spreads and international competition mounts, Egypt's export sector will surely confront even tougher challenges to improving its competitiveness. Although internal capability constraints remain at the core of Egypt's export woes, trade competitiveness is increasingly being determined by supranational forces such as trade preferences, stringent rules, and competition from third countries. Among all these external factors, the competitive threat posed by China and other fast-growing economies is possibly one of the main worries facing governments in the developing world.

In the case of China, its giant economy threatens to become the global workshop for manufacturing activity, shutting many developing countries out of the international industrial scene. What makes the Chinese case exceptional is that its industrial progress has spanned the entire technological spectrum—from garments to electronics—creating a competitive threat not only to developing countries but also to industrialized ones. Yet the main threat has been felt by countries specializing in resource-based and low-technology labor-intensive products, where China now accounts for 15.3 percent of world trade.

The implications for Egypt's export sector are significant and need detailed analysis. For instance, take the EU market, in which Egypt concentrates nearly 37 percent of its manufactured exports. Chinese manufactured exports to the EU sharply increased from US$ 4 billion in 1990 to US$ 97 billion in 2004—an impressive 24.6 percent annual growth in the period. The massive penetration of Chinese goods to Europe—not necessarily cheap or low-tech—has surely eroded Egypt's export competitiveness.

But trade competition for Egypt does not always lie in the Far East. The preferential access that the EU gives to neighboring countries such as Turkey imposes further obstacles to Egypt's export sector. The distortion is such that "Turkey's impressive trade performance has much to do with its preferential access to the EU, which many of its competing neighbors do not enjoy."[2] As the EU liberalizes its trade with the rest of the

[1] Manuel Albaladejo
[2] Oxford Analytica, 2006.

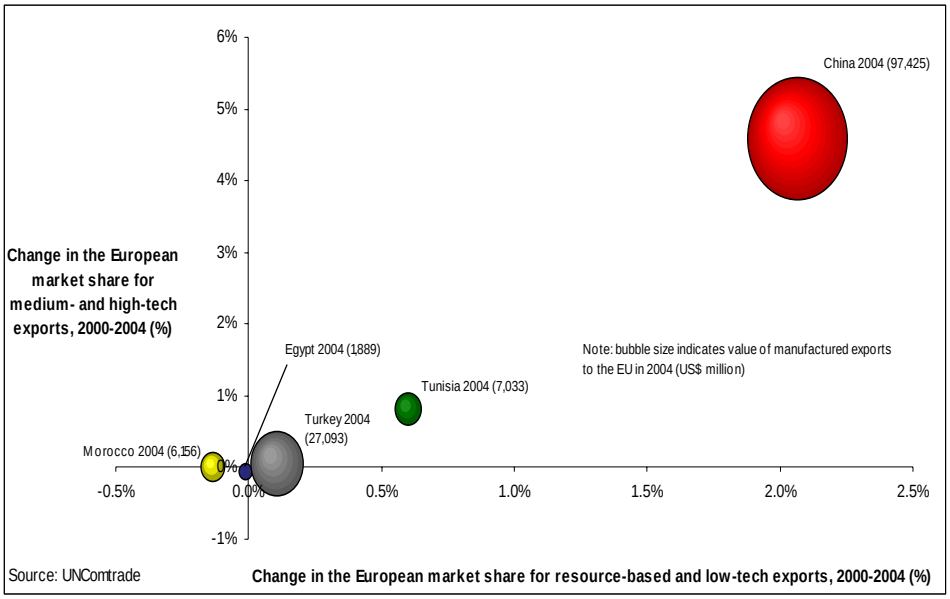
world, Turkey's manufactured exports will face stronger competition, but not necessarily from Egypt.

This section quantifies the competitive threat that Turkey and China may pose to Egypt's manufactured exports in its key markets: the EU and the MENA region. The outcome has implications for policy as it clearly points out Egyptian sectors and products that need to be strengthened to remain competitive. Similarly, it may shed light on sectors and products that have little chance to survive the strong competitive pressures posed by these countries.

4.1.1 Relative market share and export growth rates

Aggregated market share analysis and growth rate trends provide useful preliminary information for understanding the possible competitive threat posed by Turkey and China to Egypt in the EU and MENA markets. Figure 4.1 compares the manufactured export performance of Egypt, Turkey, China, and other country comparators in the EU market.

Figure 4.1. Changes in the European Market Share of Resource-Based, Low-Technology, Medium-Technology and High-technology Manufactured Goods for Egypt and Comparators, 2000-2004



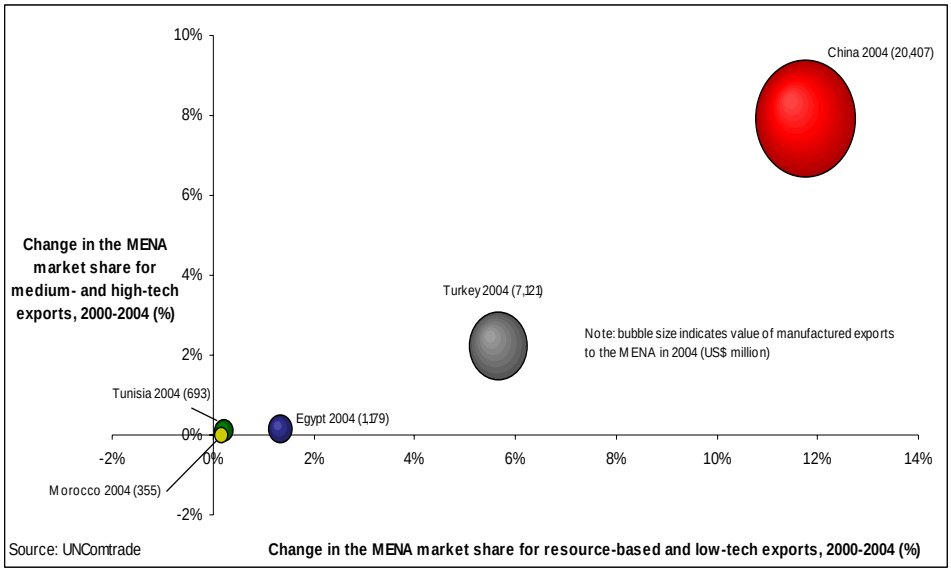
As noted previously China displays an impressive trade performance spanning the whole technological spectrum. In the period from 2000 to 2004, China gained 4.6 percent of European market share in complex, technology-intensive products, and two percent in resource-based and low-technology products. This is a huge bite of the European market in only four years, particularly in products where China is not supposed to have a competitive edge.

Turkey and Tunisia have also gained market share in both categories but at a much lower scale. Tunisia has been particularly dynamic in the last four years, doubling its manufactured exports to the EU between 2000 and 2004. Although Turkey has a larger

export base, it only increased its market share in the EU by 0.11 percentage points in resource-based and low-technology exports and 0.06 percentage points in medium- and high-technology exports.

Egypt has the smallest manufactured export base of all comparators—only US$ 1.9 billion to the EU—and has clearly felt strong competitive pressures from other countries. From 2000 to 2004, Egypt lost market share in the EU market both in "simple" and "complex" manufactured exports. This is not good news if we consider that the EU market absorbs more than one third of Egypt's total manufactured exports. Figure 4.2 compares the manufactured export performance of Egypt, Turkey, China, and other country comparators in the MENA market.

Figure 4.2. Changes in the MENA Market Share of Resource-Based, Low-Technology, Medium-Technology and High-Technology Manufactures for Egypt and Comparators, 2000-2004



China has also made a very impressive showing in the MENA market and is rapidly eroding the competitive edge of MENA countries in their own region. China exported to the region US$ 20 billion of manufactured items in 2004, doubling the total regional manufactured exports of Turkey, Egypt, Tunisia and Morocco combined. This outstanding trade performance has led to China's substantial gain in market share in the MENA region across the whole technological spectrum. Between 2000 and 2004, China has gained 12 percent of the region's market share in resource-based and low-technology products, and 8 percent of the region's market share in medium- and high-technology products.

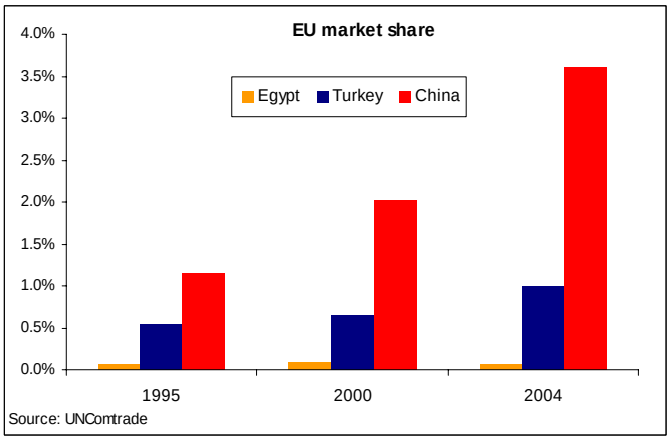
On a different scale, Turkey is also gaining a manufacturing presence in the region. Manufactured exports to MENA reached US$ 7 billion in 2004. Turkey's strongest gain was in resource-based and low-technology products—almost six percentage points between 2000 and 2004.

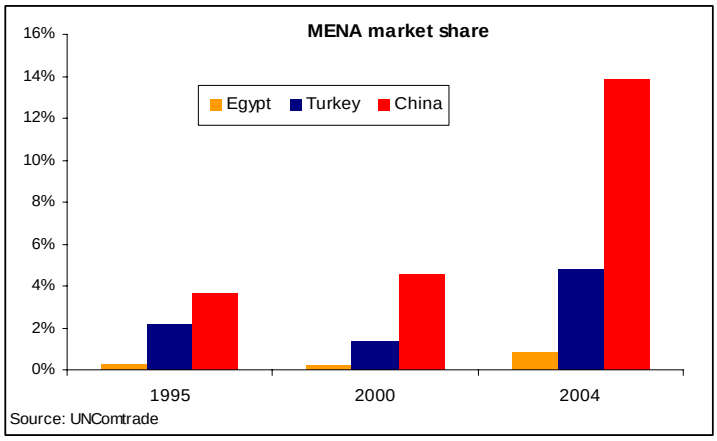
There is no doubt that Egypt has felt strong competitive pressures from these two countries. Despite having increased its manufactured presence in the region—as seen previously the MENA region accounts for nearly 30 percent of Egypt's total manufactured exports—competition has toughened. In the period between 2000 and 2004, Egypt only gained 1.3 percent of MENA's market share of resource-based and low-technology products, mainly due to refined petroleum exports and iron. Yet its regional presence in technology-intensive products remains dismal.

Tunisia and Morocco do not offer competitive pressure akin to China or Turkey, as they concentrate around 80 percent of their manufactured exports in the EU and have not made strategic efforts to diversify into the MENA market. Their manufacturing presence is limited and constrained by the bigger competitors.

Figure 4.3 presents the share of manufactured trade in the EU and MENA by Egypt, Turkey and China. Egypt only accounted for 0.07 percent of the European market share for manufactured exports in 2004, down from 0.09 percent in 2000. Egypt's manufacturing presence in the EU market today is essentially unchanged from 1995 levels. By contrast, the positive evolution of Turkey and China's manufactured exports in the EU is noticeable. Turkey now accounts for 1 percent of the EU's total manufactured imports, up from 0.4 percent in 1990. China puts in an impressive performance and now accounts for more than 3.5 percent of the European market share for manufactured goods. (Note that in 1990 Turkey was ahead of China in manufactured exports to Europe.)

Figure 4.3. European and MENA Market Share in Manufactured Trade by Egypt, Turkey and China, 1995-2004 (%)

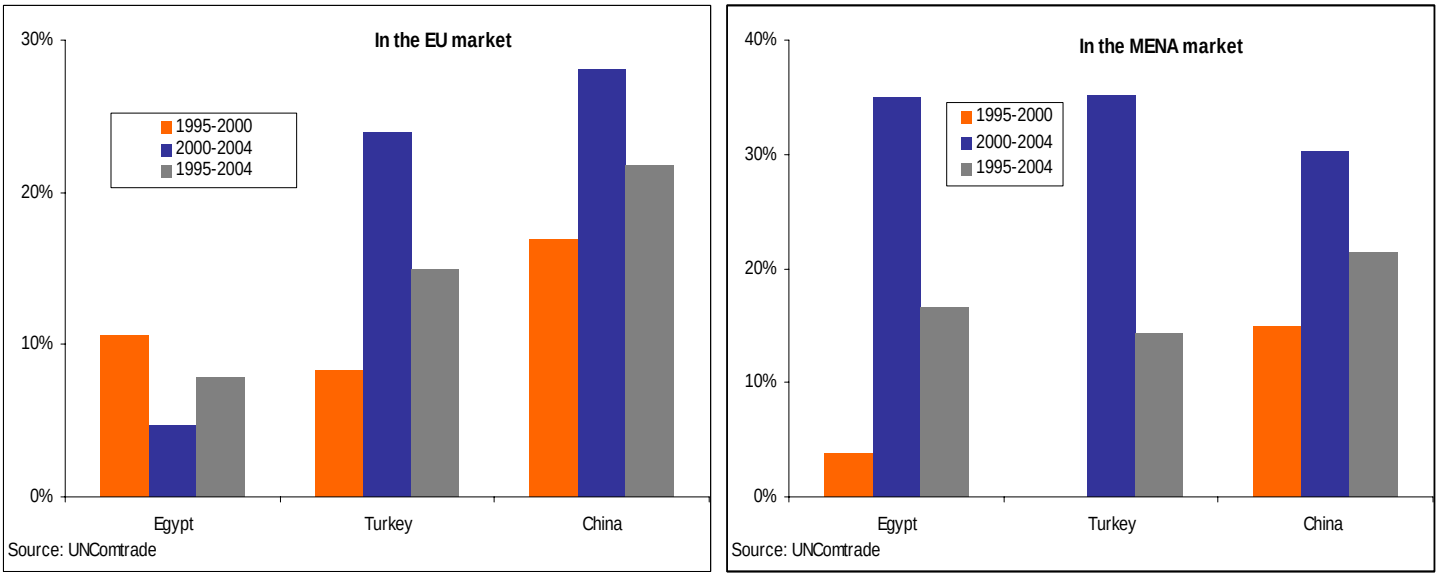




In the MENA market, Egypt had 0.8 percent of the regional manufacturing market share in 2004, up from 0.3 percent in 1995. Turkey lost market share between 1995 and 2000, but recovered dramatically to reach 4.8 percent of MENA's manufacturing market share by 2004. By contrast, the Chinese presence in the region has made steady increases over the last decade. In 2004, China had 14 percent of the region's market share for manufactured products, up from only 4 percent in 1995.

Egypt's manufactured export growth to the EU declined dramatically in the first half of the new millennium after a significant export growth in the first half of the 1990s (see Figure 4.4). Between 1995 and 2000 Egyptian manufactured exports to the EU grew annually at around 10.5 percent, but the manufactured export growth significantly slowed, to 4.6 percent in the period 2000-2004. In MENA, Egypt's manufactured exports grew at 35 percent between 2000 and 2004, recovering ground from the erratic growth of the second half of the 1990s.

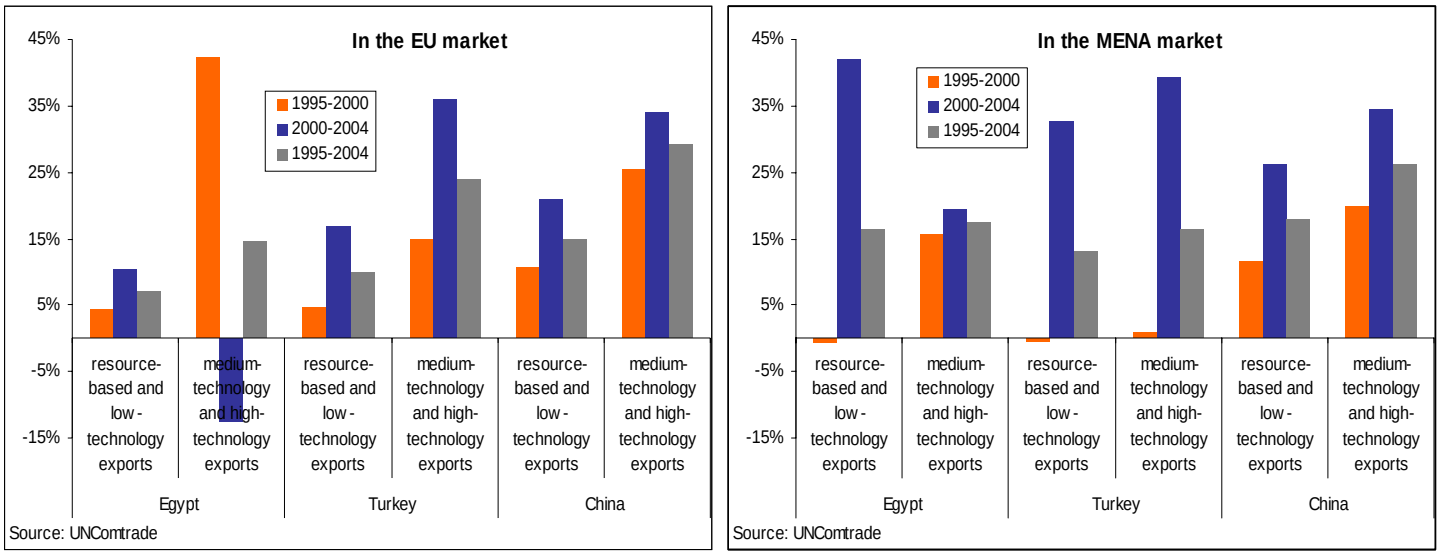
Figure 4.4. Annual Growth Rate of Manufactured Exports to the EU and MENA by Egypt, Turkey and China, 1990-2004 (%)



Chinese manufactured export growth to the EU and MENA has been staggering—between 1995 and 2004 manufactured exports to the EU and MENA grew annually at 21.7 percent and 21.5 percent respectively. The high manufactured growth rate of the late 1990s increased even more in the early 2000s. Turkish manufactured export growth gathered speed between 2000 and 2004, similar to the Chinese case; prior to that, Turkey was facing slower manufactured export growth rates than Egypt both in EU and MENA markets, even though its export base was much larger.

Egypt's manufactured export slowdown in the EU has mainly been the result of the decline of medium- and high-technology exports to the EU during the period 2000-2004 (see Figure 4.5). Exports in this category dropped from US$ 505 million in 2000 to US$ 294 million in 2004. By contrast, both Turkey and China experienced the highest annual growth in sophisticated manufactured exports for the period—36 percent for Turkey and 34 percent for China. Interestingly, Turkey and China, best known for their competitive labor-intensive industries and wage advantage over more advanced economies, have increased their technology-intensive exports to the EU faster than in those regions where they are supposed to have a comparative advantage.

Figure 4.5. Annual Growth Rate of "Simple" (Resource-Based and Low-Technology) and "Complex" (Medium-Technology and High-Technology) Exports to the EU and MENA by Egypt, Turkey and China, 1990-2004 (%)



In MENA, Egyptian manufactured exports have especially grown in the resource-based and low-technology category between 2000 and 2004. Egypt also had double digits for medium- and high-technology exports to the region, though it has a very small export base of sophisticated manufactured products to MENA markets. As in the EU case, both Turkey and China have experienced a massive growth in medium- and high-technology manufactured exports. China's "complex" manufactured exports to MENA grew annually at 26.1 percent between 1995 and 2004.

It is clear that Turkey and China's impressive trade performance in the EU and MENA can be seen as a possible threat to Egypt's export sector in two of its key markets. Egypt is not gaining manufactured market share in the EU, and in spite of its regional efforts, it has marginally gained market share in MENA. Competitive pressures are increasing strongly over time, and Egypt will even find it even more difficult to gain market share in the near future. If trends continue this way we may see a further erosion of Egyptian manufactured trade presence in the EU. In Middle East and North Africa, China and Turkey will have a stronger presence and this may hamper Egyptian manufacturing interests in the region. But which particular Egyptian products are under direct threat from competition now or potentially in the near future? And what Egyptian products are not feeling competitive pressures from third countries today, but yet need further strengthening to consolidate their market share? These two questions are of high relevance for industrial restructuring if Egypt is to raise the manufactured trade competitiveness bar in the EU and MENA. The next section tries to shed light on these questions.

4.1.2 Matrix of competitive effects

One general indicator used to determine the competitive effect of one country's trade on another is examination of the relative evolution of export structures: greater similarity indicates that countries are heading toward similar specializations and therefore are competing. Analysis of the competitive effects matrix reveals that only Turkey and Egypt's manufactured export structures to the MENA market in 2004 are correlated. This means that similarity in manufactured export structures could translate into low trade complementarity and higher competition. It is also worth noting that the structure of Egypt's manufactured exports to MENA have evolved dramatically and are not correlated between 2000 and 2004.

With respect to the EU, the manufactured export structures of China, Turkey and Egypt in 2004 do not correlate with any country except themselves four years earlier. Can we then assume that the competitive threat of China and Turkey to Egypt in the EU market is limited? This is rather unlikely, given the evidence of the previous figures on changing market share. Comparing manufactured export structures at an aggregate level can hide key information on competitive threats at the product level. [3] What is needed is a product-level methodology that provides solid evidence on the possible competitive threats that China and Turkey may be posing to Egypt in the EU and MENA markets.

The severe flaws of the export structure approach have raised an interesting academic debate on how to measure the "export threat." Relative market share is a common measure used in the business literature: that is, there is a competitive threat from country A to B if country A gains export market share and country B loses, with the intensity of the threat measured by the size of the relative change. This technique, with some slight modifications, has been recently used to measure the competitive threat of China to East Asia with relative success (Lall and Albaladejo, 2004). The approach is not without limitations,[4] yet it provides useful information on the possible competitive threat for particular products by analyzing relative market share changes combined with export growth rates.

Table 4.1 presents four scenarios of market share change in the EU and MENA markets by Egypt and Turkey and China to assess the competitive interactions and possible threats.

[3] Similarities in the manufactured export structure only show the potential for competition, but they do not demonstrate that competition actually exists. The product categories are still broad (SITC 3 digit level) and may include products that do not compete with each other. Even if the products were comparable, it is possible that countries specialize in differentiated versions. Even in the same product, countries may complement each other by performing different functions within an integrated production system. On top of that, export structure analysis does not take into account a country's export impact in world markets, as it only considers its weight in the country's total exports.

[4] The most important limitation is the assumption that the market share loss of country A is caused by the "competitive threat" from country B, and not by a third country. Also it does not take account of complementarities between countries, either by integration into MNC systems or by the shift of export activities from losing countries to the country that poses the threat. For full details of the limitations of the approach, see Lall and Albaladejo, 2004.

Table 4.1. Matrix of Competitive Interactions Between Egypt and Turkey and China in EU and MENA Markets

		Turkish and Chinese export market share in the EU or MENA	
		Rising	Falling
Egyptian export market share in the EU or MENA	Rising	A. *No ostensible competitive threat* from Turkey or China to Egypt's exports in the EU or MENA, unless the Turkish and Chinese export growth is faster than that of Egypt. If that if the case the *threat is partial.*	B. *No competitive threat* from Turkey and China to Egypt in period under consideration. By contrast the threat could flow in *reverse*, from Egypt to Turkey and China.
	Falling	C. Possible *direct competitive threat* from Turkey and China to Egypt in EU or MENA markets.	D. Egypt, Turkey and China lose competitive advantage in EU or MENA markets. There might be a *mutual withdrawal* caused by a shrinking EU and MENA market or strong competition posed by other countries.

Source: Adapted from Lall and Albaladejo(2004).

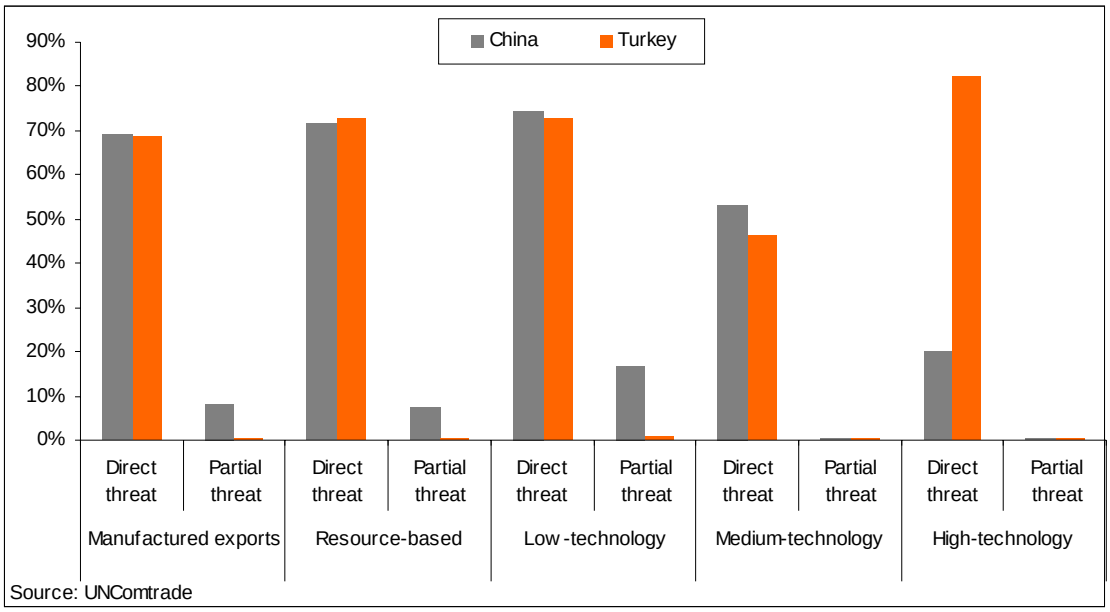
Scenarios A and C are of particular interest for our analysis. They both show some type of possible competitive threat to Egypt—in the case of scenario A, Turkey and China have to grow faster than Egypt to be a partial threat.

For the sake of clarity, the next section separately discusses the competitive threat in the EU and MENA.

4.1.2.1 Competitive threat in the EU

Figure 4.6 shows the shares of Egyptian manufactured exports (by technological category) to the EU that are under direct and partial threat from Turkey and China.

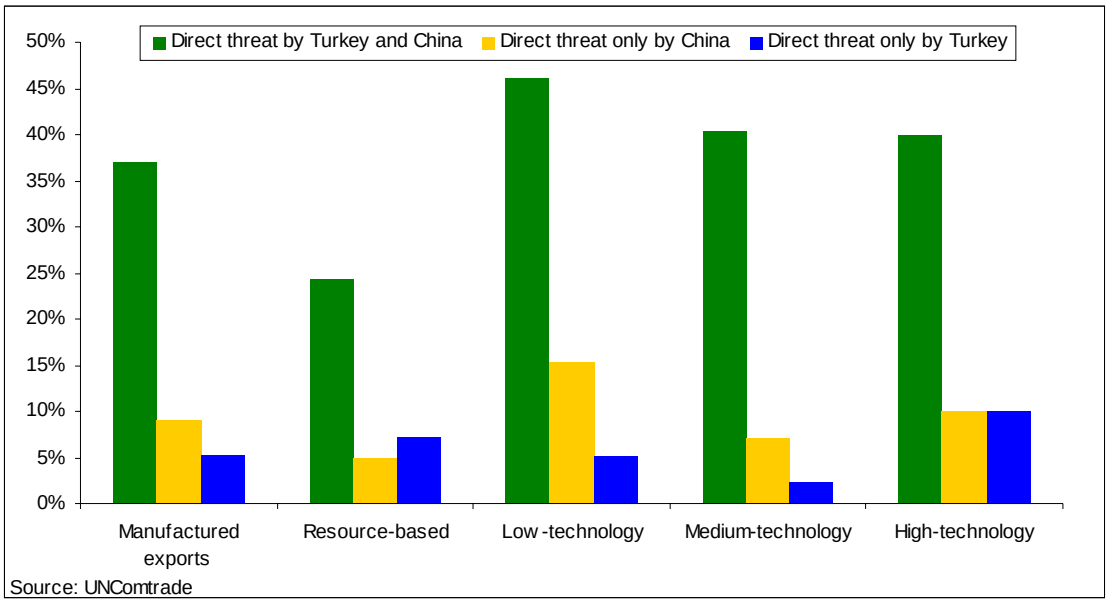
Figure 4.6. Share of Egypt's Manufactured Exports to the EU Market Under Direct or Partial Threat from Turkey and China, 2004 (%)



Nearly 70 percent of Egypt's manufactured exports to the EU are under direct threat from both Turkey and China. (See Appendix 4.1 for a list of Egypt's products under direct threat.) In dollar terms, this means that US$ 1.3 billion of Egyptian manufactured exports are directly exposed to strong Turkish and Chinese competition. Turkey poses a major threat to Egypt's limited high-technology exports to the EU, which are primarily pharmaceutical products. Egypt's main concern should, however, be the strong competitive pressures in resource-based and low-technology exports, which account for 61 percent of Egypt's total exports to the EU. The direct threat comes both from Turkey and China and may have an erosive effect on more than US$ 1 billion of Egyptian exports to Europe in the near future. Below we will shed light on the particular products for which the direct threat is more acute.

Complementing the information from the previous figure, Figure 4.7 now presents the share of Egyptian manufactured products—from a total universe of 181 products in the SITC rev 2, 3-digit classification—under direct threat from Turkish and Chinese competition.

Figure 4.7. Share of Egypt's Manufactured Export Products to the EU Under Direct Threat from Turkey, China or Both, 2004 (%)



Out of the 132 Egyptian manufactured products exported to the EU, only six are considered to be under no direct threat from Turkey and China (a dismal 4.5 percent of all manufactured products), six of which are in the resource-based category. These are: sugar and honey; chocolate; vegetable fibers, excluding jute; fixed vegetable oil, non-soft; residual petroleum products; and radioactive material.

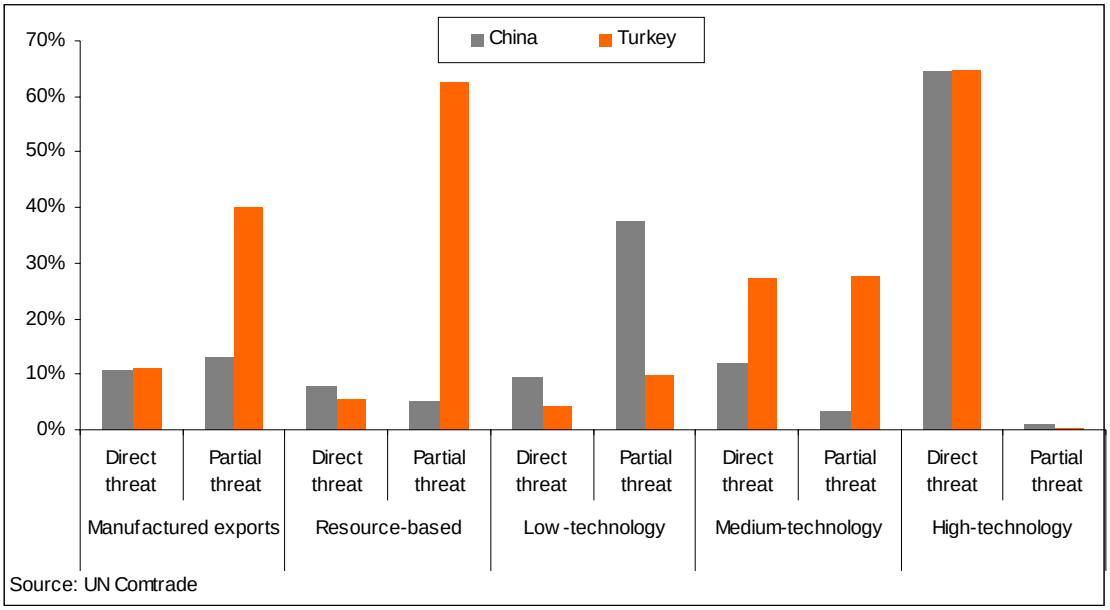
However, a higher number of Egyptian manufactured goods are under no partial threat from Turkey or China (that is, they all gain market share but Egyptian exports grow faster in EU markets). These nineteen products are in a delicate situation, and can indeed become directly threatened, if export growth in Turkey and China accelerates in the coming years. These products are spread throughout the technological spectrum but have a higher presence in the medium-technology and resource-based categories.

There are 67 Egyptian manufactured products (out of the 132 that Egypt exports to the EU) that are under direct threat from China and Turkey: 49 products are directly threatened by both countries, 12 from China only, and 6 from Turkey only. They are spread through the whole technological spectrum, from resource-based based to high-technology products. (See Appendix 4.2 for a threat analysis of Egypt's 15 main manufactured exports to the EU.) But not all of them have the same implications for Egypt's export competitiveness to the EU—many of these products are exported marginally and therefore are not significant for foreign currency earning. Yet there are others that are extremely important to Egypt due to their high export value.

4.1.2.2 Competitive threat in MENA

Figure 4.8 shows the shares of Egyptian manufactured exports (by technological category) to MENA under direct and partial threat from Turkey and China.

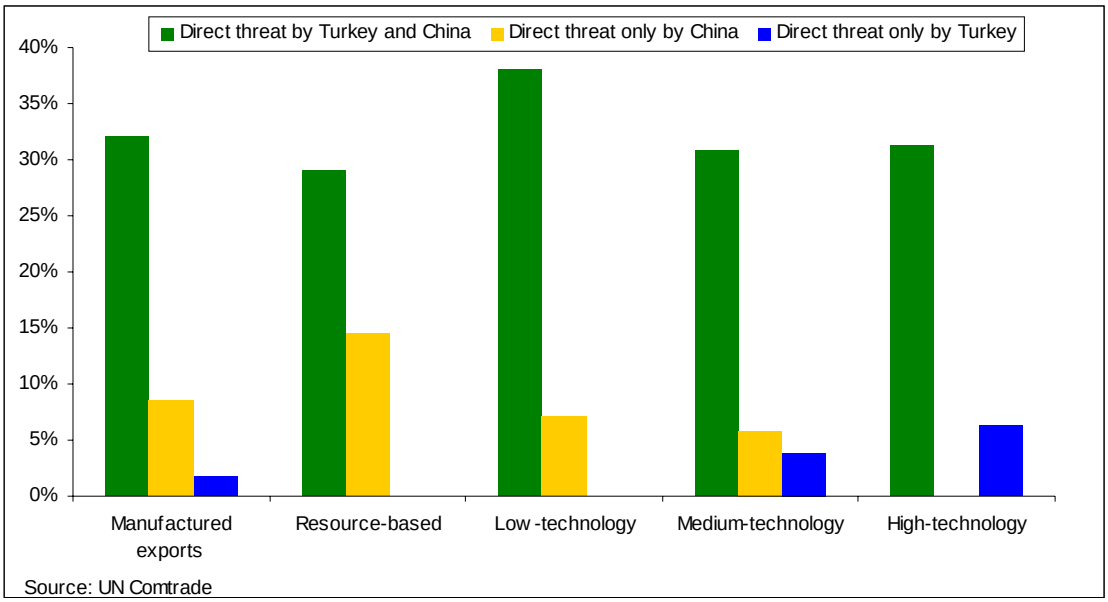
Figure 4.8. Shares of Egypt's Manufactured Exports to MENA Under Direct or Partial Threat From Turkey and China, 2004, (%)



Around 10 percent of Egypt's manufactured exports (nearly US$130 million) to MENA are under direct threat both from Turkey and China. This is much lower that the comparative threat posed by these two countries in the EU. Turkey seems to be an important threat to Egypt, though it is partial (i.e. both countries are gaining market share but Turkey is growing faster). Egyptian high-technology exports to MENA only reached US$ 32 million in 2004, of which 60 percent are under direct threat both from Turkey and China. These threatened exports mainly correspond to the pharmaceutical industry, in which China and Turkey have gained substantial regional share between 2000 and 2004. In medium-technology manufactured goods, the direct and partial threats come mainly from Turkey, while in low-technology goods the threat corresponds to China and is mainly partial.

Although the threat in MENA may not be very dramatic in terms of export values, there is a need to analyze the number of products under direct threat. Figure 4.9 now presents the share of Egyptian manufactured products—from a total universe of 181 products in SITC rev 2, 3-digit—under direct threat from Turkish and Chinese competition.

Figure 4.9. Share of Egypt's Manufactured Export Products to MENA Under Direct Threat from Turkey, China or Both, 2004, (%)

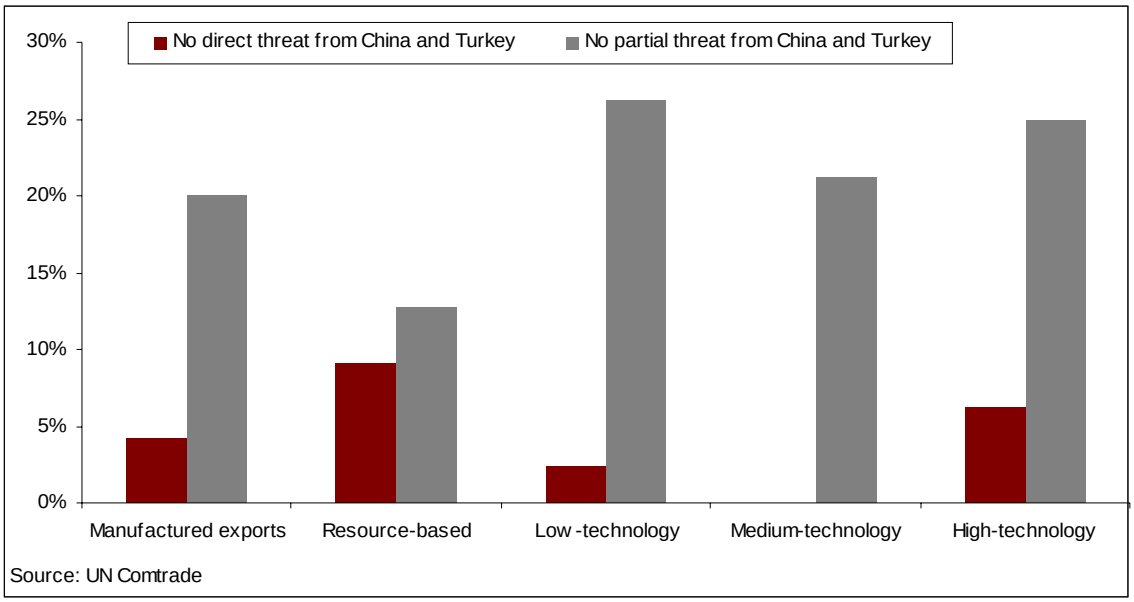


Although only 10 percent of Egyptian manufactured goods to MENA are under direct threat, the number of products is much higher. Egypt exported a total of 165 manufactured products to MENA in 2004. More than 32 percent of these products (a total of 53) are under direct threat both from Turkey and China. This means that there are fewer Egyptian export products being threatened in the EU, but with higher export values than those exported to MENA. On top of that, China by itself is threatening 14 other Egyptian manufactured export products in the region and Turkey alone 3 more. Summing them up, a total of 70 Egyptian manufactured products exported to MENA (42.4 percent of all exported products to the region) are under direct threat from China, Turkey or both.

While Turkey is the main threat with fewer products but larger volumes, China is clearly the competitive threat in a wider range of products. Egyptian low-technology products, particularly in the fashion cluster, are highly exposed to Turkey's and particularly China's competitive pressures. In resource-based products, China alone is putting some extra stress on Egyptian rubber, animal and vegetable oils, and vegetable fiber exports to MENA markets.

But how many Egyptian products exported to the MENA are in a safe haven from these two countries, for now? Figure 4.10 gives the share of Egyptian manufactured exports to MENA under no direct or partial threat from Turkey or China.

Figure 4.10. Share of Egypt's Manufactured Export Products to MENA Under No Direct or Partial Threat From Turkey and China, 2004, (%)



Less than 5 percent of Egyptian manufactured products exported to MENA are under no threat from China and Turkey. This is only seven products: five in the resource-based category (meat and edible offals, salted or in brine; sugar and honey; wood in the rough; residual petroleum products; and dyeing and tanning extracts), one in the low-technology (articles of apparel), and one in the high-technology category (semiconductors).

However, there is a higher number of Egyptian manufactured goods that are under partial threat from Turkey or China (that is, they all gain market share but Turkish or Chinese exports grow faster in MENA markets). These thirty-three products are in a delicate situation, and can indeed become directly threatened if export growth in these two countries speeds up in the coming years. These products are spread throughout the technological spectrum but have a higher presence in the low-technology category.

Appendix 4.3 provides a list of Egypt's manufactured products exported to MENA that are under direct threat from China, Turkey, or both. They spread through the whole technological spectrum, from resource-based based manufactured goods to high-technology products. But, as in the case of the EU, not all of them have the same implications for Egypt's export competitiveness to MENA—many of these products are exported marginally and therefore are not significant for foreign currency earnings. Yet there are some other that are extremely important to Egypt due to their high export value. The following three products are of strategic significance for Egypt if it is to maintain most of its manufactured share in MENA in the coming years (in order of importance):

- ***Soap, cleansing and polishing preparations (554)***. Egypt exported around US$33 million of soap, cleansing and polishing preparations to MENA in 2004. Yet strong competitive pressures, partly from Turkey, made Egypt lose 1.7 percent of its market share in MENA between 2000 and 2004. During that period Turkey increased its MENA market presence by 4.3 percentage points, reaching US$ 83

million of exports in 2004, with an annual growth of 29 percent. Soap, cleansing and polishing preparations are Egypt's seventh major manufactured export to MENA, and therefore are of strategic interest to the country.

- ***Medicinal and pharmaceutical products (541)***. Egypt exported US$18 million of medicinal and pharmaceutical products to MENA in 2004. Yet exports contracted by 8.4 percent between 2000 and 2004, which made Egypt lose 0.37 percent of market share in MENA. By contrast, both Turkey and China have gained significant presence in MENA markets. China increased its medicinal and pharmaceutical exports to MENA by 30 percent per annum between 2000 and 2004, reaching US$ 118 million in 2004. Turkey has also made an impressive showing in the export of medicinal and pharmaceutical products in MENA markets—in only four years it gained 0.2 percentage points in the regional markets due to its annual export growth of 47 percent between 2000 and 2004. Medicinal and pharmaceutical products are Egypt's tenth major manufactured export to MENA. Although its export value is not high, this is a technology-intensive industry with possible externality effects to the rest of the Egyptian economy.

- ***Textile yarn (651).*** Egyptian exports of textile yarn to MENA reached US$13 million in 2004. This is much lower than the US$71 million of Egyptian exports to EU markets. Egypt has lost market share in a less competitive market and with a product that is supposed to have a strong competitive position. Interestingly the direct threat comes from Chinese penetration of textile yarn exports to MENA. Between 2000 and 2004 Chinese exports of textile yarn grew annually by 24.8 percent, reaching US$ 208 million in 2004—16 times more than Egyptian exports. Textile yarn is not one of Egypt's fifteen major manufactured exports to MENA, though it is an important export product to world markets. It is not clear why Egyptian textile yarn is losing its competitive edge in both EU and MENA markets, but the government should seriously rethink what needs to be done to re-energize the sector and bring it back to higher competitiveness levels.

Appendix 4.4 provides a summary of the competitive threat analysis applied to Egypt's 15 major manufactured exports to MENA.

Of Egypt's 15 major exports to MENA, only two (soap, cleansing and polishing preparations, and medicinal and pharmaceutical products) are under direct threat by China and Turkey. Egyptian exports of refined petroleum products are under partial threat by Turkey, and iron and steel shapes and refractory building products under partial threat by China. The rest of the products, a total of ten, are under no partial or direct threat from these two countries. This means that while all three countries are gaining market share in MENA, Egyptian exports are growing faster. Yet this should be viewed with caution, as Turkish and Chinese export growth may shoot up in the near future, therefore putting some extra pressure to Egyptian export sectors.

4.2 Conclusions

The manufacturing sector is critical to economic growth, job creation, exports and improvements in living standards. Manufacturing has proved to be the critical stimulus to economic development. But following gains in Egypt's manufacturing sector in the 1980s and 1990s, the sector has lagged behind overall economic growth since 2000. Egypt also ranks low on the Competitive Industrial Performance Index (CIP) and has been falling behind other countries.

Egypt has a very low market share of world manufacturing exports. Furthermore, it is highly dependent on natural resource-based and low-tech product segments, even if it has recently reduced its dependency on the regions to which it sells. Egypt needs to move beyond natural resource and low-tech exports to medium-tech and high-tech exports, which are also the industries that are growing faster and which can support better jobs.

But Egypt is and will continue to be subject to competition in the markets to which it sells. Analysis shows that Egypt suffers potential displacement from China and Turkey and has already lost market share in exports related to textiles and apparel. There are few product areas that do not face some threat.

What needs to be done in response? Egypt is in the process of developing an industrial strategy. This industrial strategy should take lessons from the failures of "industrial policy" in India, Latin America and other countries that protected industry and included high levels of government interference in private sector activity. Egypt's new industrial competitiveness policy should focus on a variety of reforms that together can boost private investment and productivity. It should include foreign investment promotion to attract companies with good technology and good jobs. Given the relatively modest size of Egypt's internal market for manufactured goods, it is necessary to secure access to key world markets in the EU, North America and Middle East. This access will serve to attract foreign investment by enabling the production of goods in Egypt for a large potential export market.

The industrial competitiveness policy will also require making life easier for domestic investors. GAFI has already made a remarkable transition. Years ago it was describe jokingly as having the mission of "protecting Egypt from investors, foreign and domestic," but it has made the transition to being a facilitator.

More needs to be done to reduce red tape and change the attitudes of civil servants. This should not be a piecemeal approach. A major change in the reduction of barriers is urgently required if a turnaround in manufacturing is to take place. Progress has been made, but more needs to be done to create industrial parks, which can be privately developed and run, that provide efficient infrastructure, services and even training facilities relevant to investors locating there. Finally, it is urgent to improve the quality of human resources both at the basic education level as well as in the areas of science, technology and innovation.

When such policies are being implemented as a part of an overall industrial competitiveness strategy, Egypt will again see its manufacturing exports and value added become the engine of growth.

Appendix 4.1. List of Egypt's Manufactured Products in EU markets Under Direct Threat From China, Turkey or Both, 2004, (SITC 3 digit rev 2)			
	DIRECT THREAT BOTH FROM CHINA AND TURKEY	**DIRECT THREAT ONLY FROM CHINA**	**DIRECT THREAT ONLY FROM TURKEY**
RESOURCE-BASED	**AGRO- BASED:** 012 MEAT DRIED, SALTED, SMOKED; 621 MATERIALS OF RUBBER; 628 RUBBER ARTICLES NES; 634 VENEERS, PLYWOOD, ETC; 635 WOOD MANUFACTURES NES; **OTHER RESOURCE-BASED:** 288 NONFERROUS METAL SCRAP NES; 334 PETROLEUM PRODUCTS, REFINED; 516 OTHER ORGANIC CHEMICALS; 522 INORGANIC ELEMENTS, OXIDES,ETC; 664 GLASS	**OTHER RESOURCE-BASED:** 551 ESSENTIAL OILS, PERFUME, ETC.; 689 NON-FERROUS BASE METALS NES	**AGRO- BASED:** 056 VEGETABLES PREPARED AND PRESERVED; 122 TOBACCO, MANUFACTURED; **OTHER RESOURCE-BASED:** 282 IRON AND STEEL SCRAP
LOW-TECHNOLOGY	**FASHION CLUSTER:** 612 LEATHER ETC MANUFACTURES; 651 TEXTILE YARN; 652 COTTON FABRICS, WOVEN; 655 KNITTED FABRICS; 656 LACE, RIBBONS, TULLE, ETC.; 658 TEXTILE ARTICLES NES; 842 MENS OUTERWEAR NOT KNITTED; 843 WOMENS OUTERWEAR NOT KNITTED; 844 UNDER GARMENTS NOT KNITTED; 845 OUTERWEAR KNITTED NONELASTC; 846 UNDER GARMENTS KNITTED; 847 TEXTILE CLOTHNG ACCESORIES NES; **OTHER LOW-TECHNOLOGY:** 642 PAPER, PRECUT, ARTS OF; 677 IR0N, STEEL WIRE; 821 FURNITURE, PARTS THEREOF; 893 ARTICLES OF PLASTIC NES; 894 TOYS, SPORTING GOODS, ETC.; 897 GOLD, SILVER WARE, JEWELRY	**FASHION CLUSTER:** 654 OTHER WOVEN TEXTILE FABRIC; 659 FLOOR COVERINGS, ETC.; 848 HEADGEAR, NONTEXTILE CLOTHING; **OTHER LOW-TECHNOLOGY:** 665 GLASSWARE; 693 WIRE PRODUCTS NON ELECTRIC; 697 BASE METAL HOUSEHOLD EQUIPMENT	**FASHION CLUSTER:** 831 TRAVEL GOODS, HANDBAGS; **OTHER LOW-TECHNOLOGY:** 666 POTTERY

MEDIUM-TECHNOLOGY	**PROCESSING INDUSTRIES:** 267 OTHER MAN-MADE FIBRES; 553 PERFUMERY, COSMETICS, ETC.; 562 FERTILIZERS, MANUFACTURED; 598 MISCEL CHEMICAL PRODUCTS NES; 653 WOVEN MAN-MADE FIB FABRIC; 672 IRON, STEEL PRIMARY FORMS; 678 IRON, STEEL TUBES, PIPES, ETC.; **ENGINEERING INDUSTRIES:** 723 CIVIL ENGINEERING EQUIPMENT ETC.; 724 TEXTILE, LEATHER MACHINERY; 726 PRINTING MACHINERY AND PARTS; 727 FOOD MACHINERY NON-DOMESTIC; 728 OTHER MACHINERY FOR SPECIALISED INDUSTRIES; 741 HEATING, COOLING EQUIPMENT; 742 PUMPS FOR LIQUIDS ETC.; 749 NONELECTRIC MACHINERY PTS, ACCESSORIES, NES; 812 PLUMBING, HEATING, LIGHTING EQUIPMENT; 872 MEDICAL INSTRUMENTS NES	**PROCESSING INDUSTRIES:** 671 PIG IRON ETC.; **ENGINEERING INDUSTRIES:** 745 NONELECTRIC MACHINERY,TOOLS NES; 773 ELECTRIC DISTRIBUTING EQUIPMENT	**ENGINEERING INDUSTRIES:** 885 WATCHES AND CLOCKS
HIGH-TECHNOLOGY	**ELECTRIC AND ELECTRONICS:** 759 OFFICE MACHINES, PARTS AND ACCESSORIES; 764 TELECOM EQUIPMENT, PARTS AND ACCESSORIES, NES; 771 ELECTRIC POWER MACHINERY NES; **OTHER HIGH-TECHNOLOGY:** 874 MEASURING, CONTROLING INSTRUMENTS	**ELECTRIC AND ELECTRONICS:** 778 ELECTRICAL MACHINERY NES	**OTHER HIGH-TECHNOLOGY:** 541 MEDICINAL, PHARMACEUTICAL PRODUCTS
Source: author from UNComtrade data			

Appendix 4.2. Threat Analysis of Egypt's Fifteen Main Manufactured Exports to the EU, 2004						
Ranking	**Product (SITC 3-digit, rev 2)**	**Technology classification**	**US$ million, 2004**	**Share in total manufactured exports to the EU, 2004**	**Share in EU market, 2004**	**Threat analysis**
1	334 PETROLEUM PRODUCTS, REFINED	resource-based	830.6	43.9%	1.04%	Direct threat from China and Turkey
2	661 LIME, CEMENT, BUILDING PRODUCTS	resource-based	146.5	7.7%	2.91%	No partial threat from China or Turkey
3	583 POLYMERIZATION PRODUCTS	medium-technology	123.1	6.5%	0.25%	No partial threat from China or Turkey
4	658 TEXTILE ARTICLES NES	low-technology	91.1	4.8%	0.87%	Direct threat from China and Turkey
5	323 BRIQUETS, COKE, SEMI-COKE	resource-based	82.2	4.3%	2.30%	Partial threat from China
6	672 IRON, STEEL PRIMARY FORMS	medium-technology	82.0	4.3%	0.40%	Direct threat from China and Turkey
7	651 TEXTILE YARN	low-technology	71.0	3.8%	0.53%	Direct threat from China and Turkey
8	846 UNDER GARMENTS KNITTED	low-technology	45.0	2.4%	0.21%	Direct threat from China and Turkey
9	673 IRON, STEEL SHAPES ETC	low-technology	44.6	2.4%	0.25%	Partial threat from China
10	812 PLUMBING, HEATING, LIIGHTING EQUIPMENT	medium-technology	30.1	1.6%	0.23%	Direct threat from China and Turkey
11	061 SUGAR AND HONEY	resource-based	25.9	1.4%	0.42%	No direct threat
12	522 INORGANIC ELEMENTS, OXIDES, ETC	resource-based	25.0	1.3%	0.29%	Direct threat from China and Turkey
13	056 VEGETABLES PRESERVED, PREPARED	resource-based	22.3	1.2%	0.43%	Direct threat from Turkey
14	335 RESIDUAL PETROLEUM PRODUCTS NES	resource-based	22.1	1.2%	0.29%	No direct threat
15	671 PIG IRON ETC	medium-technology	20.6	1.1%	0.22%	Direct threat from China

Source: author from UNComtrade data

Appendix 4.3

List of Egypt's Manufactured Products in MENA Markets Under Direct Threat from China, Turkey or Both, 2004 (SITC 3 digit rev 2)			
	DIRECT THREAT BOTH FROM CHINA AND TURKEY	**DIRECT THREAT ONLY FROM CHINA**	**DIRECT THREAT ONLY FROM TURKEY**
RESOURCE BASED	**AGRO- BASED:** 035 FISH SALTED, DRIED, SMOKED; 048 CEREAL ETC PREPARATIONS; 062 SUGAR CANDY NON-CHOCLATE; 073 CHOCOLATE AND PRODUCTS; 098 EDIBLE PRODCTS, PREPARATIONS NES; 111 NON-ALCOHL BEVERAGES NES; 112 ALCOHOLIC BEVERAGES; 424 FIXED VEGETABLE OIL NONSOFT; 625 RUBBER TYRES, TUBES ETC; 628 RUBBER ARTICLES NES; 333 CORK MANUFACTURES; 634 VENEERS,PLYWOOD,ETC **OTHER RESOURCE-BASED:** 516 OTHER ORGANIC CHEMICALS; 522 INORGANIC ELEMENTS, OXIDES,ETC; 531 SYNTHETIC DYE; 551 ESSENTIAL OILS, PERFUME,ETC	**AGRO-BASED:** 023 BUTTER; 122 TOBACCO, MANUFACTURED; 233 RUBBER, SYNTHETIC; 251 PULP AND WASTE PAPER; 265 VEGETABLE FIBRE,EXCLUDING JUTE; 431 PROCESSED ANIMAL VEGETABLE OIL, ETC **OTHER RESOURCE-BASED:** 288 NONFERR METAL SCRAP NES; 664 GLASS	
LOW-TECHNOLOGY	**FASHION CLUSTER:** 612 LEATHER ETC MANUFACTURES; 655 KNITTED FABRICS; 658 TEXTILE ARTICLES NES; 659 FLOOR COVERINGS, ETC; 831 TRAVEL GOODS, HANDBAGS; 844 UNDER GARMENTS NOT KNITTED; 847 TEXTILE CLTHNG ACCES NES; 851 FOOTWEAR **OTHER LOW-TECHNOLOGY:** 666 POTTERY; 679 IRON,STEEL CASTINGS UNWORKED; 696 CUTLERY; 697 BASE METAL HOUSEHOLD EQUIPMENT; 894 TOYS, SPORTING GOODS, ETC; 897 GOLD, SILVER WARE, JEWELRY; 898 MUSICAL INSTRUMENTS; 899 OTHER MANUFACTURED GOODS	**FASHION CLUSTER:** 651 TEXTILE YARN; 652 COTTON FABRICS, WOVEN **OTHER LOW-TECHNOLOGY:** 694 STEEL, COPPER, NAILS, NUTS, ETC	
MEDIUM-	**AUTOMOBILE INDUSTRIES:**	**PROCESSING INDUSTRIES:**	**PROCESSING INDUSTRIES:**

TECHNOLOGY	784 MOTOR VEHICLE PARTS, ACCESORIES NES **PROCESSING INDUSTRIES:** 533 PIGMENTS, PAINTS, ETC; 562 FERTILIZERS, MANUFACTURED; 582 PRODUCTS OF CONDENSATION ETC; 653 WOVEN MAN-MADE FIBRE FABRIC; 786 TRAILERS, NONMOTOR VEHICLES,NES; 882 PHOTO, CINEMA SUPPLIES **ENGINEERING INDUSTRIES:** 721 AGRIC MACHINERY, EXCLUDING TRACTORS; 724 TEXTILE, LEATHER MACHINERY; 728 OTHER MACHINERY FOR SPECIALISED INDUSTRIES; 741 HEATING, COOLING EQUIPMENT; 745 NONELECTRIC MACHINERY, TOOLS NES; 749 NONELECTRIC MACHINERY PARTS, ACCESORIES NES; 772 SWITCHGEAR ETC, PARTS NES; 773 ELECTRIC DISTRIBUTING EQUIPMENT; 812 PLUMBING, HEATING, LIGHTING EQUIPMENT	584 CELLULOSE DERIVATIVES ETC **ENGINEERING INDUSTRIES:** 725 PAPER ETC MILL MACHINERY; 727 FOOD MACHINERY NON-DOMESTIC	554 SOAP, CLEANSING ETC PREPARATIONS; 678 IRON, STEEL TUBES, PIPES,ETC
HIGH-TECHNOLOGY	**ELECTRIC AND ELECTRONICS:** 716 ROTATING ELECTRIC PLANT; 771 ELECTRIC POWER MACHINERY NES; 778 ELECTRICAL MACHINERY NES **OTHER HIGH-TECHNOLOGY:** 541 MEDICINAL, PHARMACEUTICAL PRODUCTS; 874 MEASURING, CONTROLING INSTRUMENTS		**OTHER HIGH-TECHNOLOGY:** 881 PHOTO APPARATUS, EQUIPMENT NES
Source: author from UNComtrade data			

Appendix 4.4

Threat Analysis of Egypt's Fifteen Main Manufactured Exports to the Middle East and North Africa, 2004

Ranking	Product (SITC 3-digit, rev 2)	Technology classification	US$ million, 2004	Share in total manufactured exports to the MENA, 2004	Share in MENA market, 2004	Threat analysis
1	334 PETROLEUM PRODUCTS, REFINED	resource-based	362.4	30.7%	3.87%	Partial threat from Turkey
2	673 IRON, STEEL SHAPES ETC	low-technology	84.0	7.1%	2.67%	Partial threat from China
3	661 LIME, CEMENT, BUILDING PRODUCTS	resource-based	77.7	6.6%	8.48%	No partial threat from China or Turkey
4	691 STRUCTURES AND PARTS NES	low-technology	53.9	4.6%	4.12%	No partial threat from China or Turkey
5	665 GLASSWARE	low-technology	53.5	4.5%	4.97%	No partial threat from China or Turkey
6	672 IRON, STEEL PRIMARY FORMS	medium-technology	49.7	4.2%	1.42%	Partial threat from Turkey
7	554 SOAP, CLEANSING ETC PREPARATIOS	medium-technology	33.4	2.8%	3.88%	Direct threat from Turkey
8	583 POLYMERIZATION ETC PRODUCTS	medium-technology	32.4	2.7%	0.59%	No partial threat from China or Turkey
9	061 SUGAR AND HONEY	resource-based	19.5	1.7%	1.34%	No direct threat
10	541 MEDICINAL, PHARMACEUTICAL PRODUCTS	high-technology	18.3	1.5%	0.22%	Direct threat from China and Turkey
11	783 ROAD MOTOR VEHICLES NES	medium-technology	16.1	1.4%	0.54%	No direct threat from Turkey and no partial threat from China
12	024 CHEESE AND CURD	resource-based	15.6	1.3%	2.39%	No direct threat from China and no partial threat from Turkey
13	843 WOMENS OUTERWEAR NONKNITTED	low-technology	15.2	1.3%	1.00%	No partial threat from China or Turkey
14	662 CLAY, REFRACTORY BUILDING PRODUCTS	resource-based	14.7	1.2%	1.43%	Partial threat from China
15	598 MISCEL CHEMICAL PRODUCTS NES	medium-technology	14.1	1.2%	0.49%	No partial threat from China or Turkey

Source: author from UNComtrade data

Guide to Figures/Tables for Chapter 4

Fig/ Table Number	Name	Special Notes for Designer	Source
Table 4.1	Matrix of Competitive Interactions Between Egypt and Turkey and China in EU and MENA Markets		Adapted from Lall and Albaladejo (2004).
Figure 4.1	Changes in the European Market Share of Resource-Based, Low-Technology, Medium-Technology and High-technology Manufactured Goods for Egypt and Comparators, 2000-2004		UN Comtrade
Figure 4.2	Changes in the MENA Market Share of Resource-Based, Low-Technology, Medium-Technology and High-Technology Manufactures for Egypt and Comparators, 2000-2004		UN Comtrade
Figure 4.3	European and MENA Market Share in Manufactured Trade by Egypt, Turkey and China, 1995-2004 (%)		UN Comtrade
Figure 4.4	Annual Growth Rate of Manufactured Exports to the EU and MENA by Egypt, Turkey and China, 1990-2004 (%)		UN Comtrade
Figure 4.5	Annual Growth Rate of "Simple" (Resource-Based and Low-Technology) and "Complex" (Medium-Technology and High-Technology) Exports to the EU and MENA by Egypt, Turkey and China, 1990-2004 (%)		UN Comtrade
Figure 4.6	Share of Egypt's Manufactured Exports to the EU Market Under Direct or Partial Threat from Turkey and China, 2004 (%)		UN Comtrade
Figure 4.7	Share of Egypt's Manufactured Export Products to the EU Under Direct Threat from Turkey, China or Both, 2004 (%)		UN Comtrade
Figure 4.8	Shares of Egypt's Manufactured Exports to MENA Under Direct or Partial Threat From Turkey and China, 2004, (%)		UN Comtrade
Figure 4.9	Share of Egypt's Manufactured Export Products to MENA Under Direct Threat from Turkey, China or Both, 2004, (%)		UN Comtrade
Figure 4.10	Share of Egypt's Manufactured Export Products to MENA Under No Direct or Partial Threat From Turkey and China, 2004 (%)		UN Comtrade

CHAPTER 5

NURTURING INNOVATION: IMPROVING EGYPT'S CAPACITIES IN SCIENCE AND TECHNOLOGY

CHAPTER 5
NURTURING INNOVATION: IMPROVING EGYPT'S CAPACITIES IN SCIENCE AND TECHNOLOGY[1]

5.1 Introduction

Today, everyone recognizes that we are moving rapidly towards a knowledge-based society and a technology-driven economy in a globalized, highly competitive world where ideas, goods and services know no political boundaries. The revolution in Information and Communication Technologies (ICT) and the rapid expansion of international trade has made this possible. But more importantly, an unprecedented wave of innovation has accelerated the invention of new technologies and the manufacturing of new products to a point where the life cycle of product on the market today is measured in months, not years. The dizzying pace of change is creating many new problems and opportunities.

It is this dizzying pace of innovation that I intend to address in this essay. For Egypt, like any other society today, is a part of that global interlocking system where your opportunities are global, and so are your competitors. It is no longer unusual to find that the product displacing yours in your own home market is sold by a competitor based in Singapore whose products are designed in France and manufactured in China, with funding from the Gulf. In this world, protective barriers mean little, and it is a world that favors the rich, the powerful, the educated and the nimble. Speed and innovation, not size, are increasingly the decisive factors.

What is innovation? In this context, we mean the capacity to generate new ideas to solve particular problems, or respond to particular latent needs, and to translate these ideas into reality. Note that innovation is not limited to physical products. Indeed, innovation may well take the form of a new business model or a new service.

Some innovations are responses to expressed needs, such as finding a cure for cancer or AIDS. Others are twists on existing services that take them to a new level: mobile phones, for example. Still other innovations are processes that achieve results much more efficiently: that is, new business models. Henry Ford invented the assembly line and revolutionized manufacturing in the twentieth century. He produced cars more cheaply and faster than other producers. Great innovations generate their own demand: the internet, for example, permeates our lives in ways no one could have predicted twenty or even ten years ago.

But innovation goes beyond having a good idea. It requires the capacity to translate vision into reality, a reality that is tested in the unforgiving environment of the world's competitive markets. Thus, to nurture innovation we need three elements: the ideas themselves, the means to transform them into reality, and the marketing ability to promote them to the public.

---

[1] Ismail Serageldin, Director, Bibliotheca Alexandrina

5.2 Generating ideas

Societies generate an overall climate that can be open and supportive of new ideas or closed and stifling. There are many specific factors that go into creating this overall climate. In general, openness, inquisitiveness, and healthy skepticism are among the values that must be nurtured if science and the scientific outlook—with its rationality, its evidence-based approach and its appeal to reason—are to flourish. Indeed, whether it is carried out by the private sector or the public sector, in universities or in independent labs, the practice of science is governed by certain values: truth, honor, teamwork, constructive subversiveness, engagement with the other, and a method for the arbitration of disputes. These values of science are adhered to by its practitioners with a rigor that shames other professions.

Truth: Any scientist who manufactures his data is ostracized forever by the scientific community. Just recently, we have seen the most eminent scientist in South Korea forced to resign from all his positions for having manufactured his results. It was his colleagues in the scientific community who tore off the mask of achievement and exposed the reality. In science, truth will always come out, and the practicing community of scientists ensures that all its members rigidly adhere to the standards it has set.

Honor, to give each his or her due, is another tenet for the practice of science. The second most heinous crime in science is plagiarism. A whole array of tools such as footnotes and references are deployed to ensure that none steals the work of others. Perhaps a most eloquent statement of that concept is Newton's statement that "if I have seen farther than most, it is because I have stood on the shoulders of giants."

Teamwork has become essential in most fields of science. The image of the lone scientist who challenges the established order with unique and brilliant insights, exemplified by Newton and Einstein, exists only in a few small domains of contemporary science. Increasingly it is teams of researchers in labs who make the breakthroughs, especially in experimental science. We must teach our young scientists of the future the importance of teamwork, and the essence of that is to ensure that all members of the team receive the recognition they deserve.

Science advances by overthrowing the existing paradigm, or at least significantly expanding or modifying it. Thus there is a certain **constructive subversiveness** built into the scientific enterprise, as a new generation of scientists makes its own contribution. And so it must be. Without that, there would be no scientific advancement. But our respect and admiration for Newton is not diminished by the contributions of Einstein. We can, and do, admire both. This constant renewal and advancement of our scientific understanding is a feature of the scientific enterprise. Its corollary is that scientists must **engage with the other**: considering all opinions, the most controversial of which frequently come from very young persons, no matter how strange or weird these opinions first appear. Opinions are not to be dismissed out of mere prejudice, but are subject only to the arbitration of evidence to confirm the claims.

This final point is essential. For in science, there is a process and a method, based on rationality and empirical evidence, that governs all activity. It provides the means to **arbitrate disputes**. It is what makes science great. The then-obscure Einstein's view of the bending of light by celestial objects was accepted when it was empirically verified by the 1919 observations

of the positions of stars during a total eclipse of the sun. Conversely, the claims of cold fusion made by the well-established professors Pons and Fleischmann were rejected when the claims could not be replicated in other labs. Thus, in science the ultimate authority is not a person, but a process of reasoning and a method of empirical observation.

These are societal values worth defending, not just for the practice of science, but also because they promote a tolerant and open society.

Indeed, contrary to general perception, it was the Arabs and Muslims who defined the modern scientific method, and who created the climate of openness and tolerance that allowed science to flourish during the Middle Ages. Among the most powerful of those voices are El Khawarezmi, El Razi, Ibn Al-Nafis, Ibn Al-Haytham, Ibn Sina, and Ibn Rushd—names that are forever engraved in the honor roll of humanity's benefactors through their efforts at advancing knowledge and rejecting superstition. Listen to their powerful, modern voices as they speak to us through the centuries:

Listen to Ibn El Nafis[2] on the importance of listening to the contrarian view:

> "When hearing something unusual, do not preemptively reject it, for that would be folly. Indeed, horrible things may be true, and familiar and praised things may prove to be lies. Truth is truth unto itself, not because [many] people say it is."
>
> —Ibn Al-Nafis, (1213-1288 A.D.), *Sharh' Ma'na Al Qanun*.

Listen to Ibn Al-Haytham[3], known in the West as Alhazen, who revolutionized optics and made major contributions in several fields of inquiry. Listen to him speak of how he prefers the experimental method to the authority of the ancients, which should always be approached with caution:

> "He who searches for truth is not he who reviews the works of the ancients…[it is] he who follows argument and evidence, not the statement by an individual, who is inevitably affected by context and imperfection. It is the duty of he who reads science books, if he wants to learn truths, that he should set himself up as an opponent to all he looks at… [accepting only what is supported by evidence and argument]."
>
> —Ibn Al Haytham, (965–c.1040) *Al Shukuk Fi Batlaymous.*

---

[2] Ibn Al-Nafis (1213-1288 A.D.), a renowned expert on Shafi'i School of Jurisprudence as well as a reputed physician, was head of the famous Nasri Hospital. He also served at the Mansuriya School at Cairo. When he died he donated his house, library and clinic to the Mansuriya Hospital. His major contribution lies in medicine.

[3] Ibn al-Haytham (965–c.1040) was a distinguished Arab mathematician. He was born in Basra but made his career in Cairo, where he supported himself copying scientific manuscripts. Among his original works, only those on optics, astronomy, and mathematics survive. His work on optics, which relied on experiment rather than on past authority, introduced the idea that light rays emanate in straight lines in all directions from every point on a luminous surface.

Even more impressive is his description of how the scientific method should operate, through observation, measurement, experiment and conclusion:

> "We start by observing reality … we try to select solid (unchanging) observations that are not affected by how we perceive (measure) them. We then proceed by increasing our research and measurement, subjecting premises to criticism, and being cautious in drawing conclusions… In all we do, our purpose should be balanced, not arbitrary: the search for truth, not support of opinions."
>
> —Ibn Al-Haytham, *Kitab Al-Manadhir*.

Centuries before Bacon and Descartes, before the emergence of modern science in the west, our forefathers were calling for the experimental method, relying on the power of observation and the application of rationality and logic. They promoted openness to the contrarian view, balanced by a healthy skepticism. They advocated prudence in running ahead of the available facts, and cautioned against falling prey to our innate prejudices and weaknesses that may bias our work without our noticing it. This is a truly amazing description of the modern scientific method, which was way ahead of its time.

These are stellar lights in the history of science and in the advancement of knowledge. They are our forbearers and we, as Muslims and Arabs, should be their proud disciples. We need to recapture that great tradition. It is our tradition, our history, our legacy. If today the torch has passed to the West, we should be mindful that we have done our share and more in earlier times, and should strive to take our place, by dint of hard work and innovation, alongside our western colleagues at the forefront of global scientific endeavor.

Worth stressing is that our legacy of tolerance and open-minded inquiry applies broadly through society, not only in relation to scientific work. Contemporary to Ibn Al-Haytham in Egypt, Abul Alaa' Al-Ma'ari (973-1057) lived in Syria. Al-Ma'ari, a giant of Arabic literature, wrote poetry attacking religion, God and the prophets, and he was not punished for it, even though a certain amount of opprobrium attached to his name. His work was not only published and known in his own time, it has passed down to us in the 21st century without loss. Moreover, he was appreciated for his talent as a poet and a linguist even by those who totally rejected his heretical writings.

The challenge for Egypt today is to ensure that it can create an overall climate that is open and tolerant. In addition, it will have to ensure that its children and young people are brought up with these values, and within an education system that nurtures talent and encourages questioning. The bulk of the new scientific and technical breakthroughs come from the young. When they made their major breakthroughs, giants like Einstein, Dirac, Heisenberg and Watson were all in their twenties. Many technological breakthroughs in business processes and new software were also made by very young people: Bill Gates (Microsoft), Larry Page and Sergey Brin (Google), and Michael Dell (Dell Computers), to name but a few.

Regrettably, the situation in Egypt requires nothing less than a major revolution in the education system. Curriculum reform is just one part of the solution that must be pursued. Overall school atmosphere and teacher attitudes are just as important. We must move from demanding rote memorization to prizing problem solving, from valuing conformity to appreciating creativity and imagination, from desiring obedience to nurturing questioning. In addition, we must also address the prevalent public discourse and family values that revere seniority and muzzle inquiry by the young. Nothing less will do if Egypt is to become a dynamic, innovative, learning nation in this time of the knowledge-based society and the technology-driven economy.

5.3 Building a base for transforming ideas to reality

Having an atmosphere that allows young people to generate ideas is a necessary but not sufficient condition for innovation. We need to have a significant societal base in science and technology (S&T). The development of an indigenous capacity in S&T is not a luxury, but an absolute necessity if the developing world is to realize its potential in the coming decades. This is also true of Egypt, as well as most of the Muslim and Arab world, whose populations are mostly poor, and whose national economies are mostly developing or lagging.

To better understand where, when, and how we must act, it is useful to develop scenarios that are functions of certain key elements and that clearly identify the actual "drivers" of change. Such scenario construction does not render exact predictions but rather provides insight into the transformation process. The recommendations that ultimately flow from such insight may then be formulated to "bend the curve" of the most *likely* forecast in the direction of the most *desirable* forecast. And by focusing on the levers for so doing, we may bring realism to bear on our collective goal—building worldwide science and technology capacity—and the selected ways of trying to achieve it.

The InterAcademy Council (IAC), which links all the academies of science of the world, produced a major report on this subject (undertaken by a panel that I had the honor to co-chair). This report suggests **five clusters of recommendations**, dealing with each of these five topics: policy, human resources, institutions, the public/private interface, and financing. I will summarize here some observations drawn from that study. To these, I must add a special mention of the digital libraries of tomorrow, which, I believe, will have a major role to play in helping bring about the desired outcomes.

5.3.1 Policy for science and science for policy

Countries need a coherent national framework for actions that directly affect the promotion of science and technology. Such a national S&T strategy should be developed by the government in consultation with the scientific, engineering, and medical academies of the country. The strategy should benefit from the experiences of other countries, and it should spell out the government's commitments to funding, standards of excellence, openness to innovation, dissemination of knowledge, regional consortia and networks, private-public interactions, and entry into partnerships with others—locally, regionally, and globally.

National academies of science, engineering, and medicine can improve the quality of national S&T programs. National academies as understood here are member-based autonomous institutions, motivated by their commitment to scientific or engineering excellence, in which peers elect new members, elect their officials, and execute agreed-upon work programs for decision-makers in government. The presence of such institutions is extremely important for upholding the quality of S&T activity in a country, for guiding national policies based on science and technology, and for maintaining dialogue with other countries, often through their counterpart academies. In some countries a National Research Council (sometimes mistakenly called "Academy"), is supposed to set the strategy, but it usually suffers from conflict of interest as it members head the institutions that are the primary recipients of the funding to be provided. Sometimes it will be necessary for the countries to rely on an eminent group of scientists and intellectuals to act as an ad-hoc committee in the absence of formal academies, and they may even find it beneficial to create such an ad-hoc committee for the specific task of helping draft a national strategy or to ascertain excellence in certain centers. Frequently such groups can also draw on international expertise, including a country's expatriated talents.

International institutions such as TWAS (the Third World Academy of Sciences), IAC, and ICSU (the International Council for Science) should help in the formation and strengthening of nascent national and regional institutions. The participation of these international bodies will help new organizations establish the requisite high standards and effective mechanisms of operation. Sometimes an outsider's fresh look at problems can add insight missed by the jaded eye of local practitioners. Sometimes the participation of international experts enables the locals to avoid the social and political pressures that the work of such committees can be subjected to.

In addition, it is essential that the academies actively participate in national and international debates in order to make the voices of science and technology heard on a broad range of issues. Scientists are citizens too!

5.3.2 Human resources

The education and training system of a country must address the quality of instruction, especially in science and math, from pre-school through graduate studies. The issue is not only coverage of curricula and teacher training, important as these are; it is even more about being able to communicate to children the enormous adventure of discovery that is the scientific enterprise. It is about teaching them to appreciate the elegance and beauty of mathematics, helping those who have the interest and aptitude to pursue a scientific career to discover their latent potential and to realize it. It is to engage children in the quest for knowledge and to impart that most valuable of all skills: learning to learn. That is the key to lifelong learning.

Reforming universities and their governance is a major endeavor that needs our attention and support. It is a vital task that cannot be ignored. The university as a locus of modernization and change in any developing society is a powerful engine for progress. Thus its social and political role is as important as its scientific and technological role, although these former should not be allowed to eclipse the latter.

In addition, it is important to address the so-called "brain drain" issue. The enormous gaps existing between the North and the South, as well as the demographic trends that show an aging

North unable to provide enough young people for the needs of its growing, technologically driven economy, all imply that brain drain will continue. The South should accept that and try to train more young people in the needed disciplines, while encouraging more of the training burden to be picked up in the advanced research universities of the North, through arrangements like sandwich programs and enhanced fellowships. Special outreach and support programs should be promoted by the S&T community for assuring gender and diversity. The developing countries should try to retain talent in their own institutions, within their own borders, by measures such as providing, on a temporary basis, special working conditions for our best talents (whether formed abroad or at home), including income supplements and adequate research support.

In addition, the Government and the national S&T community should build ties with our expatriate scientists, doctors and engineers, especially those who are working in industrialized countries.

5.3.3 Centers of Excellence

Science, medicine and engineering advance largely at "centers of excellence"—physical locations where research and advanced training are carried out, often in collaboration with other centers, institutions, and individuals. Centers of excellence are the key to innovation, and their importance cannot be overestimated. Therefore, for the S&T capacities of developing countries to grow, they too should have centers of excellence—whether of local, national, regional, or international status. These centers of excellence do not necessarily have to be created *de novo*. The bolstering or reform of a country's most promising existing R&D programs can achieve the desired outcome. A key to promoting excellence is merit-based allocation of resources based on rigorous review, both in deciding on new research projects and evaluating current programs. Given the relatively modest scientific capacity of most developing nations, such reviews should ideally include appropriate experts from other nations.

Centers of excellence—whether of local, national, regional, or international status—should be created, or seriously planned for the near future, in practically every developing country in order for their S&T capacities to grow. Such centers can serve as the main nodes for individuals or groups charged with enhancing S&T knowledge of national and even regional importance. The centers should have institutional autonomy, sustainable financial support, knowledgeable and capable leadership, international input, focused research agendas that include interdisciplinary themes, applied research as well as basic research, technology transfer, peer review as a systemic element, merit-based hiring and promotion policies, and mechanisms for nurturing new generations of S&T talent.

Where such institutions already exist, they should be reinforced or, if necessary, reformed. When reform is indicated, changes should be system-wide and carried out in ways that make best use of scarce resources (including the local talent).

New scientific and technological research projects should be decided on the basis of input from expert reviewers, with each project and program evaluated both for technical merit and its potential benefits to society. All existing research programs and centers of excellence can similarly benefit from periodic expert review and evaluation. Techniques for such procedures

should include, as appropriate, peer-review teams, relevance-review panels, or benchmarking studies.

Merit reviews should ideally include appropriate experts from other nations. Such involvement of the global research community, possibly through a program of international cooperation among academies of science, engineering, and medicine, can make the merit-review processes more effective—and not just for particular programs, but in general.

Virtual networks of excellence (VNEs) can link the scientific talents of entire regions and the globe. An important step toward building centers of excellence will be the creation of such VNEs, extending throughout the developing world, with the primary objective of nurturing scientific and engineering talent in mostly "virtual" science and technology institutes. These entities should be relatively small, efficient, and embrace innovative research groups that may be far apart geographically but closely linked via the internet and anchored in recognized research centers. The VNEs' institutes will work to blend their activities into coherent programs, yet the individual research groups will work in areas of prime interest to their own countries. Successful examples of VNEs are the Millennium Science Institutes created in several countries by the Millennium Science Initiative with the support of the World Bank. VNEs should be created nationally, regionally, and globally.

5.3.4 The private/public interface

In advanced industrial countries, the private sector accounts for well over 50 percent of the R&D effort. In the US the private sector covers close to 68 percent of R&D, but implements about 75 percent, since some publicly funded projects are executed by private contractors. Globally the figure has gone up from about 30 percent 15 years ago to about 62 percent today. This enormous expansion has placed a premium on marketable outcomes and patenting or other forms of intellectual property rights (IPR). This raises many questions for developing countries like Egypt, since we have to rely on an overwhelming share of our R&D coming from public funding. Increasingly we will find that the administrative and financial burden of coping with an intrusive patenting system inhibits the conduct of research, since a large part of intermediate outputs that serve as research inputs are covered by IPR protection.

No one would argue against the private sector's enormous value to the global research enterprise. Imaginative proposals must be found to create true partnerships that benefit both Egypt and the advanced industrial countries to advance R&D locally and regionally. This is a topic that urgently needs attention, not just in terms of legislation, but also to address the climate within which research is undertaken.

5.3.5 Financing

While conventional mechanisms for funding R&D will probably continue to play an important role, it is essential to move to more efficient and effective mechanisms to implement the reform agenda. However, the fundamental issue regarding funding is not the absolute amount of funding that a country provides, although we believe that this is quite important to create a critical mass of R&D work to enhance the S&T base in the country. The essential point is how that funding is allocated. It must be focused on strategically important research priorities

determined in the national strategy, and must be allocated through a competitive grant system based on merit. That alone is the single most important condition that will ensure effectiveness of the utilization of the funds available.

Beyond these basic questions, we can mention some new funding instruments worthy of consideration.

National Sector Funds: Sectoral funding for R&D should be seriously considered by the public, private, and academic sectors of Egypt and the region. Brazil successfully redirected corporate taxes for the conduct of research in areas of economic interest to the nation. The management of each sectoral fund should be tripartite, with the participation of the academic community, government, and industry. A portion of each fund's resources should be used to support basic science, and another portion should support infrastructural needs. These sectoral funds, which can help implement the national strategic policy goals, require close interaction by the academic community, private sector, and government to create the funds, establish their priorities, and manage them. Decisions on the selection of strategic sub-sectors, their respective shares of the fund's resources, the blend of basic and applied research, the required overall budget, and sources of support should all be jointly made.

Regional S&T networks: Regional networks, through which neighboring nations can together pursue world-class research and training activities on issues of mutual concern, should be created and supported in order to complement sectoral funds. The regional networks could in turn be involved in cooperative programs with S&T-advanced countries (such as the US, EU, Japan, and others), who should, along with the international donor and financing community, be willing to fund these networks.

Global funding mechanisms should be strengthened for the support of S&T in developing nations. While the possibility exists for such funding through the targeted sectoral funds discussed above, it would require exceptionally committed governments and in some places could be insufficient for generating the needed foreign-currency resources. Therefore the Study Panel suggested that two global funds—an institutional fund and a program fund—be set up in a consultative fashion. These global funds would not have to be pooled but could remain distinct, though coordinated centrally, and they would allow those donors with particular restrictions to honor them while still participating in the funding.

An Institutional Fund should be established that would provide "soft funding" over a period of 5 to 10 years to some 20 centers of excellence of a national or regional character (operating by themselves or in developing world networks). This funding would not be program-specific; it would be used instead to allow centers to promote the values of science and engineering and to create atmospheres in which the practice of high-quality research can flourish. Specifically, the money would help each center to develop its programs, cultivate its management, and build its long-term funding base. The Egyptian government and donors would meet in a consultative mode to review proposals resulting from an open call for competitive submissions, and they would select the centers according to clearly established evaluation criteria.

A Program Fund should be established as a competitive-grants system for support of research programs in centers of excellence, in which international referees would review the quality of the projects being proposed. Preference would be given to proposals that involved cooperation with a research institute in an S&T-advanced or proficient nation.

5.3.6 The digital libraries of tomorrow

Digital libraries of S&T can bring knowledge to virtually everyone, everywhere. Scientists and technologists in developing countries, including Egypt, have limited access to recent research findings (mostly in journals), to reference materials (mostly in libraries elsewhere), and to databases (some of which are proprietary); and these problems have been exacerbated in the last decade as information streams turned into torrents. The enormous advances in information and communications technology (ICT) have opened up opportunities for remedying the situation as never before, though these same advances have also raised issues of intellectual property rights. The proper harnessing of digital technologies is essential to S&T capacity-building in Egypt as in other developing countries, which should make major efforts to provide adequate ICT infrastructure and trained technical personnel for their learning and research institutions. The Bibliotheca Alexandrina, the new Library of Alexandria, is making enormous efforts in this direction, but it is clearly a small part of what must become a vast regional and global enterprise.

Egypt's government has followed a very enlightened policy to encourage penetration of the internet into Egypt, providing multiple toll-free numbers to provide heavily subsidized dial-up access to the internet. The number of subscribers to the internet has gone from only 75,000 Egyptians in 1998 to some five million in 2006. This helps lay the foundations for a much greater interaction with the new digital materials of the 21st century. More needs to be done in this area, in particular in production and accessibility of Arabic digital content. Nothing will be as helpful to young Egyptians and Arabs as finding a large amount of relevant material in their own language in addition to all they can find in other languages.

5.4 Moving to market: hubs for technological innovation

If ideas are transformed into technologies, they must still be brought to market, and subjected to the ruthless filter of marketing and consumer acceptance. This is what Research and Development (R&D) is intended to ensure, and increasingly R&D is conducted by the private sector in the context of a whole infrastructure of IPR regimes. The quality of R&D and the move from lab to market is central for an effective competitive economy.

All agree that Egypt should be able to deploy much higher quality R&D facilities than are presently available, and that its R&D efforts in all aspects of S&T need to be directed to areas of high impact on the development of its industrial base. This will require recognizing that there is a disconnect between the educational and research facilities of the Ministries of Higher Education and Scientific Research and the industrial enterprises in Egypt and the external world. For technology transfer to actually occur at a scale compatible with Egypt's needs, it is essential that industry play a central role in the design and management of facilities that would undertake R&D for S&T in Egypt. Only then will it be possible for these facilities to truly respond to the

needs of industry, and ultimately be able to tap into the R&D work of the private sector, which in industrialized countries accounts for some 65–80 percent of the funding of such work.

5.4.1 A proposal: technological hubs in Cairo and Alexandria

High technology hubs should be developed with strong ties to industrial parks, where special incentives should encourage some multinationals to enter into joint ventures with selected Egyptian enterprises. This effort can start with fairly focused activities, which will involve multinationals in setting standards and ensuring the quality of the work being done by young Egyptians under the guidance of the experts of the multinationals. Such activities would include the setting up of special labs, albeit to a limited extent in the initial phase.

The key will be to work with local and international firms in setting up activities that require the best of the locally available scientific input, as well as providing opportunities for the gradual ramping up to broader and better work, while giving our graduate students opportunities for hands-on work commensurate with international industry standards. Examples of such activities include:

- Testing labs for the quality of industrial and agricultural production for export
- Arabization of software programs
- Outsourcing of work on bio-informatics (from the US, Europe and Japan, handled by high speed IT links)
- Biological applications in agriculture (input vs. output traits) and health (diagnostics, vaccine development, etc.) and industry (enzymes for textiles and tanneries, cleaning the waste of industry, pollution reduction technologies, and moving from chemical to biological processes).

The program should start with only two hubs, one in Cairo and one in Alexandria. The Cairo hub could be located at the 6th of October/Smart Village area and would be linked to the proposed Nile University. The Alexandria hub could be linked into the Bibliotheca Alexandrina (BA), with its vast research support system, and could draw on the universities of Alexandria and the Arab Academy for Science and Technology.

5.4.2 Around the hubs: campuses, industrial parks and incubators

For the hubs to actually attract multinationals and allow for the effective technology transfer that Egypt needs, it is essential that they have a supply chain of young talent to draw on and to train, and that some of the alumni of such training – the more ambitious among them – would be encouraged to initiate their own start-up activities. Technological incubators would support them with initial start-up loans, with the possibility of setting up their labs in a close-by campus atmosphere. Common services such as the legal, administrative, financial and auditing services could be shared in a way that would minimize the cost to young entrepreneurs and allow them to focus on their own technological businesses.

The start of the hub concept would be linked to a graduate level research facility that would service the needs of the labs being set up by the multinationals and their joint venture partners.

That facility would have to be managed autonomously in a way that allows a focus on learning and doing with a clear commitment to excellence.

5.4.3 What is a hub?

Each hub would have:

- An autonomous management structure that involves international expertise and the genuine participation of the multinationals taking part in the joint ventures that would benefit from the hubs.

- A central group of labs that would function in relation to the needs of industry, managed by situation-specific management structures involving the relevant industry in the management of each of the labs. Real work would be done at these labs to serve the needs of industry and would be linked with a proper training program—grounded in the tradition of industrial R&D—undertaken in conjunction with a graduate level center of excellence.

- Direct links to a center of excellence at the graduate level which would be a joint venture between an Egyptian academic institution and an international consortium combining research expertise and industrial R&D experience.

- Links to undergraduate facilities that would provide a flow of smart young graduates for further training at the central graduate center of excellence and for simultaneously working at the central lab facility for industry-related R&D.

- An excellent ICT infrastructure that would allow on-line web-based interface applications in all aspects of management, research and actual applications. This would be provided in Cairo by the Smart Village and in Alexandria by the BA.

- An incubator involving administrative offices, meeting rooms, labs and other facilities for rental; the participation of banks and selected high quality legal services (with expertise in IPR issues); and financial, administrative and audit services. A counseling service that could call on eminent retired CEOs to advise young entrepreneurs would be set up.

- Links to industrial parks that would provide the basic services for the multinationals and their joint ventures on the production side, with adequate links to transport and shipment corridors for export.

This program must be managed from an industry perspective if it is to be successful. It requires a board chaired by the Minister of International Trade and Industry (MITI), with a vice chairman/CEO who would oversee the day to day management. Board membership would be drawn from representatives of the industrial and financial sectors in Egypt as well as international figures. The advisory board could be chaired by a person of international standing, or by the vice chair of the board and the CEO of the whole program.

Regrettably, there is a terrible lack of financing for startups. Egypt, like many other countries, lacks a base of **venture capitalists to finance startups.** The government must play a role in the early stages and encourage the emergence of venture capitalists by, for example, setting up a fund in which shares can be sold on the stock exchange, and to which the government would provide the largest part of backing to encourage private capital to join in this endeavor. Indeed, it is sobering to note that the success rate of innovation within sectors is about 5 percent, but venture capitalists have a success rate that exceeds 30 percent.

5.5 Conclusions

The speed of change is dizzying. In the ICT world, the product life cycle is now on the order of 18 months. A six-month delay in bringing a product to market can mean the loss of 30 percent of the expected benefits. With this relentless pressure increasingly seeping into other sectors of economic activity, it becomes even more compelling to urgently focus on improving our competitiveness.

Competitiveness does not require size. If we look at the *Global Competitiveness Report* issued by the World Economic Forum (WEF) in 2006, the global rankings show that of the top ten countries, only the USA is large. Japan comes at number 12. The UK, Canada and Germany come in at positions 13, 14 and 15 respectively. (See Box 5.1)

Box 5.1: The Most Competitive Economies in the World, 2006

1. Finland
2. USA
3. Sweden
4. Denmark
5. Taiwan
6. Singapore
7. Iceland
8. Switzerland
9. Norway
10. Australia
11. Netherlands
12. Japan
13. United Kingdom
14. Canada
15. Germany

Source: World Economic Forum (WEF), *Global Competitiveness Report*, 2006

These global rankings also highlight other important issues concerning Egypt's current position. First, despite the fact that the major reforms in Egypt have so far been only at the macroeconomic level, they have already created a recognized upward trend that placed Egypt in 53rd position out of 117 (the bottom-ranking country was Chad). Egypt's reforms at the sectoral

levels will reinforce this upwards trend. It is also very interesting that Egypt is close to the giants of the developing economies: China (49th) and India (50th). However, the speed of reform is important, for these giants are themselves on the move, and if Egypt does not force the pace of reforms, especially to supplement macro-level reforms with sectoral reform, it will fall farther behind them, rather than catching up. Second, the long-term weakness of the education system of Egypt must be addressed now if it is not to become a major drag on the growth of productivity and hamper competitiveness.

The future is not pre-ordained. We can create our own futures. We *can* replicate the performance of such countries as Singapore, Korea and China. We can reclaim our proud heritage and ensure that the values of science are integrated into the fabric of our society. We can create the spaces for the young to soar. We can transform our economic institutions, we can unleash the latent capabilities of our people, we can have a dynamic Nile Valley that competes with Silicon Valley. The pyramids are not just witnesses to a glorious past, they are also a call to future greatness.

CONCLUSIONS: INSTITUTIONALIZING COMPETITIVENESS

This year's Egypt Competitiveness Report has presented a clear picture of the Egyptian economy. There has been great progress in macroeconomic reforms including income tax reduction, tariff reduction and simplification of compliance for both. As a result of good macroeconomic management, GDP is up, inflation is down and employment rates have improved slightly. However, the fiscal deficit remains to be addressed. More worrying is the situation at the structural and microeconomic level. Despite impressive reforms, investment is still low at 16 percent of GDP. Credit to the private sector increased only modestly, confirming that access to credit remains a major problem for business. Real exports, especially in the manufacturing sector, are below potential. Foreign investment levels, while up recently, are still below desirable levels. Research and development in Egypt as a percentage of GDP is very low even by developing country standards. As Chapter 1 has shown, there is a major problem with human resources and the adequacy of training and preparation for the workforce. The latest data available indicate very low growth in productivity—which is key to growth in incomes and standards of living. Unless these structural and microeconomic issues affecting the business environment are addressed, good macroeconomic policy alone will be unable to ensure sustainable growth. Both Michael Porter's Business Competitiveness Index and the World Bank Doing Business 2006 indicators illustrate that Egypt's competitiveness in the business environment lags severely.

As a result, a deepening of reform is now required that will focus substantive attention on the structural and microeconomic levels. This focus encompasses many areas and will require careful prioritization and sequencing. The first priority is to address human resource issues, which will include understanding the reasons for low productivity growth, the problems with labor markets and the responsiveness of basic education, and the need for vocational training and university preparation that is relevant to the market. This issue should be the number one priority for competitiveness. The linkage between industry and educational and research institutions must be closer and this will require innovative approaches to ensure close coordination. Another priority is designing and implementing an industrial competitiveness strategy that stimulates the performance of manufacturing exports. This may involve a focus on a national innovation system which can help Egypt reposition itself from resource-based and low-cost industries to medium- and high-tech exports, in accordance with the declared "Industrial Development Strategy for the Year 2025.". However, such an industrial policy must learn from the experience of other countries, both successes and failures. Foreign investment promotion will play a role in this transition, as will the creation of appropriate business infrastructure and the reduction of red tape. The business environment for SMEs, which has begun to be examined, must be further addressed. Financial modernization, as it proceeds, should be monitored with the goal of ensuring

more universal access to credit. Registration and protection of real property and intellectual property needs to be strengthened. Commercial law adjudication must be addressed.

Confronting the complex problems facing Egyptian policy makers will require a concerted effort by many parts of society. All Government ministries will need to contribute and work together as a team if Egypt is to attack these problems. Other parts of society must also be actively involved, especially those educating and training the next generation. Business leaders and entrepreneurs must take part if Egypt is to reposition its industries in world markets, raise investment levels, improve productivity and grow the economy. Civil servants should be enlisted in the Government's civil service reform program. Journalists, writers and thought leaders will be important if the broader public is to understand and support the efforts to address these challenges.

Egypt needs to build consensus around a common vision building on the initiatives taken so far. Without a common vision, it will be difficult to inspire and mobilize the many parts of society for the efforts that are needed to address Egypt's competitiveness challenges.

It is proposed in this context that the Egyptian National Competitiveness Council bring together Egypt's private sector, public sector and civil society leaders to form a common vision and unify action. The Council would include business leaders representing all sectors of Egypt's economy: agriculture, manufacturing, tourism, trade, construction, energy and ICT. It would include key leaders from the public sector who have demonstrated vision. It would also include representation from trade unions and leaders from Egypt's universities and research institutes.

The Council would set priorities, provide advice to the Government and monitor progress. At its first meeting, the members would agree on 10 or 11 priorities for the first year, such as educational reform, industrial development, financial sector reform, investment promotion, SME development, innovation, export development, ICT development, reduction of red tape and/or other agreed-upon areas. An agenda would then be set for the subsequent meetings, each of which would focus on a given priority. The Council would also monitor progress in the economy on various areas of concern and also the progress in implementation of reforms.

The Council would make recommendations based on the latest data, best expertise, and the insights and experience that they themselves bring to the table. Prior to each meeting, the members would receive the latest data on a particular issue affecting Egypt's competitiveness in one of the priority areas chosen in the first meeting. The leading Egyptian expert on that issue would be invited to give a short presentation. The best international expertise and examples would also be given and an international expert would be invited to provide lessons from other countries that have successfully dealt with these issues (e.g. Sweden and Finland have excellent innovation systems, while Ireland and Singapore are leaders in promoting foreign investment).

These recommendations would be assembled over the next 12 months to form a comprehensive Egyptian national competitiveness strategy. Each meeting would result in a short action-oriented advisory package, substantiated with the data and analysis mentioned above. These would be assembled, month by month, until an overall package was synthesized to form the next

annual *Egypt Competitiveness Report—2007:* a complete, inter-locking and mutually reinforcing strategy for boosting competitiveness, productivity and economic growth.

The Council would advise the Government on competitiveness-related initiatives. Each month, the particular recommendations in a given area would be communicated to the relevant leaders and ministries and at year's end the complete Report would be presented.

An annual "competitiveness retreat" would be held to pull the strategy together, invite comments and involve a larger set of government, private and social sector actors. This retreat would not only present the next year's competitiveness indicators and assessments, but would provide an agenda for action with specific recommendations affecting key priority areas for the nation's economy.

The Egypt Competitiveness Council would mobilize broader public understanding and support for competitiveness-related reforms. The Council would also play a role in changing mindsets. Starting from the moral purpose of creating dignified jobs and standards of living for all Egyptians, the Council would disseminate knowledge and understanding of the problems affecting the Egyptian economy and their solutions. The Council would do this by sharing the results of its sessions, by addressing leadership groups, and by working closely with the journalists and media. Presentations to students and economic faculties, business schools, universities, chambers of commerce, ministries and other venues would be part of this effort.

The Council members would have to commit to meeting monthly, but the time would be extremely focused and well used. Since the members are very busy people, the basic time commitment would be only two hours per month, usually on the same day and time and starting and ending punctually. Each session would be well planned and well utilized as described below, so that members would see the value of coming each month during a one-year commitment.

The Council would have a Director/Coordinator and an efficient 2-person team. The Egyptian Competitiveness Council would choose an executive director or coordinator along with two talented professionals who would prepare the meetings, ensure attendance, organize logistics, coordinate working groups and experts, ensure that excellent briefings are provided with both PowerPoint and written documentation, and record and distribute minutes of the meetings. The coordinator of the ENCC will function much like a CEO functions prior to a Board of Directors meeting.

The Council would also challenge the private sector to improve its competitiveness. The private sector also needs reform. The Council would invite Egypt's industry clusters to formulate their competitiveness strategies and identify real barriers to their ability to reposition themselves in world markets. These barriers and constraints would be communicated to the Government.

The Council would be open, inclusive and transparent, and would maintain a website useful to many. The Council would not be a restricted, elite group but would be open to inputs and participation by others. One way to immediately expand the involvement and impact would be to form working groups for each of the 10 or so priority areas identified by the Council. While one Council member could take the lead or participate in each working group, an additional 10-20 experts and stakeholders would be invited to help work on the analysis and recommendations. A website would be maintained where all of the recommendations to Government would be posted, and this would be open

to responses from the general public. In this way, the Council would work with new methods to involve broad sectors of society in an open, inclusive and transparent way.

It is hoped that this year's *Egyptian Competitiveness Report 2005-2006* will have contributed to public understanding of the issues and to its benchmarking of current progress. The point, however, is not merely to issue a report, as useful as this may be. The point is to mobilize action—to create change that improves the lives of ordinary Egyptians. This proposal will help turn thought into action and will provide a mechanism for following up and enlisting the help of Egyptians from all walks of life—including the reader of these words today.