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Arab Republic of Egypt: Selected Issues

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ARAB REPUBLIC OF EGYPT

Selected Issues

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Approved by the Middle East and Central Asia Department

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I. EXCHANGE RATE PASS-THROUGH[1]

A. Introduction

1. After pegging its currency to the U.S. dollar for almost a decade, Egypt began a transition to a flexible exchange rate system in 2000. The exit from the peg went through several phases, including a series of step devaluations between 2000 and 2002, a first attempt at a float in January 2003, and the successful transition to a unified, flexible exchange rate system in late-2004. From 2000 to 2004, the Egyptian pound experienced a cumulative depreciation of 68 percent against the U.S. dollar. During this period, there was an active parallel market for foreign exchange, with a premium that reached as high as 15 percent over the official (banking) rate. The parallel market rate converged with the banking rate in mid-2004, prior to the establishment of a formal interbank market for foreign exchange.

2. This chapter examines the dynamic relationship between the nominal exchange rate and prices during Egypt's exit from a managed exchange rate regime. In theory, the movements in the nominal exchange rate since 2000 should have affected domestic prices and inflation through changes in import prices (both final and intermediate goods), as well as through expectations. A cursory examination of the data, however, suggests otherwise: inflation as measured by the consumer price index (CPI) remained remarkably low and stable from 2000 to 2003, despite the sizable cumulative depreciation of the pound (Figure 1). CPI inflation started rising only after July 2003, the first observation of a new CPI series with updated weights introduced in early 2004.[2] The effects of the 2000–04 exchange rate movements on the wholesale price index (WPI) appear to have been quantitatively larger than on the CPI, but also exhibited long lags.

3. The methodology used in the chapter to measure the impact of exchange-rate movements on wholesale and consumer prices is based on a "price chain" model that seeks to identify the effects of exchange rate "shocks" at each stage of the distribution process through the estimation of a recursive vector autoregressive (VAR) model.[3] This method was put forward by McCarthy (1999), and has become standard for examining empirical pass-through issues.[4]

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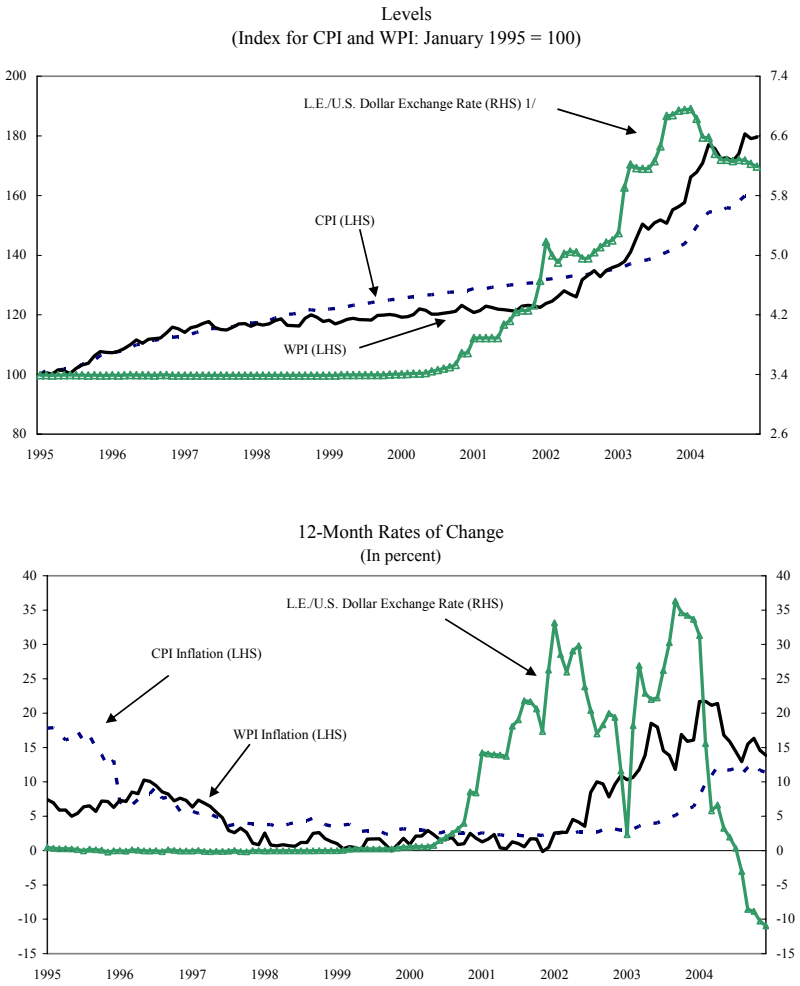
[1] Prepared by Pau Rabanal. The author would like to thank the Monetary Policy Unit of the Central Bank of Egypt (CBE) for useful comments on an earlier version of this paper.

[2] The new series was released in January 2004, with the initial observation going back to July 2003. A further backward revision with the new weights has not been produced.

[3] The main advantage of this methodology over single-equation regressions or cumulative pass-through calculations is that it takes into account the influence of other macroeconomic variables (e.g., supply shocks, the cyclical position of the economy, the effects of commodity prices) on the price level. One potential shortcoming is that the model is linear: it assumes that large and small exchange-rate shocks (in either direction) have the same proportional effect on prices. The methodology is also not well equipped to deal with parameter instability, a likely consequence of changes in the exchange rate regime, or with very short sample periods.

[4] See, for instance, Rabanal and Schwartz (2001) and Belaisch (2003) for the case of Brazil; Billmeier and Bonato (2002) for Croatia; Leigh and Rossi (2002) for Turkey; and Bhundia (2002) for South Africa.

Figure 1. Egypt: Consumer Price Index, Wholesale Price Index,
and the Egyptian Pound (L.E.) per U.S. Dollar Exchange Rate, 1995–2004



Source: Central Bank of Egypt.
1/ The exchange rate series is the official (banking) rate from January 1995 to December 2000, and from October 2004 to December 2004. From January 2001 to September 2004, the chart depicts the parallel market rate.

4. The main findings of the chapter can be summarized as follows:

- The exchange rate pass-through to the CPI in Egypt from the late 1990s to 2004 was low (ranging between 6 and 27 percent) and not statistically significant. The pass-through to the wholesale price index was much higher (from 30 percent to 60 percent) and statistically significant.

- The pass-through in Egypt was slow. It took between six to 12 months for exchange rate changes to have a quantitatively significant impact on the WPI, and between 12 to 24 months to affect the CPI, though not significantly.

- The pass-through in Egypt was much lower and slower than the one observed in other emerging markets in recent years.

- A "counterfactual" model-based CPI suggests that the 12-month CPI inflation rate would have been 2 to 3 percentage points higher during the 2001–03 period, if the dynamic relationship between the exchange rate and prices identified for the late 1990s had been maintained.

B. Exchange Rate Pass-Through in Emerging Markets

5. The VAR methodology for estimating the pass-through was applied to a selected group of emerging market countries to provide a benchmark for the results obtained with Egypt's data.[5] The group consisted of Brazil, the Czech Republic, Israel, Mexico, Poland, South Africa, and Turkey. The same methodology, variable definitions, and sample period (1995–2004) were used in all cases in order to maximize comparability.[6]

6. The dynamic relationship between exchange rates and prices identified with the VAR can be usefully summarized by estimated measures of the level and speed of the pass-through at several horizons. The ***level*** of the pass-through at horizon *j* is defined as the ratio of cumulative responses of the price level and the exchange rate *j* periods after the exchange-rate shock.[7] The ***speed*** of the pass-through measures the time it takes for the exchange rate shock to build up in the system, and is calculated as the ratio of the pass-through coefficient at horizon *j* over the long-run pass-through (assumed in this exercise to be the level of the pass-through after 24 months).

7. Results from the estimation are presented in Table 1. In terms of the ***level*** of the pass-through, countries fall into two broad groups: in the first group (Israel, Mexico, and Turkey), the level of pass-through is high; in the second group (Brazil, the Czech Republic, Poland, and South Africa), the pass-through is low to moderate.[8] All the impulse responses of

[5] See Appendix I.1 for a brief description of the VAR methodology and other details of the estimation.

[6] The estimations do not take into account possible changes in the monetary policy and exchange-rate regime. Belaisch (2003) and Kara, et. al (2005) investigate this possibility for the cases of Brazil and Turkey, and find evidence of a decline in the pass-through coefficients in both countries in recent years.

[7] The pass-through at horizon *j* is defined as $PT_{t,t+j}=P_{t,t+j}/E_{t,t+j}$, where $P_{t,t+j}$ is the cumulative response of the price level *j* periods after the shock, and $E_{t,t+j}$ is the cumulative response of the nominal exchange rate. For example, if six months after the shock, the nominal exchange rate has depreciated by 3 percent and the price level has increased by 2 percent, the pass-through level would be 66.6 percent.

[8] The results for Brazil, South Africa, and Turkey are similar to those obtained in the studies cited in footnote 4. The VAR included the producer price index (PPI) in the four countries where it is available (the Czech Republic, Mexico, Poland, and South Africa). In the other three countries (Brazil, Israel, and Turkey), the VAR was estimated with the WPI instead.

the (PPI) (or the WPI) and the CPI, even when quantitatively small (e.g., South Africa), are statistically significant at several horizons. Also, in all cases, the pass-through to the PPI (or the WPI) is not much different from the pass-through to the CPI.

Table 1. Exchange Rate Pass-Through in Selected Emerging Markets (1995–2004) 1/

	Level						Speed				
Horizon 2/	**1**	**3**	**6**	**12**	**24**		**1**	**3**	**6**	**12**	**24**
Brazil											
WPI	9.8	26.7	33.7	34.0	26.8	WPI	36.7	99.9	126.1	127.2	100.0
CPI	0.2	5.6	13.1	27.0	32.0	CPI	0.8	17.7	41.0	84.4	100.0
Czech Republic											
PPI	0.3	6.6	8.1	11.1	9.9	PPI	3.2	66.5	81.8	111.5	100.0
CPI	1.5	7.5	12.6	18.9	23.8	CPI	6.2	31.5	52.9	79.2	100.0
Israel											
WPI	9.5	36.3	39.3	51.5	58.5	WPI	16.1	62.0	67.1	88.0	100.0
CPI	21.7	38.8	50.4	64.1	67.2	CPI	32.4	57.7	75.0	95.5	100.0
Mexico											
PPI	8.9	21.6	44.8	50.8	64.4	PPI	13.8	33.6	69.6	78.9	100.0
CPI	3.9	14.9	39.2	47.5	64.0	CPI	6.1	23.3	61.3	74.3	100.0
Poland											
PPI	3.6	10.2	11.0	13.1	13.8	PPI	26.1	73.8	79.5	94.6	100.0
CPI	-0.6	2.9	10.9	18.4	19.2	CPI	-2.9	15.1	56.8	95.7	100.0
South Africa											
PPI	-0.2	6.5	12.7	15.5	13.2	PPI	-1.4	49.4	96.8	117.7	100.0
CPI	-0.3	5.1	7.8	13.4	14.3	CPI	-2.3	35.6	54.2	93.5	100.0
Turkey											
WPI	12.7	36.4	51.0	57.2	61.3	WPI	20.8	59.4	83.2	93.3	100.0
CPI	3.6	20.7	31.6	45.3	54.7	CPI	6.6	37.8	57.7	82.7	100.0

Sources: IFS; national authorities; and IMF staff estimates.
1/ Response of the wholesale price index (WPI), producer price index (PPI), and consumer price index (CPI) to an exchange rate shock.
2/ Number of months after the shock.

8. The differences in the ***speed*** of the pass-through are relatively small across countries. In all cases, most of the build-up of the pass-through to the WPI (at least two-thirds of the total) occurs between three and six months after the exchange-rate shock. In Israel, Poland, and South Africa, virtually all of the pass-through to the CPI (more than 90 percent of the total) is completed after 12 months. In the remaining countries (Brazil, the Czech Republic, Mexico, and Turkey), the pass-through is slightly slower, with about 75 percent to 85 percent completed after twelve months.

9. Mexico and Turkey, two of the countries that displayed high pass-through coefficients, experienced the highest and most volatile inflation rates during the sample period (Table 2). Countries that adopted inflation targeting relatively early in the period (e.g., the Czech Republic, Poland, and South Africa) generally had lower pass-through coefficients. The exception was Israel, which displayed high pass-through coefficients, despite having adopted inflation targeting in the early 1990s and having lowered the level and variability of inflation.

Table 2. Annual CPI Inflation Rate
in Selected Emerging Markets, 1995–2004

	Average	Standard Deviation
Brazil	8.3	4.5
Czech Republic	5.2	3.7
Egypt	5.8	3.8
Israel	4.9	4.3
Mexico	15.4	12.3
Poland	10.4	8.5
South Africa	6.5	3.0
Turkey	60.2	27.7

Source: IFS.

C. Estimating the Exchange Rate Pass-Through in Egypt[9]

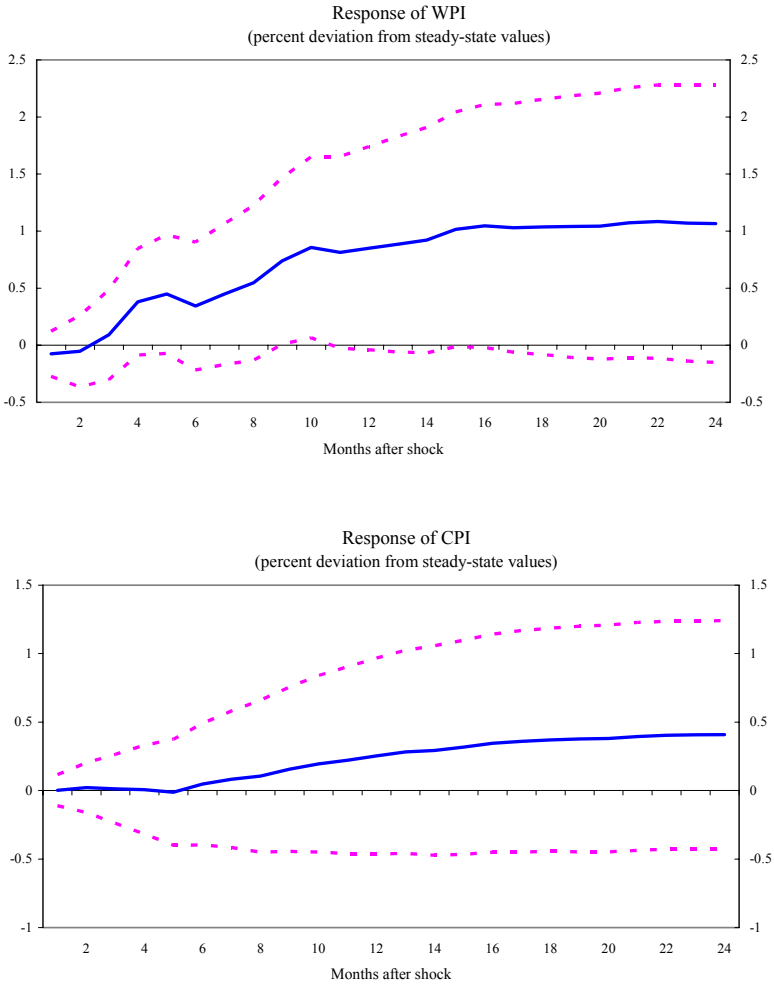
10. Since the period with flexible exchange rates in Egypt is short, the estimation of the VAR includes data from the fixed exchange rate years. Concretely, the estimates were obtained with monthly data for the period 1995–2004. This choice could introduce two potential biases: first, possible changes in the behavior of price setters in response to the change in exchange rate regime may render the estimated regression coefficients unstable; and second, the absence of exchange rate shocks during the first six years of the sample (the fixed exchange rate period) may lower the statistical significance of the estimates.[10]

11. The main results of the estimation are presented in Figure 2, and the top panel of Table 3. The results show significant differences in the responses of Egypt's WPI and CPI to an exchange rate shock. The long-run pass-through to the WPI is about one third, and its response is statistically significant at the 95 percent level at several horizons. However, the response of the CPI to exchange rate shocks is not statistically significant at conventional levels, and the point estimate for the long-run pass-through is very low (11 percent). For both price indices, the pass-through is slow: it took between six and 12 months for exchange rate shocks to affect the WPI, and from 12 to 24 months for those same shocks to have a full impact on the CPI.

[9] The data used in the estimation is described in Appendix I.2. The estimations used the parallel market rate from January 2001 to September 2004 (i.e., the exchange rate series plotted in Figure 1) under the assumption that the parallel market rate was the one that influenced the pricing behavior of retail importers. The results were broadly similar when the estimations were done using the official exchange rate.

[10] The behavior of CPI and WPI inflation during 2003–04 presented an additional complication for the choice of the sample period. Because these series exhibited low and stable values between 1999–2003, and started rising afterwards, a VAR estimated with a starting date in 1999 or 2000 delivered unstable roots. Hence, more observations from the past, when both inflation and the exchange rate were stable, had to be added to make the system stationary.

Figure 2. Egypt: Cumulative Response to a LE/U.S. Dollar Exchange Rate Shock
(+/- 2 Standard Error Bands)



Source: IMF staff estimates.

12. The weak relationship between exchange rate shocks and the CPI found for Egypt is at odds with most of the findings in the pass-through literature, including those reported in Table 1. One feature that may have contributed to this result is the relatively large share of goods with administered prices in Egypt's CPI.[11] In terms of the price chain implied by the VAR (see Appendix I.1), a large share of goods with administered prices would tend to compress the markups along the distribution process and weaken the transmission of exchange-rate shocks, at least temporarily.

[11] Roughly one third to one half of the items in the CPI series that was used until July 2003 is believed to have consisted of goods with administered prices, including food items, utilities, transportation, and rent.

Table 3. Egypt: Estimated Pass-Through Coefficients under Several VAR Specifications 1/
(1995–2004)

	Level						Speed				
Horizon 2/	**1**	**3**	**6**	**12**	**24**		**1**	**3**	**6**	**12**	**24**
LE/USD Rate and Oil Prices 3/											
WPI	-6.8	3.2	7.3	23.6	32.9	WPI	-20.5	9.8	22.1	71.9	100.0
CPI	0.5	-1.2	1.5	6.0	11.1	CPI	4.6	-10.5	13.3	54.0	100.0
NEER and Oil Prices											
WPI	0.0	7.5	15.2	22.7	26.4	WPI	0.1	28.3	57.5	85.9	100.0
CPI	0.7	-1.1	0.0	3.6	6.4	CPI	11.3	-17.6	0.4	56.9	100.0
LE/USD Rate and Nonfuel Commodity Prices											
WPI	-2.9	6.5	16.5	40.3	61.5	WPI	-4.7	10.6	26.9	65.6	100.0
CPI	0.7	1.5	2.6	12.7	27.5	CPI	2.6	5.4	9.6	46.3	100.0
NEER and Nonfuel Commodity Prices											
WPI	0.7	7.9	17.3	26.6	30.4	WPI	2.2	26.1	56.7	87.4	100.0
CPI	0.0	-2.7	-1.8	4.1	8.5	CPI	-0.5	-32.1	-21.0	48.6	100.0
LE/USD Rate and All Commodity Prices											
WPI	-7.2	5.3	12.6	29.6	46.1	WPI	-15.7	11.5	27.3	64.3	100.0
CPI	0.5	-1.6	-0.1	5.1	13.6	CPI	3.5	-12.0	-1.0	37.6	100.0
NEER and All Commodity Prices											
WPI	0.7	8.0	16.2	24.6	28.9	WPI	2.3	27.6	56.0	85.3	100.0
CPI	0.8	-1.3	-0.4	3.8	7.1	CPI	11.0	-19.0	-5.1	53.3	100.0

Sources: IMF's Information Notice System; and IMF staff estimates.
1/ Response of the wholesale price index (WPI) and the consumer price index (CPI) to an exchange rate shock.
2/ Number of months after the shock.
3/ Baseline specification.

13. The basic results for Egypt were not altered when the estimations were conducted using alternative measures of the exchange rate (the nominal effective exchange rate instead of the bilateral L.E./U.S. dollar exchange rate), and of supply shocks (commodity prices instead of oil prices)—see Table 3.[12] In all cases, the cumulative response of the WPI remained significant at several horizons after the shock, while the responses of the CPI were not statistically significant from zero.[13]

D. A "Counterfactual" CPI

14. The large difference in the level and the speed of the pass-through coefficients between the WPI and the CPI is one salient result obtained in the Egypt case. This result corroborates the *prima facie* evidence presented in Figure 1: from 2001–03, the nominal exchange rate displayed large volatility, but CPI inflation was remarkably low and stable. In

[12] The two series of commodity prices used in those estimations were obtained from the IMF Research Department.

[13] Additional robustness checks (not reported in Table 3) included: starting the sample period in 1997, introducing M2 in domestic currency (M2D) in the system, or changing the ordering of the variables. The results did not change significantly with any of these changes.

fact, the sample mean for the 12-month CPI inflation in Egypt during that period was 3.1 percent, and the standard deviation was 1.2 percent. These statistics are much lower than those observed in Egypt and other emerging markets during the whole sample period (see Table 2).

15. One factor that may account for this result is the highly persistent compression of margins that would result from a large share of administered prices in the price index. As noted earlier, this would tend to weaken the "price chain" model in its final stage (from the WPI to the CPI). To explore this possibility, three different "counterfactual" CPI indices were constructed for the years 2001–04, using the economic relationships derived from the VAR estimates. The first counterfactual consisted of an "unconditional" forecast of all five variables in the VAR model, with estimates obtained using data from January 1995 to December 2000. Since this model had difficulty forecasting the large depreciations of 2002–03, the second model used the actual values of the parallel market exchange rate and the estimated parameters from the VAR to produce the CPI counterfactual. The third counterfactual was produced using the estimated VAR parameters and the actual values of all the other variables in the system.

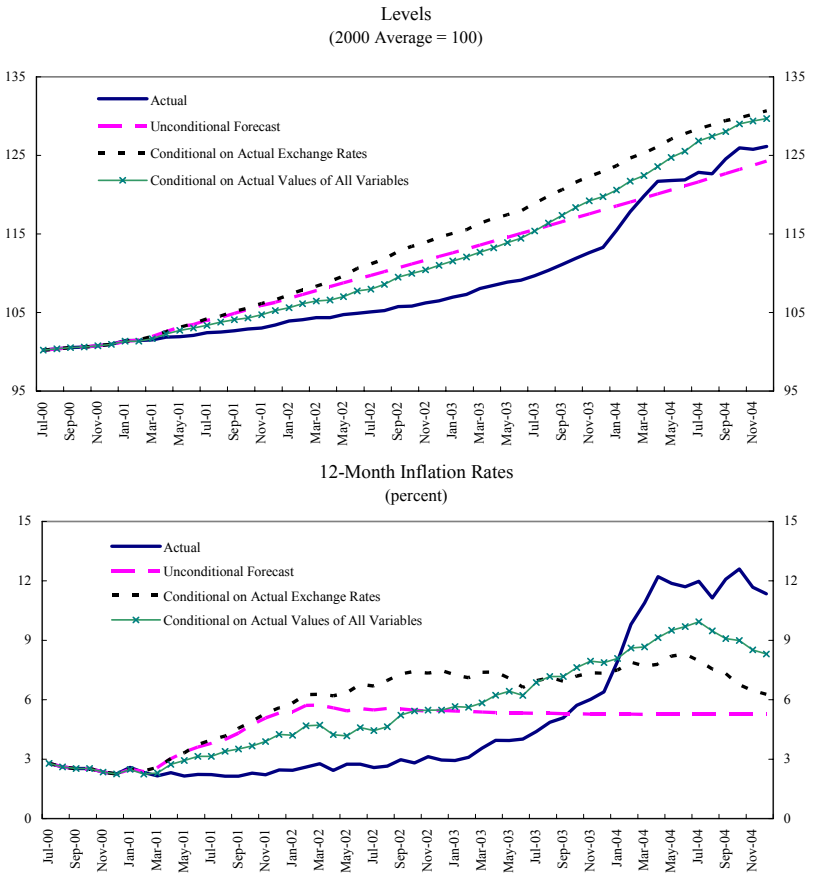
16. The unconditional forecast produced a CPI inflation rate that is 2 to 3 percentage points higher than the one recorded during 2001–03 (Figure 3). However, this model cannot replicate the sharp increase in the inflation rate that followed the release of the new CPI. This forecast converges with the actual CPI by end-2004.

17. The forecast conditional on the actual path of the nominal exchange rate differed from the unconditional forecast only after mid-2002. During 2002–03, the CPI inflation forecasts obtained with this model were 1–1½ percentage points above those obtained with the unconditional forecast, and more than 4 percentage points higher than the actual CPI inflation rate. By end-2004, this conditional forecast was about 5 percentage points above both the actual CPI figure and the unconditional forecast.

18. Compared to the first two counterfactuals, the third CPI forecast predicted a lower inflation rate during 2001–02, and a higher rate during 2003–04. This is most likely due to the influence of the lagged values of the actual WPI that were used to produce the forecasts. This third counterfactual CPI would have been about 4 percentage points higher than the actual CPI by end-2004.

19. All considered, the results from this exercise are broadly supportive of the hypothesis that Egypt's CPI underestimated the underlying level of, and changes in, the CPI during 2001–03. The forecasts obtained with the three models suggest that, in the initial stages of the transition to a flexible exchange rate, the dynamic relationships embedded in a VAR estimated with data for the 1995–2000 period were not operating fully. The new CPI index released in 2004, as well as price adjustments in some administered items, have helped to partially offset this compression of markups.

Figure 3. Egypt: Counterfactual CPI Based on VAR Model
July 2000–December 2004



Source: IMF staff estimates.

E. Conclusions

20. This paper has examined the pass-through of exchange rate fluctuations on wholesale and consumer prices in Egypt from 1995 to 2004. The pass-through of changes in the exchange rate to the WPI, and especially the CPI, was small and slow. The results based on a VAR model that identifies exchange rate shocks and their effects along the distribution process suggest that the pass-through to the WPI was in a range from 30 percent to 60 percent. The pass-through to the CPI was much lower, and was not statistically significant.

21. The large differences in the reaction of the WPI and the CPI point to structural problems with the CPI, which may have resulted in a temporary compression of price markups. Forecasts of the CPI produced in a counterfactual exercise suggest that CPI inflation in Egypt might have been higher in the 2001–03 period, if the dynamic relationships that existed in earlier periods had been maintained.

THE VAR MODEL

The methodology employed in the chapter was first proposed by McCarthy (1999) and is based on a vector autoregressive (VAR) model that incorporates a recursive distribution chain of pricing. A five-variable VAR, that includes the price of oil in domestic currency (p_t^{oil}), output (y_t), the nominal exchange rate (e_t), the wholesale price index (wpi_t), or, if available, the producer price index (ppi_t) and the consumer price index (cpi_t) is estimated. All variables are introduced in logs and first differences to render them stationary. Formally, the system is:

$$\begin{bmatrix} \Delta p_t^{oil} \\ \Delta y_t \\ \Delta e_t \\ \Delta wpi_t \\ \Delta cpi_t \end{bmatrix} = E_{t-1} \begin{bmatrix} \Delta p_t^{oil} \\ \Delta y_t \\ \Delta e_t \\ \Delta wpi_t \\ \Delta cpi_t \end{bmatrix} + \begin{bmatrix} \varepsilon_t^s \\ \alpha_1 \varepsilon_t^s + \varepsilon_t^d \\ \beta_1 \varepsilon_t^s + \beta_2 \varepsilon_t^d + \varepsilon_t^{er} \\ \gamma_1 \varepsilon_t^s + \gamma_2 \varepsilon_t^d + \gamma_3 \varepsilon_t^{er} + \varepsilon_t^{wpi} \\ \delta_1 \varepsilon_t^s + \delta_2 \varepsilon_t^d + \delta_3 \varepsilon_t^{er} + \delta_4 \varepsilon_t^{wpi} + \varepsilon_t^{cpi} \end{bmatrix}$$

The rationale for this model is that oil shocks identify supply shocks, while output identifies demand shocks. The inclusion of output also measures the cyclical position of the economy. The exchange rate is therefore allowed to respond to supply and demand shocks, and to its own shock. Wholesale prices respond to these shocks, and to their own shock. The CPI responds to all the shocks of the system. The ordering of the variables denotes the "price chain" structure of the model, as it seeks to identify the effects of exchange rate innovations at each stage of the distribution process. The shocks are identified (orthogonalized) using the Cholesky decomposition of the variance-covariance matrix of the reduced form residuals.

In all cases, the sample covers the period 1995–2004, and uses monthly data. In all cases, six lags of each variable are introduced in the VAR. Due to data limitations, the starting date for Poland is November 1996; the starting date for Brazil is January 1996 in order to exclude observations from that country's last hyperinflationary period.

VARIABLES AND DATA SOURCES

The data series used for the estimation of the VAR for Egypt were:

- Price of oil in domestic currency: the Suez Canal blend price (in U.S. dollars per barrel) converted to Egyptian pounds using the nominal exchange rate.
- Monthly real output: monthly electricity consumption by industry. Source: CBE.[14]
- Exchange rate: the official (banking) nominal exchange rate with the U.S. dollar, except in the period January 2001–September 2004, when the official exchange rate was replaced with the parallel market exchange rate. Source: CBE.
- Wholesale and the consumer price indices. Source: CAPMAS.

In the VAR estimation, all variables are introduced in logs and first differences after running the appropriate unit root tests. The monthly electricity series exhibits a strong seasonal pattern, and was therefore seasonally adjusted using the X–11 method. Six lags of the endogenous variables are used. While the Akaike and Schwartz criteria suggest two lags, the likelihood ratio test suggest twelve. An intermediate choice of six lags is made, in order to allow for enough endogenous transmission of the shocks in the system and obtain white noise residuals.

[14] This proxy is often used in empirical work for Egypt; see, for example, Hassan (2004).

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II. SOURCES OF GROWTH: 1960–2004[15]

22. This chapter analyzes Egypt's growth record from 1960 to 2004. In particular, it tries to ascertain empirically: (i) the contributions of factor accumulation and total factor productivity (TFP) to growth in output per worker; and (ii) the relative importance of the permanent and cyclical components of growth. Growth accounting exercises are useful for comparing the relative importance of capital accumulation (physical and human) and TFP in a country's growth process. Trend-cycle decompositions are useful complements of growth accounting exercises as they help to understand growth spells and slowdowns, and assess short-term growth prospects.

A. Egypt's Growth Record: An Overview

23. Economic growth in Egypt slowed from an average rate of 6 percent per year during the period 1961–1980, to 4.8 percent per year during the 1980s and 1990s (Table 1). From 2001 to 2004, growth decelerated further to an average annual rate of 3.5 percent.

Table 1. Egypt: Real GDP Growth
(In percent, annual average)

Years	Growth in Real GDP	
	Total	Per worker
1961–2004	5.2	2.5
1961–1980	6.0	3.4
1981–2000	4.8	1.8
1961–1970	5.4	2.3
1971–1980	6.6	4.5
1981–1990	5.6	1.3
1991–2000	3.9	2.3
2001–2004	3.5	1.3

Sources: Ministry of Planning; CAPMAS; and World Development Indicators (WDI).

24. From a regional perspective, Egypt has experienced relatively high rates of growth in GDP per capita since the 1960s (Table 2). This rapid growth notwithstanding, income per capita in Egypt remains below that of other non-oil producing countries in the Middle East and North Africa (MENA) region, though the differences have narrowed considerably in recent years.[16]

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[15] Prepared by Anna Ivanova. The author would like to thank staff from the Ministry of Planning and from the Central Agency for Public Mobilization and Statistics (CAPMAS) for their assistance with the data used in this chapter.

[16] Data reported in the Penn World Tables and the WDI suggest that, measured in PPP terms, Egypt's real GDP per capita caught up with the average level of other non-oil producers in the MENA region during the 1990s.

Table 2. Real GDP, Growth, and Investment in Non-Oil MENA Countries 1/

Years	Real GDP per capita (percent change)		Real GDP per capita (constant 1995 U.S. dollars)		Investment ratio 2/ (percent)	
	Egypt	Non-oil MENA 3/ 4/	Egypt	Non-oil MENA 3/ 4/	Egypt	Non-oil MENA 3/ 4/
1961–1970	3.0	3.0	431	693	14.7	14.9
1971–1980	4.3	2.3	574	869	19.6	17.1
1981–1990	3.0	2.6	872	1072	27.8	19.0
1991–2000	1.8	1.5	1067	1314	19.9	20.3
2001–2002	1.3	0.3	1243	1369	17.9	17.3

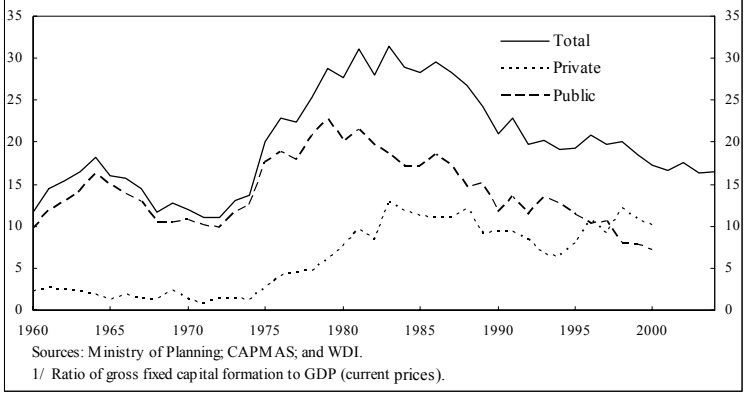
Source: Ministry of Planning; CAPMAS; and WDI.

1/ Egypt, Jordan, Lebanon, Morocco, Pakistan, Syria, Tunisia, and Turkey.
2/ Defined as the ratio of gross fixed capital formation to GDP (current prices).
3/ Population-weighted average for Jordan, Lebanon, Morocco, Pakistan, Syria, Tunisia, and Turkey.
4/ Data for some years was missing for Jordan and Lebanon.

25. Growth in output per worker in Egypt over the last four decades has exhibited a strong cyclical pattern. Except for the 1970s, the average annual rate of growth in output per worker has alternated between 1.3 percent and 2.3 percent per year (Table 1). The high and uneven growth in employment during this period accounts for the differences between this cyclical pattern and the secular decline in total output growth observed since the 1970s.[17]

26. The behavior of the investment-to-GDP ratio since 1960 shows some similarities with the pattern of output per worker (Figure 1). Egypt experienced an investment boom from the mid-1970s to the mid-1980s, with investment ratios nearing 30 percent of GDP. Those levels, and fluctuations, in total investment are atypical among non-oil MENA countries (Table 2). The surge in investment in the mid-1970s may have contributed to the significant increase in growth of output per worker during that decade; however, the investment ratio remained relatively high during the 1980s, when output per worker experienced a sharp drop. The analyses in the following two sections will help reconcile these two stylized facts of Egypt's growth record.

Figure 1. Egypt: Investment Ratio, 1960–2004 1/
(In percent of GDP)



Sources: Ministry of Planning; CAPMAS; and WDI.
1/ Ratio of gross fixed capital formation to GDP (current prices).

[17] The rapid growth in employment and labor force during the 1980s mirrored the demographic boom of the 1960s and 1970s, which continued through the 1980s, with population growing on average at 2.3 percent per annum. More recently, population growth has stabilized at about 2 percent per annum.

B. Growth Decomposition

27. A regression-based procedure was used to estimate the contribution of capital per worker and total factor productivity to the long-term behavior of output per worker.[18] The estimated coefficients were utilized in the standard growth accounting equation (where lower case letters denote logarithms): $\Delta y_t = \Delta a_t + \alpha \Delta k_t + (1-\alpha)\Delta h_t$ to calculate the annual contributions of physical (*K/L*) and human (*H*) capital per worker, and of total factor productivity *(A)*, to the observed growth in output per worker (*Y/L*). Table 3 summarizes the results from the exercise.

Table 3. Egypt: Sources of Economic Growth, 1961–2004

	Output per Worker (percent change)	Contribution of:			Investment Ratio 2/ (percent)	ICOR 3/
		Physical Capital	Human Capital 1/	TFP		
1961–2004	2.5	1.0	0.6	0.9	20.2	2.9
1961–1980	3.4	1.2	0.4	1.7	17.2	3.0
1981–2000	1.8	0.9	0.9	0.1	23.8	3.0
1961–1970	2.3	0.9	0.2	1.1	14.7	3.4
1971–1980	4.5	1.6	0.6	2.3	19.6	2.6
1981–1990	1.3	1.3	1.0	-0.9	27.8	3.7
1991–2000	2.3	0.5	0.7	1.1	19.9	2.4
2001–2004	1.3	0.2	0.5	0.7	17.5	1.9

Sources: Ministry of Planning; CAPMAS; WDI; and IMF staff estimates.

1/ Human capital is calculated as the return on education (see Appendix II.1 for details).
2/ Defined as the ratio of gross fixed capital formation to GDP (current prices).
3/ Calculated as the ratio between the increase in the real capital stock and the change in real GDP.

28. The exercise shows that both physical capital accumulation and TFP growth were important determinants of growth in output per worker in Egypt from 1960 to 2004, but their relative importance changed over time. During the period of high growth (the 1960s and 1970s), TFP and physical capital accumulation contributed almost equally to growth in output per worker. However, during the 1980s, TFP growth collapsed and physical capital

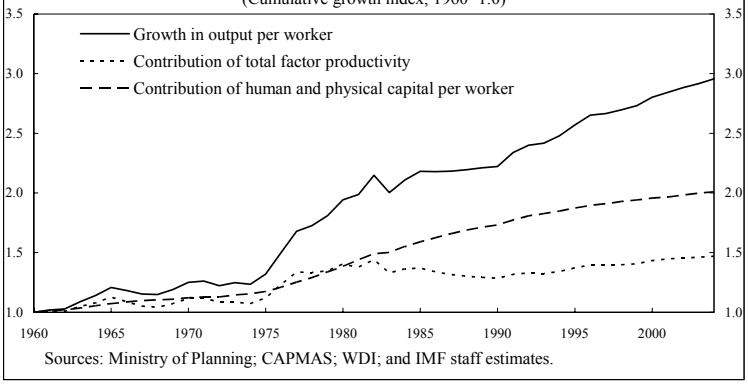
[18] A Vector Error Correction Model (VECM) was used to estimate a production function of the form $y_{HLt} = a_t + \alpha k_{HLt}$, where $y_{HLt} = \ln\left(Y_t / H_t L_t\right)$ is the logarithm of output per workforce adjusted for human capital quality; $k_{HLt} = \ln\left(K_t / H_t L_t\right)$ is the logarithm of capital per workforce adjusted for human capital quality; and a_t (the logarithm of TFP) was assumed to follow: $a_t = a_0 + at + \varepsilon_t$. The estimated coefficient of α (the capital share) was 0.25, and the estimated coefficient on the time trend (*a)* was 0.01. See Appendix II.1 for details.

accumulation (supported by strong growth in human capital) became the main engine of economic growth. The efficiency of investment fell, and growth in output per worker experienced a large decline.

29. The relative contributions of TFP and physical capital per worker changed during the 1990s. TFP growth recovered, but physical capital accumulation slowed down sharply. This trend continued after 2000: the contribution of physical capital to growth in output per worker fell to 0.2 percent per year and the investment to GDP ratio declined to 17.5 percent—far below its long-term average. With TFP growth and human capital accumulation also slowing, output per worker grew on average by only 1.3 percent annually during 2001–04. However, the overall efficiency of investment improved.

30. The results in Table 3 are broadly in line with earlier findings in the growth literature. For example, in a recent study of worldwide growth, Bosworth and Collins (2003) found that both TFP growth and physical capital accumulation were important for explaining growth in output per worker from 1960 to 2000.[19] One of their findings for the MENA region was the occurrence of a sharp decline in TFP growth in the mid-1970s. As Figure 2 shows, the growth accounting exercise undertaken here also finds evidence of a slowdown in TFP growth in Egypt, although it appears to be less severe than the one found by Bosworth and Collins (2003) for the whole MENA region, and to have occurred slightly later. The results in Table 3 are also broadly consistent with the evidence for Egypt reported in the growth chapter of the September 2003 *World Economic Outlook* (IMF, 2003) for the period 1980–2000.

Figure 2. Egypt: Sources of Growth, 1960–2004
(Cumulative growth index; 1960=1.0)



Sources: Ministry of Planning; CAPMAS; WDI; and IMF staff estimates.

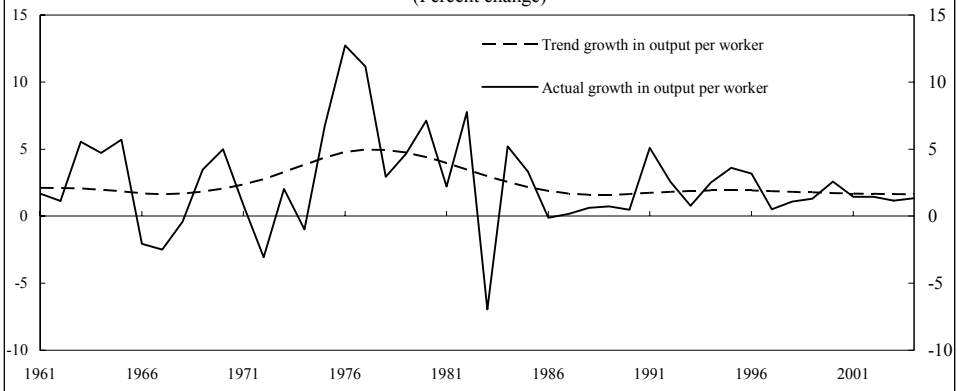
[19] The study covered 84 countries, representing 95 percent of the world's GDP and 85 percent of the world's population. Egypt was one of the countries in the sample.

C. Growth in Output per Worker: Trend Versus Cycle

31. To ascertain whether the slowdown in the growth of output per worker observed since 2000 reflects mostly cyclical or secular forces, a trend-cycle decomposition of the variables used in the growth accounting exercise was performed.[20]

32. Figure 3 plots the ***actual growth*** and the ***estimated trend growth*** in output per worker (Y/L) in Egypt from 1960 to 2004. The figure shows that trend growth increased significantly in the 1970s, declined steadily during the 1980s, returned in the early 1990s to the rates prevailing in the 1960s, and experienced a slight decline after 2000.

Figure 3. Egypt: Actual and Trend Growth in Real GDP per Worker, 1961–2004
(Percent change)



Sources: Ministry of Planning; CAPMAS; WDI; and IMF staff estimates.

33. The trend-cycle decomposition shows that fluctuations in the growth of output per worker around its trend from 1960 to the mid-1980s were very large, and fairly long. Importantly, the decomposition shows clearly that the slowdown in the growth of output per worker observed since the 1980s is explained by both secular and cyclical components.

34. An examination of the trend and cyclical components of two of the three growth determinants (physical capital per worker and TFP) suggest that a similar confluence of factors have been at play in recent years. Concretely, the analysis shows that the slowdown in growth of output per worker observed since 2000 is partly due to the decline in trend growth of physical capital per worker that started in the 1980s, and partly due to a negative cyclical deviation in TFP growth.

[20] The results reported are those obtained from applying the Hodrick-Prescott filter. The main results were not affected when a band-pass filter was used or when the trend in output per worker was calculated as the fitted values from the VECM.

35. The above finding suggests that arresting and reversing the downward trend in physical capital accumulation would be necessary to increase growth in output per worker in the years ahead. Gains in productivity also would be needed to return TFP growth to its trend. In fact, the parameters from the growth-accounting exercise suggest that, in order to raise growth in output per worker to 1.8 percent per annum (its growth rate during 1981–2000) for the next six years, TFP would need to increase slightly from its current levels, and investment in real terms would have to grow at an average annual rate of 4.5 percent—almost twice the average rate of growth of real investment during the last 24 years.[21]

D. Conclusions

36. The main results from this chapter can be summarized as follows:

- Physical capital accumulation and growth in TFP were both important contributors to growth in output per worker in Egypt from 1961–2004, but the relative importance of the two factors changed over time.

- Trend growth in output per worker has been declining since the early 1980s, and is currently below the rate observed in the 1960s.

- The boom in output per worker during the 1970s was driven by an increase in trend growth of physical capital per worker and trend TFP growth.

- The current slowdown in growth of output per worker is due to the confluence of a decline in trend growth of physical capital per worker, and a negative cyclical deviation in TFP growth. To raise the growth of output per worker in the coming years, the current downward trend in physical capital accumulation would need to be reversed, and/or productivity would need to improve significantly.

[21] Similarly, in order for overall output growth to rise to 4.8 percent per year (the average growth from 1981–2000) on a sustained basis, real gross fixed investment would need to increase by 12.4 percent annually.

MODEL ESTIMATION AND DATA SOURCES

A. Estimation Results

The Vector Error Correction Model (VECM), estimated with annual data for the period 1960–2004, assumes that the short-term dynamics of output and capital per workforce adjusted for human capital quality is governed by contemporaneous stochastic shocks, ε_{yt} and ε_{kt}, and by the previous period's deviation from long-run equilibrium. The estimated equations were:[22]

$$\Delta y_{HLt} = \alpha_y (y_{HLt-1} - \alpha k_{HLt-1} - at - a_0) + \varepsilon_{yt}$$

$$\Delta k_{HLt} = \alpha_k (y_{HLt-1} - \alpha k_{HLt-1} - at - a_0) + \varepsilon_{kt}$$

where α_y and α_k are the speed of adjustment coefficients.

The long-run (cointegrating) relationship, i.e., the long run production function, is: $y_{HLt} = a_t + \alpha k_{HLt}$,where a_t, the logarithm of TFP, was assumed to follow: $a_t = a_0 + at + \varepsilon_t$. The results of the VECM estimation are summarized in the table below:

VECM Estimates

Equation/Variable	Coefficient 1/	Standard error
Cointegrating equation (CE)		
Capital share (α)	**0.25**	0.063
Time trend in ln(TFP) (a)	**0.01**	0.002
Growth in output per worker--equation (Δy_{HLt})		
CE (lag) (α_y)	-0.02	0.087
R-squared	0.18	
Growth in capital per worker--equation (Δk_{HLt})		
CE (lag) (α_k)	**0.31**	0.071
R-squared	0.62	
Number of observations	44	

1/ The coefficients in bold were significant at the 95 percent level.

[22] The number of lags included in the VECM was chosen based on two information criteria: Schwartz Bayesian and Hannan and Quinn. One lag was chosen for the underlying VAR in levels, which implied that no lags had to be included in the estimation in first differences.

B. Variables and Data Sources

Y_t: GDP at constant 1992 prices. Sources: Ministry of Planning and World Development Indicators.

K_t: capital stock at constant 1992 prices. Constructed as the previous period capital stock, adjusted by a 5 percent depreciation rate, plus gross fixed capital formation. The initial (1959) estimate of the capital stock was obtained from Nehru and Dhareshwar (1993). Gross fixed capital formation at current prices was obtained from the Minister of Planning. The investment deflator was assumed to be the same as the GDP deflator.

H_t: human capital per worker. Measured as the return on education; namely, $H_t = (1+r)^{N_t}$, where *r* is the return on each year of schooling (assumed, as in Bosworth and Collins (2003), to be equal to 7 percent), and N_t is the average number of years of schooling per person in year *t* calculated as the average of the years of schooling in the datasets from Barro and Lee (2000), and Cohen and Soto (2001).

L_t: employment. Source: CAPMAS, except for the years 1963–1968, 1976, and 1985–1989, for which the observations were obtained by linear interpolation.

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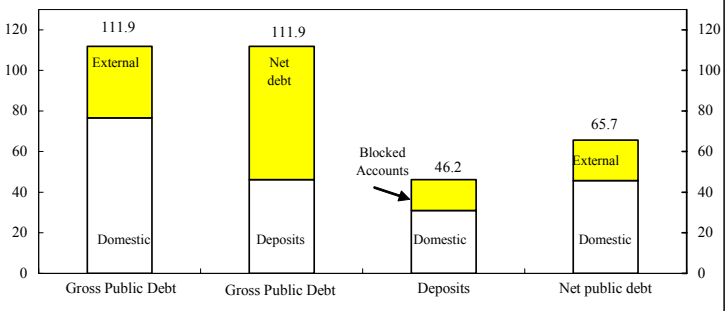
III. PUBLIC DEBT[23]

37. This chapter describes the main features of Egypt's public debt. The first section reviews the evolution of gross and net public debt since the early 1990s, and compares Egypt's debt level and structure to those in other emerging market countries (EMCs). The second and third sections describe the main features of Egypt's external and domestic public debt, including its composition and structure.

A. Gross and Net Public Debt

38. Gross public debt in Egypt is defined as the sum of domestic and external debt of the consolidated general government.[24] This definition includes government guaranteed external debt, but excludes the contingent pension liabilities of the social insurance funds (SIFs) and the outstanding stock of arrears. Net public debt is calculated by subtracting government deposits in the banking system from the stock of gross debt. These deposits include: (i) resources to service the debt rescheduled under the 1991 Paris Club agreement (foreign currency-denominated deposits held in "blocked accounts" at the Central Bank of Egypt (CBE) until the repayment falls due); and (ii) large cash surpluses by revenue-generating government agencies held at commercial banks and the CBE—mostly denominated in local currency. Net external debt is defined as gross external debt minus the blocked accounts, while net domestic debt is equal to gross domestic debt minus government deposits (Figure 1 and Table 1).

Figure 1. Composition of Public Debt—June 2004
(In percent of GDP)



Source: Ministry of Finance; Central Bank of Egypt; and IMF staff estimates.

[23] Prepared by Maria Teresa Guin-Siu.

[24] Egypt's general government comprises the budget sector (central and local government agencies as well as decentralized entities at central and local levels), the General Authority for the Supply of Commodities (GASC), the National Investment Bank (NIB), and the Social Insurance Funds (SIFs).

Table 1. Egypt: Gross and Net Public Debt
(Stocks as of end-June, in percent of GDP)

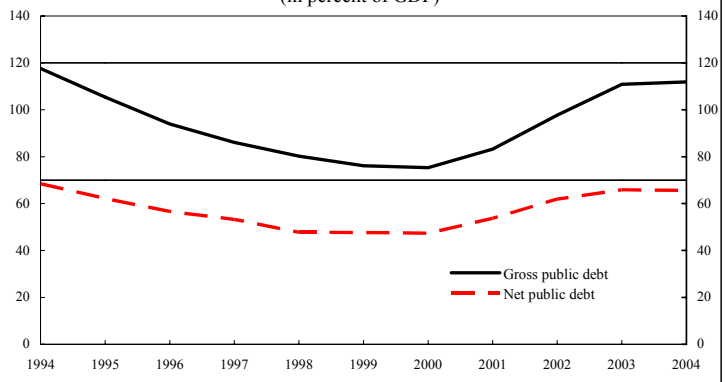
	1994	2000	2004
Gross public debt 1/	117.6	75.4	111.9
Domestic	58.3	48.9	76.6
External	59.3	26.5	35.2
Deposits	49.1	28.0	46.2
Domestic	26.3	17.0	31.0
External (blocked accounts)	22.8	11.0	15.2
Net public debt 2/	68.5	47.4	65.7
Domestic	32.0	31.9	45.7
External	36.5	15.5	20.0
Memorandum items:			
Nominal GDP (in millions of LE)	175,600	340,100	474,400
Share of external debt in gross public debt	50.5	35.2	31.5
Government securities (percent of GDP) 3/	57.0	38.6	75.3

Sources: Ministry of Finance; CBE; and IMF staff estimates.

1/ Refers to debt of the general government: budget sector, the GASC, the NIB, and SIFs. Includes government guaranteed external debt, but excludes the contingent pension liabilities of the SIFs.
2/ Net of government deposits with banks. Deposits include the blocked accounts on rescheduled Paris Club debt held at the CBE.
3/ Securities issued by the Ministry of Finance, long term saving deposits, and certificates issued by the NIB and postal offices.

39. After declining during the 1990s, Egypt's public debt started increasing in 2000. At end-June 2004, the outstanding stock of gross and net public debt amounted to 112 percent and 66 percent of GDP, respectively, close to the levels recorded in 1994 (Figure 2).[25]

Figure 2. Public Debt, 1994–2004
(in percent of GDP)

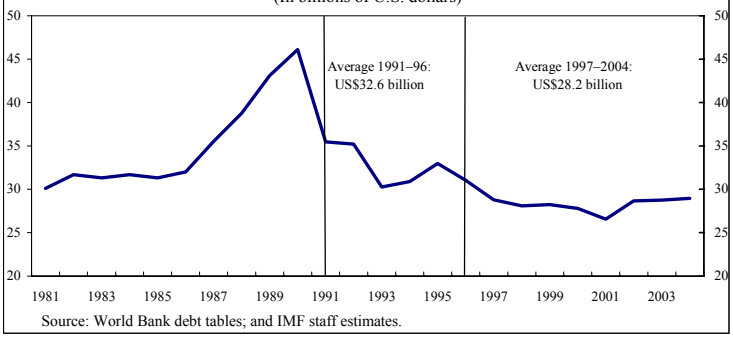


Sources: Ministry of Finance; Central Bank of Egypt; and IMF staff estimates.

[25] Comparable data on domestic public debt exists only since 1994.

40. Higher domestic borrowing and valuation changes on external debt account for the increase in Egypt's public debt ratio since 2000. Egypt's external public debt has remained broadly stable in U.S. dollar terms since 1991 (Figure 3); as a share of total public indebtedness, external debt has fallen steadily.

Figure 3. Egypt: Total External Debt, 1981–2004
(In billions of U.S. dollars)



Source: World Bank debt tables; and IMF staff estimates.

41. Compared to a sample of emerging market countries (EMCs), Egypt's recent gross public debt levels appear high.[26] Table 2 shows that the gross public debt-to-GDP ratio in Egypt has been consistently above the average and median for EMCs for the last 15 years,

Table 2. Public Debt in Selected Emerging Market Countries
(In percent of GDP)

	Averages			Increase (+) / Decrease (-) in debt ratios	
	1990-1994	1995-1999	2000-2004		
	(1)	(2)	(3)	(2)-(1)	(3)-(2)
Egypt: Gross public debt	117.6	88.4	95.8	-29.3	7.4
Net public debt	68.5	53.5	58.9	-15.0	5.4
EMCs, excluding Egypt 1/	69.3	59.6	64.6	-9.7	5.0
Latin America (11) 2/	51.3	44.8	58.1	-6.5	13.3
Transition economies (6) 3/	102.7	56.1	45.8	-46.6	-10.3
Asia (7) 4/	45.3	45.6	61.7	0.3	16.0
Africa (3) 5/	116.1	95.3	72.0	-20.8	-23.3
Europe and Middle East (6) 6/	84.2	88.1	94.8	3.9	6.7
Median	64.5	54.2	57.8	-10.3	3.6

Source: World Economic Outlook (September 2003); and IMF staff estimates.

1/ Includes 33 countries listed in footnotes 2-6; groups are unweighted averages; the number of countries in parentheses.
2/ Includes Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, Uruguay and Venezuela.
3/ Includes Bulgaria, Croatia, Hungary, Russia, Ukraine and Poland.
4/ Includes China, India, Indonesia, Korea, Malaysia, Philippines and Thailand.
5/ Includes Cote d'Ivoire, Nigeria and South Africa.
6/ Includes Israel, Jordan, Lebanon, Morocco, Pakistan and Turkey.

[26] Data limitations and differences in coverage create difficulties for in-depth comparisons of public debt ratios across EMCs. All comparisons should therefore be regarded as illustrative. For example, Egypt compares more favorably with the rest of the EMCs in terms of net public indebtedness. However, the majority of EMCs calculate and report public debt in gross terms, hence cross-country comparisons should be made on that basis.

although it has been close to the ratios recorded in other countries in Europe and the Middle East. In terms of five-year trends, the differences between the EMCs average and Egypt's public debt ratio appear smaller: both experienced a decline in the mid-1990s followed by a rise after 2000.

42. The composition and structure of Egypt's public debt, however, differs from those of typical EMCs. Egypt has a smaller share of foreign currency-denominated debt in total debt, and a significantly larger ratio of domestic government bonds to GDP than the average for EMCs. In addition, Egypt's borrowings from international capital markets are almost nil, and issues mostly nominal (non-indexed) domestic debt with relatively long maturities (Tables 3 and 4).

Table 3: Structure of Government Debt in Emerging Market Countries 1/
(In percent of total debt, unless indicated otherwise)

	Foreign Currency Debt 2/	Long -Term Domestic Currency Debt 3/	Government Debt to GDP (percent)
Emerging Market Countries	48.0	21.5	57.3
Latin America (5) 4/	60.9	2.1	18.8
Asia (7) 5/	32.7	22.7	50.7
Other countries (7) 6/	54.1	30.2	71.1
Of which: Egypt	35.0	52.0	112.0

Sources: IMF (2004), Reinhart et. al (2003); J.P. Morgan (2003); GFS; and IMF staff estimates.

1/ All data are for the central government, except the share of foreign currency debt, which is for the general government. Egypt data is for the general government. Number of countries are in parentheses.
2/ Sovereign debt contracted or denominated in foreign currency.
3/ Long term is all debt with initial maturity longer than one year.
4/ Average of 2001 data for Argentina, Brazil, Chile, Mexico, and Venezuela.
5/ Average of 2001 data for China, India, Indonesia, Korea, Malaysia, the Philippines, and Thailand.
6/ Average of 2001 data for Hungary, Israel, Poland, Russia, South Africa and Turkey; 2004 data for Egypt.

Table 4. Features of Domestically-Issued Government Bonds 1/
(In percent of total domestic debt, unless indicated otherwise)

	Domestic Government Bonds/GDP (percent)	Domestic-Currency-Denominated Bonds				Foreign Currency-Denominated Bonds
		Not indexed		Indexed to:		
		Long Term 2/	Short Term 2/	Domestic Interest Rate	Inflation	
Emerging market countries 2/	31.6	43.7	18.9	24.8	6.7	6.3
Latin America (4) 3/	24.0	5.6	13.7	50.8	16.6	13.4
Asia (5) 4/	26.6	52.4	16.5	22.2	7.8	1.1
Other countries (7) 5/	39.6	59.3	23.6	11.7	0.3	5.9
of which : Egypt 6/	75.3	76.0	24.0	0.0	0.0	6.0

Sources: IMF (2004), and IMF staff estimates.

1/ Short term is defined as an initial maturity of less than one year; all other maturities are considered long term.
2/ Refers to the 16 countries in footnotes 3 to 5; averages are unweighted; number of countries are in parentheses.
3/ Average of 2001 data for Brazil, Chile, Mexico, and Venezuela.
4/ Average of 2001 data for India, Indonesia, Malaysia, the Philippines, and Thailand.
5/ Average of 2001 data for the Czech Republic, Egypt, Hungary, Poland, Slovak Republic, South Africa, and Turkey.
6/ Stocks as of June 2004.

B. External Public Debt

43. As noted, Egypt's external debt (in U.S. dollars) has remained relatively stable since the debt rescheduling of the early 1990s, largely reflecting a prudent approach to foreign borrowing by the government. With the exception of a $1.5 billion sovereign bond issued in June 2002 (the Eurobond), new public foreign borrowing has largely been matched by amortization payments. The rise in the external debt-to-GDP ratio recorded during 2002–2003 was entirely a result of valuation changes related to the large depreciation in the Egyptian pound.

44. Egypt's external public debt is mostly owed to official creditors and has long-term maturities. The composition of this debt has remained remarkably stable for the last decade (Table 5).

Table 5. Egypt. External Public Debt Composition
(Stocks as of end-June, in percent of total)

	1994	2000	2004
Gross foreign debt	100.0	100.0	100.0
Medium and long-term public and publicly guaranteed debt	96.3	90.0	92.6
Suppliers' and buyers' credits	6.9	3.4	3.7
Multilateral loans	11.4	16.2	16.4
Bilateral loans	78.0	70.4	70.4
Sovereign bonds	0.0	0.0	2.1
Short-term debt	3.6	8.3	6.8
Private sector debt	0.1	1.7	0.6

Sources: Central Bank of Egypt; and IMF staff estimates.

C. Domestic Public Debt

45. The increase in Egypt's domestic public debt since 2000 has been mostly in the form of government securities. Bank loans to the government have fallen steadily and are now very small. Net bank credit to the government has been negative since February 2001.

46. The bulk of Egypt's government securities are denominated in local currency, carry fixed interest rates, and have long-term maturities. As of June 2004, roughly half of the total stock of government securities was held by the CBE, mostly in the form of nontradable paper. Of the rest, 20 percent was held by state-owned banks; and the remaining 30 percent was held directly by households in the form of 10-year, nontradable savings certificates issued by the NIB and the postal offices. Less than 25 percent of the stock of government securities is fully tradable, with another half having only limited tradability—i.e., they are only tradable among financial institutions (Figure 4).

47. Most domestic securities are issued by the Ministry of Finance (MoF). Other than to finance recurrent government spending, the MoF has issued bonds to recapitalize state banks, compensate the CBE for exchange rate valuation losses, and, more recently, for monetary purposes—since the CBE does not issue its own securities to conduct open market operations (Table 6).

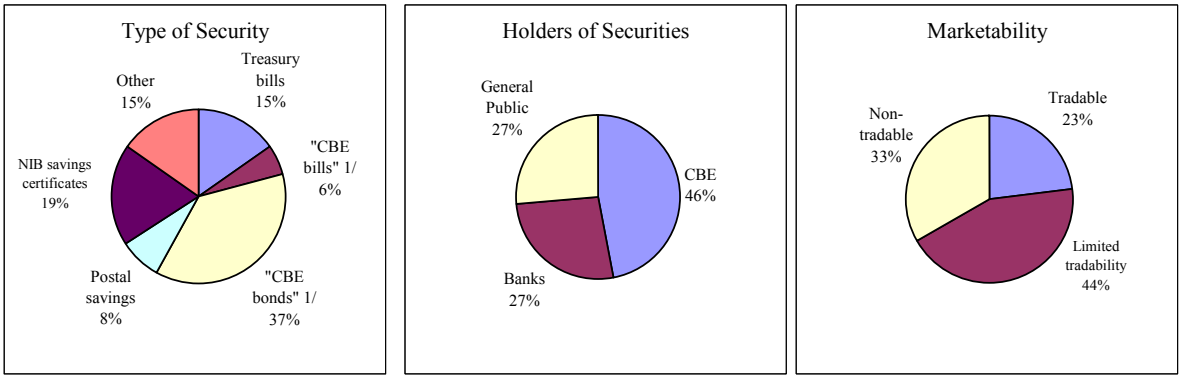
Table 6. Egypt. Domestic Public Debt Composition
(Stocks as of end-June, in percent of total)

	1994	2000	2004
Gross domestic debt	100.0	100.0	100.0
Securities	97.9	79.0	98.3
Issued by the Ministry of Finance	83.8	44.8	71.7
Other 1/	14.1	34.2	26.5
Bank loans	2.1	21.0	1.7

Sources: Ministry of Finance; and IMF staff estimates.

1/ Savings certificates issued by the NIB and the postal offices.

Figure 4. Egypt: Structure of Domestic Debt — June 2004



Source: Ministry of Finance and IMF staff estimates.

1/ Bonds and bills issued by the Ministry of Finance on behalf of the CBE.

48. The domestic interest bill has increased by about 1.5 percentage points of GDP since 1998/99, to 5.3 percent of GDP in 2003/04, mainly as a result of the increase in the debt stock. The average interest rate paid on domestic debt, however, has actually declined in recent years, from 10.2 percent in mid-2001 to 8.4 percent in mid-2004 (Table 7).

Table 7. Egypt: Interest on Domestic Public Debt, 2001–2004
(Data as of end-June)

	2001	2002	2003	2004
	(In billions of Egyptian pounds)			
Interest payments	17.0	18.0	21.8	25.4
New government securities 1/	55.9	33.4	42.7	54.3
Gross domestic debt	205.3	248.3	301.1	363.5
	(In percent)			
Implicit interest rate 2/	10.2	8.8	8.8	8.4
Three-month T-bill rate (percent, average)	9.1	7.8	8.3	8.4
CPI inflation (average)	2.4	2.4	3.2	8.1

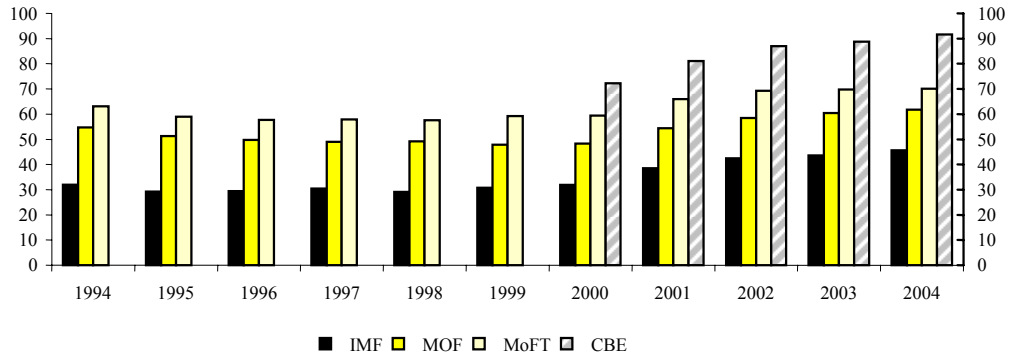
Sources: Ministry of Finance; and IMF staff estimates.

1/ Flow increase in securities issued by the Ministry of Finance.
2/ Interest payments on domestic debt divided by previous period debt stock.

MEASURES OF PUBLIC DEBT

There are some differences in the components of public debt reported in official documents and those used by staff to compute Egypt's public debt. The source of the differences are weaknesses in official public debt statistics. Among these, the partial cancellation of transactions and reciprocal stock positions among the government entities that are being consolidated is an important factor. Also, external debt statistics and domestic government debt statistics are reported separately, and no aggregated figure is published. Furthermore, publications from different official agencies appear to use different methodologies to calculate gross and net domestic public debt (Figure A).

Figure A. Net domestic public debt
(Stock as of end-June, in percent of GDP)



Source: Ministry of Finance (MOF); Ministry of Foreign Trade (MoFT); Central Bank of Egypt (CBE); and Fund staff estimates.

Official domestic debt statistics tend to reflect inaccurately the liabilities of the general government with nongovernment entities. In general, official statistics tend to overestimate some components of gross domestic public debt, and underestimate banks' loans to the general government. In numerical terms, the recording of NIB liabilities is one key source of discrepancy between official debt statistics and staff estimates. Official statistics include as "NIB debt" the loans the budget sector has received from the NIB. For the consolidated general government, however, those loans do not represent liabilities with nongovernment entities. The "NIB debt" included in the staff's calculation of domestic public debt comprises, instead, the liabilities of NIB with the nonpublic sector—i.e., the certificates of deposits which provide the funding for a fraction of the NIB's lending operations. Since this figure has tended to be smaller than the NIB loans outstanding with the budget sector, staff estimates of gross domestic debt are generally lower than the estimates of domestic debt reported in official publications.

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IV. The Oil and Gas Sector in the Balance of Payments[27]

A. Introduction

49. The oil and gas sector plays a more prominent role in the Egyptian economy than what is depicted at present in balance of payments data. The two main reasons are:

- Crude oil exports are not recorded accurately. As a result, the oil trade balance consistently appears weaker than it should be. The official balance of payments misleadingly portrayed Egypt as a net importer of oil from 1998/99–2001/02.

- Foreign direct investment in the oil and gas sector is also not recorded accurately; some foreign-financed investments in the hydrocarbon sector are not included in the balance of payments, making the financial account consistently weaker than what it should be.

50. While oil production has been on a declining trend over the past decade, gas output has doubled in the past five years and is expected to almost double again in the coming five. The expansion of gas production will turn Egypt into a major gas exporter over the medium term. Financial flows related to the gas sector will therefore become increasingly important for Egypt's balance of payments.

51. Accurate and comprehensive recording of balance of payments flows related to the operations of the oil and gas sector will increase the information content of the balance of payments. This chapter will review current recording practices focusing on the data of recent years, outline how a more accurate and comprehensive recording of oil and gas flows would have affected the main balance of payments aggregates, and present medium-term projections of the balance of payments flows related to the oil and gas sector.

B. Basic Trends in Egypt's Oil and Gas Sector

52. Oil production has been on a declining path since the mid-1990s, when output exceeded 900,000 barrels per day (bpd) (Figure 1).[28] In combination with the gradual increase in domestic consumption, the net quantity of oil available for exports has been

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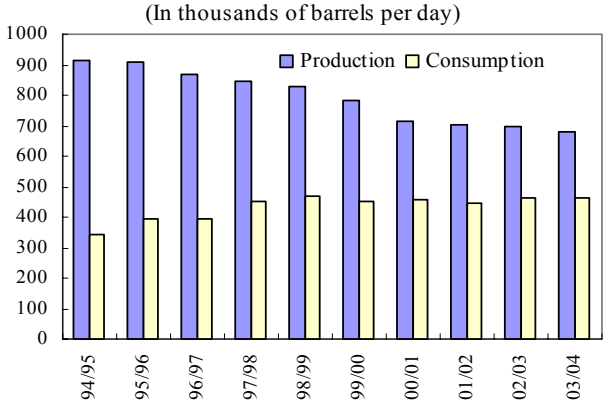
[27] Prepared by Geert Almekinders. The author would like to thank officials from the Ministry of Petroleum for helpful discussions during the staff visits.

[28] The Egyptian authorities do not publish regularly time series data on oil production, and the annual report of the state-owned Egypt General Petroleum Corporation (EGPC) has limited circulation. Staff received data for the period 1995/96–2003/04, as well as the 2002/03 Annual Report of the EGPC from the Ministry of Petroleum. Data published by the International Energy Agency and in British Petroleum's *Statistical Review of World Energy* differ considerably from the EGPC data, possibly reflecting different treatments of condensate and Liquefied Petroleum Gas (LPG).

shrinking rapidly. EGPC's annual report for 2002/03 indicates that Egypt's production of crude oil, condensate, and LPG in the reporting year averaged 719,000 bpd. Consumption of petroleum products (including LPG) averaged 461,000 bpd, leaving 258,000 bpd for net exports. These estimates would have made Egypt about the 20th largest oil exporting country in the world in 2003. Egypt's proven oil reserves amounted to 3.6 billion barrels in mid-2003. Ongoing exploration activities are expected to add to these reserves. On this basis, oil production is expected to be maintained near current levels (590,000 bpd of crude oil, 70,000 bpd of condensate, and 40,000 bpd of LPG) through 2020.

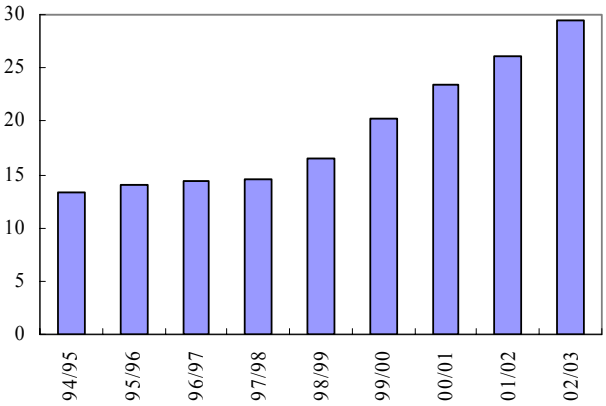
Figure 1. Egypt: Production and Consumption of Oil, 1994/95–2003/04
(In thousands of barrels per day)



Source: Egypt General Petroleum Company.

53. Egypt is developing rapidly its large gas reserves. Gas production was approximating 30 billion cubic meters in 2002/03, about double what was produced five years earlier (Figure 2). Until recently, domestic consumption moved in tandem with production, leaving no room for exports. However, five major gas projects, currently at varying stages of development, are expected to raise annual gas production to 50 billion cubic meters by 2008 (Appendix IV.1). In most cases, contracts have already been signed to sell abroad the additional output of the new projects. Full execution of these contracts could place Egypt among the 10 largest net exporters of natural gas (in terms of 2003 levels) in the world (Table 1). Natural gas reserves were officially estimated at 66 trillion cubic feet (tcf) as of end-2004.[29] Additional probable reserves have been estimated at 100 tcf. The proven gas reserves would be sufficient to last some 40 years based on projected output in 2008, the year that all currently contracted production is forecast to come on-stream.

Figure 2: Egypt: Production of Gas, 1994/95–2002/03
(In billions of cubic meters)



Source: Egypt General Petroleum Company.

[29] A trillion cubic feet is equivalent to approximately 1,848 billion cubic meters.

Table 1. Ten Largest Net Gas exporters in 2003
(in billions of cubic meters)

1.	Russia	186
2.	Canada	102
3.	Norway	71
4.	Algeria	64
5.	Turkmenistan	43
6.	Indonesia	41
7.	Malaysia	25
8.	Trinidad and Tobago	25
9.	Netherlands	23
10.	Egypt (2008)	21

Sources: IEA, BP, Egyptian authorities.

C. Oil and Gas in the Balance of Payments

54. Foreign companies play a key role in the production of oil and gas in Egypt. Virtually all stages of the production process involve balance of payments flows.

- Exploration activities in Egypt are mostly conducted by foreign companies. According to best practices, all expenses incurred by foreign companies for exploration purposes should be classified as inflows of foreign direct investment in the financial account of the balance of payments, even when no oil or gas is found (see IMF (2003), p. 50). To the extent that the exploration activities involve the use of (capital) goods and services sourced from abroad, these expenses should be recorded as outflows in the current account of the balance of payments.

- Foreign companies also take the lead in developing the fields and setting up the related infrastructure after oil or gas has been found. The financing of all spending on rigs, drilling equipment, pipelines, *etc.,* also should be classified as foreign direct investment in the financial account of the balance of payments. To the extent that the production activities make use of inputs, such as goods and services sourced from abroad, these should be recorded as outflows in the current account of the balance of payments.

- The oil and gas that is sold outside the producing country (Egypt) ought to be recorded as exports in the current account of the balance of payments.

- Remittances of foreign oil and gas companies' profits to their headquarters should be recorded as outflows in the services account of the current account of the balance of payments. Reinvested earnings are to be recorded in both the current account (as an outflow) and the financial account (as an inflow).

The involvement of foreign companies in the exploration, production, and export of oil and gas therefore gives rise to four important categories of balance of payments flows: two inflows (foreign direct investment to finance the capital costs of exploration and production, and revenues generated by the sale of oil and gas on the international market) and two outflows (foreign exchange used to pay for (capital) goods and services sourced from abroad and profit remittances by foreign oil and gas companies).

D. Oil and Gas in Egypt's Balance of Payments

55. The Egypt General Petroleum Corporation (EGPC), a state-owned entity, is a partner in all oil and gas projects in Egypt, either through its stake in joint-venture companies (JVCs) set up to operate individual projects, or through production sharing agreements. EGPC may finance investments in downstream operations (e.g., the domestic refineries and pipelines to and from the refineries), but it does not provide financing for upstream projects. Consequently, all other things equal, foreign direct investment (FDI) in Egypt's oil and gas sector is probably higher than what it would have been if the EGPC were allowed to invest in the upstream oil and gas sector. Conversely, the foreign oil and gas companies participating in Egypt's JVCs receive a larger share of the oil and gas produced to offset their investment costs than would otherwise be the case.

56. The recording of flows related to the oil and gas sector in Egypt's balance of payments does not adhere to the best practices outlined in Section C. A key source of data used in the compilation of Egypt's balance of payments is the international transactions reporting system (ITRS). Under this reporting system, resident commercial banks and authorized dealers in foreign exchange submit detailed statements on the foreign exchange transactions of their customers to the Central Bank of Egypt (CBE). The CBE then uses the ITRS to produce estimates of profit remittances by joint venture partners and operators of the production sharing agreements in the oil and gas sector (US$559 million and US$686 million in 2002/03 and 2003/04, respectively).[30] A cross-check with alternative data sources and a comparison with best practices in balance of payments recording suggest four major shortcomings:

- First, Egypt's balance of payments underestimates inflows of FDI, particularly in the oil and gas sector. Table 2 presents the official (CBE) estimates of FDI net inflows and staff estimates of FDI in the oil and gas sector from 1999/2000 to 2003/04, derived from data compiled and published by the General Authority for Investment (GAFI). As the table shows, the difference between these two estimates may have been of the order of US$2–3 billion (2.5–3.7 percent of GDP) in the last two fiscal years.

[30] While these estimates and their recording appear methodologically sound, the CBE has no alternative data sources against which to compare the estimates it obtains from this methodology.

Table 2. Egypt: Estimates of Foreign Direct Investment
(In millions of U.S. dollars)

	1999/00	2000/01	2001/02	2002/03	2003/04
CBE: Inward FDI in Egypt (net)	1,656	509	428	701	407
Inflow	...	...	...	892	435
Outflow	...	...	...	-191	-28
GAFI: FDI in Egypt (commitments)	2,819	2,386	2,723	3,008	4,168
Oil and gas sector	1,593	1,684	2,057	2,123	3,125
Other	1,226	702	666	885	1,043
Staff estimate: Inward FDI in Egypt (net)	2,415	2,077	2,384	2,427	3,619
Inflow	2,415	2,077	2,384	2,619	3,647
Oil and gas sector 1/	1,434	1,516	1,851	1,911	2,813
Other 2/	981	562	533	708	834
Outflows				-191	-28

Sources: Central Bank of Egypt; GAFI, Ministry of Finance; and IMF staff estimates.

1/ Assumes implementation rate of 90 percent of commitments recorded with GAFI.
2/ Assumes implementation rate of 80 percent of commitments recorded with GAFI.

- Second, sales of crude oil and petroleum products abroad by foreign companies are not recorded in official export figures. The CBE uses EGPC estimates of exports and imports of crude oil and petroleum products. This data does include (as imports) the purchases of crude oil by the EGPC from foreign companies for the domestic refineries, but does not include crude oil sold abroad by foreign companies. As a result, Egypt's export data has underestimated net exports of crude oil and petroleum products by approximately US$1 billion per annum in the past two years (Box 1).

- Third, some financial transactions between the EGPC and its foreign partners are incorrectly recorded in the balance of payments. Egypt's service and income account contains the item "invisible receipts of the EGPC", which record inflows of about US$1.1 billion in the last two years. According to CBE officials, this item reflects foreign exchange obtained by the EGPC from foreign oil companies to pay domestic workers, suppliers, as well as taxes. If this is indeed the case, the transaction should not be included in the balance of payments as it represents a transfer of foreign exchange between partners that does not involve a cross-border transaction.

- Fourth, exports of gas are not yet separately identified in the official balance of payments. EGPC data indicate that gas export revenues amounted to US$57 million in 2003/04, but it is not clear whether those gas exports were included in the CBE's export figures.

Box 1. Egypt: The Net Oil Trade Balance in 2002/03

The balance of payments published by the Central Bank of Egypt shows a net oil trade balance of US$850 million in 2002/03.

Net Oil Trade Balance
(In U.S.$ billions)

Oil Exports	3.15
Oil Imports	2.30
Oil Trade balance	0.85

Volume data provided by the EGPC implies a net oil trade surplus of about US$1.9 billion in 2002/03. According to these data, the volume of net exports of crude oil and petroleum products in that year was at least 9.34 million metric tons (MT). This estimate was obtained as follows:

		In million MT
(1) Production of oil and condensate		34.67
(2) Production of LPG		1.15
(3) Total production of oil, condensate, and LPG	(1+2)	35.82
(4) Loss in production and refining		0.92
(5) Effective availability of crude oil and petroleum products	(3-4)	34.90
(6) Consumption of petroleum products (including LPG)		22.96
(7) Sales of bunker and aviation fuel[1]		2.60
(8) Net export of crude oil and petroleum products	(5-6-7)	9.34

Using the average WEO oil price for 2002/03 (U$27.87 per barrel), this would imply a net oil trade balance of roughly US$1.9 billion.[2]

[1] It is assumed that all bunker and aviation fuel is sold to domestic shipping companies and airlines.

[2] Using a conversion factor of 7.331 barrels per metric ton.

E. Revisions to Oil and Gas-Related Flows: An Illustration

57. The possible impact of revising Egypt's official balance of payments estimates using alternative data sources for oil and gas-related flows and standard methodologies for balance of payments recording was investigated. The revisions take into account the deficiencies in the recording of FDI inflows, exports of crude oil and gas, and the "invisible receipts of the EGPC" identified in the previous section. Table 3 compares CBE estimates of the balance of payments for 2000/01–2003/04 with the revisions undertaken by staff.[31] The exercise yields three key results:

[31] The CBE estimates record the difference between a headcount-based estimate of tourism-related inflows (US$5.5 billion in 2003/04) and the estimates obtained from the ITRS (US$2.3 billion in 2003/04) as an outflow in the capital account. The estimates in Table 3 record only the flows based on direct estimates of tourist arrivals

(continued…)

- Egypt's trade balance and oil trade balance seem to be considerably stronger than suggested by the CBE data (by about US$1.4 billion in 2003/04).

- Egypt's service balance appears to be weaker than what is reported in the CBE data (by about US$1 billion in 2003/04), due mainly to the elimination of the "invisible receipts of the EGPC" item.[32]

- Net FDI inflows would appear to be significantly higher than recorded in the CBE balance of payments, owing to the omission of FDI of oil and gas companies (between US$1.5 billion (2000/01) and US$3.2 billion (2003/04)).

58. The sizable revisions to key balance of payments aggregates resulting from this exercise raise questions about the quality of the non-oil current account data. For example, the illustrative estimates for FDI and the oil trade balance would imply, all other things equal, very large unrecorded balance of payments outflows (negative errors and omissions) of US$5.3 billion, or almost 7 percent of GDP in 2003/04. Alternatively, the non-oil current account balance would have to be weaker than what is implied by the CBE estimates.

59. The medium-term projections presented in Table 3 suggest that Egypt's net oil and gas trade balance will post surpluses of around US$5 billion per annum until the end of this decade. This is a major improvement compared to the annual average net oil and gas trade balance of US$400 million implied by the official balance of payments data for the period 2000/01–2003/04. The emerging gas export sector accounts for half of this increase. Other factors contributing to this improvement include a more comprehensive recording of oil exports, higher oil prices projections in the medium term, and increased scope for crude oil exports following Egypt's move towards gas-fired power plants.

60. The gas sector is expected to have a strong positive net impact on Egypt's balance of payments over the medium term. Very preliminary projections suggest that gas exports, net of cost recovery by the foreign gas companies, will strengthen Egypt's current account by close to US$1.5 billion per annum by the end of the decade (Appendix IV.2).

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with the errors and omissions line offsetting any upward bias implicit in these estimates. The balance of payments in Table 7 of the staff report for the 2005 Article IV consultation follows the same methodology.

[32] The reclassification of profit remittances from the "Other" category to the "Investment Income" category under service payments leaves the total for service payments unchanged.

Table 3. Egypt: Balance of Payments—Current Estimates and Oil and Gas-related Revisions
(In billions of U.S. dollars, revisions are shaded)

	2000/01	2001/02	2002/03	2003/04	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
	Current estimates 1/				**Oil and Gas-related revisions (shaded)**							
					Estimates				Projections			
Current account balance	0.0	0.6	1.9	3.4	0.1	0.5	2.1	3.8	5.0	4.4	3.5	2.9
Trade balance	-9.4	-7.5	-6.6	-7.8	-8.2	-6.6	-5.5	-6.5	-7.3	-7.3	-8.4	-9.6
Exports	7.1	7.1	8.2	10.5	8.2	8.1	9.4	11.8	15.8	18.1	18.7	19.1
Petroleum and gas	2.6	2.4	3.2	3.9	3.8	3.3	4.3	5.3	7.5	9.0	8.9	8.5
Petroleum	2.6	2.4	3.2	3.9	3.8	3.3	4.3	5.2	7.1	7.3	6.6	6.2
Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.7	2.2	2.2
Other	4.4	4.7	5.0	6.5	4.4	4.7	5.0	6.5	8.3	9.1	9.8	10.6
Imports	-16.4	-14.6	-14.8	-18.3	-16.4	-14.6	-14.8	-18.3	-23.1	-25.4	-27.1	-28.7
Services (net)	5.6	3.9	4.9	7.3	4.6	2.9	3.9	6.3	7.8	7.4	7.5	8.2
Service receipts	11.7	9.6	10.4	13.0	10.7	8.6	9.4	12.0	14.5	15.8	16.7	17.5
Other	2.6	2.4	2.8	3.1	1.6	1.4	1.8	2.1	3.1	3.3	3.5	3.7
Service payments	6.1	5.7	5.5	5.7	6.1	5.7	5.5	5.7	6.7	8.4	9.2	9.3
Investment income	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.7	1.1	2.5	2.9	2.7
Interest payments	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.8	0.9	0.9
Other 2/	0.1	0.2	0.1	0.1	0.7	0.8	0.7	0.7	1.0	2.3	2.6	2.4
Other	3.3	2.6	2.5	2.5	2.7	2.0	1.9	1.9	2.2	2.4	2.5	2.6
Capital account	2.3	1.2	-0.4	-1.8	3.9	3.2	1.5	1.4	0.2	1.0	1.1	1.5
FDI	0.5	0.4	0.7	0.3	2.0	2.4	2.6	3.5	3.0	2.7	2.7	2.7
Errors and omissions (net)	-3.1	-2.3	-1.0	-1.7	-4.9	-4.2	-3.1	-5.3	-2.8	-2.6	-2.5	-2.4
Overall balance	-0.9	-0.5	0.5	-0.2	-0.9	-0.5	0.5	-0.2	2.4	2.7	2.1	2.0
Memorandum items:												
Oil and gas trade balance	-0.5	-0.1	0.8	1.3	0.6	0.8	2.0	2.7	4.1	5.2	5.3	4.9
Crude oil price (US$ per barrel)	28.1	22.7	27.9	31.4	28.1	22.7	27.9	31.4	44.0	45.7	42.2	40.2
Natural gas price (US$ per barrel)	144.0	111.3	108.5	126.7	144.0	111.3	108.5	126.7	144.6	149.1	139.0	133.2

Sources: Central Bank of Egypt; and IMF staff estimates and projections.

1/ From Table 7 of the Staff Report for the 2005 Article IV Consultation.
2/ Includes profit repatriation from oil and gas.

F. Conclusions

61. This chapter has reviewed current recording practices of oil and gas-related flows in Egypt's balance of payments. Due to deficiencies in the recording of oil and gas exports, export revenues appear to have been underestimated by more than US$1 billion per annum in recent years. Weaknesses in the recording of FDI inflows in the oil and gas sector have also led to under-recording, possibly by as much as US$3 billion per annum.

62. A more accurate and comprehensive recording of oil and gas flows could lead to important revisions in key aggregates of Egypt's balance of payments. Revisions to the oil and gas-related flows are likely to expose weaknesses in the recording of other items in the balance of payments, including non-oil merchandise trade.

63. The imminent expansion of gas exports will have a strong positive impact on Egypt's balance of payments, and underscores the need to address weaknesses in the recording of oil and gas-related flows.

CURRENT AND PROSPECTIVE GAS EXPORTS

Five major gas projects, currently at varying stages of implementation, are expected to raise Egypt's gas exports to approximately 21 billion cubic meters per annum by 2008. At current prices (US$126 per thousand cubic meters), this would result in gross annual inflows of about US$2.7 billion (3.1 percent of GDP).

(i) Gas exports to Jordan via an undersea pipeline started in mid-2003. This first phase of the Arab Gas Pipeline project feeds a power station in Aqaba. Gas exports amounted to US$60 million in 2003/04 and are projected at US$80 million in 2004/05. A 30-year agreement envisages export volumes rising from the current level of 1.1 billion cubic meters per year (bcmy) to 2.3 bcmy by 2010/11. Construction of the next phase, an extension of the pipeline to Lebanon and Syria, is scheduled to begin in 2005. The pipeline should eventually reach Cyprus and Turkey, after which it could be connected to the European gas grid.

(ii) An agreement to sell gas to Israel via an off-shore pipeline was approved in principle in May 2004. The government of Israel endorsed the Memorandum of Understanding (MoU) in February 2005. Under the MoU, the state-owned Israel Electric Corporation would buy 1.2 bcmy of Egyptian gas from July 2006, rising to 1.7 bcmy one year later under a 15-year contract, with an option to extend the agreement for a further five years.

(iii) Exports from an LNG plant at Damietta, on the Mediterranean coast, started in January 2005. Union Fenosa of Spain and ENI of Italy built the plant at a cost of US$1.3 billion. The plant is owned by Spanish Egyptian Gas (SEGAS), a consortium in which Union Fenosa has an 80 percent share. The EGPC and the Egyptian Holding Company for Natural Gas (EGAS) each own a 10 percent share. Union Fenosa has a 25-year contract to buy the equivalent of 4.4 bcmy of natural gas from the Damietta plant. British Gas is taking a further 1 bcmy and discussions are advanced with a buyer for the plant's remaining output of LNG (equivalent to 2.2 bcmy of natural gas).

(iv) Production at another LNG plant, at Idku, east of Alexandria, is scheduled to begin in the third quarter of 2005. British Gas and Petronas of Malaysia built the $1.1 billion plant and Gaz de France has committed to buy its output (equivalent to 5 bcmy of natural gas) under a 20-year contract. Gaz de France, British Gas, and Petronas form the bulk of Egyptian LNG, the consortium that owns the Idku facility. EGPC and EGAS have a combined stake of 24 percent.

(v) A second production train under construction at Idku is due to come on stream in mid-2006. Up to six LNG trains (independent production units for gas liquefaction) can be accommodated at Idku, compared with two at Damietta. The second train is the same size as the first train and will cost around US$900 million to construct. British Gas has signed on to purchase the output of this train.

MEDIUM-TERM PROJECTIONS OF OIL AND GAS-RELATED FLOWS

The medium-term projections in Table 3 incorporate the trend decline in oil production and a steady rise in domestic demand for petroleum products in line with the projected growth of the Egyptian economy. Accordingly, the projections for net exports of oil assume a 4 percent annual increase in the volume of oil imports and a 2 percent annual decline in oil exports. The assumptions which underlie the medium-term projections of balance of payments flows related to the new gas projects are summarized below.

Egypt: Projections of Current Account Flows Related to the New Gas Projects, 2004/05–10

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Total projected output of new export projects (in bcm)	3.0	13.6	20.1	20.9	21.2	21.2
Damietta	1.9	7.5	7.5	7.5	7.5	7.5
Idku 1		5	5	5	5	5
Idku 2			5	5	5	5
Jordan pipeline	1.1	1.1	1.4	1.7	2	2
Israel pipeline			1.2	1.7	1.7	1.7
Projected gas price (WEO, US$ per thousand cubic meters)	144.6	149.1	139.0	133.2	131.4	132.5
Projected gross export revenue from gas (US$ millions)	430	2,028	2,793	2,784	2,786	2,808
Correction factor for liquefaction and regassification	0.8	0.8	0.8	0.8	0.8	0.8
Correction factor for pending contracts with Israel			0.5	0.6	0.7	0.8
Adjusted export revenue from gas (US$ millions)	376	1,655	2,223	2,227	2,259	2,299
Repatriation of profits (percent of adjusted gross revenue)	0.85	0.85	0.75	0.65	0.50	0.40
Profit repatriation and cost recovery (US$ millions)	320	1,407	1,668	1,448	1,129	920
Net effect for the current account of gas exports (US$millions)	56	248	556	780	1,129	1,380

Sources: Ministry of Petroleum; and IMF staff estimates and projections.

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