# Egypt and the Crisis*

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## 1 Executive summary

- When Egyptian policymakers discuss how to respond to the effects on their economy of the world financial crisis, they typically focus on two questions:
  - can domestic fiscal policy compensate for the reduction in growth induced by the world slowdown?
  - what would be the consequences for the budget and for debt sustainability of such a use of fiscal policy?

This is not the right place from where to start the discussion. Egypt's binding constraint is not internal but external: it is the balance of payments, not domestic debt sustainability.

- The shock.
  - the crisis has so far reduced growth from 7% to 4% (Q2 2008/09). All components of demand have been affected: lower net exports, lower consumption (also due to a drop in remittances) and lower investment (also because of the drop in FDI's). The government has decided to use public investment with the aim of bringing growth back to around 5.5%, the level consistent with a constant unemployment rate

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- financial markets can greatly amplify the effect on Egypt of the global recession. The channel through which the amplification takes place is the "appetite for risk" of international investors. One way to measure it is the spread between BAA and AAA U.S. corporate bonds. The current level of the spread (about 300 bp and above the historical average of below 100 bp) suggests that absent policy intervention—and absent a faster pace of world recovery— growth would come close to zero (0.5%) in 2009/10
- one channel through which investors' "appetite for risk" affects the Egyptian economy are FDI's. But others may be at work as well: portfolio investments and revenues from tourism and the Suez Canal

- The room of fiscal policy
  - the current fiscal plan foresees a primary deficit of 3.5% of GDP in 2008/09, up from 3% the previous year. Thereafter what is still planned is a sharp fiscal contraction: 0.8% in 2009/10, -1% in 2010/11
  - we have studied the effect of a fiscal stimulus next year that brings the primary deficit to 3.8% of GDP in 2009/10. Thereafter we foresee a gradual consolidation, which returns the primary deficit to zero only in 12/13. Part of the higher deficit we foresee is already in the cards since some observers have suggested that the 2009/10 deficit target (a primary deficit equal to 0.8%) will not be met. Hence, the additional stimulus we consider is closer to 2% of GDP
  - we have also studied what would be the impact of the fiscal stimulus on the debt-to-GDP ratio if it were ineffective at raising growth; if growth fell to zero in 2009/10 and only resumed in 2010/11. This assumption is consistent with the government's plan to use public investment as its major fiscal tool and our finding of a very small short run multiplier for public investment. Even assuming positive real rates (+2%, they were -6% last year) such an (ineffective) stimulus would have a very moderate effect on debt. The debt-GDP ratio would increase from 62 to 68% of GDP in 2010/11, before starting to fall
  - a similar fiscal stimulus would become a source of concern only if accompanied by a large devaluation. The combination of a 30% currency depreciation, an ineffective fiscal stimulus and zero growth would push the debt-GDP ratio above 72% in 2010/11. This of course assumes that the

positive effects of the depreciation on net exports—if any—would take time to materialize.

- The multiplier of public sector investment
  - we find this mutiplier to be quite small on impact—that is the year following the increase in the deficit. In our analysis one explanation for the low multiplier is the crowing out effect on private investment
  - our estimate of the short-run multiplier range between 0.17 and 0.26, thus suggesting that to offset a 1% slowdown in growth in the same year, public investment, as share of GDP, should increase by an amount between 4 and 6 percentage points of GDP. The effect on output of a one-time increase in public investment expenditure would rise over time: after 4 years a one-time increase in public investment equal to 4% - 6% of GDP would raise the level of output by 2% - 3%
  - these estimates are subject to two caveats: (i) they are based on an analysis of the effects of an across-the-board increase in public investment: there is evidence that investment in infrastructures has higher multipliers; (ii) in the current situation—with private investment particularly depressed—the crowding out effect should be modest. Thus, to the extent that the low multipliers are the result of crowding out, one would expect mutipliers to be a bit higher in the current crisis
  - in any event, even allowing for these caveats, an increase in public investment of 1% - 2% of GDP, as currently envisaged by the government, falls short of of what is needed to offset the effects of the external shock on unemployment
  - the finding of very small multpliers for public investment, particularly over short horizons, suggests that Egypt should explore other fiscal tools. Maybe a cut in taxes would do more to push demand than an increase in public investment. This possibility would need further study.

- Internal and external balance
  - a fiscal stimulus capable of bringing growth back close to 5.5% would raise the current account deficit above 2% of GDP, the level estimated before the crisis. Could Egypt finance it? In other words, are internal and external balance consistent?

- our analysis of the desirable mix of fiscal and monetary policy suggets that
  - although both fiscal and monetary policy can stimulate aggregate demand and drive output toward full employment, an expansionary, but sustainable, fiscal policy allows to reach the output target with a minimum exchange rate depreciation. By contrast, an expansionary monetary policy that aims at full employment, risks destabilizing inflation expectations and through inflation expectations the exchange rate as well, opening up the possibility of a vicious circle: capital flight, a rise the debt ratio, a further increase in the risk premium—an outcome that evokes a currency crisis.
  - a policy mix mostly focused on fiscal policy would however require a reconsideration of the appropriate fiscal policy tool.

## 2 The effects of the external shock

When Egyptian policymakers discuss how to respond to the effects on their economy of the world financial crisis, they typically focus on two questions:

- can domestic fiscal policy compensate for the reduction in growth induced by the world slowdown?
- what would be the consequences for the budget and for debt sustainability of such a use of fiscal policy?

This is not—at least in our view—the right place from where to start a discussion of how should Egypt respond to the crisis. Not because keeping growth close to potential should not be the country's priority: it is. But because the binding constraint is not internal but external: it is the balance of payments, not domestic debt sustainability.

Up to 2007/08 Egypt, as many emerging market economies, had been running a current account *surplus* of about 1-2% of GDP per year. Before the crisis this surplus was expected to turn, in 2008/09, into a small *deficit*, about 2% of GDP. This was not a source of concern. First, because an emerging market economy—where capital is scarce, the productivity of capital is relatively high and thus attracts foreign investment—should run a current account *deficit*, not a *surplus*. Second, because the inflow of foreign direct investment (FDI's) was more than enough to finance such a deficit: a current account deficit of about 2% of GDP means a financing need of about US$ 3.3 billion per year: in 2007/08 the FDI inflow amounted to US$ 13.3 billion, up from 6 billion, two years earlier Thus, up to the crisis Egypt was not facing an external constraint

The crisis has put this into question. In three ways:

- *the current account deficit is widening* due to fall in net exports demand (goods and services, tourism and Suez Canal revenues) and in remittances (Egyptian workers overseas loosing their jobs). Data for the first half of 2008/09 (July-December 2008) show a deficit of US$ 2.5 billion (1.5% of GDP), up from 0.3 billion for the same period of 2007/08. But these data are the sum of two quite different quarters. The services balance, for instance, achieved a surplus of about US$ 7.5 billion against US$ 6.7 billion during the first half of 2007/08. This was due to a rise of 8.1% in the Suez Canal receipts, to almost US$ 2.7 billion. In the second quarter (October/December) however these receipts fell by

2.9% compared with the same quarter of the previous year. Similarly, tourism revenues rose by 2.8% in the first half of the year, but declined by 10% during October/December 2008. Data on remittances are only available for the sum of the two quarters, and show an increase of 3.3% compared with the previous year, but this may not yet reflect the recent rise in OECD unemployment. Thus, the current account is expected to show a deficit between 3.5 and 4% of GDP in 2008/09, that is about US$ 6 billion;

- *FDI's are drying out.* The data for the first half of 2008/09 show a flow half the size of H1 2007/08 (4 billion down from 7.8 billion). In Q2 2008/09 FDI inflows were US$ 2.4 billion. Current estimates assume a constant quarterly flow of about US$ 1.5 billion, thus a year total of US$ 7 billion. Such an amount (4.2% of GDP) would still be enough to finance the current account deficit, but at this stage it looks optimistic;

- In the first half of the year *portfolio outflows accelerated*, achieving a net outflow of US$ 7.4 billion (of which 6 billion from a reduction of foreigners' holdings of Egyptian TBs). The outflow was US$ 1.7 billion during the corresponding period of the previous year. The foreign assets held by the non-bank sector also fell in the first half of 2008/09, recording an outflow of US$ 4.8 billion. The combined total outflows of US$ 12.2 billion was almost completely offset by a reduction of US$ 11.1 billion in foreign assets held by banks, mostly CBE foreign currency deposits at local banks.

As a result, *international reserves* have fallen gradually: the reserve loss in January-April of this year was about US$ 3 billion, bringing total reserves to US$ 31 billion, or 19% of GDP, a still comfortable number but down from US$ 34 billion a year earlier. The current reserve loss amounts to about US$ 1 billion per month.

Thus, at the core of Egypt's macroeconomic policy lies the trade-off between internal and external balance, in other words between unemployment and capital flows.

**Internal and external balance.** The crisis has so far reduced growth from 7% to 4% (Q2 2008/09). All components of demand have been affected: lower net exports, lower consumption (also due to a drop in remittances) and lower investment (also because of the drop in FDI's). The government has decided to use public investment with the aim of bringing growth back to around 5.5%, the level consistent with a

constant unemployment rate[1]. But would internal balance be consistent with external balance? By putting air back into domestic demand, a rise in public investment would maintain a current account deficit and thus the need to finance it. How large this deficit would be is not obvious: in principle if public investment were to replace private investment one for one (and if the import content of private and public investment were similar), net national saving would remain unchanged, and so would the current account. But the external shock to demand has come not only from the contraction in FDI's: exports of goods and services and remittances have also fallen.[2] We would need a small macro model of the Egyptian economy to estimate the overall effect (from lower FDI's, higher public investment and lower exports) on the current account, but the sign is unambiguous: a fiscal stimulus capable of bringing growth back close to 5.5% would raise the current account deficit above 2% of GDP, the level estimated before the crisis. Could Egypt finance it? In other words, are internal and external balance consistent? We see two options:

- one is to finance the current account deficit gradually depleting international reserves. Starting from a stock equal to about 19% of GDP, Egypt could in principle finance the deficit for a few years. But as reserves start being depleted, portfolio outflows might accelerate. Only the introduction of controls on international capital movements could stop a run on reserves (Egypt has a very liquid financial market: the monetary base is 16% of GDP);

- the alternative is to use reserves in combination with the exchange rate. Since the real exchange rate is essentially in equilibrium[3], a nominal depreciation could be accompanied by an expected appreciation thus inducing capital inflows, or at least stemming outflows[4]. What would this imply for monetary policy?

[1] A simple regression of the change in unemployment on (non-hydrcarbon) GDP growth over the years 1998 to 2007 shows a natural rate close to 5.5%.

[2] The effects of a fall in exports on the current account depend on the import content of exports. In countries such as Egypt where the import content of exports is small—i.e. that import lots of final goods and few intermediate goods—the effect is larger than in countries, *e.g.* such as China, where imports of intermediate goods are large. In Egypt, the effect on imports of the fall in exports will come mostly from lower income and lower consumption.

[3] Figure 10 in Section 4 shows Egypt's real effective exchange rate since 1980. There is no clear evidence of a significant disequilibrium. Unfortunately the only real exchange rate measure available is based on CPI's, and is thus not very reliable given the fact that the share of food in Egypt's CPI basket is a unusually high.

[4] Such a policy would not seem inconsistent with the central bank's stated objectives. In February,

To better understand the role of monetary and fiscal policy in shaping the trade-off between internal and external balance, we shall use a simple model. Before getting there, however, the next two sections address two preliminary questions

- what determines output fluctuations in Egypt and how effective is fiscal policy as a tool to stimulate output
- how much room does fiscal policy have, *i.e.* by how much can the budget surplus be reduced, before giving rise to concerns about debt sustainability

# 3 The size of the shock and the multiplier of public investment

This section addresses two isues: (i) How large are the effects of the crisis on the Egyptian economy and (ii) How effective is public investment as a tool to offset them.

To assess the potential of Egyptian domestic fiscal policy to counter the effects of the international crisis it is important to have some measure of the relative contribution of domestic and international factors in the determination of Egyptian output fluctuations. Building on previous work at the World Bank (Herrera, 2009, hereafter WB) we do so by means of an empirical model estimated on annual data over the sample 1968-2007, aimed at assessing the effectiveness of public investment as a countercyclical tool to compensate the effects of the external shock. The model is a simultaneous equation model: a Cointegrated VAR. We use Generalized Impulse Response functions to evaluate the effect of public investment on growth, explicitly taking into account the possibility of "crowding out" effects of public on private investment. The model includes six variables: Egypt's GDP (LEGDP601), Egypt's capital (disaggregated between public, LKSTOPUB and private, LKSTOPRI), OECD GDP (LOEC6010), MENA GDP (LMEGDP6010) and the real price of oil (LOILPRI).

We have first re-estimated the WB model. Table 1 shows the results for the equation describing output growth. The short-run dynamics of the estimated model supports the hypothesis of a dependence of Egypt's growth on MENA and OECD growth. It also shows that public and private capital stocks have an effect on growth,

when it cut rates by 100 bp, the MPC wrote: *"The MPC will continue to take the necessary measures to contain the adverse effects of the global economic turmoil on the domestic economy, provided that they do not conflict with the price stability objective."* (Central bank of Egypt, MPC statement, February 12, 2009)

though larger and more significant in the case of private capital. In this specification, the impact on Egyptian growth of the global recession goes through the effect of the recession on MENA and OECD growth and, to a more limited extent, through real oil prices (such effect however is only a long-run level effect and has no short-run effect on growth). The coefficients reported in Table 1 lead Herrera (2009) to conclude that: "to compensate a 1 percentage point growth slowdown originating from the shock to OECD growth, the Egyptian capital stock has to increase by about 2 percentage points of GDP". [5] Assuming a public capital-output ratio close to one (the sample average of Egypt's overall capital-output ratio is close to two) this means an increase in public investment of the same amount. This result—2 points of additional public investment to compensate each point of slowdown in GDP—is the response after 4 years to a 1% increase in public investment. The response on impact—one year after the increase in investment—is much smaller: an increase in growth of 0.2% for each percent increase in public investment.

In the WB specification, the model is restricted to have only two cointegrating vectors in its long-run solution: these vectors are identfied statistically by imposing that they are orthogonal to each other have no direct economic interpretation. We have extended this specification to allow for a more immediate economic interpretation of the long-run coefficients and to investigate other channels through which the international financial crisis might affect growth in Egypt.

We start from the observation that a cointegrating analysis that includes a deterministic trend in the long-run solution of the system (which seems natural in the light of the strong trend pattern of all GDP components) does not lead to the rejection of the hypothesis that the long-run solution for all the GDP components and for the capital stock can be described in deviations from a deterministic trend[6]. We have thus re-specified an Error Correction Model for Egyptian GDP growth, $\Delta \ln y_t^E$, as

[5] It is important to note what these multipliers are. They do not measure the effect on output of "fiscal shocks" as such shocks are normally thought of, that is shifts in the budget that are orthogonal to any other shock that might hit the economy. These multipliers measure the response of output to "reduced form" shocks in the equation for public investment. Thus they measure the effect on output of anything that might move public investment, including, importantly, the response of public investment to a recession.

[6] In other words, the long run matrix is full rank. This result is obtained using the Johansen trace and max-eigenvalue tests.

follows:

$$\begin{aligned}\Delta \ln y_t^E &= \alpha + c_0 \Delta \ln y_{t-1}^E + c_1 \Delta \ln y_{t-1}^{OECD} + c_2 \Delta \ln y_{t-1}^{MENA} \\ &+ c_3 \Delta \ln K_{t-1}^{PRIVATE} + c_4 \Delta \ln K_{t-1}^{PUBLIC} + c_5 \Delta \ln poil_{t-1} \\ &+ \beta \ln y_{t-1}^E + \gamma \ln y_{t-1}^{MENA} + \delta trend + \epsilon_t\end{aligned} \tag{1}$$

Short run growth dynamics is determined by the lagged growth in the dependent variable, the lagged MENA and OECD growth, the lagged differences in oil prices and the private and public capital growth; moreover two disequilibria are significant: these can be interpreted as deviations of Egyptian GDP from its trend and deviations of MENA GDP from its trend. The coeffcients on the levels of all other variables can be restricted to zero in this specification: therefore a deterministic trend is sufficient to fit the long run dynamics of Egyptian trend growth[7]. Equation (1) is estimated after dropping non-significant variables from the specification of the Error Correction Model (ECM). The results are reported in Table 2.

In this new specification the long-run solution has a clear economic interpretation: Egyptian growth reacts positively to deviations of MENA GDP from its trend and negatively to its own deviations from trend. The specification dominates in terms of fit the original model. The implications for using public investment as a countercyclical tool are a bit more favourable than in the original model: the point estimate of the "impact multiplier" rises to 0.26 (from 0.20 in the WB model): a 1% growth slowdown can be neutralized (within a year) by an increase of about 4 percentage points in the stock of public capital.

In Tables 1 and 2 the spillovers of the international crisis on Egyptian GDP are restricted to come only via slower MENA and OECD growth. This specification, however, does not allow for the possibility that financial market conditions might affect the transmission of an OECD recession to Egypt. The reason why this channel might be relevant is suggested by the importance for Egypt of FDI inflows, which mostly originate from the U.S. and the Euro area.

Figures 1 and 2 help understand this. Figure 1 plots Egyptian GDP growth alongside the NBER dating of US recessions and shows a clear correlation between bad years for Egyptian growth and NBER recession. Figure 2 again shows the NBER dating of U.S. recessions, this time alongside the spread between BAA and AAA U.S. corporate bond yields, a measure of the "appetite for risk" of financial investors. The

[7] A deterministic trend is consistent with output growth depending only the growth of population and technological progress in the steady-state solution of a Solow growth model.

picture shows that this spread typically increases during recessions, but the current crisis is special, in the sense that the increase in the spread is unprecedented (at least in the past 40 years). This evidence, and the importance of FDI's for Egypt, suggest that the effect of the current crisis on Egyptian growth might be larger than during past recessions because the hit coming from FDI's could be larger.

To investigate whether this intuition might be correct we augmented the output equation in our baseline VAR model with the BAA-AAA spread interacted with a dummy that takes the value of 1 in the final period of the last four U.S. recessions (1975, 1982, 1991, 2001). The rationale for interacting the spread with this dummy is that the spread has an asymmetric role as predictor of growth, as it works mostly in recessions. The results are reported in Table 3 and show that the spread is very significant in explaining growth slowdowns in Egypt related to U.S. slowdowns: any specification that omits this spread (or a corresponding variable) would seriously underestimate the effects of a U.S. slowdown on Egyptian growth. Our estimates use a sample that extends back to 1968. While in more recent years the spread may capture the effect of investors' appetite for risk on FDI's, this cannot be the main explanation in periods when FDI's were small or inexistent. What our variable must be capturing in those years are other channels through which the Egyptian economy was affected by international financial markets conditions and risk premia, for instance, portfolio investment, other borrowing, and tourism.

The estimates in Table 3 suggest that a spread of 100 bp during a U.S. recession of the size we are currently experiencing, translates in a slowdown of about 2% of annual Egyptian GDP growth. Thus if the corporate spread were to remain at the level of 300 bp, Egyptian growth in 2009/10 would approximate zero (0.5%); growth would rise to 2% if the spread were to fall back to 200 basis point by the end of 2009 and to 4% if the spread fell to a more normal level of 100 basis points.

In this specification public investment is less effective as a tool to counter a contraction in output growth. The multiplier after one year is 0.17 (it was 0.26 in the model without the spread interaction): a 1% growth slowdown can be neutralized (on impact) only by an increase in public investment of almost 6% of GDP. The cumulated effect after 4 years is obvously larger, although the multiplier never rises above one: a 1% growth slowdown can be neutralized by an increase in public investment of about 2.5% of GDP. One of the reasons for why these multipliers never rise above 1.0 is probably the crowding out of private investment. In the specification of Table 3 we find that an increase in public investment equivalent to 1% of GDP reduces private investment (within a year) of about half that amount. The crowding out effect dies

out over time, but it remains significant up to 4 years after the increase in public investment. A word of caution is necessary. Our results are based on an analysis of the effects of an across-the-board increase in public investment: there is evidence (Fawzy and El-Megharbel 2006) that investment in infrastructures crowds in private investment and thus has higher multipliers. Since the government stimulus plan is mostly based on infrastructure spending, its effects on output could be larger than those estimated here.

These results have two implications

- financial markets introduce an additional channel through which international recessions translates to growth in Egypt, one that can be measured by the level reached by the corporate bond spread during a U.S. recession. The current level of the spread suggests that absent policy intervention—and absent a faster pace of world recovery—growth would come close to zero (0.5%)

- the increase in public investment necessary to counter the effect of the external shock could be much higher than that currently considered by the Egyptian authorities (1% - 2% of GDP)

  - we find the public investment mutiplier to be quite small on impact—that is the year following the increase in the deficit. As we mentioned, one explanation for the low multipliers is the crowing out effect on private investment
  - our estimate of the short-run multiplier range between 0.17 and 0.26, thus suggesting that to offset a 1% slowdown in growth in the same year, public investment, as share of GDP, should increase by an amount between 4 and 6 percentage points of GDP. The effect on output of a one-time increase in public investment expenditure would rise over time: after 4 years a one-time increase in public investment equal to 4% - 6% of GDP would raise the level of output by 2% - 3%
  - these estimates are subject to two caveats: (i) they are based on an analysis of the effects of an across-the-board increase in public investment: there is evidence that investment in infrastructures has higher multipliers; (ii) in the current situation—with private investment particularly depressed—the crowding out effect should be modest. Thus, to the extent that the low multipliers are the result of crowding out, one would expect mutipliers to be higher in the current crisis

– the finding of very small multpliers for public investment, particularly over short horizons, suggests that Egypt should explore other fiscal tools. Maybe a cut in taxes would do more to push demand than an increase in public investment. This possibility would need further study.

# 4 The sustainability of Egypt's public debt

Over the past five years, Egypt's public debt has fallen rapidly, from 82% of GDP in 2003/04 to 62% in 2007/08 (IMF definition).[8] Fast real and nominal growth was the main driving force behind this spectacular fiscal consolidation: during the period 2004-2008 nominal growth averaged 16.5% while nominal interest rates stood around 9%. The contribution of fiscal restraint has also been significant, as primary deficits (including the acquisition of financial assets) never exceeded 3% of GDP.

As part of the major economic reforms launched in 2006 the government committed to a fiscal consolidation plan aimed at reaching an overall Budget sector deficit of 3% by the fiscal year 2011/12 (originally by 2010/11). Last October, the debt sustainability assessment by the IMF— not fully realizing how hard the global financial crisis would have hit the Egyptian economy— still projected a steady decline of the debt ratio down to 48% by 2011/12 (see Table 4). Since then, growth estimates have been revised and, perhaps more important, inflation has come down fast with little ease in nominal interest rates. This raises the issue of whether fiscal policy is still sustainable under the new (deteriorated) macroeconomic environment and, more importantly, how much room for manoeuvre the fiscal authorities can afford in addition to the recent stimulus package of 1.5% of GDP (already factored in the projected deficits). We answer these questions by means of a standard debt sustainability analysis for a number of scenarios regarding growth, inflation and exchange rate depreciation, and different hypotheses regarding the primary deficits set by the fiscal authorities.

In our baseline scenario, we assume that GDP growth will fall to 3.5% this year, and to 2.8% in 2009/10 and, then, gradually resume starting in 2010/11 up to a long run growth of 6% in 2012/13 (see Tables 5 and 6). As for the inflation rate (measured

[8] Here and in what follows, we use the debt-to-GDP ratio for 2007/08 reported in the IMF (2008) "Staff Report for the 2008 Article IV Consultation". The IMF definition considers the General Government net debt but adds to the external debt of the General Government (about 13% of GDP) the external debt of the public sector (and guaranteed debt) for a total external debt of about 19% of GDP. This makes the data for 2007/08 about 6% higher than the official figure for the General Government net debt.

by the GDP deflator) we expect a 15% average inflation this year (a number consistent with an end-of-year inflation rate as low as 5%) and suppose that inflation will fall to 5.5% next year and then stabilize around 6.5% in the medium run. We carry out the sustainability assessment under the hypothesis of a moderate (and temporary) decline in the nominal interest rate and thus in the cost of debt in the short run.[9] In particular, we assume a real cost on the entire debt between 1.5% and 2%, that implies an even higher ex-post real interest rate on the domestic debt because a large part of the external debt (about 30% of the total) is on concessional terms.[10]

To assess fiscal sustainability we proceed as follows:

- we start from the path for primary deficits reported in the fiscal consolidation plan that aims at first reducing the primary deficit to 0.8% in 2009/10 (from 3.5% this year), and then at turning it into a surplus of 1% and 0.8% in 2010/11 and 2011/12, respectively (see Table 5). Then, we ask whether a temporary fiscal expansion designed to stimulate the economy and counter the effect of the crisis would be sustainable. We consider the following path for primary deficits: 3.8% in 2009/10, 2.5% in 2010/11 and 1.5% in 2011/12, to be followed by a primary budget balance thereafter (see Table 6). We call this the "High Primary Deficits Scenario". Compared with the consolidation plan this scenario implies an additional deficit of 3% in 2009/10 and 3.5% in 2010/11, and a slightly more restrictive fiscal stance in the long run (see Table 7). However, part of this higher deficit accounts for the effect of automatic stabilizers (and assumes that the consolidation plan is fully implemented).[11] A tentative estimate of 0.3 for the elasticity of the primary surplus to GDP growth suggests that between one third to one half of the additional deficit for 2009/10 would result from lower growth, while the fiscal impulse should not exceed 2% of GDP.[12]

[9] As the term to maturity of the domestic public debt is very short (around one year) and the domestic debt accounts for 70% of the total, changes in short trem interest rates are rapidly reflected in the cost of debt service.

[10] The nominal interest payments on the external debt are around 4%.

[11] Notice that the consolidation plan foresees fiscal measures for 1.7% of GDP in 2009/10.

[12] The special features of the Egyptian economy make it difficult to estimate the elasticity of the deficit-to-GDP ratio to GDP growth and, more generally, the effect of the crisis on the government budget. While, after the recent reform, the progressivity of the tax system should be very low, the tax revenues from the tourism sector and the Suez Canal should be quite sensitive to the global recession. On the other hand, on the expenditure side, the fall in energy and food prices should reduce the expenditure for subsidies (relative to GDP) that in 2007/08 accounted for 9.4% of GDP.

- we then assess the sustainability of the fiscal stimulus by examining the path of the debt-to-GDP ratio under the 'High Primary Deficits Scenario". We find that if the fiscal stance were relaxed to counter the effect of the crisis, the rise in the debt ratio would be small and temporary, not really affecting sustainability. Figure 3 shows that the debt ratio increases by no more than 3 percentage points of GDP in 2010/11 and then reverts to a downward trend. This suggests that the government could even consider a greater stimulus, say, as high as 3% of GDP, so as to increase growth by 0.5-0.8% (see Section 3), would not be a threat to sustainability in the baseline scenario.[13] It is also worth noting that there is still some scope for an additional fiscal stimulus in 2008/09 (beside that already announced), though even a 4.5% primary deficit would lead the debt ratio to increase already this year. [14]

- next, we examine how robust is the case for an expansionary fiscal policy to a negative shock that reduces GDP growth to 3.3% this year and to 0% in 2009/10 and also lowers inflation raising the real cost of debt service from 1.5% to 2% in 2009/10 (see Table 8). We find that, even under this pessimistic 'Zero Growth' scenario, the sustainability of the public debt would not be a real concern if the higher primary deficits were only temporary and the government went back to a balanced budget as the global economy recovers. Figure 4 shows that the debt ratio increases up to 68% of GDP in 2010/11 but then it steady declines reaching 60% by 2014/15.

- finally, we consider the consequences for debt sustainability of a 30% depreciation of the exchange rate. Although (as argued in Section 2) Egypt may not be currently exposed to the large capital outflows that are usually at the origin of large devaluations, similar effects may arise because of the vulnerabilities of the current account to the international financial crisis. Indeed, if Egypt were constrained in borrowing on the international capital market, the fall in remittances and tourism revenues, the lower exports and the drop in FDI's could have similar effects of a sudden stop in capital flows. A 30% exchange rate depreciation caused by a 4% deficit in the current account is obviously an unlikely event when the CBE holds an amount of international reserve of 31 US$ billion

[13] The impact of higher deficits on debt accumulation could be smaller than projected insofar as such deficits have a positive effect on GDP growth. We take a conservative view and do not account for such effects in our simulations.

[14] The announced primary deficit for 2008/09 is 3.5%.

(19% of GDP), but it is still worth examining how such shock would affect debt sustainability.[15]

The effect on the debt ratio of a 30% depreciation in 2008/09 is shown in Figure 5 for both the baseline growth scenario and for the case of 'Zero Growth' (both with high deficits). The valuation effect on the foreign-currency denominated debt clearly leads to an increase in the debt ratio that is limited and short lived in the baseline growth scenario while it becomes significant when combined with zero growth:

- in the baseline growth scenario, the impact of the exchange rate shock on the debt ratio is contained: the debt increases by no more than 7% of GDP (see Table 9) because the share of debt denominated in foreign currencies (30% of GDP) is small compared to other emerging economies.
- by contrast, the combined effect of a currency depreciation with an economic slowdown is significant and suggests that debt sustainability could be an issue in this case. Indeed, with zero growth the debt reaches 73% of GDP in 2010/11 and four years later, though declining, is still above the 2007/08 level (see Table 10). Hence, Egypt's debt dynamics is vulnerable to a combination of negative shocks; a strong depreciation and zero growth could trigger a debt dynamics that becomes self reinforcing because of credibility problems, high interest rates, etc. This suggests that avoiding a balance of payments crisis should be a priority in the policy agenda.

**Summing up**

- assume a fiscal stimulus of 2% of GDP next year (this is beyond the stimulus already in the books) that brings the primary deficit to 3.8% accompanied by a gradual decline in the primary deficit in the following years. Even if the package were unable to raise Egyptian output growth above zero, and real interest rates became positive (+2% from -6% a year ago), such a stimulus would have a very moderate effect on debt accumulation: the debt-to-GDP ratio would increase from 62% to 68% and then it would start falling.

- debt sustainability becomes a source of concern in the presence of a large exchange-rate depreciation. The combination of a 30% depreciation with zero

[15] To correct a current account deficit of 4% of GDP, imports must fall by 12% which in turn requires a 12% change in the absorption of tradable goods. With a relative price elasticity of tradable goods equal to 0.4, the increase in the relative price needed to correct the deficit is equal to 30%.

growth and high deficits, pushes the debt-to-GDP ratio above 72%, possibly, on an unsustainable path.

### 4.1 A new approach to fiscal sustainability

The sustainability analysis allows us to make a final (and important) point for the design of fiscal policy. Our analysis shows how misleading can be a fiscal plan that targets the overall deficit in a volatile inflation environment. Figure 6 shows that changes in the inflation rate (more precisely in nominal growth) may lead to sizeable differences in debt accumulation for the same overall budget deficits. In other words, fulfilling an overall deficit target does not ensure debt sustainability. Indeed, achieving a given overall deficit target could require a strong fiscal contraction in a high inflation and interest rate environment whereas it could be consistent with an expansionary fiscal stance when inflation and interest rates are low.[16]

We thus propose a new approach to fiscal sustainability that is based on the research by Bohn (1998, 2006). The rule for the primary deficit that we propose exploits an error correction mechanism that ensures convergence of the debt ratio to a targeted level in the long run, while allowing for some flexibility in the short run; *i.e.* it prevents fiscal policy from being pro-cyclical. The rule for the primary surplus (in terms of GDP), $S_t$, is as follows:

$$S_t = (r^p - g^p)D_{t-1} + \rho(D_{t-1} - D^*)$$

where $r^p$ and $g^p$ are the 'permanent' or long run real interest rate and growth rate, respectively, $D_{t-1}$ is the previous period debt-to-GDP ratio, $D^* < D_{t-1}$ is the debt target and $\rho$ is the error correction (it measures the reaction of the surplus to deviations of the debt from its target).[17] The fiscal rule combines the permanent balance rule advocated by Buiter and Grafe (2003)—according to which the surplus is set equal to $(r^p - g^p)D_{t-1}$, *i.e.* to the lowest constant primary surplus that, in the absence of news or surprises, would ensure long run fiscal solvency—with the error correction mechanism suggested by Bohn (1998, 2006), here adjusted to consider deviations from a specific debt target. We set $r^p = 1.5\%$, $g^p = 6\%$ and $D^* = 50\%$ and

[16] It is also worth noting that, if the government is committed to the deficit target, an increase in the interest rate and, thus in interest payments, requires a reduction of the primary deficit. Hence, the CBE inability to stabilize inflation may result in higher nominal interest rates that impose a fiscal contraction. Although the government is not directly responsible for inflation, fiscal policy bears a strong share of the adjustment cost.

[17] More precisely, the error correction coefficient is equal to $\rho + r^p - g^p$.

choose an correction coefficient equal to $\rho = 0.1$ so as to ensure the stationarity of the debt ratio even under adverse short-run deviations of the real interest rate and of the growth rate as large as a combined 10%, as shown by the change in the debt ratio[18]

$$D_t - D_{t-1} = [(r_t - r^p) - (g_t - g^p) - \rho]D_{t-1} + \rho D^*$$

In Tables 11 and 12 we examine the dynamics of the debt-to-GDP ratio that would result from the adoption of this fiscal rule starting in 2010, both in the baseline growth scenario and in the case of zero growth, and compare it with the debt dynamics associated with the planned primary deficits and the fiscal expansion. As shown in Table 11, in the baseline growth scenario, the fiscal rule leads to a stable primary deficit of about 1.6% of GDP and allows for a slight and temporary increase in the debt ratio. Figure 7 shows that the path of the debt ratio under the fiscal rule is close to that arising from a fiscal expansion and significantly higher than the debt ratio implied by the deficits set forth in the fiscal consolidation plan (under the same growth scenario).

Notice that a rule contingent on the deviation of the debt ratio from its target would have minimized the revision in the announced fiscal plan that is called for by the fiscal expansion. More important, Figure 7 provides further evidence of the sustainability of a temporary fiscal expansion in that the debt increase is soon reversed; the debt ratio falls below that implied by the fiscal rule before the end of the simulation period.

In the Zero Growth scenario the fiscal rule implies primary deficits of only 0.2% of GDP higher than in the baseline growth scenario (see Tables 11 and 12). Hence, the fiscal rule allows for some flexibility in fiscal policy while avoiding the risk that the dynamics of the debt gets out of control. Figure 8 shows that the fiscal rule would lead the debt ratio to reach 65% of GDP in 2011, a level only slightly lower than the 68% peak produced by a fiscal expansion in same year.[19] Finally, it is worth noting

[18] Obviously, the debt target $D^*$ and the correction coefficient $\rho$ are policy variables whose values should be decided by the government; the specific values assumed here are only for explanatory purposes.

[19] The fiscal rule can provide a useful benchmark to assess the stance of fiscal policy but it cannot account for discretionary policy measures (or automatic stabilizers). Hence, its adoption in 2009/10 would prevent the government from taking the discretionary fiscal policy measures that we are advocating in this paper. Indeed, though allowing for higher deficits than the consolidation plan, and more flexibility in the dynamics of the debt, the fiscal rule falls short of providing the stimulus needed to counter the effect of the crisis.

that a fiscal expansion followed by a balanced budget in the long run would also lead to a fast convergence of the debt ratio thus ensuring sustainability.

# 5 A simple model

We now return to the issue raised in the introduction: the role of monetary and fiscal policy in shaping the trade-off between internal and external balance.

To discuss alternative policy options to respond to this external shock we make use of a simple model that describes the interactions between risk premia, capital flows, output, the exchange rate, domestic inflation and monetary and fiscal policies. The model draws on Dornbusch (1976): we follow Dornbusch in modelling domestic demand and the capital account, but we depart from that model assuming that the central bank sets the interest rate and specifying exchange rate expectations consistently with an inflation targeting regime.

*Here is the skeleton of our model:*

- there is only one period.
- there are four endogenous variables: output, $y$, the nominal exchange rate, $e$, the domestic price level, $P$, and the risk premium, $rp$, on Egyptian assets. There is one source of exogenous shocks: the risk appetite of foreign investors, $a$. There are two policy instruments, the domestic interest rate, $i^E$, and government primary budget surplus, $S$.
- the exchange rate is flexible and capital flows match the current account deficit, so that the balance of payments is always in equilibrium.
- potential output is exogenous. Fluctuations in current output are demand determined. Demand for domestic output depends on the real exchange rate, via net exports, on the interest rate set by the Egyptian central bank (CBE), on the primary surplus, $S$, and on the flow of foreign direct investment, $FDI$. Foreign direct investments are exogenous and respond to the risk appetite of foreign investors which is the source of shocks to the economy.
- there are two financial assets: Egyptian deposits denominated in Egyptian pounds and foreign deposits denominated in a foreign currency (U.S. dollars for simplicity).
  - dollar deposits abroad are risk free. Their dollar return is $i^{\$}$.

– Egyptian deposits are risky. There are two sources of risk from the viewpoint of an international investor: one arising from the risk of an exchange rate depreciation, a second associated with the risk of a default. Default could happen as a result of the introduction of capital controls which prevent investors from switching from Egyptian to dollar deposits and is one reason why these deposits are imperfect substitutes for dollar deposits abroad. Thus, the return on Egyptian deposits, $i^E$, has to compensate investors for the return on dollar deposits, the expected depreciation and the default risk: $i^{\$} + \frac{Ee'-e}{e} + rp$,

– where $e$ is the exchange rate (Egyptian pounds per one U.S. dollar), $Ee'$ denotes the expected exchange rate, and $rp$ is the default risk, Egypt's country risk.

– the country risk, $rp$, depends on the appetite for risk of international investors, $a$, but is also affected by domestic fundamentals: the output gap $y-y^*$ and the distance of the debt-to-GDP ratio, $D$, from a target level $D^*$. (The country risk, as measured by the EMBI spread, is shown in Figure 9.)[20]

$$rp = rp(a, y - y^*, D - D^*) \qquad rp_a < 0, \qquad rp_{y-y*} < 0, \qquad rp_{D-D^*} > 0$$

The risk premium decreases as the international appetite for risk rises. The assumption that it decreases with the output gap reflects the concern about the possibility of a negative interaction between unemployment and political instability. The recent experience of a number of Central and Eastern European countries (Latvia, and Hungary for instance) suggests that investors worry about the risk of political instability associated with a rise in unemployment and consider it as an independent risk factor, in addition to the risk associated with a shortfall in external financing. (As already noted in footnote 1, a simple regression suggests that the output growth needed to keep unemployment stable, and thus $y$ close to $y^*$, is slightly above 5% per year.)

The risk premium increases with the distance of the debt-to-GDP ratio, $D$, from its target, $D^*$, *i.e.* with deviations of fiscal policy from its sustainability path. As we shall discuss later on, the risk premium could also be affected by the stock of international reserves and by evidence that the

[20] The relation between $rp$ and its determinants is likely to be non-linear and possibly asymmetric, particularly with respect to $y - y^*$ .

central bank is deviating from the interest rate rule consistent with its inflation targeting.

*Internal balance*

- We assume that the Egyptian economy produces goods that are imperfect substitutes for goods produced elsewhere in the world. Demand for domestic goods and, thus, output, $y$, depends on the relative price of home to foreign goods (the real exchange rate) $q = eP^*/P$, the domestic interest rate, $i^E$, the budget surplus $S$, and foreign direct investment, $FDI$. Internal balance is obtained when aggregate demand, $y$ matches full employment output, $y^*$

$$y^* = y(FDI(a),\ S,\ i^E,\ q) \qquad y_a > 0, y_S < 0, y_{i^E} < 0, y_q > 0 \tag{2}$$

where we have normalized world prices $P^* = 1$. An increase in $FDI$ raises demand by financing domestic investment. The other signs are standard. The equilibrium condition in the goods market is plotted in Figure 11 as the $IB$ schedule. An increase in the domestic interest rate, $i^E$, reduces absorption, the demand for domestic goods and thus output. To restore equilibrium, the real exchange rate must depreciate to switch demand towards domestic goods. The slope of the $IB$ schedule depends on how sensitive is the demand for domestic goods (and services) to changes in the interest rate and in the real exchange rate. We believe that, in the current crisis, foreign demand in particular, and thus net exports are rather unresponsive to the real exchange rate: thus the $IB$ schedule is rather flat.

*External balance*

- In equilibrium (with a flexible exchange rate) the balance of payments, *i.e.* the sum of the capital and the current account, is zero and international reserves do not change. The condition for no change in international reserves is

$$Capital\ Flows + NX(q) = 0\ ,\ \ NX_q > 0 \tag{3}$$

where $NX$ denotes the current account, an increasing function of the real exchange rate, $q$.

- there are two sources of capital flows: portfolio shifts between Egyptian and foreign deposits and $FDI$ flows

$$Capital\ Flows = Portfolio\ Flows\ +\ FDI \tag{4}$$

$FDI$ flows are an increasing function of the appetite for risk, $a$. Investors are risk averse and portfolio flows are determined by the difference in the expected returns (in domestic currency) between Egyptian deposits and dollar deposits abroad

$$Portfolio\ Flows = P\left(i^E - i^{\$} - \frac{Ee' - e}{e} - rp\right) \tag{5}$$

- to derive the relation between the interest rate and the real exchange rate implied by *external balance*, note that the expected depreciation of the nominal exchange rate is equal, by definition, to the sum of the expected depreciation of the real exchange rate and expected inflation. Hence, the expected nominal depreciation is

$$\frac{Ee' - e}{e} = \frac{Eq' - q}{q} + E\pi' \tag{6}$$

and the external balance condition is given by

$$C\left(i^E - i^{\$} - \frac{Eq' - q}{q} - E\pi' - rp\right) + \ FDI(a) + \ NX(q) = 0 \tag{7}$$

- in Figure 11 the relation between $i^E$ and $q$ implicit in equation (6) is labeleld $EB$. The schedule is drawn for a given expected inflation, $E\pi'$: it describes the economy's *external balance*. The $EB$ locus is downward sloping. A decrease in the domestic interest rate leads to a capital outflow. For a given expected inflation, $E\pi'$, and a given expected real exchange rate, $Eq'$, the real exchange rate, $q$, must depreciate, thus inducing expectations of a future appreciation. The real depreciation also improves $NX$, thus contributing to restoring external balance. In the short run, domestic prices are pre-determined and adjustment is mainly brought about by a nominal depreciation. [21]

*Inflation expectations*

- Portfolio flows depend on the expected nominal exchange rate. Equation (6) distinguishes between the real and nominal determinants of the expected change in the nominal exchange rate, that is, between movements related to the changes in the expected real exchange rate and to expected inflation. While the former depends on real factors, *i.e.* on economic fundamentals, the latter reflects nominal factors, in particular, monetary conditions.

[21] The slope of the $EB$ schedule depends on the degree of risk aversion: the larger the degree of risk aversion, the steeper the $EB$ schedule.

Egypt's real exchange rate before the crisis was close to equilibrium: this judgment is confirmed by inspection of Figure 10, which shows the evolution of the effective real exchange rate since the beginning of the eighties, and by the observation that the current deficit, though increasing in the past few years, was sustainable, *i.e.* consistent with the $FDI$ inflow. We see no good reason why the equilibrium real exchange rate, and thus $Eq'$, should have changed as a result of the international crisis. Hence, to determine the expected nominal exchange rate we simply need to determine $E\pi'$, expected inflation.

In an inflation targeting regime, when monetary policy is credible, expected inflation is equal to the inflation target $\pi^T$ and, thus, $E\pi' = \pi^T$. We shall define $i(R)$ the interest rate rule consistent with achieving $\pi^T$ over the horizon announced by the central bank. If the central bank were ever to deviate from this rate rule—for example lowering rates to stabilize output—such a move would determine a change in expectations. We capture these effects by assuming that expected inflation is equal to

$$E\pi' = \pi^T + \mu(i(R) - i^E) \tag{8}$$

when the CBE follows the interest rate rule, expected inflation is equal to the target; if the bank deviates from the rule, by setting a lower interest rate, $E\pi'$ rises above $\pi^T$.

This is clearly seen replacing (7) in (6) and rewriting the external balance condition as

$$C\left((1+\mu)i^E - \mu i(R) - i^{\$} - \frac{Eq' - q}{q} - \pi^T - rp\right) + FDI(a) + NX(q) = 0 \tag{9}$$

The slope of the $EB$ schedule depends on the extent to which the central bank sets interest rates consistently with the rule. As long as $i^E = i(R)$, expected inflation is equal to the target and external balance can be restored by small changes in the real exchange rate: the $EB$ schedule is steeper. By contrast, if the monetary authorities abandon the inflation target to set an interest rate $i^E$ lower than $i(R)$, expected inflation increases and so does the expected nominal exchange rate. In this case the real exchange rate must depreciate further to induce the expectation of a future appreciation needed to attract foreign capital: the $EB$ schedule is flatter. This is shown in Figure 12: an interest rate lower than $i(R)$ implies a flatter $EB$ locus.

Finally, and importantly, a deviation from the interest rate rule might also

induce an increase in the country risk premium, $rp$: this shifts the $EB$ schedule to the right leading to an even greater depreciation.

### 5.1 Egypt's policy options

We use our model to analyse the impact of a shock to the risk appetite of international investors and to discuss alternative policy options.

So far in this crisis, the fall in international risk appetite has led to a contraction in $FDI$ flows and to an increase in Egypt's risk premium, $rp$. This (together with lower exports and service payments, $NX$) has in turn led to a marked slowdown in growth. Such a reaction is what the model indeed suggests. Assume that the external shock to $FDI$ (and $NX$) occurs in the following initial conditions: the real exchange rate is in equilibrium, output is close to potential, the debt ratio to its target level and monetary policy is consistent with the inflation target. The effect of the external shock is shown in Figure 13. A fall in international risk appetite lowers $FDI$ and increases $rp$ shifting both the $EB$ and $IB$ curves to the right

- the $EB$ schedule shifts up. The real exchange rate depreciates because portfolio inflows must compensate for the fall in $FDI$ and the rise in $rp$; this requires that the nominal (and real) exchange rate depreciate to induce expectations of a future appreciation
- the $IB$ schedule shifts down. To keep output close to potential and maintain full employment, higher net exports or lower interest rates (or both) are needed to compensate for the fall in investment associated with the reduction in foreign-financed investment.
- at $E'$ both internal and external balance are restored. This requires:
  - an exchange rate depreciation that leads to the expectations of a future appreciation, attracts foreign capital and ensures external balance. The depreciation is larger the lower the expected appreciation that it induces and the less responsive are capital flows, that is, the flatter the $EB$ locus;
  - a reduction in the domestic interest rate, which is needed to clear the home goods market and avoid an increase in unemployment. If the central bank were to keep the interest rate constant, at $E''$, we would have external balance, with little or no change in international reserves, but output would fall below potential.

The question that arises is what are the benefits and the risks of lowering $i^E$ to move the economy to $E'$ thus avoiding the increase in unemployment.

- The benefits are clear. In $E''$ output is below potential and the increase in unemployment further increases the risk premium—that is beyond the increase associated with the initial fall in the risk appetite of international investors. Lowering interest rates avoids the risk of a vicious circle: a rise in the debt ratio, a further increase in $rp$ and, eventually, capital flights.

- The risk is a shift in expectations. The reduction in domestic interest rates could be consistent with the central bank not deviating from its interest rate rule: in $E''$, with lower output and higher unemployment, expected inflation would be lower, thus justifying a cut in interest rates. But if the elasticity of output to the nominal interest rate is small, the reduction in $i^E$ would have to be large to be effective. Add inflation expectations and it is easy to see that a move to $E'$ might imply abandoning the interest rate rule consistent with the inflation target.

  As $i^E < i(R)$ inflation expectations are destabilized and, through equation (5), this translates into exchange rate expectations. As a result, the increase in portfolio inflows needed to compensate the fall in $FDI$ requires a larger nominal depreciation: the $EB$ locus becomes flatter as we have seen in Figure 12. What happens is shown in Figure 14: the new equilibrium is in $E'''$ were output is at full employment but at the cost of a large real (and nominal) exchange rate depreciation. The effect on the country risk premium is ambiguous because, though the output expansion tends to reduce it, monetary and exchange rate instability raise $rp$. The net effect of abandoning the inflation targeting rule and aiming for a large depreciation is likely to be an increase in $rp$. If this is the case, the $EB$ schedule shifts further to the right with an even greater exchange rate depreciation.

The risk of a vicious cycle can be avoided by the use of fiscal policy.

An expansionary fiscal policy—a reduction in the primary surplus, $S$—would increase the demand for domestic goods and restore full employment. This however requires that two conditions be satisfied:

- the impact of fiscal policy on output must be sufficient to compensate the impact of the initial adverse shock and

- the fiscal stimulus should not raise doubts about medium term debt stability. To this end it is important to adopt fiscal measures that have positive spillovers on the private sector, and to provide clear evidence that the government intertemporal budget constraint has been taken explicitly into account when designing the fiscal package.

Assume for the moment, that the country risk premium, $rp$, does not change (and the interest rate is unaffected). Then, the fiscal stimulus shifts the $IB$ schedule back to the left; the equilibrium is still in $E''$ (Figure 14) but it now lies on the $IB$ schedule; *i.e.* output is now at full employment. Consider next the effect of the fiscal stimulus on the country risk premium $rp$. The net effect on $rp$ is in principle ambiguous; on the one hand the increase in output restores full employment and reduces the risk premium while, on the other hand, it leads to an increase in the debt-to-GDP ratio that, if unsustainable, would raise $rp$. It is then crucial that the expansionary fiscal policy be temporary and sustainable; *i.e.* that the intertemporal budget constraint is explicitly taken into account when designing the fiscal stimulus package. If this is the case, the net effect is a reduction of the $rp$ (though not enough to offset the initial increase due to the fall in the appetite for risk); the $EB$ schedule slightly shifts to the left so that the equilibrium is reached in a point close to $E''$ on its left.

There is an additional argument which suggests a moderate use of the exchange rate. The international financial crisis is a *global shock* and a solution to it requires an increase in *global demand*: using the exchange to reallocate demand across countries is not going to work. As we have learned from the experience of the 1930s, devaluations risk opening the door to protectionist responses that would enhance the collapse of world trade. Of course there are a few countries whose external position was unsustainable *before the crisis* and whose real exchange was vastly out of equilibrium. Egypt is not one of them: as we have argued, before the crisis the real exchange rate was close to equilibrium and the current account deficit small and sustainable.

An alternative degree of freedom would arise if Egypt had access to official international borrowing, for example IMF financing. Such financing could be designed—as it has in other emerging markets during this crisis—to finance the temporary shortfall in capital inflows, thus complementing the expansionary fiscal policy. Borrowing from the IMF would allow to counter the $FDI$ shock, thus preventing the shift in the $EB$ schedule and the ensuing exchange rate depreciation. Of course the same objective could be also achieved by running down international reserves. The two alternatives however are not equivalent: maintaining a high level of international reserves could be an important signal for financial markets—and in fact the persistence of a high level

of reserves is the most likely explanation of the recent fall in Egypt's EMBI spread to a level which is now one of the lowest among emerging economies.

**Summing up**

- Although fiscal and monetary policy are both effective in stimulating aggregate demand and driving output toward full employment, an expansionary, but sustainable, fiscal policy allows to reach the output target with a minimum exchange rate depreciation. By contrast, an expansionary monetary policy that aims at full employment, risks destabilizing inflation expectations and the exchange rate, opening up the possibility of a vicious circle: capital flight, a rise the debt ratio, a further increase in the risk premium—an outcome that evokes a currency crisis.

- The analysis in this model assumes that fiscal policy is effective. Our conclusions in Section 3 were not optimistic: in Egypt, an increase in public investement as large as 4% of GDP adds at most 1% to growth. This suggests that the government should investigate the realtive merit of alternative fiscal policy tools. Maybe a cut in taxes would do more to push demand than an incresae in public investment.

# 6 Conclusions: policy targets and policy credibility

We conclude the paper with a more general observation of the design of monetary and fiscal policies in Egypt and the role of credibility.

Credibility is the key element of policy and of the policymaker who implements it. In monetary policy the more credible is the central bank, the lower the output cost of keeping inflation stable. In fiscal policy the higher the credibility of the path of taxes and government spending announced by a government, the lower the cost of servicing the public debt and thus the amount of taxes and tax distortions imposed upon the economy.

A pre-condition of credibility is that a policymaker commits to an action he has the power to control. This is why policemen can be credible when they announce that will fine whoever is caught speeding (because they control the speedometer), while weathermen are not known for high credibility: they can predict the weather, but they do not control it. Lack of credibility sometimes arises not because policymakers

fail to keep up with their announcements, but simply because they have committed to outcomes they do not control.

In Egypt today this problem is particularly acute for the fiscal authorities who have committed, within the Fiscal Consolidation Plan, to a given path of overall budget deficits, a variable that they do not control. Indeed, the overall budget deficit depends on the interest payments and thus on nominal interest rates and inflation, that is, on variables that are controlled by the central bank. In this paper we have shown that fulfilling an overall deficit target does not ensure debt sustainability: a given deficit could be expansionary if inflation and interest rates turn out to be lower than expected. On the other hand, with high inflation and high real interest rates achieving the same deficit would require a strong fiscal contraction. In the latter case, the government inability to control inflation and interest rates could either result in higher budget deficits with a loss of credibility or in the government bearing a high cost for maintaining the announcement. It is hard to see a rationale for making the government fiscal stance depend on variables such as the interest rate and the inflation rate, that are controlled by the central bank, as this prevents a full assessment of the relative responsibilities of fiscal and monetary authorities. Accountability is an additional reason why the authorities should commit to outcomes that they can control: how could a government be responsible for higher than expected inflation and interest rates?

The government should instead announce a medium term target for the debt-to-GDP ratio and commit to a path for the primary deficit (that is the deficit net of interest payments) that stabilizes the debt ratio around this target. The primary deficits should be contingent on the level of debt and should be promptly revised in order to correct any deviation of the debt-ratio from its convergence path toward the target. Ideally, the primary deficits should be specified as a fraction of potential output, rather than current output. The fiscal rule that we have proposed in this paper accomplishes this task in part. Although it is not contingent on deviations of current output from potential output, it specifies the primary deficit so as to reach the debt target in the medium term, while still allowing for some flexibility. This fiscal rule is close in spirit to inflation targeting for a central bank, in that it targets the debt-to-GDP ratio, that is, the variable that the government should and can control over a medium-term horizon.

The CBE also faces a credibility problem in that it does not specify the target for inflation, the variable it can control. The central bank is committed to price stability, but it has so far been unwilling to announce an inflation target. The delay in the

process of moving to a formal inflation-targeting framework harms the central bank credibility in two ways. First, the central bank unwillingness to commit to a specific inflation rate may signal a lack of confidence in achieving the target and deprives the Egyptian economy of the full benefits of a nominal anchor. More important, the absence of an inflation target gives rise to the suspicion that the CBE aims to control the dollar exchange rate. Although the exchange rate is an important channel of monetary policy transmission and an instrument to be used especially at times of rising international prices to avoid pass trough into domestic prices, it cannot be a target in itself. The fact that in recent months interest rate have moved, inflation and inflation expectations have moved, while the dollar exchange rate has remained as steady as a rock, leads agents in the economy to believe that the central bank behaves as if it had an exchange rate target. This is risky. The central bank should dispel doubts that it is targeting the exchange rate. As the experience of fixed exchange rates has taught us, absent strict capital controls—which Egypt does not have—the central bank cannot control the exchange rate. It may even not wish to keep the rate stable: the real exchange rate may shift around as a result of shocks, inflation at home and abroad may change, all requiring a change in the nominal exchange rate. Moreover, the longer the time horizon the less likely it is that the central bank will wish to keep a specific bilateral exchange rate constant.

The only variable that a central bank can (over a medium-term horizon) and should commit to control is inflation. Credible central banks have gained their reputation by delivering stable inflation and following some form of inflation targeting. The CBE should rapidly move to an inflation targeting regime, a key element of which is the announcement of the inflation target.

In conclusion, the message should be clear. The Egyptian authorities today have a large credibility: it would be a pity if they lost it simply because of a spell of bad luck and because they had committed or pursued targets they do not control.

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**Table 1**

**Short run output equation, differentiating public and private capital**

ECM for variable LEGDP601 estimated by OLS based on cointegrating VAR(2)

**********

Dependent variable is dLEGDP601

41 observations used for estimation from 1968 to 2008

**********

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|---|---|---|---|
| dLEGDP6011 | -.47410 | .12442 | -3.8104[.001] |
| dLKSTOPUB1 | .20126 | .10797 | 1.8640[.071] |
| dLKSTOPRI1 | .36322 | .083717 | 4.3387[.000] |
| dLOILPRI1 | .031596 | .013794 | 2.2906[.029] |
| dLMEGDP651 | .20494 | .097720 | 2.0973[.044] |
| dLOEC60101 | .30090 | .18302 | 1.6441[.110] |
| ecm1(-1) | -.047297 | .0072832 | -6.4940[.000] |
| ecm2(-1) | -.018116 | .0072832 | -2.4874[.018] |

**********

dLEGDP601 = LEGDP601-LEGDP601(-1)

dLEGDP6011 = LEGDP601(-1)-LEGDP601(-2)

dLKSTOPUB1 = LKSTOPUB(-1)-LKSTOPUB(-2)

dLKSTOPRI1 = LKSTOPRI(-1)-LKSTOPRI(-2)

dLOILPRI1 = LOILPRI(-1)-LOILPRI(-2)

dLMEGDP651 = LMEGDP65(-1)-LMEGDP65(-2)

dLOEC60101 = LOEC6010(-1)-LOEC6010(-2)

ecm1 = 4.2030*LEGDP601 + 2.5034*LKSTOPUB
+ 1.3216*LOILPRI -7.0216*LMEGDP65 -.78338*LOEC6010;

ecm2 = -.73984*LEGDP601 -1.9216*LKSTOPUB +
1.4130*LKSTOPRI -.85086*LOILPRI -2.3742*LMEGDP65 + 4.6655*LOEC6010

**********

| | |
|---|---|
| R-Squared | .70677 |
| S.E. of Regression | .0072832 |

**Table 2**

**Short run output equation, differentiating public and private capital**

Dependent Variable: D(LEGDP601_1)
Method: Least Squares
Date: 06/03/09 Time: 11:36
Sample (adjusted): 1968 2009
Included observations: 42 after adjustments
D(LEGDP601_1)= C(1)+C(2)*D(LEGDP601_1(-1))+C(3)
*D(LMEGDP65_1(-1))+C(4)*D(LOEC6010_1(-1))+C(5)
*D(LKSTOPRI_1(-1))+ C(6)*D(LKSTOPUB_1)+C(7)*LEGDP601_1(-1)
+C(8)*LMEGDP65_1(-1)+C(9)*@TREND

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | 0.042418 | 0.434821 | 0.097554 | 0.9229 |
| C(2) | -0.452763 | 0.118276 | -3.828004 | 0.0005 |
| C(3) | 0.262982 | 0.108582 | 2.421965 | 0.0211 |
| C(4) | 0.683945 | 0.221694 | 3.085094 | 0.0041 |
| C(5) | 0.178011 | 0.060673 | 2.933958 | 0.006 |
| C(6) | 0.267805 | 0.141997 | 1.885999 | 0.0681 |
| C(7) | -0.174401 | 0.064022 | -2.724089 | 0.0102 |
| C(8) | 0.162495 | 0.063327 | 2.565977 | 0.015 |
| C(9) | 0.003965 | 0.004227 | 0.937904 | 0.3551 |

| | | | |
|---|---|---|---|
| R-squared | 0.710898 | Mean dependent va | 0.048462 |
| Adjusted R | 0.640813 | S.D. dependent var | 0.027822 |
| S.E. of regı | 0.016675 | Akaike info criterion | -5.162456 |
| Sum squar | 0.009175 | Schwarz criterion | -4.790098 |
| Log likelihc | 117.4116 | Hannan-Quinn criteı | -5.025972 |
| F-statistic | 10.14334 | Durbin-Watson stat | 1.875201 |
| Prob(F-stat | 0.000001 | | |

**Table 3**

**Short run output equation, differentiating public and private capital with some measure of the effect of US recessions**

Dependent Variable: D(LEGDP601_1)
Method: Least Squares
Date: 06/03/09 Time: 11:43
Sample (adjusted): 1968 2008
Included observations: 41 after adjustments
D(LEGDP601_1)= C(1)+C(2)*D(LEGDP601_1(-1))+C(3)
*D(LMEGDP65_1(-1))+C(4)*D(LOEC6010_1(-1))+C(5)
*D(LKSTOPRI_1(-1))+ C(6)*D(LKSTOPUB_1)+C(7)*LEGDP601_1(-1)
+C(8)*LMEGDP65_1(-1)+C(9)*NBERLAST*SPREAD+C(11)
*@TREND

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | 0.003093 | 0.383766 | 0.008059 | 0.9936 |
| C(2) | -0.303349 | 0.113559 | -2.671294 | 0.0119 |
| C(3) | 0.197958 | 0.100118 | 1.977254 | 0.057 |
| C(4) | 0.410774 | 0.214365 | 1.916233 | 0.0646 |
| C(5) | 0.14987 | 0.054342 | 2.757887 | 0.0097 |
| C(6) | 0.171921 | 0.128246 | 1.340557 | 0.1898 |
| C(7) | -0.163869 | 0.056488 | -2.900938 | 0.0068 |
| C(8) | 0.165175 | 0.05614 | 2.942221 | 0.0061 |
| C(9) | -0.018286 | 0.005487 | -3.332908 | 0.0022 |
| C(11) | 0.00288 | 0.003744 | 0.769215 | 0.4476 |

| | | | |
|---|---|---|---|
| R-squared | 0.788743 | Mean dependent va | 0.048687 |
| Adjusted I | 0.72741 | S.D. dependent var | 0.028129 |
| S.E. of reg | 0.014686 | Akaike info criterion | -5.395588 |
| Sum squa | 0.006686 | Schwarz criterion | -4.977644 |
| Log likeli | 120.61 | Hannan-Quinn criter | -5.243396 |
| F-statistic | 12.8601 | Durbin-Watson stat | 1.765163 |
| Prob(F-sta | 0 | | |

GENERAL GOVERNMENT NET DEBT - IMF Definition

Notes:
Debt data includes the public sector external debt.
Interest rate refers to the average interest cost computed as the interest expenditure divided by the previous period debt stock.
Interest expenditure excludes valuation effects of depreciation on the debt stock.
Inflation is the GDP-deflator inflation rate consistent with average inflation rate.
Real interest rate is equal to interest rate minus inflation.
The share of foreign currency debt is equal to 30% up to 35% with devaluation.

**Table 4 - IMF with revised 2009 deficit, inflation, interest rate, and depreciation**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 0.8 | -1.0 | -0.8 | -0.2 | 0.2 | 0.2 |
| Interest rate | 7.8 | 9.0 | 9.1 | 8.8 | 8.7 | 8.5 | 8.4 | 8.4 |
| Inflation | 12.3 | 15.0 | 11.4 | 7.5 | 7.2 | 7.6 | 8.0 | 8.0 |
| Real interest rate | -4.5 | -6.0 | -2.3 | 1.3 | 1.5 | 0.9 | 0.4 | 0.4 |
| GDP growth | 7.2 | 5.5 | 5.0 | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.1 | 5.5 | 3.3 | 3.2 | 3.5 | 3.6 | 3.4 |
| Debt ratio | 62.1 | 60.0 | 56.8 | 52.7 | 49.4 | 46.5 | 44.1 | 41.7 |

Interest rate was previously assumed 8.7, inflation 16,1, depreciation 0.
A GDP-Deflator inflation rate of 15.0% corresponds to 5% end-of period inflation.

**Table 5 - Baseline growth with deficits as in stabilization plan**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 0.8 | -1.0 | -0.8 | -0.2 | 0.2 | 0.2 |
| Interest rate | 7.8 | 9.0 | 7.0 | 8.5 | 9.0 | 8.5 | 8.0 | 8.0 |
| Inflation | 12.3 | 15.0 | 5.5 | 6.5 | 7.0 | 7.0 | 6.5 | 6.5 |
| Real rate | -4.5 | -6.0 | 1.5 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.5 | 2.8 | 4.5 | 6.5 | 6.0 | 6.0 | 6.0 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.2 | 4.7 | 3.7 | 3.8 | 3.9 | 3.9 | 3.8 |
| Debt ratio | 62.1 | 61.1 | 61.1 | 58.5 | 55.2 | 52.6 | 50.5 | 48.5 |

Table 6 - Baseline growth with high primary deficits

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 3.8 | 2.5 | 1.5 | 0 | 0 | 0 |
| Interest rate | 7.8 | 9.0 | 7.0 | 8.5 | 9.0 | 8.5 | 8.0 | 8.0 |
| Inflation | 12.3 | 15.0 | 5.5 | 6.5 | 7.0 | 7.0 | 6.5 | 6.5 |
| Real rate | -4.5 | -6.0 | 1.5 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.5 | 2.8 | 4.5 | 6.5 | 6.0 | 6.0 | 6.0 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.2 | 7.7 | 7.4 | 6.6 | 4.8 | 4.3 | 4.1 |
| Debt ratio | 62.1 | 61.1 | 64.1 | 65.0 | 63.6 | 60.9 | 58.2 | 55.7 |

Table 7 - Zero growth with planned primary deficits

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 0.8 | -1.0 | -0.8 | -0.2 | 0.2 | 0.2 |
| Interest rate | 7.8 | 9.0 | 7.0 | 7.0 | 8.0 | 7.5 | 7.5 | 7.5 |
| Inflation | 12.3 | 15.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Real rate | -4.5 | -6.0 | 2.0 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.3 | 0 | 2.5 | 5.0 | 5.5 | 5.5 | 5.5 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.2 | 4.9 | 3.1 | 3.6 | 3.8 | 4.0 | 3.9 |
| Debt ratio | 62.1 | 61.2 | 63.2 | 61.8 | 59.2 | 56.7 | 54.7 | 52.8 |

Table 10 - 30% Depreciation with Zero growth and high primary deficits

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3 | 3.5 | 3.8 | 2.5 | 1.5 | 0 | 0 | 0 |
| Interest rate | 7.8 | 9.0 | 7.0 | 7.0 | 8.0 | 7.5 | 7.5 | 7.5 |
| Inflation | 12.3 | 15.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Real rate | -4.5 | -6.0 | 2.0 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.3 | 0 | 2.5 | 5.0 | 5.5 | 5.5 | 5.5 |
| Depreciation | -6.3 | 30.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.4 | 8.2 | 7.1 | 6.7 | 4.8 | 4.6 | 4.5 |
| Debt ratio | 62.1 | 65.4 | 70.5 | 72.6 | 71.9 | 69.1 | 66.5 | 63.9 |

Table 11 - Fiscal rule with Baseline growth

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 |
| Interest rate | 7.8 | 9.0 | 7.0 | 8.5 | 9.0 | 8.5 | 8.0 | 8.0 |
| Inflation | 12.3 | 15.0 | 5.5 | 6.5 | 7.0 | 7.0 | 6.5 | 6.5 |
| Real rate | -4.5 | -6.0 | 1.5 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.5 | 2.8 | 4.5 | 6.5 | 6.0 | 6.0 | 6.0 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.2 | 5.6 | 6.3 | 6.5 | 6.2 | 5.9 | 5.9 |
| Debt ratio | 62.1 | 61.1 | 61.9 | 61.9 | 60.8 | 59.9 | 59.0 | 58.2 |

Table 8 - Zero growth with high primary deficits

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3 | 3,5 | 3,8 | 2,5 | 1,5 | 0 | 0 | 0 |
| Interest rate | 7,8 | 9,0 | 7,0 | 7,0 | 8,0 | 7,5 | 7,5 | 7,5 |
| Inflation | 12,3 | 15,0 | 5,0 | 5,0 | 6,0 | 6,0 | 6,0 | 6,0 |
| Real rate | -4,5 | -6,0 | 2,0 | 2,0 | 2,0 | 1,5 | 1,5 | 1,5 |
| GDP growth | 7,2 | 3,3 | 0 | 2,5 | 5 | 5,5 | 5,5 | 5,5 |
| Depreciation | -6,3 | 4,5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7,5 | 8,2 | 7,9 | 6,8 | 6,4 | 4,5 | 4,4 | 4,2 |
| Debt ratio | 62,1 | 61,2 | 66,2 | 68,3 | 67,8 | 65,1 | 62,6 | 60,2 |

Table 9 - 30% Depreciation with Baseline growth and high primary deficits

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3 | 3,5 | 3,8 | 2,5 | 1,5 | 0 | 0 | 0 |
| Interest rate | 7,8 | 9,0 | 7,0 | 8,5 | 9,0 | 8,5 | 8,0 | 8,0 |
| Inflation | 12,3 | 15,0 | 5,5 | 6,5 | 7,0 | 7,0 | 6,5 | 6,5 |
| Real rate | -4,5 | -6,0 | 1,5 | 2,0 | 2,0 | 1,5 | 1,5 | 1,5 |
| GDP growth | 7,2 | 3,5 | 2,0 | 4,5 | 6,5 | 6,0 | 6,0 | 6,0 |
| Depreciation | -6,3 | 30,0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7,5 | 8,4 | 8,0 | 7,8 | 7,0 | 5,1 | 4,6 | 4,4 |
| Debt ratio | 62,1 | 65,3 | 68,7 | 69,5 | 68,0 | 65,0 | 62,2 | 59,5 |

Figure 1:

**Table 12 - Fiscal rule with Zero growth**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3.0 | 3.5 | 1.6 | 1.5 | 1.4 | 1.4 | 1.5 | 1.6 |
| Interest rate | 7.8 | 9.0 | 7.0 | 7.0 | 8.0 | 7.5 | 7.5 | 7.5 |
| Inflation | 12.3 | 15.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Real rate | -4.5 | -6.0 | 2.0 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.3 | 0 | 2.5 | 5.0 | 5.5 | 5.5 | 5.5 |
| Depreciation | -6.3 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.2 | 5.7 | 5.6 | 6.1 | 5.8 | 5.8 | 5.8 |
| Debt ratio | 62.1 | 61.2 | 64.0 | 65.1 | 64.6 | 63.5 | 62.6 | 61.7 |

**Table 13 - Fiscal rule with 30% Depreciation and Zero growth**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Primary deficit | 3 | 3.5 | 1.4 | 1.3 | 1.2 | 1.3 | 1.3 | 1.4 |
| Interest rate | 7.8 | 9.0 | 7.0 | 7.0 | 8.0 | 7.5 | 7.5 | 7.5 |
| Inflation | 12.3 | 15.0 | 5.0 | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Real rate | -4.5 | -6.0 | 2.0 | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| GDP growth | 7.2 | 3.3 | 0 | 2.5 | 5.0 | 5.5 | 5.5 | 5.5 |
| Depreciation | -6.3 | 30.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deficit | 7.5 | 8.4 | 5.8 | 5.7 | 6.2 | 5.8 | 5.8 | 5.8 |
| Debt ratio | 62.1 | 65.4 | 68.1 | 68.9 | 68.1 | 66.7 | 65.5 | 64.3 |

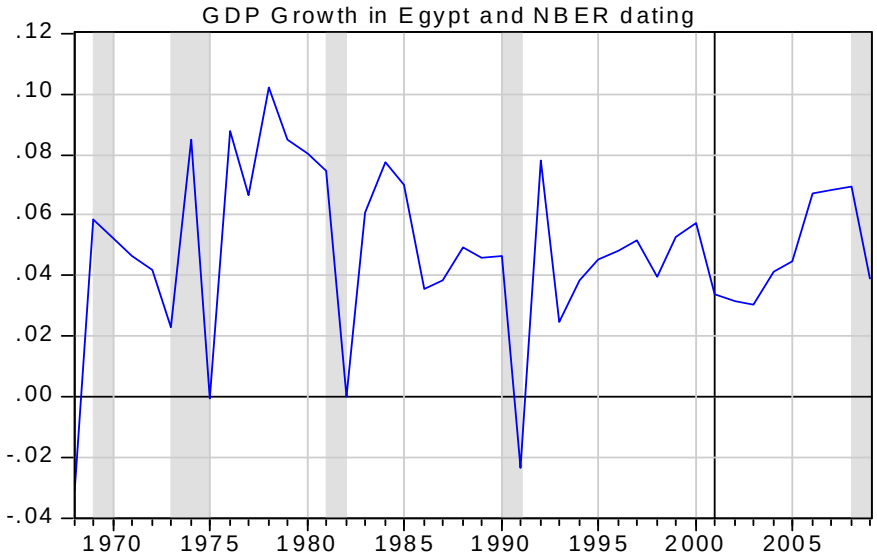

GDP Growth in Egypt and NBER dating
.12
.10
.08
.06
.04
.02
.00
-.02
-.04
1970
1975
1980
1985
1990
1995
2000
2005

Figure 1

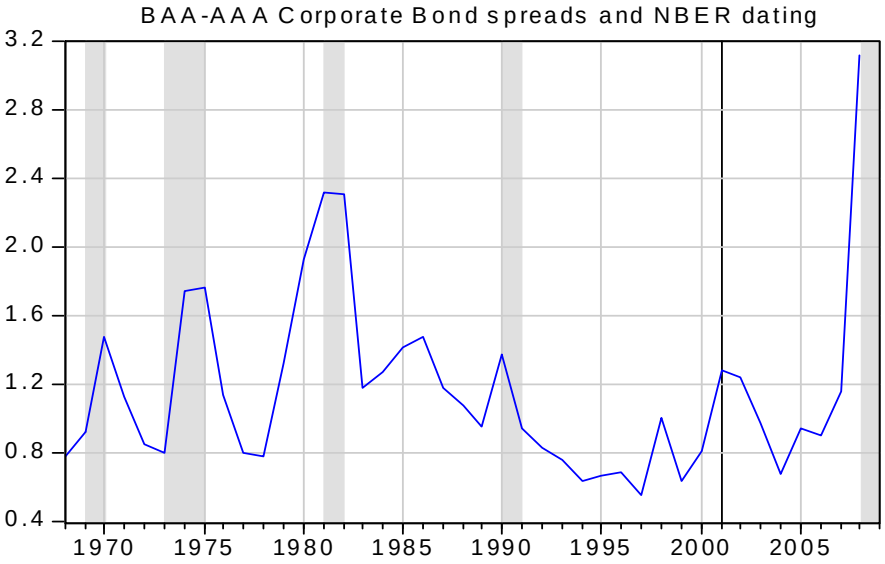

BAA-AAA Corporate Bond spreads and NBER dating
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
1970
1975
1980
1985
1990
1995
2000
2005

**FIGURE 3 - HIGH PRIMARY DEFICITS FOR FISCAL EXPANSION VERSUS PLANNED PRIMARY DEFICITS UNDER BASELINE GROWTH SCENARIO**

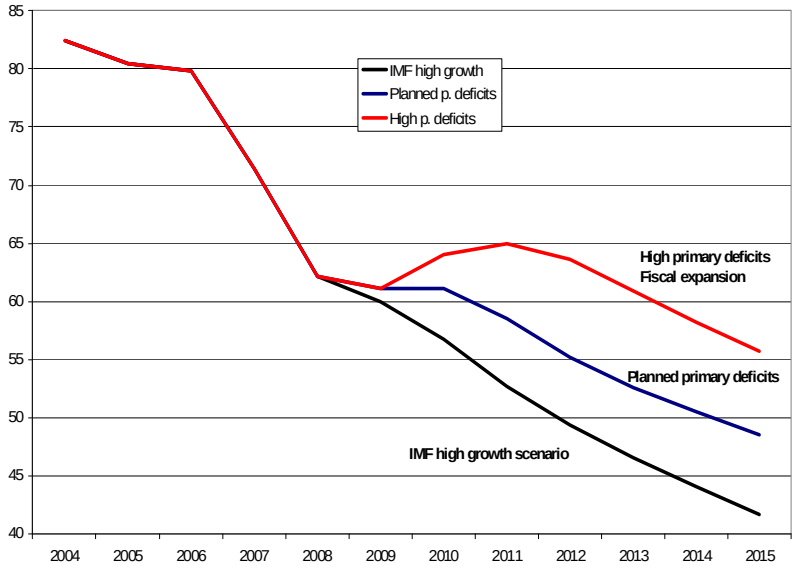



**FIGURE 4 - EFFECT OF ZERO GROWTH ON DEBT SUSTAINABILITY WITH HIGH PRIMARY DEFICITS FOR FISCAL EXPANSION**

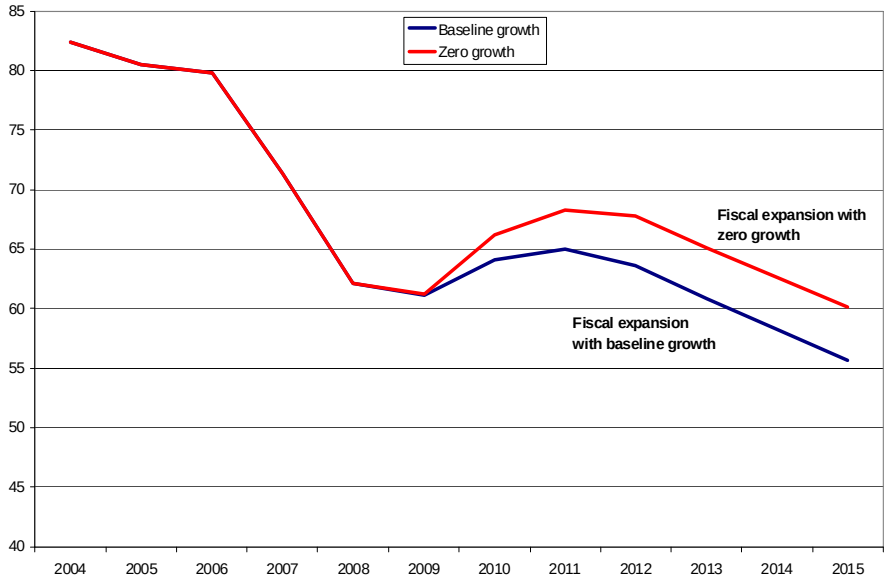


FIGURE 5- EFFECT OF A 30% DEPRECIATION AND ZERO GROWTH WITH HIGH PRIMARY DEFICITS FOR FISCAL EXPANSION

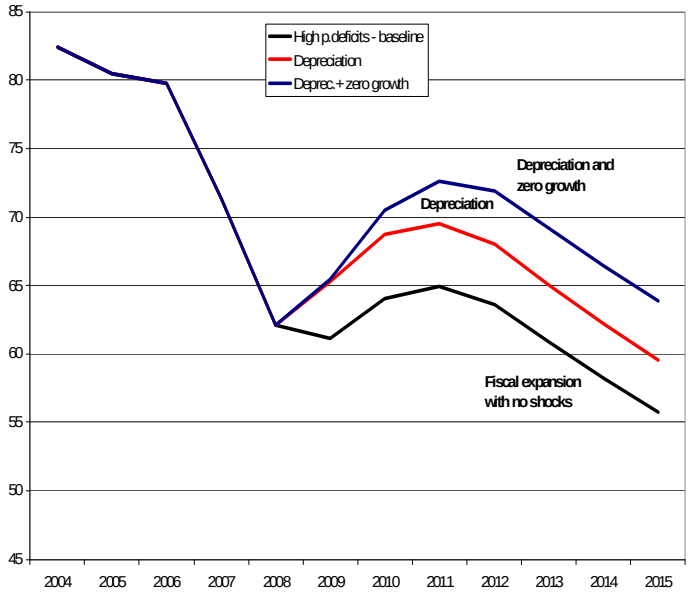



FIGURE 6 - THE OVERALL DEFICIT IS NOT THE RIGHT TARGET FOR DEBT SUSTAINABILITY
EFFECT OF ZERO GROWTH ON THE OVERALL DEFICIT AND THE DEBT RATIO

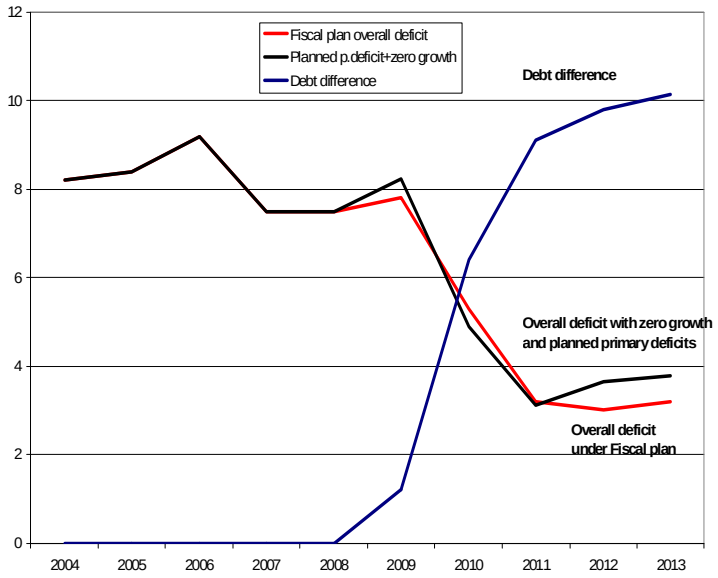


FIGURE 7 - FISCAL RULE VERSUS PLANNED PRIMARY DEFICITS AND HIGH DEFICITS UNDER BASELINE GROWTH SCENARIO

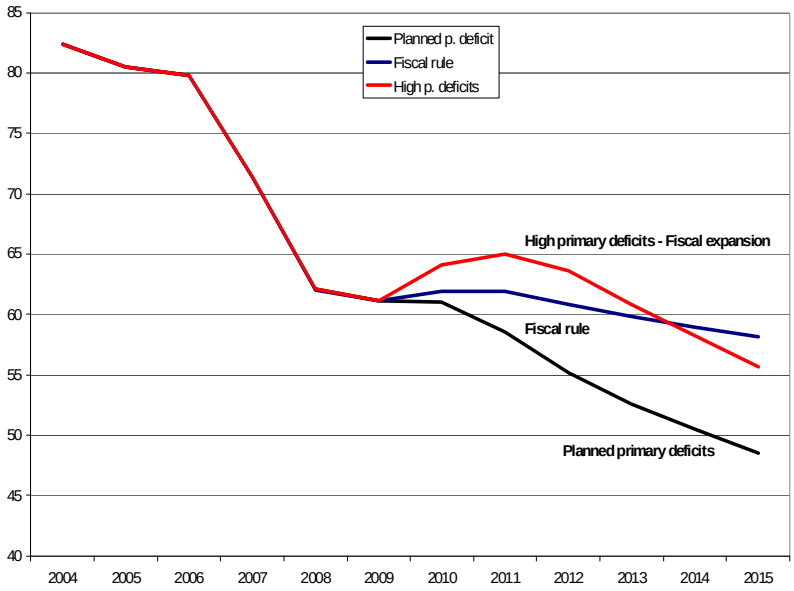
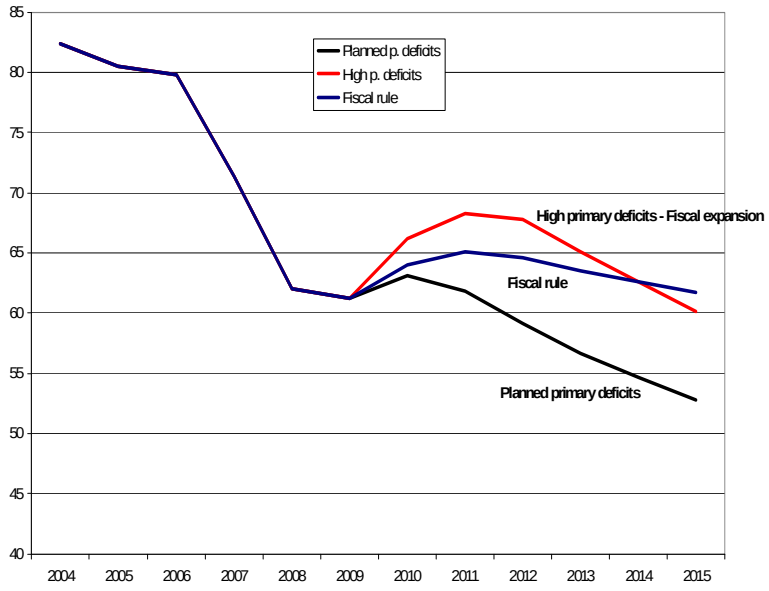
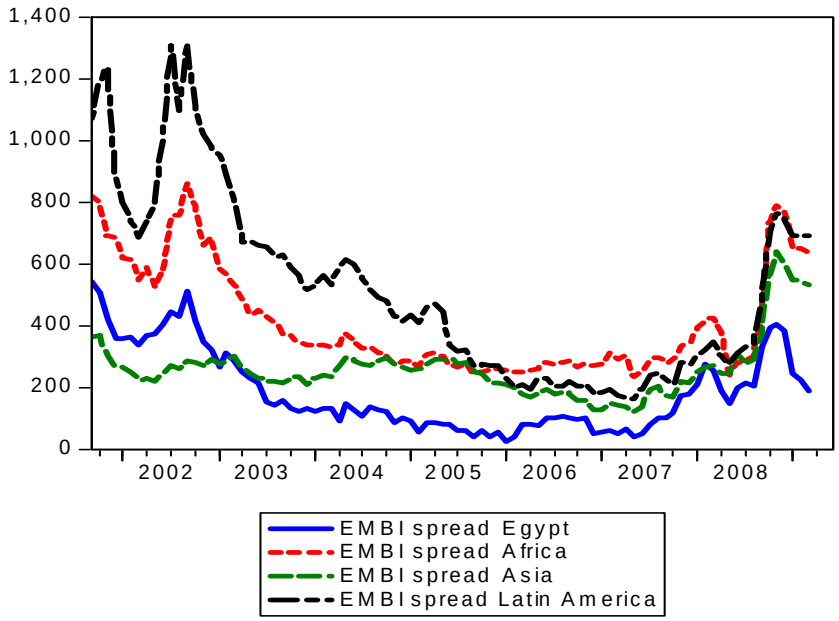



FIGURE 8 - FISCAL RULE VERSUS PLANNED PRIMARY DEFICITS AND HIGH DEFICITS UNDER THE ZERO GROWTH SCENARIO




1,400
1,200
1,000
800
600
400
200
0
2002
2003
2004
2005
2006
2007
2008
EMBI spread Egypt
EMBI spread Africa
EMBI spread Asia
EMBI spread Latin America

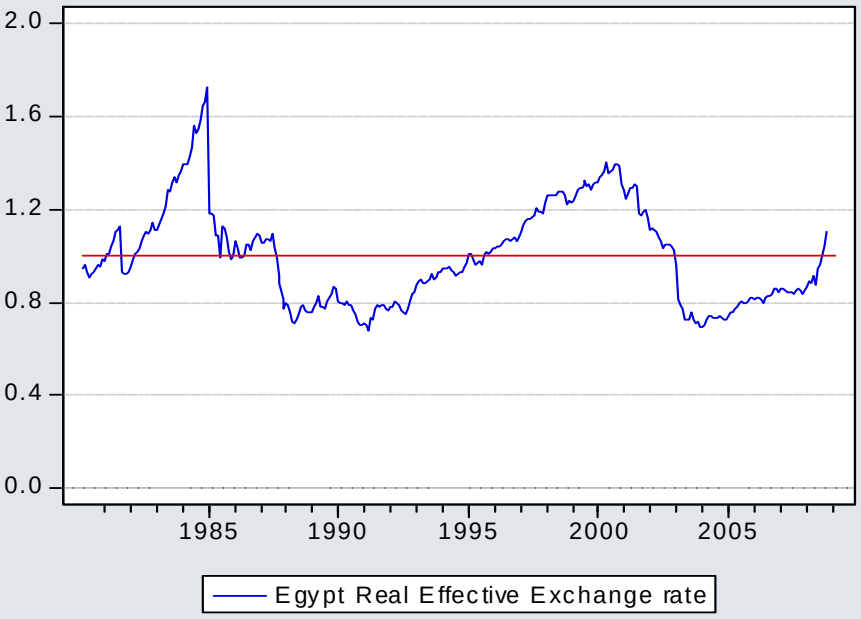

2.0
1.6
1.2
0.8
0.4
0.0
1985
1990
1995
2000
2005
Egypt Real Effective Exchange rate

Figure 11: internal and external balance

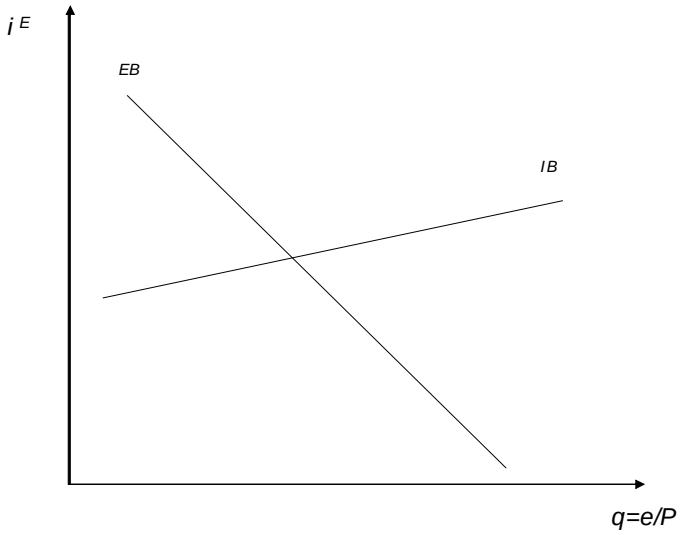



Figure 12: internal and external balance when the CBE follows and when it deviates from the IT rule

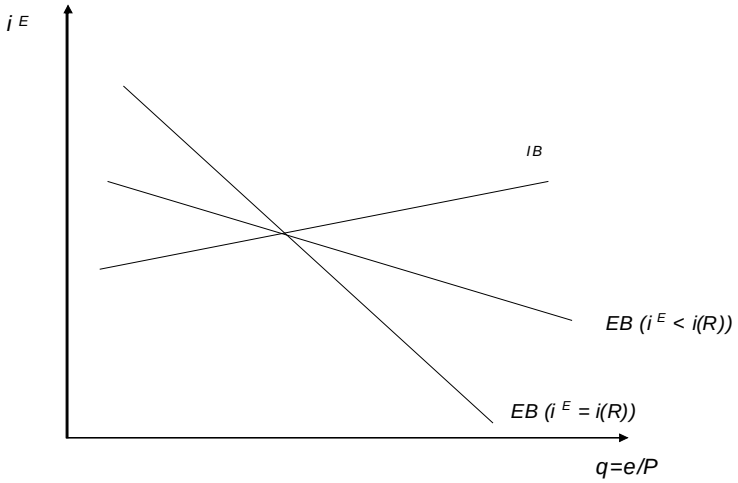


Figure 13: the effect of a fall in international risk appetite

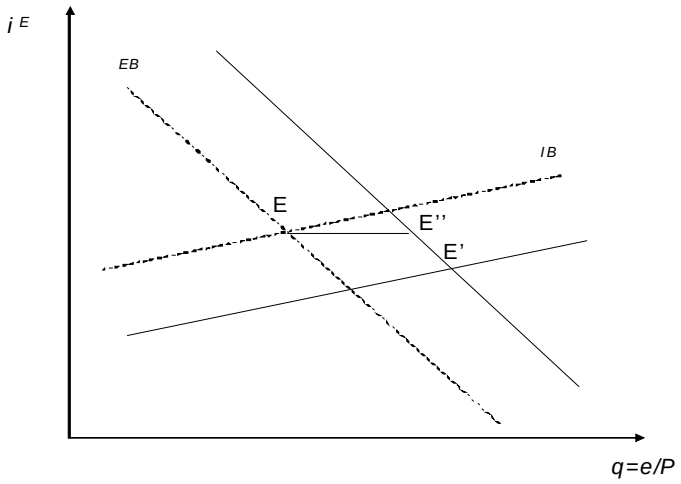



Figure 14: a shift in expectations