

Fiscal Sustainability and the Role of the State: A New Analytical Framework

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Abstract

Mainstream models of fiscal sustainability link fiscal sustainability with government budget constraint. However, such models disregard the fact that government budget constraint is a dynamic process linked with the change in the role of the state over time. Specifically, the extent of government intervention and its means influence government budget stance. The socioeconomic aspects of government intervention in a developing country like Egypt, affect its budget, particularly, the level of budget deficit and public debt. The paper has identified two types of budget constraints (narrower and broader), each of which has different fiscal implications regarding fiscal sustainability. Adopting the legal framework (narrower budget constraint) indicates that debt ratio does not exceed 60% (to GDP) that government considers as a safe ratio. Nevertheless, this legal budget constraint disregards the fact that fiscal authority utilizes other units, such as the economic authorities, to carry out its specified role. Consequently, the approach, which the paper adopts, links budget operations and the operations by the other entities in the fiscal system (Broader budget constraint). Based upon this approach public debt exceeds the official figures of deficit and debt. Moreover, the analysis of sustainability indicators reveals the fiscal challenges that face the Egyptian government given the significant cost of social policy.

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“If public debt did not exist, it would most certainly be invented soon”

William Buiter 2004

1. Introduction

The role carried out by the state (fiscal authority) in Egypt as in any other developing country, is fundamental. The analysis of government spending attitudes or functions as stated in the statements of the state budget reveals such crucial role. Basically, the functions and mechanisms of the state, in Egypt, have not been undergone fundamental changes in the last 4 decades, though the economy is said to move from a planned to market economy since the mid seventies. As a result, government has been forced to adopt considerable expenditure programs. However, the ability of the Egyptian government to cope with such active roles is constrained by resource availability, due to limited tax revenue and the vulnerability of other sources.

The limitations upon government revenues have led the state to expand its borrowing domestically and overseas. Public debt ratio in Egypt has exceeded 100 % that raises, in turn, *the question of fiscal sustainability as a crucial one*. The paper discusses the issue of fiscal sustainability in Egypt via introducing an approach that links the fiscal implications for the role of the state in the Egyptian society with the state budget stance and public debt. Moreover, the paper compares fiscal sustainability indicators, given the extent of the role of the state, with those of traditional approach that test the stationarity of public debt series.

The paper has shown that the mechanisms, by which the state implements its social protection policies, have different implications regarding the sustainability of the Egyptian fiscal system. Furthermore, it argues that ignoring institutional linkages between the state budget and other fiscal operations, done by other entities in the system, is misleading in judging fiscal sustainability. Thus, the paper emphasizes that restructuring the mechanisms and tools of the system is a reform key. Besides, it leads to significant conclusion regarding the sustainability of the system.

The paper is organized as follows. Section two discusses the issue of sustainability and budget constraint as discussed in literature. The linkage between the role of the state, fiscal implications and sustainability is presented in section 3. Given the analysis of section 3, the Egyptian Budget operations and sustainability indicators are discussed in section 4. Thus, section 4 presents the results of fiscal sustainability tests. While, in section 5 the sustainability of the system is discussed through

considering the fiscal structure and mechanisms by which the state performs its functions particularly, its social functions.

2. The Concept of Fiscal Sustainability and Budget Constraint

In literature, the ability of government to manage budget deficits and debt accumulation has been receiving a growing attention since equilibrium growth paths of the economy need to be supported by adequate fiscal policy (Afonso 2004). Thus, the issue of sustainability has occupied central concern in literature. The term fiscal sustainability has meant that is to equate the present value of total government spending and revenues (Mendoza and Oviedo 2003). Therefore, a country's economic policies are defined to be fiscally sustainable, if they lead to a situation in which the country can satisfy its budget constraint (Alvarado et al 2004). Theoretically, fiscal sustainability implies that the observed net stock of the government's financial liabilities is consistent with fiscal solvency considerations (Mendoza and Oviedo 2003). Hence, in case that the observed debt-output ratio does not satisfy the intertemporal budget constraint, the fiscal position is judged to be unsustainable and thus, there is an urgent need for policy correction (Afonso, (2004)).

Given the intertemporal budget constraint, sustainability is defined as the debt-to-GDP ratio returns to original level(s) after excessive disturbances or variation (Blanchard, (1990). For a fiscal policy to be sustainable, after having accumulated debt in the past, government must run primary surpluses in future (Ibid, p). Similar definitions are given by Gunter (2003) and Burnside (2003), where sustainability is meant that a country can meet its current and future debt service obligations in full without recourse to debt relief, rescheduling or accumulation of arrears.

Fiscal institutions have defined sustainability as that a government should be able to meet its obligations if and when they arise in the future. The ability to meet obligations when arise, implies that a government should consider debt financing only as the debt burden remains at a prudent level³. The Treaty of Maastricht (1992) determine conditions for fiscal sustainability by limiting the ratio of government debt to GDP to 60 percent, though it was also agreed that higher ratios are acceptable as long as the debt to GDP ratio is sufficiently falling over time.

The problem of fiscal sustainability exists when government revenues are not enough to keep on financing the costs associated to new issuance of public debt

³ The British budget report, HM treasury report (2003).

(Afonso, (2000)). Therefore, the absence of fiscal sustainability would be evident when, the state's contractual liabilities have reached an excessive proportion of the national Income. In this case, “*It has become clear that the claims of the bond-holders are more than the tax payers can support*” (Keynes (1923)). Given the initial level of debt, government determines the size of primary balances which would need to run, in order to keep its debt stock constant as a fraction to GDP.

Government budget constraint (identity) provides the basic framework to derive fiscal sustainability conditions (indicators)⁴. The budget constraint for period ‘ t ’ is given by equation (1) as follows:

$$Deb_t = (E_t - R_t) + \eta Deb_{t-1} \quad (1)$$

where, Deb_t is the market value of public debt in period t , E_t and R_t are government spending and tax revenues at period t , respectively, $\eta = (1 + i)$ denotes interest payments on debt, where i is the nominal interest rate, and Deb_{t-1} is the stock of public debt in period $t-1$. By rearranging the budget identity, the change in public debt issuance is given as:

$$\Delta Deb_t = Ps + i Deb_{t-1} \quad (2)$$

where, $\Delta Deb = Deb_t - Deb_{t-1}$, and Ps is the primary surplus (deficit). The change in monetary base (as an option of financing government spending), ΔM can be inserted into equation (2) that is:

$$\Delta Deb_t = Ps + i Deb_{t-1} + \Delta M \quad (3)$$

Sustainable debt ratio is obtained as percentage to output, that makes equation (3) rewritten;

$$\frac{\Delta Deb_t}{Y} = \frac{Ps}{Y} + i \frac{Deb_{t-1}}{Y} + \frac{\Delta M}{Y} \quad (4)$$

Also, equation (4) can be rewritten as:

$$\Delta d = ps + id_{t-1} + \Delta m \quad (5)$$

⁴ This analysis is based on the writings of Blanchard (1990), Buiters (1985, 2003), Burnside (2003), and others,

where the lowercase letters denote the change in debt, primary surplus (deficit) and change of monetary base as proportion to output. The time evolution of debt is obtained by taking total differentiation for the left hand side of equation (5):

$$\frac{d\left(\frac{Deb}{Y}\right)}{dt} = \frac{1}{Y} \frac{dDeb}{dt} + \left[-\frac{Deb}{Y^2} \frac{dY}{dt} \right] \quad (6)$$

That is,

$$\Delta \left[\frac{Deb}{Y} \right] = \frac{\Delta Deb}{Y} - \frac{Deb}{Y} \frac{\Delta Y}{Y} \quad (6a)$$

Equation (6a) is simplified to be written in the form:

$$\Delta d = \frac{\Delta Deb}{Y} - dn \quad (6b)$$

where, n denotes the nominal growth rate of output. Substituting for Δd in equation (5), implies that:

$$\Delta d = e - r + id_{t-1} - \frac{\Delta M}{Y} - dn \quad (7)$$

Let $\gamma = \frac{\Delta M}{M}$, then, equation (7) is simplified to be as follows:

$$\Delta d = e + id - r - \gamma m - dn \quad (8)$$

Assuming the steady-state equilibrium, ($\Delta d = 0$), makes equation (8):

$$dn = e + id - r - \gamma m \quad (9)$$

Equation (9) is defined to the long-run budget constraint, which can be rearranged to be:

$$ps - id = dn + \gamma m \quad (9a)$$

To simplify the analysis, changes in the monetary base are excluded. Inserting the fisher equation for real interest rate ($\rho = i + \pi$), and given the growth rate as ($n = g + \pi$), variables in equation (9a) is written in real terms and given by equation (10):

$$\Delta d = ps + d(\rho - g) \quad (10)$$

Clearly, equation (10), implies that there is a tendency of *debt accumulation* once $[\rho < g]$ *unless there is primary surplus*. In the steady state equilibrium, where $(\Delta d = 0)$, equation (10) is given as:

$$ps = d(\rho - g) \quad (10a)$$

In case that fiscal sustainability is defined as “keeping a constant level of public debt ratio to output”, equation (10a) shows that primary surplus equilibrate the difference between real interest rate and growth rate in the long run. Since tax revenues are the main source of government revenues, equation (10a) is written in terms of tax gap indicator as:

$$t = e + d(\rho - g) \quad (10b)$$

Given equation (10a) and (10b), fiscal sustainability is reached once there is primary surplus in the budget or the real growth rate is higher than real interest rate $[\rho < g]^5$.

Similar results are obtained if the analysis is extended to use intertemporal budget constraint. Generally, the literature defines fiscal sustainability as budget operations that are consistent with the intertemporal budget constraint that is to equate the present value of government spending with revenues without restructuring government spending or raising taxation. The starting point to derive sustainability conditions is the intertemporal budget constraint, given as:

$$Deb_t = \sum_{j=0}^{\infty} \frac{PC_{t+j}}{\prod_{i=0}^k (1+\sigma_{t+i})} = \sum_{j=0}^{\infty} \frac{RV_{t+j}}{\prod_{i=0}^k (1+\sigma_{t+i})} - \sum_{j=0}^{\infty} \frac{EX_{t+j}}{\prod_{i=0}^k (1+\sigma_{t+i})} \quad (11)$$

where PC is primary balances, RV is flow of government revenues, EX denotes the flow of spending (excluding interest payments) and σ is the discount rate (nominal interest rate). For a developing country such as the case of Egypt, it is crucial to distinguish between domestic and foreign debt, therefore, equation (11) is re-written as follows:

⁵ This is called Blanchard (1990) indicator of fiscal sustainability.

$$\begin{aligned}
Deb_t = DDeb_t + \Phi(EDeb_t) &= \sum_{t=0}^{\infty} \left[\frac{(1-\psi_{t+j})}{\prod_{i=0}^k (1+\sigma_{t+i})} + \frac{\psi\Phi \prod_{i=0}^{\infty} (1+z_{t+i})}{\prod_{i=0}^k (1+\sigma_{t+i}^*)} \right] PC_{t+j} \\
&= \sum_{j=0}^{\infty} \frac{RV_{t+j}}{\prod_{i=0}^k (1+\sigma_{t+i})} - \sum_{j=0}^{\infty} \frac{Ex_{t+j}}{\prod_{i=0}^k (1+\sigma_{t+i})} \quad (11a)
\end{aligned}$$

where, $DDeb_t$ denotes the domestic public debt, Φ denotes the Exchange rate for the Egyptian currency, $EDeb_t$ refers to external public debt. Ψ denotes external funds allocated to finance primary deficit, where Z_t is the exchange rate appreciation, and σ^* is the interest rate paid on foreign debt. Equation (12) can be written in terms of output ratio as:

$$\begin{aligned}
d_t = Dd_t + \Phi_t(Ed_t) &= \sum_{t=0}^{\infty} \left[\frac{(1-\psi_{t+j})}{\prod_{i=0}^k (1+\sigma_{t+i})} + \frac{\psi\Phi \prod_{i=0}^{\infty} (1+z_{t+i})}{\prod_{i=0}^k (1+\sigma_{t+i}^*)} \right] \prod_{m=1}^{\infty} (1+n_{t+m}) pc_{t+j} = \\
&\sum_{j=0}^{\infty} \frac{\prod_{m=1}^{\infty} (1+n_{t+m})}{\prod_{i=0}^k (1+\sigma_{t+i})} rv_{t+j} - \sum_{j=0}^{\infty} \frac{\prod_{m=1}^{\infty} (1+n_{t+m})}{\prod_{i=0}^k (1+\sigma_{t+i})} ex_{t+j} \quad (12)
\end{aligned}$$

This equation provides a powerful way of understanding the key determinants of sustainable debt ratio given the assumption that is the intertemporal budget constraint is satisfied: *government revenues, government spending, forging outstanding debt, domestic and foreign interest rate, exchange rate, inflation rate, output growth rate.*

Empirically, the test for sustainable debt level is based upon the concept adopted for sustainability. It can be distinguished between two crucial approaches, depending upon the definition of sustainability. The first definition adopted the cyclical nature of debt as it define sustainability that the value of public debt must be equal to the sum of future primary surpluses. The second definition tests the assumption that sustainability exists once the present value of public debt must approach to zero as t (time) goes to infinity.

The latter definition of sustainability is empirically adopted by Trehan and Walsh (1991), who test the absence of No-Ponzi-Game condition. The methodology applied by the authors has been to test the stationarity of the first difference of the

stock of public debt. Similarly, Hakkio and Rush (1991), have establish testing procedure in which fiscal sustainability is tested by Cointegration test. The Hakkio and Rush (1991) model test whether there is a co-integration between government revenues and government expenditures.

Trehan and Walsh (1991) have suggested the following equation to test for the debt series stationarity:

$$(1-Lag)^2 Deb_t = \alpha_0 + \alpha_1 t + \delta_0 (1-Lag) Deb_{t-1} + \sum_{j=1}^m \delta_j (1-Lag)^2 Deb_{t-j} + \varepsilon_t \quad (13)$$

with the following null hypothesis:

$$H_0 : \delta_0 = 0$$

$$H_0 : \delta_0 < 0$$

In case that, the null hypothesis is rejected, it implies that the process $(1-Lag) Deb_{t-1}$ is stationary, leading to a conclusion that the hypothesis of sustainable debt is not rejected. While, if the null hypothesis is not rejected, the process $(1-Lag) Deb_{t-1}$ is stationary only in the first difference that implies the debt series does not comply with sustainability conditions. However, the absence of stationarity for the variation in debt series does not confirm the absence of sustainable fiscal policy, since the stationarity is a sufficient condition (Afonso 2000).

The Hakkio and Rush (1991), have used the methodology of Cointegration to test the sustainability of fiscal stance starting from the following budget constraint:

$$E_t + i_t Deb_{t-1} - R_t = \sum_{n=0}^{\infty} \frac{1}{(1+\mu)^{n+1}} [\Delta Rv_{t+n} - \Delta Exp_{t+n}] + \lim_{n \rightarrow \infty} \frac{Deb_t}{(1+\mu)^{n+1}} \quad (14)$$

where $Exp_t = E_t + (i_t - \mu) Deb_{t-1}$, and they assume that the real interest rate is stationary with mean μ . With sum simplification equation (14) is rewritten as:

$$E_t + i_t Deb_{t-1} - R_t = \sum_{n=0}^{\infty} \frac{1}{(1+\mu)^{n+1}} [\Delta Rv_{t+n} - \Delta Exp_{t+n}] + \lim_{n \rightarrow \infty} \frac{Deb_t}{(1+\mu)^{n+1}} \quad (14a)$$

If EXP_t is defined as $Exp_t = E_t + i_t Deb_{t-1}$, and given the No-Ponzi game condition

$\lim_{n \rightarrow \infty} \frac{1}{(1+\mu)^{n+1}} \Delta Deb_t = 0$, then (14a) is given as:

$$Exp_t - R_t = \sum_{n=0}^{\infty} \frac{1}{(1+\mu)^{n+1}} [\Delta Rv_{t+n} - \Delta Exp_{t+n}] + \lim_{n \rightarrow \infty} \frac{Deb_t}{(1+\mu)^{n+1}} \quad (14b)$$

The test of sustainable debt level implies the existence and stationarity of the No-Ponzi condition, i.e., $\lim_{n \rightarrow \infty} \frac{1}{(1 + \mu)^{n+1}} \Delta Deb_t = 0$. The latter is simply tested through the following Cointegration regression between government expenditures and revenues given by equation (15):

$$R_t = \varphi_1 + \varphi_2 Exp_t + v_t \quad (15)$$

This technique allows us to test whether fiscal deficit is sustainable or not. If the null hypothesis no-cointegration between R_t and EXP_t , is not rejected, it implies that the debt policy is not sustainable. However, in case the null hypothesis is rejected with ($\varphi_2=1$), the deficit policy is sustainable. Nonetheless, if ($\varphi_2 < 1$), the policy might be unsustainable once the growth of government spending is higher than revenues.

Despite the tendency of literature (theoretical and empirical) links fiscal sustainability and budget constraint, it is criticized since, under any circumstance, the true government budget constraint, as an accounting identity relating the overall government borrowing requirement to all sources and uses of government revenue, always holds. Accordingly, standard fiscal sustainability analysis, implicitly, assumes that adjustments through the level and composition of tax revenue or primary expenditure are preferable to adjustments via default or inflation. A government, for instance, can decide to satisfy its budget constraint by not paying (via outright default) or by inflating away its debt. Therefore, the analysis of fiscal sustainability reflects, ultimately, a value judgment on the cost and benefits of alternative adjustment mechanisms (Mendoza (2003)).

Therefore, the paper is arguing that fiscal sustainability must be defined as “the sustainable ability of the state to manage its fiscal obligations resulted from its specified roles in the economy”. Thus, the state can cope with such obligations through the change of its scope and size of intervention. It is worth noting that the significant change in the role of the state might reveals the fiscal burden which leads to such change. These links are revealed in the next section.

3. The Role of the State and Fiscal Implications

Economic theory has not provided a unique prescription for the role of the state. However, it provides valuable guidance for the answer of the question of what should the state do, and not do, and how best to do. Two broad reasons justify

government intervention; market failure and distributional issue (equity). The classical and new-classical models limit the role of the state to correct the market failure. And thus, the state is responsible for providing basic public goods including law and order, national defense and basic physical infrastructure. The models that represents the Keynesian's economic thought, consider the state as supportive mechanism for market forces, instead of being a substitute as the Marxists believe. Generally, two broad area of intervention is recommended by economic literature;

- Correction of market failure (due to externalities, public goods characteristics, enabling the environment for the market forces,...) (efficiency issue)
- The distributional aspects of production process (equity issue)

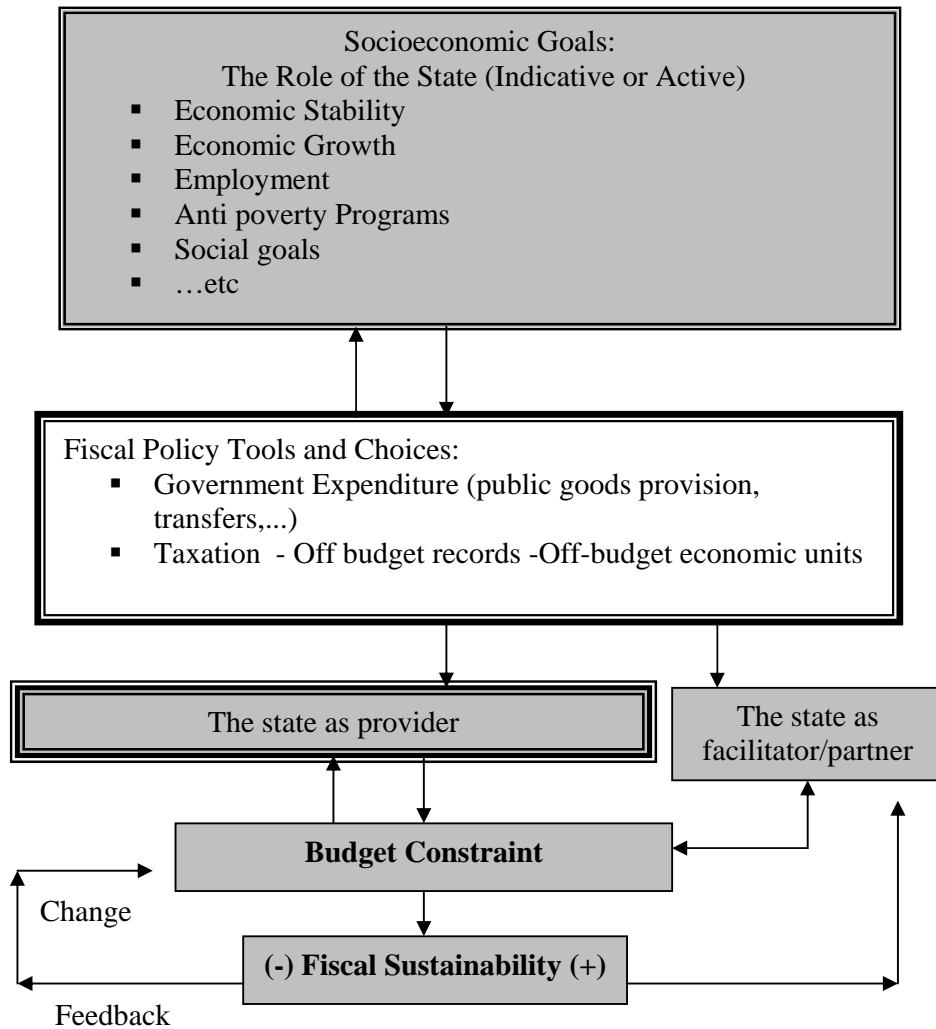
In brief, the state intervention is the key tool in order to create the ground needed for efficiency and equity. However, the scope and size of state intervention has significant fiscal implications, as fiscal policy is crucial in correcting market failure and providing such enabling environment for equitable distribution of income and wealth. The fiscal implications of state intervention are identified by Musgrave (1959, 1989), who distinguishes four models for the role of the state in fiscal theory, each of which has different fiscal scope:

- The *classical service state* (such as pure public goods, infrastructure services...).
- The *welfare state* where the state admits distributional aspects of development process.
- The *collective (communal) state*, by which the resource allocation and goals are set by the public.
- The *State failure* called as the flawed state in which the scope of state intervention exceeds its optimal scope

Moreover, fiscal policy theorists distinguish between the state as a direct provider of goods and services and the state as facilitator/partner and promoter. As argued, each pattern of state intervention has explicit and implicit budgetary implications (Dodson and Paramo 2001). Economic and social impact of financing the functions attributed to the state differs, markedly, due to the method of finance. The government budget constraint is real reflection to the choice of finance method. Financing such functions through taxation differs in its impacts if they financed by debt or printing money. The

following figure expresses such relation between the state functions, methods of finance and social and economic outcomes and fiscal sustainability:

Figure (1): Fiscal Sustainability and the Role of the State



As the model demonstrates, the budget constraint, fiscal deficit and role of the state is a system of linked entities. Sustainability of the system differs according to the scope and size of the role of the state, as provider and as facilitator or partner. Also, the failure of the system to reach sustainable fiscal indicators might push fiscal authority to adjust the mechanisms by which the state provides or facilitate services. Moreover, it may push fiscal authority to change the scope of the state role as provider and as facilitator. However, in case fiscal indicators support sustainability of the system, it might not lead to significant change for budget constraint and so on. Nevertheless,

such change might take time to go through such changes in both directions, given political and social constraints⁶. This mirrors the dynamism of budget constraint.

The country experiences has shown that, in any mixed economy, the right mix of markets and state activities is constrained by the realities of economy. In Egypt, as mixed economy, both public and private sectors work together. Till the 1970s, the state in Egypt has been the principle provider. This pattern has changed implicitly by the end of 1970s and the start of the eighties. Significant change comes with the 1990s, since the start of the structural adjustment program in 1991. Despite the role as provider has witnessed significant change, the role of state to correct market failure regarding equitable distributional issue has not witnessed significant change overtime. The analysis for the statements of the state budget reveals such significant role. For instance the main attitudes for the public expenditure in as stated in the state budget draft for the fiscal year 2004/2005, are; a)- **Social development**: aims at supporting and caring about low-income people and is the government's commitment to assist that category, b)- **Economic development**; aims at carrying out investments and increasing assets of society and production in addition to promoting exports, c)- **Improving conditions of employees**: aims at raising wages and salaries as well as living standard, Support the insurance systems by providing all care for pension holders, d)- **Control the public debt**, e)- **Care about maintaining the capitalist assets** and provide the operating requirements to control the governmental stock and rationalize expenditure, f)- **Activate and support the role of the economic authorities** through reforming their financing structures to play their role in the development process.

These aims of spending show the major role of the budget despite the change in economic environment in Egypt since the nineties. The state continues, through, the budget to support the vulnerable groups of population, though significant part of this spending has not been recorded in the state budget. Such institutional and linkages with the state budget and methods of finance are essential in affecting *sustainability indicators*. The following section provides an overview that explains how the fiscal structure in Egypt is correlated with the state objectives and how this structure affects the indicators of sustainability.

⁶ Alesina, A. and Perotti, R. (1996). "Fiscal Discipline and the Budget Process", *American Economic Review Papers and Proceedings*, 86; Pp: 400-407.

3- The Egyptian Fiscal Structure and the State Budget

The Analysis for the statement of the Egyptian state budget during the period (1978-2005), indicates that fiscal authority (government) has identified two crucial functions for fiscal policy:

- Developmental functions (goals)
- Equity aspects of income distribution (some times called social justice, social aspects of reform,..)

The developmental functions of fiscal policy aim at developing and creating enabling environment for economic growth, through public spending in infrastructures and other supportive projects. Social spending aims at protecting the needy and vulnerable groups in the Egyptian society, through establishing and supporting social security system and through more spending upon social services such as education, health, culture, food subsidies,..etc. However, the general government has used different mechanisms to reach such goals. In addition to the general budget spending, general government has utilized other units which are not part of the state budget to work as supportive (basic) mechanisms in delivering such functions.

While the legal framework of the state budget has established the base for channels of spending and revenues, *the actual act* of general government spending does not match with this legal and institutional framework. According to the Egyptian budget Law (No. 53/1973, 11/1979 and 87/2005), the state budget includes three parts:

1. Administrative Agency (Ministries)
2. Services Authorities (Units⁷ such universities, students hospitals,..)
3. Municipalities (27 governantes⁸)

However, there are other entities which are linked with the state budget, implicitly, that are crucial entities in affecting the figures of the state budget deficit and debt. These entities are:

- **The Economic Authorities** (public utilities such water, petroleum, the National Authority for Social Insurance)
- **The National Investment Bank** (NIB)

Till the fiscal year 1978/1979, the Economic authorities had been part of the Egyptian state budget. Starting from 1979/1980, the economic operations of such authorities

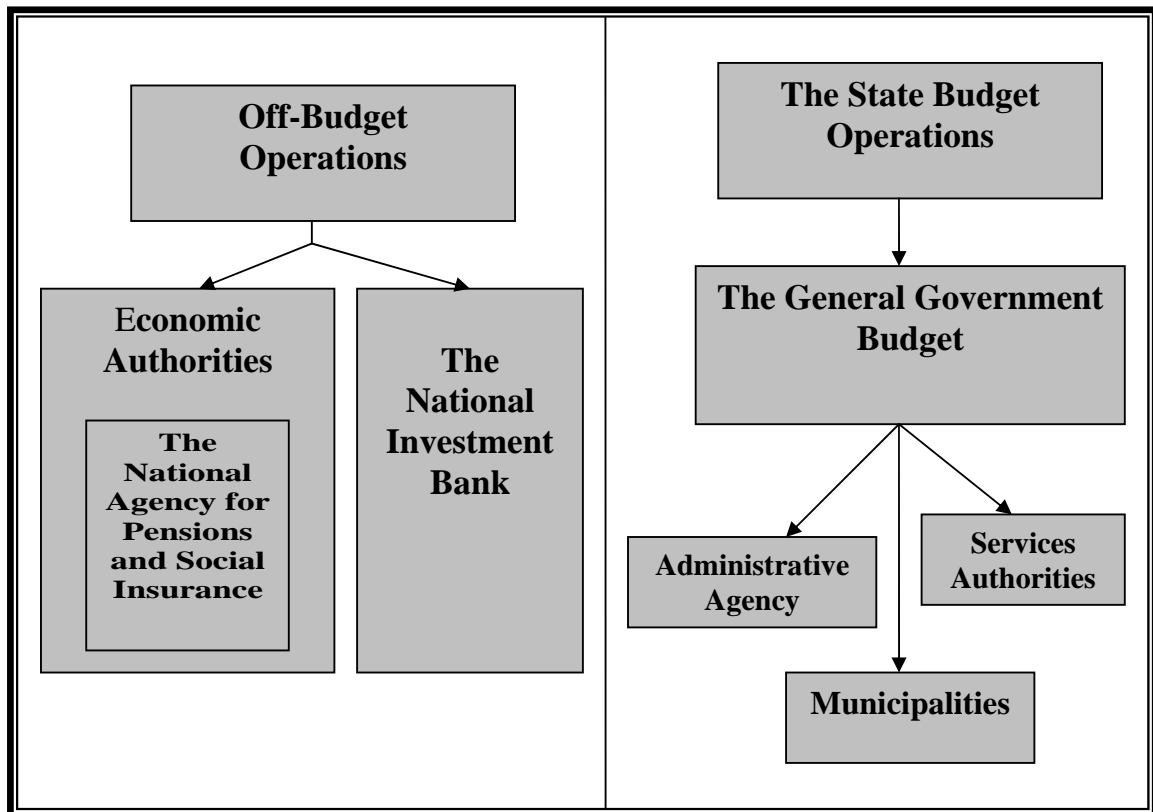
⁷ These units provide their services either free of charge or for very low fees.

⁸ Local governments.

were excluded from the budget. According to the budget law (11/1979), the authorities' spending and revenues should be recorded in separate budgets. Moreover, the state budget law stipulates that these authorities should practice their activities according to cost/benefits yardstick and must transfer their surplus -after paying taxes- to the state budget.

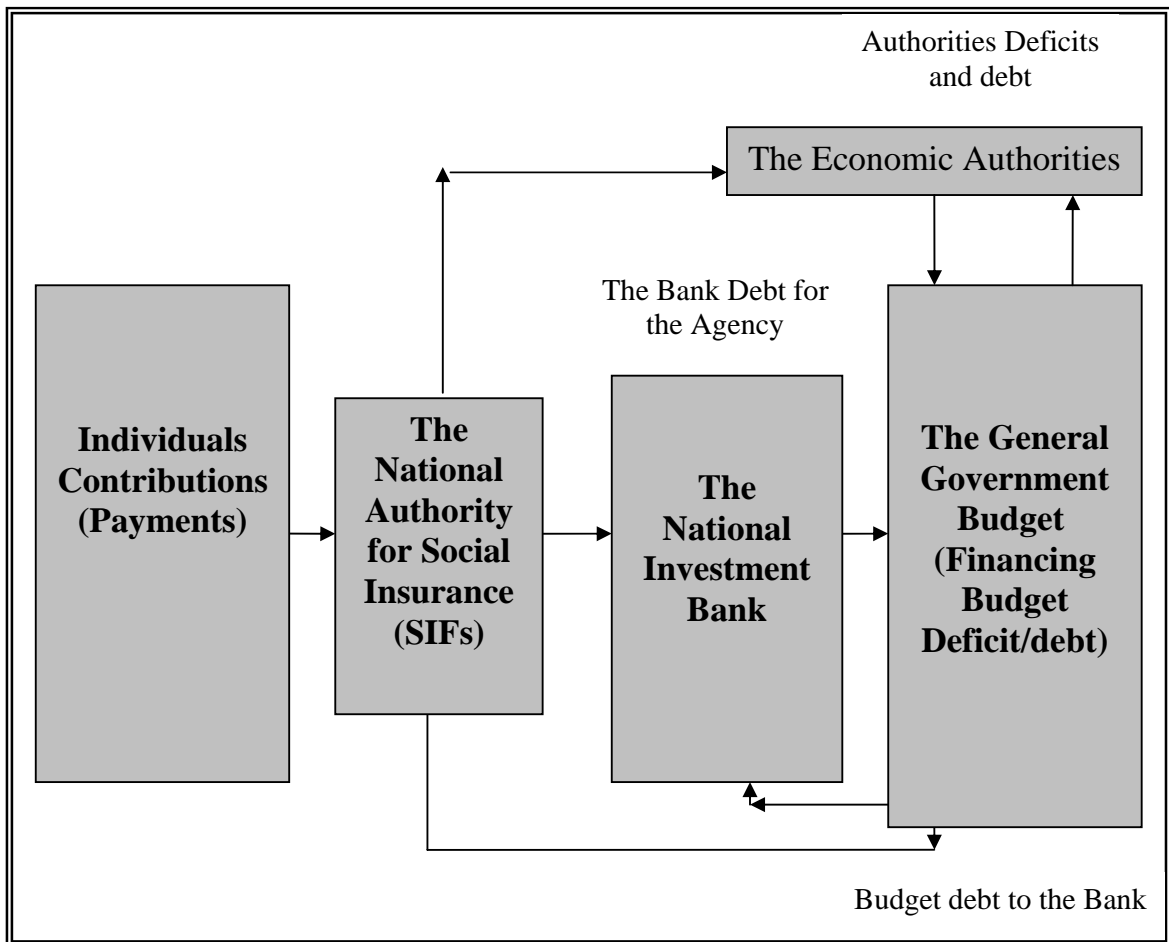
The National Investment Bank (NIB), which is established in 1980, is a key player in the Egyptian fiscal structure. The NIB is founded in order to finance government Public investments. By law, 75 % of the pension funds (Social Insurance Funds SIFs) are invested by the INB. In practice, pension funds sources account almost 90 percent of the NIB, while the other 10 percent come from commercial bank investment accounts, Post office savings, Investment certificates of Al-Ahly Bank and others. According to the budget law, the relations among these entities and the state budget can be shown in the following figure:

Figure (2): The State Budget and Off-Budget Operations according to the budget Law



Despite this legal separation between these entities, it has been incomplete. Till 1996, the investment spending of the economic authorities have recorded in the state budget. Moreover, the state budget has continued to finance the deficit of economic authorities whether this deficit has been a result of either its current or capital expenditures. Economic authorities have been the key tool for the state (government) to deliver subsidies for most of goods and services they provide. Furthermore, the authorities, namely, the national authority for social insurance⁹, has been the source for financing the state budget deficit via the borrowing process through National Investment Bank, indirectly, as shown in figure (3).

Figure (3): The State Budget and Off-Budget Operations



⁹ The National Insurance Funds includes social insurance funds for public and private sectors employees.

Given that, the Egyptian government (Fiscal Authority) is facing two different budget constraints:

- ***The narrower budget constraint*** (includes spending and revenues of the entities determined according to the state budget law).
- ***The Broader Budget constraint*** (includes all public activities and operation in and off the budget, delivered by economic authorities, the national investment bank and the national authority for social insurance).

This fiscal structure is shaped due to the structure of the Egyptian social insurance system that is considered a mix of two systems; the fully-funded and pay as you go system. Despite the Egyptian pension system is, by law, a fully-funded system, in practice; it is close to be considered pay as you go system. The state budget provides 70% of social insurance funds in the system. These funds are invested by the social funds through the national investment bank (NIB). Moreover, the government has used to pay 10 % as an increase in its share for social insurance every year. This makes the social insurance system or the pension system is, practically, a “pay-as-you go” system. The problem exists since the government (state budget) finances its fiscal deficits through borrowing these funds again from the National Investment Bank. This crucial feature of the fiscal relations among the state budget and other entities in the system affects the methodology of ***debt calculation***, where assuming, a pay as you go system, implies that the assets of social insurance funds are part of the state budget’s assets and at the same time the funds deposits are liabilities upon the budget. This classification of pension system is so crucial regarding determining the concept of public debt as the basic indicator of fiscal sustainability.

Another crucial feature of the fiscal system in Egypt is the role functioned by economic authorities. Despite the separation between the state budget and economic authorities, many of them are used as the subsidy mechanism by which the state implements its social protection policy in order to provide help for lower income individuals and other vulnerable groups. The paper managed to record 21 of economic authorities such as: Rural Electricity Authority, The National Authority for railways, The Authority of public transportation in Cairo, The Authority of public

transportation in Alexandria, the GASC....etc¹⁰, which continue to perform an influential social role in the Egyptian society. Thus, broader definition for budget constraint must take the activities of such authorities in the process of calculations.

Therefore, the fiscal entities in the Egyptian system are connected to each other through explicit and implicit relations as shown in figure (4). The linkages among fiscal entities in the Egyptian system have significant fiscal implications for sustainability indicators as it will be shown below. Thus, the narrow budget constraint is set due to the state budget law that makes equation (1) is written as:

$$GDeb_t = (GE_t - GR_t) + \eta GDeb_{t-1} \quad (16)$$

where $GDeb_t$, and GE_t and GR_t denote government debt, spending and revenues as stated in the state budget. In case other entities are included in the state budget, the concept of debt is extended to include:

- The debt of public authority
- Debt of NIB
- The debt of social insurance funds

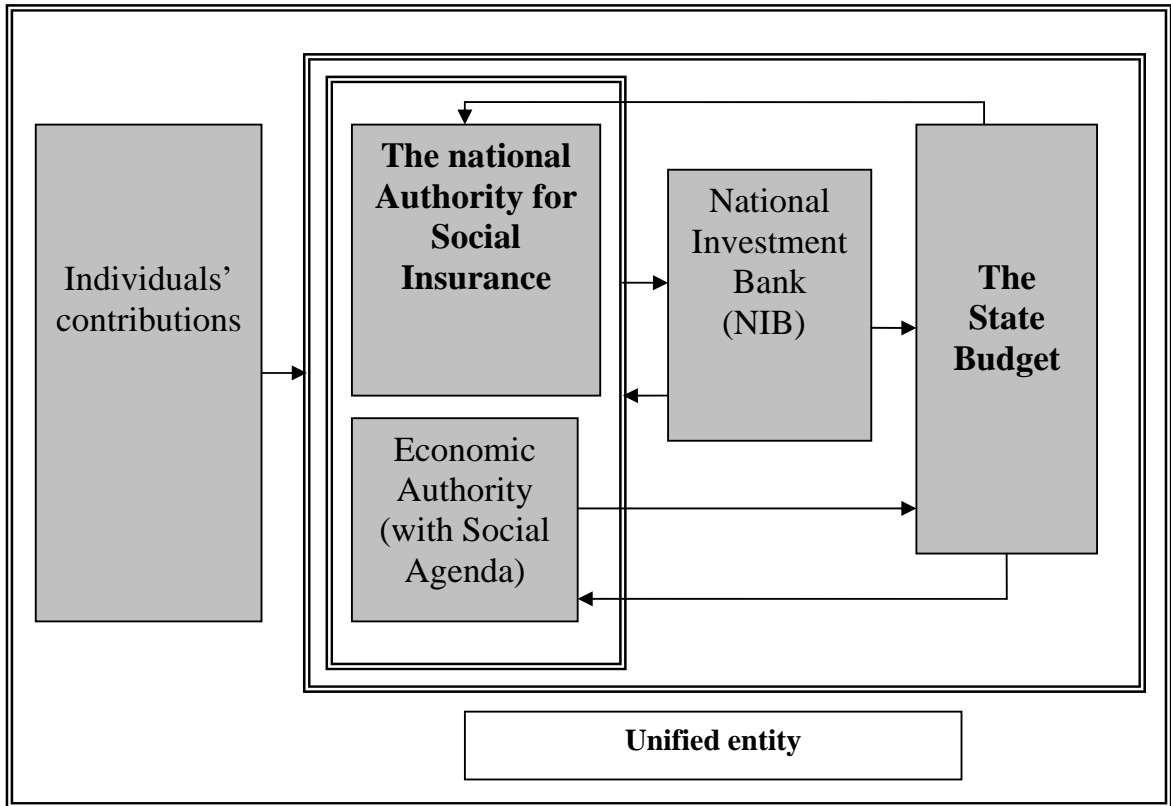
This extension of budget constraint changes the concept of debt that makes it more broader concept. It can be called the net public debt instead of government debt adopted by the state budget. Then, equation (16) is written:

$$PDeb_t = (PE_t - PR_t) + \eta PDeb_{t-1} \quad (17)$$

The broader budget constraint given in equation (17), has important implications for the indicators used to test the sustainability of public debt.

¹⁰The 21 Economic Authorities are listed in Appendix B.

Figure (4): The State Budget and Off-Budget Operations as Unified Entity



4- Fiscal Sustainability Test for the Egyptian Budget Operations: Traditional Approach

In literature of sustainability, debt ratio is the key indicator (guide) for fiscal sustainability, despite the fact that there is no common agreement regarding the safe boundaries. The Egyptian fiscal authority believes that public debt ratio is within the safe boundaries, since it does not exceed the ratio of 60% of GDP (Growth and Stability Pact Limit). Table (1) in appendix A shows the official debt ratios adopted by the Egyptian fiscal authority. This concept of debt is the narrow definition of debt that ignores the true linkages between the state budget and other entities in the fiscal structure. Moreover, it disregards the role played by the state in the Egyptian Economy. Based on this narrow concept of debt¹¹, applying the common empirical approaches for testing fiscal sustainability in Egypt, have yielded different results. The Augmented Dickey-Fuller test are used first to validate the sufficient condition of

¹¹ This is called the lawful definition of debt as stipulated by the budget law.

sustainability, then the Cointegration test between government spending and revenues is applied as a second step.

The stationarity test for the first difference of the stock of debt for the period (1976-2001), in real terms, is shown in table (1) and (2). The results indicate that:

- The first difference of the stock of debt is only stationary at the 10 % level
- The series of the first difference of the stock of debt turned to be non-stationary given the removal of the cyclical effect¹².

Table (1): ADF Test for the First Difference of the Stock of Debt (1976-2001)
(in real terms)

Variables	Test statistics	McKinnon Critical values*	Order of Integration
	<i>With Time trend</i>		
	<i>1st difference</i>	1%(-4.4415)	
Public Debt	-3.608392	5% (-3.633)	I(2)
		10% (-3.2 53)	

*MacKinnon critical values for rejection of hypothesis of a unit root.

Table (2): ADF Stationarity test after the Removal of the Cyclical Effects

Variables	Test statistics	McKinnon Critical values*	Order of Integration
	<i>With Time trend</i>		
	<i>1st difference</i>	1%(-4.4167)	
Public Debt	-1.753841	5% (-3.621)	I(2)
		10% (-3.2 47)	

*MacKinnon critical values for rejection of hypothesis of a unit root.

The Cointegration test is, also, applied between government spending and the sovereign revenues (taxes, fees, duties,...etc) since the latter variable reveals the ability of government to meets its spending obligations. Moreover, the variable of sovereign government revenues excludes government revenues from economic authorities which are considered separate units of the government budget since 1979. This makes the analysis to cope with the narrow definition of debt (the lawful budget constraint).

As first step, the Augmented Dickey-Fuller test performed to test for the stationarity of both series. The test has shown that both series are non-stationary in

¹² Cyclical effects are removed by using the Hodrick-Prescott filter.

level and the first difference of both series are stationary, i.e., both indicators are I(1).

The Cointegration test results shown in table (3) demonstrate that:

- The null hypothesis that there is no Cointegration between government spending and revenues is rejected at the 5 % level.
- The Cointegration equation estimated by the Cointegrating vector is:

$$R_t = 778.47 + 0.572 \underset{0.08}{Exp}_t \quad (15a)$$

- Since $\phi_2 < 1$, it implies that there is gap between government spending and revenues that reach more 40 %.

Table (3): Cointegration test between Government Spending and Revenues (1976-2001)

Sample: 1976 2001				
Included observations: 24				
Test assumption: Linear deterministic trend in the data				
Series: RSOVREV RGEXPWEC				
Lags interval: 1 to 1				
	Likelihood	5 Percent	1 Percent	Hypothesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.567379	23.08647	15.41	20.04	None **
0.116659	2.977048	3.76	6.65	At most 1
*(**) denotes rejection of the hypothesis at 5%(1%) significance level				
L.R. test indicates 1 Cointegrating equation(s) at 5% significance level				
Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)				
RSOVREV	RGEXPWEC	C		
1.000000	-0.572529	-778.4752		
	(0.08085)			

*Results obtained from the E-Views Software.

The *error* correction model is given by the following equation:

$$\Delta R_t = -248.22 - 1.054 \underset{-0.154}{ECM} - 0.0767 \underset{-0.376}{\Delta R_{t-1}} + 0.601 \underset{2.35}{Exp}_{t-1}$$

$$R^2 = 0.706 \quad adj.R^2 = 0.662$$

The model indicates that there is short-run gap between government spending and revenue reach a billion Egyptian pounds form its long-run path. Once the growth of

government spending is higher public revenues this creates a challenge for the Egyptian policy makers and for the hypothesis of fiscal sustainability.

5- Fiscal Sustainability and the Analysis of Government Functions in the Egyptian Economy

Adopting common traditional methodology has shown that the Egyptian fiscal system is facing a challenge regarding the sustainability of the system. However, it yields misleading results since the analysis of fiscal sustainability is based upon the official definition of debt. This section discusses sustainability indicators taking into consideration institutional relations between the state budget and off-budget operations, delivered by the economic authorities, and the state budget and the national investment bank and social insurance funds.

5.1 Domestic Public debt ratio

For the existing analysis, debt calculation includes the following entities:

The state budget + The Economic Authorities (performing the social functions of the state) + The National Investment Bank + the National Authority for Social Insurance

Therefore, the consolidated debt indicator is given by the following equation:

The Consolidated Public Debt = Net Government Domestic debt (net balance of the state budget with the NIB) + The debt of NIB (net balance of NIB with the National Authority for Social Insurance) + the Net Debt of 21 economic Authority (Net balance of the economic authority with the Banking system) + The net debt of the National Authority for Social Insurance (for Individuals) (Net balance of the National Authority with the Banking system).

Table (4) reports the consolidated debt ratio following the methodology and definition of debt adopted by the paper and that adopted by the central bank. The ratios computed by the methodology adopted in the paper are higher than those reported by the central bank even if the central bank applied broader definition of debt as shown in figure (5)¹³. The existing methodology is different from that adopted by the central bank since the latter is just an accounting method based upon aggregating the debt of

¹³ The study of, Alba, P., Al-Shawarby, S. and Iqbal, F. (2004), has adopted the same methodology of the CB.

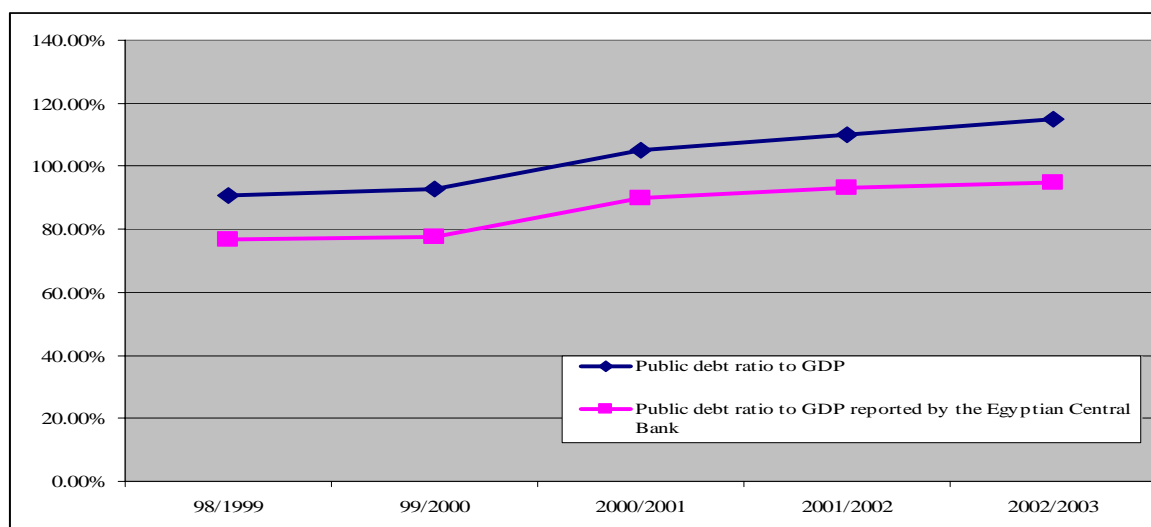
all entities. However, this methodology is misleading since it considers the pension contributions as revenue for the national authority of social insurance though this revenue is a liability towards the pensioners. Both ratios of the paper and that of the central bank are higher than the narrow definition of government debt adopted by fiscal authority (the Ministry of finance), which disregards institutional linkages¹⁴.

Table (4): The Consolidated Public Debt (1998-2003)

The Domestic public debt	98/1999	99/2000	2000/2001	2001/2002	2002/2003
<i>Net Government debt (net balance of the state budget with the NIB)</i>	68	75.3	93.6	107.4	128.2
<i>The debt of NIB net balance of NIB with the National Authority for Social Insurance</i>	57.7	67.4	74.2	86.7	99
<i>The net debt of the National Authority for Social Insurance (Net balance of the economic authority with the Banking system)</i>	130.5	150.6	172.1	195.8	222.3
<i>The Net Debt of economic Authority (Net balance of the economic authority with the Banking system)</i>	Na	na	na	Na	na
Consolidated Public Debt	256.2	293.3	339.9	389.9	449.5
GDP	282.6	315.7	323.5	354.6	390.6
Computed Public debt ratio to GDP	90.70%	92.90%	105.10%	110.00%	115.10%
Public debt ratio to GDP reported by the Egyptian Central Bank	76.80%	77.80%	89.90%	93%	94.90%

Sources: Figures are computed given the information provided by the Budgeting and Planning Committee report, various issues.

Figure (5): The Consolidated Public Debt



¹⁴ The tax gap indicator indicates such fiscal challenges even if it is computes assuming that debt ratio is the official ratio and constant over the nineties as reported in Appendix B.

Such relations between the state budget and the entities outside the budget affect not only the existing figure of debt but also the future path of public debt. It has been noted that the interest payments (of the budget) for the NIB account for 42 % of the total interest payments paid by the state budget. Moreover, debt repayment for the NIB loans accounts 94 % of domestic debt repayment by the state budget during the period 1998/1999- 2002/2003. Table (5) shows the significance share of interest and debt repayment for the NIB, as percentage of the state budget deficit. Considering the NIB as part of the state budget might lead to a significance decrease of public debt figures. Moreover, this unity of budget and the NIB affect positively the decrease in the future path of debt¹⁵ and lead to significance decrease in the budget deficit by 30 to 40 percent.

Table (5): Interest Payments and Debt Installments Paid for the NIB % of Budget Deficit

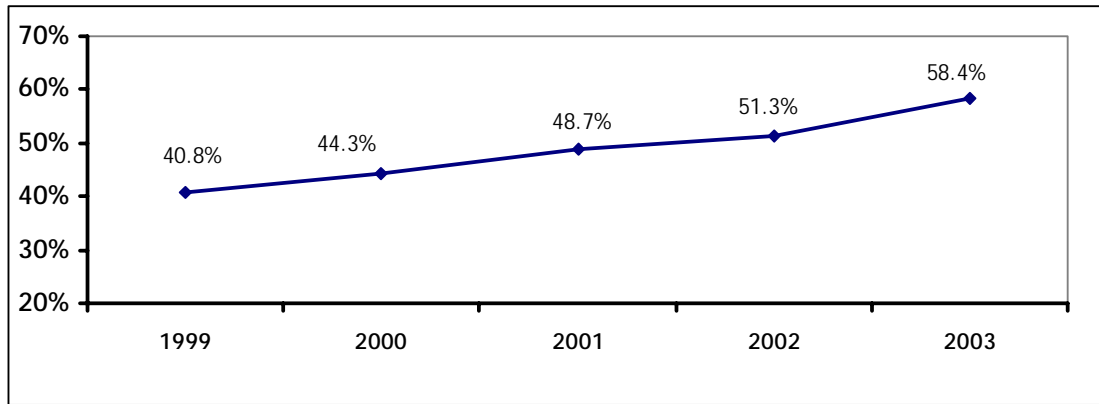
	98/1999	99/2000	2000/2001	2001/2002	2002/2003
(1) Interests Payments	7080.1	8707.4	6193.3	8234.7	9397.7
(2) Domestic Debt Installments	4564.7	4074.5	5238.5	6000	6500
3= (1+2)	11644.8	12781.9	11431.8	14234.7	15897.7
4- Aggregate Budget Deficit	23670.7	28194.2	34152.1	45338.3	52113.4
³/₄ = Payments for the NIB as percentage to budget deficit	49.20%	45.30%	33.50%	31.40%	30.50%

Sources: Computed by the authors given the figures provided in the Budgeting and Planning Committee reports.

Similarly, the financial stance of the economic authorities is crucial in affecting the figures of debt and deficit of the state budget. During the period (1998/1999-2002/2003) the state budget has subsidized the authorities by 20 billion (L.E, 4 billion \$). Also, the state budget has continued to direct substantial amount of subsidies to the economic authorities that has increased from 3.1 billion in the fiscal year 1998/1999 to 4.9. Moreover, the state budget has committed itself to repay significant part of the authorities' debt that reached 12.8 billion during period (1998/1999- 2002/2003). This burden is expected to increase given the deteriorated performance of them as shown in figure (6).

¹⁵ This measure has been already acted by the Egyptian government.

**Figure (6): The Economic Authorities Losses (% of the Authorities' Capital)
(1999-2003)**



2. Primary Deficit indicator

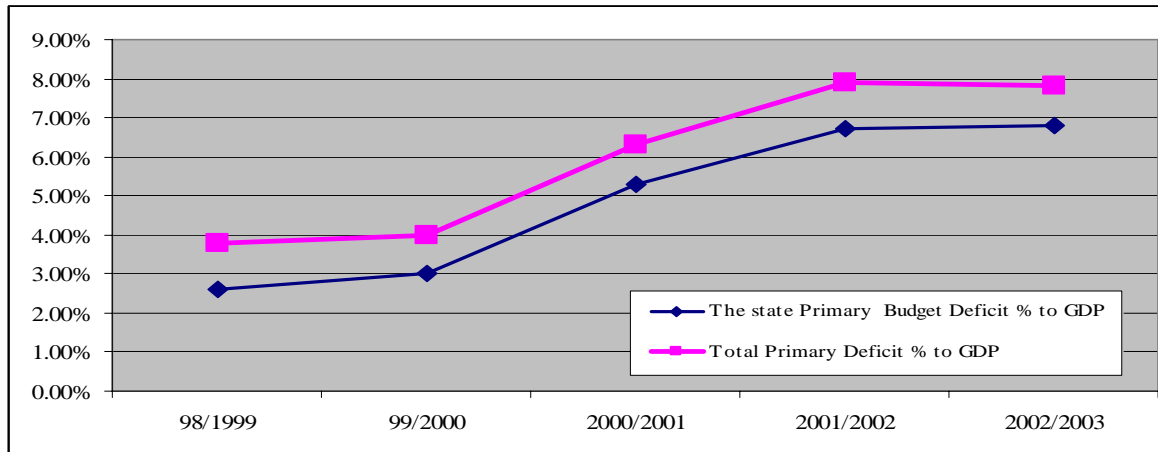
Primary deficit (surplus) is a crucial indicator for sustainability. According to literature of fiscal sustainability, for a fiscal policy to be sustainable, after having accumulated debt in the past, government must run primary surpluses in future. Therefore, accumulated primary deficit for long period of time it is a negative indicator of fiscal sustainability. Some empirical studies that adopted a broader definition of debt has shown that it improves primary surplus (deficit) indicator, since it shows that adopting such broader concept of debt lower primary deficit to be between 3% to 5 % instead of 2.6 % to 6.8% during the period (98/1999-02/2003) (Alba, Al-Shawarby, and Iqbal, (2004)). However, the methodology adopted is also based upon aggregating fiscal figures ignoring the economics behind this aggregation process. This aggregating procedure leads to misleading indications. Given our methodology shown above, the primary deficit during the same period is between 3.8 % and 7.8% since the inclusion of economic authority is added to the state budget (See table 6 and figure 7).

**Table (6): The State budget Primary deficit and the Deficit of Economic Authorities
(98/1999-02/2003) (In Billions L.E)**

Year	The state Primary Budget Deficit (1)	The state Primary Budget Deficit % to GDP	The Economic Authorities Primary Deficits (2)	Total Primary Deficit (1+2)	Total Primary Deficit % to GDP (1+2)/GDP
1999/98	(7.3)	%2.6	(3.5)	(10.8)	%3.8
2000/99	(9.6)	%3.0	(2.9)	(12.5)	%4.0
2001/2000	(17.5)	%5.3	(3.3)	(20.8)	%6.3
2002/2001	(23.7)	%6.7	(4.2)	(27.9)	%7.9
2003/2002	(26.4)	%6.8	(4.1)	(30.5)	%7.8

Sources: Computed given the figures provided by the Budgeting and Planning Committee reports.

Figure (7): Total Budget Deficits and the Economic Authorities' Deficits



6- Conclusion

The idea which the paper presents is that the sustainability of fiscal system is constrained by the scope and limits of state intervention. Increasing the role of the state, whether directly or indirectly requires increasing fiscal means, and thus, ignoring such fact leads to misleading policies and attitudes of government spending.

Accordingly, the paper has analyzed the fiscal implications for the role of the state in Egypt, particularly, in its social aspects. As argued, despite the so called explicit change in the role of the state in the Egyptian Economy, the state has continued to deliver social policies, relatively, with the same mechanisms. The usage of such mechanisms has been so crucial in determining the figures of deficit and debt. As noted, the methods by which fiscal authority implements social protection policies are the key factor in affecting the sustainability of the fiscal system.

Given that, the paper has identified two types of budget constraints (narrower and broader), each of which has different fiscal implications regarding fiscal sustainability. Adopting the legal framework (narrower budget constraint) indicates that debt ratio does not exceed 60% (to GDP) that government considers as a safe ratio. Nevertheless, this official budget constraint disregards the fact that the government utilizes other units, such as the economic authorities, to carry out its specified role. Consequently, the approach, which the paper adopts, links budget operations and the operations by the other entities in the fiscal system (Broader budget constraint). Based upon this approach, public debt exceeds the official figures of deficit and debt. Moreover, the analysis of sustainability indicators reveals the fiscal challenges that face the Egyptian government due to the significant cost of social policy.

Appendix (A)

Table (1): Domestic Public Debt % to GDP

Year	Domestic public debt % to GDP
1990/1991	68
1991/1992	74.8
1992/1993	75.5
1993/1994	71.7
1994/1995	64.4
1995/1996	61.4
1996/1997	60
1997/1998	51.2
1998/1999	52
1999/2000	52
2000/2001	58.5
2001/2002	62.4
2002/2003	64.6

Sources: The Budgeting and Planning Committee Reports, Various issues.

Table (2): Total Public Debt (Domestic and Foreign)

year	Total Foreign debt (In Billions \$)	Domestic Debt	year	Total Foreign debt (In Billions)	Domestic Debt
1974/73	2.2	4.2	1989/88	45.7	42.5
1975/74	4.84	4.77	1990/89	33	75.9
1976/75	6.4	5.4	1991/90	32.6	97.1
1977/76	11.7	6.2	1992/91	31.1	106
1978/77	12.9	7.2	1993/92	30.6	113.7
1979/78	14.9	9.7	1994/93	32.4	124
1980/79	19.1	10.8	1995/94	33.3	134.9
1981/80	22.1	15.3	1996/95	31.4	150.4
1982/81	27.3	15.3	1997/96	29.9	170.9
1983/82	30.2	18.1	1998/97	28.1	188.6
1984/83	32.2	22.3	1999/98	28.2	217
1985/84	36.1	23.7	2000/99	27.8	245.5
1986/85	39.9	27.5	2001/2000	26.6	290.8
1987/86	44.1	31.5	2002/2001	28.7	329.8
1988/87	46.1	37.6	2003/2002	28.7	370.6

Sources:

1. Ministry of Planning, www.mop.gov.eg.
2. World Bank, world bank Development report, different issues.
3. Gaber, I. (2004). "Economic Reform and Domestic Public Debt in Egypt", Unpublished master thesis, Faculty of Economic and Political Science, Cairo University. (In Arabic).

Table (3): Primary Deficit (surplus) of the State Budget (1990/1991-2002/2003)

Year	GDP	Government Spending*	Interest Payments on Foreign Debt	Interest Payments on Domestic Debt	Total Government Revenues	(Total Spending-Interest Payments)	Primary Deficit	Primary Deficit (Surplus % of GDP)
90/1991	110	46.5	1.6	4.2	36.9	40.73	-3.8	-3.5
91/1992	131.1	65.4	2.3	6.4	51.35	56.77	-5.4	-4.1
92/1993	146.2	69.3	3.9	9.3	58.71	56.01	2.7	1.8
93/1994	163	84.5	3.4	12.2	69.27	68.93	0.3	0.2
94/1995	191	81.8	3.4	11.2	63.91	67.24	-3.3	-1.7
95/1996	214.2	81.4	3.8	11.6	63.83	66.14	-2.3	-1.1
96/1997	247	88	2.9	13	65.8	72.18	-6.4	-2.6
97/1998	266.8	93.6	1.9	12.3	74.85	79.35	-4.5	-1.7
98/1999	282.6	101.1	1.8	14.6	77.47	84.73	-7.3	-2.6
99/2000	315.7	112.2	1.8	16.8	83.99	93.59	-9.6	-3
2000/2001	332.5	119.5	1.8	14.8	85.35	102.84	-17.5	-5.3
2001/2002	354.6	134.4	2	19.6	89.06	112.78	-23.7	-6.7
2002/2003	390.6	149.3	2.2	23.5	97.2	123.6	-26.4	-6.8

Sources: Ministry of Planning, www.mop.gov.eg.

* Government Spending includes the investments of the Economic Authorities till the fiscal year 1995/1996.

Table (4): Interest Payments of Domestic Public Debt % of Government Sovereign Revenues and Government Spending, (1983/84- 2002/2003) (In Billions L.E).

Year	Sovereign Revenues	Government Spending	Interest Payments on Domestic Debt	Interest Payments % Of Government Spending	Interest Payments % Sovereign Revenues
1984/83	5.59	17.4	1.02	5.9	18.3
1985/84	6.18	19.81	1.14	5.8	18.5
1986/85	6.91	24.29	1.3	5.4	18.8
1987/86	7.16	24.53	1.61	6.6	22.5
1988/87	8.46	33.46	1.93	5.8	22.8
1989/88	10.19	33.4	2.47	7.4	24.2
1990/89	12.11	34.23	2.97	8.7	24.5
1991/90	15.93	46.5	4.18	9	26.2
1992/91	24.81	65.42	6.36	9.7	25.6
1993/92	28.46	69.27	9.32	13.4	32.7
1994/93	32.46	84.53	12.18	14.4	37.5
1995/94	35.25	81.82	11.15	13.6	31.6
1996/95	38.59	81.45	11.55	14.2	29.9
1997/96	40.37	88.04	12.97	14.7	32.1
1998/97	44.19	93.59	12.3	13.1	27.8
1999/98	48.46	101.14	14.58	14.4	30.1
2000/99	51.66	112.19	16.8	15	32.5
2001/2000	52.36	119.5	14.82	12.4	28.3
2002/2001	52.27	134.4	19.57	14.6	37.4
2003/2002	57.44	149.32	23.5	15.7	40.9

Sources: The Budgeting and Planning Committee Reports, Various issues.

Table (5): Tax-Gap indicator Assuming Constant Domestic Debt Ratio

Year	government domestic public debt % to GDP	Primary Spending % to GDP	Targeting Sovereign Revenues %	Actual Sovereign Revenues (%)	Tax (Revenue) Gap %
1991/90	68	37	39.856	14.48	-25.376
1992/91	68	43.3	44.66	18.93	-25.73
1993/92	68	38.3	35.036	19.47	-15.566
1994/93	68	42.3	40.668	19.92	-20.748
1995/94	68	35.2	39.416	18.45	-20.966
1996/95	68	30.9	32.056	18.02	-14.03
1997/96	68	29.2	32.872	16.34	-16.53
1998/97	68	29.7	29.02	16.57	-12.45
1999/98	68	30	27.824	17.15	-10.67
2000/99	68	29.6	31.232	16.36	-14.87
2001/2000	68	30.9	28.112	15.74	-12.37
2002/2001	68	31.8	29.896	14.74	-15.15

Sources: The Budgeting and Planning Committee Reports, Various issues.

Appendix (B)

The 21 Economic Authorities included the Model and Calculations.

1. Rural Electricity Authority
2. Egypt Railway Authority
3. Cairo Public Transport authority
4. Alexandria Passenger Transport Authority
5. General Authority for the Supply Commodities (GASC)
6. Cairo Drinking Water Public Authority
7. Alexandria Drinking Water Public Authority
8. Cairo Sewerage Public Authority
9. Alexandria Sewerage Public Authority
10. Aswan Drinking Water and Sewerage Public Authority
11. El Menyiah Drinking Water and Sewerage Public Authority
12. Beni Sweef Drinking Water and Sewerage Public Authority
13. El Fayoum Drinking Water and Sewerage Public Authority
14. Al Dakahleiah Drinking Water and Sewerage Public Authority
15. Al Gharbiah Drinking Water and Sewerage Public Authority
16. Al Sharkeiah Drinking Water and Sewerage Public Authority
17. New Constructed Cities Public Authority
18. Construction and Housing Public Authority
19. Cairo Medical Institution
20. Alexandria Medical institution
21. Al Kalubiah Medical Institution

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