

Analyzing Egypt's Debt Sustainability Using SimSIP Debt: The Debt Projection Module

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Abstract: Debt sustainability is a critical factor and a key consideration for decision making with respect to all public projects and economic policies. In this econometric study, we use **the debt projection module** of SimSIP (Simulations for social Indicators and poverty). Debt to simulate the evolution of Egypt's public debt over a 15-year horizon (from the fiscal year 2016 to the fiscal year 2031) by using dynamic analyses of the variables under three different macroeconomic scenarios and two different financing scenarios of an ambitious government-led investment strategy. The study results show that the debt is not sustainable. According to the results of the optimistic macroeconomic scenario, Egypt's achievement of financial sustainability in the medium-term depends on increasing its economic growth rate to at least 10% and improving its balance of payments situation by increasing the growth rate of exports and reducing imports, in addition to reducing the deficit of the State budget through a contractionary fiscal policy, and targeting the appreciation of local currency; besides the reduction of the inflation rate to no more than 3%.

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Key words: Debt Sustainability, SimSIP Debt, Egypt, The Debt Projection Module, SAM (Social Accounting Matrix)

1. Introduction

The importance of studying debt sustainability stems from the fact that it reveals the extent of the State's ability to meet the obligations of its internal and external debts, in view of the rapid debt evolution in recent years. External debt and debt burden in particular have recorded continuous increases. Hence, Egypt is indebted to a myriad of Arab, foreign and regional entities, including mainly: The United States of America, Japan, European Union countries (France, Italy, Spain, United Kingdom, Austria, and others), Arab countries (Kingdom of Saudi Arabia, The United Arab Emirates, Kuwait, Bahrain, etc.), and to international and regional institutions such as: The Agency for International Development (AID), Arab Fund for Economic and Social Development, European Investment bank, World Bank (IBRD), Arab Monetary Fund, African Development Fund, African Development Bank, and the Islamic Development Bank. It is noteworthy that the European Union countries contribute the largest part or approximately 40% of Egypt's external debt, followed by international and regional institutions (18%), USA (15%) and Japan (12%), and finally the group of Arab countries with a total of 4%. (The Central Bank of Egypt, Annual Report, the 2016/2017 issue).

The rest of this paper is structured as follows: The second section presents the actual evolution of Egypt's public debt (2000 – 2016). The third section reviews previous studies. The fourth section indicates the methodology. The fifth section includes

projections of Egypt's debt according to the different scenarios. The sixth section includes a summary of the results and the conclusion.

2. Evolution of Egypt's public debt (2000 – 2016)

2.1 Evolution of Egypt's public external debt

This study examines first the evolution of the public and publicly-guaranteed external debt and the private external debt, unguaranteed by the government; in addition to the evolution of the total external debt stocks, concessional (DOD, U.S. dollars) and their ratios to the gross domestic product (GDP). The evolution of the indicators showing whether or not the external debt in Egypt lies within safe limits during the period 2000-2016 is hereunder presented.

From Table 1, we note that the public and publicly-guaranteed external debt stocks rose from 24.34 billion US dollars in 2000 to 32.1 billion US dollars in 2007 then to 51.3 billion US \$ in 2016; with an increase in their growth rate of that variable from 3.9% in 2001 to 19.85% in 2016. Interest payments on the public and publicly-guaranteed external debt increased from 0.6 billion US\$ in 2000 to approximately 1 billion US dollars in 2016, while their growth rate rose from 11% in 2001 to 34% in 2016, and we notice that total external debt (outstanding and disbursed) rose from about 29.2 billion US dollars in 2000 to about 67.2 billion US dollars in 2016; while the ratio of the total external debt to GDP rose from 29.2% in 2000 to 33.7% in

2002 and kept increasing to reach its peak value of 39.8% in 2004; it then fluctuated up and down

standing at 13.7% in 2014 then climbed again to 20.2% in 2016.

Table 1: Evolution of the public and publicly guaranteed debt, and of total external debt stocks (disbursed and outstanding debt- DOD) as a ratio of GDP during the period 2000-2016

Year	External debt stocks & publicly guaranteed*	Interest payments on external debt public & publicly-guaranteed*	External debt stocks-Private non-guaranteed*	Growth rate of external debt stocks, public and publicly guaranteed (%)	Growth rate of interest payments on external debt, public and publicly guaranteed (%)	Total external debt(DOD)*	Ratio of total external debt (DOD) to GDP (%)
2000	24.34	0.603	0.57			29.2	29.2
2001	25.3	0.67	0.62	3.94	11.1	28.3	29.0
2002	26.64	0.737	0.66	5.29	10	29.6	33.7
2003	28.04	0.639	0.32	5.26	-13.3	30.4	36.7
2004	29.34	0.648	0.09	4.65	1.41	31.4	39.8
2005	28.59	0.616	0.09	-2.55	-4.94	30.5	34.1
2006	28.98	0.733	0.08	1.34	18.99	31.0	28.8
2007	32.08	0.803	0.02	10.7	9.55	34.6	26.5
2008	30.76	0.829	0.08	-4.11	3.24	33.9	20.8
2009	31.37	0.806	0.07	1.99	-2.77	35.4	18.7
2010	32.25	0.735	0.05	2.8	-8.81	36.8	16.8
2011	30.82	0.726	0.02	-4.44	-1.22	35.2	14.9
2012	32.03	0.68	0.02	3.95	-6.34	40.1	14.3
2013	42.35	0.666	0.01	32.21	-2.06	46.6	16.1
2014	37.18	0.687	0.02	-12.2	3.15	41.8	13.7
2015	42.77	0.718	0.02	15.02	4.51	48.5	14.6
2016	51.26	0.962	0.16	19.85	33.98	67.2	20.2

*Values are in current billion US dollars Source: www.worldbank.org.

2.2 Safety indicators for external debt(The Economic Journal, issued by The Central Bank of Egypt, Research, Development and Publication Sector, 2016/2017)

The main safety indicators of external debt sustainability are the following:

- Ratio of the external debt stocks to GDP;
- Ratio of the external debt service to exports of goods and services (tangible and intangible exports);
- Total external debt per capita (in US dollars);

- Ratio of the external debt service to the current foreign exchange proceeds (including remittances of Egyptians residing abroad);
- Ratio of the short-term debt to the external debt (at the end of the period); and
- Ratio of the short-term debt to foreign reserves (at the end of the period)

The first and second indicators are the most important in this concern. The first indicator (external debt/ GDP) should not exceed 100% and the second indicator (external debt service/ exports of goods and services) should not exceed 20%. (Sultan Abu Ali 2015).

Table 2: External public debt indicators during the period (2000-2016)

Year	External debt stocks, public and publicly guaranteed/GDP	External debt stocks, public and publicly guaranteed and private nonguaranteed/GDP (1)	Total debt service (% of exports of goods, services and primary income) (2)	Short-term debt (% of total external debt) (3)	Short-term debt (% of total reserves) (4)	Total External debt US\$ per capita (5)
2000	24.4	25.0	9.8	14.1	29.8	356.4
2001	25.9	26.5	11.3	7.8	16.2	363.9
2002	30.3	31.1	12.1	7.3	15.3	376.1
2003	33.8	34.2	13.0	6.1	12.8	383.3
2004	37.2	37.3	8.0	5.5	11.2	390.4
2005	31.9	32.0	7.1	5.4	7.6	373.7
2006	27.0	27.0	6.3	5.5	6.6	371.8
2007	24.6	24.6	6.1	6.5	6.9	403.6
2008	18.9	18.9	5.7	8.4	8.3	381.0
2009	16.6	16.6	6.5	7.2	7.3	381.3
2010	14.7	14.8	6.1	8.5	8.5	384.0
2011	13.1	13.1	7.8	8.6	16.2	358.9
2012	11.5	11.5	6.5	16.6	42.5	365.0
2013	14.7	14.7	7.6	6.0	17.0	471.7
2014	12.2	12.2	12.5	7.9	22.2	405.2
2015	12.9	12.9	10.0	9.1	27.9	456.3
2016	15.4	15.4	18.9	17.8	50.5	537.3

Source: Computed by the author, data from www.worldbank.org

Hence in Egypt, the external debt stocks, public and publicly guaranteed, grew from US\$ 24.3 billion in 2000 to US\$ 51 billion in 2016. However, this evolution represented a decrease in their ratio to GDP from 24.4% to 15.4%. In other words, during the period from 2000 to 2016, Egypt's external debt has been kept within safe limits; although after tending to decline, it started to increase from 11.5% in 2011 to 15.39% of GDP in 2016 (According to the Central Bank of Egypt data, the Ratio of the external debt to GDP in Egypt recorded 23.7% in 2002/2003, dropped to 16.7% in 2003/4, then kept rising to reach 32.66% in 2016/. **Source: Central bank of Egypt, Annual Report, several issues**). Similarly, the ratio of the external debt service to total exports did not reach 20% (The **Central Bank of Egypt data** indicate that the ratio of the debt service on the total external debt (public and publicly guaranteed and private) to total exports recorded a downward trend during the period (2003/2004 -2009/2010), began to rise slowly starting 2010/11 then climbed to 24% in 2015/16 and 27.2% in 2016/17) although it has been continuously increasing during the last years, rising from 9.8% in 2000 to 18.9% in 2016. In addition, the ratio of short-term debt to total debt has increased from 14.1% in 2000 to 17.8% in 2016, after a drop to 5.4% in 2005. Similarly, the ratio of short-term debt to foreign reserves increased from 29.8% in 2000 to 50.5% in 2016 after recording a low of 6.6% in 2006. The external debt per capita climbed from 356.4 US dollars in 2000 to 537.3 US dollars in 2016.

According to the criteria of the World Bank and the International Monetary Fund, external debt indicators in Egypt although increasing, were maintained within safe limits during the period (2000-2016).

When we compare external debt indicators of groups of countries in various economic regions to Egypt's corresponding indicators, we find that the ratio of the external debt to GDP ranged in those countries from 18.11% to 61.9% as compared to 15.4 % in Egypt; while the ratio of the external debt service to total exports ranged in those countries from 28.6% to 51.4% as compared to 18.9% in Egypt. (Source: The Central Bank of Egypt, Annual Report, several issues).

2.3 Evolution of Egypt's public domestic debt

2.3.1 The public domestic debt concept

The total public domestic debt in Egypt includes the net domestic debt of the government plus the net debt of the public economic enterprises plus the net debt of the National Investment Bank.

2.3.2 The sustainability of the public domestic debt

(There is no agreement on safety limits for the public domestic debt. However, it is necessary to study its sustainability in order to evaluate whether or not the State will be able to meet the current and future obligations of the debt service in full, without having to resort to debt relief, rescheduling of debt service payments or to the accumulation of arrears)

To achieve sustainability, the growth rate of the public domestic debt must not exceed the growth rate of real GDP.

Table 3: Evolution of the ratio of the public domestic debt to GDP and the growth rates of these two variables during the period (2000-2016)

Year	GDP growth rate (%)	Total Public Domestic debt growth rate (%)	Total public domestic debt / GDP
2000	5.4		
2001	3.5		
2002	2.4		63.8
2003	3.2	16.1	60.3
2004	4.1	74.5	104.6
2005	4.5	16.2	114.5
2006	6.9	7.4	103.4
2007	7.1	4.5	90.6
2008	7.2	14.3	86.1
2009	4.7	16.7	84.8
2010	5.1	17.6	84.9
2011	1.8	18.5	88.4
2012	2.2	23.4	90.3
2013	2.2	18.9	91.6
2014	2.9	16.5	97.9
2015	4.4	23.8	102.4
2016	4.3	20.7	94.7

Source: Computed by the author, data from www.worldbank.org www.cbe.org.annual report (several issues)

We note **the absence of public domestic debt sustainability at the present time** given that the growth rate of the domestic debt ranged from 16.1% in 2003 to 20.7% in 2016, thus by far exceeding the GDP growth rate which ranged from 3.2% in 2003 to 4.3% in 2016. Furthermore, the ratio of the domestic debt to GDP is remarkably high, as it rose from 63.8% in 2003 to 94.7% in 2016. So how will the government meet its obligations towards these debts?

2.4. The debt sustainability concept (International Monetary Fund)

A common definition of debt sustainability is whether a country can meet its current and future debt service obligations in full, without recourse to debt relief, rescheduling, or accumulation of arrears.

2.5. Main Criteria of Debt Sustainability (Sachs, et al., 1999).

There are two main criteria for the evaluation of debt sustainability: External debt sustainability and the State's financial sustainability. The first criterion relies on calculating the ratio of the State's external debt or the burden of its service to national exports; while the second criterion relies on calculating the ratio of the public domestic debt and the public and publicly guaranteed external debt or the burden of their service to government revenues, then comparing these ratios with given indicators. However, total evaluation results must depend on both criteria, since neither criterion can by itself describe the whole picture.

2.6. The study indicators

The Debt Projection Module was used for computing the following indicators:

Solvency ratios: (NPV= Net Present Value)

- Ratio of the NPV of the total public debt to GDP;
- Ratio of the NPV of the external debt to GDP;
- Ratio of the NPV of the external debt to average exports;
- Ratio of the NPV of the external debt to government revenues;

Liquidity ratio: Ratio of the external debt service to government revenues.

3. Previous studies

A review of previous studies shows that some of these studies found that public debt was sustainable in Bangladesh (Gunter, B.G.A. and Rahman, A.F.M. (2008), in the SAARC as a group (Sheikh, M.R., Abbasi, M.N., Iqbal, S. and Masood, S. (2014), in Madagascar (Owen, D., Murgasova, Z. and Casero, P. A. (2017) and in Pakistan (Kemal, M. A. and Malik, B. A. (2016). While other studies focused on the factors impeding or threatening public debt sustainability, such as: The debt burden, the quality of policies and institutions, and shocks (Kraay, A. and Nehru, V. (2003); fiscal policies (Feld, L.P., Köhler, E.A. and Wolfinger, J. (2018); and exchange rate

shocks (SOPEK, P. (2011). Moreover, Braga, A. C., Shetty, S., Krueger, Th. and Marston, D. (2009) suggest that a failure to implement structural reforms geared toward the raising the non-oil sector's competitiveness would lead to fast public debt accumulation; and Gabriela, A. S. (2013) stresses the need to generate primary surplus in Romania.

EL-MAHDY, Adel M. and TORAYEH, Neveen M. (2009):

The study endeavored to Test the impact of the debt sustainability on economic growth, utilizing data for the period running from 1981 to 2006. The results obtained from the co-integration model reveal that the public domestic debt in Egypt has a robust negative impact on growth.

Alba, P., Al-Shawarby, Sh. and Iqbal, F. (2004):

This paper assesses the sustainability of public debt in Egypt in light of fiscal trends in recent years. The paper draws four main conclusions. First, Egypt has presently a high debt-output ratio compared with a sample of lower-middle income countries. Second, the debt is being driven by structural rather than cyclical factors. Third, the structural weaknesses of the budget are mainly related to low tax buoyancy and yields as well as to rising wage and subsidy expenditures. Finally, simulation results suggest that fiscal adjustment is needed to restrain debt growth and to achieve greater sustainability.

Although the last two above-mentioned studies focused on debt sustainability in Egypt, our present study used a different methodology to analyze this feature. Moreover, whereas those two previous studies relied on actual data, our study endeavored to predict future sustainability throughout the period (2016-2031). However, we have reached the same conclusion as those previous studies, which is the absence of debt sustainability in Egypt.

4. Methodology

This study relied on the **Debt Projection Module** which can be used to simulate a country's debt sustainability based on initial conditions and projections for government expenditures, government revenues, and other parameters.

The Theoretical Foundation of the Debt Projection Module (Gunter, et al., 2002).

There are three basic elements: The modeling of government expenditures, the modeling of government revenues, and the specification of the government deficit, which is financed by new borrowing after deducting grants and debt relief. Though the model is mostly determined in domestic nominal currency (in order to take into account the effects of inflation), all data inputs by the user are in US dollars. Inputs in US dollars are converted into nominal domestic currency through the exchange rate for each period, which is

determined exogenously. Gross domestic product (Y) is determined by its initial value in t0, the projected growth rate for the year (g), and the inflation rate (π):

$$Y(t) = (1 + \pi(t))(1 + g(t))Y(t-1) \quad (1)$$

On the expenditure side, we differentiate between interest payments on public foreign debt, interest payments on public domestic debt, principal repayments on foreign and domestic debt, and other government expenditures. The average interest rates (not the interest payments) on outstanding foreign and domestic debts are fixed for any given year due to loan contracts, but we differentiate between interest rates on public domestic debt and those on foreign debt. The user may change the interest rates by specifying different initial and final rates. Given that new loans (due to principal repayments and deficit financing) are generally a small fraction of the debt stock, interest rates on domestic and foreign debts change only slowly over time.

For simplicity, principal repayments are financed by new loans, though not necessarily from the same source (domestic or foreign) and at the same interest rate and maturity. Other expenditures (all expenditures excluding interest and principal payments) are a predetermined percentage of GDP, which may change over time. If we denote the interest rates on domestic and foreign debt by i_f and i_d (averages for the various loan contracts), the stocks of debt by $D_f(t-1)$ and $D_d(t-1)$, and the exchange rate by $E(t)$, we have three kinds of expenditures: Interest payments on foreign government debt [$i_f(t-1) * D_{fd}(t-1) * D_d(t-1)$]; and government expenditures on social and non-social sectors [$G_{sec}(t)$] = $\alpha(t) * Y(t)$. Total governments pending equals:

$$G(t) = i_f(t-1) * D_f(t-1) * E(t) + i_d(t-1) * D_d(t-1) + \alpha(t) * Y(t) \quad (2)$$

On the revenue side, we simplify the analysis by combining tax-, seignorage- and all other non-tax revenues to one percentage value [$\beta(t)$] of GDP, whose change over time reflects changes in tax rates, the efficiency of revenue collection, and money-financing. The simulator calculates the intermediate values based on a linear trend. Grants $N(t)$ and debt service relief $DSR(t)$ are exogenously determined by foreign donors. Like foreign borrowing, grants and debt service relief are converted into domestic currency at the end of each period. If revenues before grants and before debt relief are denoted by $REV_{bef}(t)$ = $\beta(t) * Y(t)$, revenues with grants and debt relief are calculated as follows:

$$REV_{aft}(t) = \beta(t) * Y(t) + E(t) * N(t) + E(t) * DSR(t) \quad (3)$$

Budget deficits $BD(t)$ are simply the difference between total revenues (including grants and debt relief) and total government expenditures:

$$BD(t) = G(t) - REV_{aft}(t) \quad (4)$$

We further assume that the government faces no constraints in financing expenditures through new

borrowing, and the user is free to choose the share of the new debt coming from domestic sources. If new domestic and foreign borrowing by the government are denoted respectively by $BD_d(t)$ and $BD_f(t)$, the change in debt is:

$$BD(t) = E(t) * BD_f(t) + BD_d(t) \quad (5)$$

Changes in the source of new borrowing are reflected in the ratio of public foreign debt to public domestic debt (in the box for including public domestic debt), while changes in the average interest rate and maturity are reflected in the parameters stated in the top section of the panel.

To avoid negative implications of increased money-financing on growth, money-financing is usually restricted. In general, the non-inflationary level of seignorage is limited to about one percent of GDP.

The simulator makes no assumptions for the impact of new borrowing on GDP growth, inflation, the exchange rate, and the level of loan concessionality. The assumptions for GDP growth, inflation, exchange rate depreciation, and average interest rates on domestic and foreign loans are provided by the user. It is however suggested that there is need to adjust the growth rate of real GDP downward, the inflation rate and the exchange rate depreciation upward, and the interest rates on domestic and foreign loans upward, the higher the average ratio of government deficit to GDP is over the projection period. For countries with sustainable poverty reduction strategies in place, these considerations are less crucial since consultations with donors would reduce the existence of excessive financing gaps.

Combining equations (4) and (5) yields:

$$G(t) - REV_{aft}(t) = BD(t) = E(t) * BD_f(t) + BD_d(t) \quad (6)$$

The model is dynamic since the current year's budget deficit is linked to the previous year's budget deficit through the current year's total government expenditures that include interest payments on previous year's debt stock. Once the level of debt is known over time, it is easy to compute the net present value (NPV) of a country's public foreign debt by using debt service projections based on the average interest rate and the average maturity of outstanding public foreign debt. For a country's public domestic debt and a country's private foreign debt, the NPV values are set equal to the nominal values.

The available data (Please see Table 3 in Appendix) from the World Bank (www.worldbank.org), the Central Bank of Egypt (www.cbe.annual) and the International Monetary Fund (www.imf.org) for the projected years (2016-2031) were used to build the study model and the projected values were obtained under the assumptions

of three macroeconomic scenarios and two financial scenarios.

5. Projections of Egypt's Debt under Alternative Scenarios

A) Macroeconomic Scenarios

A.1. Model evaluation under the first macroeconomic (baseline) scenario

All initial values as well as all values for t_0 are based on actual data for 2016. The values for t_{31} are either based on historical averages of the 2012-2016 data or set equal to the t_0 values in cases where historical data is not easily available; however, **the grant amount and its actual and historical growth rates are set equal to zero in this scenario.**

A.1.1. Input Data

***Required information (Values are in current billion US dollars)**

Assumptions 1									
Initial Value	Public For. Debt		Nominal	Initial Value	Grants	Exports	Excha. rate	Info-debt	Info-matur.
	Stock	Int. Pay.	GDP		Growth (t0)	Growth (t15)			
	51,300	9.62E+02	332,928		0	34,400	10.03		
					0.00	-14.53	30.35		
					0.00	-4.83	11.51		
	Debt Relief		Priv. & Dom. Debt						
Value (2016)	Discount rate (%)	Interest rate (%)	Inflation rate (%)	Real GDP growth (%)	Rev. to GDP (%)	P.Spe.to GDP (%)	Average Maturity	Info-interest	Info-CIRR
	12.3	1.6	13.8	4.4	22.2	32.2	10.0		
Value (2031)	12.3	1.6	10.2	3.2	20.9	33.3	10.0		

Optional information (Private&Domestic Debt)

1-External debt stocks, private nonguaranteed: Initial value and growth rates.

2- Public domestic debt and interest payments on Public domestic debt.

3-The percentage share of government budget deficits: Values for t_{16} and t_{31} .

4- The average maturity of the outstanding debt stock.

5- The discount rate on public domestic debt.

6- Interest rate: Values for t_{16} and t_{31} . (Data classification into optional data and required data was devised by the designers of the original model used in this study)

Among these data the share of the domestic debt in the deficit of the State budget is expressed as the "Share of domestic financing." (Expressed as the ratio of the domestic debt service to the deficit of the State budget.) The evolution of the State budget deficit and its ratio to the gross domestic product are presented in the following table.

Table 4 shows the increase of the State budget deficit during the period (2002/2003-2016/2017) both in absolute terms and as a percentage of GDP. Moreover, the share of domestic financing recorded a

The required input data of the Debt Projection Module are the following:

1-Public foreign debt stocks and interest payments on external debt stocks, public and publicly guaranteed (current US\$) - and nominal GDP.

2-Grants: Initial value (current US\$) and growth rates

3-Exports: Initial value (current US\$) and growth rates

5-Discount rate: Values for t_{16} and t_{31}

6-Interest rate: Values for t_{16} and t_{31}

7-Inflation rate: Values for t_{16} and t_{31}

8-Real GDP growth: Values for t_{16} and t_{31}

9-Revenue and primary expenditure to GDP ratios: Values for t_{16} and t_{31}

10-Average maturity: Values for t_{16} and t_{31} .

high of 75% in 2016 and its estimated value stands at 36% in 2031 (based on its average value during the 2012-2016 period) (Source: The Central Bank of Egypt, Annual Report, several issues)

Table 4: Evolution of the State budget deficit and its ratio to GDP during the period (2002/2003 – 2016/2017)

Year	Deficit (billion EGP)	Deficit / GDP
2002/2003	25.4	6.3
2003/2004	27	5.9
2004/2005	49.8	8.9
2005/2006	49	7.9
2006/2007	54.7	7.5
2007/2008	61.6	6.8
2008/2009	71.8	6.9
2009/2010	98	6.9
2010/2011	130.4	9.5
2011/2012	166.7	10.8
2012/2013	239.7	13.7
2013/2014	255.4	12.8
2014/2015	279.4	11.5
2015/2016	339.5	12.3
2016/2017	379.5	10.9

Source: The Central Bank of Egypt, Annual Report, several issues.

A.1.2. Estimation Results without debt relief for the years (2016-2031)**Table: 5-a NPV of public debt to GDP (%),the ratio of NPV of foreign debt to average exports and the relevant indicative debt burden thresholds for a country classified as a medium policy performer(Please refer to Table1 in the Appendix.)**

Year	NPV of total Public debt/GDP	NPV of public Foreign debt/GDP	NPV of public Domestic Debt/GDP	NPV of total Foreign debt/Av. Exports	NPV of public Foreign debt/Av. exports	NPV of private Foreign debt To average Exports
Indicative debtBurden thresholds	56	40	.....	.....	150	.....
2016	101.0	9.5	91.5	92.3	91.8	0.5
2017	103.5	13.4	90.1	154.5	153.9	0.6
2018	106.7	17.8	88.9	246.0	245.2	0.8
2019	110.5	22.8	87.7	376.3	375.3	1.0
2020	114.8	28.2	86.6	554.1	552.8	1.2
2021	119.7	34.2	85.5	790.0	788.5	1.5
2022	125.1	40.7	84.4	1095.2	1093.3	1.9
2023	130.8	47.4	83.4	1480.2	1477.9	2.3
2024	136.9	54.5	82.3	1954.5	1951.7	2.7
2025	143.0	61.8	81.3	2525.2	2522.0	3.2
2026	149.3	69.1	80.2	3196.5	3192.8	3.7
2027	155.4	76.4	79.0	3968.1	3964.0	4.2
2028	161.4	83.6	77.8	4834.9	4830.3	4.6
2029	167.0	90.4	76.5	5785.9	5780.8	5.1
2030	172.1	96.9	75.1	6804.4	6798.9	5.5
2031	176.5	102.9	73.6	7868.0	7862.1	5.9

Source: Outputs of the Debt Projection Module**Table 5-b: NPV of total public debt to average government revenues and the ratios of the public debt service to government revenues**

Year	NPV of total Public debt/Av. Gov. revenues	NPV of public Foreign debt/Av.gov. Revenues	NPV of public Domestic Debt/ av.Gov. revenues	Debt service On public Debt/gov. Revenues	Debt service On public Foreign debt/Current year Revenues	Debt service On public domestic Debt/Current yr Revenues
Indicative Debt burden threshold	.....	250	.....	.....	20	.....
2016	532.6	50.3	482.3	108.4	8.2	100.1
2017	547.3	70.7	476.6	125.7	11.0	114.7
2018	565.0	94.2	470.8	128.4	14.8	113.6
2019	585.9	120.7	465.2	131.7	19.1	112.6
2020	609.9	150.0	459.9	135.5	23.8	111.7
2021	636.8	182.1	454.8	139.9	29.1	110.8
2022	666.3	216.6	449.8	144.7	34.7	110.0
2023	697.9	253.1	444.8	149.9	40.7	109.1
2024	731.0	291.2	439.8	155.3	47.0	108.3
2025	765.2	330.4	434.8	161.0	53.5	107.4
2026	799.7	370.2	429.5	166.7	60.2	106.5
2027	833.9	409.9	424.0	172.4	66.8	105.5
2028	867.0	449.0	418.1	177.9	73.4	104.5
2029	898.3	486.6	411.7	183.1	79.8	103.3
2030	927.1	522.3	404.8	187.9	85.9	102.0
2031	952.6	555.3	397.3	192.1	91.6	100.5

Source: Outputs of the Debt Projection Module

Tables 5-a,5-b show that the ratio of NPV of the external debt /GDP continues to increase from 9.5% in 2016 to 105.6% in 2031 thus exceeding the critical ratio (40%) in all the projection years. The ratio of the NPV of total public debt/GDP increases from 101% in 2016 to 179.6% in 2031, also exceeding the critical ratio (56%) in all the projected years. The ratio of

NPV of the external debt /exports rises substantially, looming higher than the critical ratio (150%) in all the years. Hence the estimated indicators reveal the absence of external debt sustainability. Exports constitute a critical source of the foreign exchange which a country needs to service its foreign currency denominated debt. Therefore Egypt needs to

significantly improve its export performance especially in the medium term. Similarly, the ratios of the afore-mentioned variables to government revenues are continuously increasing and exceeding their critical value (250%). The NPV of external debt to the domestic budget revenue is expected to increase from 50.3% in 2016 to 570% in 2031. The expected increase in the ratio of NPV of the external debt to the domestic budget revenues underscores the importance of the Egyptian Government’s current efforts towards improving revenue collections and emphasises the need to expedite the Government’s Domestic Revenue Mobilization Strategy.

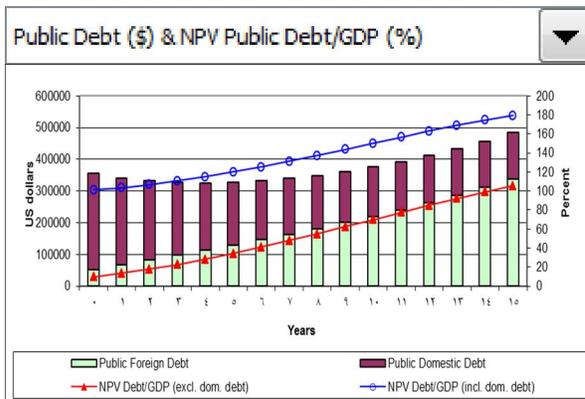
Briefly, Egypt has the possibility of realizing an internal financial sustainability in the long-run while

external debt sustainability is not expected to occur. Hence debt sustainability will not be realized as it requires meeting both sustainability criteria.

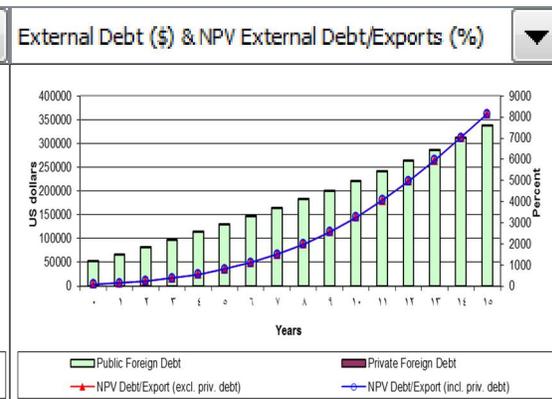
All the foregoing indicators applied in this study are Solvency Ratios.

Liquidity Ratios

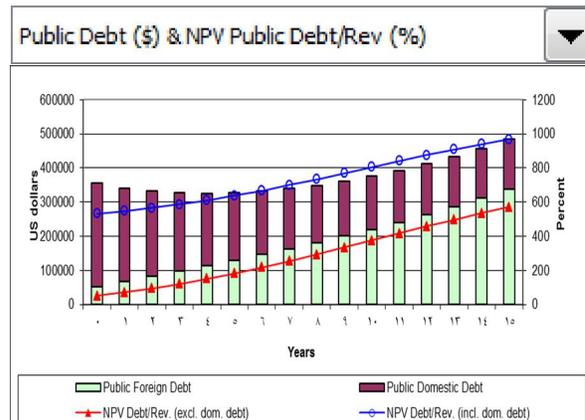
One of the important liquidity indicators for the external debt service is the ratio of the external debt service to the domestic budget revenue. In Egypt, this ratio is expected to increase from 8.2% in 2016 to 94% in 2031, also exceeding the critical ratio (20%) in all the projected years. We conclude that under this first scenario, Egypt cannot enjoy external debt sustainability. (see following Figures).



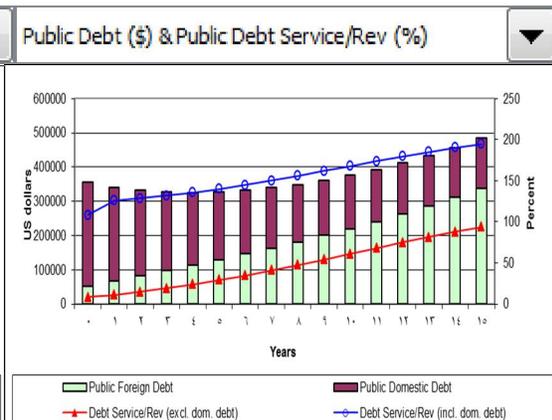
Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module

A.2. The second scenario: This pessimistic scenario assumes that in 2031, there is a decrease of 2% in each of the economic growth rate and the exports growth rate; the government is adopting an

expansionary fiscal policy; there is a further depreciation of 2% in the exchange rate and an increase of 2% in the inflation rate in 2031; the 2016 data is kept unchanged and the Grant is equal to zero.

A.2.1.: Alternative Assumptions under the Pessimistic scenario**Table 6: Alternative Assumptions under the Pessimistic scenario**

Scenarios	Baseline scenario (H)		Pessimistic scenario
	2016	2031	
GDP growth rate (%)	4.4	3.2(h)	4.4
Exports growth rate (%)	-14.53	4.83(h)-	-14.53
Inflation rate (%)	13.8	10.2(h)	13.8
Depreciation rate (%)	30.35	11.51(h)	30.35
Share of priority spending to GDP (%)	32.2	33.3(h)	32.2
Share of gov. revenues to GDP (%)	22.2	20.9(h)	22.2

A.2.2. Estimation Results**Table7-a: NPV of public debt to GDP (%) and the ratio of NPV of public debt to average exports**

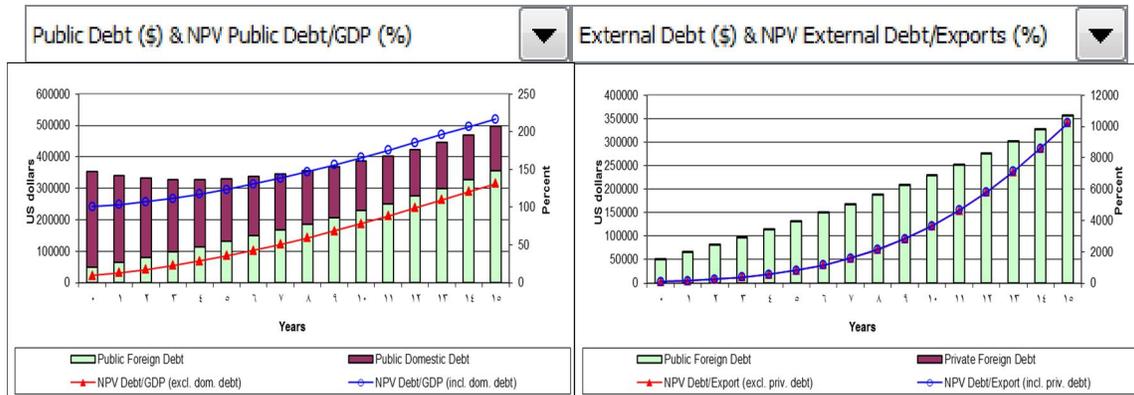
Year	NPV of total Public debt/GDP	NPV of public Foreign debt/GDP	NPV of public Domestic Debt/GDP	NPV of total Foreign debt/Av. Exports	NPV of public Foreign debt/Av. exports	NPV of private Foreign debt To average Exports
2016	101.0	9.5	91.5	92.3	91.8	0.5
2017	103.8	13.4	90.3	155.2	154.6	0.6
2018	107.5	18.0	89.5	249.0	248.2	0.8
2019	112.1	23.2	88.8	384.5	383.5	1.0
2020	117.5	29.2	88.3	572.9	571.6	1.3
2021	123.8	35.8	88.0	827.8	826.2	1.6
2022	130.9	43.1	87.8	1164.6	1162.7	2.0
2023	138.7	51.1	87.6	1599.8	1597.4	2.4
2024	147.1	59.6	87.5	2149.9	2147.0	2.9
2025	156.1	68.8	87.3	2830.7	2827.3	3.4
2026	165.6	78.4	87.2	3656.1	3652.1	4.0
2027	175.5	88.4	87.0	4636.7	4632.0	4.6
2028	185.5	98.7	86.8	5778.2	5772.9	5.3
2029	195.7	109.2	86.4	7080.2	7074.3	5.9
2030	205.8	119.8	85.9	8535.1	8528.5	6.6
2031	215.6	130.3	85.3	10126.7	10119.6	7.2

Source: Outputs of the Debt Projection Module

Table7-b: NPV of total public debt to average government revenues and the ratios of the public debt service to government revenues

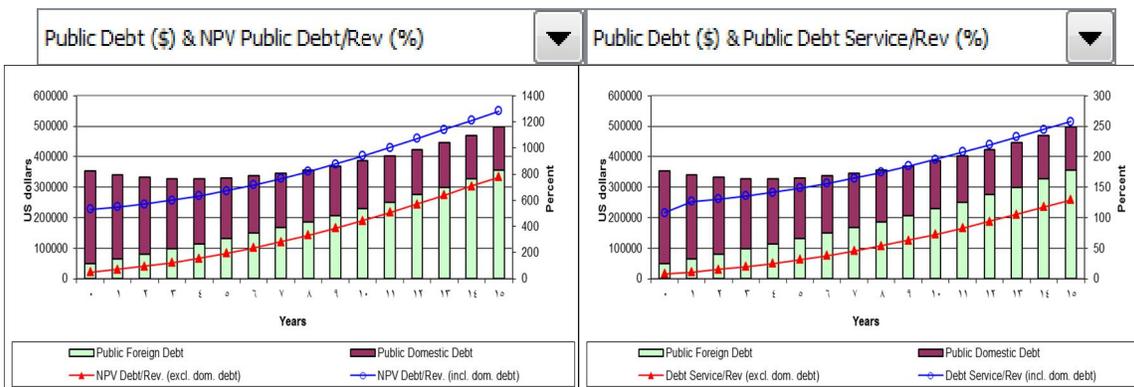
Year	NPV of total Public debt/Av. Gov. Revenues	NPV of public Foreign debt/Av.gov. Revenues	NPV of public Domestic Debt/ av.Gov. revenues	Debt service On public Debt/gov. Revenues	Debt service On public Foreign debt/Current year Revenues	Debt service On public domestic Debt/Current yr Revenues
2016	532.6	50.3	482.3	108.4	8.2	100.1
2017	550.0	71.1	478.8	126.7	11.1	115.6
2018	573.0	95.9	477.1	130.8	15.1	115.6
2019	601.9	124.8	477.1	135.8	19.8	116.0
2020	636.0	157.9	478.1	141.8	25.2	116.6
2021	675.1	195.2	479.9	148.7	31.3	117.4
2022	719.2	236.9	482.3	156.6	38.2	118.4
2023	768.0	282.8	485.1	165.3	45.8	119.5
2024	821.2	333.0	488.3	174.8	54.1	120.7
2025	878.6	387.0	491.6	185.0	63.1	121.9
2026	939.6	444.8	494.8	196.0	72.8	123.2
2027	1003.6	505.8	497.8	207.5	83.0	124.5
2028	1070.1	569.5	500.5	219.4	93.8	125.6
2029	1138.2	635.5	502.7	231.7	105.0	126.7
2030	1207.1	703.0	504.1	244.1	116.5	127.6
2031	1276.0	771.2	504.7	256.5	128.2	128.3

Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module

Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module

Source: Outputs of the Debt Projection Module.

A.2.3. Results of the second scenario compared with the results of the first scenario

We note the increase of the change rate from 0% in 2016 to 20% in 2031 in the ratio of NPV of the total public debt/GDP; and from 0% to 23.4% in the ratio of NPV of the public external debt /GDP; and from 0% to 15.3% in the ratio of NPV of the public domestic debt/GDP during the same period. Similarly we note an increase from 0% in 2016 to: 17.9%, 25.4%, 17.9%, 31.7%, 35.3%,26.4%,31.6%, 36.4%, 27.1% in 2031 in the following ratios respectively: NPV of the total external debt/exports; NPV of the public external debt/exports; NPV of the private external debt/exports; NPV of the total public debt/average government revenues; NPV of the public external debt/average government revenues; NPV of the public domestic debt/average government debt; the debt service on the public external debt/government revenues; and the debt service on the public domestic debt/government revenues.

The above analysis indicates that Egypt’s debt sustainability is mainly influenced by the following economic factors: The economic growth rate, the growth rate of exports, the ratio of government revenues to GDP, the inflation rate, and the percentage change of the local currency exchange rate.

It is noteworthy that the change of the exchange rate had the greatest influence on the above-mentioned sustainability indicators.

A.3. The optimistic scenario

This scenario assumes that the economic growth rate and the exports growth rate will be increasing, while the government will be adopting a contractionary fiscal policy. The exchange rate appreciates and the inflation rate decreases (See Table8).

A.3.1: Alternative Assumptions under the optimistic scenario

Table 8: Alternative Assumptions under the optimistic scenario

Variables	Baseline scenario (H)		Optimistic scenario
	2016	2031	
GDP growth rate (%)	2016	4.4	4.4
	2031	3.2(h)	10
Exports growth rate (%)	2016	-14.53	-14.5
	2031	4.83(h)-	3
Inflation rate (%)	2016	13.8	13.8
	2031	10.2(h)	3
Depreciation rate (%)	2016	30.35	30.35
	2031	11.51(h)	0
Share of priority spending to GDP (%)	2016	32.2	32.2
	2031	33.3(h)	0
Share of gov. revenues to GDP (%)	2016	22.2	22.2
	2031	20.9(h)	24

A.3.2. Evaluation Results

Table 9-a: NPV of public debt to GDP (%) and the ratio of NPV of public debt to average exports

Year	NPV of total Public debt/GDP	NPV of public Foreign debt/GDP	NPV of public Domestic Debt/GDP	NPV of total Foreign debt/Av. Exports	NPV of public Foreign debt/Av. Exports	NPV of private Foreign debt To average Exports
2016	101.0	9.5	91.5	92.3	91.8	0.5
2017	101.3	12.9	88.4	149.0	148.4	0.6
2018	100.1	16.2	83.9	223.5	222.8	0.8
2019	97.4	19.2	78.2	315.6	314.7	0.9
2020	93.3	21.7	71.7	420.8	419.6	1.2
2021	87.8	23.4	64.4	532.3	530.9	1.4
2022	80.8	24.3	56.5	639.5	637.8	1.6
2023	72.3	24.1	48.2	728.2	726.3	1.9
2024	62.3	22.7	39.6	781.0	778.9	2.1
2025	50.9	20.1	30.9	778.5	776.2	2.3
2026	38.2	16.1	22.0	700.8	698.4	2.5
2027	24.3	11.0	13.3	529.5	527.0	2.6
2028	9.4	4.7	4.7	250.0	247.4	2.6
2029	-6.3	-2.6	-3.7	-146.8	-149.4	2.6
2030	-22.3	-10.6	-11.7	-655.5	-658.0	2.5
2031	-38.0	-18.9	-19.1	-1258.6	-1261.0	2.4

Source: Outputs of the Debt Projection Module

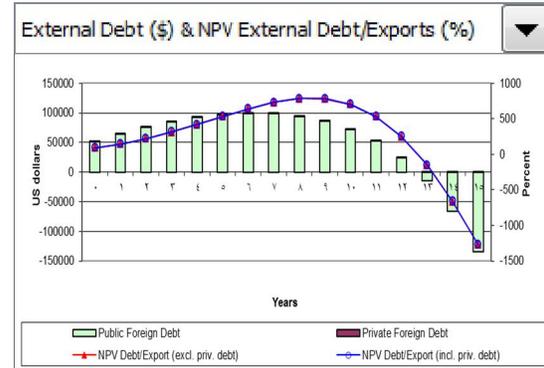
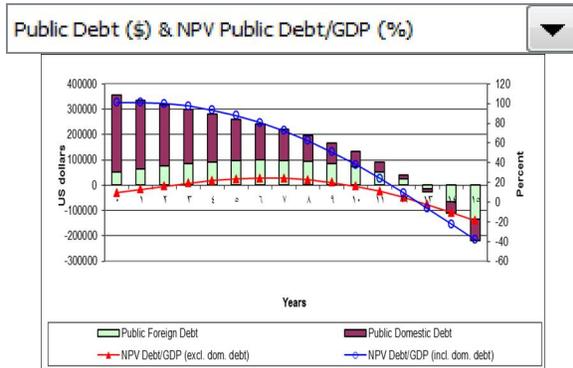
Table 9-b: NPV of total public debt to average government revenues and the ratios of the public debt service to government revenues

Year	NPV of total Public debt/Av. Gov. Revenues	NPV of public Foreign debt/Av.gov. Revenues	NPV of public Domestic Debt/ av.Gov. revenues	Debt service On public Debt/gov. Revenues	Debt service On public Foreign debt/Current year Revenues	Debt service On public domestic Debt/Current year Revenues
2016	532.6	50.3	482.3	108.4	8.2	100.1
2017	533.6	67.9	465.6	122.6	10.6	112.1
2018	524.7	84.9	439.8	119.7	13.3	106.4
2019	506.8	99.8	407.0	115.1	15.7	99.4
2020	481.7	111.8	369.9	108.9	17.8	91.1
2021	449.6	120.0	329.6	101.2	19.2	82.0
2022	410.4	123.4	287.0	92.0	19.9	72.1
2023	364.3	121.4	242.9	81.5	19.7	61.8
2024	311.5	113.5	198.0	69.8	18.5	51.2
2025	252.5	99.5	153.0	56.9	16.4	40.5
2026	187.9	79.4	108.5	43.0	13.3	29.7
2027	118.4	53.6	64.8	28.3	9.2	19.1
2028	45.3	22.7	22.6	12.9	4.3	8.6
2029	-30.4	-12.5	-17.9	0.3	-1.3	1.6
2030	-106.1	-50.4	-55.7	-7.4	-7.4	0.0
2031	-179.3	-89.3	-90.0	-13.8	-13.8	0.0

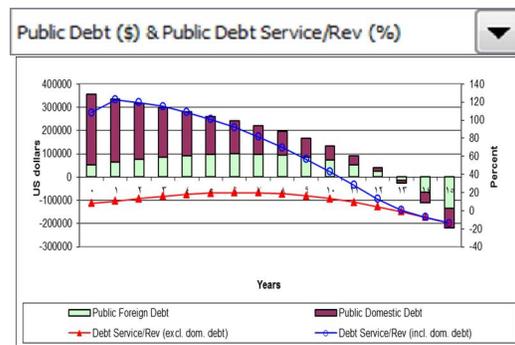
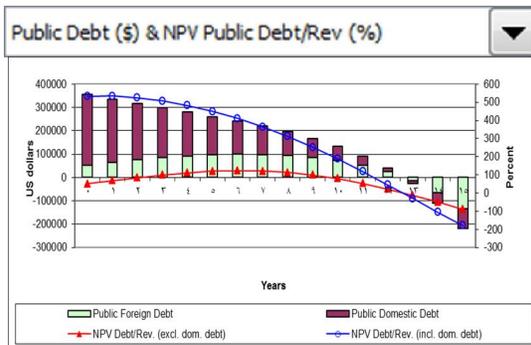
Source: Outputs of the Debt Projection Module

Tables 9-a, 9-b show that the ratio of NPV of the total public debt to GDP will be continuously decreasing, dropping from 101% in 2016 to -38% in 2031; similarly, the ratio of NPV of external debt / GDP falls down at an increasing rate from 9.5% in 2016 to -18.91% in 2031. The ratio of NPV of the public external debt/average exports shoots down from 91% in 2016 to -658% in 2030. The ratio of NPV of the total public debt to government revenues

continuously decreases from 532.6% in 2016 to -179.3% in 2031; and the ratio of the expected NPV of the external debt to average government revenues drops from 50.3% in 2016 to -89.3% in 2031. The debt service on the external public debt as a ratio of government revenues jumps down from 8.24% in 2016 to -13.8% in 2031. Therefore Egypt can enjoy external debt sustainability under this optimistic scenario (See following Figures).



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module.



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module

B. Alternative Financing Scenarios of a Government-led Investment Strategy to Achieve the MDGs (The eight Millennium Development Goals)

B.1. The first scenario: The Debt financing scenario: The gap between savings and investment (Please see Table 2 in Appendix) is financed via and equals the external debt.

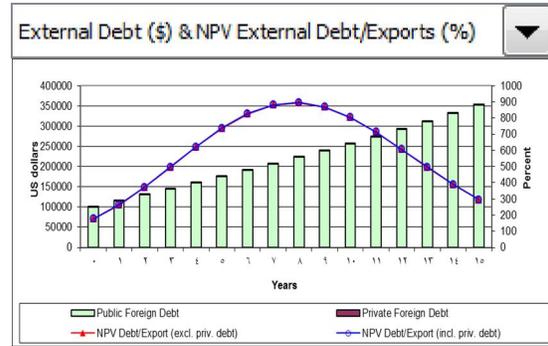
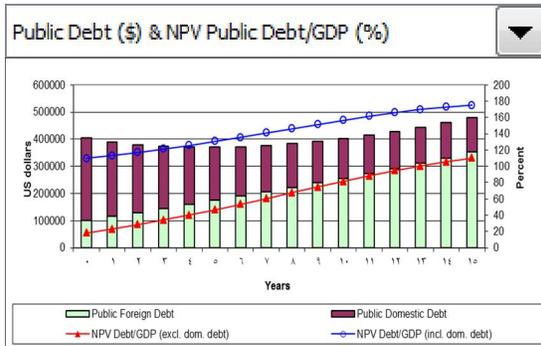
B.1.1. Required information

The external debt increases by the average gap amount (about 50 billion US dollars in 2016); the Grant element equals zero, In addition it is assumed that the export growth rate will increase, while the other macroeconomic variables remain unchanged from Scenario A.1.

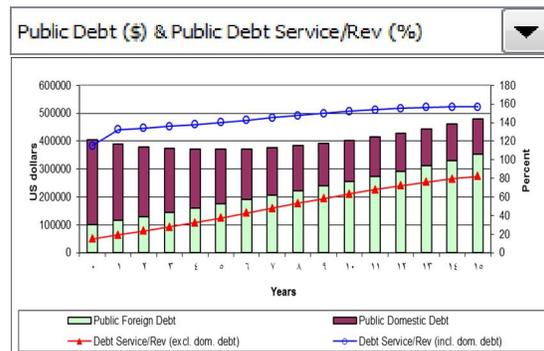
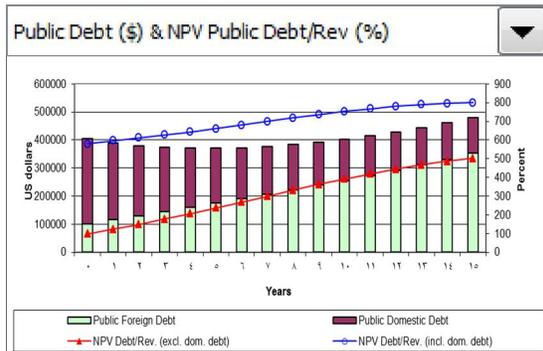
B.1.2. Evaluation results

The debt sustainability indicators still exceed their critical values. The ratio of NPV of the external debt/GDP continues to rise from 18.36% in 2016 to

110% in 2031, and exceeds its critical value (40%) in all the projected years. The ratio of NPV of the total public debt /GDP also climbed up from 109.8% in 2016 to 175.3% in 2031 standing higher than the critical rate (56%) in all the years. The ratio of NPV of the external debt/exports also increases from 176.6% in 2016 to 294.5% in 2031, and exceeds the critical value (150%) in all the projected years. The ratio of NPV of the external debt/revenues also increases from 96.8% in 2016 to 502% in 2031, and exceeds the critical value (250%). The debt service on the external debt similarly increases throughout the projection period, creeping from 14.83% in 2016 to 74.6% in 2031, and breaking the critical level (20%) in all the projection years, clearly exposing Egypt to liquidity risks. Therefore Egypt cannot enjoy external debt sustainability under this scenario (See following Figures).



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module

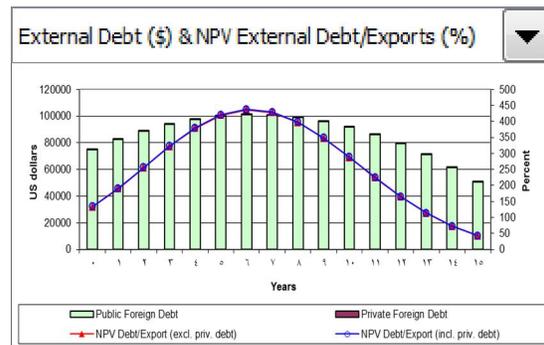
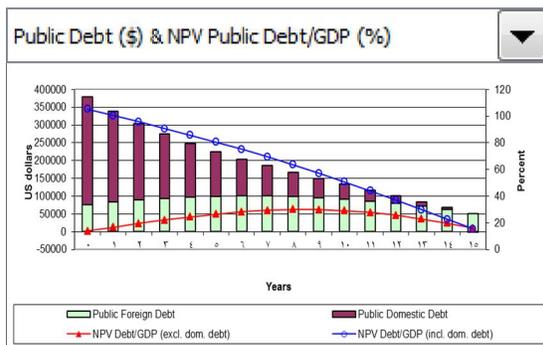
B.2. The second scenario: The Grant financing scenario assumes that economic development will be equally financed through loans and grants. In other words, the investment-savings gap of 50 billion US dollars will be half financed by loans (25 billion US dollars) and half financed by grants (25 billion US dollars). In addition, it is assumed that both the export growth rate and government revenues will increase while the other macroeconomic factors will remain unchanged.

B.2.1. Evaluation results

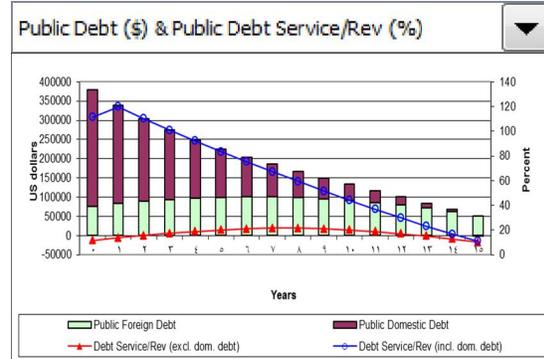
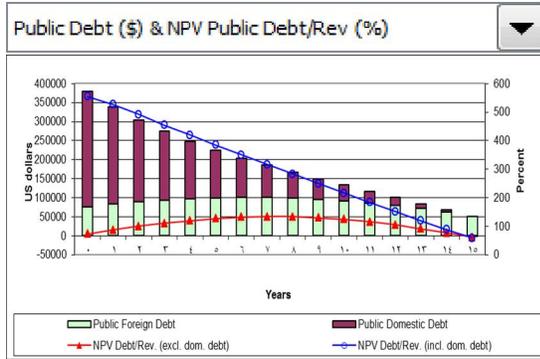
The ratio of NPV of the total public debt to GDP will be continuously decreasing, dropping from 105.3% in 2016 to 15.3% in 2031; similarly, the ratio

of NPV of external debt / GDP falls down from 29.4% in 2024 to 15.8% in 2031. The ratio of NPV of the public external debt/average exports shoots down from 133% in 2016 to 42% in 2031. The ratio of the projected NPV of the external debt to average government revenues drops from 73% in 2016 to 60.7% in 2031. The debt service on the external debt / government revenues slides down from 21.4% in 2023 to 10.22%.

When the investment-savings is equally financed with loans and grants, the economy achieves debt sustainability (in the long –run), as illustrated by the following figures



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module



Source: Outputs of the Debt Projection Module Source: Outputs of the Debt Projection Module

6. Conclusion

The study results show that public debt in Egypt is not sustainable and that the main factors influencing debt sustainability are the following: Quality of economic policies and institutions, debt burden and shocks. The study also reveals that debt sustainability is not expected to be achieved during the period 2016-2031 under the scenarios according to which the study model has been estimated since the model indicators have exceeded their critical ratios; with the exception, however, of the last scenario where the government relies on loans and grants in equal amounts to finance the gap between investment and savings in order to realize its development strategy. This result underlines the importance of grants for realizing development strategies while maintaining debt sustainability. On the other hand, when the gap between investment and savings is fully debt financed, the government will have to bear a greater debt burden and will not be able to achieve debt sustainability or meet its debt obligations. Hence, instead of realizing the desired economic development, the State will charge future generations with infinite burdens.

This study underscores the need for Egypt to foster its economic growth rate while reducing the inflation rate. For example, there may be options for reducing government expenditures, especially in non-priority sectors, without undermining the poverty reduction objective. Higher tax efficiency, better utilization of the available resources and especially improving the performance of the exports of goods and services sector, can largely contribute to increasing government revenues and foreign reserves thus eventually leading to external debt sustainability.

References

- Alba, P., Al-Shawarby, Sh., and Iqbal, F., (2004): "Fiscal adjustments? and public debt sustainability in Egypt," The Egyptian Center of Economic Studies (ECES), Working paper No. 97.
- Atingi Ego, M., Traa, B., and Casero, P. A., (2017): "Zambia," Prepared by the staffs of the International Monetary Fund and the International Development Association.
- Braga, A. C., Shetty, S., Krueger, Th., and Marston, D., (2009): "Angola, Joint Bank-Fund Debt Sustainability Analysis," Prepared by the staffs of the International Monetary Fund and the International Development Association.
- El-Mahdy, Adel M., and Torayeh, Neveen M., (2009): "Debt sustainability and economic growth in Egypt," International Journal of Applied Econometrics and Quantitative Studies, Vol. 6-1.
- Feld, L. P., Kohler, E. A., and Wolfinger, J., (2018): "Modeling Fiscal Sustainability in Dynamic Macro-Panels with Heterogeneous Effects: Evidence from German Federal States," The German Council of Economic Experts.
- Gabriela, A. S., (2013): "Sustainability of the public debt and the financial crisis," Theoretical and Applied Economics, Volume XX (2013), No. 3 (580), pp. 7-16.
- Gunter, B. G. and Rahman, A.F. M., (2008): "Analyzing Bangladesh's Debt Sustainability Using SimSIP Debt," Bangladesh Development Resource Working Paper Series (BDRWPS) No. 2.
- Gunter, B. G., Lopez, H., Ramadas, K. and Wodon, Q., 2002.
- Gunter, B. G., Lopez, H., Ramadas, K., and Wodon, Q., (2002): "SimSIP Debt: Analyzing debt sustainability," World Bank, Draft-comments-welcome, Trial version, June 25th, 2002.
- Kemal, M. A., and Malik, B. A., (2016): "Measuring Sufficient Debt Sustainability Condition in Pakistan".
- Kraay, A. and Nehru, V., (2003): "When is External Debt Sustainable?" Research workshop on Macroeconomic Challenges in Low-income countries.

12. Owen, D., Murgazova, Z., and Casero, P. A., (2017): "Republic of Madagascar," Prepared by the staffs of the International Monetary Fund and the International Development Association.
13. Sachs, Jeffrey, Botchwey, Kwesi, Cuchra, Maciej and Sievers, Sara, Implementing Debt Relief for the HIPCs, Cambridge, MA: Center for International Development, Harvard University, 1999 (available at www.cid.harvard.edu/) and European Network on Debt and Development (EURODAD), Putting Poverty Reduction First: Why a Poverty Approach to Debt Sustainability Must be Adopted, Brussels: EURODAD, 2001 (available at www.eurodad.org).
14. Sheikh, M. R., Abbas, M. N., Iqbal, S. and Masoud, S., (2014): "External Debt Sustainability Analysis: A Case of SAARC Countries," International Journal of Management Research and Emerging Sciences.
15. Sopek, P., (2011): "Testing the sustainability of the Croatian public debt with dynamic models," Financial Theory and Practice, 35(4),413-442, 2011.
16. Sultan Abu Ali, Notes on the Economies of Public Finance, Faculty of Commerce, Zagazig University, 2015, page 296.
17. The Central Bank of Egypt, Research and Development, and Publication Sectors: "Economic Journal," several issues.
18. The Central Bank of Egypt: "Annual Report (2016/2017)".
19. The World Bank's Global Development Finance (GDF), formerly World Debt Tables; (GDF: The country is classified as severely indebted). www.worldbank.org; www.cbe.org; www.imf.org.

Appendix

Table 1: Indicatives debt burden thresholds (Country Policy and Institutional Assessment CPIA)

Indicative debt burden Thresholds	Weak CPIA <3.25	Medium 3.25 <CPIA<3.75	Strong CPIA >3.75
Solvency Ratios			
PV of External Debt to GDP	30	40	50
PV of External Debt to Exports	100	150	200
PV of External Debt to Revenue	200	250	300
PV of Public debt to GDP	36	56	74
Liquidity Ratios			
External Debt Service to Exports	15	20	25
External Debt Service to Revenue	18	20	22

Source: World Bank/IMF LIC DSF

Table 2: The (investment – savings) gap (in billion US \$) from 2000 to 2016

2000	2001	2002	2003	2004	2005	2006	2007	2008
16	14.8	13.9	12.3	11.4	14.8	20.3	29.7	40.4
2009	2010	2011	2012	2013	2014	2015	2016	
39	44.9	39.8	42.7	39.2	40	46	48.6	

Source: <https://www.imf.org/external/pubs/ft/weo/2018/01/weodata/index.aspx>

Table 3-a: The required input data of the Debt Projection Module (2000-2016)

Year	Average maturity on new external debt commitments (years)	Average maturity on new external debt commitments, private (years)	Average maturity on new external debt commitments, official (years)	GDP (current US\$)	Real GDP growth (annual %)	Inflation, GDP deflator (annual %)	Interest payments on external debt, public and publicly guaranteed (PPG) (INT, current US\$)	Average interest on new external debt commitments, private (%)
2000	15.8	4.3	21.7	99838543960	5.4	4.9	6.03E+08	5.8
2001	10.9	8.6	21.5	97632008710	3.5	1.9	6.70E+08	8.0
2002	15.6	12.4	15.8	87850683979	2.4	3.2	7.37E+08	2.9
2003	18.9	10.6	19.0	82924503943	3.2	6.8	6.39E+08	0.0
2004	16.5	8.2	17.5	78845185293	4.1	11.7	6.48E+08	3.7
2005	11.9	8.2	18.8	89685725230	4.5	6.2	6.16E+08	4.4
2006	22.3	5.3	22.5	1.07E+11	6.9	7.3	7.33E+08	2.2
2007	11.3	7.3	17.3	1.30E+11	7.1	12.6	8.03E+08	6.8
2008	22.9	5.2	23.4	1.63E+11	7.2	12.2	8.29E+08	1.9
2009	21.3	14.4	21.3	1.89E+11	4.7	11.2	8.06E+08	0.3

2010	22.3	15.5	24.8	2.19E+11	5.1	10.1	7.35E+08	5.8
2011	16.7	14.3	16.8	2.36E+11	1.8	11.6	7.26E+08	2.6
2012	15.3	5.0	16.3	2.79E+11	2.2	19.5	6.80E+08	5.0
2013	6.1	1.6	7.4	2.89E+11	2.2	8.7	6.66E+08	0.1
2014	22.7	13.9	24.0	3.06E+11	2.9	11.2	6.87E+08	2.5
2015	13.1	6.3	13.6	3.33E+11	4.4	9.9	7.18E+08	3.7
2016	9.6	11.5	9.3	3.33E+11	4.3	6.2	9.62E+08	3.8

Table 3-b

Year	Average interest on new external debt commitments, official (%)	Average interest on new external debt commitments (%)	Revenue, excluding grants (% of GDP)	External debt stocks, public and publicly guaranteed (PPG) (DOD, current US\$)	Official exchange rate (LCU per US\$, period average)	Inflation, consumer prices (annual %)	Exports of goods and services (current US\$)	Exports of goods and services (annual % growth)
2000	4.7	5.1		2.43E+10	3.5	2.7	1.62E+10	3.8
2001	4.0	7.3		2.53E+10	4.0	2.3	1.71E+10	3.3
2002	2.6	2.6	24.3	2.66E+10	4.5	2.7	1.61E+10	5.8
2003	2.6	2.6	25.4	2.8E+10	5.9	4.5	1.81E+10	13.8
2004	2.6	2.7	24.6	2.93E+10	6.2	11.3	2.23E+10	25.2
2005	5.2	4.7	24.3	2.86E+10	5.8	4.9	2.72E+10	20.5
2006	4.1	4.1	28.1	2.9E+10	5.7	7.6	3.22E+10	21.3
2007	2.4	5.1	27.1	3.21E+10	5.6	9.3	3.95E+10	23.5
2008	2.7	2.6	27.6	3.08E+10	5.4	18.3	5.38E+10	28.5
2009	1.4	1.4	26.9	3.14E+10	5.5	11.8	4.72E+10	-14.6
2010	1.1	2.4	24.8	3.22E+10	5.6	11.3	4.67E+10	-2.8
2011	1.0	1.0	21.9	3.08E+10	5.9	10.1	4.85E+10	0.6
2012	2.2	2.4	20.2	3.2E+10	6.1	7.1	4.58E+10	-2.6
2013	0.3	0.2	21.4	4.23E+10	6.9	9.4	4.91E+10	4.5
2014	0.7	0.9	19.9	3.72E+10	7.1	10.1	4.35E+10	-10.9
2015	1.7	1.8	21.0	4.28E+10	7.7	10.4	4.39E+10	-0.6
2016	1.6	1.9	22.2	5.13E+10	10.0	13.8	3.44E+10	-14.5

Table 3-c

Year	Grants, excluding technical cooperation (BoP, current US\$)	Grants, excluding technical cooperation (growth annual %)	Grants, excluding technical cooperation (growth annual %)	**General government total expenditure Percent of GDP	External debt stocks, private nonguaranteed (PNG) (DOD, current US\$)
2000	1.01E+09			26.0	572800000
2001	6.99E+08	-0.3	-30.7	27.9	618500000
2002	7.30E+08	0.0	4.5	30.9	658500000
2003	5.88E+08	-0.2	-19.4	30.6	315638000
2004	1.44E+09	1.4	144.4	30.1	85200000
2005	8.78E+08	-0.4	-38.9	30.3	93000000
2006	6.77E+08	-0.2	-22.9	34.5	81000000
2007	1.28E+09	0.9	88.7	31.3	20530000
2008	1.61E+09	0.3	26.2	32.7	80030000
2009	9.02E+08	-0.4	-44.1	32.5	74000000
2010	6.48E+08	-0.3	-28.1	31.4	53750000
2011	4.20E+08	-0.4	-35.2	30.5	16250000
2012	5.64E+08	0.3	34.4	30.8	20000000
2013	3.19E+09	4.7	465.1	34.6	12288000
2014	3.55E+09	0.1	11.2	35.7	21356000
2015	7.48E+08	-0.8	-78.9	33.0	22500000
2016	7.69E+08	0.0	2.9	32.2	156619000

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