Sustainability of Sudan External Debt up 2015 and beyond

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April 2017

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Abstract:

Sudan is one of the heavily indebted countries. This study investigates the burden of external debt of Sudan and assesses its future sustainability. By all indicators, Sudan external debt is found to be excessive and unsustainable as up to the end of 2015. With policy reforms aiming at strong sustained economic growth and exports, external debt of Sudan will reach thresholds indicators of sustainability in a medium term. External debt/GDP and external debt/exports of goods and services could well be reduced to match the internationally acceptable ratios given that external indebtedness will grow at lowers rate per annum. Trade openness is good for growth but with rates of increase in exports made higher than rates of increase in imports and imports would be reduced and linked to growth of GDP and the need for contracting new foreign loans. Efforts for benefiting from the HIPCs Initiative should be accelerated. Domestic saving should be enhanced, since in one hand it is much better for economic growth than foreign saving and since it reduces needs for foreign borrowing on the other hand while makes debt more sustainable. There is a high need to attract more non-debt creating financial sources such as FDI, portfolio investments and ODA.

1. Introduction

1.1. Background

Sudan is one of the heavily indebted countries, though recently has been classified lower-middle income country. External debt has been increasing since early 1970's. Total external debt amounted to $27,006, 37,805, and 44,350 billion by the end of 2005, 2010 and 2015

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respectively. This has been due to continuous debt creating financial flows, successively increasing debt default and accumulating debt services. Sudan external debt as percentage of GDP has been 157.7% in 2000, declined to 82.9% in 2005 and to slightly above 60% in 2010 and in 2015 it was 54%. This might indicate a growing GDP or decreasing rates of growth of external debt or both. Furthermore, these ratios might indicate that Sudan external debt is heading to be sustainable. However, when compared with the net present value (NPV) of external debt defined as the ratio of total debt to exports of goods and services the indication is that Sudan indebtedness is severe by the maximum solvency thresholds as set in C. Reinhart, K. Rogoff and M. Savastano (2004). Short term debt of Sudan's fluctuates around 23% of total debt over the period 1969-2015. The international financial crisis emerged since 2008 has proved that short term debts can trigger foreign exchange volatility and create problems of debt insolvency and sustainability. Failure to meet solvency and sustainability requirements has been behind the inability of Sudan to benefit from the HIPCs initiative and rescheduling process of external debt.

1.2. Problem and Questions of the Research

Foreign borrowing is a source of development finance for low-income, low-savings countries. However, it is debt-creating and debt burden impinges on the rate of economic growth where its adverse effect works through channels related to the principal of the debt, interest payments and the efficiency of foreign loans utilization. In accord with these statements, the problem of this research is set in terms of questions as follows:

- **a.** Why Sudan has accumulated such large external debt to the extent that is threatening debt sustainability and development financing?
- **b.** To what extent Sudan meets debt sustainability and solvency indicators such as debt/GDP ratio, debt/exports and imports ratio?

1.3. Hypotheses of the Research

The research aims to test the following hypotheses:

a. Accumulated Sudan foreign indebtedness has been due to contractual and delay services and has negative impact on debt sustainability.

b. Sudan does not meet the macroeconomic performance requirements of foreign.

c. Future borrowing ability is limited by growth of GDP and the present value of external debt in terms of both debt/GDP ratio and debt/exports of goods and services ratio.

1.4. Objectives of the Research

The research objectives are:

a. To describe the patterns and structure of Sudan external debt by source and type in order to examine the causes of its historical accumulation.

b. To assess the sustainability of external debt using the framework of debt solvency methodology and indicators and to forecast the future outlook of Sudan borrowing.

1.5. Methodology of the Research

The research follows descriptive statistical methods in that it depicts trends and patterns of Sudan external debt by types, duration (maturity) and sources (creditors) over the period 1969-2015. The study tests for a cointegration relationship between the internal (i.e., government deficit) and the external (i.e., current account deficit as a manifestation external debt) within the notion of the twin deficits hypothesis. We then assess debt sustainability applying models and indicators of debt solvency. In accord with the requirements of macroeconomic indicators, the study assesses how Sudan's external debt would like.

1.6. Structure of the Study

The rest of the study is organized into four sections. Section two provides a theoretical and conceptual framework, presenting an analytical framework of debt dynamics and practical indicators of external debt sustainability. Section three overviews the performance Sudan economy with emphasis on the external sector and the need for foreign borrowing and the

resulting debt accumulation. It also presents the results of analysis of sustainability of foreign indebtedness of Sudan with some projections of Sudan future debt medium term outlook and long term sustainability. Finally results are derived and recommendations are provided.

2. Theoretical and Conceptual Framework

2.1. Saving Gaps and Economic Growth

The study departs from the neoclassical conceptualization of capital accumulation as the main causes of economic growth. Capital accumulation results from a portion of national income being saved and invested. As in the Keynesian literature of economic growth, restated in Thirlwall (1994), mathematically, the growth of output ($\Delta Y/Y$) can be expressed as the product of the ratio of investment to national output (I/Y) and the productivity of investment ($\Delta Y/I$). If g is the growth rate ($\Delta Y/Y$); s is the savings ratio (S/Y), and v is the incremental capital-output ratio ($I/\Delta Y$) i.e. the amount of investment or increase in the capital stock required to increase the flow of output by one unit (which is the reciprocal of the productivity of investment, $\Delta Y/I$). Assuming that a country targets to grow at 5 percent per annum, and the capital-output ratio is 3, it can be seen that it must save and invest 15 percent of its national income. If it saves less, growth will be slower, unless the country can somehow reduce the incremental capital-output ratio or raise the productivity of investment.

National income differs from national output to the extent of net income from abroad (positive or negative). If there is a difference between the actual savings ratio and that required to achieve a target rate of growth, there is a saving-investment (S-I) gap. In the example given above, if the required savings ratio is 15 percent and the actual ratio is 10 percent, the S-I gap is 5 percent. This needs to be filled if the target growth rate is to be achieved. That can be done by either attempting to raise the domestic savings ratio or by borrowing from abroad i.e. by foreign saving. But borrowing abroad is subject to factors that are outside of control of small open economy such as interest rate and international financial situations. With foreign trade,

not even 5 percent foreign borrowing may be enough if the difference between the import requirements for growth and export earnings is more than 5 percent of output. In this case, a dominant export-import (X-M) gap is said to exist which would need to be financed by foreign capital inflows of various types including foreign loans. This connection leads to the concept of dual-gap analysis, originally pioneered by Chenery and Strout (1966), which argued that foreign borrowing would be necessary to fill the larger of the two gaps if the target rate of growth could be achieved. Furthermore, if the X-M gap is the larger (or the dominant constraint) foreign borrowing has a dual role – not only to supplement domestic saving, but also foreign exchange.

Foreign saving raises the growth rate of a country, ignoring debt servicing, and assuming that domestic saving and the productivity of capital are not adversely affected. However, with debt servicing, foreign borrowing raises the growth of national income if the rate of return exceeds the rate of interest, and raises the growth of national output if new inflows exceed lost saving from debt servicing on past borrowing. For example, according to Thirlwall, (2003) the Dominican Republic had been a capital importer over the period 1970-2000; raising the growth of output above what it would otherwise be based on domestic saving alone. Foreign resource inflows permit investment to exceed domestic saving by allowing imports to exceed exports. This can be seen from the identity of national accounts written as:

$$Y = C + I + G + X - M$$

where Y is income, C is consumption, I is investment, G is government expenditure, X is exports and M is imports. Since saving (S) is defined as income (Y) minus consumption (C), we have:

$$I - S = M - X = F$$

where F is foreign capital inflows. Ignoring any interest payments or profit repatriation, so that the value of national income and output are equal, and assuming nothing else changes, it can be

shown that foreign borrowing raises the growth of income and output. If s is the savings ratio and F/Y is the ratio of foreign borrowing to national income, in a closed economy, $g = s\sigma$ and in an open economy, F/Y raises g provided s and σ are not adversely affected by the process of foreign borrowing. Foreign borrowing, however, must be paid for unless it is in the form of pure grants, or the resource inflow is direct foreign investment and no future profits flow out. If borrowing is in the form of loans, interest payments abroad reduce national income below the value of national output, and then the income loss reduces saving which affects the growth of output. Some Latin American countries were in this situation in the mid-1980s in the aftermath of the debt crisis. This does not mean, however, that borrowing may not be beneficial, because the outflows at the present are a reflection of past borrowing.

2.2. On Foreign Borrowing and External Debt Accumulation

2.2.1. Why Borrowing Abroad?

A legitimate question is that should the government borrow abroad at all? Some say No! Some economists argue that foreign borrowing does weaken the domestic savings effort and reduce the productivity of capital. But as in Mankiw (2003), public debt if it is not excessive, it will be a national blessing. Others argue that a public debt is a public curse. When a government budget deficit reduces national saving, it often leads to a trade deficit, which in turn is financed by borrowing abroad. This link between the budget deficit and the trade deficit leads to two further effects of government debt. In particular, the high levels of government debt may increase the risk that an economy will experience capital flight – an abrupt decline in the demand for a country's assets in the world financial markets. Also, the higher the level of the government debt, the greater is the temptation of default. The famous cases of debt default were of Latin American countries during the 1980's and Russia in 1998. Thus, as government debt increases, international investors may fear default and curtail their lending. If this loss of confidence occurs suddenly, the result could be the classic symptoms of capital flight – a

collapse in the value of the currency and increase in the interest rates. In any case, the macroeconomic reasons for borrowing abroad include, higher investment compared with domestic saving; higher consumption and hence lower saving as percentage of GDP; transitory balance of payments deficits where the value of exports fall short of imports needs and rollover exiting debt.

In fact, all the above reasons for borrowing abroad have been prominent in Sudan economy since late 1960s. As a result, it is no surprising to see such relatively excessive foreign indebtedness. There are also structural determinants of borrowing abroad which include, low nominal interest rates, lack of domestic credit and circumvent hard budget constraint, where the later two are more relevant to Sudan and in fact with lack of domestic credit and hard budget constraints a country is less likely give account to whether interest rate are high or not. Sources and types of external finance are conventionally classified into non-debt creating and debt-creating sources. Non-debt creating sources include foreign direct investment FDI and other private sources in terms of portfolio investment (equity and debt). Debt creating sources include private lending (short-term and medium or long-term), official lending (debt: bilateral and multilateral) in terms of concessional (grant element > 25%), market (e.g. bilateral trade credits) and special multilateral facilities.

2.3. Effects of External Debt

There have been many theoretical and analytical investigations of the effects of large external debts on economic growth together with empirical verifications of the proposed relationships. In theoretical analytical context, the flow effects of debt on economic growth are conventionally examined under two three hypotheses stated as follows.

First, the crowding out of public investment hypothesis states that a larger debt service discourages public investment, since it soaks up resources from the government budget and reduces the amount of money available for productive investment. In addition, debt services

payments shrink total spending in poverty alleviation programmes and in health and education and therefore have an opportunity cost on human capital accumulation. The flow effect is not only related to public investment, since a squeeze in public investment is likely to reduce private investment as well given that private investors need investment in basic infrastructure. This has led to the debate on the substitution or complementarity between public and private investment[2].

Second, the debts overhang hypothesis states when the stock of debt is too large, the expected interest payments are a positive function of output. Thus, investments decrease because their return will be taxed away by foreign creditors, and the pace of economic growth will slow down. This view is associated mainly with Krugman (1988) and Sachs (1989). This hypothesis seems more prevalent to the case of underdeveloped countries since they started to follow some paths of sustained positive economic growth but with increasing stocks of external debt and negligible benefits from the HIPCs initiative so far. Third, uncertainty hypothesis, which is a common factor in the crowding out and the debt overhang hypotheses. There is a wide perception that the presence of a large external debt makes the macroeconomic environment unstable and this effect is not only related to the variability of the main macroeconomic indicators (such as interest rates, exchange rates, and inflation), but also to the policy and institutional framework. Thus, the consequences are not only related to scarce investments, but also to a limited access to international financial markets with possibilities of capital flight. After the massive international indebtedness of middle-income countries in Latin America of the 1980's large body of both theoretical and empirical literature showed negative and nonlinear impacts of external debt on economic growth. Catherine, P., P. Helene, and R. Luca (2002) found a negative impact of external debt on growth and stated that high debt reduces growth mainly by lowering efficiency of investment. Referring to cases of Venezuela and

[2] Easterly and Schmidt-Hebel (1991) provide further elaborations on these issues.

Chile, it had also been explored in the literature that resource discoveries motivate countries to embark into large government expenditure a major part of it is financed by increasing external borrowing against future revenues from natural resources particularly oil and copper (Mansoorian A. 1991).

Models built to investigate the financial fragility of sustaining capital account surplus or whether capital account is under the so-called a 'Ponzi finance' position confronts external debt, current account, trade balance, and GDP. As a matter of fact, although capital inflows can avoid short-run impediments to growth, as well as guarantee macroeconomic stabilization, a calibration of these inflows is difficult and believed to lead to a knife-edge path, especially for developing economies. While macroeconomic management of capital inflows is central to successful short-run macroeconomic policy, financing external debt and dealing with profit transfers abroad are crucial questions, since it is not clear that external savings are perpetual. After triggering a typical exchange rate based stabilization programme, there is evidence that the short-run benefits of financial liberalization in capital dependent countries are basically to help the macroeconomic stabilization. In the long run, however, increasing external debt and denationalization of domestic enterprises (by means of mergers, acquisitions, and privatization) can lead to balance of payments difficulties through the effects of net transfer of profits abroad. Thus, foreign borrowing is neither a perpetually reliable source of financing development nor without macroeconomic complications in the long run.

2.4. Debt Dynamics and Sustainability Conditions

Debt dynamics is linked to GDP and its determinants. Stable Debt/GDP requires that the percentage change in real GDP should be greater than the rate of interest. A general formula for determinants of debt accumulation rate can be stated as

$$\delta ED / \delta t = f(iED + NCA - FDI + GCO)$$

where: ED is external debt; *i* is interest rate; CAB is current account excluding interest; FDI is foreign direct investment; and GCO is gross capital outflows.

This formula explains sources of difficulty of debt dynamics which include; rising international interest rates which indeed raise the cost of contracting new loans, complicate processes of debt rescheduling and lead to exchange rate depreciation and misalignment; worsening terms of trade and exacerbating current account problems; borrowing to postpone adjustment to economic growth; loss of investors' confidence which causes domestic capital flight and/or withdrawal of foreign creditors; and excessive short term borrowing which accelerates accumulation of debt services and arrears. External debt at time *t* is written as:

$$ED_t = ED_{t-1} + iED_{t-1} + CAB = (1+i)ED_{t-1} + CAB$$

Clearly, this formula states the link between external debt and current account CAB as a manifestation of magnitude and direction of external debt, and the higher the CAB, the higher the ED. Strict definition of sustainability (i.e. country is solvent) is that the present value of future primary surpluses must be enough to repay the present debt shown as the following condition.

$$ED_t = -\sum_{j=0}^{n}\left(\frac{1}{1+i}\right)^j CAB_{t+j} + \left(\frac{1}{1+i}\right)^N ED_{t+N} \qquad (i.e.\ ED_{t+N} = 0)$$

Less strict formulation of solvency and debt sustainability focuses on weaker condition is to maintain a constant debt/GDP ratio. Dividing the above formula by GDP yields:

$$ed_t = -\sum_{j=0}^{n}\left(\frac{1+g}{1+r}\right)^j cab_{t+j} + \left(\frac{1+g}{1+r}\right)^N ed_{t+N} \quad (i.e. ED_t/GDP is\ cons\tan t)$$

where: g is the rate of growth of GDP; r is real rate of interest; lower cases denote ratios to GDP.

2.5. Practical Indicators of External Sustainability

Assessment of sustainability conceptually requires comparison of the debt stock with resources available to service it. This is done using three practical indicators of indebtedness, which are (i) the value of exports of goods & services: "foreign exchange cash flow" (ii) the GDP; total productive capacity that could be mobilised to repay external debt and (iii) to account for time, net present value (NPV) is used to assess debt severity and potential sustainability. External debt sustainability indicators are summarised and contrasted in table (2-1).

Table (2-1): Indicators of Debt Severity and Sustainability

1. NPV $\frac{Debt}{Exports\ of\ G\ \&\ S}$	$\frac{Severe}{200-250\%}$	$\frac{Moderate\,(60\%\ of\ severe level)}{120-150}$	
2. Current $\frac{Debt\ Service}{Exports\ of\ G\ \&\ S}$	$20-25\%$		
3. NPV $\frac{Debt}{GDP}$	80%	50%	

Source: C. Reinhart, K. Rogoff & M. Savastano "Debt Intolerance", NBER WP 9908. Carmen Reinhart and Kenneth Rogoff "Serial Default and the Paradox of Rich – to – Poor Capital Flows", American Economic Review 94 (2), May 2004, 52-58.

Form data in table (2-1), we calculate the average thresholds for debt to GDP ratio (ATH) and for debt to exports of goods and service ratio both for the severe lower bound LB and upper bound UB (ASSTH) and the moderate lower and upper bounds (AMTH) as reported in table (2-2).

Table (2-2): Average Thresholds for Debt Sustainability

For debt to exports of goods and services ratio						For GDP/Debt ratio		
LBTH	UBTH	ASSTH	LBMTH	UBMTH	AMTH	LB	UB	ATH
200	250	225	120	150	135	50	80	65

Source: Authors' Calculations

No doubt that excessive external debt has a cost on economic growth. Patillo, Poirson, and Ricci (2002) found that the average impact of external debt on per capita growth is negative for countries with a debt/GDP ratio above 35-40 percent. Clements and others (2003) found that debt stocks with net present values over 20-25 percent of GDP would depress economic growth in low-income countries.

3. Performance of Sudan Economy

3.1. Macroeconomic Performance of Sudan

Over the past five decades Sudan had been witnessing fluctuating economic performance with unstable economic environment. Based on purchasing power parity (PPP), GDP per capita had increased from just 500$ in 2000 to about $2250 in 2006 and to more than $2400 in 2009 and it amounted to 3145 US$ in 2015. GDP has been steadily growing since 1992 until 2011 and then dropped to negative rate of growth in 2012, but started to fluctuate around 3% over the period 2013-2016. In 2010, GDP was estimated at 65,634 and in 2016 it was 88,367 US$. In accordance to GDP growth, the sectors of Sudan economy have also been showing increasing growth rates albeit with some slight changes in relative contribution of agriculture, industry and service sectors.

3.2. Sectoral Performance of Sudan Economy

Historically, the agricultural sector has been the dominant in Sudan Economy. It employs the large portion of population and contributes with the largest share in the GDP. Recently, the contribution of the agricultural sector shows slightly declining trends with slight increase in the contribution of the industrial and services sector. In 2000 the agricultural sector contributed more than 46% to the GDP, dropped to 33% in 2009 and stands at 30.3% in 2015. The contribution of the industrial sector was just 20.7% increased to more than 28% in 2009 and about 32.4% in 2015. The services sector was contributing about 32% in 2000 and since then it contribution almost remains the same. Sectoral contributions to GDP over the period 1992-2015 are calculated and reported in table (3-1).

Table (3-1): Contribution to GDP and Sectoral Growth Rates (1992-2015)

	Sectoral Share of GDP %			Sectoral Output Growth %	
Sector	1992-2001	2001-2010	2010-2015	2001-2010	2000-2015
Agriculture	45.6	44	40.2	9.4	8.2
Industry	17.4	22.2	27.6	11.1	13.8
Manufacturing	9.7	11.6	10.9	13.5	14.7
Electricity and Water	2.4	3.2	7.5	4.8	20.5
Construction	5.3	7.4	9.2	2.8	7
Services	37	33.8	32.2	2.4	6.3
Overall GDP	100	100	100	6.2	8.5

CBOS and the World Bank, World Development Indicators WDIs, 2016

The Industrial sector is subdivided into the mining & quarrying, manufacturing, electricity, water, building and construction sub-sectors. The share of the sector in Sudan economy has risen from 17.4% over the period 1992-2000 to 22.2% over the period 2001-2010 and stands at 27.6% over the period 2010-2016. The major contributor to total output of the industrial sector and its growth rate has been the mining sector with oil being its major output over the period 1999-2011and since then there is increasing contribution of the gold mining. The contribution of the services sector to the GDP has declined from an average of 37% over the period 1992-2001 to about 34% over the period 2001-2010 and to about 32% over the period 2010-2015. The large contribution to the service sector comes from the huge expansion of transportation and telecommunication services.

3.3. Government Fiscal Performance and Fiscal Deficit

Since the early 1970's Sudan economy has been in hard budget constraint. The government revenues from tax and non-tax sources have been persistently lower than the government expenditure both current and developmental indicating overall government fiscal deficit over the period 1970-2015. The deficit was mainly caused by current expenditure exceeding government revenues. Another structural feature is that government current expenditure has been far greater than development expenditure and the government has been running an increasing overall deficit as revealed in table (3-2).

Table (3-2): Government's Fiscal Performance (Million US$)

Period	Average Government Revenue	Average Government Total Expenditure	Average Government Fiscal Deficit	Average Economic Growth %
1970-1980	554.85	640.84	-85.98	4.2
1980-1990	816.45	998.24	-181.79	4.7
1990-2000	840.72	974.05	-133.33	5.3
2000-2010	1715.99	1938.91	-267.91	6.2
2010-2015	2156.78	2624.61	-467.83	2.3

Source: WDIs, 2016 and CBOS Annual Reports

Development expenditure particularly after the mid 1990 has shown slight increases. Such government fiscal performance makes the economy vulnerable to possibility and ability to borrow from abroad particularly during periods of international financial crises.

3.3.1. The Need for Foreign Borrowing in Sudan

Like other developing countries, a structural feature of Sudan economy is a historical low saving and hence low investment and capital formation financed from domestic savings. Since the early 1970's gross domestic investment has been higher than gross domestic saving and the economy has been running into a widening domestic finance gap. The saving-investment gap of Sudan consistently reflected in the fact that gross domestic investment as percentage of GDP has been persistently higher than gross domestic saving as percentage of GDP.

3.3.2. Export and Import of Goods and Services: External and Internal Gaps

Since 1969, the value of exports has been lacking behind to meet the imports requirements of the country except in the year 1973 in which a surplus of 23.6 million was attained but immediately net foreign transactions turned in a deficit of US$ 291 million upon the aftermath of the first oil price shock. This external gap has been reflected in the persistent deficit of the current account and as a result manifested in large accumulation of external debt. Given the connection between saving and investment in the national accounts on one hand and the current account on the other hand, in other words, Sudan has been experiencing a dual resource gap since the late 1960's. It has also been that accumulative DFG was higher than the value of

current account deficit (CAB), the foreign resource gap (FRG) as well as the total external debt at 2015 which was US$44,350 billion.

3.3.3. Current and Capital Account of Sudan

Current account is a main component of the balance of payments. It states wider economic relationship between a country and the rest of the world in terms of values off trade of goods and services and the official transfers. In spite of the improvement in exports, mainly brought by oil export proceeds, the trade balance has been in persistent deficits. As a result, the current account balance had been persistently in deficit although it experienced slight decrease in some years such 1999, 2002, 2003 and 2004, which could be attributed to increasing inflows of oil exports proceeds. The increasing deficit of the current account is indeed a manifestation of external debt accumulation and capital inflows[3]. On the hand, tremendous increases in imports and the degree of economic openness measured by the share of trade sector in the GDP has been and getting momentum since late 1990's.

The capital account reflects both the stock and flow of financial assets between a country and the rest of the world. It shows the flow of foreign aids and loans in addition to foreign direct investment (FDI) and official development assistance (ODA). Sudan has been receiving ODA with increasing values since early 2000's perhaps due to commitments of international community to stabilize peace and accelerate provision of basic infrastructure services as well as capacity building in various government bodies. At a macroeconomic level inflows of ODA may offset some of the negative impacts of large external debt services on public investment and economic growth. Since the Independence Sudan had negligible FDI record. However, the mid 1990s, many multi-national companies were encouraged to invest in Sudan. Specifically since 1997, the net flows of FDI began to grow rapidly, and the country became attractive to

[3] For how resource discoveries induce excessive external borrowing and their impacts on current government expenditure see Mansoorian A. (1991).

FDI in oil and mineral resource sectors. Major portion of FDI has been from Asian investments, mainly from China, Malaysia and India. Sudan orientation to the East also represents a real shift in foreign trade direction, and trade partners increasingly become Asian countries. FDI net inflows have been significantly rising from $400.000 in 1996 to $3,534.080 in 2006 and more than 4 billion in 2009, but declined to about $2 billion by 2015. Noticeable that one of the major sources of foreign exchange resources in the balance of payments is the transfer of Sudanese nationals working abroad; latest available statistics reveal remittances transferred to domestic economy increased to more than US$1,5 billion in 2009 and stands at 2,3 billion in 2015. To put things together, the average of the resource gaps (domestic finance gap DFG, government budget gap (GBG), foreign resource gap (FRG), current account deficit (CAB) of Sudan economy together with foreign capital flows over the period 1969-2015 is calculated and presented in table (3-3).

Table (3-3): Period Average Resource Gaps (1969-2015)

G	DRG	GBG	FRG	AID	FDI	ODA	GDS	GI	CAB	XGDP
4.30	-6.06	-3.49	-8.34	4.41	1.585	4.23	12.816	18.87	-4.57	11.595

Source: Authors' calculation based on CBOS Reports and WDI, 2016

3.4. Patterns and Trends of Sudan External Indebtedness

3.4.1. Foreign Borrowing in Sudan

Sudan started to borrow from abroad for more than five decades. From different official and documentary sources it appears that the country objectives of borrowing abroad have been:

a. Establishment of infrastructures of the economy.
b. Enhancement and acceleration of long term economic growth.
c. Correction of the current account problems resulting from the structure of Sudan's exports as well as high cost of agricultural production.
d. Financing national development plans.
e. Impacts of natural and human disasters, political instability and external shocks.

The need for foreign borrowing in Sudan has been the historical dual finance gap particularly government savings with successively increasing need for financing government expenditure as well as the difference between export earnings and import liabilities. This in part reflects low gross domestic product (GDP) and high rates of household consumption resulting inevitably in low domestic savings that fall short in financing investment. Indeed, financing development through external borrowing is not a problem per se, but the problem lies in the ways of utilizing the borrowed funds and the management of the national economy as well as accumulation of debt services. Since 1958 Meade J. E. stated that "external debt is a burden on the community because there must be a transfer of real goods and services from the debtor to the creditor country in payment of interest and sinking fund on the debt". External debt of Sudan has largely been composed of long term but with relatively significant portion of short term external debt that has been evolving around an average of 23% of total external debt. This is a real a threat to economic stability, since international financial crises had proved that short term debts can trigger foreign exchange volatility and create a country run down of foreign exchange.

The distribution of Sudan external indebtedness by creditor over the period 1995-2015 is shown in table (3-4).

Table (3-4): Contributions to Sudan External Debt by Source 1995-2015

Source	% Share 1995	% Share 2000	% Share 2005	% Share 2010	% Share 2015
Paris Club	30	32	32	31	31
Non-Paris Club	37	35	36	36	37
Multilateral Institutions	14	15	16	16	15
Int. Commercial Banks	16	14	12	13	13
Foreign Importers	3	4	3	3	4
Total	100	100	100	100	100

Source: CBOS, External Debt Unit

The composition of the stock Sudan external indebtedness has been dominated by delay interest with its share being higher than the share of principal external debt as shown by table (3-5) for the period 2000-2015.

Table (3-5): Composition of Stock of Sudan External Indebtedness

Component of Debt	% Share in							
	1980	1985	1990	1995	2000	2005	2010	2015
Principal of Indebtedness	46	44	45	42	39	41	44	43
Contractual Interest	14	17	16	18	17	14	14	11
Delay Interest	40	39	39	43	44	45	42	46
Total	100	100	100	100	100	100	100	100

Source: CBOS, External Debt Unit

As from data, one major reason for accumulation of large external debt in Sudan was in the services both contractual and delay interest as indicated in table (3-5). For example, total amount of external borrowing and trade facilities of Sudan since Independence until the end of 2007 reached only US$17.998 billion of which US$13.888 billion were outstanding debt. Due to continual borrowing aboard and failure to repay debt on due time, indebtedness of Sudan accumulated successively at high positive rate since 1970 and it is only after the mid 1990's it started to fluctuate around a rate of increase more or less 10 percent. Sudan debt burden indictors show that the debt severity and the country is debt distress as depicted in table (4.6) for the period 2007-2015.

Table (3-6) Sudan's External Debt Burden indicators

Year External Debt Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015
External Debt (% of GDP)	64.6	57.9	51.6	56.8	75.3	67.43	72.57	64.16	56.43
External Bet (% of exports of Goods & Services)	525	357	295	441	354	379	822	732	754
Debt Service paid as % of Exports of Goods and Services	4.3	5.2	5.4	5.6	4.9	4.3	5.2	5.4	5.7
Debt Paid % of GDP	1.6	1.7	1.6	1.0	1.1	1.6	1.7	1.6	1.4

Source: Authors' calculations based on data from the World Bank, WDIs, 2016.

3.5. Foreign Borrowed Funds and Utilization

Stock of Sudan external debt was US$275 million in 1970, increased to US$5,176.90 in 1980 and to US$14,762 in 1990, then to US$20,531 in 2000 and by the end of 2010 it was more than US$35 billion, and by the end of 2015 total external debt was US$45,384.00 billion.

Utilization of foreign borrowing by benefiting sector over the period 1995-2015 is presented table (5-7) from which it is clear that in the major portion of borrowed fund has been directed to the agricultural sector (over 40%) followed by the services sector (about 30%) and then energy and mining sub-sector and with the proper industrial sector receiving the least. The structure of foreign loans by sectors has changed with increased share for the agricultural sector but also with increased share for the service sector and a decreased share for transportation and the industrial sector. It is well founded that the economies of scale and technical progress occur in industry. As such, the structure of utilized foreign funds in which the industrial sector receiving the least share might be one of the reasons of low and slow capital accumulation that the country has been experiencing.

Table (3-7): Distribution of Shares of Foreign Loans in Sudan by Sector

Sector	% Share 1995	% Share 2000	%Share 2005	% Share 2010	% Share 2015
Agricultural Sector	43	42	44	46	40
Transportation Sector	3	2	2	2	2
Services Sector	28	29	26	28	30
Energy and Mining Sector	7	8	7	7	7
Industrial Sector	3	2	1	2	1
Other (Monetary Loans + Rescheduling)	16	17	20	15	20
Total	100	100	100	100	100

Source: CBOS Reports and External Debt Unit

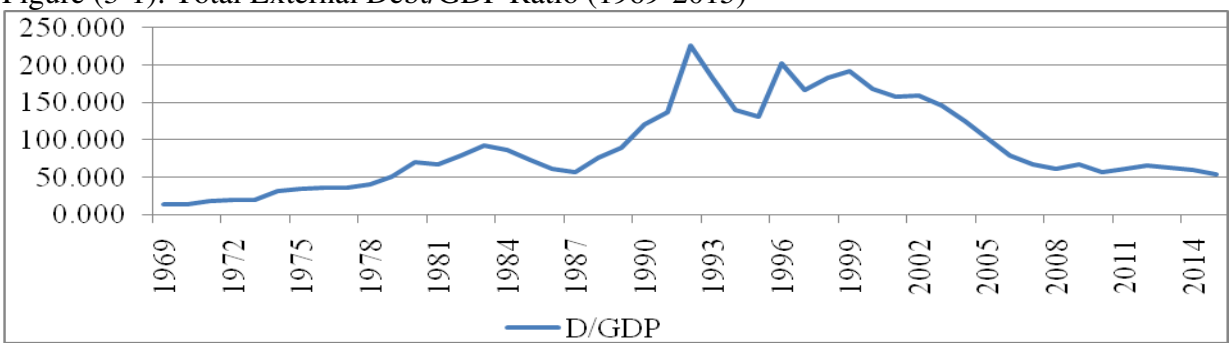
3.6. Solvency and Sustainability of Sudan External Indebtedness

3.6.1. External Debt and GDP of Sudan

Movements in both GDP and total external debt of Sudan are shown in figure (4-1), from which it is noticeable that fluctuations in GDP were more frequent and acute while total external debt showed steady increase since 1969. During the 1970's GDP was larger than total external debt, while from the mid 1990's up to early 2000’s total external debt was greater than GDP. It only since 2005 GDP was growing higher than total external debt, a trend that indicates stable Debt/GDP ratio and external debt sustainability in the near future. Overall, it has also been observed that the annual increase in external debt had historically been higher

than the annual GDP growth rate with a remarkable increase of external indebtedness during the year 1973-1974; the year of the first oil price shock with GDP growth parley around zero in that same year. Statistics also shows that the ED/GDP ratio started at lower rates indicating sustainability during the early 1970's, but dramatically increased during the early 1990s and finally started to decline during the 2000's indicating again increasing likelihood of sustainability in line with the international standard Debt/GDP ratios as in figure (3-1).

Figure (3-1): Total External Debt/GDP Ratio (1969-2015)

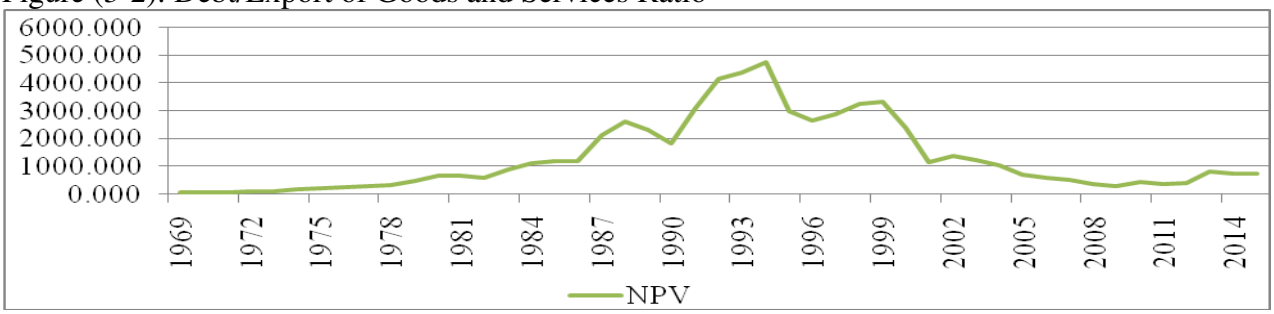


Source: Authors' Calculation based on CBOS and WDIs,

3.6.2. Debt/Export of Goods and Services Ratio

External debt to exports of goods and services ratio shows that Sudan external debt has been sustainable up to late 1970s and then started to be unsustainable as shown in figure (3-2) and appendix 1.

Figure (3-2): Debt/Export of Goods and Services Ratio

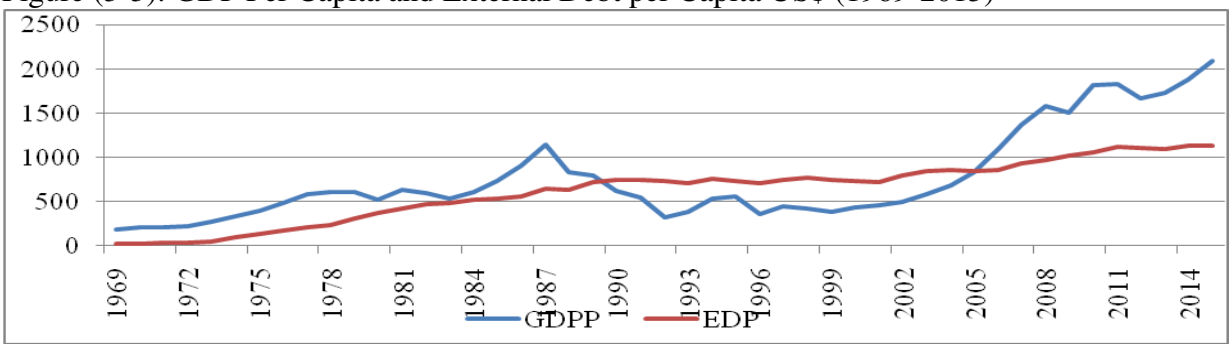


Source: Authors' Calculation based on CBOS and WDIs,

From figure (3-1) and (3-2), it appears that there is a co-movement of ED/GDP ratio and debt to exports of goods and services ratio over the period 1969-2015. In econometric context the two series are co-integrated and simultaneously determined. Thus, in order to sustain positive

growth records of Sudan economy, debt/GDP ratio should be stabilized to range between 20% - 25%. In many years over the period 1969 -2015, external debt per capita exceeds GDP per capita. In other words, actual GDP per capita netted from external debt per capita has historically been low and grows at low rates as shown in figure (3-5).

Figure (3-3): GDP Per Capita and External Debt per Capita US$ (1969-2015)



Source: Authors' Calculation based on CBOS and WDIs,

3.7. The Twin Deficits: Current Account Deficit and Fiscal Deficit

It has been found that in countries in transition in Western Europe that current account and fiscal balances move together. This requires testing for the so-called the-twin deficit-hypothesis defined as a long-run (cointegrating) relationship between the current account and the fiscal balance. The calculation of the current account and fiscal deficit as percentage of GDP and on average over the period 1969-2016 was -6.57% and respectively. This suggests a a long term cointegrating relationship between the two types of deficit, and can be tested within the context of the twin deficit hypothesis. The GBG and CAB cointegration test results in first difference lag are reported in table (3-9) and the coefficients of adjustments in table (3-10).

Table (3-9): GBG, CAB Cointegration Test (Linear Deterministic Trend)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.330621	29.75647	15.49471	0.0002
At most 1 *	0.217667	11.29182	3.841466	0.0008
Trace test indicates 2 cointegrating equations at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.330621	18.46465	14.26460	0.0102
At most 1 *	0.217667	11.29182	3.841466	0.0008
Max-Eigen value test indicates 2 cointegrating equations at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors' Estimations

Table (3-10): Coefficients and Adjustment Mechanism of the GBG and CAB

Unrestricted Adjustment Coefficients (alpha):				
D(GBG)	-0.588735	-1.456919		
D(CAB)	-2.025800	-0.103648		
1 Cointegrating Equation(s):		Log likelihood	-230.6604	
Normalized cointegrating coefficients (standard error in parentheses)				
GBG	CAB			
1.000000	2.445845			
	(0.58624)			
Adjustment coefficients (standard error in parentheses)				
D(GBG)	-0.079438			
	(0.06732)			
D(CAB)	-0.273342			
	(0.06019)			

Source: Authors' Estimations

3.8. Foreign Borrowing and Sustainable External Debt

3.8.1. Forecast of Medium Term of Sudan Debt Outlook

The objective of foreign borrowing is always sought to benefit from external financing without creating future debt problems. Key to successful debt and debt strategy management is that foreign borrowing must lead to increased productivity and economic growth and export growth in order to keep debt sustainable. This also amounts to answering a basic question: how much external debt? A methodology for assessing future debt sustainability for Sudan requires a combination of elements including macroeconomic performance indicators, foreign trade and

foreign debt burden indicators. For the purpose of exploring the future of Sudan external debt, the prospective of Sudan foreign indebtedness over the five years (2015-2020) is projected and the results are shown in table (3-11)) assuming a GDP growth of 6% and exports of goods and services growth of 8% and ED grows at 3% per annum.

Table (3-11): Medium Term Debt Outlook of Sudan

Year	GDP	ED	EDGDP	X	NPV	G
2015	84066.77098	45384.000	53.98566	6022.597	753.56196	3.4
2016	88648.32643	46842.000	52.84025	7242.7	646.74776	4.3
2017	93967.22602	48715.680	51.84327	7822.116	622.79414	6
2018	99605.25958	50664.307	50.86509	8447.885	599.72769	6
2019	105581.5752	52690.879	49.90537	9123.716	577.51555	6
2020	111916.4697	54798.515	48.96376	9853.613	556.12609	6

Source: Authors' Estimations

3.8.2. Three Scenarios of Sudan's External Debt in the Long Term

Three scenarios are set, combining indicators GDP, foreign trade and external debt accumulation. It is assumed that GDP grows at g = 6% per annum given the average growth rate of over the past two decades. Debt creating sources (external debt is projected to grow at *d* = 3% in scenario one, and at *d* = 2% in scenario two and exports of goods and services grow at 8% per annum in both scenarios. Scenario three is a more optimistic one, in which export of goods and services growth at 10% and a *d* = 1%. Inflows of FDI, ODA are not explicitly considered in the assessment of sustainability, but definitely their flows relax the negative effects of external debt. All scenarios assume no resorts to exceptional financing from external sources. Indicators are calculated as in tables (3-11) to table (3-13). Under Scenario one, Sudan will reach a ratio of external debt to GDP about 50% by 2017-2018 and becomes lesser over the rest of the period which indicates that external debt will be sustainable. However, external debt/exports of goods and services will continue to be severe up to the year 2030.

Table (3-11): Growth-Debt Strategy: Scenario One: *g = 6%; d = 3%; x = 8%* per Annum

Year	GDP	ED	ED/GDP	X	NPV
2005	26524.539	32430.000	122.2641	3821.88	848.54
2010	65634.109	35076.288	53.44216	8581.83	408.73
2016	88648.326	46842.000	52.84025	7242.70	646.75
2017	93967.226	48247.260	51.34477	7822.12	616.81
2018	99605.260	49694.678	49.89162	8447.89	588.25
2029	105581.575	51185.518	48.47959	9123.72	561.02
2020	111916.470	52721.084	47.10753	9853.61	535.04
2021	118631.458	54302.716	45.7743	10641.90	510.27
2022	125749.345	55931.798	44.4788	11493.25	486.65
2023	133294.306	57609.752	43.21996	12412.72	464.12
2024	141291.964	59338.044	41.99676	13405.73	442.63
2025	149769.482	61118.185	40.80817	14478.19	422.14
2026	158755.651	62951.731	39.65322	15636.45	402.60
2027	168280.990	64840.283	38.53096	16887.36	383.96
2027	178377.850	66785.491	37.44046	18238.35	366.18
2028	189080.52	68789.06	36.38083	19697.419	349.23
2029	200425.35	70852.73	35.35118	21273.212	333.06
2030	212450.87	72978.31	34.35068	22975.069	317.64

Source: Authors' Estimations

However, in scenario two, NPV is still high and severe as shown in table (3.12).

Table (3-12): Growth-Debt Strategy: Scenario Two: *g = 6%; d = 2%; x = 8%* per Annum

Year	GDP	ED	ED/GDP	X	NPV
2005	26524.539	32430.000	122.2641	3821.88	848.5351
2010	65634.109	35076.288	53.44216	8581.83	408.7275
2016	88648.326	46842.000	52.84025	7242.70	646.7478
2017	93967.226	47778.840	51.34477	7822.12	610.8173
2018	99605.260	49212.205	49.89162	8447.89	582.5387
2029	105581.575	50688.571	48.47959	9123.72	555.5694
2020	111916.470	52209.228	47.10753	9853.61	529.8486
2021	118631.458	53775.505	45.7743	10641.90	505.3185
2022	125749.345	55388.771	44.4788	11493.25	481.9242
2023	133294.306	57050.434	43.21996	12412.72	459.6129
2024	141291.964	58761.947	41.99676	13405.73	438.3345
2025	149769.482	60524.805	40.80817	14478.19	418.0412
2026	158755.651	62340.549	39.65322	15636.45	398.6875
2027	168280.990	64210.766	38.53096	16887.36	380.2297
2027	178377.850	66137.089	37.44046	18238.35	362.6265
2028	189080.52	68121.201	36.38083	19697.419	345.8382
2029	200425.35	70164.837	35.35118	21273.212	329.8272
2030	212450.87	72269.782	34.35068	22975.069	314.5574

Source: Authors' Estimation

In scenario three, ED/GDP indicates sustainability while NPV remains high and severe as shown in table (3-13).

Table (3.13): Growth-Debt Strategy: Scenario Three: *g = 6%; d=1%; x= 10%* per Annum

Year	GDP	ED	ED/GDP	X	NPV
2005	26524.539	32430.000	122.2641	3821.88	848.5351
2010	65634.109	35076.288	53.44216	8581.83	408.7275
2016	88648.326	46842.000	52.84025	7242.70	646.7478
2017	93967.226	47310.42	50.34779	8604.328	549.8445
2018	99605.260	48256.63	48.44787	9292.674	519.2976
2029	105581.575	49704.33	47.07671	10036.09	495.256
2020	111916.470	51195.46	45.74435	10838.97	472.3275
2021	118631.458	52731.32	44.44969	11706.09	450.4605
2022	125749.345	54313.26	43.19168	12642.58	429.6058
2023	133294.306	55942.66	41.96928	13653.99	409.7167
2024	141291.964	57620.94	40.78147	14746.31	390.7483
2025	149769.482	59349.57	39.62728	15926.01	372.6581
2026	158755.651	61130.05	38.50575	17200.09	355.4054
2027	168280.990	62963.95	37.41596	18576.1	338.9515
2027	178377.850	64852.87	36.35702	20062.19	323.2593
2028	189080.52	66798.46	35.32805	21667.16	308.2936
2029	200425.35	68802.41	34.3282	23400.53	294.0207
2030	212450.87	70866.49	33.35665	25272.58	280.4086

Source: Authors' Estimations

From the above projections of GDP, debt and exports it becomes clear that a well structured and implemented external debt strategy should strive to make growth rate of exports greater than growth rate of imports and where the former should be greater than 10% per annum.

4. Conclusion and Recommendations

4.1. Conclusion

This study is an attempt to explore the burden of external debt of Sudan and to assess its future sustainability. By all indicators, Sudan external debt is large, excessive and unsustainable as up to the end of 2015. Although Sudan has been making large efforts in adopting and implementing structural economic programmes and policy reforms under the support of the IMF, but it is still not fully eligible to benefit from the HIPCs initiative for debt relief. However, with well set and coordinated external debt management strategy and programmes and policy reforms aiming at strong sustained economic growth and exports, external debt of Sudan will reach thresholds indicators of sustainability in a medium term. In particular, external debt/GDP and external debt/exports of goods and services could well be reduced to

match the internationally acceptable ratios given that external indebtedness will grow at lowers rate per annum. Trade openness is good for growth but with rates of increase in exports made higher than rates of increase in imports.

4.2. Recommendations

a. Efforts for benefiting from the HIPCs Initiative should be accelerated with regard to macroeconomic indicators and poverty reduction programmes.

b. Exports of goods and services would be increased and diversified while the annual increase of imports would be reduced and linked to growth of GDP and the need for contracting new foreign loans.

c. Domestic saving should be enhanced, since in one hand it is much better for economic growth than foreign saving and since it reduces needs for foreign borrowing on the other hand while makes debt more sustainable.

d. Attracting more non-debt creating financial sources such as FDI, portfolio investments and ODA.

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Appendix (1): Assessment of Sustainability of External Debt of Sudan

Year	SSTH	MSTH	NPV	Comment	MSTH	SSTH	ED/GDP	Comment
1969	(200-250)	(120-150)	57	Sus	50	80	15	Sus
1970	(200-250)	(120-150)	58	Sus	50	80	14	Sus
1971	(200-250)	(120-150)	71	Sus	50	80	18	Sus
1972	(200-250)	(120-150)	77	Sus	50	80	20	Sus
1973	(200-250)	(120-150)	79	Sus	50	80	19	Sus
1974	(200-250)	(120-150)	160	Sus	50	80	31	Sus
1975	(200-250)	(120-150)	190	Sus	50	80	35	Sus
1976	(200-250)	(120-150)	236	Sus	50	80	36	Sus
1977	(200-250)	(120-150)	299	Unsus	50	80	36	Sus
1978	(200-250)	(120-150)	333	Unsus	50	80	40	Sus
1979	(200-250)	(120-150)	463	Unsus	50	80	51	Sus
1980	(200-250)	(120-150)	658	Unsus	50	80	71	Sus
1981	(200-250)	(120-150)	650	Unsus	50	80	67	Sus
1982	(200-250)	(120-150)	596	Unsus	50	80	79	Sus
1983	(200-250)	(120-150)	894	Unsus	50	80	92	Unsus
1984	(200-250)	(120-150)	1109	Unsus	50	80	86	Unsus
1985	(200-250)	(120-150)	1178	Unsus	50	80	73	Sus
1986	(200-250)	(120-150)	1202	Unsus	50	80	62	Sus
1987	(200-250)	(120-150)	2147	Unsus	50	80	57	Sus
1988	(200-250)	(120-150)	2633	Unsus	50	80	76	Sus
1989	(200-250)	(120-150)	2337	Unsus	50	80	90	Unsus
1990	(200-250)	(120-150)	1835	Unsus	50	80	121	Unsus
1991	(200-250)	(120-150)	3123	Unsus	50	80	137	Unsus
1992	(200-250)	(120-150)	4181	Unsus	50	80	226	Unsus
1993	(200-250)	(120-150)	4386	Unsus	50	80	182	Unsus
1994	(200-250)	(120-150)	4769	Unsus	50	80	140	Unsus
1995	(200-250)	(120-150)	3009	Unsus	50	80	131	Unsus
1996	(200-250)	(120-150)	2668	Unsus	50	80	201	Unsus
1997	(200-250)	(120-150)	2883	Unsus	50	80	166	Unsus
1998	(200-250)	(120-150)	3274	Unsus	50	80	182	Unsus
1999	(200-250)	(120-150)	3351	Unsus	50	80	192	Unsus
2000	(200-250)	(120-150)	2383	Unsus	50	80	168	Unsus
2001	(200-250)	(120-150)	1134	Unsus	50	80	158	Unsus
2002	(200-250)	(120-150)	1378	Unsus	50	80	159	Unsus
2003	(200-250)	(120-150)	1235	Unsus	50	80	146	Unsus
2004	(200-250)	(120-150)	1039	Unsus	50	80	125	Unsus
2005	(200-250)	(120-150)	707	Unsus	50	80	102	Unsus
2006	(200-250)	(120-150)	567	Unsus	50	80	79	Sus
2007	(200-250)	(120-150)	525	Unsus	50	80	68	Sus
2008	(200-250)	(120-150)	357	Unsus	50	80	62	Sus
2009	(200-250)	(120-150)	295	Unsus	50	80	67	Sus
2010	(200-250)	(120-150)	441	Unsus	50	80	58	Sus
2011	(200-250)	(120-150)	354	Unsus	50	80	61	Sus
2012	(200-250)	(120-150)	379	Unsus	50	80	67	Sus
2013	(200-250)	(120-150)	822	Unsus	50	80	63	Sus
2014	(200-250)	(120-150)	732	Unsus	50	80	60	Sus
2015	(200-250)	(120-150)	754	Unsus	50	80	54	Sus
2016	(200-250)	(120-150)	742	Unsus	50	80	49	Sus