

How to do a Debt Sustainability Analysis for Low-Income Countries

May 20, 2005

Contents

I. Introduction	2
II. Basic Concepts of a DSA for Low-Income Countries	3
A. When is public debt sustainable in LICs?	3
B. Basic Steps for Undertaking a DSA	3
C. Debt Measures used in the LIC Template	5
D. The Concessionality of Debt	7
E. Debt Burden Indicators	10
F. Indicative Debt Burden Thresholds	12
G. Classifying a Country's Risk of Debt Distress	13
H. Operational Implications	14
III. The LIC External DS Template	15
A. Basic Structure	15
B. Data Input	15
1. Basic Data	15
2. Calculation of NPV of Debt	18
3. New Borrowing Projections	20
C. The Evolution of External Debt	21
D. The Output Sheets	24
1. Baseline	24
2. Sensitivity Analysis	25
IV. Summary and Conclusion	29
Glossary	30
Annex I: CPIA Performance Categories	32
Annex II: Key Creditors and Terms of their Loans	33
Annex III: Input Variables of External Template	36
Annex IV: Evolution of External Debt	37
References	38

I. Introduction

Under the World Bank – Fund Debt Sustainability Framework a debt sustainability analysis (DSA) should be prepared annually for all IDA-only, PRGF eligible countries jointly with the IMF.¹ The objective of the framework is to support low-income countries in their efforts to achieve the Millennium Development Goals (MDGs) without creating future debt problems, and to keep countries that have received debt relief under the HIPC Initiative on a sustainable track. In order to assess whether a country’s current borrowing strategy may lead to future debt-servicing difficulties, any LIC country team is required to conduct a DSA in close collaboration with the IMF, using the two common agreed LIC templates. As a result of this DSA, a country would be classified according to its risk of debt distress. This classification would be used to determine the share of grants and loans in IDA’s assistance to the country.²

This guide provides the necessary information for conducting a DSA and explains the use of the two LIC templates. It describes the basic relevant concepts and terms, leads through the different steps and points out caveats. It guides through the two LIC templates: the LIC External Template and the LIC Public Template. The templates are easy-to-use tools for assessing debt sustainability in low-income countries. Once the required data is entered, the templates automatically produce output tables. Tailored to the specific circumstances of low-income borrowers, the main difference between the two templates is the focus of analysis. While the LIC External Template assesses the sustainability of external debt, the public template analyses public debt sustainability. Both templates can be downloaded from the internal World Bank Web site.³

The guide is structured as follows: Section 2 “Basic Concepts of a DSA for Low-Income Countries” discusses the basic concepts and definitions, laying the ground for the following chapters. Section 3 “The LIC External DS Template” explains the use of the external template and provides the example of an external DSA. Section 4 “Conclusion” summarizes the core features and issues of a DSA.

¹ See IDA and IMF “Operational Framework for Debt Sustainability Assessments in Low-Income Countries – Further Considerations.” March 2005.

² Grants in IDA14 will be allocated on the basis of the risk of debt distress classification that emerges from the joint WB-IMF DSA,

³

http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/DEC/DATA/0,,contentMDK:20097840~menuPK:85076~pagePK:85006~piPK:85115~theSitePK:84804,00.html#dsa_framework

II. Basic Concepts of a DSA for Low-Income Countries

A. When is public debt sustainable in LICs?

External public debt is sustainable

when it can be serviced without resort to exceptional financing (such as debt relief) or a major future correction in the balance of income and expenditures.

Debt-servicing problems in low-income countries are likely to arise when:

- official creditors, such as international organizations or governments, and donors do not to provide sufficient new financing in terms of loans or grants for financing a country's primary deficit.⁴
- when the costs of servicing domestic debt become very high.

Although external official debt is the dominant source of financing, domestic debt is far from negligible in some LICs.⁵ Interest rates on domestic debt are generally very high in low-income countries and maturities tend to be short, exposing a country to significant roll-over risks. Unlike external debt, domestic debt is usually issued at market rates. This implies that costs of servicing domestic debt do depend on the macro-economic environment and are therefore volatile.

B. Basic Steps for Undertaking a DSA

A debt sustainability analysis (DSA)

assesses how a country's current level of debt and prospective new borrowing affects its ability to service its debt in the future.

Conducting a DSA, consists largely of two parts:

1) Preparing the DSA

- Determine the schedule for the preparation of the DSA with IMF area department. The general expectation is that one DSA will be prepared annually for each country.⁶

⁴ Information regarding which factors determine the allocation of resources from official creditors to low-income countries can be found in Birdsall et al. (2002) and Powell (2003).

⁵ A recent study showed that 6 out of 20 low-income countries had a ratio of domestic debt to GDP greater than 25 percent. See IDA "Debt Sustainability in Low-Income Countries: Proposal for an Operational Framework and Policy Implications", February 2004, IDA SECM2004-0035.

⁶ However, updating the DSA may be less frequent in countries with a stable debt situation. For countries in distress, an update may be required within less than a year. The WB country team may update the DSA

A Guide to LIC Debt Sustainability Analysis

- Develop the macroeconomic framework in close cooperation with the IMF. According to the joint WB/IMF framework the IMF has the lead on the medium-term macro framework and the World Bank on long-term growth projections.
- Consult key creditors with respect to their lending plans.

2) Assessing Debt Sustainability

- Link LIC Templates to macroeconomic projections and debt data.
- Calculate current and future debt burden indicators under the baseline.
- Design alternative scenarios and stress tests and identify the country specific factors to be included in the DSA.
- Produce relevant tables and charts as provided by the LIC Templates.
- Form a view regarding how debt burden indicators evolve over time and assess their vulnerability to exogenous shocks.
- Compare external debt burden indicators to appropriate indicative debt burden thresholds.
- Assess whether and how other factors, such as the evolution of domestic debt or contingent liabilities, affect a country's capacity of servicing future debt service payments.
- Classify a country according to its probability of debt distress in collaboration with the Fund.⁷
- Determine a country's appropriate borrowing strategy and identify adequate policy responses.

if changes in assumptions are relatively minor, but should notify the IMF country team of the change and give it adequate time to comment.

⁷ In case the WB and Fund teams cannot reach a common understanding of the baseline scenario or the risk classification, dispute resolution mechanisms are elaborated in IDA and IMF "Operational Framework for Debt Sustainability Assessments in Low-Income Countries – Further Considerations", April, 2005.

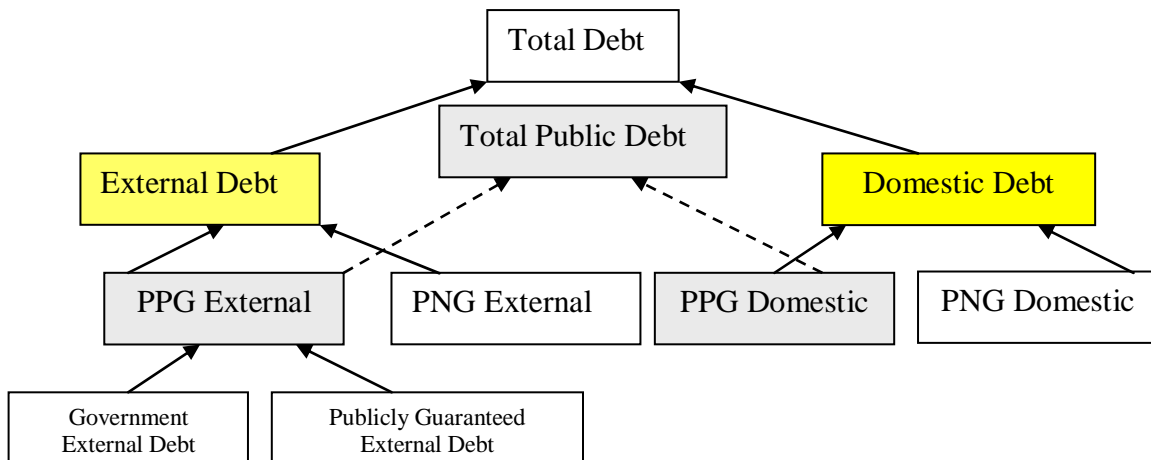
C. Debt Measures used in the LIC Template

The LIC External Template analyzes total external debt; the LIC Public Template focuses on total public and publicly guaranteed (PPG) debt, i.e. the sum of PPG external and domestic debt.

Total external debt refers to liabilities that require payments of principal and/or interest at some point in the future and that are owed by resident to non-residents of an economy. It can be decomposed into public and publicly guaranteed (PPG) external debt, private non-guaranteed (PNG) external debt and short-term debt.⁸

- **Public and publicly guaranteed (PPG) external debt** comprises the external debt of the public sector, defined as central, regional and local government and public enterprises. Public enterprises subsume all enterprises, of which the government owns 50 percent or more. PPG external debt also includes public sector-guaranteed private sector debt. More than 80 percent of total external debt in all low-income countries together is PPG external debt.
- **Private sector non-guaranteed (PNG) external debt** refers to external liabilities that are owed by private residents of an economy, i.e. private sector companies and individuals and which are not guaranteed by the public sector. Statistics regarding PNG external debt are often difficult to obtain, especially since low-income countries have general weak statistical capacities and have adopted liberal exchange control regimes.

Figure 1: Structure of Debt



⁸ More information on external debt definitions and classification can be found in *External Debt Statistics – Guide for Compilers and Users*, IMF, June 2003, which can be download from <http://www.imf.org/external/pubs/ft/eds/Eng/Guide/index.htm>

Total PPG debt is the sum of PPG external and PPG domestic debt. PPG domestic debt refers to liabilities owed by the public sector to residents. In low-income countries PPG domestic debt refers largely to central government debt.

Other relevant debt measures

- **Short-term external debt** is any debt with an original maturity of one year or less. Trade credits, for example, often have a maturity of less than one year. Short-term external debt may be public and publicly guaranteed, however it is generally shown separately. The LIC external template has therefore a particular entry for short-term debt. When compared to foreign reserve short-term debt may be used as an indicator for potential liquidity issues.
- **Foreign direct investment** occurs if a non-resident entity –the investor- owns at least 10 percent of the ordinary share or voting power or the equivalent of an entity resident in the economy. Once established, all financial claims of the investor in the enterprise are included under direct investment. While borrowing and lending of funds – including debt securities and suppliers’ credits – among direct investors and related subsidiaries are included in the definition of external debt, equity capital and reinvested earnings are excluded. Consequently, net inflows based on equity capital and reinvested earnings are non-debt creating foreign capital inflows.

Net Debt versus Gross Debt

The LIC DSA focuses on the evolution of gross debt, i.e. the total stock of outstanding government liabilities. If the government has significant liquid assets that could quickly be liquidated to repay the debt, then the gross debt may overstate a country’s probability of debt distress. This situation may occur in countries, for example, that are endowed with substantial natural resources. Moreover, in cases where public enterprises or extra-budgetary funds have substantial assets, it may be recommendable to take these assets into account.

Example: A small island economy

A small island economy has suffered from a substantial decline in its main export item. As a consequence, its NPV of debt to exports ratio has risen to 350 percent. At the same time, the economy receives revenues from offshore investments through a trust fund, which are five times higher than debt-service payments. Notwithstanding the country’s high NPV of debt to exports ratio, the country is unlikely to face a high probability of debt distress.

D. The Concessionality of Debt

About 80 percent of new loans contracted by low-income countries are concessional, which implies that their interest rate is below market rates. Moreover, they are generally characterized by a grace period, a long maturity period and a back-loaded repayment profile. A repayment profile is back-loaded if repayments increase as a loan matures. For terms of the loans by creditor see Annex I.

Grace period is the period during which only interest payments, but no repayments are due.

Repayment period is the period during which the loan is repaid.

Maturity period is the sum of grace and repayment period.

Example: Terms of IDA loan

An IDA loan for IDA-only countries (a so called ID40 loan) does not require any principal payment during the first 10 years (see Table 1). The loan has to be repaid during a period of 30 years. The repayment profile is back-loaded: from the 11th to the 20th year of the maturity period, principal repayment amounts to 2 percent of the loan amount and increases to 4 percent per year thereafter.

Depending on the interest rate charged and the repayment structure of the loan, the same nominal amount of a loan can imply a very different effective debt burden. By discounting the debt-service stream by the *same* rate, the NPV is able to capture this difference in the effective debt burden.

The nominal (face) value of a loan equals the loan amount borrowed and is defined as the sum of principal payments outstanding. It is unrelated to the interest rate of a loan.

The net present value (NPV) of a loan is sum of all future debt service obligations (principal and interest) on existing debt, discounted at the market interest rate.

$$NPV_t = \frac{DS_{t+1}}{(1+r)^1} + \frac{DS_{t+2}}{(1+r)^2} + \frac{DS_{t+3}}{(1+r)^3} + \frac{DS_{t+4}}{(1+r)^4} + \dots$$

DS_t refers to debt service payments due in time t and r denotes a constant market interest rate, called the discount rate. The NPV of a loan is smaller than the nominal value of the loan, if the interest rate on the loan is smaller than the discount rate.

Example: NPV of IDA loan

The NPV of an IDA40 loan with terms as specified in the previous example and a nominal value of USD 10 million amounts to USD 3.8 million, given a discount rate of 5%.

Choosing the discount rate

An obvious choice for the discount rate is to use a risk-free, forward looking “world market interest rate. The NPV of a loan then summarizes the amount a country would have to invest risk free today to cover its future debt-service obligations. Putting this notion into practice has led to the use of currency specific commercial interest rates (CIRRs).

CIRRs correspond to secondary market yields on government bonds in advanced economies with maturities of least five years. CIRRs are used by the OECD for officially supported export credits of OECD countries. They can, in theory, be interpreted as forward-looking world market rates and at the same time, allow a market-based comparison across creditors. Interpreting however the effect of movements in CIRRs on the effective debt burden is not obvious. To the extent that world interest rates embody information on expected future inflation, lower CIRRs may signal weaker export earning of borrowing countries in the future. This notion however is difficult to prove empirically. Moreover, CIRRs fluctuate in response to temporary shifts in world-market conditions, making it difficult to distinguish cyclical from structural changes. Finally, CIRRs may exaggerate exchange-rate movements justified by interest differentials. This arises from the fact that the maturity of the bonds that determine the CIRRs is shorter than the maturity of most concessional loans.

The discount rate in the LIC template is related to the six-month average of the US\$ currency-specific commercial interest rate (CIRR). The discount rate has initially been set at 5 percent and will be adjusted by 100 basis points, whenever the U.S. dollar CIRR deviates from 5 percent by at least 100 basis points for a consecutive period of 6 months. This approach is intended to strike a balance between the desire to insulate NPV calculations from cyclical movements, without de-linking it entirely from long-term market trends.

The Grant element measures the percentage difference between the nominal value of a loan and its NPV It is calculated as

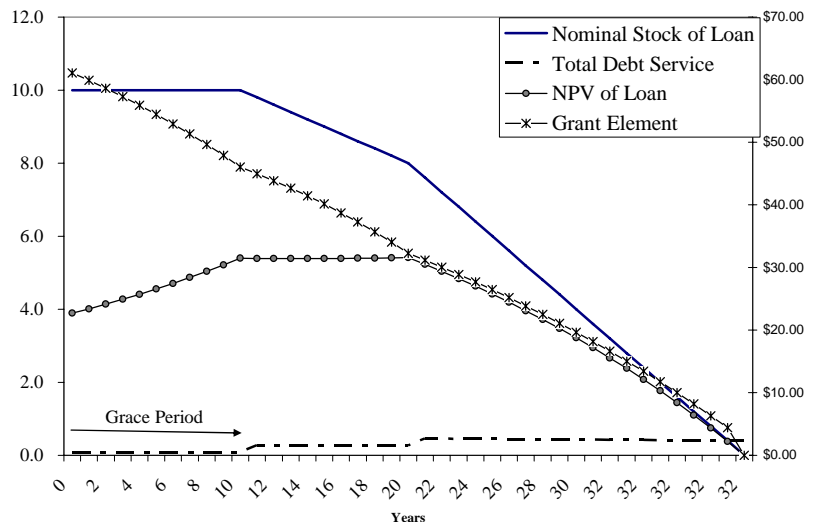
$$GE_t = \frac{Nominal_t - NPV_t}{Nominal_t} * 100$$

Nominal_t refers to the nominal value of the loan. The grant element is used to determine the degree of concessionality of a loan.

Example: Evolution of NPV and grant element of an IDA loan

During the grace period, the nominal stock of debt remains unchanged (see Figure 2) since no principal payments are made. The NPV of the loan however increases during the grace period, before starting to decline. The grant element decreases throughout the maturity period.

Figure 2: Profile of IDA Loan



A loan is **concessional** if its grant element, i.e. the difference between the nominal value of the loan and its NPV, exceeds 35 percent.

The concessionality of a loan, i.e. its grant element, **increases**

- the lower the interest rate
- the longer the grace period
- the longer the maturity period
- the more back-loaded the repayment profile.

Note:

There exist **different definitions of the concessionality of debt**. According to the OECD a loan is considered to be concessional if it has a grant element of at least 35 percent using Commercial Interest Reference Rates. For the 49 low income countries falling under the United Nation's classification of least developed countries (LLDC), the concessionality threshold is a grant element of 50 percent or higher. The IMF has adopted the 35 percent grant as the threshold of the concessionality of the loan, based on the average CIRR rate for the preceding six months.

E. Debt Burden Indicators

Debt burden indicators compare debt service and debt stock with various measures of a country's repayment capacity.

Debt service provides information of the resources that a country has to allocate to servicing its debts and the burden it may impose through crowding out other uses of financial resources. Comparing debt service to a country's repayment capacity yields the best indicator for analyzing whether a country is likely to face debt-servicing difficulties in the current period. Debt service based indicators, however, are likely to be inadequate for predicting future debt servicing problems, since the repayment of concessional loans usually increases as a loan matures. Current debt service ratios therefore tend to understate the future debt service burden. One can circumvent this issue, in principle, by examining the projections of debt-service ratios over as long as 40 years (or even longer, when analyzing the effect of new borrowing). But the error margin of projections increases substantially with the length of the projection period and consequently, projections over such a long horizon are very likely to be unreliable.

Debt stock indicators take future debt service payments into account. The debt stock, as measured by the nominal value of the debt or its NPV, is the sum of either the entire stream of future repayments or the sum of discounted future debt service payments. These indicators, however, ignore the fact that a country's repayment capacity may evolve over time. Whether high debt burden indicators today indicate future debt-servicing problems will depend largely on whether the repayment capacity of a country improves as debt service payments increase. Since the share of concessional debt in total external debt is large for low-income countries, the NPV of debt may be preferred to the nominal stock as a debt stock indicator for external debt. Since domestic debt is generally contracted on market rates, the nominal debt stock is generally used as a measure of total public debt.

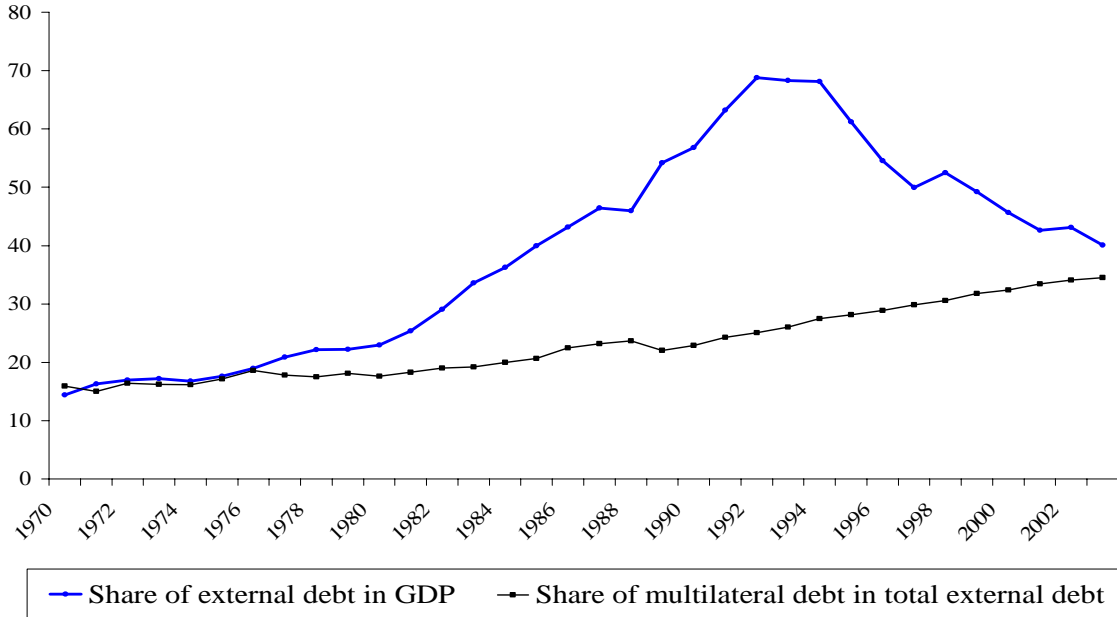
Repayment capacity may be measured by GDP, exports and revenues. GDP captures the amount of overall resources, while exports provide information on the availability of foreign exchange. Revenues depict the government's ability to generate fiscal resources.

The choice of the most relevant denominator depends on the constraints that are more binding in an individual country. In general, it is useful to monitor external debt in relation to GDP and exports and public debt in relation to GDP and fiscal revenues. Similarly, external and public debt service are usefully expressed relative to exports and revenues, respectively.

The LIC debt crisis

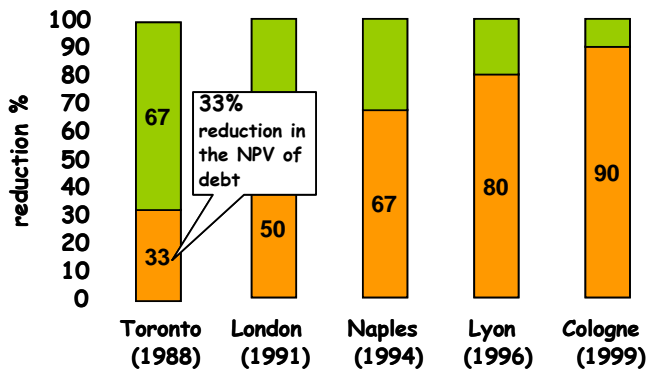
An increase in external financing combined with adverse terms of trade shocks and macroeconomic mismanagement, lead to a build up of the debt burden and a deterioration of debt indicators in LICs, providing the onset for the debt problems of the 1980s. In response to the increasing debt burden private creditors reduced their exposure, while official creditors responded through non-concessional flow rescheduling in the Paris Club (involving the delay of most or all principal and interest payments falling due) and new lending from multilateral agencies.

Evolution of LIC External Debt



Paris Club rescheduling that lead to a reduction in the NPV of debt combined with an increasing share of concessional lending did not prevent the debt burden indicators from deteriorating further. From 1988-91, 20 LIC countries received rescheduling on Toronto Terms. As early as 1990, however it was clear that the NPV reductions provided under the Toronto terms would be insufficient to prevent the continued raise in the debt stocks. In response increasingly concessional reschedulings were adopted. Addressing the fact that LIC countries owed an increasing share to multilateral creditors, the HIPC Initiative was launched in 1996 to provide debt relief on multilateral debt.

Paris Club Reschedulings



F. Indicative Debt Burden Thresholds

To assess debt sustainability, debt burden indicators are compared to indicative debt-burden thresholds. If a debt-burden indicator exceeds its indicative threshold, this may indicate that a country is at a higher probability of debt distress. The underlying notion is that a country's with a high debt service burden relative to its repayment capacity, is more likely to run into debt-servicing difficulties.

A key empirical finding is that low-income countries with weaker policies and institutions tend to face debt-servicing problems at lower levels of debt than countries with strong institutions. Countries with a weak institutional environment tend to be more prone to misuse and mismanagement of fund. These countries may also be more vulnerable to exogenous shocks, such as for example a decline in the price of the main export good or a drought, since they are less likely to take preemptive measures or to respond adequately to exogenous shocks.

The indicative debt-burden thresholds⁹ depend on a country's quality of policies and institutions, measured by the Country Policy and Institutional Assessment (CPIA) index of the World Bank (see Table 2). The CPIA rates countries according to their economic management, structural and social policies as well as public sector management and institutions. The index is update annually. A list of all low-income countries and their corresponding performance in terms of quality of policies and institutions is provided in Annex II.

Table 2. Indicative External Debt Burden Indicators 1/
(in percent)

	Quality of Policies and Institutions 1/		
	Poor	Medium	Strong
<i>NPV of debt in percent of:</i>			
Exports	100	150	200
GDP	30	40	50
Revenue 3/	200	250	300
<i>Debt service in percent of:</i>			
Exports	15	20	25
Revenue 3/	25	30	35

1/ See IDA and IMF "Operational Framework for Debt Sustainability

Assessments in Low-Income Countries - Further Considerations" Sec xx/05.

2/ Country's with a CPIA below or equal to 3.25 are defined to have a poor quality of policies and institutions, while a CPIA above 3.75 indicates strong institutional

3/ Revenue defined exclusive of grants.

Note:

The indicative debt burden thresholds are not intended to be used as rigid ceilings. They should rather be seen as indicative benchmarks to inform the overall assessment of sustainability based on a forward-looking analysis of debt and debt-service trends. In a similar vein, it is neither expected nor suggested, that countries with low debt ratios borrow up to their thresholds.

⁹ The derivation of the indicative debt burden thresholds is explained in IDA and IMF, "Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations" (IDA/R2005-0056), April 2005 and available via internet at <http://siteresources.worldbank.org/INTDEBTDEPT/PublicationsAndReports/20478153/032805.pdf>

G. Classifying a Country's Risk of Debt Distress

A country faces an episode of **debt distress** if it cannot service its debt without resort to exceptional financing (such as debt relief) or a major future correction in the balance of income and expenditures.

The joint WB/IMF DSA framework classifies countries according to their probability of debt distress into four broad categories::

1) Low risk

All debt indicators are well below the relevant indicative debt burden thresholds. Alternative scenarios and stress tests do not result in indicators breaching thresholds in any significant way.

2) Moderate risk

The baseline scenario does not indicate a breach of thresholds. Alternative scenarios and stress tests show a substantial rise in the debt-service ratio over the projection period. As a consequence, the debt-service ratio may reach its indicative threshold, while debt-stock ratios may breach them.

3) High risk

The baseline scenario indicates a breach of debt stock and/or service ratios over the projection period. This is exacerbated by the alternative scenarios/stress tests.

4) In debt distress

Current debt stock and service ratios are in significant and/or sustained breach of thresholds.

Example: High Risk Country

A country with a CPIA of 2.5 has an NPV of debt to exports ratio of 135 percent which is projected to fall below 100 percent in 2017. Its NPV of debt to GDP ratio amounts to 45 percent. Both debt stock indicators worsen significantly in the event of exogenous shocks. The country is therefore likely to be rated as having a high risk of debt distress.

Note:

Any prudent assessment of debt distress will have to identify country-specific factors, that are likely to determine a country's probability of debt distress and that are not considered within the context of the threshold analysis A risk assessment would, for example, also consider other factors, such as a country's track record in remaining current on its debt-service obligations. Moreover, if, for example, only one indicator is

above the benchmark, this may reflect data issues rather than indicating a debt sustainability problem.

H. Operational Implications

The classification of risk distress forms the basis for determining the grant/loan mix in future IDA allocations under IDA14 and of some multilateral creditors, such as the African Development Fund.

IDA-only countries that are classified at:

- **high risk of debt distress** receive 100 percent grant financing from IDA at a 20 percent volume discount.¹⁰
- **moderate risk of debt distress** receive 50 percent grant financing at a 10 percent discount.
- **low risk of debt distress** receive 100 percent loan financing.

Grant eligibility under IDA14

Grant eligibility is limited to IDA-only countries as defined in February 2005.¹¹ Gap countries (with per capita incomes above IDA's operation cut-off for more than two consecutive years) are not eligible for IDA grants. If a country is reclassified from blend to IDA-only status, it will continue to be ineligible for grants over the course of IDA14.

Post-conflict countries that are eligible for exceptional post-conflict IDA allocations would receive limited grant financing to support recovery efforts during the pre-arrears clearance phase.

Free riding would jeopardize IDA's objective of contributing to debt sustainability, but would also over time reduce IDA's financial strength. To address such concerns, IDA management is presenting a proposal to the Executive Directors in June outlining a mechanism that (i) identifies non-concessional borrowing by IDA countries; (ii) proposes an overall level of concessionality compatible with debt sustainability; and (iii) describes the IDA resource implications for countries that contract loans that could threaten to defeat the objective of achieving debt sustainability. This mechanism would begin to be implemented over the course of FY06 and could affect the FY07 IDA allocations to countries that are not observing prudent borrowing practices.¹²

Note:

Since the result of the DSA is –among other things – the IDA grant allocation, **only the grant financing that has actually been allocated should be included in the DSA**. For future years, loan financing should be assumed.

¹⁰ The 20 percent volume discount on grants is subdivided into an incentives-related portion (11 percent) and a charges-related portion (9 percent). The incentives-related portion will be reallocated to IDA-only countries through the use of PBA-based rule and the same loan grant mix will be applied to the reallocated resources. However, no further volume discount would be applied for grant allocation.

¹¹ For more information, see on IDA grant allocation see http://siteresources.worldbank.org/IDA/Resources/14th_Replenishment_Final.pdf

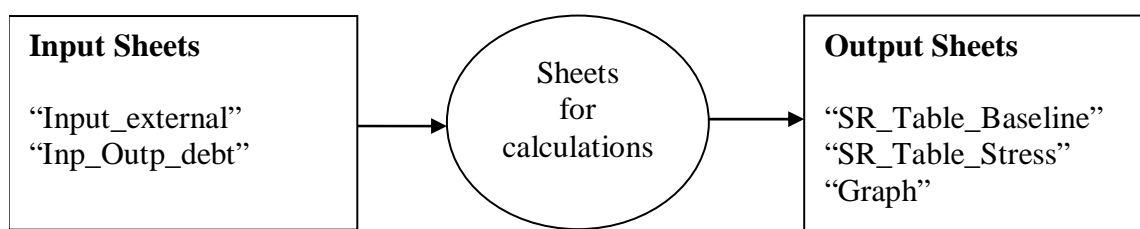
¹² There are two transitional cases. Kosovo and Timor-Leste are currently grant eligible under IDA14. Kosovo's remains eligible for grants until it is able to borrow due to a change in its political status, while Timor-Leste will be gradually phased out of grant eligibility.

III. The LIC External DS Template

A. Basic Structure

Based on macroeconomic projections and information on the external debt outstanding and its terms, the LIC external DS Template produces various external debt burden indicators. Taking care of the fact that LICs contract mostly concessional debt, the LIC External Template derives debt stock in net present value and uses a projection horizon of 20 years. It consists of (i) two input sheets, (ii) two output tables, (iii) one output figure (last sheet) and (iv) a range of worksheets that transform the input data into the information provided in the output tables.

Figure 3: Structure of the External LIC Template



B. Data Input

1. Basic Data

Assessing external debt sustainability requires **historical information and projections on external debt and a range of macroeconomic variables**, mostly related to the external sector (see Table 3). For calculating the NPV of debt, the template requires more detailed information on PPG external debt, in particular the terms of debt by major creditor groups. **Annex III** provides a list of all variables and their respective LDB codes.

Table 3: LIC External Template -Data Requirements

Debt Data	Macroeconomic Variables
PPG External	Current Account balance
PNG External	Exports of Goods and Service
Short-term External Debt	Imports of Goods and Service
	Current transfers
	Net foreign direct investment*
	GDP, current prices
	GDP, constant prices
	Exchange rate
	Exceptional Financing

*excluding debt creating liabilities.

Debt Data: Historical information on the external debt stock can be obtained from GDF. To receive information regarding the current debt stock as well as debt service projections over the next 40 years based on the current debt stock, please contact DECDG.

That data that needs to be requested is principal and payments projected over 50 year in original currency. For multilateral creditors this data is required by creditor, while for bilateral creditors only the distinction in Paris Club/non Paris Club is necessary. Commercial creditors may be aggregated.

For projections of disbursements, it may be recommendable to contact key creditors in order to receive information on their lending strategies. Key creditors and the terms of their loans can be looked up in Annex III.

Note:

The quality of data obtained from the DRS (and reported in the GDF) varies substantially across countries, hinging upon the countries reporting capacity. The quality of a country's reporting capacity is assessed at http://sima.worldbank.org/data/frames/process_debtrep.htm

Apart from the reporting capacity, the debt data provided by the country may reflect certain assumptions. This may be, for example, the case if a government does not want to recognize certain liabilities, if repayment has to be made in terms of goods or if a country receives debt relief. It is therefore recommendable to compare the debt data with the information provided by the authorities and to reach a thorough understanding of the underlying assumptions.

WEO Exchange Rates Projections: In order to convert debt service streams from original currencies into USD, the joint WB/Fund framework recommends the use of average year WEO exchange rate projections. WEO exchange rates can be downloaded via SIMA. This access is, however, restricted by a password. To obtain this password, please contact DECDG.

Macroeconomic data can be obtained from the Live Database (LDB), an Excel-based system used for managing and reporting macroeconomic data used by the country teams. Information regarding the LDB can be found at <http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/DEC/DATA/0,,contentMDK:20097840~menuPK:85076~pagePK:85006~piPK:85115~theSitePK:84804,00.html>

Since the LIC template calculates historical averages it is recommendable to provide historical data of the **past ten years**. The joint WB-Fund DSF requires macroeconomic projections over a period of **twenty years**. Country teams may generate long-term macroeconomic projections using RMSM-X¹³ based on the macroeconomic projections that have been developed cooperatively by Fund staff and the member country authorities during missions.

¹³ The address of the RMSM-X website is:

<http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/DEC/DATA/0,,contentMDK:20098345~menuPK:85077~pagePK:85006~piPK:85115~theSitePK:84804,00.html>

Note:

The **macroeconomic variables** used in the LDBs, **may not coincide** with the definition determined under the joint WB-IMF DSF. It is therefore important that the macroeconomic variables are adjusted to match the definitions required under the DSF.

Example: Exports and GDP

The export variable used in the LDB may include workers remittances. The export variable used for the LIC templates, however, is defined as exports of goods and services. The LDB provides GDP in current prices in local currency, while the LIC template requires GDP in current prices converted to US Dollars.

The data can be transferred from LDB into the LIC External Template via:

a) Automatic Data Transfer:

DECDG and PRMDE have developed an interface with the country's LDB which updates the data automatically. You can find the template at the web-address <http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/DEC/DATA/0,,contentMDK:20097840~menuPK:85076~pagePK:85006~piPK:85115~theSitePK:84804,00.html#dsaframework>.

To transfer the data, proceed as follows:

1. Open the LDB file and transfer the projections from RMSM-X to LDB.
2. Open the requested template, which contains a worksheet called "LDB".
3. Change the data in the worksheet "LDB" by using the command:
Edit -> Links -> Change Source.
4. If adjustment, advice and/or clarifications are needed please call DECDG.

b) Manual Data Input:

Enter data into the **yellow** shaded cells of the two input sheets "Input_external" and "Inp_Outp_debt". Using this data, the non-shaded cells calculate automatically additional, required information.

Note:

- 1) The two input sheets use **different definition of external debt**. While the "Input_external" sheet uses information on total external debt, only PPG external debt is entered into the "Inp_Outp_debt"!
- 2) To **change the base year** in the worksheets, go to cell S3 in the worksheet "Input_external". Changing this cell will automatically shift projections in the sheets "Baseline". Verify that the output tables are adjusted accordingly.
- 3) **Historical averages and standard deviations** are computed in the template for the past ten years. They are automatically derived for shorter periods, if historical data

are missing. To modify the period over which historical averages and standard deviations are calculated, if warranted, go to lines 58-63 in the sheet “Baseline” and adjust formulas accordingly.

2. Calculation of NPV of Debt

Calculating the NPV of PPG debt requires three steps:

- 1) Obtain data on principal and interest payments in original currency as indicated above.

Calculate interest and principal payments due of current outstanding, external PPG liabilities for major creditor groups in US dollar or in originally currency if possible.¹⁴

- 2) If the data is available in original currency, convert debt service stream into US Dollar by using WEO exchange rate projections.¹⁵
- 3) Insert debt service projections and terms of the loans into the “Inp_Outp_Sheet”.

Note:

- **debt service projections have to be provided over the entire maturity period**, i.e. until all existing claims are paid off. Otherwise, the NPV of debt will be underestimated. Given the long maturity periods of concessional loans, debt service projections of up to 50 years are required. This is substantially longer than the projection period of the macro variables, which is defined to equal 20 years.

- **converting debt service payments in USD**

The joint World Bank-Fund Debt Sustainability Framework recommends converting external debt service streams into US dollars by using average year **WEO exchange rate projections**. The country authorities generally provide debt service payments converted into US dollars by using the exchange rate of a given base date (e.g. December, 31 2004). Since exchange rates may have a substantial effect on the NPV of debt, it is therefore recommendable to request the debt service data in original currency.

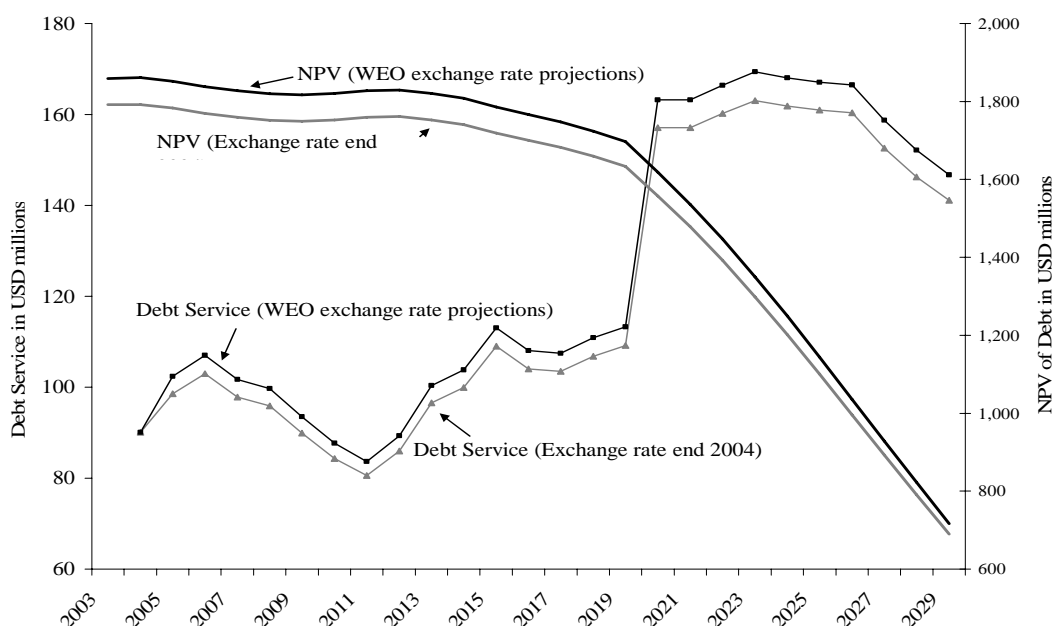
The nominal debt stock is generally converted into US dollar using the exchange rate of a given base date, such as the end of the calendar or fiscal year. Converting debt service payments into US dollar by using WEO exchange rate projections and using the nominal stock of debt based on the end of the base date exchange rate implies that the nominal stock of debt will differ from the sum of principal payments. This will be

¹⁴ The creditor groups are: IDA, IMF, other multilateral creditors, Paris Club creditors, Non Paris Club and commercial creditors.

¹⁵ WEO exchange rate projections can be downloaded from SIMA. For more information see section previous section.

reflected in the fact that the “Check” cell I26 in worksheet “Inp_Outp_debt”, will be different from zero.

Figure 4: Exchange Rate Effect



- **the discount rate in the LIC External Template is currently 5 percent, but may be revised.** This discount rate is related to the six-month average of the US\$ currency-specific commercial interest rate (CIRR). CIRRs are used by the OECD for officially supported export credits of OECD countries. The discount rate has initially been set at 5 percent, corresponding to the rounded, 6-month average U.S. dollar CIRR on maturities of at least 8.3 years. It will be adjusted by 100 basis points, whenever the U.S. dollar CIRR deviates from 5 percent by at least 100 basis points for a consecutive period of 6 months. The U.S. dollar CIRR rate can be downloaded at http://www.oecd.org/LongAbstract/0,2546,en_2825_495663_2428234_1_1_1_1.00.html. Moreover, any changes to the discount rates will be reflected in the most recent version of the template. The discount rate assumption is displayed in the upper section of the “Inp_Outp_Sheet”. The discount rates in the first column of Table 4 are applied to the entire PPG external debt, new debt as well as old debt.¹⁶
- **For private external debt, the NPV is assumed to be identical to the nominal value of debt** (i.e. the nominal interest rate is assumed to be equal to the discount rate.)

¹⁶ Interest rate, grace period and loan maturity are only used for calculating the NPV of new borrowing.

3. New Borrowing Projections

One of the main questions that a DSA tries to answer is how future borrowing will affect a country’s debt sustainability. External debt as provided in the “Input_Sheet” should be consistent with the BOP concept, which includes projections of new disbursements. The user, however, should verify, whether the country is projected to have a financing gap and what are reasonable assumption for closing this gap. If it is projected that the country may contract addition external loans for reducing the financing gap, these loans should be included in the external debt figure.

Table 4. Discount Rates and Terms of New Debt1/

	Discount rate	Interest rate	Grace period	Loan Maturity	Grant element, %
Multilaterals					
IMF (PRGF)	5.0%	0.5%	5.0	10.0	25.9
IDA	5.0%	0.8%	10.0	40.0	56.9
Others	5.0%	3.0%	5.0	15.0	14.6
Official Bilaterals					
Paris Club	5.0%	3.0%	7	20	18.4
Non-Paris Club	5.0%	3.5%	5	15	10.9
Commercial	5.0%	8.0%	1	6	-8.0

1/Extract from "Inp_Outp_Sheet" of LIC External Template.

Not only the level of new borrowing, but also its terms affect a country’s debt sustainability. The user is therefore asked to provide new borrowing projections of PPG external debt as well as the terms of the loans by major creditor groups. This information has to put into yellow cells of the “Inp_Outp_Sheet”.in Section “A. Input” under Item “3. NEW MLT DEBT: Disbursements”.

Note:

Not providing information on new debt would lead to an underestimation of the NPV based debt burden indicators. Since all nominal debt burden indicators are derived from the external debt data of the “Input_Sheet”, the information provided on new borrowing in the “Inp_Outp_Sheet” does not affect the nominal debt burden indicators in the template.

C. The Evolution of External Debt

The evolution of external debt in the LIC templates is embedded in the context of the overall macroeconomic framework. First the key macroeconomic variables are projected and then the evolution of external debt is derived.

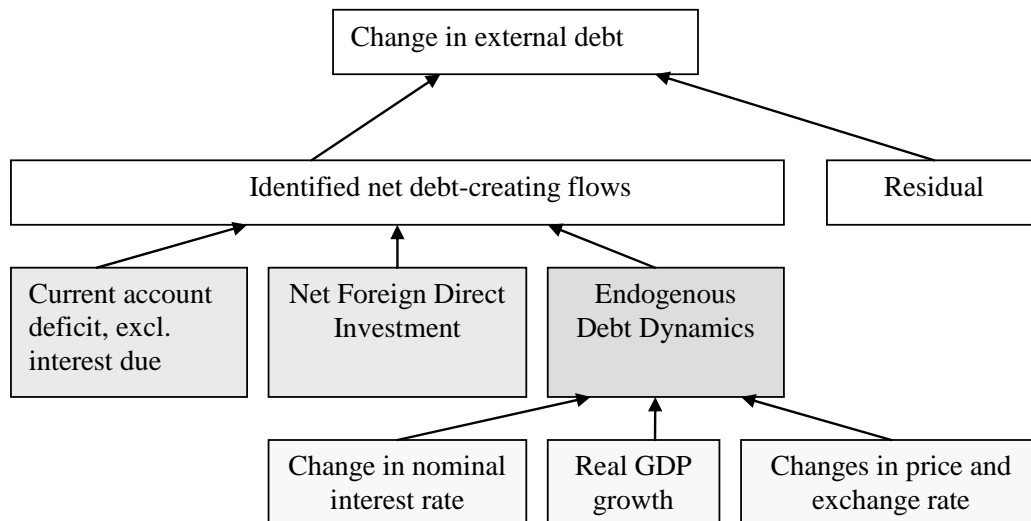
1) Projection of key macroeconomic variables

Using latest macroeconomic data, the evolution of key variables from the real sector and the external, monetary and fiscal accounts are projected. These variables are output growth, investment and inflation, as well as imports, exports, the current account balance and reserves; interest rates, interest payments and the evolution of exchange rates access to new external financing terms of grants and loans.

2) Projection of external debt

The evolution of the external debt stock is based on the projections of these key macroeconomic variables and determined by the following components: current account deficit, net foreign direct investment and endogenous debt dynamics and a residual. The combined effect of the first three effects is labeled “Identified net debt creating flows”. The residual captures all factors that determine the projections of external debt, but are not captured under “Identified net debt creating flows”. The decomposition helps to identify whether the change in the debt burden indicators is largely driven by adjustment of the current account or is rather the result of the behaviors of interest rates, growth rates and/or price and exchange rate movements.

Figure 4: Evolution of External Debt



A Guide to LIC Debt Sustainability Analysis

Put differently, the nominal stock of external debt of an economy is assumed to increase due to the net debt created for financing the balance of payments and can be written as:

$$D_t = C_t - NFDI_t + (1 + r_{t-1})D_{t-1} + Z_t$$

where D_t is nominal external debt in US Dollars at time t , C_t is the external current account balance excluding interest payments on external debt, $NFDI_t$ is net foreign direct investment, r_t is the nominal interest rate on the nominal external debt and Z_t refers to other factors. Note that amortizations and new disbursements of loans are captured within the capital account and are therefore included in the current account balance.

After several manipulations (see Annex IV) and defining lower case variables as upper-case variables expressed as a proportion of GDP, the evolution of debt can be written as:

$$d_t - d_{t-1} = c_t - nfdi_t + \frac{r_t d_{t-1}}{1 + g_t + \rho_t + g_t \rho_t} - \frac{g_t d_{t-1}}{1 + g_t + \rho_t + g_t \rho_t} - \frac{\rho_t (1 + g_t) d_{t-1}}{1 + g_t + \rho_t + g_t \rho_t} + z_t$$

Change in nominal interest rate	Real GDP growth	Changes in price and exchange rate
---------------------------------------	--------------------	---------------------------------------

where g_t refers to the real growth rate and ρ_t to the growth rate of the GDP deflator in USD dollar terms.

The evolution of external debt is determined by the following components:

Current Account Deficit

A current account deficit occurs if imports of goods and services (excluding interest payments) exceed exports of goods and service plus net transfers. It is often the most important factor that leads to a rise in external debt. A persistent negative current account balance is likely to indicate that a country may face an increase in its probability of debt distress.

Net Foreign Direct Investment

Since non-debt creating foreign direct inflows are generally the most important item in the category non-debt creating net capital flows, the decomposition refers directly to them. Any other non-debt creating net capital flows are part of the residual.¹⁷

Endogenous Debt Dynamics

In order to assess to which extend GDP growth has alleviated the external debt burden, the interest, growth and exchange rate components are shown separately.

¹⁷ For more information on net foreign direct investment see section II.C. “Debt Measures used in the LIC Templates”.

The nominal interest rate effect: The nominal interest rate is calculated in the template as debt service due in the current period over the nominal debt stock in the past period. Since interest rates on loans to low-income countries are largely fixed and de-linked from market movements, the nominal interest rate effect largely reflects a change in the concessionality of debt.

Real GDP growth: Real GDP growth captures the changes in the country's earning capacity. Moreover, since exports to GDP and revenue to GDP ratio are generally assumed to be constant over time, it determines the evolution of the denominators of all debt burden indicators. The quality of the GDP growth projections is therefore crucial for assessing a country's debt sustainability outlook.

Price and exchange rate effect: Changes in US dollar inflation and the real exchange rate may affect the debt sustainability outlook since a depreciation of the local currency is likely to worsen the debt burden. A substantial share of external debt in low-income countries may be denominated in other currencies than the USD, e.g. Euro or SDR. Cross-currency changes however are not taken into consideration here, but form part of the residual.

Residual: The residual captures exceptional financing, e.g debt relief and arrears, as well as changes in gross foreign assets, non-debt creating net capital flows which are not FDI, numerical approximations and valuation changes in cross-exchange rates.

Total gross financing need is calculated as the sum of total external amortization due, current account deficit (including interest payments) and short term debt in the previous period minus non-debt creating net foreign investment flows. This statistics may help to assess whether liquidity constraints may become binding. It is not expressed relative to GDP, but in nominal US dollar terms.

Non-interest current account deficit that stabilizes debt ratio is defined as the non-interest current account deficit minus the change in debt. An increase in the debt stock hence implies that non-interest current account deficit that stabilizes the debt ratio is lower than the non-interest current account deficit. A country is likely to be solvent in the current period if the current account balance is consistent with a stable debt to GDP ratio.

D. The Output Sheets

Once the input sheets are filled in correctly, the output tables and the graph are derived automatically, based on the standardized calculations described in the previous section. There are three output sheets: “SR_Table_Baseline”, “SR_Table_Stress” and a graph. These sheets display the dynamics of the relevant debt burden indicators as well as their main components, provide summary statistics of the principal macroeconomic variables and present the results of standardized alternative scenarios and stress tests.

1. Baseline

A **baseline** is the main macroeconomic scenario which describes the evolution of the debt and the macroeconomic variables based on realistic (not too optimistic, not too pessimistic) assumptions.

Table 5: Extract from the “SR_Table_Baseline”

Table 3a. Country: External Debt Sustainability Framework, Baseline Scenario, 2003-2025 1/
(In percent of GDP, unless otherwise indicated)

	Actual		Historical Average 6/	Standard Deviation 6/	Estimate		Projections	
	2003	2004			2005	2006	2007	2008
External debt (nominal) 1/	62.5	63.5			64.5	65.7	69.3	70.3
o/w public and publicly guaranteed (PPG)	58.2	59.1			60.0	61.2	64.7	65.7
Change in external debt	3.0	1.0			1.0	1.2	3.6	1.0
Identified net debt-creating flows	2.6	1.0			2.2	3.0	2.6	2.0
Non-interest current account deficit	6.4	6.5	8.2	2.4	11.3	12.2	12.4	12.2
Net FDI (negative = inflow)	-2.5	-3.9	-3.7	2.2	-6.9	-7.4	-7.9	-8.6
Endogenous debt dynamics 2/	-1.3	-1.7			-2.2	-1.8	-1.9	-1.7
Contribution from nominal interest rate	1.5	1.5			1.6	1.7	1.5	1.6
Contribution from real GDP growth	-2.1	-3.0			-3.8	-3.5	-3.5	-3.3
Contribution from price and exchange rate changes	-0.7	-0.2			...	...	...	...
Residual (3-4) 3/	0.4	0.1			-1.2	-1.8	1.0	-1.0
o/w exceptional financing	-1.3	-0.9			0.0	0.0	0.0	0.0
NPV of external debt 4/	...	48.7			48.4	48.3	50.8	51.3
In percent of exports	...	196.7			194.9	199.3	204.3	206.4
NPV of PPG external debt	...	44.2			43.9	43.8	46.2	46.7
In percent of exports	...	178.6			176.8	180.8	185.7	187.9
Debt service-to-exports ratio (in percent)	22.6	25.5			22.5	24.6	22.9	23.2
PPG debt service-to-exports ratio (in percent)	18.6	21.1			18.1	20.0	18.2	18.5
Total gross financing need (billions of U.S. dollars)	0.3	0.3			0.4	0.4	0.4	0.4
Non-interest current account deficit that stabilizes debt	3.4	5.5			10.3	11.0	8.9	11.2
Key macroeconomic assumptions								
Real GDP growth (in percent)	3.8	5.1	5.9	15.6	6.5	6.0	5.5	5.0
GDP deflator in US dollar terms (change in percent)	1.2	0.3	2.3	14.9	2.0	2.9	-1.5	1.5
Effective interest rate (percent) 5/	2.7	2.6	2.8	0.2	2.8	2.9	2.4	2.4
Growth of exports of G&S (US dollar terms, in percent)	2.5	0.5	8.4	9.9	9.1	6.4	6.6	6.5
Growth of imports of G&S (US dollar terms, in percent)	-0.4	-0.6	9.1	22.5	12.0	10.0	6.0	6.0
Grant element of new public sector borrowing (in percent)	...	...	...	...	37.4	34.0	30.1	31.0

Source: Staff simulations.

The sheet “SR_Table_Baseline” consists of the three sections (see Table 5): The upper section presents the evolution of the nominal debt-to-GDP ratio and decomposes its evolution. The middle section reports the NPV of PPG debt relative to

GDP and exports and the debt service on PPG debt relative to exports. The lower section provides information regarding the macroeconomic assumptions underling the baseline scenario and how they compare to the country’s historical averages.

The quality of a DSA depends to a large extent on whether the projections under the baseline scenario are realistic. Historical information about the most important macro-economic variable may provide some guidance regarding the extent of optimism in the baseline projections. A comparison between historical averages and projections is presented in the section on key macroeconomic assumptions of the “SR_Table_Baseline”. (see Table 6.)

Table 6. Historical Performance and Projections^{1/}

		Historical	2003-08	2009-23
	#	Average	6/Average	Average
Key macroeconomic assumptions				
Real GDP growth (in percent)	...	5.9	5.5	5.0
GDP deflator in US dollar terms (change in percent)		2.3	1.4	2.2
Effective interest rate (percent) ^{5/}	...	2.8	2.5	3.6
Growth of exports of G&S (US dollar terms, in percent)		8.4	6.9	6.1
Growth of imports of G&S (US dollar terms, in percent)		9.1	7.8	5.6
<u>Grant element of new public sector borrowing (in percent)</u>	...		29.2	12.2

^{1/}Extract from Output Tables.

2. Sensitivity Analysis

The sensitivity analyses in the LIC external template consist of standardized tests: two “alternative scenarios” and “six bound tests”. While the two alternative scenarios (“historical average scenario” and “scenario of less favorable new financing”) are designed as permanent modifications of key baseline assumptions, the “bound tests” represent temporary deviations though some with permanent level effects. These tests are used in order to assess the robustness of the principal debt sustainability indicators to changes in key assumptions and parameters, such as economic and export growth, interest rates or the concessionality and amount of new external financing. The results of the sensitivity analyses are summarized in the sheet “SR_Table_Stress” (see Table 8) and a graph, which can be found at the end of the template.

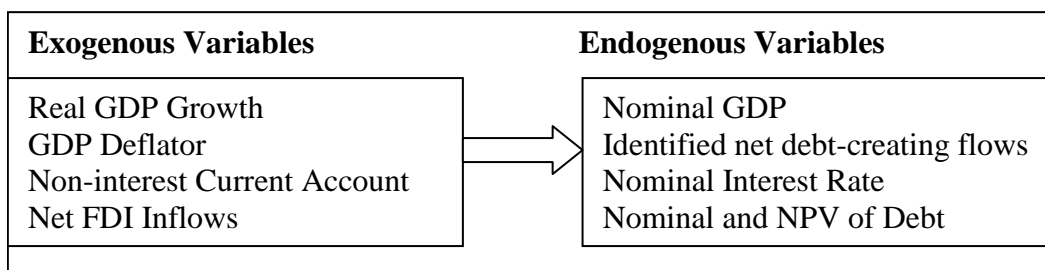
a) Historical average scenario

Basics: This scenario may provide some guidance on whether the projections under the baseline are realistic, by assuming that key variables assume their historical averages throughout the projection period. It uses ten –year historical averages as the default. If the historical data in the template is provided for less then ten years, the historical average will be calculated on the basis of the historical data available.

Mechanics: Real GDP growth, the GDP deflator, the non-interest current account and the net FDI inflows are set at their historical average, as calculated in lines 60-65, column N of the worksheet “Baseline”. The projections based on these historical averages are calculated in work sheet “A1_historical”. The changes that were introduced with respect to the baseline are highlighted in red.

Endogenous Variables: The change in real GDP growth and the GDP deflator leads to a change in the evolution of nominal GDP (see Table 7). The change in the non-interest current account and net FDI inflows affects the identified net debt creating flows. Moreover, since the GDP deflator is also set at the historical level and the nominal interest rate endogenously determined the endogenous debt dynamics change. As a consequence, the nominal debt dynamics differ from the baseline assumption and the new borrowing assumptions are adjusted accordingly.

Table 7: The Historical Average Scenario



b) Scenario on less favorable new financing

Basics: This scenario assumes that the interest on new borrowing is 2 percentage points higher than in the baseline scenario. It allows to assess a country’s vulnerability to changes in the concessionality of debt.

Mechanics: The spreadsheet assumes that the nominal interest rate on new PPG debt increases by 2 percent.¹⁸ As a consequence, the nominal interest rate on the total stock of debt increases. This affects the endogenous debt dynamics, leading to an increase in the nominal stock of debt relative to the baseline scenario. Higher interest payments and amortization due imply that the financing need increases. The gap between the new financing need and the financing need as determined under the baseline scenario, is assumed to be filled by additional new borrowing on less favorable financing terms..

Note:

- For a country where an **exceptional episode**, such as a war or a unique natural disaster has severely affected its economic performance, the period covered by such

¹⁸ This assumption can be changed in cell B5 of sheet “NPV_Stress2”.

an extraordinary episode may have to be excluded when computing historical averages. Alternatively, historical averages of similar countries may be used.

- **The two alternative scenarios are not embedded in a consistent macroeconomic framework.** For example, although the non-interest current account deficit assumes its historical average in the first scenario, export and import growth as well as the nominal exchange rate depreciation remain the same as in the baseline. Moreover, additional new borrowing is assumed to have the same terms as under the baseline scenario.¹⁹ The team may therefore want to present an alternative macroeconomic scenario, analyzing the policy response to a specific, important shock in a comprehensive manner.

c) The Bound Tests

The **six bound tests** analyze shocks on the principal macro-economic variable. The first four tests assume that GDP growth (B1), exports growth (B2), inflation (B3) and net non-debt flows (B4), as measured by FDI and current transfers, are one standard deviation below their respective historical average in each of the first two years. The fifth bound test (B5) combines these four variables. It assumes that all these variables are one-half standard deviation below their historical average in each of the first two years. The sixth bound test (B6) assumes a one-time 30 percent depreciation of the domestic currency in the first year of the projection period.

Table 7. Extract from “SR_Table_Stress”²⁰

Table 3b. Country: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2003-23
(In percent)

	Estimate	Projections		
	2004	2005	2006	2007
NPV of debt-to-GDP ratio				
Baseline	44	44	46	47
A. Alternative Scenarios				
A1. Key variables at their historical averages in 2004-23 1/	44	44	44	45
A2. New public sector loans on less favorable terms in 2004-23 2/	44	46	51	53
B. Bound Tests				
B1. Real GDP growth at historical average minus one standard deviation in 2004-05	44	51	63	64
B2. Export value growth at historical average minus one standard deviation in 2004-05 3/	44	45	51	51
B3. US dollar GDP deflator at historical average minus one standard deviation in 2004-05	44	52	61	62
B4. Net non-debt creating flows at historical average minus one standard deviation in 2004-05 4/	44	50	58	59
B5. Combination of B1-B4 using one-half standard deviation shocks	44	53	65	65
B6. One-time 30 percent nominal depreciation relative to the baseline in 2004 5/	44	62	65	66

¹⁹ The terms of new borrowing for the average historical scenario can be verified in lines 6-9 of the sheet “NPV_Stress.”

²⁰ 1/ The table actually provides projections up to 2023 and tests for all three debt burden indicators: NPV of debt to GDP ratio, NPV of debt to exports ratio and debt service to exports ratio.

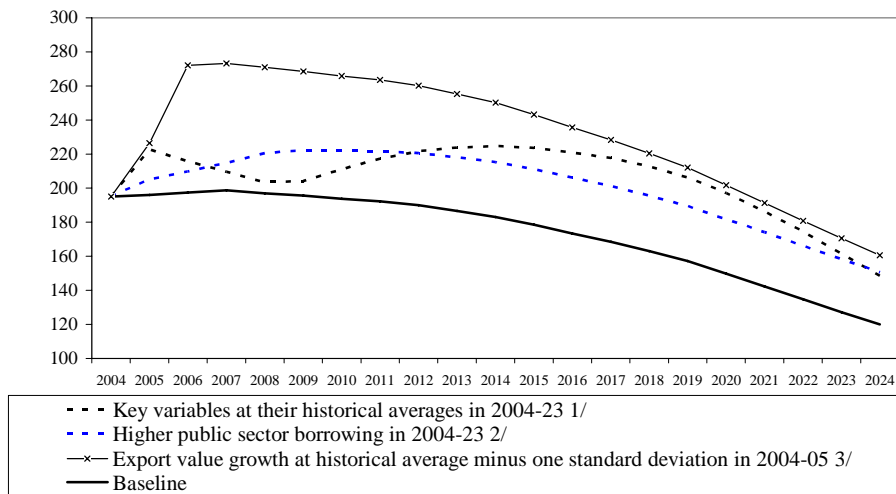
A Guide to LIC Debt Sustainability Analysis

The **graph** (see Figure 4) displays the dynamics of the debt ratios in the baseline scenario, broken down in its main components and summarizes the result of stress tests to assess the country's vulnerability to shocks. It presents the historical average scenario and the stress test that provides the highest indicator in the 10th year of the projection period.

Note:

The **stress tests** are not intended as alternative scenarios but rather as **probabilistic upper bounds** on the evolution of the debt burden indicators. They help to classify countries probability of debt distress and may also provide useful information for developing strategies to mitigate the identified risk of debt distress.

Figure 4: Extract from "Graph" of LIC External Template
NPV of Debt to Exports Ratio



Example: Country with small export base

The debt burden indicators of a landlocked country are below their indicative thresholds. While NPV of debt to GDP and debt-service to exports ratio do not breach the thresholds under the stress tests, the NPV of debt to exports ratio exceeds its indicative threshold by sixty percentage points under the lower export growth bound test. This may indicate that the country may substantially reduce its risk of debt distress by increasing and diversifying exports.

IV. Summary and Conclusion

The objective of a DSA consists in assessing whether a country's current borrowing strategy may lead to future debt-servicing difficulties. The LIC templates are an easy-to use tool for conducting DSA. They allow identifying the main determinants of debt dynamics and simulate stress test, which help to identify the factors that are most likely to jeopardize debt sustainability. They are henceforth an important tool for identifying not only borrowing strategies that are in line with a countries repayment capacity, but also adequate policy responses.

The LIC Templates standardize the DSA procedures, but cannot ensure a good quality of the DSA. The quality of the DSA hinges critically on the assumptions underlying the baseline scenario, since alternatives can lead to substantially different debt dynamics. Moreover, the framework is limited, which may make it recommendable to tailor it to the specific issues of a country. Finally, the indicative debt burden thresholds are not intended to be used as rigid ceilings. They should rather be seen as indicative benchmarks to inform the overall assessment of sustainability based on a forward-looking analysis of debt and debt-service trends.

Supporting low-income countries in their efforts to achieve the Millennium Development Goals (MDGs) without creating future debt problems is a challenge, especially in countries with a high probability of debt distress. High debt burden indicators can be reduced through a large array of policy options, such as for example increase in foreign grants, higher domestic revenue mobilization or a reduction in public spending. At the same time, enhancing GDP and export growth and reducing a country's vulnerability to exogenous shocks by, for example, expanding the export base, may be crucial for improving a country's debt sustainability outlook. It is therefore important for any DSA to develop a thorough understanding about the factors that determine GDP and export growth and how they are linked to public spending

Glossary

Arrears

Unpaid amounts of principal and/or interest payments.

Commercial debt

Credits owed to commercial banks and other financial institutions.

Commercial interest reference rate (CIRR):

Currency-specific reference rate used by the OECD for officially supported export credits of OECD countries. The discount rate used in the LIC External Template is linked to the U.S. dollar CIRR. Information on CIRRs can be found at http://www.oecd.org/LongAbstract/0,2546,en_2825_495663_2428234_1_1_1_1,00.html

Concessional loan

Loans with a grant element of at least 35 % or more.

Contingent liabilities

Obligations that arise from a particular, discrete event(s) that may or may not occur.

Disbursement

The release of funds or the purchase of goods or services for a recipient; by extension, the amount thus spent.

Exports credits

Loans extended to finance trade, usually on market-related terms.

Grace period

The period before the first repayment of the loan, during which only interest payments are due.

Grant

Transfers made in cash, goods or services for which no repayment is required.

Grant element

Measure of the concessionality of a loan and defined as the percentage by which the NPV differs from the nominal loan amount.

Loans

Transfers for which repayment is required.

Maturity

The date at which the final repayment of a loan is due; by extension, a measure of the scheduled life of the loan.

Maturity Period

The sum of the grace and the repayment period.

Official creditors

Includes international organizations such as the World Bank, regional development banks, and other multilateral and intergovernmental agencies, as well as governments, their agencies (including central banks) and official export credit agencies.

Official Development Assistance (ODA)

Grants or Loans to countries and territories of developing countries which are: (a) undertaken by the official sector; (b) with promotion of economic development and welfare as the main objective; (c) at concessional financial terms [if a loan, having a Grant Element (q.v.) of at least 25 per cent]. In addition to financial flows, grants, loans and credits for military purposes are excluded

Short term debt

Loans with a maturity of one year or less.

Annex I: CPIA Performance Categories

Country	CPIA Performance		Country	CPIA Performance	
	Category	IDA status		Category	IDA status
Armenia	Strong	IDA-only	Niger	Medium	IDA-only
Cape Verde	Strong	IDA-only	Cameroon	Medium	IDA-only
Maldives	Strong	IDA-only	Yemen, Republic of	Medium	IDA-only
St. Vincent and the Grenadines	Strong	Blend	Moldova	Medium	IDA-only
Tanzania	Strong	IDA-only	Zambia	Medium	IDA-only
St. Lucia	Strong	Blend	Mauritania	Medium	IDA-only
Uganda	Strong	IDA-only	Kiribati	Weak	IDA-only
Samoa	Strong	IDA-only	Sierra Leone	Weak	IDA-only
Burkina Faso	Strong	IDA-only	Tajikistan	Weak	IDA-only
Honduras	Strong	Hardened terms	Djibouti	Weak	Hardened terms
Nicaragua	Strong	IDA-only	Gambia, The	Weak	IDA-only
Bhutan	Strong	IDA-only	Papua New Guinea	Weak	Blend
Senegal	Strong	IDA-only	Chad	Weak	IDA-only
Grenada	Medium	Blend	Tonga	Weak	IDA-only
Pakistan	Medium	Blend	Uzbekistan	Weak	Blend
Mali	Medium	IDA-only	Vanuatu	Weak	IDA-only
Dominica	Medium	Blend	Congo, Republic of	Weak	IDA-only
Sri Lanka	Medium	IDA-only	Cambodia	Weak	IDA-only
Ghana	Medium	IDA-only	Sao Tome and Principe	Weak	IDA-only
Azerbaijan	Medium	Blend	Guinea	Weak	IDA-only
Benin	Medium	IDA-only	Burundi	Weak	IDA-only
Serbia and Montenegro	Medium	Hardened terms	Lao People's Democratic Republic	Weak	IDA-only
Albania	Medium	Hardened terms	Congo, Democratic Republic of	Weak	IDA-only
Vietnam	Medium	IDA-only	Guinea-Bissau	Weak	IDA-only
Bolivia	Medium	Blend	Nigeria	Weak	Blend
Bosnia-Herzegovina	Medium	Hardened terms	Haiti	Weak	IDA-only
Indonesia	Medium	Blend	Cote d'Ivoire	Weak	IDA-only
India	Medium	Blend	Eritrea	Weak	IDA-only
Madagascar	Medium	IDA-only	Togo	Weak	IDA-only
Georgia	Medium	IDA-only	Solomon Islands	Weak	IDA-only
Lesotho	Medium	IDA-only	Sudan	Weak	IDA-only
Kenya	Medium	IDA-only	Central African Republic	Weak	IDA-only
Kyrgyz Republic	Medium	IDA-only	Angola	Weak	IDA-only
Guyana	Medium	IDA-only	Comoros	Weak	IDA-only
Nepal	Medium	IDA-only	Zimbabwe	Weak	Blend
Bangladesh	Medium	IDA-only	Afghanistan	Weak	IDA-only
Rwanda	Medium	IDA-only	Kosovo	Weak	IDA-only
Mongolia	Medium	IDA-only	Liberia	Weak	IDA-only
Mozambique	Medium	IDA-only	Myanmar	Weak	IDA-only
Malawi	Medium	IDA-only	Somalia	Weak	IDA-only
Ethiopia	Medium	IDA-only	Timor-Leste	Weak	IDA-only

Note: * Ratings are based on available DSAs. Updated May 17, 2005

Annex II: Key Creditors and Terms of their Loans

Multilateral Creditors

World Bank Group

The World Bank Group provides lending through the International Development Agency (IDA), the International Bank for Reconstruction (IBRD) and the International Finance Corporation (IFC). IDA provides highly concessional loans and grants to low-income countries, while IBRD provides non-concessional financing to middle income and creditworthy poorer countries. (see Table A2 for terms of major multilateral creditors). This implies that IBRDs net transfers to low-income countries are currently on average negative. The IFC provides loan and equity finance for private sector projects. IFC loans are generally classified as private non-guaranteed debt.

IMF

The International Monetary Fund (IMF) provides concessional loans to low-income countries through its Poverty Reduction and Growth Facility (PRGF). Non-concessional loans are extended through the following facilities: Stand-By-Arrangements (SBA), Extended Fund Facility (EFF), Supplemental Reserve Facility (SRF), Contingent Credit Lines (CCL) and Compensatory Financing Facility (CFF). For more information see <http://www.imf.org/external/np/exr/facts/howlend.htm> or <http://www.imf.org/external/np/pdr/roff/2000/eng/fc/index.htm>

AfDB Group

The African Development Bank Group provides non-concessional loans through the African Development Bank (AfDB) and the African Development Fund (AfDF). Moreover, the AfDB disburses concessional loans to African low-income countries via the Nigeria Trust Fund (NTF). NTF provides financing at intermediate rates - which are lower than the conventional ADB terms but higher than ADF charges.

ADB

The Asian Development Bank provides non-concessional financing through its ordinary capital resources (OCRs) and concessional resources through the Asian Development Fund (ADF). Project loans financed from ADF have a 32-year maturity including an 8-year grace period, 1% interest charge during the grace period and 1.5% during the amortization period, and equal amortization. Quick-disbursing program loans from AfDF are characterized by the following terms: 24-year maturity including an 8-year grace period, 1% interest charge during the grace period and 1.5% during the amortization period, and equal amortization. There is no commitment fee associated with ADF-financed loans. In addition to ADF, ADB manages other special funds such as the Technical Assistance Special Fund and Japan Special Fund, financed by periodic voluntary contributions from donors.

European Union and EIB

The European Union provides financing through the European Investment Bank, the financing institution of the European Union, which also administers the European Development Fund. The European Development Fund (EDF) is the main instrument for Community aid for development cooperation and consists of several instruments, including grants, risk capital and loans to the private sector. The EIB also provides financing out of its own resources. <http://www.eib.org>

IADB

The Inter-American Development Bank (IADB) provides non-concessional loans (Ordinary Capital) to its member states and concessional finance through its Fund for Special Operations (FSO). For more information on FSO loans, see http://www.iadb.org/exr/pic/VII/OP_903.cfm

IFAD

The International Fund for Agricultural Development (IFAD) provides concessional loans and grants in support of rural poverty reduction. For more information see www.ifad.org/operations.html

Bilateral creditors and export credit agencies

Bilateral donors and creditors are sovereign governments or their aid and development policy agencies, such as the UK's Department for International Development (DFID), the Swedish International Development Agency (Sida) and the German Kreditanstalt fuer Wiederaufbau (KfW). Bilateral donors and creditors generally provide external assistance through concessional loans or grants.

Non-concessional export credit loans are provided by most development countries government in addition to concessional financing. They either extend non-concessional export credit loans directly to the borrower or through guarantees of export credit finance provided by exporters or banks and financial institutions. Loans provided by the export credit agency are classified as bilateral credits. Finance provided by exports, banks and financial institutions and guaranteed by an export credit agency is classified as commercial debt. If the debtor fails, however, to service the loan and the guarantee is invoked, the export agency becomes the creditor and the debt is classified as bilateral. For more information on export credit agencies visit: http://www.oecd.org/countrylist/0,2578,en_2649_34169_1783635_1_1_1_1,00.html

A ceiling on the concessionality of new loans has been established for many low-income countries. This implies that new loans should have a minimum grant element of 35 percent or higher. As a consequence, many bilateral creditors provide financing packages which combine grants or concessional loans with non-concessional funds, such as export credits.

Table A2. Concessionalty of Loans by Selected Creditors 1/

Creditor	Grace Period	Maturity	Interest Rate	Service Charges	Commitment Charge ^{4/}	Repayments per year	Repayment Profile	Currency	Grant Element	
									Current IMF Method ^{2/}	CIRR 2003 ^{3/}
IDA40	10	40	0.75%	0%	0.50%	2	IDA40 ^{6/}	SDR and USD	82.00%	63.22%
IDA35	10	35	0.75%	0%	0.50%	2	IDA35 ^{7/}	SDR and USD	77.83%	58.09%
IaDB ^{5/}	10	40	1% & 2% ^{8/}	0%	0%	2	EQUIP	Multiple	76.33%	57.01%
IMF	5.5	10	0.50%	0%	0%	2	EQUIP	SDR	38.21%	26.69%
African Dev Fund	10	50	0.00%	0.75%	0.50%	2	Specific ^{12/}	Multiple	84.42%	67.45%
Nordic Development Fund	10	40	0.00%	0.75%	0.50%	2	EQUIP	SDR	72.00%	49.59%
IFADI	10	50	1.00%	0%	0%	2	EQUIP	SDR	72.64%	49.95%
OPEC	5	20	0.50%	0%	0%	2	EQUIP	USD	56.56%	35.76%
JBIC	10	40	0.75% ^{9/}	0%	0%	2	EQUIP	Yen	49.40%	33.86%
EU	10	40	0.75% ^{9/}	0%	0%	2	Specific	EUR	73.01%	54.57%
BADEA	10	30	1% ^{10/}	0%	0%	2	EQUIP	USD	67.48%	42.87%
EIB	10	50	1% ^{10/}	0%	0%	2	Specific	EUR	73.62%	55.16%
Asian Development Fund	8	32	1% & 1.5%	0%	0%	2	EQUIP	USD	71.89%	51.80%
Islamic Dev. Bank	10	30	0.00%	0% ^{11/}	0%	2	EQUIP	SDR	74.48%	53.99%

Source: Staff estimates, based on publicly available information for each Institution.

- For some creditors, lending terms vary depending on the borrower country and/or the project financed. For simplicity, those conditions which represented the "softest" loan terms were used to calculate the grant element.
- Refers to concessionalty calculations for debt ceilings in Fund-supported programs, which uses 10-year averages of CIRR as discount rates, plus a spread subject to the maturity period. For loans with maturity of less than 15 years, the CIRR 6-month average.
- Current CIRR six-month average.
- Levied on undischursed amounts. For the purpose of this exercise, it was assumed that the loan is disbursed in one observation.
- IaDB lends in multiple currencies, in this case the discount rate used was the USD CIRR.
- 20 percent of the loan is repaid during the first 10 years after grace period. The rest is paid afterwards.
- Principal repayable at 2.5 percent per annum during the first 10 years after the grace period and 5 percent per annum afterwards.
- 1 percent during the grace period, 2 percent afterwards.
- Current rate ranges from 0.75 percent up to 4 percent.
- Current rate ranges from 1 percent up to 4 percent.
- Current rate ranges from 0 percent up to 2.5 percent.
- 10 percent of the loan is repaid in the 10 years following the grace period and the remaining 90% over 30 years.

Annex III: Input Variables of External Template

Series Code	Variable
<i>Macroeconomic Variables</i>	
NY.GDP.MKTP.CN	Gross domestic product, current prices, LCU
NY.GDP.MKTP.KN	Gross domestic product, constant base-year prices, LCU
PA.NUS.ATLS	Exchange rate, local currency per U.S. Dollar
BN.CAB.XOKA.CD	Current account balance
BX.GSR.GNFS.CD	Exports of goods and services
BM.GSR.GNFS.CD	Imports of goods and services
BN.TRF.XOKA.CD	Current transfers, net total
BN.TRF.OFDC.CD	of which official
BN.KLT.DINV.CD	Net FDI, excluding debt-creating liabilities
<i>Debt Variables</i>	
DT.DIS.DLXF.CD	LT disbursement
DT.TDA.DECT.CD	Adjustment to scheduled debt service
DT.IND.DEXF.CD	Total external debt interest due
DT.AMD.DLXF.CD	Total external amortization due
DT.DOD.DECT.CD	Total external debt outstanding at EoP including arrears
DT.DOD.PRVT.CD	Private sector debt, guaranteed
DT.DOD.DSTC.CD	Short-term total external debt
DT.AXA.DPPG.CD	Principal arrears (stock)
DT.IXA.DPPG.CD	Interest arrears (stock)
DT.DIS.DIMF.CD	IMF Purchases
DT.DIS.MIDA.CD	IDA disbursements
DT.DIS.MLAT.CD	Multilateral incl. IDA disbursements
DT.DIS.BLAT.CD	Official bilaterals
DT.DIS.PRVT.CD	Private creditors (guaranteed)
DT.AMT.DIMF.CD	IMF Repurchases
DT.INT.DIMF.CD	IMF Charges
DT.AMT.MIDA.CD	IDA Amortization
DT.INT.MIDA.CD	IDA Interest
DT.AMT.MLAT.CD	Multilateral (incl. IDA, excluding IMF) Amortization
DT.INT.MLAT.CD	Multilateral (incl. IDA, excluding IMF) Interest
DT.AMT.BLAT.CD	Bilateral Amortization
DT.INT.BLAT.CD	Bilateral Interest
DT.AMT.PRVT.CD	Private guaranteed AMT
DT.INT.PRVT.CD	Private guaranteed INT
DT.AMT.DPNG.CD	Private NON-guaranteed AMT
DT.INT.DPNG.CD	Private NON-guaranteed INT
DT.IND.DLXF.CD	L-T Interest Due
DT.INT.DSTC.CD	Interest on ST Debt
DT.TDS.DIMF.CD	IMF repurchases+charges
DT.TDS.MIDA.CD	IDA debt service
DT.TDS.MLAT.CD	Multilateral (incl. IDA, excluding IMF) debt service
DT.TDS.BLAT.CD	Bilateral debt service
DT.TDS.DIMF.CD	IMF repurchases+charges
DT.TDS.MIDA.CD	IDA debt service
DT.TDS.MLAT.CD	Multilateral (incl. IDA, excluding IMF) debt service
DT.TDS.BLAT.CD	Bilateral debt service
<i>Secondary variables calculated from LDB data</i>	
NY.GDP.MKTP.CD	Gross domestic product, current prices, US\$ million
NY.GDP.MKTP.KD	Gross domestic product, constant base-year prices, USD million

Annex IV: Evolution of External Debt

The evolution of external debt is based on the balance of payments identities and can be written as

$$D_t = C_t - NFDI_t + (1 + r_{t-1})D_{t-1} + Z_t$$

where D_t is nominal external debt in US Dollars at time t , C is the external current account balance excluding interest payments on external debt, $NFDI$ is net foreign direct investment, r_t is the nominal interest rate on the nominal external debt²¹ and Z refers to other factors. Other factors include other non-debt creating net capital flows, exceptional financing, e.g. debt relief and changes in arrears, changes in gross foreign assets such as foreign exchange reserves, cross-exchange rate effects and valuation adjustment. Moreover, it includes the fraction of the financing gap that is financed through additional external loans.

Dividing both sides by GDP_t and defining lower case variables as upper-case variables expressed as a proportion of GDP leads to

$$d_t = c_t - nfdi_t + d_t(1 + r_t) \frac{GDP_{t-1}}{GDP_t} + z_t$$

Subtracting d_{t-1} from both sides and substituting $\frac{GDP_{t-1}}{GDP_t} = 1 + g_t + \rho_t + g_t\rho_t$ yields the following equation:

$$d_t - d_{t-1} = c_t - nfdi_t + \frac{r_t d_{t-1}}{1 + g_t + \rho_t + g_t\rho_t} - \frac{g_t d_{t-1}}{1 + g_t + \rho_t + g_t\rho_t} - \frac{\rho_t (1 + g_t) d_{t-1}}{1 + g_t + \rho_t + g_t\rho_t} + z_t$$

Change in nominal interest rate	Real GDP growth	Changes in price and exchange rate
---------------------------------------	--------------------	---------------------------------------

where g_t refers to the real growth rate and ρ_t to the growth rate of the GDP deflator in USD dollar terms.

²¹ The template calculates $r_t = \frac{InterestPaid_t}{D_{t-1}}$

References

- Birdsall, Nancy, Stijn Claessens, and Ishac Diwan, 2002, “Will HIPC Matter? The Debt Game and Donor Behaviour in Africa,” Center for Economic Policy Research, Discussion Paper Series, No. 3297, pp. 1-35.
- International Development Association and International Monetary Fund, 2005, “Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations” (IDA/R2005-0056) and available via internet at <http://siteresources.worldbank.org/INTDEBTDEPT/PublicationsAndReports/20478153/032805.pdf>
- International Development Association, 2004, “Debt Sustainability and Financing Terms in IDA14: Further Considerations on Issues and Options.” and available via internet: <http://siteresources.worldbank.org/IDA/Resources/DebtSustainabilityNov04.pdf>
- International Development Association, 2003, “Debt Sustainability in the Context of Achieving the Millennium Development Goals”(IDA/SecM2003-0453).
- International Monetary Fund and International Development Association, 2004a, “Debt Sustainability in Low-Income Countries: Further Considerations on an Operational Framework and Policy Implications”, (IDA/SecM2004-0629/1 and SM/04/318) and available via internet: http://siteresources.worldbank.org/IDA/Resources/DebtSustainability_June2004.pdf
- International Monetary Fund and International Development Association, 2004b, “Debt Sustainability in Low-Income Countries: Proposal for an Operational Framework and Policy Implications” (IDA/SecM2004-0034 and SM/04/27) and available via internet: <http://siteresources.worldbank.org/INTDEBTDEPT/PolicyPapers/20279458/DSfullpapersept.pdf>
- International Monetary Fund, 2003a, “Debt Sustainability in Low-Income Countries – Towards a Forward-Looking Strategy,” prepared by the Policy Development and Review Department, SM/03/185 and available via internet: <http://www.imf.org/external/np/pdr/sustain/2003/052303.htm>
- International Monetary Fund, 2003b, “External Debt Statistics – Guide for Compilers and Users,” June 2003 and available via internet: <http://www.imf.org/external/pubs/ft/eds/Eng/Guide/index.htm>
- International Monetary Fund, 2002, “Assessing Sustainability,” prepared by the Policy Development and Review Department, SM/02/166 and available via internet: <http://www.imf.org/external/np/pdr/sus/2002/eng/052802.htm>

A Guide to LIC Debt Sustainability Analysis

International Monetary Fund, 1999, “From Toronto Terms to the HIPC Initiative: A Brief History of Debt Relief from Low-Income Countries,” prepared by the Christina Daseking and Robert Powell, WP/99/142 and available via internet:
<http://www.imf.org/external/pubs/ft/wp/1999/wp99142.pdf>

Kraay, Aart and Vikram Nehru, 2004 “When is Debt Sustainable?”, World Bank Policy Research Working Paper No. 3200 and available via internet:
http://www.worldbank.org/hipc/Kraay_Nehru2004.pdf