FISCAL AFFAIRS

FISCAL RISK TOOLKIT

State Owned Enterprise Health Check Tool:

User Guide

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CONTENTS

ACRONYMS

CAGR	Compound Annual Growth Rate
D2D	Distance to Default
EBIT	Earnings before Interest and Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortization
FAD	Fiscal Affairs Department
GDP	Gross Domestic Product
GFSM	Government Finance Statistics Manual
HCT	Health Check Tool
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
PD	Probability of Default
QFA	Quasi-Fiscal Activities
ROA	Return on Assets
ROE	Return on Equity
SOE	State-Owned Enterprise

State-Owned Enterprise Health Check Tool User Guide[1]

I. Overview and Purpose of the Tool

State-owned Enterprises (SOEs) comprise a significant share of economic and public sector activity. SOEs deliver critical services in important economic sectors such as utilities, infrastructure, natural resources, manufacturing, and finance. They typically account for a sizable proportion of a country's output and net financial wealth. In 2018, assets of the world's largest SOEs were USD 45 trillion, equivalent to 50 percent of global GDP, while their debt amounted to USD 7.4 trillion (IMF, 2020). Many SOEs now rank among the world's largest companies, with their assets comprising 20 percent of assets of the world's largest 2,000 largest firms (IMF, 2020).

Poor performing SOEs can be costly for public finances and generate significant fiscal risks. Fiscal risks are factors that may cause fiscal outcomes to deviate from expectations or forecasts. Fiscal risks from SOEs can arise from lower-than-expected dividends, royalties or taxes received from SOEs, higher subsidies, the non-repayment of loans, need to service guarantees on their borrowing, or equity injections to cover previous losses. Historically, equity injections or other support provided to individual SOEs have cost on average, about 3 percent of GDP, and in some cases have been as large as 15 percent of GDP (Bova and others, 2016).

Underperforming SOEs can also hinder economic development. SOEs are typically leading players in network industries like energy, water, transport, and telecommunications, responsible for providing core infrastructure, public utilities, and other services critical for enabling economic growth and improving social conditions. However, access to key infrastructure remains an urgent challenge in many emerging and low-income countries and remains a key impediment to economic growth and development. Overall, profits and labor productivity are lower in SOEs than in private firms, which can reflect for example, uncompensated public policy mandate or inefficiencies.

Assessing the financial health of SOEs and the fiscal risks that may arise from the sector is therefore important to ensuring sound public finances. The IMF provides a range of guidance and tools to support countries in this area. Several IMF policy papers have provided broad based guidance on: best practices for managing fiscal risks, including those for SOEs (IMF, 2016); managing specific risks from SOEs and strengthening financial oversight of them (Allen and Alves, 2016); and stress testing SOEs and benchmarking their performance against peers (Baum and others, 2021).

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[1] The SOE Health Check Tool was prepared by Avril Halstead, Patrick Ryan, and Amanda Sayegh for primary use in country capacity development. The Tool has benefited from substantial inputs from Chris Marrison and Kezhou Miao. The User Guide has also benefited from useful comments and suggestions provided by Fritz Bachmair, Taz Chaponda, Jason Harris, Sybi Hida, Vladimir Krivenkov, Arturo Navarro, Iana Paliova, Mathilde Ravanel, Michelle Stone, and Alexander Tieman, and other IMF staff.

The SOE Health Check Tool (HCT) is a practical excel-based tool designed to help countries assess financial vulnerabilities and risks emerging from SOEs. The Tool has been specifically designed to offer country authorities a way of monitoring their portfolio of SOEs with the goal of improving oversight and fiscal risk management. It allows users to identify and monitor those SOEs that are more likely to pose fiscal risks and thereby helps inform early and targeted interventions where necessary. The Tool provides a starting point for SOE vulnerability assessment and can be complemented by more in-depth analysis of the underlying drivers of financial performance as well as the IMF's SOE Stress Test Tool which examines the resiliency of an individual SOEs financial position.

The SOE HCT is designed to assess the financial health of non-financial SOEs based on their financial performance and financial position. It can assess the financial vulnerability of up to 40 non-financial SOEs. The Tool computes a set of financial soundness indicators (e.g., profitability, solvency, and liquidity), which can be used to categorize an SOE's level of risk based on a simple or weighted average of the selected indicators. In addition, transactions between the government and SOEs, including subsidies, loans, equity injections and contingent liabilities, are analyzed. The Tool has been tailored so that it can be applied in countries where data and capacity may be limited, by requiring only condensed balance sheet and income statement information. The assessment can be based on historical financial data, or forward-looking financial projections where that information is available, to assess how an SOE's risk profile evolves over time.

The Tool provides a detailed overview of the SOE sector as well as an analysis of individual SOEs. It generates an overall risk table, ranking SOEs by the magnitude of their liabilities and liquidity position as well as providing the distribution of SOEs across risk categories for financial indicators. It also automatically generates values for the selected financial indicators and associated risk ratings for the latest five years of data. In addition, an analysis of financial indicators over time is provided for each SOE. Outputs charts and tables are provided to illustrate SOE performance at both the aggregate level for the SOE portfolio as well as for individual SOEs.

The analysis generated by the SOE HCT can support fiscal policy and decision making. The Tool informs policymakers which SOEs may require more intense monitoring, need to be subject to more in-depth analysis, or that may require corrective actions to strengthen their financial position and reduce the likelihood of fiscal risks materializing. It can also help inform whether, and on what terms, to extend public support, such as loans or government guarantees, to SOEs.

The Tool can also be used as the basis for disclosing information relating to SOEs. The IMF's Fiscal Transparency Code (2019) and Fiscal Transparency Handbook (2018) provides guidance to countries on disclosing SOE-related contingent liabilities, quasi-fiscal activities (QFAs) undertaken by SOEs and their transactions with the government. In addition, the OECD's corporate governance guidelines provide guidance on aggregate SOE reporting. In line with these principles, countries are increasingly disclosing information related to the SOE sector, either in fiscal risk statements (e.g., Georgia, Tajikistan), budget documents (e.g., South Africa) or standalone annual reports (e.g., Sweden, Lithuania). The SOE HCT provides summary charts and tables of financial soundness

indicators for the SOE sector as well as aggregate balance sheet information that can support these disclosures. However, as in many cases, risks related to SOEs are implicit, care should be taken in to ensure public disclosures are done in a way that does not increase the likelihood of risks materializing or the potential costs to government if they do.

II. Linking Fiscal Risks to Financial Indicators

Fiscal risks from SOEs can negatively impact fiscal aggregates and sovereign liquidity. Lower than anticipated taxes, royalties or dividends received from SOEs, will result in lower than forecast government revenue. Higher than anticipated transfers to SOEs in the form of subsidies, loans or equity can also result in higher-than-expected expenditure or financing requirements. Similarly, where SOEs fail to make scheduled interest or debt repayments on government extended loans, or if the government is required to step in to meet guarantee calls, this will impact on government financing requirements (see GFSM 2014). Poor financial performance can also erode the value of SOE equity and result in a deterioration in general government net financial worth or public sector net worth. Poor operational performance by macro-significant SOEs can also constrain economic growth, which can indirectly impact on fiscal aggregates.

Fiscal risks can arise from exogenous shocks that adversely impact on an SOEs financial position or from SOE specific factors. Exogenous macroeconomic shocks, such as changes in economic growth, trade, interest rates, exchange rates or commodity prices, impact on an SOEs financial performance and increase the likelihood that SOE-related fiscal risks will materialize. These risks tend to crystalize with other sources of fiscal risks for government. In addition, SOE-specific factors, such as lower demand, lower prices at which their goods and services are sold, higher input costs or difficulties obtaining key inputs, damage to assets and infrastructure, delays and overruns in construction, and costs associated with climate change or environmental rehabilitation, amongst many others, can also adversely impact on an SOEs financial position. Weaknesses in an SOEs governance and/or management, and changes to the industry structure and regulatory environment can also significantly impact SOE performance.

These SOE-level risks are more likely to have a budgetary impact when SOEs are thinly capitalized, loss-making and have low levels of liquidity. Equity serves as a cushion that enables companies to absorb shocks. If an SOE has little equity, even modest shocks may result in the entity experiencing financial difficulties, potentially requiring fiscal support or recapitalization to continue to operate. Recurring losses result in an SOE's equity being eroded. Loss-making entities that do not generate sufficient cash flow, may be reliant on debt-financing to fund their activities, which increases their leverage and can crate liquidity challenges. If SOEs do not have sufficient liquidity, they may be unable to meet their financial obligations as they fall due.

The SOE HCT therefore focuses on assessing SOEs' profitability, solvency, and liquidity to assess their financial vulnerability and risk of generating fiscal costs. Table 1 shows the relationship between the fiscal risks, the main sources of risk at the SOE level and the key indicators used for assessing the potential for those risks to arise. The indicators fall into three categories:

- **Profitability**: assess an SOEs efficiency in using its assets to generate returns for its shareholders. The net profit margin, operating profit margin, return on working capital, return on assets, return on equity, and cost recovery indicators are calculated by the Tool.
- **Solvency:** evaluate an SOEs ability to withstand unexpected losses, repay its debt in the long term and continue operating as a going concern. The debt to equity, debt to assets, debt to EBITDA, debt coverage, cash interest coverage and interest coverage indicators are used in the Tool.[2]
- **Liquidity:** analyze the ability of an SOE to pay off its current liabilities as they become due. This focus is not only on how much cash a business has, but also how easy it will be for the SOE to convert assets into cash. The current ratio, quick ratio, creditor turnover days and debtor turnover days are determined by the Tool.

Table 1. Linkage between fiscal risks and financial indicators

Fiscal risk	Main sources of risk at SOE level	Key financial indicators
Lower dividends and taxes	• Lower revenues • Higher costs	Deteriorating ***profitability*** indicators
Higher subsidies	• Higher cost of subsidized activities	Deteriorating **profitability** indicators
Equity injections	• Losses eroding equity • Unsustainably high debt levels • Write-off or impairment of assets	Deteriorating **solvency** indicators (debt to assets)
Increased borrowing needs	• Weak internal generation of cash (often due to poor profitability) • Poor working capital management (collection from debtors and payment of creditors) • Inadequate access to market financing to meet obligations as they fall due	Deteriorating **liquidity** or **solvency** (interest coverage) indicators
Crystallization of contingent liabilities	• Weak internal generation of cash (often due to poor profitability) • Inadequate access to market financing to meet obligations as they fall due	Deteriorating **liquidity** or **solvency** (interest coverage) indicators

Source: IMF staff.

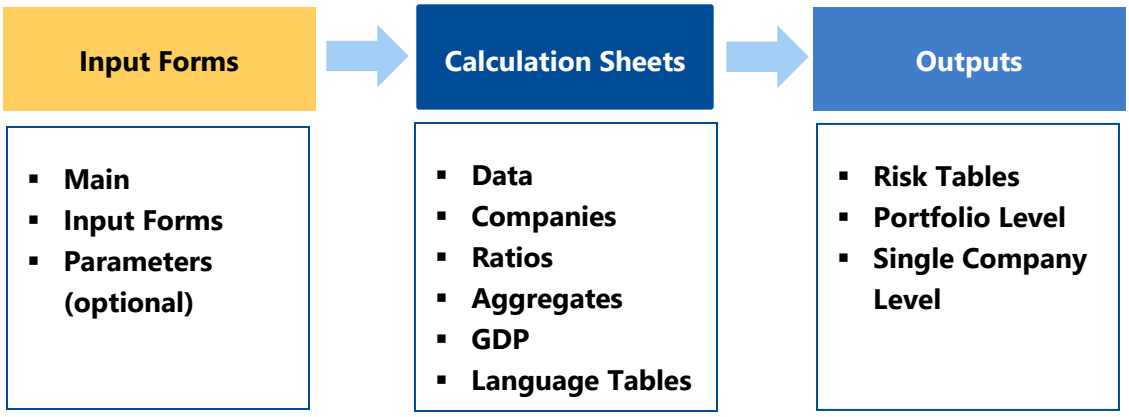
III. Structure of the Tool

The Tool is divided into three main sections: general information and user inputs, calculation sheets, and outputs. The 'README' sheet, 'Ratio Metadata' and 'Financial Statement Metadata' sheets provide general information on the Tool, the financial indicators used, and the SOE financial information to be entered. The user inputs are in the three sheets with yellow tabs: 'Main', 'Input Forms', and 'Parameters'. There are three main output sheets, which are in blue. There are also several calculation sheets where the analysis is performed that is presented in the output sheets.

[2] EBITDA refers to earnings before interest, tax, depreciation, and amortization

These are hidden to the user. The workflow of the Tool is illustrated in Figure 2, and the full structure is set out in Annex I.

Figure 1. Template Workflow



IV. Using the SOE Health Check Tool

This section provides an overview of how the Tool is used. Detailed step-by-step instructions are provided in Annex I. To start working with the tool, users should click on 'Get Started' on the introductory page or begin on the 'Main' Sheet, after familiarizing themselves with 'README'.

A. INPUTS

Users should input relevant information about the country, data, and number of SOEs in the 'Main' sheet. Based on this information, the 'Input Forms' sheet adjusts to incorporate the appropriate number of SOEs and years of financial data. Users are easily able to adjust the number of SOEs or incorporate additional years of data by simply adjusting the values in the 'Main' sheet. The Tool can accommodate up to 15 years of financial data for 40 SOEs. While the Tool does not forecast financials, users can input SOE business plans and forecasts into the Tool to see how risks may evolve in the future. The user needs to adjust the number of years in the 'Main' tab to incorporate the forecast period. The user can also select the language to be used in the Tool from the 'Main tab', with language options currently consisting of English, French, Spanish and Russian.

For each SOE, three types of data inputs are required: descriptive information, financial data, and government support data. This data is entered on the 'Input Forms' sheet. The descriptive data includes the SOE's name, sector, its legal form, and ownership information. The user must input a relevant Company Acronym for each SOE. This acronym is used to uniquely identify the SOE in the rest of the Tool. Financial data for each SOE includes a balance sheet and income statement based on International Financial Reporting Standards (IFRS) or similar reporting format. Lastly, users input data on the financial support provided by the government.

Data sources may vary depending on country reporting arrangements and standards. Data used for the Income Statement and Balance Sheet input forms should ideally be sourced from the SOEs' annual financial statements, to ensure input quality. It can also be useful to triangulate this information with information obtained from the SOE or entity responsible for their oversight. Consulting the notes to the financial statements can aid in ensuring the correct classification of the line items. Data on the government support can generally be sourced from budget documentation, government finance statistics reports, fiscal risk statements. Historical information could also be obtained from the financial statements of the government, where these are being prepared in line with international standards. The required data could also be requested from the relevant departments responsible for preparing the budget, financial statements, or debt management.

Risk categories in the Tool are determined based on threshold ranges set by the user in the 'Parameters' sheet. The Tool includes five risk categories, with Category 1 representing SOEs with lower levels of risk and Category 5 representing higher level of risk. The classification of entities into risk categories is based on thresholds set by the user for each financial indicator and risk category. In addition, for any entity that has negative equity or a negative debt to EBITDA indicator, the indicator is automatically classified in the highest risk category (Category 5). This is because entities with negative equity are technically insolvent and unable to operate without some form of fiscal support or restructuring, while ones that are consuming cash in their business will have to borrow to service their debt, which is not sustainable. The thresholds can be derived from historical experience, third party information (e.g., from credit rating agencies or banks), benchmarking using financial performance of international or local comparator companies, or benchmarks commonly used by financial analysis. For tractability, the Tool applies common thresholds for all SOEs in the portfolio; however, thresholds can be tailored to the characteristics of particular sectors and countries to increase the sophistication and robustness of the analysis.

B. OUTPUTS

After importing the data, the user will be directed to the overview table in the 'Risk Tables' sheet. This output provides the user with an overall risk assessment for each of the SOEs for a given year. By default, this table is populated with data for the most recent year. However, the user can select different years from the drop-down box.

Users can select the financial soundness indicators, and their weightings, which will be used generate the overall risk rating. The weightings for selected indicators must sum to 100 percent. Based on the selection, the overall risk rating is generated as the weighted average of the selected ratings. The indicators that are selected in this sheet will also be used to calculate overall risk ratings in the 'Portfolio Level' and 'Single Company Level' sheets. Guidelines for interpreting these indicators are provided in the Tool in the 'Ratio Metadata' sheet as well as in Annex II.

The Tool generates an analysis of the whole SOE sector in the 'Portfolio Level' sheet. The automatically generated outputs include charts showing the evolution over the most recent 5-year period of aggregated financial indicators for the SOE sector. These include: the (i) profitability of the

sector as reflected by the return on assets (ROA); return on equity (ROE); operating profit margin and net profit margin; (ii) solvency of the sector using the debt to equity; debt to assets, cash interest coverage, and interest coverage indicators; and (iii) liquidity of the sector as illustrated by the current ratio. The Tool also highlights which SOEs have the largest share of liabilities, and the proportion of their liabilities relative to EBITDA, as well as the worst net liquid asset position.[3] The debtors' and creditors' turnover days for each SOE are also compared. The user can select whether the charts are presented with the amounts in local currency or as a percentage of GDP. Additionally, for each of the latest five years of data, the weighted average financial indicators for the SOE sector, overall risk rating, and summary financial information are presented in this sheet. Lastly, the Tool calculates, for each of the financial indicators, the distribution of the SOEs across the risk ratings and identifies the worst performing SOE on each metric. A chart comparing the SOEs by the size of their liabilities and their risk ratings, allows the SOEs that pose the largest fiscal risk to be quickly identified.

An analysis for each individual SOE is generated in the 'Single Company Level' sheet. The outputs on the Single Company Level Sheet will update after the user selects an SOE from the dropdown box. These outputs include automatic calculation and illustration of financial indicators over the last five years, including graphs of key profitability, solvency, and liquidity metrics. The charts and tables are available in local currency or as a percentage of GDP. Additionally, the indicators are classified according to the risk thresholds in the 'Parameters' sheet and an overall Altman z-score and risk rating calculated for each of the 5 years using the indicators and weightings selected in the 'Risk Tables' sheet. Summary income statement and balance sheet information is presented.

V. Limitations of the Tool

A. SCOPE OF THE TOOL

The SOE HCT is currently designed for the analysis of non-financial public corporations as defined by the IMF's Government Finance Statistics Manual (GFSM) 2014.[4] In contrast to public corporations, general government units' revenue, and consequently, their financial performance and ability to meet their obligations will largely be determined by the funding allocation decisions of the government. Like other traditional budgetary units, their performance should be assessed based on the efficiency with which they achieve their objectives using the resources they are allocated. Nevertheless, in the absence of SOEs being clearly distinguished into public corporations and general government units, the SOE HCT can be applied to both, and the outputs can be used as a starting point for such classification by identifying those SOEs that would be considered to be non-market entities in line with the quantitative guidance outlined in GFSM 2014.

[3] Net liquid assets are the Current Assets excluding Inventories less Current Liabilities.

[4] Government Financial Statistics Manual (2014)

While the approach used for the HCT could be extended to public financial corporations, the financial soundness indicators and thresholds applied would need to be adjusted. The role that banks play in channeling funds from savers to borrowers and maturity transformation, means that their financial statements take a different form to those of other companies. Interest income and expenditure comprise the main sources of revenue and costs; they tend to own few fixed assets, instead their main assets are the loans they make; and their short-term liabilities tend to exceed their short-term assets. Consequently, analysis of the financial soundness of banks tends to focus on: (i) their capital adequacy, to determine its ability to withstand shocks; (ii) the quality of the asset portfolio; (iii) profitability; (iv) liquidity, where the adequacy of the bank's current and prospective sources of liquidity is evaluated; and (v) sensitivity to market risk. Indicators such as those used as the basis for regulatory standards, monitored in banking supervision, or the IMF's Financial Soundness Indicators developed for supporting analysis and assessing strengths and vulnerabilities in the financial sector could be more appropriate.

The SOE HCT is most commonly applied to analyze historical financial information. The Tool does not generate financial projections for SOEs, nor assess how financial performance is impacted under alternative scenarios. However, the Tool is not limited to historical analysis. Where forward financial projections are available, these can be used as inputs to conduct forward-looking analysis to determine how the risk profiles of SOEs are expected to evolve in the future. Even still, projections are generally based on expectations of the current external and operating environment of the SOEs. The IMF's SOE Stress Test Tool provides a basis for projecting SOE finances under baseline and alternative scenarios.

The Tool applies the same risk thresholds across the SOE portfolio, even though the level of risk may vary by industry. The level of returns generated by the SOE should be related to the riskiness of the entity, with higher returns expected from higher risk industries. Likewise, the appropriate leverage or liquidity required will vary depending on the predictability of the business – companies operating in riskier sectors may need to have larger buffers to accommodate difficulties. The working capital cycle will vary by industry, with some having a longer period between acquiring inputs and collecting revenues from clients. While users can tailor risk thresholds for particular sectors by using multiple copies of the HCT for each sector; this does not allow for easy aggregate or cross-portfolio analysis.

The Tool can accommodate up to 15 years of data for up to 40 SOEs. However, many countries have more SOEs. That said, normally a small number of SOEs account for most of the fiscal risk. The Tool could be used to focus on the 40 largest, high-risk SOEs. Alternatively, multiple copies of the HCT could be used to cover all the SOEs, grouping them by size or sector.

B. A STARTING POINT FOR ANALYSIS

The SOE HCT provides a starting point for analyzing SOEs. It is useful to identify those SOEs with large liabilities and that may be of higher risk of generating fiscal costs, which warrant closer scrutiny, and which should be the subject of more in-depth analysis. For countries with many SOEs or limited

capacity, applying this two-step process can be helpful. A high-level assessment first helps to identify large, high risk and systemically important SOEs. The SOE HCT is tailored to support this assessment by quickly highlighting those SOE with the largest liabilities, which can be seen as a proxy for the government's exposure, and which are more financially vulnerable based on the analysis of financial indicators. The second step, an in-depth analysis of the large, high risk and systemically important SOEs, is needed to understand the sources and drivers of risk, the potential implications should these materialize, and appropriate mitigation strategies.

The IMF's SOE Stress Test Tool can be used supplement the SOE HCT by examining the impact of changes in the macro-fiscal forecasts on SOE finances. The SOE Stress Test Tool generates projections for an individual SOE's cash flow and balance sheet aggregates and calculates the net inflows or outflows from the budget under different macro-fiscal forecast scenarios (see Baum and others, 2021). The Tool also provides support in benchmarking SOE performance against other SOEs operating in the same sector internationally.

Supplementary quantitative information can be requested from SOEs to investigate areas of concern in greater depth. Table 2 suggests additional information that could be requested depending on the specific areas of risk.

Table 2: Areas for deeper analysis

Fiscal risk	Areas for deeper analysis
Lower dividends and taxes	Rate of growth in revenues and major cost items Drivers of revenue and major costs, including linkage of revenues and costs to macroeconomic variables Assessment of dependency on key client or supplier Benchmarking of costs to peers
Higher subsidies	Drivers of costs of subsidized activities, including linkage to macroeconomic variables
Increase to equity	Level of foreign denominated debt Benchmarking of leverage to peers
Increase in loans	Aging profile of debtors and creditors Debt repayment profile Debt exposure to interest rate or exchange movements Factors influencing profitability (see above)
Crystallization of contingent liabilities	Aging profile of debtors and creditors Debt repayment profile Debt exposure to interest rate or exchange movements Factors influencing profitability (see above)

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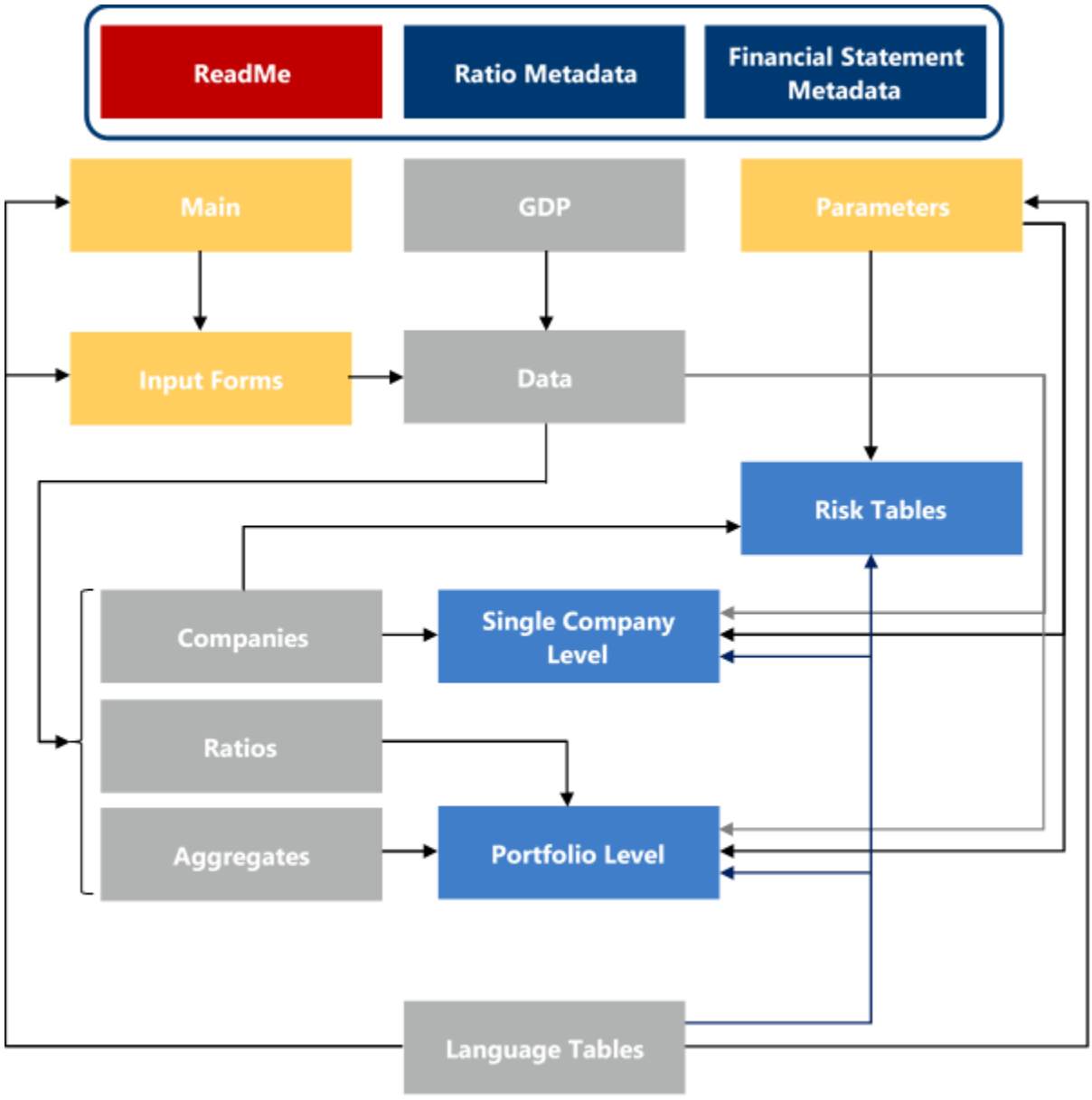
Annex I. Structure of the Tool



Annex II: Step-by-step Instructions for Using the SOE Health Check Tool

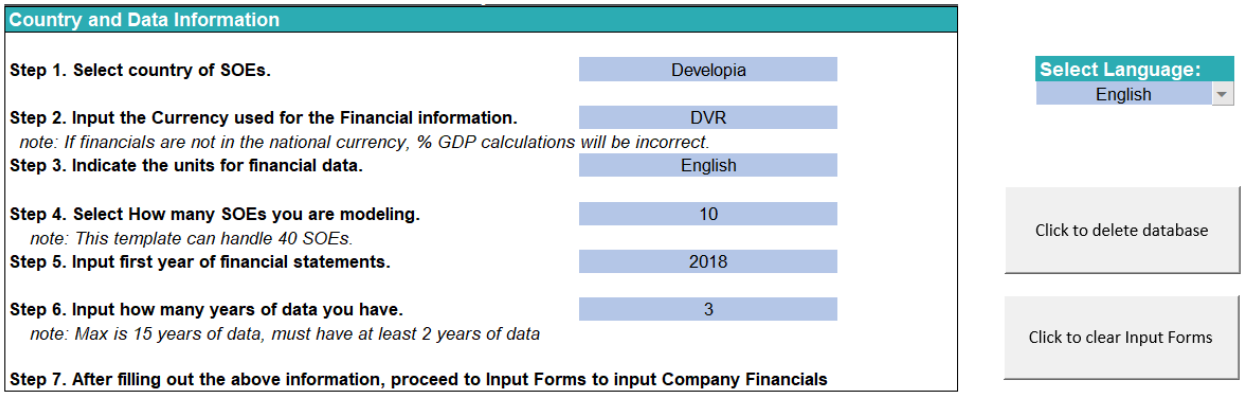
To be fully functional, the SOE HCT ideally should be run in Excel 2013 or a later version. Users must enable Macros in Excel each time the Tool is opened. Macros are used to manipulate user-input data and dynamically adjust input and output sheets, among other things.

A. MAIN SHEET

Users should start on the 'Main' sheet by selecting the country, currency, and units in which the data will be entered as well as the language to be used. The country is selected from a dropdown box. With respect to the currency, it is important to note is that if the local currency is not used, the percentage of GDP calculations will not be correct as these are based on the GDP in local currency as per the IMF's World Economic Outlook database. The units in which the data will be entered can be selected from the dropdown box and must be consistently applied through-out. The user can select the language to be used in the Tool from English, French, Spanish and Russian.

The relevant information about the data, including the start year and number of years of data to be entered as well as the number of SOEs, is also selected in the 'Main' sheet. Based on this information, the sheet 'Input Forms' adjusts to incorporate the appropriate number of SOEs and years of financial data. Users are easily able to adjust the number of SOEs or incorporate additional years of data by simply adjusting the values in the 'Main' sheet. While the Tool does not forecast financials, users can input SOE business plans and forecasts into the Tool to see how risks may evolve in the future. The user only needs to adjust the number of years in the 'Main' sheet to incorporate the forecast period.

Figure A2.1. Main Sheet



Please note that the initial page may move slowly because it is structuring the input forms. Once all of the correct data information is selected, the file should move quickly.

B. INPUT FORMS

SOE descriptive information, financial data, and government support is entered on the 'Input Forms' sheet. In addition, to descriptive data on the SOE, users are required to input data from the SOEs' balance sheet and income statements, and on the government support provided to the SOE. There are two primary data sources for these components. The descriptive data, balance sheet and income statement data can usually be sourced from the SOE annual financial statements. Although the income statement and balance sheet are premised on IFRS, if the SOEs report on a different basis this information can still be used by entering the available information under the corresponding line items in the template using the guidelines provided in the 'Financial Statement Metadata' sheet. Whether the SOE reports based on IFRS or another standard, consulting the notes to the financial statements can aid in ensuring the correct classification of the line items. For data on government support, users should refer to the published budget information, any fiscal risk statement or the financial statements of the central and subnational government or request the relevant data from the responsible authorities, which would normally be the departments responsible for compiling the budget and the debt management as well as the treasury department at the Ministry of Finance. It can be beneficial to triangulate this information with information obtained from the SOEs and/or the entity responsible for their oversight.

For each SOE basic descriptive information must be entered. The descriptive data includes SOE name, sector, legal form, and ownership data (Figure A2.2). The user must input a relevant Company Acronym or short version of the company name for each SOE. This acronym is used to identify the SOE in the rest of the Tool. The user is also requested to identify whether the SOE as a nonfinancial corporation – currently the functionality is tailored only for nonfinancial companies.[5]

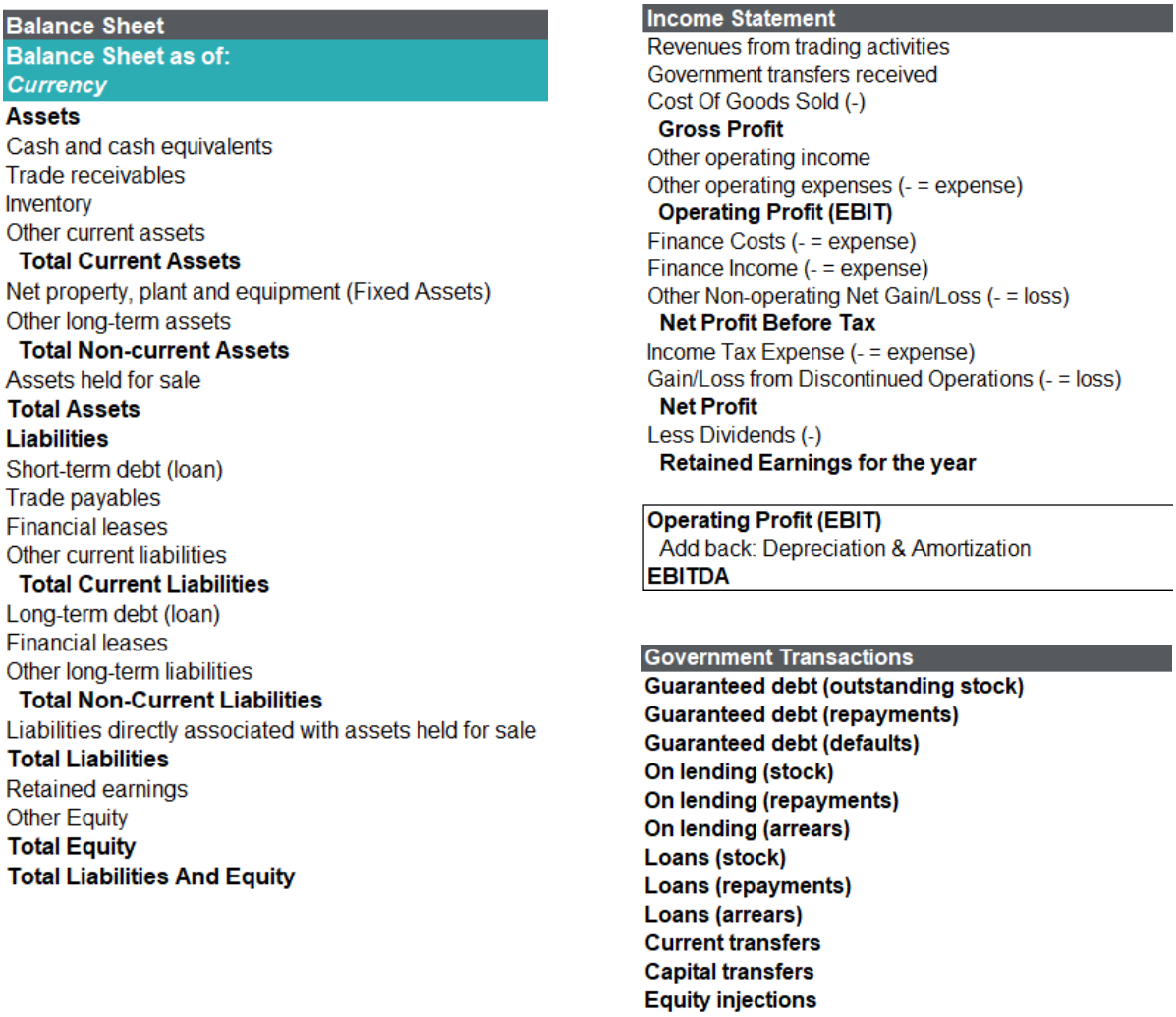
Figure A2.2. Descriptive Data on 'Input Forms' Sheet

Company Information: SOE # 1	
Company Type	Non-Financial Public Corporation
Fin / NonFin	NonFin
Company Acronym	Airline
Full Name	Developia Airways
Primary Sector	Transporte
Secondary Sector	
Legal Form	JSC
Government Shareholder	Ministry of Transportation
Domestic Central Government Ownership	100%
Domestic Subnational Government Ownership	
Private Domestic Ownership	
Private Foreign Ownership	

[5] For banks, deposit-taking and development finance institutions, different financial indicators need to be used for the analysis. A good starting point would be those used by the local bank regulator or the IMFs financial soundness indicators commonly reported in IMF staff reports.

To streamline the data capturing process only line items needed to calculate the selected financial indicators are provided for in the summary balance sheet and income statement data (Figure A2.3). Any other items must be totaled and input under the relevant catchall line item (e.g., Other Current Assets or Other Operating Expenses). Even for the line items that are included it may still be necessary to aggregate several items. On the other hand, some SOEs may not have data for all the line items. Occasionally, current assets or liabilities, like Trade Receivables, may also have a long-term component or vice versa. In such a case, the long-term component could be captured under Other Non-current Assets. This would mean that the Debtors days may be under-estimated. Alternatively, both the long and short-term component could be captured under the line-item Trade Receivables that is provided for under Current Assets, noting that this will distort the Current and Quick ratios. What is most important is to ensure that the same line items are consistently treated in the same way. Detailed descriptions for each line item are contained in the 'Financial Statement Metadata' sheet and Table A2.1.

Figure A2.3. Summary Financial Information and Government Support on 'Input Forms' sheet



In the income statement, the current government transfers that are received are distinguished. This can be important in determining the classification of a corporation for statistical reporting purposes. A key quantitative test used to establish whether an entity should be classified as a public corporation is whether it is able to cover more than half of its operating costs from their own revenues, excluding government transfers, over a multi-year period (GFSM 2014).

Operating income and expenditure must be distinguished from non-operating income and expenditure or gains and losses. Operating income and expenditure include all income earned or expenses incurred in the normal operation of the business. Importantly, this includes Depreciation and Amortization expenses, but not finance income or expenses, income tax, exchange rate gains or losses, and gains or losses from the disposal of assets, amongst others. Losses from discontinued operations should be entered under the appropriate line item, and not be included as operating expenditure. The total Depreciation and Amortization, which may be reported as part of the Cost of Sales or as an Operating Cost in the financial statements, must be captured at the note after the income statement, to enable the calculation of EBITDA, which is used in the financial indicators.

Some data validation is provided for in the Tool. At the end of the balance sheet is a consistency check that will highlight whether the two sides of the balance sheet balance ('Pass') or not ('Check'). Where there are problems, it can be useful to check that the totals for the current and non-current assets and liabilities as well as equity correspond to the source data to identify where errors may have occurred. To check the income statement, the net profit should be the same as in the original data. It may be possible to compare other interim totals, but if the income statement was not prepared on a IFRS basis, line items may have been moved around and these items may not correspond exactly. It is important to note that even if the balance sheet does not balance, the Tool will still proceed with calculating the indicators, which may, as a result, be distorted.

Users should also include data on the government support to SOEs. This provides an indication of the potential fiscal risk exposures from explicit contingent liabilities, direct transactions with government, as well the degree of past fiscal risk realization. The data includes information on guaranteed debt, loans from the government, cash transfers and equity injections.

After the data for the SOE portfolio is entered, the user must click the 'Import Data' button at the top of the 'Input Forms' sheet. This will import the data that has been captured in the 'Input Forms' sheet into the Tool's database (captured in the hidden 'Data' sheet) which will be used as the source data for all the analysis. If the user has previously imported data into the Tool, a confirmation that they wish to overwrite the existing data in the Tool will appear. This means that the existing data in the database will be replaced with the new data as captured in the 'Input Forms' sheet. This situation could, for instance, occur if the user recently entered a new year of a financial data or an additional SOE on the 'Input Forms' sheet and wishes to import the data. The user can clear data from the database or input forms, using the two buttons on the Main sheet. Deleting the database clears the data in the hidden sheet, 'Data', which is the source data for all output sheets. Clearing the Input forms simply clears the 'Input Forms' sheet data that the user previously entered, but the information remains available in the HCT's database.

Table A2.1. Description of Data Inputs Per Line Item

Line item	Guidelines for inputs
Balance Sheet	
Assets	
Current Assets	
Cash and cash equivalents	Cash and cash equivalents line item, which includes cash on hand and any highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.
Trade receivables	Trade receivables line item, which represents receivables that have been invoiced to clients and remain outstanding.
Inventory	Inventories line item, which encompasses all assets which are (i) held for sale in the normal course of business; (ii) in the process of production for such sale; or (iii) in the form of materials or supplies to be consumed in the production process or rendering of services.
Other current assets	All remaining current assets should be aggregated under this line item.
Non-current Assets	
Net property, plant, and equipment (Fixed Assets)	Property, plant, and equipment line item, reflecting the net amount after taking into account accumulated depreciation. Property, plant, and equipment includes all tangible items that are held (i) for use in the production or supply of goods or services or (ii) for administrative purposes; and are expected to be used for more than one period. Importantly, it does not include investment property, which should be included under long -term investments.
Other long-term assets	Aggregation of all remaining non-current assets.
Assets held for sale	Assets held for sale line item or any assets for which there is (i) a committed plan to sell; (ii) a program to locate a buyer or to market the asset has been initiated; (iii) there is a high probability that the sale will take place within 12 months and (iv) the sales price at which the asset is being marketed is reasonable in relation to the fair value. This also includes discontinued operations, which represent a separate major line of business or geographical area of operations for which there is a plan sell.
Liabilities	
Current Liabilities	
Short-term debt (loan)	Includes the short-term component of all borrowing, other than borrowing from the government, including loans, bonds, corporate paper etc.
Trade payables	Trade payables line item or all amounts billed to the entity by its supplies for goods delivered to or services consumed by the entity in the ordinary course of business.
Financial leases	Short-term financial lease liability line item or the short-term liability component of the fair value for a lease that transfers substantially all the risks and rewards incidental to ownership of the underlying assets. As from 1 January 2019, due to a change in IFRS accounting rules, this would include the short-term component of any lease liabilities.
Other current liabilities	All remaining current liabilities should be aggregated under this line item.

Non-current Liabilities	
Long-term debt (Loan)	Includes the long-term component of all borrowing, other than borrowing from the government, including loans, bonds, corporate paper etc.
Financial leases	Long-term financial lease liability line item or the long-term liability component of the fair value for a lease that transfers substantially all the risks and rewards incidental to ownership of the underlying assets. As from 1 January 2019, due to a change in IFRS accounting rules, this would include the long-term component of any lease liabilities
Other long-term liabilities	Aggregation of all remaining non-current liabilities.
Liabilities directly associated with assets held for sale	All liabilities directly associated with the assets held for sale or discontinued operations are aggregated under this line item.
Equity	
Retained earnings	Retained earnings line item, which represents the sum of the profits that have been retained and not paid out as dividends since the entity's inception.
Other equity	Aggregation of all other equity items
Income Statement	
Revenue from Trading Activities	Revenue from the sale of goods or rendering of services through the course of the ordinary activities of the entity earned during the period
Government Grants Received	Current transfers (e.g., grants or subsidies) received from the government. Importantly, this does not include any revenue received from the government for the goods or services purchased from the company in the normal course of business.
Cost of Goods Sold	Cost of goods sold line item or (i) the costs of the direct materials; (ii) direct labor costs; and (iii) any other direct costs associated with the production of the principal goods or services. Sometimes this item may not be reflected in the financial statements, in which case the expenses would be aggregated with the operating expenses.
Other Operating Income	Aggregation of all revenue and income generated through the course of the ordinary activities of the entity, but which are not related to the principal activities of the entity. It does not include interest, dividend, or finance income, gains from disposals or revaluations etc.
Other Operating Expenses	Aggregation of all remaining expenses incurred during the ordinary activities of the entity, including salaries and wages, administrative expenses, impairments, or reversals thereof, depreciation etc. Importantly, it does not include interest or finance costs, losses from disposals or revaluations etc.
Finance Costs	Finance costs line item, which includes interest and other costs that an entity incurs in connection with the borrowing of funds.
Finance Income	Finance income line item, which includes interest and dividend income received.
Other Non-Operating Net Gain/Loss	This will include any other non-operating gains or losses (income, expenditure, or costs), including foreign exchange or revaluation gains and losses.
Income Tax Expense	Income tax line item, which includes all domestic and foreign taxes that are based on taxable profits.
Gain/Loss from discontinued operations	Gain/loss (profit or loss) from discontinued operations line item, i.e., the post-tax profit or loss of the discontinued operations as well as the post-tax gain or loss recognized on the disposal of assets.
Dividends	Total dividends declared for the year.

Operating Profit	
Depreciation and Amortization	Total depreciation and amortization recognized for the period. Sometimes this may not be reflected as a line item in the main body of the income statement, but rather aggregated into the Cost of Goods Sold and/or Operating expenses for which the detailed breakdown is usually available in the notes.
Government Transactions	
Guaranteed debt (outstanding stock)	At the year end, the total stock of debt, loans or other borrowing guaranteed by the central or subnational government.
Guaranteed debt (repayments)	The total amount of guaranteed debt that was repaid by the SOE during the period.
Guaranteed debt (defaults)	The total amount that was paid by the government on behalf of the SOE, including capital and interest. Rather than allowing an SOE to default, which, depending on the legal agreements, could trigger cross-default clauses on other debt of the SOE, governments sometimes step in to provide support to the distressed SOE to preempt a default. This line item is intended to capture the total amount paid by the government on behalf of the SOE, both as a result of the SOE being distressed or defaulting.
On lending (stock)	At the year end, the total stock of debt, loans or other amounts that have been on lent by the central or subnational government, i.e., where the central or subnational government has a debt, loan, or other borrowing with a third party, that they have then used to provide a loan to the SOE on similar terms.
On lending (repayments)	The total amount repaid by the SOE during the period in respect of on lent debt.
On lending (arrears)	The total amount in respect of on-lent debt that fell due during the period, and which was not paid by the SOE, including both principal and interest payments.
Loans (stock)	At the year end, the total stock of debt, loans, or other borrowings from the central or subnational government (excluding on lending).
Loans (repayments)	The total amount repaid by the SOE during the period in respect of loans from central or subnational government (excluding on lending)
Loans (arrears)	The total amount in respect of loans from central or subnational government that fell due during the period, and which was not paid by the SOE (excluding on lending), including both principal and interest payments.
Current transfers	Cash transfers, including subsidies (unrequited payments made by the central or subnational government to a public corporation) or grants (non-compulsory capital or current transfers from the central or subnational government to a general government unit) that are not for the purpose of paying for capital assets
Capital transfers	Cash transfers allocated for the purpose of paying for capital assets, upgrades, additions, rehabilitation, and refurbishments, e.g., property, plant, and equipment. It also includes any equity injection into the SOE by the government on which a market related return is not expected to be generated.
Equity injections	Total additional share capital injected into the SOE by the central or subnational government during the period, for which shares are issued, a market related return is expected to be generated and that is recognized as a payment for financial assets in the accounts of the government. This may take the form of financial or nonfinancial (e.g., transfer of assets) contributions.

C. PARAMETERS

SOEs are classified into risk categories based on their outcomes for the selected set of financial indicators against specified benchmarks or thresholds. Figure A2.4. outlines The financial indictors used in the SOE HCT and the formulas for calculating them. More detailed explanations are provided in the 'Ratio Metadata' sheet and Table A2.4 and Annex III.

Figure A2.4 Financial Ratios

Ratios	Formula
Liquidity	
Current Ratio	$\frac{Total\ Current\ Assets}{Total\ Current\ Liabilities}$
Quick Ratio	$\frac{(Total\ Current\ Assets\ -Inventory)}{Total\ Current\ Liabilities}$
Debtor Turnover Days	$\frac{(Trade\ Receivables \times 365)}{Revenue\ from\ Trading\ Activities}$
Creditor Turnover Days	$\frac{(Trade\ Payables\ \times 365)}{Costs\ of\ Goods\ Sold}$
Solvency	
Debt to Assets	$\frac{Total\ Liabilities}{Total\ Assets}$
Debt to Equity	$\frac{Total\ Liabilities}{Total\ Equity}$
Debt to EBITDA	$\frac{Total\ Liabilities}{EBITDA}$
Interest Coverage	$\frac{EBIT}{Finance\ Costs}$
Cash Interest Coverage	$\frac{EBITDA}{Finances\ Costs}$
Debt Coverage	$\frac{EBITDA}{(ST\ Debt + LT\ Debt\ + Financial\ Leases)}$

Ratios	Formula
Profitability	
Net Profit Margin	$\frac{Net\ Profit\ after\ Tax}{Total\ Revenue\ excluding\ government\ grants}$
Operating Profit Margin	$\frac{EBIT}{Total\ Revenue\ excluding\ government\ grants}$
Return on Assets	$\frac{Net\ Profit}{Total\ Assets}$
Return on Equity	$\frac{Net\ Profit}{Total\ Equity}$
Cost Recovery	$\frac{Total\ Revenue\ excluding\ government\ grants}{(COGS + Other\ Operating\ Expenses)}$
Government Relationship	
Government Transfers to Total Revenue	$\frac{Government\ Grants\ Received}{Total\ Revenue\ including\ government\ grants}$
50% Test	$\frac{Cost\ of\ Goods\ Sold + Other\ Operating\ Expenses + Finance\ costs\ - Finance\ Income}{Revenue\ from\ Trading\ Activities + Other\ Operating\ Income}$

Z- Score (EMEs): Predicts probability that Non-Financial firms will enter bankruptcy within 2 years

$$Z = 6.56 \times \left(\frac{Current\ Assets - Current\ Liabilities}{Total\ Assets}\right) + 3.26 \times \left(\frac{Retained\ Earnings}{Total\ Assets}\right) + 6.72 \times \left(\frac{EBIT}{Total\ Assets}\right) + 1.05 \times \left(\frac{Book\ Value\ of\ Equity}{Total\ Liabilities}\right)$$

Note: EBIT equals Earnings Before Interest and Tax and EBITD equals Earrings before Interest, Tax and Depreciation.

The risk thresholds used to apply a risk rating to each financial indicator are set by the user on the 'Parameters' sheet. After entering the thresholds, users can save these as defaults. This enables the user to reset back to these defaults at any time should subsequent changes be made. In the HCT, the risk level of entities increases from Category 1 to Category 5, that is, entities in Category 1 are considered lower risk than entities in Category 5. The threshold set for Category 2 means that any indicator with a lower/higher value (depending on the indicator) will be classified as Category 1. Indicators lying between the Category 2 and Category 3 thresholds, the Category 3 and Category 4 thresholds, and the Category 4 and Category 5 thresholds will be classified as Category 2, Category 3, and Category 4, respectively. Indicators beyond the Category 5 threshold will be classified as Category 5. It is important to note that the thresholds are applied to all SOEs throughout the Tool. Should users wish to introduce sector specific risk thresholds, which can make the analysis more robust, this can be done by using separate versions of the Tool for each sector.

Several different approaches can be used to define appropriate thresholds. These include using historical data, third party information (e.g., from credit rating agencies or banks), benchmarking, or industry norms and expert judgement.

Using Common Benchmarks, Ratings Guidance, and Judgement to Set Thresholds

Thresholds can be derived from credit rating agency guidance, common benchmarks used by financial analysis, and judgement. Figure A2.5 provides an illustrative set of thresholds for each of the financial indicators which could be used for in the SOE HCT, in the absence of more robust datasets.

Figure A2.5. Indicative Risk Thresholds

Profitability	Category 1	Category 2	Category 3	Category 4	Category 5
Return on Assets	greater than	0.1	0.0	0	(0.1)
Return on Equity	greater than	0.2	0.1	0	(0.1)
Cost Recovery	greater than	1.5	1.3	1.0	0.8
Liquidity					
Current Ratio	greater than	2.0	1.5	1.3	1.0
Quick Ratio	greater than	1.2	1.0	0.8	0.7
Debtor Turnover Days	less than	30.0	40.0	50.0	75.0
Creditor Turnover Days	less than	30.0	60.0	90.0	120.0
Solvency					
Debt to Assets	less than	0.3	0.5	0.8	1.0
Debt to Equity	less than	0.5	1.0	1.5	2.0
Debt to EBITDA	less than	1.5	2.0	3.0	5.0
Interest Coverage	greater than	2.0	1.5	1.2	1.0
Cash Interest Coverage	greater than	3.0	2.0	1.5	1.0
Debt Coverage	greater than	0.8	0.6	0.4	0.3

Government Relationship		Category 2	Category 3	Category 4	Category 5
Government Transfers to Total Revenue	less than	0.3	0.4	0.5	0.6
50% Test	less than	0.7	1.0	1.5	2.0

	Category 2	Category 3	Category 4
Z-Score	Z > 2.6	2.6 > Z > 1.1	Z < 1.1

The illustrative thresholds have been informed by the following:

- **Cost-recovery** reflects whether an SOE is generating sufficient revenue to cover its operating costs. An SOE that has a cost recovery indicator of less than 1 is not breaking even at an operating level (before taking financing costs and taxation into account). Hence, entities with a cost-recovery indicator less than 1 are classified in the two highest risk categories under the indicative risk thresholds, while entities with a cost recovery indicator above 1.5 are classified in the lowest risk category.
- **Return on equity** (ROE) measures the ability of a firm to generate profits using its shareholding capital. Ideally, SOEs should generate risk-adjusted returns commensurate with other investments, or at least equivalent to the government's cost of borrowing, since if the government sold its shareholding, sovereign debt could be repaid. As such, SOEs are classified in the lowest risk category where their ROE exceeds average returns of the domestic stock market (this will vary by country but is assumed to be 15 percent for illustrative purposes). Category 2 SOEs are those that are at least generating returns that cover the risk-free interest rate paid by the government on its 10-year debt (again, this will vary by country and is assumed here to be 8 percent). SOEs realizing negative returns will gradually reduce their equity and increase their leverage, contributing to solvency problems in the future. Consequently, loss making SOEs are included in the two highest risk categories.

- **Return on Assets** (ROA) measures the allocative efficiency of the SOE in managing its assets to produce profits. The risk thresholds have been determined based on the risk thresholds for ROE and balance sheet leverage.
- **Debt to Assets** measures the proportion of an SOE's financing that comes from liabilities. Entities with higher levels of liabilities compared to assets are riskier because they have less financial flexibility. An SOE whose debts exceed its assets—that is, where the indicator is greater than 1, has negative equity—is technically insolvent. Therefore, the Category 5 threshold is set at 1. The lowest risk category is set where less than 25 percent of the company's financing comes from debt, with other categories set at the intermediate values.
- **Debt to Equity** measures the proportion of an SOE's financing that comes from liabilities relative to equity. The risk thresholds have been set at levels equivalent to the Debt to Assets indicator.
- **Debt to EBITDA** indicates the ability of a firm to service any debt it holds. EBITDA is a proxy for the cash a company can generate in a year from its operations, so the indicator indicates the number of years it would take for the company to generate sufficient cash to pay off all its debt. A higher indicator indicates a more indebted company, where there is a higher risk that it may not be able to service its debt. The risk thresholds have been based on levels used by the rating agency Standard & Poor's (S&P) for a similar metric.
- **Interest cover** measures whether a company is generating sufficient operating profits to be able to cover its financing costs. An SOE with an interest cover indicator of less than 1, cannot meet its financing costs and remain profitable. This has been used as the Category 5 threshold. However, a company should have sufficient buffer to accommodate any risks and still be able to meet its debt servicing costs. Generally, an interest cover indicator of 2 is considered, in most cases, to be adequate. Hence the lowest risk category is set at greater than 2, with other categories set at intermediate values.
- **Cash Interest Coverage** indicates the cash generated from operations relative to the SOE's interest expense. A ratio of 3 is a common benchmark analysis use for assessing whether entities have capacity absorb negative events and still be able to meet their financing costs, thus the lowest risk category threshold has been set at a level greater than 3. An indicator lower than 1, means the company will need to borrow to cover its interest payments, which is not sustainable, so the highest risk threshold is set at this level, with other categories set at intermediate values.
- **Debt Coverage** indicates the ability of a firm to generate cash to service its debt and financial lease obligations. A higher value would indicate a stronger company that is better able to service its debt. These are related to the inverse of the Debt to EBITDA risk thresholds but are somewhat higher to take account of the fact that only borrowings and finance lease liabilities are included.
- **Current ratio** assesses an SOE's ability to meet its current liabilities from its current assets. A current ratio of less than 1 indicates that the entity does not have sufficient assets that are expected to be converted into cash within a year to meet the amounts due to creditors within the next 12 months. Consequently, such companies are classified as Category 5. A common

benchmark used by analysts is that current assets should cover the current liabilities at least 2 times to ensure that, in most cases, even if there were difficulties converting all the current assets into cash, there would still be sufficient buffer to meet the current liabilities. Hence, the lowest risk category is set at a threshold greater than 2, with intermediate values for other categories.

- **Quick Ratio** measures the ability of an entity to pay its current liabilities when they fall due using only its most liquid current assets, i.e., current assets excluding inventory. The indicator should be somewhat higher than 1 to ensure that there is still some buffer to meet the current liabilities. Hence, the lowest risk category threshold is set at greater than 1.2, with intermediate values set for other categories.
- **Debtor Turnover Days** measures the speed with which an entity collects its revenue from its customers. If the Debtor Turnover Days is high, it could indicate that the entity has a loose credit policy, an inadequate collection function, or a substantial proportion of customers are having financial difficulties. The illustrative risk thresholds use a 30-day period as the norm for collecting revenue due from debtors, but this may vary depending on the country context as well as the sector in which an SOE operates. For effective working capital management, the time taken to pay creditors should be longer than the time taken to collect from debtors, hence the risk thresholds have been set somewhat lower than the risk thresholds for creditor turnover days.
- **Creditor turnover days** measures how quickly an entity pays its suppliers. If the turnover time is long, it would reflect the accumulation of arrears, which could be the result of a worsening financial condition. The illustrative risk thresholds have used a 30-day period as the norm for paying creditors, but this may vary depending on the country context as well as the sector in which an SOE operates. In terms of the Basel Committee on Banking Supervision, loans that are more than 90 days overdue are considered non-performing and those retail loans 180 days overdue as in default. Thus, the lowest risk category threshold is set at less than 30 days.
- **Government transfers to total revenue** indicates the dependency of the SOE on transfers from the government by assessing the proportion that such transfers constitute of its total revenue. The higher the indicator, the more dependent the SOE is on government transfers and the higher the risk that any reduction could threaten the financial sustainability of the SOE. Consequently, the risk thresholds increase from 0.3 as the Category 2 threshold to 0.6 as the Category 5 threshold.
- **The 50% Test** looks at the proportion of the SOE's operating and net financing costs that it can cover from its own internally generated revenues (excluding property income, finance income and government transfers). This is the key quantitative test used alongside a number of qualitative criteria, to establish whether an SOE should be classified for statistical reporting purposes as a general government entity (in which case it should be consolidated as part of the general government sector) or a public corporation (in which case it is only reported as part of the public sector).[6] Entities that are consistently unable to cover at least half of their operating costs from

[6] It is important to note that some simplifications have had to be made in the calculation of the financial indicator, because only abridged financial statement data is captured in the SOE HCT. All Other Operating Income is included in the calculation

their own revenues are considered to be general government entities, hence, the risk threshold for Category 5 is set at 2. The lowest risk threshold is set at less than 0.7, reflecting that the entity can cover all its operating costs with own revenues and still have a buffer to meet other expenditures.

- **Z-score** indicates the likelihood of a business going bankrupt in the next two years. The thresholds have been based on the established thresholds for the metric (Box 1). An entity is classified as Category 2 category where the metric is more than 2.6, Category 3 if it is between 1.1 and 2.6 and in the Category 4 category if is less than 1.1. These thresholds cannot be adjusted.

Box 1. Z-score

In 1968, Altman developed the original Z-score model using medium-sized manufacturing firms in the United States (US). However, recognizing that this model may not be appropriate for emerging market companies, because of the different context in which they operate Altman developed a Z-score model using data from emerging market companies, in 1993, for both manufacturers and non-manufacturing companies (see Altman (2005)). This model is as follows:

Z-Score (Emerging Markets) = 6.56X 1 + 3.26X 2 + 6.72X 3 +1.05X 4 + 3.25

Where X 1 = Working capital / Total assets
X 2 = Retained earnings / Total assets
X 3 = Operating income / Total assets
X 4 = Book value of equity / Total liabilities

Using Altman's emerging market model, a Z-score of less than 4.35 was indicative of a company that was expected to go bankrupt, whereas companies with a Z-score higher than 5.85 were not expected to experience distress. For scores in between, it could not be clearly stated whether the company was likely to experience bankruptcy or not.

Eidelman (1995) modified this model by removing the constant and adjusting the thresholds accordingly. This adjustment can be made because the constant In Altman's emerging market model (3.25) was used only standardize the model results with US bond rating equivalents. Hence, in Eidelman's model, companies with a score less than 1.1 were likely to experience bankruptcy, while companies with a score is excess of 2.6 were not expected to experience distress. The SOE HCT uses Eidelman's version of the model, i.e.:

Z-Score (Emerging Markets) = 6.56X 1 + 3.26X 2 + 6.72X 3 +1.05X 4

Users should note that fiscal risks from SOEs often arise well before an entity reaches the point of bankruptcy, for example in the form of reduced inflows from dividends and royalties, or government decisions to provide equity injections to support troubled SOEs.

of the indicator in the SOE HCT, although property income (as well as financial income) should be excluded. All revenue from government grants and subsidies as well as compulsory payments (e.g., taxes or other compulsory charges levied by the SOE) must be excluded, but revenue can be included where the government is purchasing a service. Exchange rate gains and losses should not be included in the calculation and so should be recorded under Other non-operating gain/loss as per the guidance set out in Table A2.1 and the 'Financial Statement Metadata' sheet. While the strict application of the GFSM 2014 concept requires that depreciation be calculated based on current replacement cost, depreciation as reported in the financial statements has been used in the SOE HCT calculation. When using the ratio for the purposes of classification, it is important to look at several years of data (ideally a minimum of 3 years' financial results).

Using Statistical Approaches to Set Thresholds

Statistical and model-based approaches can also be used to set the parameters. The choice of approach depends on the amount of data that is available. For this exercise, data on the current rating of a set of companies and their corresponding financial indicators is used to determine threshold ranges by credit rating. If information on less than a dozen companies are available, it is possible to use a Merton-based approach to derive parameters. If a dozen to a hundred companies is available it is possible to use averaged financial indicators, and if more than one hundred are available it is possible to consider a regression approach. Each approach is explained below.

(i) Merton-Based Approach to Setting the Thresholds

The Merton-based approach to setting the thresholds for each indicator uses the concept of Distance to Default (D2D). A company's financial indicators and credit rating are mapped to a probability of default. This is then used to calculate D2D and estimate the value of the indicator that would indicate default in the absence of other financial information. Table A2.2 Sets out the steps involved in this approach and provides examples at each stage.

Table A2.2 The algorithmic steps are as follows along with an example.

Step	Example
Obtain a company's financial indicators and rating	For this example, the indicator of EBITDA/Interest is 13.0 and the rating is BBB
Map the rating to a probability of default (PD)	BBB corresponds to a PD of 0.2 percent over the next year
Calculate the distance to default as being the inverse of the normal distribution for the given probability of default.	In Excel NORMINV(1-0.2%,0,1) equals 2.9
Estimate the value of the indicator that would indicate default if no other financial information was known.	If EBITDA equals the Interest payment required, the company would be on the verge of default. In reality this would depend on the other factors such as principal payments, and cash on hand, but if this indicator were known, it could reasonably be assumed that when EBITDA/Interest is 1.0, the company will be on the threshold of default.
Calculate the implied standard deviation of the financial indicator over the next year by subtracting the value at default from the current value and then dividing by the distance to default.	Implied standard deviation of EBITDA/Interest = (indicator-default threshold)/D2D i.e., 4.1 = (13 – 1)/2.9
If multiple companies are available, repeat the steps above for each company, and then take the average for the different estimates of standard deviation.	
To set the thresholds in the Tool, define the probability of default for each risk level, and then calculate the corresponding financial indicator using the normal function.	For this example, the first required rating band has a PD of 1 percent. The financial indicator for this band is given in Excel by: NORMINV(1-PDband, Default threshold, Standard deviation) i.e., 10.5 = NORMINV(1-1%, 1, 4.1)

(ii) Using Averages of Financial Indicators

The second approach, which uses average financial indicators, is much more direct and is possible if data on more companies are available. The approach groups all companies according to their rating and then takes the average of each indicator. Table A2.3 illustrates the results from an initial analysis, drawing on financial information and credit ratings for more than 2,500 companies. These results are preliminary only, and further work is being undertaken to strengthen the robustness of the results. Many of these results are not monotonic (i.e., do not increase or decrease uniformly as the grades change). This could be due to inconsistencies in the data or more complex reasons such as the required return on capital being less for highly rated companies because they are less risky. A simple step is to fit a straight line through the results and use the straight line to give monotonic changes in the indicators.

Table A2.3. Preliminary Analysis of Average Financial Ratings by Credit Rating

	AA	A	BBB	BB	B	CCC
EBITDA Margin (%)	31.16	32.51	31.31	24.65	20.72	18.78
EBITDA / Interest Exp.	29.96	19.71	15.39	11.92	5.82	2.43
Net Debt/EBITDA	5.24	4.89	4.43	3.96	7.04	17.71
Current Ratio	2.72	1.33	1.65	1.99	1.95	1.44
Quick Ratio	2.09	0.91	1.14	1.39	1.22	0.94
Return on Capital	9.02	9.10	10.04	10.77	6.61	2.71
Recurring Earnings / Total Assets	7.28	6.91	7.44	8.59	6.78	5.48
Net Working Capital / Revenue	-0.04	0.09	0.08	0.15	0.15	0.11
Asset Turnover	0.45	0.44	0.54	0.68	0.62	0.48
Intangible Assets / Revenue	0.60	0.34	0.51	0.61	0.67	0.45
Net Working Capital/ Total Assets	0.00	0.02	0.03	0.04	0.06	0.05
Payables / Receivables	5.27	1.61	2.04	2.13	13.72	1.40
Management Rate of Return (%)	29.24	50.54	47.18	45.70	93.08	7.73
Gross Margin (%)	44.03	46.84	44.45	40.90	39.57	34.73
FFO Interest Coverage	12.28	17.18	12.08	8.86	6.90	1.04
FFO to Total Debt	0.67	0.81	0.33	0.43	0.43	0.09
Total Debt to Capital	44.49	44.11	48.53	54.76	68.53	85.01
Total Debt/Total Liabilities (%)	52.84	55.74	58.71	61.32	65.39	67.65
Total Debt/Revenue	1.94	1.80	1.74	1.30	1.35	2.08
(FFO + Cash) to Short Term Debt	46.89	858.06	46.04	32.73	42.53	10.37
FFO to Gross Profit	2.87	0.61	0.55	0.46	0.43	0.08

Source: IMF Staff estimates and S&P Market Intelligence.
Note: FFO refers to Funds from Operations.

(iii) Regression based approach to setting the thresholds

If data is available on hundreds, or thousands, of companies it is possible to run a regression between the financial indicators and the grades. Rather than the letter grades, the regression is actually run against the Probability of Default (PD) of each grade, or the log of the PD, or the

distance to default based on PD. One of the primary advantages of this approach is that it also gives an indication of the importance of each indicator in the regression, and thereby helps to set the weights for summing the results from each indicator to get the overall grade.

D. RISK TABLES

The 'Risk Tables' sheet presents a risk assessment for each of the SOEs for a given year. By default, this table is populated with data for the most recent year. However, the user can select different years from the drop down.

Users can decide which of the financial indicators to use as the basis for the risk assessment. This is done by selecting the required profitability, solvency and liquidity indicators and assigning a weighting to each indicator (Figure A2.6). The weights must sum to 100 percent. The overall risk ratings in the 'Single Company Level' and 'Portfolio Level' sheets are determined based on the indicators selected in this sheet and their assigned weights. The indicators that are selected in this sheet, and their weighting, will be used to calculate overall risk ratings in the Tool. As authorities build up data, the indicators that are the best predictors of risk can be selected, appropriate weights applied, and the risk thresholds adjusted to better reflect the likelihood of fiscal risks materializing in their specific context.

Figure A2.6. Selection of Financial Indicators to Use in Risk Assessment

Select Year:		
1. 2020		
Select Profitability Indicators:		**Weighting**
1. Return on Assets	☐	0%
2. Return on Equity	☑	20%
3. Cost Recovery	☑	10%
Select Liquidity Indicators:		**Weighting**
1. Current Ratio	☑	15%
2. Quick Ratio	☐	0%
3. Debtor Turnover Days	☑	10%
4. Creditor Turnover Days	☑	10%
Select Solvency Indicators:		**Weighting**
1. Debt to Assets	☑	15%
2. Debt to Equity	☐	0%
3. Debt to EBITDA	☑	20%
4. Interest Coverage	☐	0%
5. Cash Interest Coverage	☐	0%
6. Debt Coverage	☐	0%

The HCT will produce a summary of the selected indicators for each SOE and a heat map showing the risk rating for each indicator and the overall risk rating. The risk ratings are determined by classifying the indicators using the risk thresholds from the 'Parameter' sheet. Based on the indicators selected, the overall risk rating is generated as the weighted average of the ratings across the selected indicators. This can be used to identify the highest risk SOEs as well as the weakest areas of their business. Shared areas of concern across the SOE sector, where many SOEs

have indicators rated as high or very high-risk, can also be identified. These should be focus areas for deeper analysis and remedial measures.

E. PORTFOLIO LEVEL

The HCT generates an analysis of the SOE sector as a whole in the 'Portfolio Level' sheet. The user can select, using the dropdown box, whether the charts should be presented using amounts in local currency or as a percentage of GDP. Whilst authorities may find it practical to work with the amounts in local currency converting the amounts to a percentage of GDP is especially useful for benchmarking against other countries.

The portfolio level analysis generates the following outputs:

- **Aggregate statistics describing the SOE sector.** These include the number of companies broken down by legal form, ownership entity, and industry sector. The number of profitable companies is also provided. A chart presents the total equity (net worth), assets, liabilities and revenues broken down by industry sector over the five-year period, highlighting how the overall value as well as the contribution from each industry sector has changed over time. These metrics can be used to benchmark the overall size of the SOE sector to other countries.
- **Graphs of some of the main indicators.** This enables the user to assess performance of the SOE portfolio over time. Guidance on how to interpret the financial indicators is provided in Annex III.
- **The weighted average value for each financial indicator for the SOE sector for each of the last five years and overall rating for the SOE sector.** Each of the indicators has been color-coded based on its risk rating determined using the thresholds set in the 'Parameters' sheet. Like the indicators for the individual entities, these indicators can be analyzed to get an assessment of the financial condition of the SOE sector in aggregate (see the 'Ratio Metadata' sheet and Annex III for detail on interpreting the indicators). Whilst this aggregate perspective provides a useful indication of the riskiness of the sector, it can obscure differences in the financial condition of individual SOEs as well as linkages between SOEs that could lead to risk contagion. As the SOEs are separate legal entities, the differences cannot offset one another and consequently fiscal risks may still arise even where the sector as a whole is sound, underlining the importance of also analyzing each SOE individually as well.
- **The distribution of SOE risk ratings across different financial indicators.** Charts are presented summarizing the risk distribution for key profitability, liquidity, and solvency indicators. The worst performing SOE on each metric is identified, highlighting SOEs that are most likely to experience challenges in the particular area.
- **Analysis of the total liabilities against the risk rating for each SOE.** This can be used to identify those SOEs that could pose the largest fiscal risk. Those companies with a higher risk rating (e.g., Category 4 or 5) are most likely to give rise to fiscal risks materializing. When they have significant outstanding liabilities, the impact is likely to be the largest. Hence, it is important to pay attention

to the companies in the top, right-hand corner of the chart attention. These companies should, in particular, be prioritized for in-depth analysis.

- **Summary aggregate financials statements.** These enable not only an assessment of the health, but also the macroeconomic relevance of the SOE sector. The aggregate financial statistics provide an overall perspective of the sector, including the total revenue, profits, assets, and liabilities of the sector as well as the total value of the equity (net worth). Trends in how each line item has evolved over that time can be analyzed. Useful indicators for gauging the macroeconomic relevance of the SOE sector include the magnitude of SOE revenues, expenditures, assets, or liabilities relative to GDP, some of which can be benchmarked against peer countries. Another element to assess is the magnitude of the SOE sector and the support received relative to the government budget.
- **Tables and charts summarizing the transfers between the government and SOEs and trends over time.** These indicate the level of outstanding on-lending and other loans as well as debt that has been guaranteed by the government as well as the repayments received and arrears or defaults that have taken place. The magnitude of the financial support provided to SOEs in the form of current transfers, capital transfers or equity injections is also illustrated.

F. SINGLE COMPANY LEVEL

An in-depth analysis of individual SOE financials can be found in the 'SingleCompany_Level' sheet. After the user selects an SOE from the dropdown box, the outputs on this sheet will update. The user can also select from a dropdown box whether the amounts in the charts should be presented in local currency or as a percentage of GDP.

The single company level analysis generates the following outputs:

- **Calculation of financial indicators over the last five years for each SOE.** This can be used as the starting point for undertaking an in-depth analysis of the SOE. The purpose of such an in-depth analysis is to get a good understanding of the sources and drivers of risk; the potential implications should risks materialize; and potential mitigation strategies. Guidelines for interpreting these indicators are provided in the Tool in the 'Ratio Metadata' sheet and in Annex III Trends over several years can be analyzed. The financial indicators can be benchmarked against international or local comparator companies to determine underperforming areas of the business.
- **Heat map of the risk ratings assigned to each indicator and the overall risk rating.** The indicators are classified according to the thresholds in the 'Parameters' sheet. The overall risk rating is calculated as the weighted average of the ratings for the indicators selected in the 'Risk Tables' sheet. In addition, the Z-score is calculated, which indicates the likelihood of the entity going bankrupt within the next 2 years. This analysis indicates the level of risk that an SOE poses to the fiscus and highlights the areas of the SOE's business that are the main sources of risk. These areas would the focus of an in-depth analysis of the SOE.

- **Graphs of some of the main indicators are provided.** This enables the user to assess performance of the SOE portfolio over time. Guidance on how to interpret the financial ratios is provided in Annex III.
- **Summary financial statements for each SOE.** For each line item, the change or variance from the previous year (Var) both in amount (abs) and as a percentage (%) and compound annual growth rate (CAGR) are calculated. The metrics provides an indication of the magnitude of the change in the line item in the previous year relative to the average change over the previous five years. This can give an indication of whether the change is in line with previous trends as well as the volatility of the line item. High volatility is indicative of greater risk as good performance in one year is not a good predictor of good performance in subsequent years. In terms of the CAGR, a key focus should be on ensuring that the growth in costs is not outstripping the growth in revenue is an important indication of the sustainability of the business.

Annex III. Guidance for Interpreting Financial Indicators

Profitability	
Net Profit Margin: $\frac{Net\ Profit\ after\ Tax}{Total\ Revenue\ excluding\ government\ grants}$	Reflects what percentage of each unit of revenue earned by a business ends up as profit at the end of the year. A positive indicator indicates the entity is profitable. The higher the indicator, the more profitable the entity and the better costs are being contained.
Operating Profit Margin: $\frac{EBIT}{Total\ Revenue\ excluding\ government\ grants}$	Reflects what percentage of each unit of revenue ends up as operating profit. It is an indicator of a company's earnings ability and the extent to which operating costs are being contained. It also indicates the proportion of revenues that are available for cover non-operating expenses such as paying interest. The indicator should be positive, indicating that the entity's operations are profitable, before taking into account financing costs and taxation. The higher the indicator the better. Trends can be analyzed, and the indicator benchmarked against other companies, including internationally as it excludes the impact of different taxation regimes.
Cost Recovery: $\frac{Total\ Revenue\ excluding\ government\ grants}{COGS + Other\ Operating\ Expenses)}$	Reflects whether an entity is generating sufficient revenue to cover its operating costs. The higher the indicator. An indicator of less than 1 reflects an entity is not breaking even at an operating level. An important consideration with this indicator is the direction it takes over time. An indicator that is decreasing over time means the entity is operating less efficiently from period to period. The indicator can be benchmarked against other companies. It assesses the same aspect of a business as the Operating Profit Margin.
Return on Assets: $\frac{Net\ Profit}{Total\ Assets}$	Measures the allocative efficiency of the entity in using its available capital (both debt and equity) or put differently how efficiently an entity is managing its assets to produce profits. Trends can be analyzed to assess whether the returns are increasing (improving) or not. The indicator can be used for benchmarking.
Return on Equity: $\frac{Net\ Profit}{Total\ Equity}$	Measures the ability of a firm to generate profits from its shareholder's investments in the entity. Return on ROE is an indicator of how effective management is at using equity financing to fund operations and grow the entity. The higher the indicator the more profitable the business. Trends can be analyzed. The returns can be compared to the returns that could be generated from other investments (on a risk-adjusted basis) and should be higher than the cost to the shareholder of the capital that has been invested. For loss making SOEs, indicator of how quickly the government's equity is being eroded.
Solvency	
Debt to Equity: $\frac{Total\ Liabilities}{Total\ Equity}$	Measures the extent to which the entity's financing comes from liabilities relative to equity. A higher indicator indicates that more reliance is being placed on credit rather than shareholder financing. A lower indicator usually implies a more financially stable business. Companies with a higher debt to equity indicator are considered riskier as they have a higher debt burden, and unlike equity financing, the required interest payments on debt must be met, and the debt repaid to the lender on the stipulated dates. Companies with large amounts of

	debt might not be able to make the payments. In contrast, dividends can be paid only when the entity has realized profits and has the cash to do so - allowing greater financial flexibility to weather financial difficulties. However, equity is a more expensive way of financing a business and higher levels of equity mean that the ROE will be lower.
Debt to Assets: $\frac{Total\ Liabilities}{Total\ Assets}$	Like the Debt to Equity indicator, this indicator measures the proportion of an entity's financing that comes from liabilities. It shows an entity's ability to cover its liabilities with its assets, indicating its solvency. Companies with higher levels of liabilities compared with assets are considered highly leveraged and riskier.
Debt to EBITDA: $\frac{Total\ Liabilities}{EBITDA}$	Indicates the ability of a firm to service its liabilities. EBITDA is a proxy for the cash an entity can generate in a year from its operations, so the indicator indicates the number of years it would take for the entity to generate sufficient cash to pay off all its debt. A higher value would indicate a more indebted entity which may not be able to service its debt.
Interest Coverage: $\frac{EBIT}{Interest\ Expense}$	Measures an entity's ability to meet its interest payments on its debt and remain profitable. It helps to identify whether an entity is generating sufficient operating profits to be able to service its debt. Lenders want to see that the entity can cover its financing costs and that there is a buffer to accommodate any risks. A higher indicator is indicative of a stronger entity.
Cash Interest Coverage: $\frac{EBITDA}{Interest\ Expense}$	The indicator indicates the cash flow available to meet the entity's interest expense. EBITDA is a proxy for the cash generated from the operations of the business. A higher indicator indicates greater ability to pay. There should be a buffer so that the entity is able to absorb negative events.
Debt Coverage: $\frac{EBITDA}{(ST\ Debt + LT\ Debt + Financial\ Leases)}$	Similarly, to the Debt to EBITDA indicator, it indicates the ability of a firm to generate cash to service its obligations. However, in this case only the borrowings and financial lease obligations are taken into account. A higher value would indicate a stronger entity that is better able to service its debt; it is better placed to absorb shocks and remain current on its debt obligations.
Liquidity	
Current Ratio: $\frac{Total\ Current\ Assets}{Total\ Current\ Liabilities}$	Assesses an entity's ability to meet its short-term liabilities (those falling due in the next 6 months) from its short-term assets. An entity with larger amounts of current assets will more easily be able to pay off current liabilities when they become due without having to sell off long-term, revenue generating assets. The current assets should cover the current liabilities with some buffer, to ensure that if there were difficulties turning some of the current assets into cash there would still be sufficient other resources that could be mobilized to meet the current liabilities. A higher indicator is indicative of a stronger entity.
Quick Ratio: $\frac{Current\ Assets - Inventories}{Total\ Current\ Liabilities}$	Measures the ability of an entity to pay its short-term liabilities when they come due using only its more liquid short-term assets. It is a stricter form of the current ratio as inventories are excluded from the current assets available to service the current liabilities. The remaining

	current assets should cover the current liabilities to ensure an adequate buffer to meet the current liabilities, but the higher the indicator the better.
Debtor Turnover Days: $\frac{(Trade\ Receivables \times 365)}{Revenue\ from\ Trading\ Activities}$	Measures speed with which an entity collects its revenue from its customers. It is intended to evaluate the ability of an entity to effectively issue credit to its customers and collect funds from them in a timely manner. If the Debtor Turnover Days is high, it could indicate that the entity has a loose or nonexistent credit policy, an inadequate collection function, and/or a large proportion of customers are having financial difficulties and consequently that the entity may experience liquidity challenges. Working capital is being effectively managed, when the time taken to pay creditors should be longer than the time taken to pay debtors, indicating that the entity is using credit from its creditors to finance its business.
Creditor Turnover Days: $\frac{(Trade\ Payables\ \times 365)}{Costs\ of\ Goods\ Sold}$	Measures the speed with which an entity pays its suppliers. If the turnover time increases from one period to the next, this indicates that the entity is paying its suppliers more slowly and may be an indicator of worsening financial condition and accumulation of arrears.
Z-score $Z = 6.56 \times \left(\frac{Current\ Assets - Current\ Liabilities}{Total\ Assets}\right) + 3.26 \times \left(\frac{Retained\ Earnings}{Total\ Assets}\right) + 6.72 \times \left(\frac{EBIT}{Total\ Assets}\right) + 1.05 \times \left(\frac{Book\ Value\ of\ Equity}{Total\ Liabilities}\right)$	
Z-score	Indicates the likelihood of a business going bankrupt in the next two years. The Tool calculates the Altman Z-score for emerging markets. If the Z-score is greater than 2.6, the probability of the company going bankrupt is very low. If it is less than 1.1 there is a high risk of the company going bankrupt. If the Z-score is between 1.1 and 2.6, then the outcome is uncertain. The predictive accuracy of the Z-score will vary between countries and should first be established in the relevant context.
Government relations	
Government transactions to revenue $\frac{Government\ Grants\ Received}{Total\ Revenue\ including\ government\ grants}$	Shows the dependency of the SOE on transfers from government. On the one hand a reduction in the indicator may indicate that the SOE is better able to operate independently without government support. This could be a result of improvements in SOE efficiency, reducing the subsidies it requires to be sustainable, or a reduction in the QFAs it undertakes and for which it should be compensated. On the other hand, it may reflect a decision by the government to reduce the transfers without any improvements in efficiency or curtailment of QFAs, which can signal that fiscal risks may be mounting.
50 percent test $\frac{(COGS + Other\ Operating\ Expenses + Finance\ Costs - Finance\ Income}{Revenue\ from\ Trading\ Activities + Other\ Operating\ Income}$	According to GFSM 2014 an SOE should only be classified as a public corporation where it is a market producer, for which one of the criteria that is used is that it is able to cover at least half of its operating costs from its revenues, excluding transfers from the government. A lower indicator indicates a more independent SOE.