

Accounting for fiscal obligations and contingent liabilities in public-private partnerships in South Africa

A framework for analysis

Refilwe Mokanse, Dorcas Kayo, Yoliswa Sambo,
Mkhulu Maseko, Cigdem Aslan

SA-TIED Working Paper #68 | July 2019



About the programme

Southern Africa –Towards Inclusive Economic Development (SA-TIED)

SA-TIED is a unique collaboration between local and international research institutes and the government of South Africa. Its primary goal is to improve the interface between research and policy by producing cutting-edge research for inclusive growth and economic transformation in the southern African region. It is hoped that the SA-TIED programme will lead to greater institutional and individual capacities, improve database management and data analysis, and provide research outputs that assist in the formulation of evidence-based economic policy.

The collaboration is between the United Nations University World Institute for Development Economics Research (UNU-WIDER), the National Treasury of South Africa, the International Food Policy Research Institute (IFPRI), the Department of Monitoring, Planning, and Evaluation, the Department of Trade and Industry, South African Revenue Services, Trade and Industrial Policy Strategies, and other universities and institutes. It is funded by the National Treasury of South Africa, the Department of Trade and Industry of South Africa, the Delegation of the European Union to South Africa, IFPRI, and UNU-WIDER through the Institute's contributions from Finland, Sweden, and the United Kingdom to its research programme.

Copyright © Author(s) 2019

Corresponding author:

The views expressed in this paper are those of the author(s), and do not necessarily reflect the views of the of the SA-TIED programme partners or it's donors.



Accounting for fiscal obligations and contingent liabilities in public-private partnerships in South Africa: A framework for analysis

Refilwe Mokanse, Dorcas Kayo, Yoliswa Sambo, Mkhulu Maseko,
Cigdem Aslan

ABSTRACT

The research proposes a general approach to assessing and accurately quantifying fiscal obligations and the state's contingent liabilities that arise from financing infrastructure projects through public-private partnerships (PPPs). It includes a method for assessing the likelihood of these contingent liabilities materializing due to contract termination because of private party default or public institution default or the triggering of a minimum revenue guarantee payment from the fiscus. South Africa's fiscal framework governing PPPs has been in existence since 2000 and, to date, 34 PPP projects valued at R89.3 billion have been completed. South Africa's methods for valuing and accounting for PPPs in the public sector accounts, and in particular, the contingent liabilities involved require review and improvement to meet international best practice. This paper sets out a framework for appropriate methods and provides a basis for developing public sector capacity for effective valuation and reporting.

Keywords: infrastructure investment, contingent liabilities, public sector assets and liabilities management, risk rating

JEL classification: H 54, H 61, H 81, H 83

1 INTRODUCTION

The provision of adequate and well-maintained infrastructure is a common problem facing many developing countries, including South Africa. The emergence of public-private partnerships (PPPs) has provided a window of opportunity for partnership between government and the private sector in the provision of infrastructure. South Africa has a strong PPP framework, with a total of 34 PPPs, valued at R89.3 billion, completed to date. For government, private participation and financing through PPPs offers an opportunity to increase infrastructure investment without immediately adding to government borrowing and debt. User charges can be a source of revenue for the government. User charges or unitary payments (payments made to the private party¹ (PP) for service rendered) also provide a return on investment for the PP.

However, for the private sector to fully commit to entering into a PPP or a long-term contract with government, a guarantee from the Minister of Finance binding the National Revenue Fund is required, such a guarantee mitigating the risk of revenue shortfall or default by creating a fiscal obligation or a contingent liability to the fiscus if the project sponsor is unable to pay the PP. Although some PPPs were undertaken almost 20 years ago, the full fiscal obligations and contingent liabilities that could accrue to government have not been calculated with a high level of accuracy. There is therefore a need to update and fully account for these fiscal obligations and contingent liabilities. In addition, there is a need to reliably predict the probability of the contingent liability materializing.

1.1 Background

PPP projects offer an opportunity for a partnership between government and the private sector to implement infrastructure projects. The PPP framework has been in existence since mid-2000 in South Africa. Table 1 shows a list of the 34 completed PPPs undertaken to date. Of the 23 PPPs, 26 are design-finance-build-operate-transfer (DFBOT) PPP models, four are design-finance-operate (DFO) models, two are design-build-operate-transfer models (DBOT), one is an equity partnership model, and one is a facilities management project model. These projects include hospitals, transport and roads, tourism and head office accommodation projects.

Table 1: Public-private partnership projects completed

| Project name | Government institution | Type | Date of close ¹ | Duration (years) | Financing structure | Project value (R m) | Form of payment |
|--------------------------------|---|-------|----------------------------|------------------|---------------------------------------|---------------------|----------------------------|
| Transport | | | | | | | |
| SANRAL N4 East Toll Road | SANRAL | DFBOT | Feb 1998 | 30 | Debt: 80% Equity: 20% | 3 200 | User charges |
| SANRAL N3 Toll Road | SANRAL | DFBOT | Nov 1999 | 30 | Debt: 80% Equity: 20% | 3 000 | User charges |
| SANRAL N4 West Toll Road | SANRAL | DFBOT | Aug 2001 | 30 | Debt: 80% Equity: 20% | 3 200 | User charges |
| Northern Cape fleet | N. Cape Dept of Transport, Roads and Public Works | DFO | Nov 2001 | 5 | Equity: 100% | 181 | Unitary payment |
| Chapman's Peak Drive Toll Road | W. Cape Dept of Transport and Public Works | DFBOT | May 2003 | 30 | Debt: 44% Equity: 10% Govt: 46% | 450 | User charges and guarantee |
| Fleet management | Eastern Cape Dept of Transport | DFO | Aug 2003 | 5 | Debt: 100% | 553 | Unitary payment |
| National fleet management | Dept of Transport | DFO | Sep 2006 | 5 | Equity: 100% | 919 | Service fee |

¹ In this note, special purpose vehicle (SPV) and private party are used interchangeably.

| Project name | Government institution | Type | Date of close ¹ | Duration (years) | Financing structure | Project value (R m) | Form of payment |
|--|---|-----------------------|----------------------------|------------------|---|---------------------|--------------------------------------|
| Tshwane fleet management | City of Tshwane | DFO | Nov 2015 | 5 | Equity: 100% | 1 612 | Service fee |
| Gautrain Rapid Rail Link | Gauteng Dept of Public Transport, Roads and Works | DFBOT | Sep 2006 | 20 | Debt: 11% Equity: 2% Govt: 87% | 31 800 | User charges and patronage guarantee |
| SANRAL Gauteng Freeway Improvement Plan Toll Road | SANRAL | DFBOT | Oct 2007 | 20 | Debt: 100% | 20 000 | User charges |
| Water and sanitation | | | | | | | |
| Dolphin Coast water and sanitation concession | Kwa-Dukuza Local Municipality | DFBOT | Jan 1999 | 30 | Debt: 21% Equity: 18% Govt: 61% | 130 | User charges |
| Mbombela water and sanitation concession | Mbombela Local Municipality | DFBOT | Dec 1999 | 30 | Debt: 40% Equity: 31% Govt: 29% | 189 | User charges |
| Correctional services | | | | | | | |
| Mangaung and Makhado maximum security prisons | Dept of Correctional Services | DFBOT | Aug 2000 | 30 | Debt: 88% Equity: 12% | 3 600 | Unitary payment |
| Health | | | | | | | |
| Inkosi Albert Luthuli Hospital | KwaZulu-Natal Dept of Health | DFBOT | Dec 2001 | 15 | Debt: 70% Equity: 20% Govt: 10% | 4 500 | Unitary payment |
| Universitas and Pelonomi Hospitals co-location | Free State Dept of Health | DFBOT | Nov 2002 | 16.5 | Equity: 100% | 81 | User charges |
| State Vaccine Institute | Dept of Health | Equity partnership | Apr 2003 | 4 | Equity: 100% | 75 | Once-off equity contribution |
| Humansdorp District Hospital | E. Cape Dept of Health | DFBOT | Jun 2003 | 20 | Equity: 90% Govt: 10% | 49 | Unitary payment |
| Phalaborwa Hospital | Limpopo Dept of Health and Social Development | DFBOT | Jul 2005 | 15 | Equity: 100% | 90 | User charges |
| W. Cape Rehabilitation Centre and Lentegeur Hospital | W. Cape Dept of Health | Facilities management | Nov 2006 | 12 | Equity: 100% | 334 | Unitary payment |
| Polokwane Hospital renal dialysis | Limpopo Dept of Health and Social Devt | DBOT | Dec 2006 | 10 | Equity: 100% | 88 | Unitary payment |
| Port Alfred and Settlers Hospital | E. Cape Dept of Health | DFBOT | May 2007 | 17 | Debt: 90% Equity: 10% | 169 | Unitary payment |
| Tourism | | | | | | | |
| SANPARKS tourism projects | SANPARKS | DFBOT | Apr 2000 | Various | Equity: 100% | 270 | User charges |
| Eco-tourism Manyeleti three sites | Limpopo Dept of Finance, Economic Affairs, Tourism | DFBOT | Dec 2001 | 30 | Equity: 100% | 25 | User charges |
| Cradle of Humankind Interpretation Centre Complex | Gauteng Dept of Agriculture, Conservation, Environment and Land Affairs | DBOT | Oct 2003 | 10 | Equity (opex): 100% Govt (capex): 100% | 39 | User charges |

| Project name | Government institution | Type | Date of close ¹ | Duration (years) | Financing structure | Project value (R m) | Form of payment |
|--|---|-------|----------------------------|------------------|---------------------------------------|---------------------|-----------------|
| Western Cape Nature Conservation Board | W. Cape Provincial Government | DFBOT | Jul 2005 | 30 | Equity: 100% | 40 | User charges |
| Information technology | | | | | | | |
| Information systems | Dept of Labour | DFBOT | Dec 2002 | 10 | Equity: 100% | 1 500 | Unitary payment |
| Social grant payment system | Free State Dept of Social Development | DFO | Apr 2004 | 3 | Equity: 100% | 260 | Unitary payment |
| Office accommodation | | | | | | | |
| Head office accommodation | Dept of Trade and Industry | DFBOT | Aug 2003 | 25 | Debt: 80% Equity: 8% Govt: 12% | 870 | Unitary payment |
| Head office accommodation | Dept of International Relations and Cooperation | DFBOT | Jan 2005 | 25 | Debt: 81% Equity: 19% | 1 959 | Unitary payment |
| Head office accommodation | Dept of Education | DFBOT | Aug 2009 | 27 | Debt: 90% Equity: 10% | 512 | Unitary payment |
| Head office accommodation | Dept of Environmental Affairs | DFBOT | May 2012 | 25 | Debt 49% Equity: 15% Govt: 36% | 2 731 | Unitary payment |
| Head office accommodation | Statistics South Africa | DFBOT | Mar 2014 | 24 | Debt 54% Equity: 9% Govt: 37% | 2 533 | Unitary payment |
| Head office accommodation | City of Tshwane | DFBOT | Mar 2015 | 25 | Debt: 86% Equity: 14% | 2 005 | Unitary payment |
| Head office accommodation | Dept of Rural Development | DFBOT | Feb 2019 | 27 | Debt: 54% Equity: 10% Govt: 36% | 3 991 | Unitary payment |

In South Africa, all PPPs are required to go through regulatory tests to check for compliance before implementation. The three tests are value-for-money, affordability, and risk transfer. The process of accounting for fiscal obligations and contingent liabilities is directly linked to risk transfer.

PPP projects rely on unitary payments by the off taker and a few of them on user charges, sometimes backed by a minimum revenue guarantee. The key sources of contingent liabilities for the government mainly stem from these guarantees and the termination events that can result from PP default, government institution decision, corrupt acts or force majeure. The National Treasury (NT) has been publishing an estimation of the termination amounts in the Annexure E of the Budget Review since 2016.

Fiscal obligations and contingent liabilities exposure from PPPs arises mainly from government's obligation to a PP should there be an early contract termination. The amount of the resultant contingent liability is driven by the reason for termination. These are: termination as a result of PP default, public institution default, or force majeure ("act of God"). It also occurs if government has agreed to top up a shortfall if the project does not generate the minimum revenue set out in a contract with the PP. The materializing of contingent liabilities has an adverse and financial effect on the fiscus. Thus the NT undertakes to analyse and estimate the contingent liabilities arising from PPPs.

In terms of responsibilities, the Asset and Liability Management (ALM) division in the NT conducts credit risk analysis that focuses on state-owned companies' (SOCs) balance sheets, income statements and cash flow statements to determine whether they generate sufficient cash flow to service their obligations. This kind of analysis evaluates business and financial risk indicators to gauge whether

sufficient cash flows are likely to be generated over the life of the outstanding liabilities and whether the liabilities are likely to increase or decrease in the near future. When a PPP is implemented, the NT as a guarantor of the PPP debt also has to scrutinize the associated cash flows and creditworthiness of the PP to ascertain the ability of the special purpose vehicle (SPV) to service its principle payments plus interest when they become due. Given that ALM conducts credit analysis focusing on the credit worthiness of SOCs, there is a need to explore the possibility of conducting this kind of analysis on SPVs of PPP projects.

This paper is written jointly by the ALM division and Budget Office (BO) in the NT. ALM is responsible for analysing contingent liabilities that government is exposed to and for monitoring risk and likelihood of materialization of contingent liabilities emanating from PPPs. The BO division is the regulator of PPPs and its main responsibility is to ensure that all PPPs are undertaken in accordance with Treasury Regulation 16.

2 PROBLEM STATEMENT

To publish information on fiscal obligations and contingent liabilities and to assess the risk exposure from the PPPs, the ALM and BO teams rely on data received from the PPP unit within the Government Technical Advisory Centre. The data provides a risk score for all projects, which is not necessarily based on a scientific methodology but on qualitative aspects of contract management such as attendance at meetings, disputes, penalties imposed and operations of the SPVs. This method of analysis is heavily focused on qualitative assessment and does not consider the financial outlook of the projects. In addition, technical advisors make contingent liability (CL) calculations on behalf of government institutions, and it cannot be ascertained whether these calculations are accurate.

The research aims to develop a general approach to assessing and accurately quantifying fiscal obligations and CLs as well as to identify a methodology to determine the likelihood of these CLs materializing (Moody's, 2015). More specifically, it aims to achieve the following:

- improve the accuracy of the information published in the PPP annexure of the Budget Review, in particular the table on the termination amounts (see Table 1);
- assess the creditworthiness of the SPV companies that manage the current PPP projects;
- develop the capacity of the Credit Risk and BO teams to analyse the key risks from the PPPs to the public sector and assess reports to inform decision-making.

Table 2: Level of potential government contribution to contingent liabilities by category (R million)

| | Termination private party default | | Termination force majeure | | Termination government default | |
|---------------------------------|-----------------------------------|----------------|---------------------------|----------------|--------------------------------|-----------------|
| | 2017/18 | 2018/19 | 2017/18 | 2018/19 | 2017/18 | 2018/19 |
| National departments exposure | 3 070.5 | 3 464.6 | 2 777.9 | 3 655.9 | 4 687.6 | 5 348.0 |
| Provincial departments exposure | 3 803.2 | 3 571.3 | 2 591.3 | 2 372.8 | 4 892.5 | 4 732.3 |
| Public entities exposure | 557.0 | 489.2 | 555.7 | 414.8 | 767.0 | 614.4 |
| Municipal exposure ¹ | 2 675.9 | 2 274.5 | 2 269.1 | 1 928.8 | 3 360.9 | 2 856.7 |
| Total | 10 106.5 | 9 779.6 | 8 194.0 | 8 372.3 | 13 708.0 | 13 561.4 |

1. Municipalities are an autonomous sphere of government and therefore their liabilities are not part of the fiscus.

Source: National Treasury

Table 1 shows the level of potential government contribution to CLs by category. It shows CLs for PPPs as a result of contracts terminating due to government default amounted to R13.6 billion in 2018/19, with national PPPs accounting for most of them, followed by provinces, municipalities and public entities. This information was published in the Budget review of 2019 but there is currently doubt about its accuracy, because the information was provided by technical advisors and NT does not have a reliable methodology of quantifying these liabilities – hence the present research. In summary, this paper seeks to establish the accuracy of the current qualitative methodology used to calculate contingent liabilities and if necessary establish a methodology that will outline a general approach to assessing and quantifying fiscal obligations and contingent liabilities. Furthermore, it will outline a methodology that will determine the likelihood of these contingent liabilities materializing as a result of any of the following reasons: private party default; government institution default, and triggering of a minimum revenue guarantee payment.

3 RESEARCH OBJECTIVES AND APPROACH

Currently each PPP has its own formula for calculating contingent liabilities. The research objective is to create a model to accurately determine the volume of government's fiscal obligations and contingent liabilities and to assess the creditworthiness of SPVs. This will be based on the cash flow profile of the project in order to quantify total risk exposure and likelihood of materialization. The model that will be adopted aims to assess default risk of the PP by estimating the risk probability as well as the risk impact (default/credit loss) of individual projects. The model will also aim to establish qualitative indicators that can be used to determine the likelihood of default of either the PP or the public institution or force majeure. This methodology will help the NT to manage the credit risk exposure of the PPP portfolio and, consequently, the implications on the fiscus.

3.1 Data

Data on the eight sampled projects that are currently in operation was required, and sourced from Treasury Approval value for money reports (Treasury Approval III reports), financial models, approved memos and letters. Income statements and balance sheets of the SPVs will also be requested from the relevant institutions. These projects include the following: Gautrain Rapid Rail, Chapmans Peak Drive Toll Road; SANRAL N3 and N4 Toll Roads; Dolphin Coast Water and Sanitation Concession; Department of Environmental Affairs and Department of Education buildings; Inkosi Albert Luthuli and Pelonomi and Universitas PPP hospitals. These projects were sampled mainly because they represent various sectors of PPPs and have a diverse range of risks that can assist with the quantification of fiscal risks and contingent liabilities. A screening of these documents showed that only three projects had some of the relevant information. Some SPVs had also some publicly available data in their annual reports such as the income statements and balance sheets. However, for this research, the Department of Education (DoE) accommodation building has been chosen to serve as a pilot for the research. A brief description of the DoE has been provided below:

- The DoE office accommodation PPP project reached financial closure in August 2007.
- The total project cost, including construction and maintenance of the building, was R512 million at 2007 prices, discounted at 11.14 percent.
- The total size of the building is 57 778 m², which includes 34 000 m² office space, 15 832 m² basement space, and 7 946 m² special area.
- The building was constructed to house an estimated 1 200 employees of the DoE.
- The unitary payment in year 1 of the operations was estimated to be R70 million over 25 years, escalating by inflation every year.
- The funding structure of the project was 87 percent debt and 17 percent equity.
- There was no capital contribution by the DoE.

3.2 Research question

The research project answers the following questions:

- What is the total cost of all the fiscal obligations and contingent liabilities of the eight sampled PPP projects?
- What is the best methodology to estimate the risk exposure from PPPs and to estimate the probability of default or termination?
- What is the best methodology to estimate and assess the likelihood of a revenue guarantee being triggered?
- Should any of these agreements fail or be terminated, how much would government be liable to pay the private sector?
- What are the qualitative factors that would be most reliable in determining the likelihood of default or termination?
- How should these fiscal obligations and contingent liabilities be managed to minimize and mitigate the fiscal risk that could accrue to government?

3.3 Significance of the study

The research will enable government to fully account for all its fiscal obligations and contingent liabilities and come up with recommendations on how best to manage PPPs to reduce fiscal risks that could potentially accrue to South Africa. The research is also expected to contribute to policy discussions about the importance of PPPs and crowding in of private financing.

3.4 Research methodology

The research adopts a methodology used by Bachmair (2016) which calculates the expected loss (EL) from each PPP project, through the following formula (see Figure 1):

$$EL = EAD * LGD * PD,$$

where EL = Expected loss; EAD = Exposure at default; LGD = Loss given default; and PD = Probability of default.

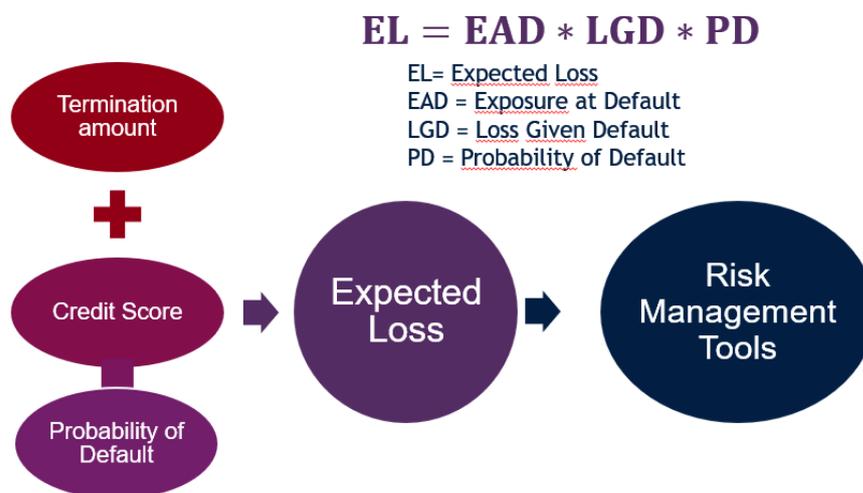


Figure 1: Proposed methodology

Source: World Bank

This formula can be decomposed into i) the calculation of the termination amounts from the triggers indicated in the PPP contracts (EAD); ii) development of a credit score to assess the creditworthiness of a PPP project; iii) translation of the credit score into a probability of default (PD); and iv) the estimation of the recovery rate (LGD) that might be high for a PPP. It should be noted that the EL is a present value number, so the formula, as seen below, must discount the cash flows with the government’s yield at a particular year.

$$EL_y = \sum_1^y \frac{EAD_y * PD_y * LGD_y}{(1 + Govt. Yield_y)^y}$$

4 CALCULATION OF THE TERMINATION AMOUNTS

The calculation of the exposure tries to answer the question on how much is at risk if a PPP project is terminated, as this event generates some cost to the off-taker. Depending on whether the off-taker is a central government entity (e.g. sectoral departments), a SOC, or a sub-national government, there is an explicit or implicit CL with a potential to impact the government’s public finances. In the event of a termination, payments are expected to be made to debt counterparties, equity (shareholder) counterparties, and hedging counterparties.

To calculate the termination amounts, it is necessary to generate the project cash flows. A typical PPP project is financed through equity and debt. Equity shareholders expect a compensation to match their required internal rate of return (IRR) through dividends and equity repayments (at the end of the concession, the SPV closes with no asset or liability). Debt investors receive interest payments and principal repayments.

At termination, a compensation needs to be made to those who finance and hedge the project. The hedging cost arises from the breakage, i.e. cancellation, of the derivative agreements that the SPV put in to manage the financing risks such as the interest rate or currency. However, this compensation must consider the debt- and equity-related payments at the date of the termination, and subject to penalties linked to the cause of the termination. For example, if the project terminates due to PP default or corrupt acts, the equity shareholders are penalized more heavily than if the public sector decided to withdraw. Furthermore, there are other cost components such as payments related to the subcontractor costs or redundancy costs.

A PPP project in South Africa can be terminated upon the PP default, if the off-taker decides to terminate, due to force majeure, or in the occurrence of corrupt gifts and acts. Even though each PPP project can have its particularities, usually the debt is amortized before equity and according to the seniority of debt. An analysis of the financial contract and the financial model for the DoE project was undertaken. Based on this input, an Excel template was prepared to calculate the termination amounts under the four triggers indicated above. The analysis considers the payments to the equity shareholders, lenders and hedging counterparties. Given that there was not enough information, a quantification of potential payments could not be conducted due to the subcontractor or redundancy costs.

Figure 2 shows an analysis of equity and debt profile of the DoE PPP project. The debt and equity profile of the project consists of senior debt, sub-debt, equity and interest expense. These are components of the project that need to be paid in case of project termination.

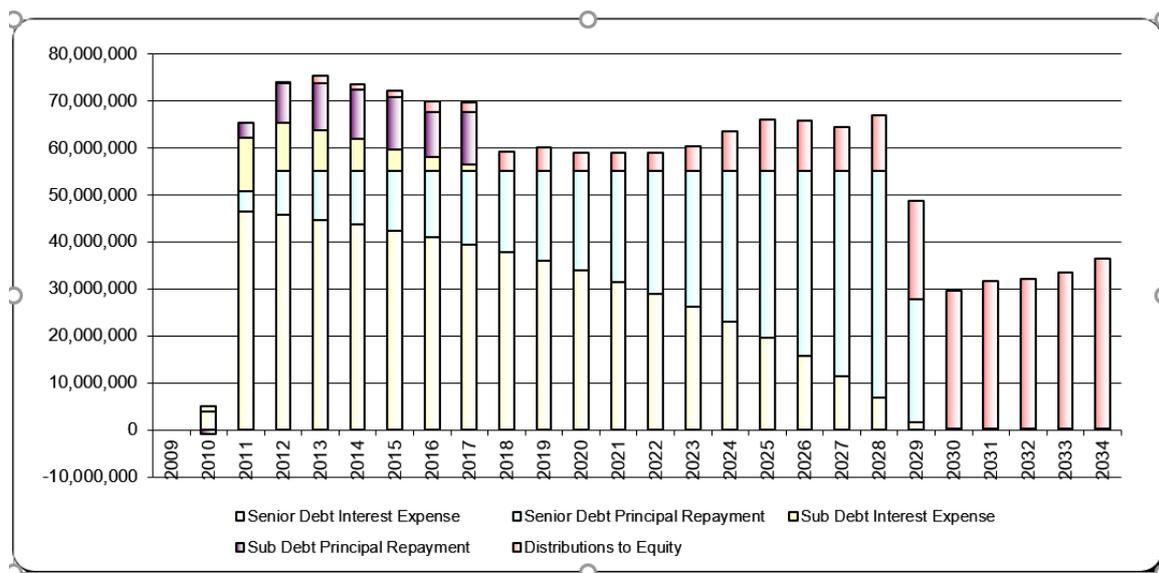


Figure 2: Equity and debt payment profile of the Department of Education project

Source: "Summary" sheet of DoE Financial Model_3 August 2009.xls

| Department of Education Building | | Termination Amount | | | |
|---|---|---------------------------|----------------------------|------------------------------|--------------------------|
| Sethelgo Private Party (Pty) Ltd - Operations | | Public Sector Default | Private Party Default | Force Majeure Termination | Corrupt Acts Termination |
| | | 441,312,419 | 359,342,902 | 359,342,902 | 359,342,902 |
| | | | Period End Date | Saturday, September 30, 2006 | Saturday, March 31, 2007 |
| 1 | | | | 0 | 1 |
| 2 | | | | | |
| 3 | Senior Debt Amount | | | - | - |
| 4 | Project Co share capital | | | - | 56,561,105 |
| 5 | Project Co share distributions | | | - | - |
| 6 | Project Co share distributions Cumulative | | | - | - |
| 7 | CPI Index | | | 1.00 | 1.00 |
| 8 | Project Co share real cashflows | - | 18,262,828 | - | 56,165,112.60 |
| 9 | | | | | |
| 10 | SPV LIABILITIES AT TERMINATION | Termination Date | Last Payment Date | | |
| 11 | | Sunday, November 11, 2018 | Sunday, September 30, 2018 | 24 | |
| 12 | Senior Debt Amount | | 345,744,457 | | |
| 13 | Project Co share capital | | 1,611,733 | | |
| 14 | Project Co share distributions | | 11,916,226 | | |

Figure 3: Snapshot of the termination amount template

5 DEVELOPMENT OF THE CREDIT SCORE

Another important component for the risk assessment of PPPs is to develop a credit scoring methodology. This is a methodology with which the ALM’s Credit Risk team is familiar, given the use of a similar approach to evaluate the CLs from South Africa’s SOCs.² This approach helps to achieve understanding of the fundamental risk drivers of a PPP project, to assess the creditworthiness of the SPV managing the project, and produce a credit score (e.g. 1 for low risk, 9 for high risk)

Moody’s (2015) methodology for operational privately-financed public infrastructure (PFI/PPP/P3) projects has been adopted. This is the standard method to assess credit rating of PPP SPVs at the operation phase of the project and consists of the following eight factors:

- complexity of project operations and performance regime;
- strength of contractual arrangements and operations approach;

² National Treasury of South Africa. (2017). Methodology for conducting credit risk assessments on state-owned companies operating within the electricity sector.

- performance and quality of the sub-contractor;
- leverage and coverage;
- project track record;
- refinancing risk;
- structural features; and
- off-taker considerations.

To develop credit scores based on this methodology is not straightforward, in order to appreciate the complexity, it is important to have a good understanding of the contractual, financing and operational structure of the PPP project. In some cases, the methodology could be adjusted with specifics of South African PPPs, for example by assigning larger weights to factors (e.g. Factor 4 on leverage and coverage and Factor 5 on track record) that can be updated with recent financial information to monitor the performance of the SPV. This will allow NT to keep track of the performance of the projects and to develop some early warning indicators to anticipate increasing risks.

To develop a credit score, financial statements of the SPV are required. However, the financial statements of the DoE SPV could not be obtained. As a proxy, the financials statements of the Department of Environmental Affairs (DoEA) were used. The DoEA project was used because it is similar to the DoE in terms of project size and it is also an office accommodation PPP project. The Moody’s credit rating score was applied (see Figure 2) with some adjustments made to South Africa, such as the adoption of a score of 1 to 9 scale used for South Africa’s SOCs (1 for strong credit quality, 9 for the riskiest SPVs), which would consist of superimposing the scale of nine over the Moody’s scale of 20.

| Factors | Sub-factors | Subfactor weight within scorecard | Department of Environmental Affairs Office Building | |
|---|--|-----------------------------------|---|-------------|
| | | | Indicative score | Score |
| FACTOR 1: COMPLEXITY OF PROJECT OPERATIONS AND PERFORMANCE REGIME | Complexity of Facility Management (FM) Obligation | 10% | 6.00 | 0.60 |
| | Complexity of Lifecycle Obligation | 10% | 6.00 | 0.60 |
| | Nature of Performance Regime | 5% | 6.00 | 0.30 |
| | Concession/Sub-Contract Interface | 5% | 6.00 | 0.30 |
| FACTOR 2: STRENGTH OF CONTRACTUAL ARRANGEMENTS AND OPERATIONAL APPROACH | Robustness of FM Sub-Contract Package Terms | 7.5% | 15.00 | 1.13 |
| | Robustness of Lifecycle Contract Arrangements | 10.0% | 15.00 | 1.50 |
| | Adequacy of FM Budgeting, Benchmarking and Resources | 7.5% | 9.00 | 0.68 |
| | Adequacy of Lifecycle Plan | 10.0% | 9.00 | 0.90 |
| FACTOR 3: PERFORMANCE AND QUALITY OF SUB-CONTRACTOR | | 10.0% | 9.00 | 0.90 |
| FACTOR 4: LEVERAGE AND COVERAGE | Minimum Annual Debt Service Coverage Ratio (DSCR) | 7.5% | 3.00 | 0.23 |
| | Average Annual DSCR | 7.5% | 3.00 | 0.23 |
| | Minimum Annual DSCR Break-even ratio | 10.0% | 3.00 | 0.30 |
| Initial Rating | | | Baa1 | 7.65 |
| Factor 5: Project Track Record | Quality of Relationships Among Project Parties | | 0.0 | |
| Factor 6: Refinancing Risk | Operational Performance | | 0.0 | |
| Factor 7: Structural Features | Debt Service Reserve Account (DSRA) | | 0.0 | |
| | Maintenance Reserve Account (MRA) | | 0.0 | |
| | Security and Creditor Controls | | 0.0 | |
| Final Moody's Rating | | | Baa1 | 7.65 |
| Credit Score using SOC's rating scale | | | 4 | |

Figure 4: Snapshot of the SPV credit score template

Source: World Bank

One point to note is that if the off-taker is an SOC or a subnational government, the credit score from the PPP project would have to be complemented by an additional credit score for the off-taker. The

rationale is that the government's public finances is exposed to credit risk from these off-takers and thus the credit risk from both the SPV and the related off-taker has to be considered. The scenarios that could materialize are :

- SPV defaults, but the off-taker is able to pay the termination costs
- SPV defaults, but the off-taker does not have the resources to pay the termination costs

Therefore, in case the off-taker is an SOC or a subnational government, the credit score of the SPV would be:

- Rating of SPV = min (rating of SPV using factors 1-7; rating of off-taker minus³ one notch)

Given that the ALM's Credit Risk team is already producing credit scores for the SOCs benefitting from sovereign guarantees, the only additional work would be for those off-takers that do not currently have guaranteed debt, for example Gauteng province in the case of Gautrain project, to have their credit scores calculated.

6 DERIVATION OF THE PROBABILITY OF DEFAULT FROM THE CREDIT RATING

To calculate the PD of public sector termination would depend on the team's ability to identify and assess the triggers; this might not be quantifiable (e.g. political decisions, social motives). Similarly, force majeure risks might have been leveraged through insurance, or alternatively capacity to assess the probability of events such as war or disaster which is outside their mandate would have to develop significant would have to be developed. Similarly monitoring the likelihood of corrupt acts might not be an expertise of the NT.

To compute the PD of the SPV, the step following the production of the credit score of the SPV is to match the rating with the probability of default. This can be backward looking, by using historic default rates from Moody's tables or forward looking using market credit spreads. The challenge with the use of market credit spreads is their availability and the fact that they contain risk and liquidity premia on top of credit risk.

In line with the methodology used for the SOCs, it was decided to translate the ordinal ratings into PD (for the respective year), with the use of Moody's default databases. It is important to take time into account and in particular distinguish between cash flow impact and economic impact. For instance, the termination payment is not an economic loss. While the termination amounts might be very large and hence translate into large cash outflows with a significant impact at the time of the default, the actual economic loss might be much smaller, as the government would be acquiring the PPP's assets in all cases of termination. This might imply much lower overall running cost going forward for the government (e.g. no more unitary payment to be made).

³ There is minus one notch because it is slightly "easier" for the off-taker to default on a unitary payment than on a public bond.

| Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa | 0.000 | 0.013 | 0.013 | 0.037 | 0.104 | 0.170 | 0.241 | 0.318 | 0.401 | 0.489 |
| Aa | 0.022 | 0.068 | 0.136 | 0.260 | 0.410 | 0.550 | 0.682 | 0.800 | 0.900 | 1.017 |
| A | 0.062 | 0.199 | 0.434 | 0.679 | 0.958 | 1.271 | 1.615 | 1.995 | 2.387 | 2.759 |
| Baa | 0.174 | 0.504 | 0.906 | 1.373 | 1.862 | 2.375 | 2.872 | 3.386 | 3.965 | 4.623 |
| Ba | 1.110 | 3.071 | 5.371 | 7.839 | 10.065 | 12.123 | 13.911 | 15.700 | 17.479 | 19.323 |
| B | 3.904 | 9.274 | 14.723 | 19.509 | 23.869 | 27.957 | 31.774 | 34.993 | 37.936 | 40.560 |
| Caa-C | 15.894 | 27.003 | 35.800 | 42.796 | 48.828 | 53.270 | 56.878 | 60.366 | 63.730 | 66.212 |
| Inv Grade | 0.091 | 0.272 | 0.519 | 0.802 | 1.113 | 1.441 | 1.776 | 2.126 | 2.498 | 2.887 |
| Spec Grade | 4.460 | 9.161 | 13.634 | 17.571 | 21.014 | 24.042 | 26.690 | 29.035 | 31.212 | 33.234 |
| All Rated | 1.675 | 3.407 | 5.015 | 6.398 | 7.587 | 8.619 | 9.513 | 10.312 | 11.062 | 11.771 |

Figure 5: Moody's Investor Services, historic probabilities of default

Source: Moody's, 2015

7 QUANTIFICATION OF THE EL AND THE USE OF THIS OUTPUT FOR THE MANAGEMENT OF THE CLS FROM PPP PROJECTS

With the EAD in the event of PP termination and the PD computed, the only variable is loss given default (LGD), which corresponds to the amount that would be recovered through the government either retendering the PPP asset or taking charge of its operation. Given that there is still no information in this respect, and to adopt a very conservative approach, it was proposed at this stage to assume a recovery rate of 0%, thus $LGD = 100\%$. In reality the recovery rate might usually be high for a PPP project given the underlying asset.

See Box 1 for the application of these methodologies to the DoE office building project, where obtain an expected loss amount of R655 000 is obtained for the government regarding the risk of the PP defaulting in 2019. Given that quantifying risks, in addition to analysing them, facilitates action, this methodology can be applied to all the active PPP projects and allocate expected loss from the portfolio as an appropriation in the next year's budget. Furthermore, the portfolio level expected loss information can be published in PPP annexure in the Budget review of 2019 or at least monitor the performance of these estimates against the materializations going forward.

Box 1: Application of the proposed methodologies to a sample project: DoE

Based on the information obtained from the financial model from the financial close of the project in 2012, and using the Termination Amounts Template, the exposure at termination in year 2018 under the four triggers were calculated. See table below.

| Termination amount (R) | | | |
|------------------------|-----------------------|---------------------------|--------------------------|
| Public sector default | Private party default | Force majeure termination | Corrupt acts termination |
| 444 739 918 | 346 166 308 | 346 166 308 | 346 166 308 |

The credit score was constructed based on the financial contract for the DoEA, and with the assumption that DoEA and DoE would have the same rating given the similarities between the two projects, see in section 2. The credit score thus generated is 4 out of South Africa's 9 scale. This corresponds to 0.174% PD in year 1.

Therefore, the EL for the first year is calculated as $R346.2m * 0.174\% * 100\% = R602.3\ 000$ for a project valued at R512 million.

8 NEXT STEPS

One of the main challenges is the lack of comprehensive information about the active PPP projects. The data is scattered; even the financial close documents such as the concession agreement, the financial model, and the annexes regarding the arrangements on hedging and subcontractors are not available for the eight originally selected projects. Updated information could not be maintained, as most projects have been operational for a certain number of years.

PPP agreement and accompanying data has been obtained for most of the eight projects, but the challenge is financial statements of the SPV. The next step is to write to all identified SPVs and seek the relevant financials. Once the required information has been obtained, the credit score methodology can be adopted and applied to all projects sampled.

REFERENCES

- Bachmair, F. 2016. Contingent liabilities risk management: a credit risk analysis framework for sovereign guarantees and on-lending—country experiences from Colombia, Indonesia, Sweden, and Turkey (English). Policy Research working paper; no. WPS 7538. Washington, D.C. : World Bank Group. [Online] Available: <http://documents.worldbank.org/curated/en/138921468195001816/Contingent-liabilities-risk-management-a-credit-risk-analysis-framework-for-sovereign-guarantees-and-on-lending-country-experiences-from-Colombia-Indonesia-Sweden-and-Turkey> Accessed: 25 March 2019.
- Moody's. 2015. Rating methodology: operational privately-financed public infrastructure (PFI/PPP/P3) projects. 9 March 2015. [Online] Available: <http://www.congem.com.br/file/Operational-Privately-Financed-Public-Infrastructure-Projects.pdf> Accessed: 25 March 2019.
- National Treasury Public Private Partnership Manual. 2004. Pretoria.
- National Treasury Standardised Public Private Partnership Provisions. 2004. Pretoria.
- National Treasury. 2014. Accounting Guidelines GRAP 13 lease. January. [Online] Available: www.oag.treasury.gov.za Accessed: 19 march 2019.
- National Treasury. 2019. 2019 Budget Review. 25 February. [Online] Available: www.treasury.gov.za Accessed: 25 February 2019.
- The World Bank. 2006. Managing the government's fiscal obligations in public-private partnerships. Report to the National Treasury of South Africa. 14 September 2006.

About the authors

Most of the authors are employed by the National Treasury of South Africa. Refilwe Mokanse is Senior Policy Analyst, Infrastructure Finance; Dorcas Kayo is Director, Infrastructure Finance; Yoliswa Sambo is an Analyst in the Credit Risk section and Mkhulu Maseko is Director of the section. Cigdem Aslan is from the World Bank.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A world free of hunger and malnutrition

1201 Eye Street, NW | Washington, DC 20005-3915 USA

T: +1.202.862.5600 | F: +1.202.862.5606

Email: ifpri@cgiar.org | www.ifpri.org

This paper was prepared as an output for the Towards Inclusive Economic Development in Southern Africa (SA-TIED) project and has not been peer reviewed. Any opinions stated herein are those of the authors and not necessarily representative of or endorsed by IFPRI. The boundaries, names, and designations used in this publication do not imply official endorsement or acceptance by the authors, the International Food Policy Research Institute (IFPRI), or its partners and donors.