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Valuation of Credit Guarantees to State-owned Enterprises

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Abstract*

Guarantees to back state-owned enterprise (SOE) borrowing are one of the most significant contingent liabilities that the public sector has had to face. Particularly in times of crisis, credit guarantees are an important solution for financing SOEs. It is, however, essential to fully measure their risks to adequately manage the public sector balance sheet. This note examines this question and presents a simple credit guarantee valuation methodology as a first step toward sound management of the financial risks linked to SOEs.

JEL Codes: C51, H81, L32

Key words: contingent liabilities, guarantees, methodology, state-owned enterprises, valuation

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Introduction

State-owned enterprises (SOEs) are a fundamental item on the public sector balance sheet. SOEs affect the balance sheet through revenues (taxes, royalties, transfers, etc.), expenditures (subsidies and transfers), and borrowing, through both explicit and implicit public sector guarantees. SOEs seek explicit government guarantees to extend or improve the financing conditions they need to execute their investment decisions. At the same time, the market often considers that SOE borrowing has an implicit guarantee from its final owner or controlling body—that is, the State—which cannot credibly refuse to settle SOE debts. This also seems to be the interpretation of the credit rating agencies, which are only too aware of the soft budget constraint that SOEs enjoy.

Sovereign guarantees are reflected in the market's valuation of SOE-issued bonds. Musacchio and Pineda (2019) compare the performance of corporate bonds issued by SOEs with that of similar private issues (by year, size, country, and industry). Based on a sample of 14,619 bond issues made by 1,836 firms from 61 countries between 1994 and 2015, they found that the markets tend to lend more cheaply to SOEs than to comparable private firms, an average difference of between 30 and 80 basis points.[1] This finding is attributed to the fact that the market anticipates the government guarantee and therefore sets the price by considering the balance of the sovereign rather the business fundamentals of the issuing firm. The authors find that the discount received by SOEs (in relation to their fundamentals) owing to their link with the government is maintained even when there is no explicit guarantee in the debt contract, strengthening the hypothesis that the market perceives an implicit government guarantee.

Globally, SOE debt is considerable. In 2014, according to the Thompson Reuters Eikon database, bonds issued by SOEs represented nearly 10 percent of all corporate bond issues at the global level, or US$3.3 billion. Therefore, the risks associated with SOE guarantees can have a significant bearing on the sovereign balance sheet. Consequently, from the fiscal standpoint, it would be prudent to have methodologies that can explicitly value the sovereign contingent liabilities arising from guarantees to SOEs, and thus manage the risks inherent in such bond issues and sovereign contingent liabilities. Good risk management could reduce the unforeseen costs of SOE bailouts and recapitalizations during systemic crises.

Valuation of guarantees granted to SOEs is, therefore, a fundamental part of managing the risk associated with the public sector balance sheet. It is also a vital part of the cost-benefit analysis inherent in the decision to back SOEs with government guarantees. This technical note aims to provide a simple methodology for valuing guarantees granted to SOEs, with a view to improving risk management of the public sector balance sheet. To this end, it first examines the relevance for the sovereign balance sheet of the contingencies arising from guarantees to SOEs from a comparative perspective, highlighting the fact that the execution of guarantees to SOEs

[1] Banks issued more than half of the bonds in the sample (8,030), of which around a third (2,841) are SOEs. The industrial sector issued the remaining 6,589 bonds, 904 of which were SOEs.

is one of the largest contingencies that governments have faced. Second, it proposes an SOE guarantee valuation methodology, which includes a description of the main parameters and an example of a hypothetical calculation. Finally, it summarizes how risk management can benefit from a valuation methodology and presents some basic principles for implementing a risk management strategy for SOE credit guarantees.

1. Risks and Contingent Liabilities arising from State-owned Enterprises: A Comparative Perspective

The risks associated with SOEs are extremely high. For example, Bova et al. (2016)—in a sample of 80 countries spanning the period 1990 through 2014—describe 230 events in which SOE-related contingent liabilities (hereinafter, CLs) were incurred, 80 percent of which derive from implicit guarantees, with an average fiscal cost of 6.1 percent of gross domestic product (GDP).[2] SOE bailouts occupied fourth place in terms of source of costs (3 percent of GDP per case, on average), after CLs arising from the financial system, lawsuits against the State, and subnational government bailouts. The most onerous events were in Jordan (between 2011 and 2014), equivalent to 15.1 percent of GDP, which included transfers for losses by the state electricity supplier (strongly affected by the disruption of gas supplies from Egypt); Portugal (between 2001 and 2013), which assumed the debt of its SOEs to the tune of 12.1 percent of GDP, and Moldova (between 1996 and 1998), for assuming back payments owed by its energy supplier for the purchase of gas from the Russian SOE, Gazprom.

In Latin America and the Caribbean (LAC), Colombia and the Dominican Republic are the two cases where governments directly assumed SOE debts. In 2003, the Dominican government faced a cost equivalent to 1.6 percent of GDP for re-nationalizing two electricity suppliers and shouldering the debt of the distribution company. The agreement included signing a memorandum with a government option to repurchase/restructure the debt from the external creditor. In 2004, the Colombian government assumed the debt of the Medellín metro system of around US$2.435 billion, equivalent to 2.1 percent of GDP (the regional government, comprised of Medellín and Antioquia, contributed an additional US$513 million).

As can be seen in Table 1, SOE debt for the 46 countries[3] for which information is available represents, on average, 19 percent of GDP. In 20 of these countries this ratio exceeds 10 percent. Russia and China have the highest ratio of SOE debt to GDP. In Russia, SOE borrowing was 142 percent of GDP in 2012, when the survey was conducted. Moody's estimated a ratio of 115 percent for China in 2016. Excluding these extreme cases, average SOE borrowing in the sample drops to 12.4 percent of GDP, a result that is slightly higher for the advanced economies than for developing economies (Table 1 and Figure 1).

[2] The fiscal cost distribution shows an asymmetry toward the right, implying a low frequency of CLs with fiscal costs of over 20 percent of GDP.

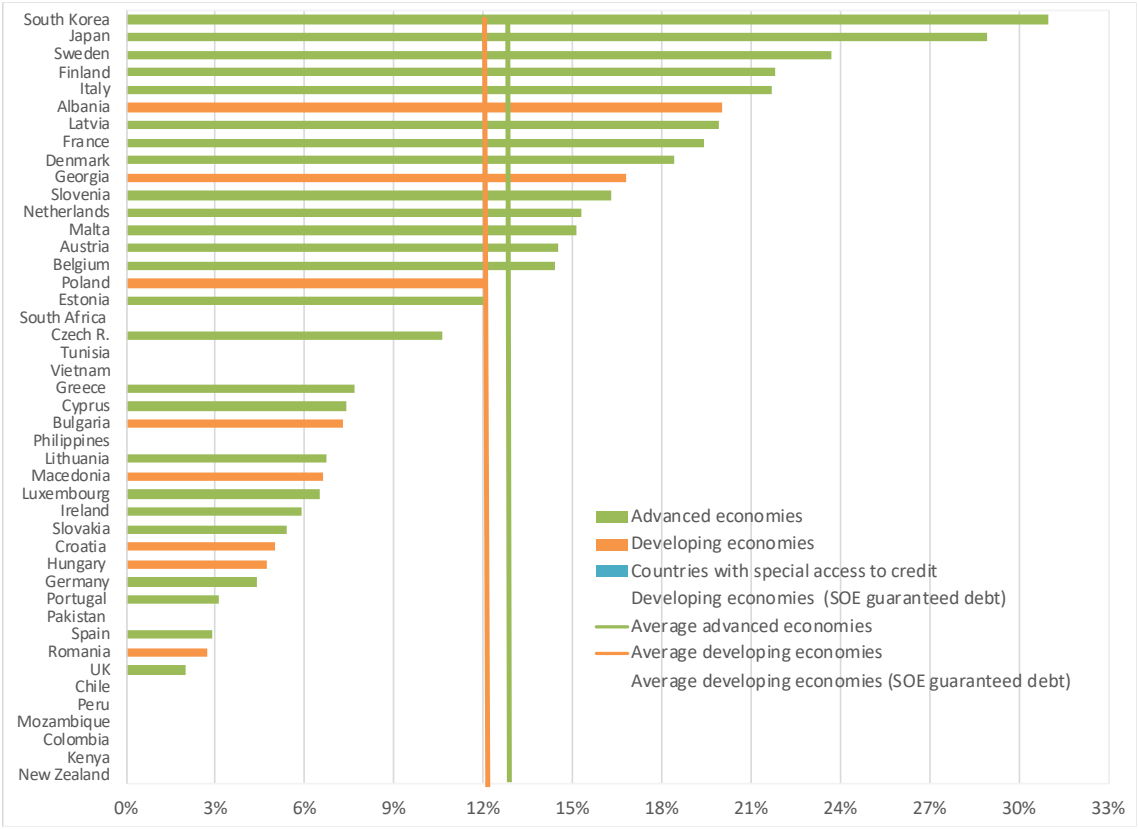
[3] See the list in Table A2 of the annex.

Table 1. Public Debt and State-owned Enterprise Borrowing (averages[a])

	General average	Advanced economies	Developing economies [c]	Latin American economies
Public debt (percentage of GDP)	**62.9%**	75.1%	50.0%	32.3%
Cases	**46**[b]	26	16	3
Cases > 60% of GDP	**18**	14	4	0
SOE debt (% of GDP)	**19.0%**	13.4%	9.4%	
Cases	**35**	25	8	n/a
Cases > 10% of GDP	**20**	15	3	
SOE guaranteed debt (% of GDP)	**3.6%**	1.9%	4.7%	0.6%
Cases	**12**[b]	2	9	3
Cases > 5% of GDP	**4**	0	4	0
SOE debt/public debt	**65.8%**	27.7%	19.6%	
Cases	**35**	25	8	n/a
Cases > 20% of GDP	**18**	12	4	

Source: Authors' elaboration, based on Table A2 of the annex.
Notes: The IMF classification of countries was adopted. n/a= not available.
[a] The average data for each category are obtained based on the country data found in Table A2 of the annex. The country data correspond to the 2012–18 period, according to the latest available data for each country (Table A2 of the annex).
[b] Includes Mozambique and Kenya, classified as having "special access to credit".
[c] Excludes Russia and China. The averages for developing economies after their inclusion are 47.5 percent, 32.2 percent, 4.7 percent, and 160.9 percent for public debt, SOE debt, SOE guaranteed debt and SOE debt/public debt, respectively.

Figure 1. State-owned Enterprise Borrowing (percentage of GDP)



Source: Authors' elaboration, based on the annex.
Note: China and Russia were excluded (developing countries), with SOE debt of 115 percent and 142 percent of GDP, respectively.

With regard to SOE borrowing with an explicit guarantee, information is available for only 12 of the 46 countries surveyed. The average ratio is 3.6 percent of GDP, with four cases where it exceeds 5 percent of GDP.[4] South Africa has the highest ratio, with guarantees representing 10.6 percent of GDP. Bachmair and Bogoev (2018) point out that the nine largest South African SOEs have financial commitments representing 20.4 percent of GDP, while, of that total, borrowing backed by explicit state credit guarantees reaches 6.2 percent of GDP (just over 30 percent of the debt).

The issuance of explicit debt guarantees by governments varies by country. Around 50 percent of the Organisation for Economic Co-operation and Development (OECD) member countries authorize the issuance of state guarantees for commercial debt (OECD, 2018). In Africa, most of the sovereign risk arises from explicit credit guarantees to SOEs (CABRI, 2017). In Latin America, the issuance of explicit guarantees by the State is also a frequent practice (see Table A2 of the annex) (OECD, 2014; Ter-Minassian, 2017). As has been shown in the past, the absence of an explicit guarantee is no impediment to the State's assuming the risks of SOE borrowing. In fact, there is a general perception of an implicit guarantee for financing. In Panama, for example, the State assumes the existence of a guarantee even when there are no explicit documents or regulations.

2. Credit Guarantees for State-owned Enterprises: Regulatory Framework

The existence of an explicit regulatory framework for SOE borrowing and the granting of credit guarantees are fundamental elements of the credibility, transparency, and sustainability of public finances because a clear and defined institutional structure limits government exposure. This framework must specify the procedures to be followed (e.g., for the granting, valuation, and accounting of guarantees), current requirements and limits, and the responsibilities and attributes of the actors involved.

The SOE credit guarantee regulatory framework is organized on two levels. The first is comprised of supranational regulations expressed in recommendations or guidelines put forward by international agencies. The second applies to the national level (and the supranational level when countries are part of a union). In general, it is based on the adoption and adaptation of the guidelines provided on the first level. These rules and procedures establish the incentives and the restrictions that guide the decisions and strategies of the actors that intervene in the guarantee granting process.

2.1. Supranational Regulation: Accounting, Registration, and Valuation

The international standards regarding CL accounting and registration come under three basic variants: (i) the International Public Sector Accounting Standards (IPSAS) rules, developed by the International Public Sector Accounting Standards Board (IPSASB); (ii) the International Monetary Fund (IMF) directives; and (iii) the Eurostat directives. The three basic systems have similarities and differences.

[4] This average underestimates the value of guarantee-backed debt, since for Colombia and New Zealand, the estimate of the CL for guaranteed SOE debt is reported. Moreover, in the latter case, non-quantifiable CLs are excluded.

Under the IMF rules and those of Eurostat, only standardized guarantees should be included on the balance sheet, that is, those granted in large number and under similar conditions and whose probability of execution can therefore be estimated according to past experience. The remaining explicit CLs should be considered, in general, exclusively as a memorandum item on the public sector balance sheet. In any case, all guarantees granted by the government or the CLs that could influence the public budget must be published annually, including identification of their final beneficiaries, the value of the gross exposure, and the probability of execution. The one-off guarantees—those granted in special cases, which are not repeated, and whose probability of execution, therefore, cannot be reliably estimated—must necessarily be registered as public debt, especially when the main borrower is undergoing financial stress and there is a high probability that the guarantee will be executed.

The IPSAS rules (IPSAS 19) establish that guarantees must be recognized and recorded as a provision in the balance sheet if the probability of occurrence is higher than 50 percent and the amount of the obligation can be reliably estimated. The following information must be reported for each provision: (i) the carrying amount at the beginning and the end of the period; (ii) additional provisions made; (iii) amounts used during the period; (iv) unused amounts reversed during the period; and (v) the increase in the discounted amount arising from the passage of time or any change in the discount rate (whenever applicable). Furthermore, the guarantees with a probability of execution of below 50 percent and above 0 should not be registered, but reported as a memorandum item on the balance sheet. The information reported must include: (i) an estimate of its financial effect (similar to the registered guarantees); (ii) an indication of the relative uncertainty of the amount or the timing of the financial outflows; and (iii) the possibility of reimbursement of the funds.

There are obvious similarities in the valuation criteria. The IPSAS 19 rules stipulate that the valuation of a guarantee should be the best estimate of the disbursement necessary to cancel the obligation. When the estimate involves a large number of different cases, their expected value should be used. Likewise, both IMF and Eurostat rules determine that in the case of standardized guarantee schemes, the present value of the expected amount to be covered by the guarantor must be estimated. To calculate the amount, the probability that the guarantor will have to assume responsibility for the guarantee provided must be estimated.[5]

2.2. National and Supranational Regulatory Frameworks

SOE credit guarantee regulation begins with regulations applicable to public borrowing in general and SOE borrowing in particular that have to do with the circumstances that give rise to the issuance of guarantees. For example, the Stability and Growth Pact establishes that in no European Union (EU) country can the gross debt-to-GDP ratio exceed 60 percent. In the financial and fiscal vulnerability analysis that it applies to countries, the IMF also includes, among other parameters, a ratio of 60 percent as an early warning sign for risks arising from borrowing. These guidelines provide a frame of reference for SOE borrowing.

[5] The IMF suggests that the rest of the explicit guarantees granted (one-off, for example) should be presented at their nominal value.

With regard to SOEs, among the measures to minimize the risk posed by their obligations, administrative procedures can be established that limit their public funding and/or restrict their borrowing, as well as regulations that specify restrictions on bailouts or the existence of laws that allow SOEs to go bankrupt.

In practice, the frameworks that regulate the issuance of credit guarantees vary widely among countries, specifically with respect to the restrictions applied to granting them.[6] In countries where there are limits, an annual budget limit is usually established for the total stock of guarantees. In most cases, this is a soft limit that can be modified annually with the publication of each budget.[7] Less frequently, restrictions are applied to the object of the funding to be guaranteed, stipulating that only infrastructure or investment projects are eligible (e.g., in Austria, Ecuador, Spain, and Peru); only a partial guarantee might be permitted (e.g., in Iceland, Turkey, and Vietnam), or certain financial requirements are established for the borrower, such as, for example, a minimum debt/capital ratio (e.g., in Colombia and Vietnam).

Furthermore, SOEs must meet certain requirements before guarantees are granted. The most common are the demand for a counter guarantee or collateral and evidence attesting to the SOE's financial viability or its capacity to repay the debt. Vietnam is a paradigmatic case. In 2017, it severely restricted the leeway for SOEs (and other bodies) to access sovereign guarantees.

Beyond the conditions and requirements instituted in the regulatory sphere, there is very often a gap between legality and practice. This may be expressed, among other ways, in the existence of rules that are not audited and that, therefore, are largely ignored. Governments issue credit guarantees according to political and economic priorities. These can change over time, depending, among other things, on the evolution of domestic and global markets.

Following this decision, approving a guarantee requires intervention by a higher authority. In some countries, this might be a collegiate body appointed by the executive branch, or the country's president may make the decision. Even with this approval, however, authorization by the legislature is usually required.

[6] South Africa is a problematic case, as seen in Section 1, in that there are no limits to the granting of guarantees.

[7] In Brazil, the situation is stricter, since by law, the pending amount of the guarantees envisaged must not exceed 60 percent of the federal government's current net annual revenue.

3. Estimate of Contingent Liabilities Arising from Credit Guarantees to State-owned Enterprises

Given its quantitative relevance and regulatory trends, quantifying CLs is indispensable for effective management to mitigate the risks faced by the State as the guarantor of SOE borrowing. Table 2 presents a classification of CLs that arise from SOE credit guarantees, identifies their object, and categorizes them according to whether they are explicit (i.e., when there is a legal instrument that provides the guarantee) or implicit (i.e., when there is a de facto assumption of the SOE's debt by the State).

Table 2. Classification of Contingent Liabilities arising from Guarantees to State-owned Enterprises

Type/source of the CL	Credit guarantee	Other guarantees
Explicit	Guaranteed bonds/loans	Take or pay contracts; input price guarantees
Implicit	Partial bailout (for example, bonds)	Bailout (default)

Source: Authors' elaboration.

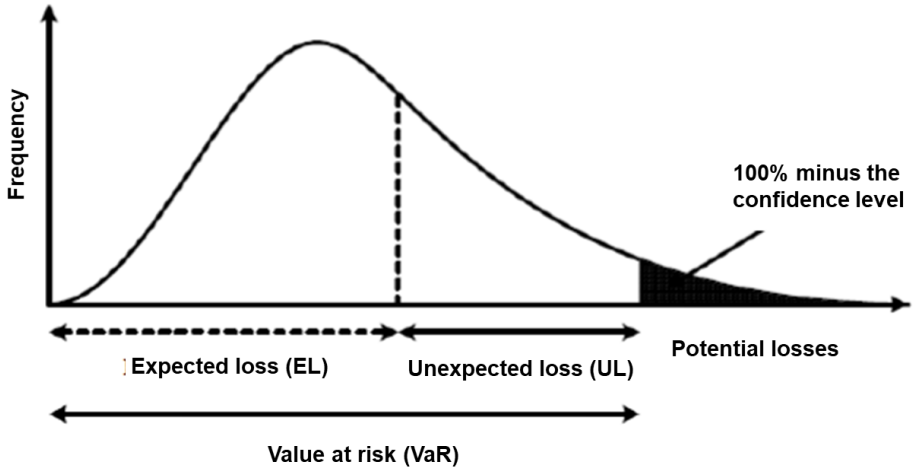
These characteristics help limit the field of action and define the essential elements needed to estimate CLs. Regardless of whether the CLs are explicit or implicit, there are always three elements: (i) the (maximum) exposure of the State (more difficult to determine in the case of implicit guarantees), (ii) a correction factor that indicates the effective impact of a default, and (iii) the probability of occurrence of the event that triggers the guarantee. This probability, normally assumed to be the probability of default, can also be understood as the probability of financial distress or stress. Under this approach, firms would not go into default; rather, the guarantee would be executed to make the payment immediately before the default occurs. This is the approach taken by Bachmair and Bogoev (2018) in their work applied to the case of South Africa, and it is the practice used in Honduras to estimate implicit CLs arising from SOEs.

3.1. Basic Approach

The standard methodology for estimating the stock of CLs faced by the sovereign due to SOE credit guarantees is based on an estimate of the expected losses in the CL portfolio over the desired time horizon.[8] Expected losses are an estimate of the average loss that would be expected annually in a well-diversified portfolio (Figure 2) (Bachmair, 2016; Bachmair and Bogoev, 2018; BCBS, 2005). In general, according to this methodology, an estimate of the CLs can be obtained for short periods. For example, Colombia uses this approach for the period of one year.[9]

[8] Unforeseen losses may also be considered. These refer to the (infrequent) possibility of assuming very high costs in "extreme" scenarios.
[9] Resolution No. 0932 of the Ministry of the Treasury and Public Credit (Ministerio de Hacienda y Crédito Público) of Colombia (April 10, 2015).

Figure 2. Typical Loss Distribution



Source: BCBS (2005).

In algebraic terms, *EL* (expected loss) is defined as:

$$EL = \sum_{i=1}^{N} LGD_i * EAD_i * P(D)_i \qquad \text{(i)}$$

where:

EAD_i (exposure at distress) is the exposure to default, measured as the capital balance of the CLs in current values at the time of default.

LGD_i (loss given default) is the loss due to the default. This is a parameter that adjusts the value of EAD_i considering the coverage and the fraction of the CLs that is expected to be recovered in the event that the SOE incurs the liability i; in other words, this parameter seeks to identify the real impact that materialization of the CL will have.

$P(D)_i$ is the probability of default of the asset i.[10]

[10] The measures of probability of default or distress are limited to include factors related to the effective possibility of payment, rather than willingness to pay.

Exposure at Distress (EAD)

In the case of debt guarantees, the EAD_i is the amount of the bonds issued and guaranteed and/or of the commercial loans that the SOE has acquired and that also have a guarantee. Specifically, the EAD_i is determined by the characteristics of (i) the guarantee or surety contract and (ii) the loan contract or the clauses of the bonds issued/guaranteed. Under these circumstances there are two basic alternatives, according to whether or not there are acceleration clauses in the debt obligation. In the first case, the EAD_i is equivalent to a single payment that cancels the amount of the capital balance of the guaranteed debt, added to any accrued service and non-payment that might exist. In the second, the event that triggers the contingency requires the State to continue servicing the debt of the guaranteed borrower. In the latter assumption, the EAD_i for each moment of time is the flow of payments (capital and interest) that remains from the occurrence of the contingency until the maturity of the guaranteed debt.

In algebraic terms:

$$EAD_{i,t} = \delta * \mu_{i,t}\left(1-\delta\right) * \phi_{i,t} \qquad \text{(ii)}$$

where:

$\mu_{i,t}$ represents the amount that cancels the capital balance; $\phi_{i,t}$ represents the vector of the flows of payments of capital and interest,[11] and δ is a parameter that represents the form in which the treasury assumes responsibility for the CLs—given the characteristics of the guaranteed debt. The value is 1 if a single payment is made and 0 if the liability takes the form of a flow of payments.

A further characteristic to bear in mind when estimating the exposure to default—or maximum exposure—is whether the debt has a cross-default clause under possible stress. Should such a clause exist, the exposure extends to the entire SOE debt. An identical criterion applies when there is no explicit guarantee, but there is an implicit one.

Loss Given Default (LGD)

The adjustment parameter LGD_i represents the percentage of the expected exposure to default that the State must address in the event of a default on the liability i. In general, it would be limited by (i) the State's negotiating capacity to get creditors to accept a haircut regarding the amount to pay (renegotiate terms, rates, etc.) and (ii) the possibility of recovering part of the cost by sequestering the original borrower's resources or on the existence of improved credit terms (counter guarantees, additional guarantees, etc.).

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[11] Each vector $\phi_{i,t}$ can be expressed as the sum of a vector that contains the capital payments $k_{i,t}$ and another vector that shows the payment of interests $I_{i,t}$.

$$\phi_{i,t} = k_{i,t} + I_{i,t}.$$

Therefore, representing the State's capacity to negotiate with different creditors as γ_1, and the fraction expected to be recovered as γ_2, LGD_i can be quantified as follows:

$$LGD_i = \left(1 - \gamma_1 - \gamma_2\right) \qquad \text{(iii)}$$

where:

γ_1 and γ_2 are between 0 and 1, with the restriction that LGD_i is also located in the same interval.

To summarize, including an estimate of parameter LGD_i in the analysis and estimate of CLs arising from SOE credit guarantees implies considering jointly the creditor's characteristics (γ_1) and the possibility of recovering at least some of the money provided through counter guarantees or, more generally, through mechanisms that help the guarantor to recover funds (e.g., investment trust flows, collateral, or others), and of the guarantor's willingness and capacity to use them. Parameter γ_1, which refers to the negotiating power of the borrower and guarantor, is minimum with respect to multilateral agencies and official creditors and maximum when the creditor is the public sector (including public banks). Located in intermediate situations are, in decreasing order, foreign banks and foreign debt holders, and local banks and domestic debt holders.

Parameter γ_2 is maximum when there is no explicit commitment of a counter guarantee and minimum when the borrower has previously made contributions to a fund or there are investment trust flows. The intermediate alternatives include the existence of flows liable to be withheld or the availability of collateral. Table 3 shows the range of variability for the different creditor-guarantee combinations.

Table 3. Determining the Parameter LGD_i

Creditor / Counter guarantee	Multilateral agency	Official creditor	Foreign banks and foreign debt holders	Local banks and domestic debt-holders	Public sector [a]
Without explicit commitment	$[0,9;1]$	$[0,9-\gamma_1;1]$	$[0,9-2\gamma_1;1]$	$[0,9-3\gamma_1;1]$	$[0,9-4\gamma_1;1]$
Flows liable to be withheld/ collateral	$[0,9-\gamma_2;1]$	$[0,9-\gamma_2-\gamma_1;1]$	$[0,9-\gamma_2-2\gamma_1;1]$	$[0,9-\gamma_2-3\gamma_1;1]$	$[0,9-\gamma_2-4\gamma_1;1]$
Previous contributions/trust flows	$[0,9-2\gamma_2;1]$	$[0,9-2\gamma_2-\gamma_1;1]$	$[0,9-2\gamma_2-2\gamma_1;1]$	$[0,9-2\gamma_2-3\gamma_1;1]$	$[0,9-2\gamma_2-4\gamma_1;1]$

Source: Authors' elaboration.

Notes: γ_1*:* linear rate at which the power of the creditor decreases; γ_2: linear rate at which counter guarantees increase; $[x;1]$*:* uniform distribution between x and 1.

[a] Includes public banks.

Probability of Default

The relevant probability of the event that triggers the contingency is determined by the fact that the borrower experiences a default event (or distress), which will enable the creditor to request the corresponding payment from the guarantor. This parameter can be approximated, for one year, by using the spreads of the credit default swaps (CDS) of the sovereign extrapolated to the SOE, taking into account its credit ratings or those of its instruments. This is the methodology used in Colombia, for example. The extension to longer terms and, therefore, the estimate of different probabilities over time, can be carried out by using Markov transition matrices, which indicate the probability that the SOE incurs default in any future period[12] (Table 4).

Table 4. Transition Matrix to Determine the Probability of Default

	$R1_{t+1}$	$R2_{t+1}$	$R3_{t+1}$	$R4_{t+1}$	$R5_{t+1}$
R1t	$s-a$	p_{12}	0	0	$p_s^{4/5}$
$R2_t$	p_{21}	$s-2a$	p_{23}	0	$p_s^{3/5}$
$R3_t$	0	p_{32}	$s-3a$	p_{34}	$p_s^{2/5}$
$R4_t$	0	0	p_{43}	$s-4a$	$p_s^{1/5}$
$R5_t$	0	0	0	0	1

Source: Authors' elaboration.

where:

Rh_t (h=1,…,5) is the credit rating of the bond at moment t. The performance ranking goes from 1 (best) to 4 (worst), with 5 being a default situation. (The rating can be elaborated internally or by rating agencies.)

p_s is the probability of sovereign default.

$s=1-p_s$ is the probability of solvency of the sovereign.

a is a parameter for the stability of the ratings (or the "rate of transition").

$p_{j,k}\left(j,k=1,\ldots,\right)$ is the probability of transition of the rating j to the rating k.

To simplify, the existence of four possible rating levels and the default is assumed. It is assumed that the probability of remaining in the same rating decreases linearly at a rate a of transition, insofar as the rating is reduced; that is, the lowest ratings are more volatile than the highest ratings. Likewise, it is assumed that—with the four possible rating levels—the probability of transitioning from rating *j* to rating *k* for nonconsecutive

[12] Transition matrices are usually used to establish the probability that one rating "migrates" to another, after a period of time has elapsed. If these migrations are homogeneous (that is, if the probabilities of migrating from one rating to another remain constant over time, regardless of the period concerned), the probability that a given rating in the moment *t=0* migrates to another rating in the moment *t+i* with *i>0* is obtained by the multiplication of the initial matrix. Thus, the Markov matrix can be used to find the probability of default in each future *t*, for a firm that in *t=0* obtained a certain rating, regardless of its history.

values of *j* and *k* is zero. For example, if the credit rating in *t* was 1, the probability that the credit rating in *t+1* is 3 would be zero (p_{13}=0).

In general it can be stated, according to the outcome of the Markov matrix, that the estimate of $P(D)_i$ requires establishing, on the one hand, the probability of sovereign default (as a point of reference) and, on the other, the rating (either internal or the risk rating) of the SOE debt as a starting point at the initial moment.

The probability of sovereign insolvency (p_s) can be estimated in two ways. The first requires direct market information to be used, such as spreads of CDS contracts or spreads measured by the Emerging Markets Bond Index. One possible approach to estimating the probability of default using information provided by CDS spreads, for the term of one year,[13] is the following:

$$p_{s,t} = \frac{s_t(1+r_t)}{(1-RR)} \qquad \text{(iv)}$$

where:

$p_{s,t}$ is the probability (risk neutral) of default for the period of the contract.

s_t is the CDS spread, measured in basis points.

$(1-RR)$ is the recovery rate.

r_t is the risk-free rate (e.g., the U.S. Treasury bond rate with the same maturity as that of the debt or the period considered).

By following this procedure, a series can be obtained for p_s and, based on its measurement and standard deviation, a log-normal distribution that will determine its behavior. If this information is unavailable, an alternative for estimating p_s requires the use of historical information from rating agencies and "indirect" market information, such as information from other sovereigns with a similar debt rating.

Estimate of Long-term Contingent Liability

In the basic approach, *EL* is expressed in common currency, according to its short-term time horizon. When the long term is considered, the CL flows must be discounted over time to a relevant risk-free rate *(r)*. The expected losses therefore take the form of the expected value adjusted to the pending balance at the time of the default or financial stress. The proposed approach is expressed as follows:

$$EL = \sum_{t=1}^{T} \frac{EAD_t * LGD * P(D=1)}{(1+r)^{t-1}} \qquad \text{(v)}$$

[13] If there is information available regarding CDS contracts for different periods, then a more robust method may be applied, such as the one presented in Duffie (1999).

3.2. A Hypothetical Case

A stylized example illustrates the proposed methodology. For the sake of simplicity and illustration, this hypothetical exercise is set in a non-random world model. However, the estimation technique differs from the methodology proposed above only in operational terms.[14]

Let us suppose that an energy sector SOE takes out a loan from a foreign bank for US$20 million with an explicit guarantee from the State for the total amount. The loan is over 10 years at a 5 percent annual interest rate, with amortization payments in 10 annual and equal installments. Since the loan does not include an acceleration clause, in the event of noncompliance, the payments must continue to be made according to the original schedule $(\delta = 0)$. There are no counter guarantees $(\gamma_2 = 0)$. The annual risk-free rate is 1.5 percent (Table 5).

Table 5. Characteristics of the Loan and Parameters Used

Concept	Characteristics	Value
State guarantee; exposure	Explicit; total	US$20 M
Counter guarantees	No	$\gamma_2 = 0$
Negotiating power	International bank	$\gamma_1 = 0.1$
Repayment schedule	No acceleration	$\delta = 0$
Discount rate	Nominal annual rate	r = 0.015
***LGD**$_i$*	$0{,}9 - 2\gamma_1$	$LGD = 0.7$

Source: Authors' elaboration.

The loan does not have a credit rating,[15] which means that the office responsible for the loan in the Ministry of Finance carries out an internal evaluation and assigns a credit rating to the SOE. Let us suppose that an evaluation of 3 was obtained as a rating for the SOE (in a performance ranking that runs from 1, best, to 4, worst, while 5 is default). Supposing that the CDS spread at one year is 300 basis points for the country and that the recovery rate is 75 percent for the sovereign, then a 4.08 percent probability of default is obtained (Table 6).

[14] Randomness is introduced by employing software commonly used in public debt offices, such as Oracle Crystal Ball or @Risk.
[15] Neither does the firm in question.

Table 6. Parametric Information Relevant to the Markov Matrix

Parameter	Unit/ identification	Value
CDS spread	Basis points	300
Risk-free rate	Basis points	200
Recovery rate of the sovereign	$1-RR$	0.75
Probability of sovereign default	p_s	0.0408
Probability of solvency of the sovereign	s	0.9592

Source: Authors' elaboration.

This probability is used in the Markov matrix, along with the probabilities of transition between ratings, to find the probabilities of transition between states to longer terms. If the parameter of stability of the classifications is $a = 0.15$, then the Markov matrix presented in Table 7 is obtained.

Table 7. Markov Matrix Based on the Proposed Assumptions

	R1 $_{t+1}$	R2 $_{t+1}$	R3 $_{t+1}$	R4 $_{t+1}$	R5 $_{t+1}$
R1$_t$	0.8092	0.1134	0	0	0.0774
R2$_t$	0.0647	0.6592	0.1294	0	0.1467
R3$_t$	0	0.0709	0.5092	0.1418	0.2781
R4$_t$	0	0	0.1134	0.3592	0.5274
R5$_t$	0	0	0	0	1

Source: Authors' elaboration.

Using this procedure establishes in probabilistic terms the moment that the SOE is expected to incur execution of the guarantee. Subsequently, to estimate the expected loss for this loan, a probability of 1 is assigned from the period in which the Markov chain reached the state of default, and 0 if it was not reached, since the previous payments are considered to have been made by the SOE and only those pending after the default should be covered by the guarantee.

The present value of the expected loss from the guarantee of this loan is obtained according to the proposed methodology [summarized in equation (v)]. Table 8 presents the flow of loan funds relevant for obtaining the value of the CL.

Therefore, introducing the SOE credit rating into the Markov matrix, using the probability of sovereign default (which is based on the country's historical CDS information), an ad hoc transition parameter, and the correction proposed by the parameter LGD_i (which is obtained for the characteristics of the loan in Table 5) produces a present value for the CLs for a 10 year period, or an expected loss at the 95 percent confidence level, of US$7.26 million.

Table 8. Flow of Funds and Estimate of Expected Loss (in millions of US$)

	Year									
	1	2	3	4	5	6	7	8	9	10
Amortizations	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Coupons	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10
Total services	3.00	2.90	2.80	2.70	2.60	2.50	2.40	2.30	2.20	2.10
Discount factor (percent)	100.0	98.5	97.1	95.6	94.2	92.8	91.5	90.1	88.8	87.5
Probability of transition R3 to R5 (percent)	27.8	50.5	76.5	93.2	98.8	99.9	100.0	100.0	100.0	100.0
Default						1	1	1	1	1
EAD						2.50	2.40	2.30	2.20	2.10
EAD * LGD discounted						1.62	1.54	1.45	1.37	1.29
Expected loss TOTAL	7.26									

Source: Authors' elaboration.

This result does not include randomness, which, for simplicity's sake, is eliminated from the example. However, to obtain the result with stochastic variability, simulation software can be used, making as many iterations as considered necessary (e.g., 5,000), and achieving a complete simulation by using the Monte Carlo method. In each iteration, a result is calculated, from which the distribution of the present value of the CLs arising from the guarantee could be obtained. The process is as follows: (i) the values of LGD_i are calculated at random using uniform distributions delimited by γ_1 (type of creditor) and γ_2 (type of counter guarantee), given the initial value of the upper limit; (ii) a value is obtained for the probability of sovereign default based on the log-normal distribution with the median and deviation calibrated on the basis of the CDS historical data, with this value and that of the transition parameter, to calculate the matrix of transitions in the Markov chain; (iii) based on this matrix, a simulation of the random process of transition toward the loan default is made, obtaining the period in which the borrower defaults or, failing that, an iteration in which the borrower remains solvent for the entire time horizon of the simulation (as occurs in every Markov process; once there is a default in the chain of events, it is considered that the borrower remains in that state until the end of the projected flow); and (iv) the present value of the simulated contingent flow is calculated.

3.3. Valuation in Practice

To estimate the State's maximum exposure to SOE credit guarantees, Bachmair and Bogoev (2018) assume, in the case of South Africa, that the government will intervene to make payments to creditors in case of a distress event and that, therefore, the creditors do not accelerate the debts, assuming a similar maturity period for both guaranteed and nonguaranteed liabilities. When accounting for all liabilities—not just

guaranteed debt—these authors also assume strong implicit government backing for nonguaranteed liabilities.[16]

In South Africa, estimates of the probabilities of distress--$P(D)$--are based on the internal risk rating determined by the National Treasury for each institution. The National Treasury's Assets and Liabilities Management (ALM) department supervises the entities that generate CLs for the State. To evaluate the credit quality of these entities, the ALM developed an internal credit rating system that is used by credit analysts to evaluate the entities. It is based on various qualitative and quantitative factors that evaluate the operational environment, the regulatory framework, management quality, diversification, profitability, solvency, and liquidity, among others. The entities are usually classified on a scale of 1 (low risk) to 9 (high risk). Then, the treasury compares its internal risk ratings with Moody's rating scale and estimates the $P(D)$ for each rating category. The internal risk ratings of the National Treasury of South Africa provide an accurate reflection of the credit risk.

In Honduras, the Fiscal Contingency Unit, within the Ministry of Finance, conducts a similar internal rating procedure, in this case based fundamentally on the SOE's financial performance indicators. The decision to design an internal rating system arose from the lack of credit ratings for Honduran SOEs. As in the case of South Africa, the internal ratings are then translated into the rating scale of the risk-rating agencies and, based on the use of transition matrices, the probability of default is obtained. Colombia takes a similar approach in translating the credit risk rating into the probability of default. However, in this case, it also uses the available external ratings.

4. Mitigation of Risks from Guarantees to State-owned Enterprises

Managing the risk of SOE credit guarantees is a fundamental element of effective management of the public sector balance sheet. As previously indicated, SOE credit guarantees can become a very significant contingency from the fiscal standpoint if they are not managed appropriately. Measuring contingency is only one task in an integrated risk management cycle in which, put simply, the following three phases can be discerned: (i) identification, analysis of alternatives, and quantification of risks; (ii) design of prevention mechanisms, retention, and transfer of risks; and (iii) risk control and monitoring.

With respect to identifying and evaluating alternatives, before issuing a guarantee, it is essential to analyze the various support options available to SOEs (e.g., guarantee vs. budgetary support), following a cost-benefit or cost-effectiveness analysis and a transparent process. Then, if the guarantee is not the most appropriate option, the reasons must be provided in the clearest and most understandable way to reduce possible arbitrariness. If granting a guarantee is the most appropriate course, then the risk management process must be duly followed.

[16] According to Bachmair and Bogoev (2018), this approach is consistent with market data, since the observed spread between the nonguaranteed SOE debt and government bonds is insignificant.

Risk prevention, retention, and transfer mechanisms are central to risk management. On the prevention side, it is crucial to avoid potential problems of moral hazard and opportunistic behavior in granting SOE credit guarantees. To this end, the first line of mitigation is through compliance with possible limitations linked to maximum exposure to guarantees, or to the purpose of such guarantees (Ülgentürk, 2017). Likewise, guarantees must be designed following best practices in terms of price, level of coverage, objectives and time limits, collateral, and thresholds.

With respect to retention and transfer of risk, it is important that the country decides which part of the risk it chooses to retain and which part to transfer. The greater the probability and the lower the impact of the risk, the more expedient it will be to retain it. The decision, therefore, to choose one option over another will depend on the risk quantification. Among the options for dealing with retained risk is the creation of specific contingency funds (as in the case of Colombia). The transfer of risks is generally carried out through insurance companies or guarantees from multilateral agencies. Since multilateral agencies usually boast a very high credit rating, guarantees from multilateral agencies can also have positive effects on the capacity of countries to gain access to international markets on better terms and at lower cost.

Finally, from the risk monitoring and control perspective, it is important to consider the assignment of responsibilities and the different actors involved, as well as to specify the agencies or public offices involved and the mechanisms for coordination between them. This is fundamental for ensuring process transparency and accountability. Furthermore, to avoid or minimize the creation of implicit CLs, periodic technical and financial monitoring is required. Monitoring, auditing, and reporting CLs are also mechanisms for mitigating risk arising from CLs.

5. Conclusions

This note has described a methodology for measuring the CLs arising from guarantees granted to SOEs and their relevance for appropriate risk management. This exercise has sought to illustrate the importance of measurement for accurate risk identification, evaluation, monitoring, and reporting. Various key questions have emerged for adequate risk measurement and management, the most important being the following:

- First, regulatory frameworks are needed to regulate risk measurement and management using methodologies that are both rigorous and simple to apply, as well procedures that assign clear responsibilities with regard to the different phases of risk management linked to the issuance of sovereign guarantees. Most countries lack the frameworks needed to define a method of evaluating whether a guarantee is the best option, enable its risks to be measured, establish good criteria for its operation, or establish registration and reporting requirements, among other considerations.

- Second, well-defined strategies must be in place to decide whether to retain or transfer the assumed risks. In part due to the lack of risk measurement mechanisms, countries lack clear strategies on whether to retain or transfer the risks they assume. It is therefore possible that they assume risks without

adequate coverage, or that transferring them to third parties would be more efficient, thereby generating benefit from the standpoint of the public sector balance sheet.

Progress on these two questions would be essential to enable countries to prevent the opportunistic use of SOE credit guarantees, with a view to improving both governance and performance. In this way, contingencies with grave impacts on the public sector balance sheet and, consequently, on society as a whole, could be avoided.

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. Policy Research Working Paper No. WPS 7538. Washington, DC: World Bank Group.

Bachmair, F. and J. Bogoev. 2018. Assessment of Contingent Liabilities and their Impact on Debt Dynamics in South Africa. MTI Discussion Paper. Washington, DC: World Bank Group.

Basel Committee on Banking Supervision (BCBS). 2005. An Explanatory Note on the Basel II IRB Risk Weight Functions. Basel, Switzerland: Bank of International Settlements.

Bova, E., M. Ruiz-Arranz, F. Toscani, and H. Elif Ture. 2016. The Fiscal Costs of Contingent Liabilities: A New Dataset. IMF Working Paper No. 16/14. Washington, DC: International Monetary Fund.

Collaborative Africa Budget Reform Initiative (CABRI). 2017. Management of Explicit Contingent Liabilities: Credit Guarantees for State-owned Entities' Debt. Available at: https://www.cabri-sbo.org/en/publications/management-of-explicit-contingent-liabilities.

Demaestri, E., C. Moskovits, and J. Chiara (Compilers and editors). 2018. Management of Fiscal and Financial Risks Generated by PPPs. Conceptual Issues and Country Experiences. Discussion Paper No. IDB-DP-628. Washington, DC: Inter-American Development Bank.

DIPRES. 2018. Informe de Pasivos Contingentes 2017. Dirección de Presupuestos, Ministerio de Hacienda: Santiago, Chile. Available at: http://www.dipres.gob.cl/598/articles-172509_doc_pdf.pdf.

Duffie, D. 1999. Credit Swap Valuation. Financial Analysts Journal, 55(1): 73–87.

European Commission 2016. State-Owned Enterprises in the EU: Lessons Learnt and Ways Forward in a Post-Crisis Context. European Economy Institutional Paper No. 031. Brussels: European Commission.

Eurostat. 2013. European System of Accounts: ESA 2010. Luxembourg: Publications Office of the European Union.

_____. 2018. The Extent of Contingent Liabilities and Nonperforming Loans in the EU Member States. Press release. Available at: https://ec.europa.eu/eurostat/documents/2995521/8624398/2-29012018-AP-EN.pdf/ee504046-6ccc-4b79-8dfb-7a5e1d38328f 7a5e1d38328f.

Finance Division, Government of Pakistan. 2018. Pakistan Economic Survey 2017–18. Available at: http://www.finance.gov.pk/survey/chapters_18/Economic_Survey_2017_18.pdf.

Ministerio de Hacienda de Colombia. 2018. Marco Macro Fiscal de Mediano Plazo 2018. Bogotá D. C.: Government of Colombia. Available at: http://www.minhacienda.gov.co/HomeMinhacienda/ShowProperty?nodeId=%2FOCS%2FP_MHCP_WCC-119167%2F%2FidcPrimaryFile&revision=latestreleased.

Moody's Global Credit Research. 2016. Government of China: Sovereign Exposed to Sizeable, Rising Contingent Liabilities. New York, NY: Moody's Investor Services.

Musacchio, A. and E. Pineda (Eds.). 2019. Fixing State-Owned Enterprises. New Policy Solutions to Old Problems. Available at: https://publications.iadb.org/en/fixing-state-owned-enterprises-new-policy-solutions-old-problems.

OECD. 2014. Financing State-Owned Enterprises: An Overview of National Practices. Paris: OECD Publishing. Available at: https://doi.org/10.1787/9789264209091-en.

_____. 2018. Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices. Paris: OECD Publishing. Available at: https://www.oecd.org/daf/ca/ownership-and-governance-of-state-owned-enterprises-a-compendium-of-national-practices.htm.

National Treasury, Republic of South Africa. 2018. Budget Review 2018. Available at: http://www.treasury.gov.za/documents/national%20budget/2018/review/FullBR.pdf.

Polackova Brixi, H. 2012. Avoiding Fiscal Crisis. *World Economics,* 13: 27–52.

Ter-Minassian, T. 2017. Identifying and Mitigating Fiscal Risks from State-Owned Enterprises (SOEs). IDB Discussion Paper No. IDB-DP-546. Washington DC: Inter-American Development Bank.

Ülgentürk, L. 2017. The Role of Public Debt Managers in Contingent Liability Management. OECD Working Papers on Sovereign Borrowing and Public Debt Management, No. 8. Paris: OECD Publishing. Available at: https://www.oecd-ilibrary.org/finance-and-investment/the-role-of-public-debt-managers-in-contingent-liability-management_93469058-en.

World Bank. 2014. Corporate Governance of State-Owned Enterprises: A Toolkit. Washington DC: World Bank Group. Available at: http://documents.worldbank.org/curated/en/228331468169750340/Corporate-governance-of-state-owned-enterprises-a-toolkit.

Annex. State-owned Enterprise Debt and Incurred Contingent Liabilities

The tables shown below help illustrate the frequency and magnitude of the problem generated by guarantees—both explicit and implicit—of SOE borrowing. Table A1 shows episodes of the assumption of costs by governments as a consequence of the incurrence of CLs linked to SOEs.

Table A1. State-owned Enterprises: Events and Estimated Cost of the Contingent Liability Incurred

Country	Start	End	Estimated cost (percent of GDP)	Specifications
Austria	2009	2009	0.2	Privatization of the national airline company; the Austrian government settled part of the SOE debt
Azerbaijan	2009	2010	4.8	Injection of capital and state guarantee for loan to the national oil company (SOCAR) and aluminum producer following difficulties in repaying external debt
Belgium	2005	2005	2.4	Transfer of capital for the assumption of the debt of the national enterprise SNCB by the Railway Infrastructure Fund
Bosnia and Herzegovina	2008	2009	1.5	Assumption of the mining sector SOE debt
Chile	2009	2009	0.6	Capitalization of the state-owned copper producer
China	1996	1996	0.3	The SOE debt was transformed into a public asset of the Development Bank. In strategic sectors, such as coal, hydroelectricity and the military, all debt was converted into government assets.
	2003	2003	0.1	Expenditures to pay for labor costs, redundancies and unemployment benefits
Colombia	2004	n/a.	n/a.	The Medellín metro system
Croatia	2007	2012	1.7	Payment of guarantees to shipbuilding companies
Dominican Republic	2003	2003	1.6	Renationalization of two electricity suppliers. The government shouldered the debt of the distributing company. A memorandum was signed with a government option to repurchase/restructure the debt with the external creditor, Unión Fenosa.
Ecuador	2004	2004	0.2	Support for electricity distributing companies
Greece	2007	2010	11.2	Reclassification of SOE debt to the central government
Hungary	2000	2002	1.4	Assumption of the debt of the Budapest public transport and railways SOE
	2011	2012	1.3	Assumption of the debt of the public transport and railways SOE. (MAV and BKV)
Indonesia	1998	1998	4.0	Payment of the costs of purchasing fuel oil
Italy	2006	2006	0.9	Assumption of railway SOE debt
Japan	1987		4.0	After privatization of the national railway company (JNR) in 1987, the government assumed the debt. It was never incorporated into the budget.
Jordan	2011	2014	1.1	Assumption of debt and transfers to cover losses by the water supplier
	2011	2014	15.1	Assumption of debts and transfers to cover losses by the electricity supplier
Kazakhstan	1994	1995	0.3	Back payments made for guaranteed debt
Macedonia	2006	2008	0.5	Additional funds for the electricity supplier
Malta	2003	2003	3.3	Restructuring of shipyard expenditures

Country	Start	End	Estimated cost (percent of GDP)	Specifications
	2008	2009	1.7	Assumption of shipyard debts
	2011	2015	1.8	Restructuring of Airmalta with injection of capital
Moldova	1996	1998	8.3	Issue of public debt for back payments to Gazprom
Pakistan	2013	2013	1.5	Cancellation of electricity suppliers' debts with other SOEs
Portugal	2001	2013	12.1	Reclassification of SOE debt into central government debt
Serbia	2009	2012	0.8	Execution of guarantees
South Africa	2009 2014	2010 2014	0.8 0.6	Loan to the energy firm, Eskom Injection of liquidity into Eskom
Ukraine	2008	2008	1.2	Payment of the Naftogaz debt
	2009	2009	2.5	Recapitalization bonds for Naftogaz
United Arab Emirates	2008	2010	9.0	Support for SOEs. Maximum approximate figure

Source: Elaborated based on Bova *et al*. (2016) (the original versions are presented in the document).
Note: n/a = not available.

Table A2 gathers the data regarding public debt, SOE debt and SOE debt with state guarantee, based on diverse primary and secondary sources, for 46 countries from different regions and at different stages of development. The information on public debt (traditional or registered) comes from the IMF source; the SOE debt data come, in 28 cases, from that reported by the European countries to Eurostat (highlighted in sky blue in the figure), whereas nearly all the rest of the cases originate from official information. For Austria, information published by the IMF was included because it added data unavailable in Eurostat with respect to the SOE guaranteed debt and it was different from data reported by that source. Table A2 also includes the year for which the information (or estimate) was reported.

Table A2. Public Debt, Government Guarantees, and State-owned Enterprise Debt (percentage of GDP)

Country	Year	Public debt (a)	SOE debt (b)	SOE guaranteed debt (c)	SOE debt/public debt (d)
Advanced economies					
South Korea	2016	39.9	31.0		77.7
Japan	2016	235.6	28.9		12.3
Sweden	2017	40.8	23.7		58.0
Finland	2017	61.3	21.8		35.5
Italy	2017	131.8	21.7		16.5
Latvia	2017	36.3	19.9		54.8
France	2016	96.6	19.4		20.1
Denmark	2017	35.3	18.4		52.1
Slovenia	2017	73.6	16.3		22.1
The Netherlands	2017	56.5	15.3		27.1
Malta	2017	50.7	15.1		29.8
Austria	2018	74.2	14.5	3.60	19.5
	2016	83.6	13.5		16.2
Belgium	2017	103.4	14.4		13.9
Estonia	2017	9.0	12.0		133.6
Czech Republic	2016	36.8	10.6		28.8
Greece	2017	181.8	7.7		4.2

Country	Year	Public debt (a)	SOE debt (b)	SOE guaranteed debt (c)	SOE debt/public debt (d)	
Cyprus	2017	97.5	7.4		7.6	
Lithuania	2017	39.7	6.7		16.9	
Luxemburg	2017	23.0	6.5		28.3	
Ireland	2017	68.6	5.9		8.6	
Slovakia	2017	50.9	5.4		10.6	
Germany	2016	67.9	4.4		6.5	
Portugal	2017	125.7	3.1		2.5	
Spain	2017	98.4	2.9		2.9	
United Kingdom	2017	87.5	2.0		2.3	
New Zealand	2017	29.8		0.10		a
Developing economies						
Russia	2012	11.9	**142.0**		1.192.5	
China	2016	44.20	115.0		260.2	
Albania	2014	72.0	20.0		27.8	b
Poland	2017	50.6	12.1		23.9	
Bulgaria	2017	23.9	7.3		30.5	
Macedonia	2016	39.5	6.6		16.7	
Croatia	2017	77.8	5.0		6.4	
Hungary	2017	73.6	4.7		6.4	
Romania	2017	36.8	2.7		7.3	
South Africa	2016/17	53.0		**10.6**		c
Tunisia	2015	55.4		10.3		
Vietnam	2016	59.9		9.5		
Philippines	2012	47.9		7.1		d
Pakistan	2017	67.0		3.0		
Chile	2017	23.6		0.95		
Peru	2014/15	24.0		0.52		
Colombia	2017	49.4		0.3		e
Georgia	2017	44.9	16.8	0.0	37.4	
Countries with special access to credit						
Mozambique	2012	40.1		0.5		
Kenya	2013	44.0		0.1		
Average		**62.9**	**19.0**	**3.6**	**64.4**	
Cases 35		**Cases > 60% 18**	**Cases > 10% 20**	**Cases > 5% 4**	**Cases > 20% 18**	

Source: Authors' elaboration, based on: WEO report of October 2018, Database (IMF); Eurostat; Guarantee Reports, Statistics Austria; DIPRES, Chile; Risks Subdirectorate (DGCPTN) (Subdirección de Riesgo), Colombia; Annual Financial Report, GOCC Annual Report and Fiscal Risks Statement, Philippines; Annual report on debt and IMF, based on SOE financial statements, Kenya; Annual Debt Report on Public Debt Management, Ministry of Finance, Macedonia; Public Debt Management Report, Ministry of Finance, Mozambique; Ministry of Finance, Pakistan; Ministry of Economy and Finance, Peru; Public Debt Management Report, Central Bank, Russia; National Treasury, South Africa; Ministry of Finance, Tunisia; ADB based in the Ministry of Finance, Vietnam; Moody's, China, South Korea and Japan.

Notes:

[a] Excludes non-quantifiable guarantees.

[b] SOE external debt.

[c] Borrowing of the largest 20 SOEs.

[d] Implicit guarantees estimated at 60.7 percent of GDP.

[e] Estimated CLs.

The SOE debt in the case of Eurostat corresponds to “obligations of non-financial entities controlled by the government, classified as outside of the General Government,” a definition that comes very close to that of a SOE, although it could be somewhat more comprehensive. Normally, no debt consolidation process is carried out, which means that the indicator could be overestimating the problem of the existence of debt among the enterprises themselves, for example.

SOE guaranteed debt corresponds to the total amount of that debt. Only in the cases of Colombia and New Zealand were estimates of the CLs presented.


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