

IS IT IMPORTANT TO KNOW PUBLIC SECTOR ASSETS AND LIABILITIES? THE NEXUS BETWEEN PUBLIC SECTOR BALANCE SHEET AND CORRUPTION

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ABSTRACT

This paper underscores the importance of the public sector balance sheet. Typically, fiscal policies are analysed without considering the stock of public sector assets and liabilities, focusing instead on flows such as the state budget, fiscal balance, and GDP. However, a primary objective of these flows should be to achieve specific outcomes in the stock of assets and liabilities. For instance, investments from the state budget should increase the stock of physical capital. Our central argument is that the absence of public sector balance sheets contributes to pervasive corruption and a broader disregard for public property. Using the IMF's Public Sector Balance Sheet database, we demonstrate that the presence of a public sector balance sheet is positively associated with less corruption.

Keywords: *Public sector balance sheet, Corruption, Flow, Stock variables.*

JEL classification: *H83.*

1. INTRODUCTION

An analysis of a company typically begins with examining its balance sheet, which shows the stock of the company's assets and liabilities. Afterward, other reports are reviewed to understand the details of its operations and health. In this way, the analysis is based on stock variables, while variables that show flows are used to understand what has happened over certain periods and how it has affected the stock of assets, liabilities, and the company's equity. In contrast, traditional public finance analysis primarily focuses on flow variables, such as the budget, fiscal balance, and gross domestic product (GDP), while public debt is one of the few stock variables that is used in the analysis. Moreover, the consolidated balance sheet of the public sector is usually missing and there is no information about the stock of assets and liabilities, so the analysis is mostly focused only on the budget transactions and their impact on GDP, without consideration of how these transactions will impact the assets and liabilities of the public sector, and its difference which is the net-worth.

The International Monetary Fund's (IMF) Government Finance Statistics (GFS) analytical framework in 2001 introduced the complete public sector balance sheets (International Monetary Fund, 2014). The key point is that the balance sheet at the beginning of the year reflects the state of the public sector's assets and liabilities. Throughout the year, the government engages in various activities, some through the state budget, which includes

transactions generating revenue or expenses, ultimately affecting the public sector's assets and liabilities. Additionally, changes in the stock of assets and liabilities are not always the result of transactions; they can also arise from other factors, such as gains or losses due to holding assets or changes in the volume of assets. Therefore, the balance sheet at the end of the year should capture all changes in the stock of assets and liabilities – and in essence, it should represent the result of the actions and decisions.

IMF created a comprehensive database of the public sector balance sheet in countries around the world. However, the number of countries worldwide that systematically compile a public sector balance sheet remains low.

The relevant literature underscores the critical importance of a consolidated public sector balance sheet for accurately assessing a state's net worth and its fiscal and financial capacity (Gruber and Kamin, 2012; Bova *et al.*, 2013; Seiferling and Shamsuddin, 2015; Hadzi-Vaskov and Ricci, 2016; Henao-Arbelaez and Sobrinho, 2017; and Yousefi, 2019). Without detailed information on assets like state-owned property and natural resources, a state's financial position can be misrepresented, leading to flawed assessments of its economic health. A comprehensive balance sheet provides clarity on public sector assets and liabilities, crucial for understanding economic dynamics and enhancing macroeconomic resilience. It identifies potential revenue sources, such as non-financial assets like land, roads, and buildings, and supports fiscal transparency by tracking changes in asset values unrelated to transactions. Understanding the relationship between net debt and financial assets is essential, as it affects government bond yields and overall economic stability.

In this paper, we argue that the absence of public sector balance sheets contributes to corrupt practices and a disregard for public property. One of the primary purposes of the state budget, as a flow variable, is to enhance the stock of physical capital, among other objectives. Without measuring the outcomes of flow variables, misconduct can go unchecked. For instance, it is easier to undervalue land sales when the value of the country's land resources is not properly assessed and disclosed. Similarly, there is a greater risk that the value of public buildings will not be preserved without proper valuation and monitoring. Thus, comprehensive balance sheets in the public sector can promote greater transparency and accountability, leading to better governance and ultimately benefiting the public.

We use multiple regression analysis to examine the correlation between the decision to maintain a balance sheet and levels of corruption. Our analysis is based on data from the IMF's Public Sector Balance Sheet (PSBS) database, focusing on 30 countries with available data for the most recent year (2016). This paper contributes to the literature by providing empirical evidence that a country's decision to systematically produce a public sector balance sheet is associated with its corruption.

The remainder of this paper is organized as follows: The next section discusses the key reasons for maintaining a public sector balance sheet, as highlighted in the literature. Section 3 provides an overview of the IMF's Government Finance Statistics (GFS) analytical framework and Section 4 highlights details from the IMF's PSBS database. Section 5 outlines the methodology and data used, while Section 6 presents the empirical results. The final section concludes the paper.

2. LITERATURE REVIEW

The determinants of corruption have been extensively examined in the literature, highlighting economic, political, and social factors as key influences. Economic factors such as low levels of income and high income inequality are frequently cited as significant contributors to corruption, as they create conditions where individuals and public officials may seek illicit

means to achieve financial stability (Treisman, 2000). Similarly, a lack of economic development and weak market institutions are associated with increased corruption, as these environments often lack sufficient regulatory frameworks to ensure accountability (Mauro, 1995).

Political factors are also important to understanding corruption. Weak democratic institutions limited political stability, and restricted media freedom can reduce transparency and undermine accountability, thereby creating opportunities for corrupt practices (Persson, Rothstein, & Teorell, 2013). Furthermore, social and cultural norms play a pivotal role; societies that tolerate nepotism and favoritism tend to exhibit higher levels of corruption (Rose-Ackerman, 1999). Strong governance, including effective legal systems and the rule of law, is consistently linked with lower levels of corruption, underscoring the importance of institutional quality (North, 1990). These studies provide a comprehensive framework for understanding the multifaceted nature of corruption, forming a foundation for targeted anti-corruption policies.

The nexus between public sector balance sheet and corruption has not been examined yet in the literature. The relevant literature highlights only reasons for the importance of having a consolidated public sector balance sheet. Buiter (1983) points out that the lack of information on state-owned real estate and natural resources can lead to a distorted view of a state's net worth, as well as its current and future fiscal and financial capabilities. Allen *et al.* (2002) introduce an analytical framework for understanding crises in developing economies, which is based on stock variables from the consolidated public sector balance sheet and its subsectors. Yousefi (2019) proposes a set of measures for assessing the quality of the balance sheet, arguing that its quality is a crucial determinant of a state's macroeconomic resilience.

The literature also emphasizes the importance of specific asset categories in the public sector balance sheet. Bova *et al.* (2013) highlight the role of non-financial assets, suggesting that revenues from land, roads, and buildings could be potential sources of future government income. Seiferling and Shamsuddin (2015) emphasize the role of financial assets in ensuring fiscal transparency and accounting for changes in asset values that are not due to transactions. Gruber and Kamin (2012), Hadzi-Vaskov and Ricci (2016), and Henao-Arbelaez and Sobrinho (2017) demonstrate the impact of net debt on financial assets and government bond yields.

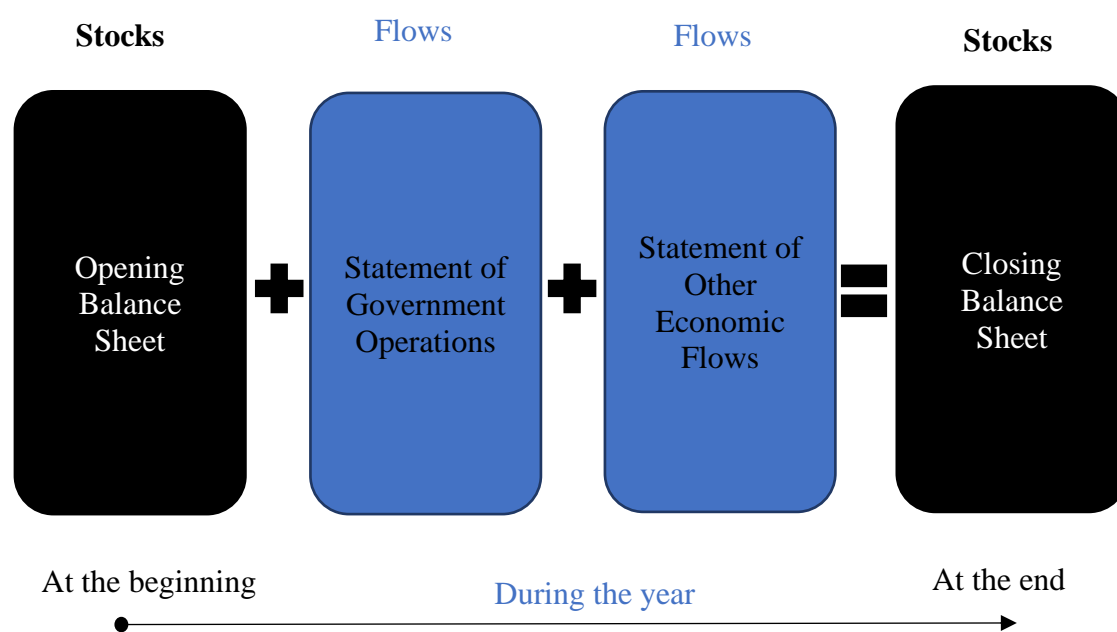
3. ANALYTICAL FRAMEWORK

The IMF's Government Finance Statistics (GFS) analytical framework from 1986 does not include public sector balance sheets. It only reports on the stock positions of certain debt liabilities and records government activities on a cash basis. This approach has the advantage of focusing government attention on liquidity constraints, which were in that period seen as the most urgent priority. However, as governments have become less constrained by liquidity and better able to separate the timing of fiscal actions from when payments are made, cash transactions alone no longer sufficiently capture the timing of activities or their economic impact. In response, the GFS analytical framework introduced in 2001 (and updated in 2014) is based on an accrual accounting system and incorporates comprehensive public sector balance sheets. The use of accrual-based statements and integrated balance sheets offers a more effective basis for monitoring the efficient allocation and use of all government resources.

The core GFS analytical framework (2001 and 2014) contains four financial statements: Statement of Operations; Statement of Other Economic Flows; Balance Sheet; and Statement of Sources and Uses of Cash (International Monetary Fund, 2014). The first three statements can be combined to show that all changes in stock positions result from flows. The fourth statement (Statement of Sources and Uses of Cash) provides key information on liquidity.

Figure 1 illustrates that the balance sheet at the beginning of the year shows the state of the public sector's assets and liabilities. During the year, two key reports are essential for presenting the flows within the (fiscal) year: Statement of Operations and Statement of Other Economic Flows. The first is the report on government operations, which includes all transactions related to revenues and expenditures, net investments in non-financial assets, net acquisition of financial assets, and net incurrence of liabilities. Essentially, this represents the state budget, or more precisely, its final account. The second report covers other economic flows, which represent changes in the state of assets and liabilities not resulting from transactions but from other factors. These can include: (1) holding gains and losses, which reflect changes in the value of assets and liabilities due to price changes, including changes in exchange rates; and (2) other changes in the volume of assets, which can occur due to the discovery of new asset stocks or liabilities (e.g., mineral resources), depletion or destruction of assets, or reclassification of assets or liabilities (International Monetary Fund, 2014). It is crucial to note that all changes in the state of the public sector's assets and liabilities by the end of the year result from transactions or other economic flows, meaning all changes in the balance sheet positions are due to flows.

Figure 1: Government finance statistics analytical framework



(Source: Based on the International Monetary Fund, 2014, p.68)

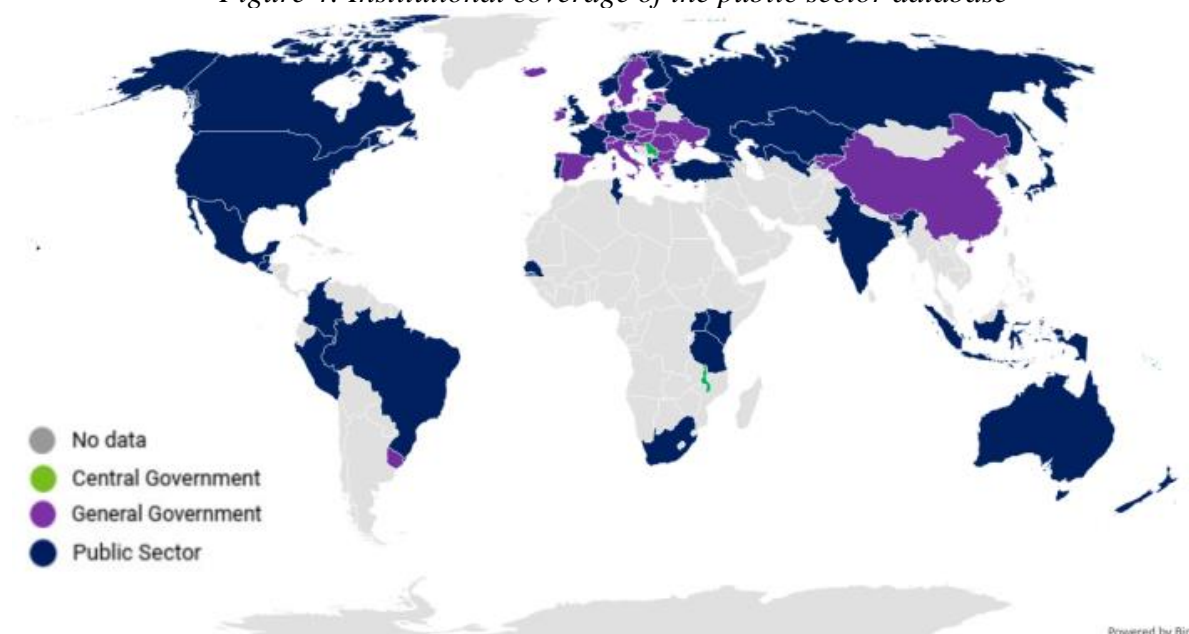
The scope of the balance sheet can vary. Figure 2, on the left side, shows the balance sheet of the General Government, which includes all institutional units at the central and local levels primarily engaged in non-market activities. The same figure, on the right side, shows the balance sheet of the public sector, which has a broader scope, including public enterprises and those involved in market and quasi-fiscal activities.

Figure 2: The balance sheet framework

4. IMF'S PUBLIC SECTOR BALANCE SHEET DATABASE

The number of countries that have public sector balance sheets is not clear. According to Alves *et al.* (2020), only a few countries in the world currently undertake the compilation of public sector balance sheets. However, the best information about it is provided IMF's public sector balance sheet database (Public Sector Balance Sheet (PSBS) - PSBS Home - IMF Data). It provides estimates of these balance sheets for a broad sample of 39 countries (that covers 63 percent of the global economy), that were compiled on a best-efforts basis using the conceptual framework of the IMF's Government Finance Statistics Manual 2014. Data for the central and general government generally are sourced from the IMF's Government Finance Statistics (GFS) database, while the data gaps are complemented by other data reported by statistical authorities at the national level or to other international organizations, or by IMF staff estimates. The IMF's database is also populated with lower institutional coverage: general government or central government estimates. The central government is available for 74 countries and territories, and the general government for 66. More about the database can be found in Alves *et al.* (2020). Figure 4 presents the highest level of government available in the dataset.

Figure 4: Institutional coverage of the public sector database



(Source: Alves *et al.*, 2020)

Table 1: Data availability in the IMF's database

Data availability	Countries
For all years in the period 2000-2016	Australia, Canada, Finland, Japan, Norway and United Kingdom
At least two years in the period 2000-2016	El Salvador, France, Georgia, Germany, India, Indonesia, Kazakhstan, Korea, New Zealand, South Africa, Sweden, United States.
Only one year in the period 2000-2016	Albania, Armenia, Austria, Brazil, Colombia, Gambia, Guatemala, Kenya,

	Lithuania, Malta, Mexico, North Macedonia, Peru, Portugal, Russia, Senegal, Tanzania, Tunisia, Turkey, Uganda, Uzbekistan.
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The public sector balance sheet database covers the period from 2000 to 2016. However, Table 1 shows that, of the 39 countries included, only 6 have public sector balance sheet (PSBS) available for every year in this period. Meanwhile, 12 countries have had PSBS for at least two years. The majority of countries, 22 out of 39, have PSBS for only one year, compiled by the IMF as part of the Fiscal Transparency Evaluation.¹ Therefore, this limited data availability cannot be seen as a sustained effort by these countries to compile a balance sheet.

5. METHOD AND DATA

We use multiple regression analysis to explore how the decision to have a public sector balance sheet is associated with the corruption perception in the set of available countries in the IMF's Public Sector Balance Sheet (PSBS) database:

$$CP_i = \beta_0 + \beta_1 \log(GDP_i) + \beta_2 PSBS_i + \beta_3 NW_i + \varepsilon_i$$

where CP_i is corruption perception score in 2016, GDP_i is GDP per capita, $PSBS_i$ is an indicator for the presence of the public sector balance sheet, and NW_i is net worth of the country in 2016. We chose 2016 because for this year there are data for most countries in the PSBS database.

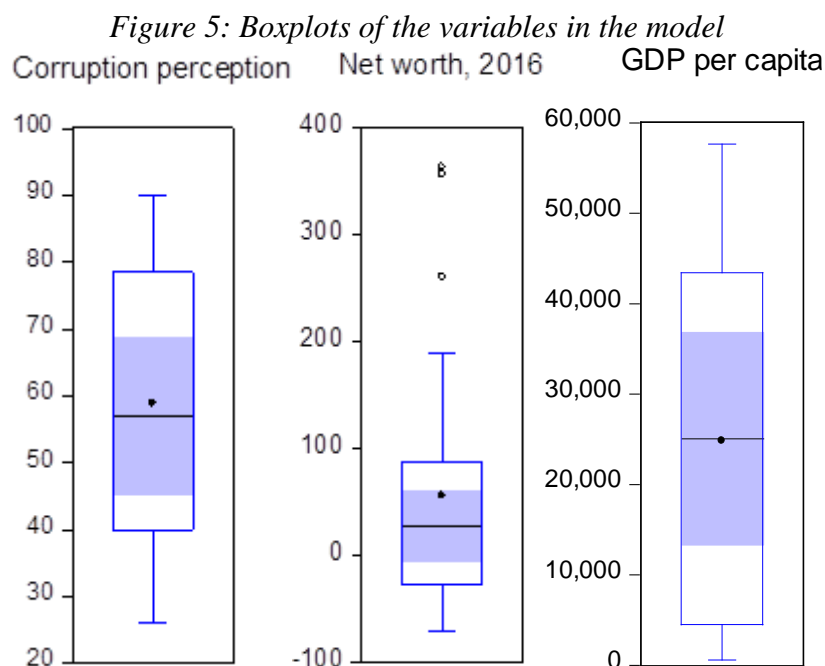
Corruption perception data are gathered from the Corruption Perception Index developed by Transparency International. This index provides a score to each country by its perceived levels of public sector corruption on a scale from 0 (highly corrupt) to 100 (very clean), as determined by expert assessments and opinion surveys. The left-hand box plot in Figure 5 illustrates that corruption perception scores among the sample countries range from 26 in Gambia to 90 in New Zealand. Additionally, 50% of the countries have scores between 40 and 79.

The presence of public sector balance sheet is based on IMF's PSBS database about countries' decision to have a public sector balance sheet. The PSBS database collects data on 39 economies about their engagement with public sector balance sheets. We use these data to create a dummy variable about whether country created a public sector balance sheet and calculated net-worth in it. Formally, this variable is equal to one if the country had data for the public sector net worth for more than one year in the period between 2000 and 2016, and zero otherwise. So, in essence, this variable is indicator for the systematic efforts of the country to produce PSBS. We expect countries that systematically use PSBS to have better score (less corruption).

Net-worth of the country in the 2016 is also gathered from IMF's Public Sector Balance Sheet (PSBS) database. As a control variable, we include the log of the GDP per capita of the country and the log of the human capital. The first variable describes the potential differences in corruption perception that may appear because of economic development whereas the second variable helps us control for the potential impact of formal knowledge on corruption. The

¹ For example, Macedonian Ministry of Finance requested Fiscal Transparency Evaluation in 2018, and IMF team produced PSBS for 2016.

central boxplot in figure 5 illustrates that net-worth among the sample countries range from -70.1% of GDP in United Kingdom to 189.8% in Australia. There are three countries considered outliers: Norway, Uzbekistan, and Kazakhstan. These outliers were removed from the data used for the regression model.



The GDP per capita data comes from the World Bank’s World Development Indicators. The GDP per capita is measured in constant 2015 US dollars. The right-hand boxplot in Figure 5 illustrates that GDP per capita among the sample countries ranges from 606.3 dollars in Gambia to 57,658.7 in the USA. We expect countries with higher GDP per capita to also have higher corruption perception scores (lower corruption).

The fact that the data for corruption perception, GDP per capita, and net worth are cross-sectional for 2016, while the PSBS indicator is calculated using data from 2000 to 2016, helps reduce potential endogeneity issues. Specifically, this approach minimizes concerns that a country's decision to have a balance sheet is influenced by its corruption perception (i.e., less corrupt economies may be more likely to implement a balance sheet, and, conversely, having a balance sheet might lead to lower corruption).

6. EMPIRICAL RESULTS

Table 2 presents the results of our analysis. The first column shows the results of a baseline model with only the log of GDP per capita as the predictor variable. The log of GDP per capita is a significant and positive predictor of corruption perception, which aligns with expectations. Higher country income is associated with stronger anti-corruption practices and lower levels of corruption.

In the second column, we add the PSBS indicator variable as a predictor to the baseline model. The results show that systematically producing PSBS is significantly and positively associated with corruption perception. Countries that maintained PSBS for more than one year, on average, had a corruption perception score that was 10 points higher, which means less corruption.

In the third column, we include net worth as an additional predictor. Here, we observe that net worth is not a significant predictor of corruption perception. However, the significance of our primary independent variable of interest, the net worth dummy, remains unchanged.

Table 2: Corruption Perception and Public Sector Balance Sheet Regression Results

	<i>Dependent variable:</i>		
	Corruption perception		
	(1)	(2)	(3)
Log (GDP per capita)	13.292*** (1.652)	11.694*** (1.659)	11.696*** (1.695)
PBSB indicator		10.655** (4.490)	10.519** (4.888)
Net-worth			0.003 (0.032)
Constant	-67.815*** (15.891)	-59.292*** (15.032)	-59.299** (15.354)
Observations	30	30	30
Adjusted R ²	0.721	0.774	0.774

Note: * p<0.1 ** p<0.05 *** p<0.01.

7. CONCLUSION

Despite the introduction of comprehensive public sector balance sheets in the IMF's Government Finance Statistics in 2001, the number of countries compiling these balance sheets remains low. This paper argues that the absence of public sector balance sheets contributes to corruption and a lack of accountability for public property. The rationale is straightforward: it is easier to misappropriate a country's assets when they are not systematically measured and valued. Our empirical analysis, based on the IMF's Public Sector Balance Sheet database and a sample of 30 countries, indicates a significant positive correlation between the existence of a public sector balance sheet and lower levels of corruption, on a scale from 100 (very clean) to 0 (highly corrupt).

In South-East Europe, including N. Macedonia, public financial management systems are not yet systematically producing public sector balance sheets. According to the International Monetary Fund (2014), several steps can facilitate the collection of public sector balance sheets, ranked by complexity: (1) adopting accrual-based reporting in accounting systems; (2) implementing the classification structures of the Statement of Operations or Statement of Sources and Uses of Cash and adjusting cash-based statistics to address known deficiencies, such as incorporating information on revenue or expense arrears; (3) compiling balance sheet information on financial assets and liabilities to estimate other economic flows related to these financial instruments; (4) gathering comprehensive data on the stock positions of non-financial assets and valuing them at current market prices; and (5) implementing a fully-developed accrual accounting system that enables complete and robust public sector balance sheets.

Lastly, it is important to note that balance sheets may not capture all aspects of the government's financial position and should be supplemented with additional data, particularly regarding contingent liabilities and public-private partnerships.

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