



# Public debt, sovereign default risk and shadow economy<sup>☆</sup>

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## ARTICLE INFO

### Article history:

Received 1 July 2012

Received in revised form 7 July 2012

Accepted 13 September 2012

Available online 25 September 2012

### JEL classification:

F34

H26

H63

### Keywords:

Informal sector

Public debt

Sovereign yields

## ABSTRACT

This paper analyzes the interactions between government's indebtedness, sovereign default risk and the size of the informal sector. We test an underlying theory that suggests that in societies with limited tax enforcement, the presence of informality constrains the set of pledgeable fiscal policy alternatives, increases public debt and the implied probability of sovereign debt restructuring. The hypotheses that we test in our empirical analysis are: a larger size of the informal sector is associated with (1) higher public indebtedness, (2) higher interest rates paid on sovereign debt, (3) a higher level of financial instability and (4) a higher probability of sovereign default. The empirical results from cross-country panel regressions show that after controlling for previously highlighted variables in the literature that could explain the variation in financial instability, sovereign default risk and public indebtedness, the size of informality remains as a significant determinant of these variables.

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## 1. Introduction

The data on sovereign debt yields exhibit substantial cross-country variation.<sup>1</sup> It is well understood that high interest rates paid on sovereign bonds are first-order constraining factors for economic well-being in developing countries. Therefore, a vast literature concentrated on understanding the determinants of sovereign debt defaults and the implied interest rates paid on sovereign debt.<sup>2</sup> Another important problem concerning the economic performance of the developing world is the limited enforcement of tax collection and the implied presence of a non-negligible size of the informal sector.<sup>3</sup> Among other macroeconomic implications,

the presence of a large shadow economy influences the choice of fiscal policy instruments, government tax revenues, and thus a government's ability to repay outstanding government debt.<sup>4</sup>

In this paper we address the interactions between these two seemingly related issues which has been previously overlooked in both strands of literature. Specifically, we address whether the size of the shadow economy provides any explanatory power in understanding the cross-country variation in public debt and indicators of sovereign default risk. To support our empirical study, we provide an underlying theoretical mechanism that associates the size of the informality with sovereign debt default risk. We suggest that in societies where the shadow economy accounts for a substantial amount of economic activity, the presence of informality, and tax evasion, limit the set of credible future fiscal policy adjustments and increases the probability of debt defaults and thereby affects the interest rates charged on sovereign debt. Our empirical results show that after controlling for previously highlighted variables in the literature that partially explain the variation in debt and interest rates paid on sovereign debt, the shadow economy size remains

<sup>☆</sup> We are thankful to two anonymous reviewers and the editor for helpful comments and suggestions. Moreover, Ceyhun Elgin acknowledges support by the Bogazici University Research Fund (Project no: 6345).

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<sup>1</sup> Table 1 documents that interest rates paid on government has a mean around 8.4% and a standard deviation of 10.59%.

<sup>2</sup> Eaton and Fernandez (1995) and Panizza et al. (2009) provide extensive surveys on the determinants of sovereign debt and default risk.

<sup>3</sup> Shadow economy or informal sector, sometimes also titled black, hidden or underground economy is defined by Hart (2008) as a set of economic activities that

take place outside (as opposed to the formal sector) the framework of bureaucratic public and private sector establishments. Also, see Schneider and Enste, 2000 for comparison of various definitions.

<sup>4</sup> See Cicek and Elgin (2011).

as a significant determinant for a government's indebtedness and cost of sovereign debt.

The main issue concerning international lending is the problem of sustainable commitment at the two-sides of the international financial markets. Namely, commitment to repay at the borrower's side and commitment to enforce repayment at the lender's are necessary to keep interest rates low on sovereign debt. According to this view, traditional concepts of solvency and liquidity cannot explain problems of sovereign debt because creditors in international financial markets do not have the means to seize the assets of a defaulting borrower. In this respect, [Eaton et al. \(1986\)](#) suggest that the breakdown of either type of commitment may result in debt defaults, which can explain the sovereign debt repayment crises that occurred in LDC's during 1980s. In the current generation of sovereign debt crises, the limited commitment problem in financial markets is still accepted to be the major determinant of debt default/restructuring incidences observed in developing as well as in developed countries. Therefore, a good understanding of sovereign debt costs requires a careful analysis of the commitment issues in international financial markets. To this end, [Panizza et al. \(2009\)](#) find limited support for theories that explain the costs of sovereign debt based on either external sanctions or exclusion from the capital market (limited commitment at lender's side), and more support for explanations that emphasize domestic costs of default (limited commitment at borrower's side).

This paper contributes to the "domestic costs of default" perspective in explaining the variation in sovereign risk spreads. Our main hypothesis is that the presence and also the size of the shadow economy could potentially lower the cost of default and weaken borrower's commitment to collect taxes and repay debt.<sup>5</sup> A borrower's capacity to repay existing debt obligations is associated with pledgeable future contractions in fiscal policy. As long as a borrower can credibly commit to such future policy adjustments and promise future government surpluses he should be able to borrow in international financial markets at low costs and not face any sovereign debt feasibility problems. In our analysis, we claim that the size of the shadow economy constrains the set of pledgeable fiscal policy contractions. The underlying mechanism associated with this theory is as follows: in an economy characterized with a large informal production, fiscal policy contractions associated with a tax rise can lead to an expansion in the size of the shadow economy and hence limit the amount of government surplus that can be generated resulting from a tax rise. Similarly, assuming that the size of the government purchases affects the quality of infrastructure in the formal economy and therefore the benefits from formal sector production, a contractionary fiscal policy associated with a decrease in government purchases could shrink the size of the formal sector production, lower the total amount of taxes collected, and again inhibit the government surplus produced from a decrease in government purchases. Due to the same line of reasoning, debt would emerge as an optimal source of government financing in the presence of shadow economy: a tax rise, or a decrease in government purchases would lead to a contraction in the size of the formal sector whereas a rise in government indebtedness would lead to an expansion in the size of the formal sector production. This limited fiscal pledgeability problem of domestic governments, and the demand for borrowing, in the presence of a shadow economy is expected to affect the probability of sovereign debt defaults/restructuring and increase sovereign debt interest rates and the level of financial stability.

<sup>5</sup> [Fig. 1](#) provides a visual on the relationship between the probability of default and shadow economy size. As one can observe from the figure, the correlation between these two variables is strikingly positive.

We empirically test the above mentioned hypotheses using panel and cross-country regressions. Specifically, we show that a larger shadow economy size is associated with

1. a higher amount of public debt,
2. relatively higher interest rates charged on sovereign debt,
3. a higher level of country financial instability and
4. a higher probability of sovereign default.

Moreover, we also list some policy recommendations, such as improving tax enforcement through enforcement of law and order and increasing the capital-output ratio, that can reduce the size of the shadow economy and mitigate sovereign debt default risk and financial instability. We also extend our empirical analysis to provide support for those policy prescriptions.

The rest of the paper is organized as follows. [Section 2](#) reviews the literature and among other things especially emphasizes the contribution of our paper. [Section 3](#) provides the theoretical background for the interactions between the size of the informal sector, country's public indebtedness and sovereign interest rates (and sovereign default probability). [Section 4](#) presents the empirical analysis. [Section 5](#) addresses policy implications concerning the effects of informal sector size on public debt and sovereign default risk. Finally, [Section 6](#) concludes the paper.

## 2. Related literature

The empirical literature on sovereign debt yields and the determinants of sovereign debt defaults is non-exhaustive. In this literature, many papers focused on the effects of country specific factors in explaining debt default incidences and the cross-country variation in debt yields. [Edwards \(1984\)](#) shows that the size of the external debt is key in determining the sovereign debt default probability whereas [Reinhart et al. \(2003\)](#) argue it is the country's history of default that determines the future likelihood of defaulting. [Min \(1998\)](#), [Beck \(2001\)](#), and [Ferrucci \(2003\)](#) suggest that macroeconomic variables such as domestic inflation rates, foreign asset positions, terms of trade and political risk are significant determinants of sovereign risk spreads. Some studies argue that global financial market conditions are important in determining credit risk spreads. In this respect, [Calvo \(2002\)](#), [Grandes \(2003\)](#), [Gonzalez-Rozada and Levy Yeyati \(2008\)](#) analyzed the effects of global factors for emerging market sovereign debt interest rates.

In this paper we study the quantitative effects of the informal sector size in determining cross-country variation in sovereign debt yields (interest rates charged on sovereign debt) and sovereign debt default probability. Similar to our perspective, there are other studies in the literature that concentrated on the fiscal determinants of sovereign debt yields. [Faria et al. \(2006\)](#) shows that fiscal stability plays a significant role in determining sovereign bond spreads. [Min \(1998\)](#) finds when other macroeconomic variables are included, fiscal variables do not have any explanatory power for sovereign risk spreads. Close to the predictions that we derive in this paper, [Hallerberg and Wolff \(2008\)](#) show that fiscal policy is a significant determinant of debt yields in economies with weak institutions. To the best of our knowledge, our paper is the first study to analyze the size of the informal sector as a fiscal determinant of sovereign yields (interest rates) and sovereign default probability.

There is also a growing interest in macroeconomics in studying the interactions between the informal sector size and government policy. In particular, there are a number of studies that pointed a negative causal effect of taxes on the size of informal sector and long-run economic performance. Some important contributions in this respect are [Rauch \(1991\)](#), [Loayza \(1996\)](#), [Ihrig and Moe](#)

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