Does fiscal transparency matter for financial (in)stability? An empirical study on emerging and developing countries

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Abstract- **The purpose of the study is to examine to effect of fiscal transparency on financial instability in emerging and developing countries. On the top of the usual country-specific variables proposed by literature, the role of fiscal transparency is for the first time examined and found to be negative and significant beyond a certain threshold, confirming an inverted U-shaped relationship between fiscal transparency and financial instability. Our result has implications on the design of fiscal policy and on the fight against financial instability.**

Keywords-**Fiscal transparency, Financial (in)stability, Inverted U-shape**

I. INTRODUCTION

There is a growing number of studies that focus on the effects of fiscal transparency. According to International Monetary Fund ([25]): fiscal transparency is defined as "*comprehensiveness, reliability, timeliness, and relevance of public reporting of the past, present, future state of public finances.*"Most of research establishesthat fiscal transparency underpins fiscal performance and sustains public debts (e.g., [1]; [20]; [2]; [26]; [7];[43]; [3], [8], etc.).Further, countries that benefit from a higher quality of fiscal governance observe low inflation rates (see [21]; [36]). This contradicts the conclusions of [35]who, in a sovereign debt crisis scenario, finds that increasing fiscal transparency leads to greater inflation rates. Additionally, there is a positive relationship between economic growth and better transparency of fiscal practices (see [5]; [45];[35]). In the same context, [14] find that fiscal opacity erodes economic growth expectations in Brazil. Fiscal transparency is also a powerful tool to fight against corruption (see [23]; [15]; [11]; [37]) and to improve government effectiveness ([37]). Recently, [46]identifies a positive and significant case of fiscal transparency -bank credit. She shows that fiscal transparency is an appealing tool to bank development and that this effect is transmitted through reasonable conduits.Further, [38]conclude for an important effect of fiscal communication for the credibility of the fiscal policy in Brazil.

Parallel to the effects of fiscal transparency, there is a voluminous strand of literature on the determinants of financial (in)stability wherein the common measure is the share of Non-performing Loans (NPLs). Most of the studies focus on the macroeconomic determinants of NPLs. This includes [18], [31], [27], [6], 0, [16], [34] and the list is not exhaustive. Other researches are concentrated on bank-specific variables. For example, [19] find that leverage affects NPLs. [40]establish a relationship between NPLs and cost efficiency. [16] show that NPLs are affected by managerial efficiency which is proxied by the return on equity. [28] argue that efficiency and profitability are significant determinants of NPLs.[1]

Now, relating financial (in)stability to transparency has only received scant attention. To our knowledge, there are few papers that explore the relationship between transparency of policies and the stability of financial systems. The common thread across those papersis that they focus on transparency of financial stability itself. Indeed, [10] show that communication about financial stability reports decreases market volatility. Also, [12]argue that higher financial stability is associated with higher quality of financial stability reports. Based on a comprehensive index of financial stability transparency, [24]report that financial instability decreases up to a certain threshold of financial stability transparency, while [47], using the same index, conclude that it reduces financial instability if countries have a low institutional quality.Despite the calls to increasing transparency and the significant efforts to analyze its effects, the empirical question on how

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[1]We note that our paper is not intended to give a review of the determinants of financial (in)stability. For a comprehensive and succinct literature review, we refer readers to [39]and [33].

transparency of fiscal policy affects the health of financial systems remains unexplored. This paper tries essentially to fill this gap. For instance, [13] claim that poor debt management can worsen financial stability. [17] identifies channels through which fiscal policy affects financial (in)stability. The author argues that public debt management, tax policies and fiscal sustainability could have direct and indirect effects on systemic risks. Further, the impact of fiscal policy on financial cycles directly mitigates the harmful effects of financial crisis.

Both fiscal transparency and financial stability have been of much discussion in literature, but this is the first time that we make a convincing case for an empirical relationship between them in emerging and developing countries. This paper examines whether fiscal transparency impacts financial (in)stability by employing two widely used metrics of financial (in)stability, namely the share of non-performing loans to total gross loans and banking crisis dummy. Particularly, we show that an inverted U-shaped relationship exists between the index of [48] and financial instability proxies.Our result is robust to different specifications of the same model.

The rest of the paper is organized as follows. We present data and the empirical strategy in Section 2. We expose and discuss the results in Section 3 and Section 4 concludes.

II. METHOD AND DATA

In this paper, we employ country-specific variables affecting the share of non-performing loans to total loans (NPLs), which will be used as the dependent variable in the baseline regressions. We estimate a dynamic panel model by following earlier literature that explore the determinants of NPLs as a dynamical process (e.g., [16]) and by using the system GMM method consistently with [9] and [4]. The method of estimation is known to accommodate the case where the number of cross sections is higher than the temporal dimension. Furthermore, the system GMM overcomes the endogeneity bias. We use instruments based on lagged values of the dependent variable and of the explanatory variables. The validity of the set of instruments is performed with the test of overidentifying restrictions of [22]. As a part of the diagnostic tests, we limited the number of instruments to be less than the number of countries and we checked for the second order serial correlation (see [41], [41]).

We focus on 155 emerging and developing countries over the period 1998-2014. Data availability is the sole reason behind the choice of the aforementioned period of investigation. Furthermore, missing data roughly reduces the sample size to the half. We retrieve data from the World Development Indicators database and Global Financial Development database for the controls. We used particularly

macroeconomic variables that have been found to affect the fragility of the banking sector in literature. We employ GDP growth, GDP per capita (in log), two proxies of financial development, namely, credit to the private sector by banks as a share of GDP and market capitalization, trade openness, inflation rate, real interest rate, exchange rate, lending rate and unemployment rate. The variable of interest, namely fiscal transparency, is collected from [48]. The authors generously provide a database for a high number of countries. The index of fiscal transparency ranges over the interval [0,100]. A high score implies higher transparency in the fiscal practices.

Depending on the set of controls, we estimate multivariate specifications of the following model

$$NPLs = \alpha NPLs_{-1} + \theta_1 FT + \theta_2 FT^2 + \beta' X + \varepsilon \quad (1)$$

where X is a vector of the controls, FT and FT^2 denote fiscal transparency index and the squared term of fiscal transparency, the subscripts i and t denote the country and time dimensions, respectively. The autoregressive coefficient (α) tests for the persistence of NPLs and we expect a positive and statistically significant sign.

III. RESULTS AND DISCUSSION

A. Results

The scatterplot in Figure 1 is not conclusive on the form of the relationship between fiscal transparency and the share of NPLs. So, we move onto panel regressions to extract the exact type of the function (i.e., linear/nonlinear).
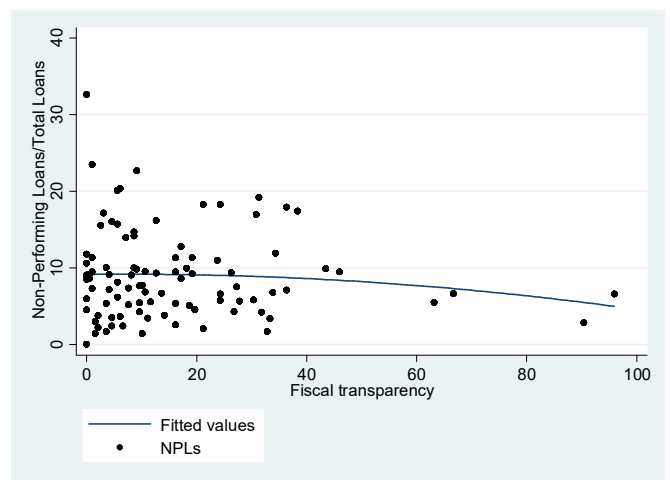

Fig 1. Average NPLs and fiscal transparency in emerging and developing countries

The estimation results of our model are presented in Table 1, where the coefficients of the quadratic form are presented along with their corresponding [50]corrected robust standard errors. As a preliminary analysis (not reported), we checked

for a linear relationship between fiscal transparency and financial instability. Our results fail to detect a significant linear form for our sample. We, therefore, hypothesize a quadratic regression. Based on Eq. (1), the first partial derivative with respect to fiscal transparency is given by

$$\frac{\partial \text{NPLs}}{\partial FT} = \theta_1 + 2\theta_2 FT \quad (2)$$

Consistently with Eq. (2), we have an inverted U-shaped relationship if and . The threshold beyond which fiscal transparency reduces financial instability is achieved when the first partial derivative in Eq. (2) is null. In other terms, we have

$$\widehat{FT} = -\frac{\widehat{\theta_1}}{2\widehat{\theta_2}}$$

The usual and common procedure implies that both and have the correct sign and are individually significant. [30] propose an appropriate test of U-shape or inverted U-shape that consists of checking two necessary conditions: (1) The sign of the second derivative has the proper sign (in our case). (2) The estimated extremum point (i.e.,) is within the data range.

TABLE I
EFFECT OF FISCAL TRANSPARENCY ON THE SHARE OF NPLs

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal transparency	0.067**	0.066*	0.066*	0.082*	0.061*	0.073*
	(0.032)	(0.039)	(0.040)	(0.043)	(0.033)	(0.042)
Fiscal transparency^2	-0.001**	-0.001*	-0.001*	-0.001**	-0.001**	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Country-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
N°observations	785	756	743	637	637	729
N°countries	89	87	86	76	76	83
N°instruments	67	72	85	72	60	74
AR1 (p-value)	0.058	0.051	0.069	0.073	0.074	0.062
AR2 (p-value)	0.159	0.146	0.150	0.119	0.103	0.141
Hansen test of over-identification restrictions (p-value)	0.295	0.527	0.482	0.172	0.473	0.221
Slope at the minimum	0.067	0.066	0.066	0.082	0.061	0.073
Slope at the maximum	-0.066	-0.061	-0.073	-0.075	-0.054	-0.082
Inverted U-test	1.986	1.698	1.652	1.852	1.847	1.650
Inverted U-test (p-value)	0.024	0.045	0.049	0.032	0.033	0.050
Extremum point	50.345	52.004	47.310	52.293	53.019	47.134
Data range	[0,100]	[0,100]	[0,100]	[0,100]	[0,100]	[0,100]

Robust standard errors in parentheses
*p< 0.1, **p< 0.05, ***p< 0.01

According to Table 1, both fiscal transparency and the squared term of fiscal transparency enter the model significantly and both have their proper signs. However, as claimed by [30], the inverted U-shaped relationship should not be assessed on the basis of the statistical significance of the individual coefficients. We, therefore, present the overall test of the inverted U-shape, the extremum point and the data range. The last lines of Table 1 corroborate the finding of a quadratic relationship between fiscal transparency and the share of NPLs at the conventional statistical levels. Particularly, the publication of high quality of information about governments' borrowing, spending, and the management of public assets and liabilities leads to a decline in financial instability beyond a certain value. The size of the threshold varies between 47.134 and 53.019 and it is within the data range ([0,100]).

As a robustness check, we replicate the econometric analysis by substituting the share of NPLs by the banking

crisis dummy. The associated data are collected from [29]. Then, we estimate a panel logistic regression with fixed effects. Results are available in Table 2. We again find a significant inverted U-shaped relationship between fiscal transparency and the occurrence of banking crisis dummy. The second partial derivative ($\widehat{\theta_2}$) is negative as expected and statistically significant. The level of fiscal transparency beyond which it reduces the occurrence of financial crisis is within the range of data and it varies between 36.639 and 39.612. Overall, our results imply that increasing transparency of fiscal practices is demanding in emerging and developing countries.

Our results imply that not only higher fiscal transparency levels foster the overall economic governance and support the fight against corruption but also, they will pay off in terms of healthier financial systems and crisis management and prevention.

TABLE II
EFFECT OF FISCAL TRANSPARENCY ON BANKING CRISIS

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal transparency	0.169** (0.083)	0.223* (0.119)	0.271* (0.151)	0.171* (0.098)	0.363** (0.157)	0.228** (0.112)
Fiscal transparency^2	-0.002** (0.001)	-0.003* (0.002)	-0.003* (0.002)	-0.002* (0.001)	-0.004** (0.002)	-0.003** (0.002)
Country-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
N° countries	71	71	71	62	62	71
Slope at the minimum	0.169	0.223	0.271	0.171	0.363	0.228
Slope at the maximum	-0.293	-0.371	-0.413	-0.266	-0.527	-0.395
Inverted U-test	1.902	1.841	1.782	1.602	2.217	1.912
Inverted U-test (p-value)	0.031	0.035	0.040	0.057	0.015	0.030
Extremum point	36.658	37.518	39.612	39.141	40.760	36.639
Data range	[0,100]	[0,100]	[0,100]	[0,100]	[0,100]	[0,100]

Standard errors in parentheses
$^*p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$

B. Discussion

When governments increase the degree of transparency of information, this lead, in the first place and according to our results, to an increase in financial instability. Indeed, starting from a zero level of transparency which fits an authoritarian regime (for example), any increase in the level of communication seems to have a disruptive effect. Economic agents who are not used to that kind of information or believe that economic climate is not favorable often find it difficult to trust that information at the first glance. The introduction of transparency seems therefore to have a negative effect on financial stability. However, beyond a certain value of fiscal transparency, markets get attentive to the disclosed information and trust more information conveyed by the government. In that case, credibility about a country's fiscal plans is strengthened and market confidence in the work of public institutions is underpinned. Financial instability, therefore, decreases. This is the case, for example, of democratic countries wherein we observe high degrees of fiscal transparency and stable financial systems.

IV. CONCLUSION

Using system GMM method and annual data of emerging and developing countries in the 1998-2014 period, we find that fiscal transparency exerts a negative and a statistically significant impact on financial instability only when it exceeds a certain threshold. Our result is robust for the use of two indicators of financial instability. This is the first empirical study that explores the real role of fiscal transparency in the stability of the financial systems. The

finding of an inverted U-shape could be useful when designing fiscal policies as well as policies to achieve financial stability. Future research could be devoted to the update of data on fiscal transparency and explore its effects on other economies'regions. Further, the unprecedented sanitary crisis appealed governments to take economic responses to limit the impact of Covid-19. Indeed, [49] argue that fiscal transparency is one the key pillars for the success of the Covid-19 to fiscal policy response. For instance, [32] highlight the importance of fiscal transparency in the process of recovering from the crisis, which strengthens public finance and reduces the borrowing costs in emerging and low-income developing countries. Incoming research could focus on the effects of fiscal transparency on financial stability in the era of the pandemic crisis. Such research is akin to the availability of data at reasonable frequency and for our sample of countries.

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