Debt and currency value, focus on the global south

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Abstract

The main aim of this paper is to examine debt and currency vulnerability during economic turbulences with the focus on the global south countries. A panel data analysis is performed on a panel of 25 economies consist of nine developed and sixteen developing countries with the focus on public and private debt. The empirical findings reveal that both public and private debt buildups have an adverse effect on the currency value. However, there is no evidence for a significant impact from the recession periods on currency value for both private and public debt estimations. We also found that private debt buildup can be more harmful as compared to the public debt in the southern countries.

Keywords: private debt, public debt, currency stress, exchange rate

1. Introduction

The value of the local currency against foreign currencies has been affected by several factors (Gharleghi, Shaari, & Shafighi, 2014; Hassan & Gharleghi, 2015; Zhuk & Gharleghi, 2015; Sabyr, et al, 2015). Besides, the impact of debt and economic crisis on the currency value has also been debated in the past decades. The literature has suggested that debt and currency crisis occur simultaneously (Dreher, Herz, & Karb; 2006).

In this research we try to shed light on the interlink between the debt and currency vulnerability in southern countries. This investigation is one of the most important features in the debt and economic outcome nexus as debt accumulation often causes currency crisis in developing countries. This is because when debt is built up, the investors become sensitive to the fluctuations that rise from weak fundamentals. This leads to pulling out their money from the country causing currency weakening.

Since the main focus of this research is on debt and its impact on currency value, we argue that private debt accumulation may not be a problem by itself as higher debt might reflect the financial sector development because it will direct the households' savings towards financing investment activities (Park, Ramayandi, & Tian, 2021). However, if the debt build up is high and take place rapidly, it may contribute to the

deterioration in the quality of debt because high level of debt may be channeled in inefficient sectors.

Our main contribution to the literature is to analyze the impact of debt and currency stress on the currency value. The type of debt examined in this research consists of both private debt and public debt. With regards to the currency stress, in particular, we are interested in the impact of three different stress periods on the currency value (i.e., GFC 2008, Taper Tantrum 2013, and quantity easing of 2015). Therefore, the main question of this research is to find out the impact of debt buildup as well as crisis stress periods on the currency value. What we found is that both types of private debt and public debt are significantly related to the currency depreciation. However, we couldn't find a significant role for the currency stress periods on the currency value.

2. Literature review

This section outlines a brief of the few literatures that have been done in the area of debt and currency value. This is an indication that this topic is empirically underinvestigated in the existing literature.

Southern countries (developing) are not able to be financed by international capital markets using in their own currencies, i.e. they have to borrow in foreign currencies (USD, Euro, etc.). This will lead to the accumulation of external debt. Even though their financial assets (if not all of them) are denominated in local currencies, this situation creates a precarious currency mismatch in the countries' balance sheets. Therefore, we consider the current account balance to measure this impact.

Dreher, Herz, & Karb (2006) argued that debt and currency crises occur often simultaneously, and the links between these two crises are not well understood.
In their empirical analysis on a panel of 80 countries from 1975–2000 time period, it was observed that there is a negative lagged influence from currency crises to debt crises. additionally, the currency crises significantly increase the risk of contemporaneous debt crises and vice versa.

Ajayi & Choi (1993) argued that external debt has an impact on the exchange rate of less developed countries (LDCs). They used a panel data of 18 LDCs with the help of a modified model of Frankel (1983) and showed that interest rate and money supply have a negative and significant impact on the currencies of these economies.

Babecký et al (2014) utilized the data from 40 developed countries from 1970 – 2010 and stated that debt and currency crisis are preceded by banking crisis. They tried to identify the early warning indicators of crises in the developed nations and found that currency crisis tends to be preceded by booms in the economic activities. In addition, they stated that currency crisis is preceded by worsening government balances and the decrease in central bank reserves.

Murray (2010) argued that after the global financial crisis (GFC) 2008 the number of households that were not able to meet their financial commitments has substantially

increased. This increase has significant implications for the individuals' physical and mental health.

3. Data and Methodology

Most of the data in this study has been drawn from the World Bank database, International Financial Statistics of International Monetary Fund. However, some other sources have also been used to fulfill the partial missing data collected from the earlier sources. The source of each data is elaborated as follow. The inverted exchange rate data is collected from International Financial Statistics. For the debt, two types of debt are collected, the Private Debt (priv_debt) as percentage of GDP and the Public Debt (pub_debt) as percentage of GDP. It is worthy of mentioning that for public debt, the Central Government Debt (% of GDP) is used, however, for the case of China, Egypt, Indonesia, Philippines, and Ethiopia, the General Government Debt (% of GDP) is used. The private and public debt data are mostly retrieved from the Global Debt Database. However, the Private debt to GDP for Tunisia is retrieved from the CEIC Data Company.

The Interest rate spread (lending rate minus deposit rate, %) data is also collected from the World Bank database. Nevertheless, there are some exceptions; the interest rate spread for Switzerland is from the CEIC Data Company. Part of the data (1996 to 2009) for interest rate Spread in Norway is from the Federal Reserve Economic Data (FRED) database. More specifically, The Long-Term Interest Rate is collected from CEIC instead of interest rate spread for Denmark.

Consumer Price index is used as a measure for inflation, and it is retrieved from the World bank Data Base and the base year is 2010 (2020 = 100). The Current account balance (% of GDP) is also from the World Bank. The inverted Exchange Rate data is from the International Financial Statistics.

The time span is from 2000 to 2018 due to the data availability for some of the developing countries. To capture the impact of economic downturns, three major events have been taken care of in this research. The Global Financial Crisis (GFC) of 2008-2009, taper tantrum of 2013-2014, and the unwinding of the US Fed's quantitative easing in 2015. During these three time periods, the global currencies came under depreciation pressure.

This research has taken 25 countries of which 9 are developed countries and 14 are developing countries (Sothern countries). To account for the differences between the level of development, a dummy variable is defined (Dev_Dummy). When the Dev_dummy = 1, it refers to the Southern economies, and 0 otherwise. This is to see if the impact of debt on currency value is more pronounced for southern countries as these economies usually have weaker fundamentals. To account for the impact of economic downturns, a Stess_Dummy is introduced. Stress Dummy = 1 if year captures three stress periods during the sample period, 0 otherwise.

Fiscal balance as percentage of GDP data is from the Fiscal Monitor of the IMF.

The data for exchange change rate regime has been collected from the data developed by Ilzetzki, Reinhart, & Rogoff (2019). The data for this variable is available until 2016 only and since the rest of the data are available until 2018, then the data for 2017 and 2018 for this variable was taken from 2016. It means that the data of 2016 is replicated for 2017 and 2018. The data for exchange rate regime ranges between 1 and 15 in which the higher number indicates more flexibility in the exchange rate system.

The underlying concept for the causal relationship between the currency value and indebtedness is that as debt increases, investors will be concerned with the vulnerabilities arising from weak fundamentals and consequently pulling their money out of the country which results in currency depreciation. So, the question under study is that to what extent high or rising private and public debt is an indication of weak fundamentals. This research therefore explores the impact of public and private debt on currency stress in the southern countries. To be more specific, the following panel data regression is utilized to explore the relationship between exchange rate and debt build-up:

$$exr_{it} = \beta_0 + \beta_1 debt_{i,t-1} + \beta_2\, ir\_spread_{i,t} + \beta_3\, CPI_{i,t} + \beta_4 ca_{i,t-1} + \beta_5 Fisbal_{i,t-1} + \beta_6 EXR\_Regime_{i,t} + \varepsilon_{i,t}$$

Where $debt_{t-1}$ is the lagged logarithm debt as percentage of GDP for country *i* at the end of year *t-1*, denoting both central government debt and private debt (loans and debt securities) depending on the two different specifications used for estimation. The macro variables of interest rate, inflation, and current account balance are used as control variables as these variables are believed to impact the currency value and financial vulnerability (based on the various exchange rate theories such as Frenkel, 1977; Meese, R. A., & Rogoff, 1983). More specifically, ca_{t-1} is the lagged current account balance as percentage of GDP, *cpi* is the logarithm of CPI and is a proxy for inflation rate, and the *ir_spread* is the interest rate spread between the lending and deposit rates. *Fisbal* is the fiscal balance (revenue minus expenditure) as percentage of GDP. *EXR_regime* is the degree of exchange rate flexibility (higher number indicates a more flexible regime). In the literature, panel data has been used to capture the country specific characteristics in the panel estimation (Bugenbayev, et al, 2021)

4. Empirical Results

When the data are matched together from various sources, the panel data is created from 25 countries with debt and control variables during 2000-2018 due to data availability for debt across all economies. The sample then includes 9 advanced economies and 16 developing economies[1]. Table 1 shows the descriptive statics of the selected variables.

Table 1. Descriptive statistics (panel data, 25 countries, 2000–2018)

[1] Bangladesh, Brazil, China mainland, Egypt, Indonesia, India, Sri Lanka, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Vietnam, Turkey, Tunisia, South Africa, Australia, Switzerland, Czech Republic, Denmark, United Kingdom, Japan, Norway, Canada, and Russia.

	EXR	IR	Private Debt	Public Debt	CA	CPI	Fiscal Balance	EXR regime
Mean	0.28	4.49	97.50	48.87	0.911	97.88	-2.44	9.42
Median	0.119	3.75	67.67	42.13	-0.24	97.89	-2.70	10
Max.	2.000	45.11	256.48	198.44	20.73	264.3	23.46	15
Min.	0.000	-74.69	7.80	6.08	-11.17	20.59	-13.43	2
Std. Dev.	0.402	9.65	68.67	31.66	5.46	31.67	4.59	3.28

Source: author computations
Note: EXR is exchange rate, IR is the interest rate spread, CA is the current account balance, CPI is the consumer price index

From table above it can be observed that the median values for private debt and public debt as percentage of GDP are 67% and 42% respectively. On average the sample economies are running a current account surplus. The median of inflation is as same as its mean suggesting that there is no high inflation economy in the sample. The table also shows that the interest rate is on average higher than the US interest rate.

Table 2 depicts the panel regression results for private debt and control variables that influence exchange rate. The size of the coefficients in model 1 suggest that when private debt increases by 100% of GDP from the sample median, the currency depreciates by 0.2% which is very small and also not significant. in the second model which includes the dummy for developing economies, it can be seen that private debt has a more negative impact on currency value in the developing economies as the coefficient of the dummy variable is significant. To be specific, a 100% higher ratio of debt to GDP causes 0.09% depreciation pressure in the developing countries than developed nations. In the third model which includes the stress period, it seems that the stress periods had no conclusive impact on the currency value. It means that the selected crisis periods had no significant impact on debt accumulation for the selected economies.

Table 2A depicts the results of the same settings in Table 2 but the exchange rate regime has been added to the model to see if the degree of flexibility of the exchange rate system makes any difference. The inclusion of this variable allows the researcher to see to what degree a more flexible exchange rate system would worsen/improve the value of the local currency. The findings show that a more flexible exchange rate

contributes into the depreciation of the local currency even though the impact is not significant.

Table 2. Private debt and currency vulnerability (panel data, 25 countries, 2000–2018)

	Model 1		Model 2		Model 3	
Variables	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Private debt	-0.0019	-0.42	0.031	1.21	-0.0073	-0.36
IR_spread	-0.0032	-3.07*	-0.0032	-2.93*	-0.0029	-2.70*
CPI	-0.0420	-2.97*	-0.0409	-2.74*	-0.047	-3.21*
CA	0.0019	1.18	0.0019	1.30	0.0021	1.52
Fiscal Balance	0.0000	0.01	0.0004	0.27	-0.0007	-0.41
Dev_dummy (dev*priv_debt)			-0.0009	-2.11**		
Stress_dummy (stress*priv_debt)					0.0002	3.43*
Constant	0.5024	6.71*	0.3004	4.19*	0.5375	7.00*
R-square		0.960		0.960		0.961
Observations		465		465		465
Country fixed effect		Yes		Yes		Yes
No of cross sections		25		25		25
Regression F-value		363.82		354.67		360.84

Source: author computations
Note: IR_spread is the interest rate spread, CA is the current account balance, CPI is the consumer price index

Table 2A. Private debt and currency vulnerability (panel data, 25 countries, 2000–2018)

	Model 1		Model 2		Model 3	
Variables	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Private debt	-0.0010	-0.04	0.0316	1.23	-0.0064	-0.32
IR_spread	-0.0033	-3.05*	-0.0033	-2.99*	-0.0030	-2.77*
CPI	-0.0423	-2.82*	-0.0404	-2.70*	-0.047	-3.17*
CA	0.0017	1.22	0.0017	1.19	0.0020	1.38
Fiscal Balance	-0.0001	-0.06	0.0003	0.20	-0.0008	-0.48
EXR_regime	-0.0022	-0.89	-0.0021	-0.84	-0.0022	-0.88
Dev_dummy (dev*priv_debt)			-0.0009	-2.09**		
Stress_dummy (stress*priv_debt)					0.0002	3.43*

Constant	0.5176	6.56*	0.4058	4.27*	0.5522	7.03*
R-square		0.960		0.960		0.961
Observations		465		465		465
Country fixed effect		Yes		Yes		Yes
No of cross sections		25		25		25
Regression F-value		351.56		343.02		349.05

Source: author computations
Note: IR_spread is the interest rate spread, CA is the current account balance, CPI is the consumer price index

Table 3 shows that in general the impact of public debt on currency value is negative. Additionally, it shows that the impact of public debt on currency depreciation is greater than private debt. Model 1 shows that on average a 100% increase in public debt is associated with a 3.9% depreciation in the currency.

In model 2, it is clear that the impact of public debt on currency value is not significantly different between developing and developed economies as the coefficient of country dummy is not significant, but it has an additional depreciation pressure for the case of developing nations. In model 3, it is evident that public debt does not undermine the currency stability during stress periods as the coefficient of stress dummy is positive.

The exchange rate regime has been added to table 3 to see the impact of the degree of flexibility of the exchange rate system on currency value using public debt. The findings show that a more flexible exchange rate contributes into the depreciation of the local currency even though the impact is not significant.

Table 3. Public debt and currency vulnerability (panel data, 25 countries, 2000–2018)

	Model 1		**Model 2**		**Model 3**	
Variables	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Public debt	-0.0393	-2.91*	-0.0339	-2.24**	-0.0421	-3.10*
IR_spread	-0.0030	-2.77*	-0.0032	-2.88*	-0.0028	-2.58*
CPI	-0.0529	-4.10*	-0.0554	-4.20*	-0.0586	-4.39*
CA	0.0026	1.86***	0.0026	1.76***	0.0029	1.98**
Fiscal balance	-0.0015	-0.84	-0.0018	-1.02	-0.0018	-1.04
Dev_dummy			-0.0005	-0.85		
(dev*pub_debt)						

Stress_dummy (stress*pub_debt)					0.0002	1.68***
Constant	0.6802	8.04*	0.6912	8.07*	0.7123	8.22*
R-square		0.961		0.961		0.961
Observations		464		462		462
Country fixed effect		Yes		Yes		Yes
No of cross sections		25		25		25
Regression F-value		369.99		355.27		357.09

Source: author computations
Note: IR_spread is the interest rate spread, CA is the current account balance, CPI is the consumer price index

Table 3A. Public debt and currency vulnerability (panel data, 25 countries, 2000–2018)

	Model 1		**Model 2**		**Model 3**	
Variables	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Public debt	-0.0384	-2.83*	-0.0338	-2.23**	-0.0413	-3.02*
IR_spread	-0.0031	-2.82*	-0.0033	-2.89*	-0.0029	-2.62*
CPI	-0.0521	-4.01*	-0.0546	-4.09*	-0.0578	-4.30*
CA	0.0025	1.75***	0.0025	1.67***	0.0027	1.85***
Fiscal balance	-0.0015	-0.86	-0.0018	-1.02	-0.0019	-1.05
EXR_regime	-0.0014	-0.58	-0.0010	-0.41	-0.0014	-0.55
Dev_dummy (dev*pub_debt)			-0.0005	-0.76		
Stress_dummy (stress*pub_debt)					0.0002	1.68***
Constant	0.6875	8.03*	0.6959	8.04*	0.7192	8.21*
R-square		0.961		0.961		0.961
Observations		464		462		462
Country fixed effect		Yes		Yes		Yes
No of cross sections		25		25		25
Regression F-value		357.12		343.16		345.02

Source: author computations
Note: IR_spread is the interest rate spread, CA is the current account balance, CPI is the consumer price index

For the control variables, current account balance has a positive impact on the currency value. The impact of interest rate spread is negative and significant, it means that a wider spread which indicates a higher country risk premium is linked with more currency stress (depreciation). The impact of inflation is also significant and negative.

It means that higher inflation rate is associated with more currency stress (depreciation). Fiscal balance has a negative impact on the currency value, i.e. a negative balance contribute to the currency depreciation.

5. Conclusion and Recommendations

The empirical findings of this research suggests that both public and private debt buildups have an adverse effect on the currency value. However, we did not find the evidence for a significant impact from the recession periods on currency value for both private and public debt estimations. We also found that private debt buildup can be more harmful as compared to the public debt in the southern countries.

Policy implications

This suggests that policy makers in southern countries should closely monitor the debt buildup. The results also suggest that debt monitoring should not be narrowed only to public debt sustainability but to a broader framework that incorporates both public and private debt. The reason is that, although public debt jeopardizes economic stability, a pronounced relationship between currency stress and private debt in southern countries points to the fact that there is a need for a broader debt surveillance because when private debt becomes unsustainable for companies and households, then the number of nonperforming loans and debt defaults will increase and that will damage the banks' balance sheets. This situation may eventually prompt a liquidity crunch that may further evolve into *government bailouts* and *fiscal deficits*. Both the latter will have an adverse impact on public debt sustainability.

Limitations

Due to data unavailability for public and private debt for 2019-2020, we were not able to measure the impact of COVID-19 crisis on debt build-up and consequently currency vulnerability as a consequence of COVID-19 crisis. This crisis will push the countries especially southern countries deeper into debt. Even though the impact of stress times was not evident in affecting the currency value, COVID crisis might have a different impact as it has started in late 2019 and there is no clear projection when it will be over. This is especially true for the case of southern countries where private debt have

a more harmful effect on debt and currency value. Therefore, future studies should incorporate the impact of COVID in affecting debt and currency value.

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