

# Boom-bust Cycles Revisited: The Role of Credit Supply

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## I. Introduction

Credit supply promotes economic growth by allowing limited resources in the economy to be reallocated. Excessive credit in some industries, on the other hand, can make the economy vulnerable to exogenous shocks and sometimes even lead to a financial crisis. The recent financial crises, such as the global financial crisis and the Eurozone debt crisis, and the subsequent years of economic stagnation, highlight the relationship between credit accumulation and the economy. Those events demonstrate that the financial crisis is not just a problem for emerging economies. Excessive increases in private credit created by the financial industry can cause a crisis, and excessive public debt can erode the economy's resilience in developed economies.

In March and April 2020, a sharp credit crunch and a sharp drop in stock prices occurred worldwide due to the expectation shock on the

economy raised from the spread of COVID-19. Due to massive fiscal stimulus measures and the expansive monetary policy stance, private credit and government debt levels have expanded fast in response to the impact of COVID-19. Such credit expansion is inevitable in alleviating the real shock of COVID-19. However, excessive private credit and soaring asset prices may intensify the economic shock in a future downturn. Moreover, the expansion of government debt can diminish the policy capacity to respond to the business cycle.

This study investigates the impacts of credit supply on economic growth and financial crisis. Excess credit supply can make the economy and financial markets more vulnerable. While credit supply can drive economic growth by reallocating resources, it can also make the economy and financial markets more fragile. Asset prices sharply fall when deleveraging occurs in

the case of a negative shock to the financial or real sector in a system where credit is excessively supplied. Furthermore, economic activity might be substantially reduced, extending the length and breadth of the recession. Even though this study does not contain the latest data after COVID-19 in the analysis, we can provide policy implications by studying the influence of credit supply on the economy.

## II. Relationship between Credit Expansion, Economic Growth, and Financial Crisis

### 1. Relationship between Credit Expansion and Economic Growth

We present qualitative analysis and event study results to describe the relationship between credit supply, economic growth, and financial crisis. In the qualitative analysis, we visualize the long-term relationship by comparing the private credit and government debt with macroeconomic variables in each country.

The relationship between private debt and GDP per capita conditional on economic development and debt growth is shown in Figure 1. We categorize both advanced and emerging countries by each median level of private debt

growth over 1995-2010. We chose the period 1995-2010 because global financial integration led to considerable growth in private credit. Countries with high debt growth<sup>1</sup> have relatively higher GDP growth than countries with low debt growth<sup>2</sup> in advanced economies. The high debt growth advanced group has an average annual growth rate of 3.4 percent, whereas the low debt growth advanced group has an average annual growth rate of 2.8 percent.

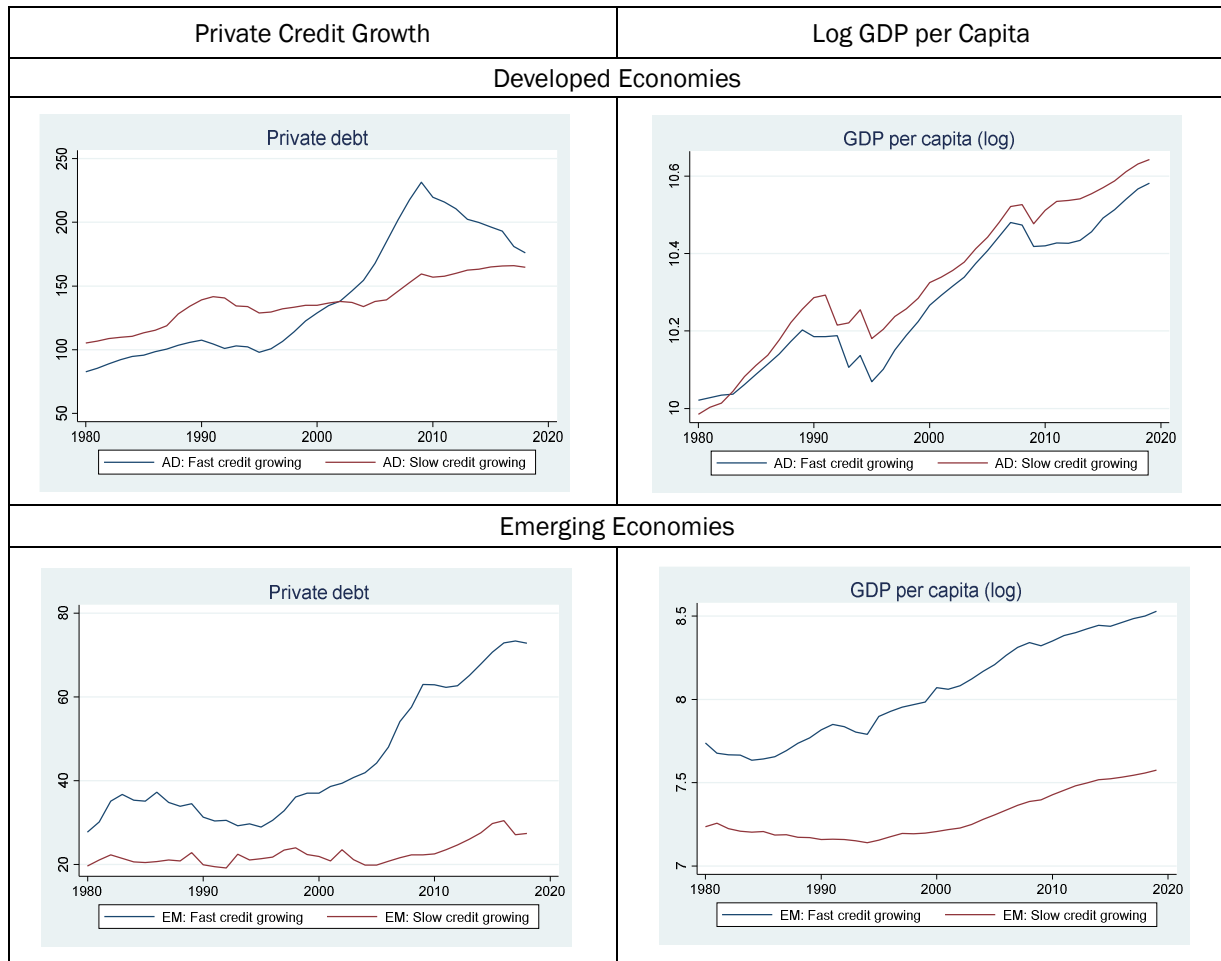
Meanwhile, the global financial crisis of 2008 demonstrates the economic impacts on credit deleveraging mainly in developed countries. In comparison to the low debt growth advanced group, the economic depression in the high debt growth advanced group is relatively severe and has lasted a long time. The average annual GDP growth rate between 2008 and 2018 is 0.8 percent in the high debt growth advanced group, against 1.0 percent in the low debt growth advanced group.

Throughout the sample period in emerging countries, GDP per capita in the high debt growth group grows faster than that in the low debt growth group, resulting in a gradual widening of the GDP per capita gap between the two groups.

<sup>1</sup> Australia, Belgium, Denmark, Estonia, Greece, Iceland, Ireland, Latvia, Malta, Netherland, New Zealand, Norway, Portugal, Slovenia, Spain, England

<sup>2</sup> Austria, Canada, Cyprus, Finland, France, Germany, Israel, Italy, Japan, Korea, Lithuania, Singapore, Slovakia, Swiss, the United States

**Figure 1. Relationship between Private Credit and GDP**



Notes: Blue line indicates high credit growth group and red line indicates low credit growth group.

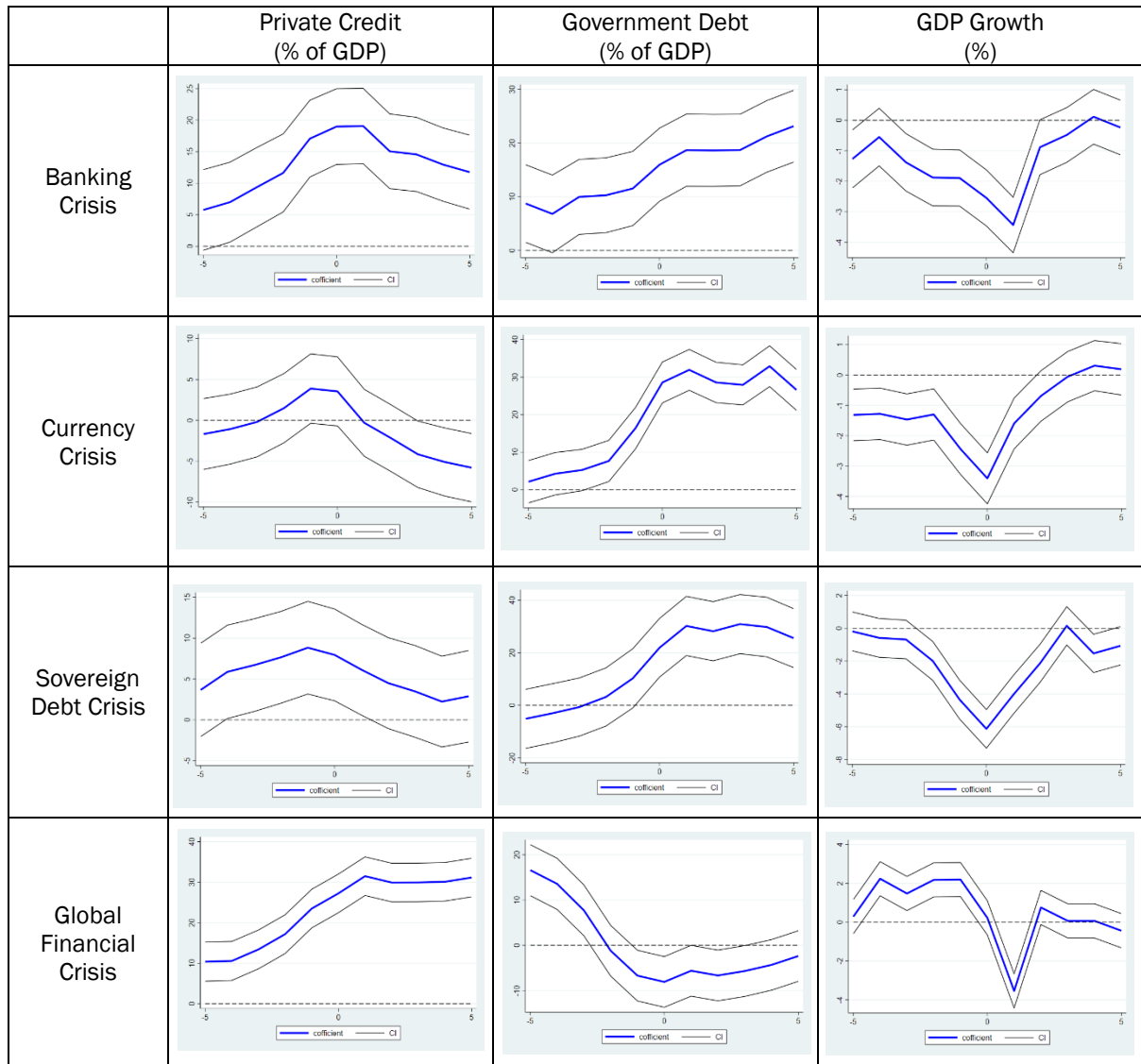
Source: Authors' calculations based on IMF Global Debt Database and World Bank World Development Indicators.

## 2. Relationship between Credit Expansion Financial Crisis

We conduct event studies to investigate credit expansion trends before and after the financial crisis. From Laevin and Valancia (2018), we identify the financial crisis episodes: 151 banking crises, 239 currency crises, and 76 government debt crises. Private credit rises dramatically before the banking crisis and the global fi-

ancial crisis, as shown in Figure 2. In comparison, private credit is rapidly adjusted after the banking crisis, relatively less adjusted after the global financial crisis. After a financial crisis, government debt tends to rise as large-scale fiscal stimulus is implemented to alleviate the crisis. Following the global financial crisis, we can see a decrease in government debt levels, owing primarily to the tendency of emerging countries.

Figure 2. Event Studies of Financial Crisis



Source: Laeven and Valencia (2018); IMF, Global Debt Database; Authors' calculations

### III. The Impacts of Private Credit and Government Debt on Macroeconomic Variables

$$AY_{i,t} = \alpha_i + \sum_{j=1}^p \beta_j Y_{i,t-p} + \epsilon_{i,t}$$

#### 1. Model

We conduct the panel VAR model with fixed effects based on Mian et al. (2017) as follows:

where  $\alpha_i$  indicates a country-fixed effect and  $\epsilon_{i,t}$  indicates structural error of  $N \times 1$ .

The identification of structural shock follows the Cholesky decomposition. In the case of the baseline model, the order of real GDP, government debt, non-financial corporate debt, and household debt follows the identification assumption of Mian et al. (2017). This implies that a structural shock to real GDP can have an immediate impact on debt variables, while a structural shock to debt variables can only have a delayed impact on real GDP. The results, however, are consistent with the identification assumptions.

## 2. Empirical Results

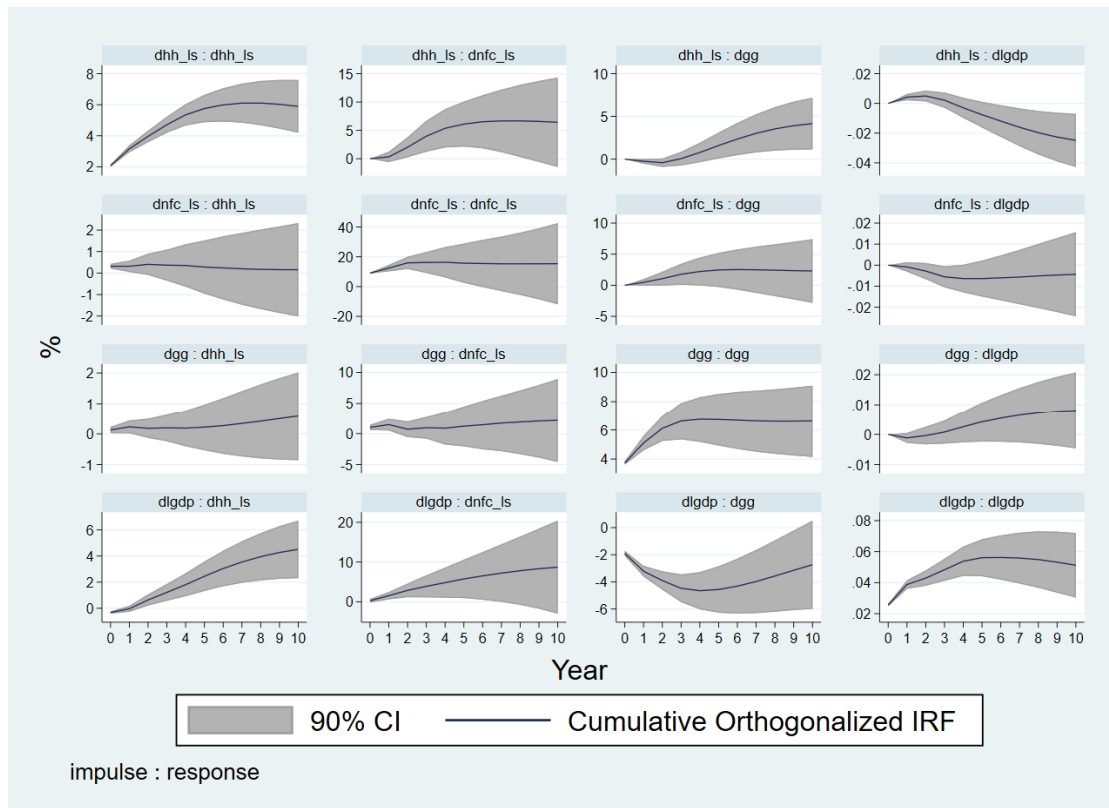
We investigate a dynamic relationship between private and government credit and various macro variables by estimating the panel VAR model. As indicated in the first row and last column of Figure 3, the household credit shock tends to boost real GDP in the short term (within 1 to 2 years). However, real GDP tends to fall in the medium term (after 3 to 4 years). This result supports the conclusion of Mian et al. (2017) based on long historical data from a few developed countries. Moreover, it remains true even for relatively short emerging market countries. This important finding reveals household credit's medium- and long-term risks. On the other hand, the increase in non-financial corporate debt tends to reduce real GDP slightly (the second row and last column of Figure 3). However, its impact is small and limited in the short term compared to household debt. Contrary to conventional wisdom,

an increase in government debt does not reduce real GDP (the third row and last column of Figure 3).

To identify the transmission channel of debt shock, we conduct several variations of the baseline model by adding extra macroeconomic variables. As a result, we find that the impact of household credit on the macroeconomy and its transmission path is significantly different from that of non-financial corporate debt. First, a household credit shock boosts real GDP in the short run, primarily by boosting consumption. In the medium- to long-term, however, it tends to diminish real GDP through real exchange rate appreciation, higher relative production of non-traded goods, decreasing productivity, and deterioration of the current account. Second, through the opposite channel of the household debt shock, a depreciation in the real exchange rate, and an increase in the relative production of trade goods, the impact on non-financial corporate debt had a relatively limited impact on real GDP.

To summarize, because the macroeconomic effects of increases in household, corporate, and government debts differ, policymakers should pay attention to and track changes in individual debts as well as total debt. It should be noted, in particular, that a short-term economic boom based on the promotion of aggregate demand may result in a deep economic slump accompanied by a decline in productivity in the medium- to long-term

Figure 3. Event Studies of Financial Crises



Note: Both advanced and emerging countries that have more than 15 years of samples are used in the analysis.  
 Source: Authors' calculations

#### IV. The Impacts of Credit on the Possibility of Financial Crisis

We investigate the impact of credit on the risk of a financial crisis using the panel probit model. Based on the database of Laeven and Valencia (2018), the financial crisis can be described in a binary representation as follows. The value 1 is taken when a crisis occurs, and value 0 when there is no crisis. We use overall 1,543 observations of 56 countries, including both developed and emerging economies.

Columns (1) and (2) in Table 1 show the effect

of credit levels on the likelihood of a bank crisis. Corporate credit statistically significantly increases the possibility of both banking crisis and forecasting indicators of a banking crisis. Household credit is also significant in the forecasting indicators of a banking crisis, defined by Baron and Xiong (2017). The estimation coefficient of household credit is seven times larger than that of corporate credit, suggesting that the level of household credit is relatively crucial in evaluating the occurrence of a banking crisis. Government credit lessens the likelihood of a bank crisis, reflecting the aspect of government authorities providing credit to the

market in case of financial instability. Foreign reserves appear to lessen the risk of a financial crisis, implying that building up foreign exchange reserves reduces the risk of a banking crisis.

Columns (3) and (4) in Table 1 present the results on currency crisis and forecasting indicators of a currency crisis. Household credit reduces the likelihood of both currency crisis and the forecasting indicators, whereas corporate credit has a significant positive effect. Alt-

though the currency crisis and forecast indicators are dummy variables, they demonstrate a sharp drop in their currency values. These findings are consistent with the panel VAR analysis in the previous section, which found that household credit raises the real effective exchange rate while corporate credit lowers it. The results are difficult to interpret as a causality, implying that an increase in household credit lessens the likelihood of a currency crisis. It is reasonable to think of this as a correlation.

**Table 1. Panel Probit Random Effect Model (All Countries)**

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Banking Crisis	Banking Crisis (f)	Currency Crisis	Currency Crisis (f)	Sovereign Debt Crisis	Sovereign Debt Crisis (f)
Household Credit	0.0000845 (0.00300)	0.0359*** (0.00649)	-0.0226*** (0.00788)	-0.0310*** (0.00803)	-0.0110 (0.0145)	0.0431 (0.0283)
Corporate Credit	0.00317** (0.00129)	0.00508** (0.00213)	0.00642*** (0.00209)	0.00951*** (0.00226)	0.00320 (0.00673)	0.0324*** (0.00933)
Government Credit	-0.00129 (0.00225)	-0.0205*** (0.00390)	0.00100 (0.00363)	-0.00799* (0.00434)	0.0161* (0.00835)	-0.000458 (0.0104)
log(GDP)	0.0248 (0.0436)	0.472** (0.206)	0.0261 (0.0645)	0.311* (0.180)	-0.0931 (0.147)	1.013** (0.484)
Foreign reserves/GDP	-0.0193** (0.00954)	-0.121*** (0.0190)	-0.0114 (0.0110)	-0.0184 (0.0119)	-0.115 (0.0769)	-0.271*** (0.0504)
REER	-0.00141 (0.00403)	0.0191*** (0.00513)	-0.00825 (0.00643)	0.0116** (0.00573)	-0.00686 (0.0153)	0.0499** (0.0241)
log( $\sigma^2$ )	-13.75 (25.04)	1.506*** (0.372)	-1.875* (1.014)	0.923* (0.521)	-0.552 (1.262)	4.377*** (0.359)
Constant	-2.539** (1.258)	-16.76*** (5.577)	-1.934 (1.903)	-11.32** (4.948)	-0.641 (4.816)	-50.11*** (13.54)
Observations	1,543	1,543	1,543	1,543	1,543	1,543
Country	56	56	56	56	56	56

Notes: ( ) indicates standard deviation; \*, \*\*, \*\*\* indicate 10%, 5%, and 1% confidence levels, respectively.

Source: Authors' calculations

Columns (5) and (6) in Table 1 report the effect of credit levels on the likelihood of a government debt crisis. Government credit increases the probability of a government debt crisis statistically significantly at the 10% confidence level. However, it is insignificant on the forecast indicators of the government debt crisis. These results can be interpreted as indicating a sharp rise in government credit during a financial crisis, rather than the level of government credit in normal time, increases the likelihood of a government debt crisis. However, these findings should be interpreted with caution because endogeneity is not adequately taken into account. For example, suppose government credit increased to deal with other financial crises, eventually resulting in a government debt crisis. In such a case, this does not mean that the level of government credit caused the government debt crisis. As a result, the building of foreign exchange reserves appears to reduce the risk of a medium- to long-term government debt crisis.

In sum, we find that the household credit expansion significantly increases the probability of a banking crisis, while it does not affect the probability of a currency crisis. On the other hand, corporate credit expansion increases the probability of all types of crises. Government credit expansion tends to increase the probability of a government debt crisis. Moreover, government credit expansion has the effect of lowering the probability of a banking crisis and a currency crisis, supporting the counter-cyclicality of government credit.

## V. Conclusion

In 2020, in response to the economic shock of the COVID-19 pandemic, the level of both private and government credits sharply increased due to the massive fiscal stimulus programs and expansionary monetary policy. The impacts of household, business, and government credit on the macroeconomics can differ, so policymakers should pay attention to the level of total credit and the change in the composition of credit.

In the short term, an increase in household credit stimulates the economy. However, more capital being allocated to non-tradable and lower productive industries, as well as an appreciation of the real effective exchange rate, may hinder economic growth in the medium to long term. Financial assets and real estate prices have soared globally in the last two years, despite the real economy still struggling from the pandemic. When a negative impact happens in financial markets or the real economy, this disparity can trigger a severe crisis by compounding the shock by expanding financial instability and deleveraging. Moreover, if this trend continues, it may impede medium- to long-term economic growth.

It is difficult to find empirical evidence that government debt slows economic growth or makes a financial crisis more likely. However, as government debt cannot grow endlessly, non-linear relationships such as thresholds between government debt and economic growth, as well as the likelihood of a financial crisis,



should be considered. Unfortunately, this aspect is not sufficiently addressed in the study

and must be left a subject for future research.<sup>KIEP</sup>

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