Discussion of "Monetary Policy, Private Debt, and Financial Stability Risks"

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1. Introduction

Preventing a repeat of the global financial crisis has become a priority for policymakers. On the regulatory side, banking institutions are facing pressure to increase capital ratios, they are often confronted with restrictions on proprietary trading, and larger institutions are required to stress-test their loan portfolios, to list a few examples. On monetary policy, interest rate setting is no longer viewed as necessarily limited to achieving price stability and full employment mandates. Central banks question with renewed curiosity whether they should also respond to rapid growth in credit and asset prices by raising interest rates preemptively. The question itself is not new, and in the past the answer seemed to be "no." But the seminal paper by Schularick and Taylor (2012) and subsequent work has shown rapid growth of credit relative to GDP to be the single best harbinger of fragility in financial markets.

The paper by Bauer and Granziera (BG henceforth) should be viewed against this backdrop. It is not an attempt to determine whether or not it is optimal for central banks to add financial stability as one of the policy objectives to be managed with interest rate policy. Rather, it asks a narrower, more operational question: Would raising interest rates to reduce froth in credit and asset markets generate unwanted financial instability in the short run? The answer they provide is a surprising "yes" based on careful and sophisticated empirics.

The reason for this paradoxical result is that output initially declines more quickly than credit in response to an interest rate hike. As a result, aggregate "leverage" increases in the short run before coming down in the medium and longer run. I use "leverage" here to indicate above-trend growth in the ratio of credit to GDP in

the aggregate sense, and not its more common usage in finance as the ratio of credit to assets.

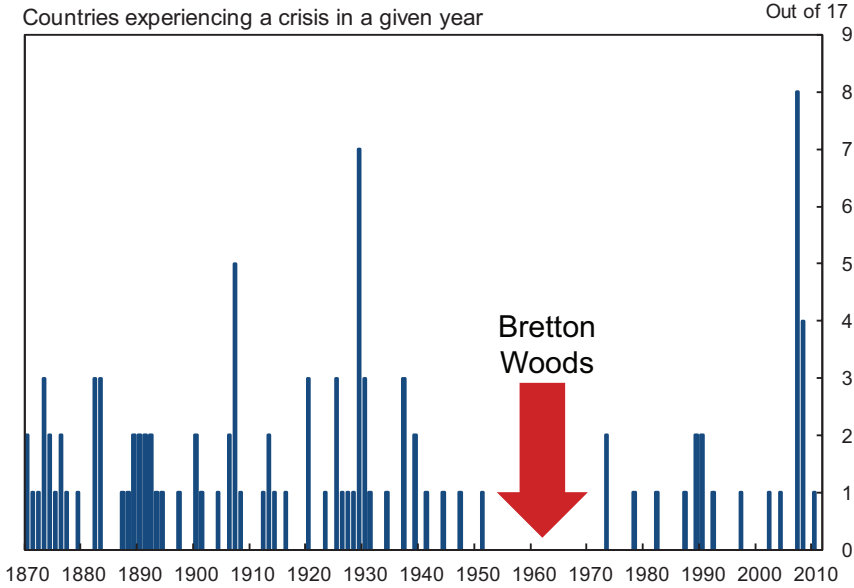
Whether or not this finding is relevant for monetary policy depends on a number of factors. I will therefore structure my discussion around three ideas. First, financial crises in the BG sample are very infrequent. I will provide more context for this risk using a similar cross-section of countries observed over a longer period, but at a yearly frequency instead of quarterly. My evidence largely supports their findings. Because crises happen infrequently, the amount of "insurance" a central bank will be willing to pay will depend greatly on how severe these rare events are, a topic I will return to momentarily.

Importantly, because crises are uncommon, they are relatively difficult to predict (see Gadea-Rivas and Pérez-Quirós 2015). Preemptive policy will often be implemented to prevent crises that might not have taken place anyway. These are arguments commonly made against using monetary policy to achieve financial stability. That said, BG note that the interaction between crisis risk and above-trend credit-to-GDP growth is very non-linear. When credit is well above trend, crisis risk increases very rapidly. In such situations, the incentives to raise interest rates grow quickly—and so do the short-run risks that BG emphasize.

My second argument is to document that leverage tends to make recessions worse, financial or otherwise. This result, first reported perhaps in Jordà, Schularick, and Taylor (2013), suggests that a central bank may wish to restrict credit even if risk of financial crisis is not yet extreme. Crises may be rare but recessions are not.

The case for using monetary policy to hold back credit is stronger, it would seem. However, credit booms are also beneficial since they are associated with longer-lasting expansions. There is a welfare calculation to be made. How much more growth is there in an expansion with above-trend credit growth? How large is the economic loss from a credit boom gone bust? I cannot answer the exact welfare calculation here. But I can provide evidence comparing the output gains in the expansion with the potential losses in the recession. Viewed from this angle, it is less clear whether or not a central bank should aggressively manage credit booms through interest rate policy. As usual, BG remind us that monetary policy is about assessing trade-offs in a forward-looking manner.

Figure 1. Frequency of Financial Crises, 1870–2011



Notes: Based on seventeen advanced economies. Number of countries experiencing a crisis in a given year. Data from Jordà, Schularick, and Taylor (2017b) macrohistory database. See reference for more details.

2. Credit Booms and Financial Crisis Risk

When investigating financial crises, the BG sample, which starts in 1975:Q1, is for all intents and purposes a post–World War II sample. The reason is that there are no financial crises in advanced economies during the Bretton Woods era, from the end of World War II to 1972. Figure 1 illustrates this point by basically extending BG's figure 3 all the way back to 1870 using the Jordà, Schularick, and Taylor (2017b) database[1] (JST henceforth). Note that the data in figure 1 are aggregated into yearly frequency, and they do not include episodes of bank equity corrections, as figure 3 in BG does. This explains the minor differences between the two figures.

[1]See http://www.macrohistory.net/data/.

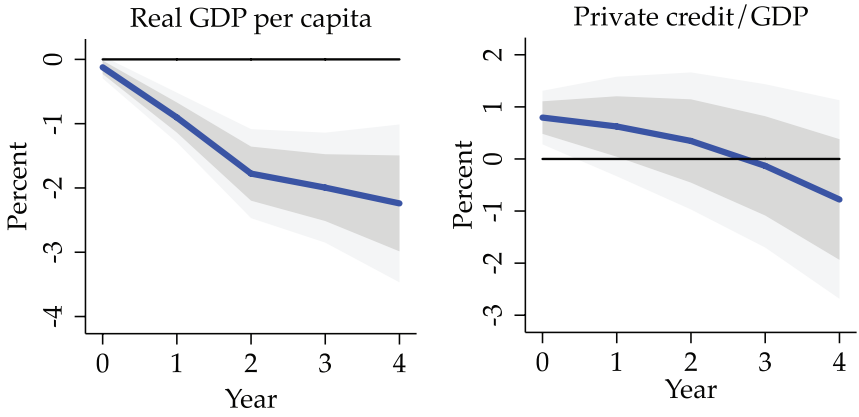
The key calculation in BG is that when credit to GDP grows at trend, the probability of a crisis in the following two years ranges from 1 to 12 percent. These numbers can be interpreted as an average benchmark and indeed match the unconditional probability of financial crisis in JST. Using a sample of seventeen advanced economies that nearly matches the BG country cross-section, the probability of a crisis in any country-year pair ranges from 5 percent to 2.5 percent depending on the period considered: higher in the pre–World War II period (excluding World War I), and lower in the post–Bretton Woods era.

Another way to look at these data is to classify recessions into financial or normal as Jordà, Schularick, and Taylor (2013) do. A financial crisis recession refers to a recession in which a financial crisis takes place within a two-year window of its start. Using this more narrow definition (and a slightly shorter sample including fourteen countries), full sample results suggest that about 20 percent of recessions could be associated with a financial crisis. The share declines if one excludes the post–Bretton Woods era.

Crises are rare but not entirely impossible to predict. Like Schularick and Taylor (2012), BG also find that above-trend growth of credit relative to GDP has some predictive power. Using their preferred model (column 2 in table 2 of their paper) and focusing only on systemic banking crises, the area under the receiver operating characteristic (AUROC) curve—a statistic used to assess binary event prediction that takes values between 0.5 (no better than a coin toss) and 1 (perfect classification)—is about 0.76. That is, predicting a crisis correctly 75 percent of the time will generate false positives about 25 percent of the time. These results are comparable to what Jordà, Schularick, and Taylor (2011) report using a similarly specified panel logit specification.

However, extreme deviations of credit from trend quickly raise the odds of a systemic event. Due to the non-linear nature inherent in the logit specification, BG show that deviations of credit from trend 20 percent or higher can result in probabilities of crisis increasing from the unconditional 1–12 percent range to the 30–60 percent range—a virtual certainty comparatively speaking. Accordingly, the central bank's decision to raise interest rates to prevent a crisis depends greatly on how much above trend credit is growing relative to GDP.

Figure 2. Impulse Responses to a 1 Percent Interest Rate Hike: External Instrument Identification, 1948–2013



Notes: Based on Jordà, Schularick, and Taylor (2017a). The external instrument is based on the trilemma of international finance. Sample based on seventeen advanced economies. See reference for more details.

3. Credit Makes Recessions Worse, not Just Financial Crises

Results from the previous section suggest that a central bank may consider raising rates to curb credit when deviating from trend by more than some number probably north of 20 percent. Of course, a great deal more work would be necessary to find what the appropriate trend-deviation threshold is. And in practice, it is always difficult to determine where the trend is in real time. These are all relevant operational considerations.

Raising interest rates reduces credit growth, but as BG and a vast literature on monetary economics shows, it also slows economic activity down. In fact, using a completely different identification approach over a different sample than BG, Jordà, Schularick, and Taylor (2017a) find an almost identical response of output and the ratio of private credit to GDP as that reported in figure 5 of BG. Figure 2 thus provides assurance about the main result in BG.

Figure 5 in BG and figure 2 here show that in the short run, monetary policy may have the unintended consequence of *raising*

crisis risk during the first year after the policy is implemented. The reason is that leverage increases over the first year, and as we saw in the previous section, more leverage increases the odds of a financial crisis. This result therefore speaks of the need for the central bank to be forward looking and to slow credit well in advance of when it reaches critical levels.

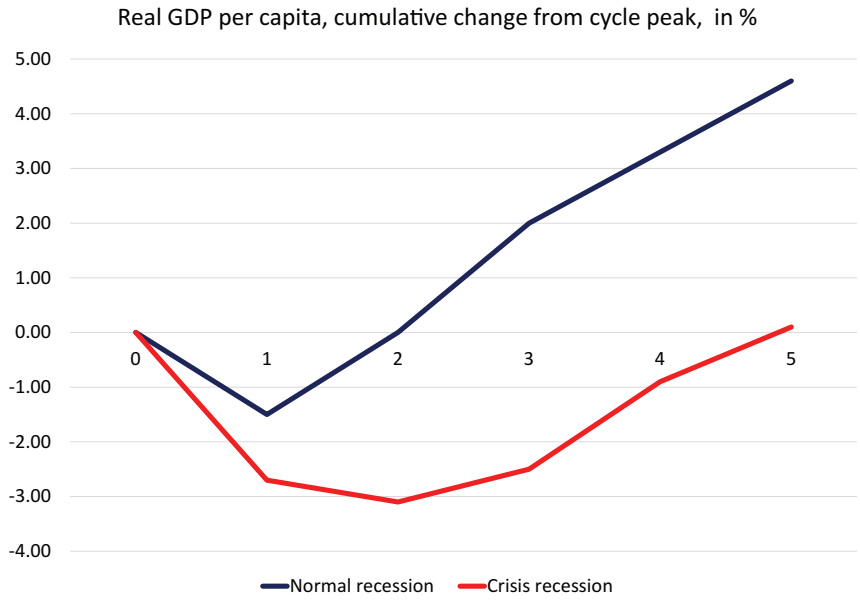
Holding back credit growth may be beneficial in other ways too. Jordà, Schularick, and Taylor (2013) show that recessions are deeper and longer lasting when credit grows above average. The sample in that paper goes back to 1870 and covers fourteen of the eighteen countries considered in BG. The main result is that recessions associated with financial crises are deeper and longer lasting.

Consider real output per capita. Normalizing relative to year 0 of the recession, in a garden-variety downturn, output declines by nearly 1.5 percent in year 1, recovers in year 2, and by year 5 is about 5 percent higher than in year 0. Contrast this to a financial crisis recession. Output declines by about 3 percent in year 2 (not year 1), and by year 5 has just about recovered its level before the contraction started. Clearly, financial crisis recessions are much worse. Figure 3 provides a visual presentation of the two recession and recovery paths just discussed.

However, regardless of type, higher rates of credit growth during the preceding expansion make matters worse. In Jordà, Schularick, and Taylor (2013), when credit to GDP grows at 3 percentage points above country-specific means on a yearly basis, output declines by over 2 percent (rather than 1.5 percent), recovers only by year 3 (rather than by year 2), and by year 5 has grown by about half of what it grows when credit hits its average growth rate. A similar picture, only slightly worse, describes what happens in financial crisis recessions.

This discussion makes evident that there may be additional advantages to holding back credit that go beyond preventing a systemic banking crisis. And such considerations would be expected to affect the "optimal" trend-deviation threshold for credit to the downside. But before concluding that central banks should be raising interest rates to guard against financial instability, it is good to remember that access to credit is one of the cornerstones to achieving higher rates of growth. The next section investigates this trade-off.

Figure 3. Cumulative Loss from Business-Cycle Peak: Normal vs. Financial Crisis Recessions, 1870–2008



Notes: Based on seventeen advanced economies. Data from Jordà, Schularick, and Taylor (2017a). See reference for more details.

4. Credit Is an Engine of Growth

So far credit appears to have only negative consequences: it increases financial crisis risk, and it makes recessions deeper and longer lasting. Moderating credit growth plainly seems like a good idea. However, there are positive aspects to consider. After all, it is well accepted that a developed financial system is an important ingredient in achieving sustained rates of economic growth (Levine 1997).

At a business-cycle frequency, higher rates of credit growth go hand in hand with higher rates of real GDP growth per capita. Hence consider the following back-of-the-envelope calculation. Using the JST data for the post–World War II period, I break down expansions into those that experienced above-average credit growth ("high credit" expansions) versus those that were below average ("low credit" expansions). I then calculate the cumulative change

in real GDP per capita experienced during the expansion as well as the loss during the subsequent recession.

High credit expansions have a cumulative growth in real GDP per capita of nearly 30 percent on average, but the subsequent recession is deeper. The cumulative real GDP per capita loss is 3.25 percent. Compare these numbers with those from a low credit expansion. These are 20 percent and 2 percent, respectively. The evidence is clear. Although recessions are made worse by high credit growth, the net gain (comparing high versus low credit expansions and subsequent recessions) is considerable—an 8.5 percent cumulative difference or about 0.7 percent faster growth per annum. That said, in a financial crisis recession, most of this advantage is lost since the recession is much deeper and lasts more than twice as long.

5. Conclusion

BG show that there is a short-run financial stability trade-off should the central bank decide to use monetary policy to moderate credit. The odds of a financial crisis increase over the year after an interest rate hike. Moreover, the odds increase dramatically when credit is already growing well above trend. The results are robust and consistent with extant results in the literature. It is unclear whether such an objective belongs in the optimal policy rule. It is clear that pursuing such an objective would require the central bank to react in a decidedly forward-looking manner. The research by BG is a welcome illustration of this important point.

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