

# Policies for Crises Prevention and Management\*

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I discuss the role of debt in financial crises and macroprudential tools to manage debt. A principal conclusion is that changes in mortgage contract designs, an ex ante measure aimed at the household sector, can deliver significant welfare benefits.

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The papers by Griss, Krogstrup, and Schumacher; Yoo; and Bahaj and Foulis (all in this issue) study macroprudential policy tools to improve financial stability. The policies include ex post tools in response to financial crises and ex ante tools to reduce the likelihood and severity of a crisis. Griss, Krogstrup, and Schumacher examine an ex post tool, studying the effective lower bound on monetary policy. Yoo also studies ex post policies, seeking to quantify the macroeconomic benefits of household debt relief relative to bank capital injections during a crisis. Bahaj and Foulis examine ex ante macroprudential policies and the role of uncertainty regarding the efficacy of macroprudential policy tools in designing optimal policy.

My comments highlight the role of debt in financial crises and macroprudential tools to manage debt. I discuss ex ante and ex post tools, uncertainty over policy outcomes, and the distinction between debt relief to the household sector and the financial sector. A principal conclusion is that changes in mortgage contract designs, an ex ante measure aimed at the household sector, can deliver significant welfare benefits.

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## 1. 1998 versus 2008

Figure 1 graphs the evolution of the Gilchrist-Zakrajsek spread (GZ spread, from Gilchrist and Zakrajsek 2012) and the three-month commercial paper to three-month Treasury-bill spread over two financial crises. The top panel spans January 1998 to June 1999, including the hedge fund crisis of the fall of 1998. The bottom panel graphs these spreads from January 2007 to July 2008, a period that covers part of the 2007–09 financial crisis.

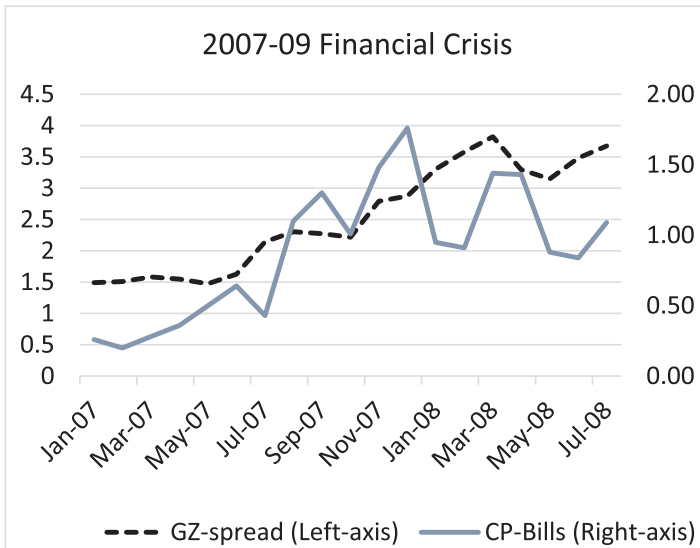
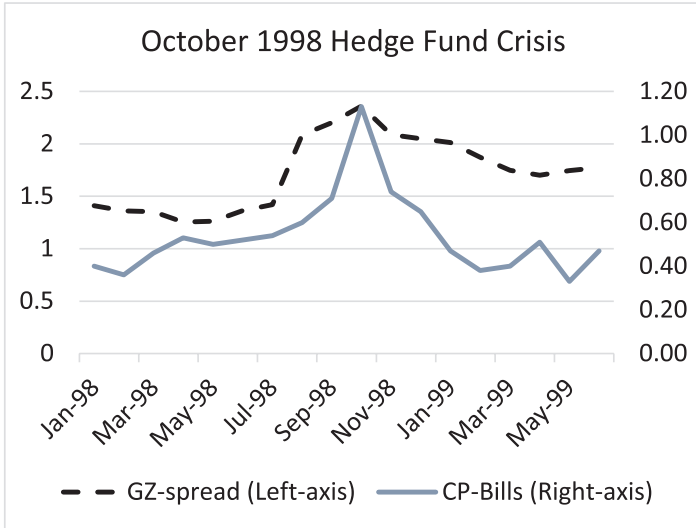
In both events, spreads rise sharply, reflecting a flight to liquidity and safety as well as increased concerns regarding a recession and default risks. But in October 1998, the spreads begin to fall, coincident with the Federal Reserve's interventions (see Scholes 2000). In the 2007–09 crisis, the spreads continue to rise through this entire period, peaking in the fall of 2008. What distinguishes these events? Why in 1998 did the financial disruption as reflected in asset markets dissipate with no real U.S. macroeconomic consequences?

## 2. Debt Is the Source of Vulnerability

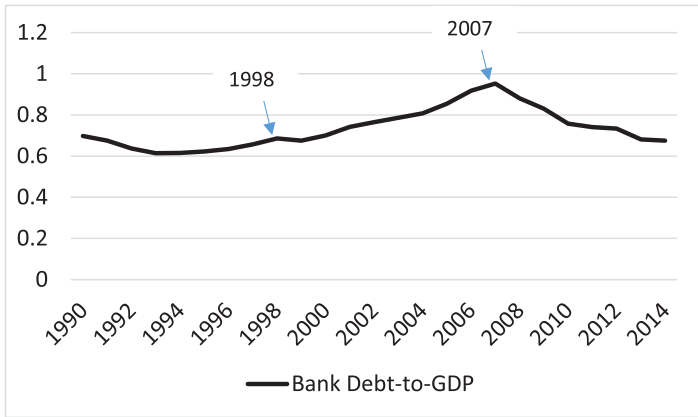
Debt is the economic channel connecting financial distress with the real economic outcomes. There is a significant debt buildup prior to 2007 and virtually no debt buildup prior to 1998. Figure 2 graphs the aggregate quantity of short-term debt liabilities of the financial sector, normalized by GDP, over the period from 1990 to 2014. The data is taken from Krishnamurthy and Vissing-Jorgensen (2015), who discuss the data construction. While the data in figure 2 measure bank debt, there is also a dramatic rise in household indebtedness ahead of the 2008 event (Mian and Sufi 2015).

This comparison speaks to a more general pattern. Jordà, Schularick, and Taylor (2013) document from many historical episodes of crises around the world that sharp increases in the credit-to-GDP ratio (primarily bank credit outstanding) increase the likelihood and severity of a financial crisis. Krishnamurthy and Muir (2016) examine the behavior of output, credit, and credit spreads in an international panel of crises episodes, covering fourteen countries and going back to 1869. In this sample, they trace out the path of GDP declines following a large increase in spreads. Conditioning only on a large increase in spreads, they show that expected output declines. This

**Figure 1. Crises and Spreads**



**Sources:** Simon Gilchrist’s webpage and the Federal Reserve.

**Figure 2. Short-Term Bank Debt**

**Source:** Krishnamurthy and Vissing-Jorgensen (2015).

finding confirms results from the literature on the forecasting power of credit spreads for economic activity (see Gilchrist and Zakrajsek 2012 for U.S. evidence). Conditioning on both a large increase in spreads and high debt levels, expected output declines are much more severe, roughly double that with mean debt levels. In short, the 1998 versus 2008 comparison embodies a general principle that debt is the vulnerability factor.

While there is a growing literature confirming these findings on the role of debt, many important questions remain. Is the vulnerability due to all maturities of debt, or primarily short-term debt as suggested by the banking literature? Does the collateral backing the debt (e.g., real estate versus cars) matter? Pertinent to the analysis of Yoo, the literature has also not quantified the relative importance of non-financial-sector indebtedness versus financial-sector indebtedness.

Managing and preventing crises is about managing the buildup of debt pre-crisis and offsetting the effect of debt overhang in a crisis. This is the post-crisis consensus as reflected in regulatory changes around the world. I next describe the toolkit that governments have used to offset debt overhang and the regulatory reforms designed to prevent debt buildup.

### **3. Ex Post Policies to Offset the Drag from High Debt Levels**

Governments around the world employ similar tools to deal with high debt levels in a crisis. Central banks provide liquidity to the financial sector to minimize funding disruptions and forestall rollover risk. The discount window in all its incarnations was active in the financial crisis both in the United States and around the world. Policy interventions to recapitalize the financial sector with equity sought to reduce the negative effects of debt on the financial sector's activity. Such legislative policy faced a higher hurdle than central bank liquidity provision. The challenges in passing and then implementing the Troubled Asset Relief Program (TARP) have been well chronicled by many of the key actors in the U.S. financial crisis.

Relative to the institutions and policies to manage financial-sector debt, policies that targeted household debt have been far harder to implement. The Federal Reserve's purchases of mortgage-backed securities reduced mortgage rates, but only borrowers with low loan-to-value (LTV) ratios could refinance their mortgages to gain the payment relief from these policies. The Home Affordable Modification Program (HAMP), which was introduced in 2009, aimed to incentivize lenders to renegotiate residential mortgages. But it reached only one-third of eligible borrowers. Moreover, the incidence of renegotiation was driven by intermediary, rather than borrower-specific, factors. In short, given banks' own financial stresses, only some banks rolled out HAMP. The government's other main mortgage restructuring program, the Home Affordable Refinance Program (HARP), also had mixed success. While HARP was initiated in 2009, takeup was low until about 2012, when the program was modified to include high-LTV loans. Moreover, as with HAMP, intermediary-specific factors dampened the impact of the program. These points are documented in two excellent papers by Agarwal et al. (2015, 2016).

Ex post policies aimed at the financial-sector debt problem were much easier to implement than those targeting the household-sector debt problem. Next, consider ex ante policies.

#### 4. Ex Ante Policies

Among both regulators and academics, the post-crisis consensus is that the financial sector should be funded with more equity and less debt. Central to this new financial system are greater capital requirements, tighter leverage requirements, and increased liquidity requirements (see Duffie 2016).

There has been much less done on the household debt front. The Qualified Mortgage rule in the United States reduces payment-to-income ratios on household mortgage debt. Around the world, some financial regulators monitor household LTVs with the goal of restricting high-LTV loans if such loans carry systemic risk.

Banks can satisfy higher capital requirements by raising external equity capital from investors. However, since households do not raise equity, macroprudential policies for household debt tend to constrain credit access. For instance, LTV restrictions constrain the total funding available to households, decreasing household expenditures.

Innovative mortgage designs that are more equity-like are an alternative solution to reduce the negative effects of household debt, with smaller effects on credit access. But the U.S. mortgage market is still dominated by a standard fixed-rate mortgage.

Surprisingly—because they are likely not needed—innovative security designs have been used by the financial sector to avoid raising common equity. Since the crisis, banks have issued contingent convertible securities as well as subordinated debt. In principle, such securities will convert from debt to equity in the event of distress of a financial firm, and thus increase the total loss-absorbing capacity of a bank. However, there are questions about the welfare benefits from these novel contract designs. Admati and Hellwig (2013) have argued, persuasively in my view, that regulators would better achieve their financial stability objectives by focusing purely on common equity rather than chasing new contract designs.

Innovative mortgage contracts, in contrast, can deliver significant macroeconomic benefits. To illustrate, consider the experiences of households with adjustable-rate mortgages (ARMs) during the financial crisis. Fuster and Willen (2013) track a set of borrowers with ARMs over the period from 2009 onwards. Since interest rates tend to fall during recessions, mortgage payments of borrowers fall

considerably when their ARMs reset. Fuster and Willen compare different cohorts of ARM borrowers whose rates reset at slightly different calendar times. They show that default and delinquency falls dramatically at the time of the reset for the borrowers receiving the reset compared with the control group of borrowers who receive the reset later. Di Maggio, Kermani, and Ramcharan (2016) document beneficial effects on consumption and debt payments for ARM borrowers with rate resets. These studies reveal the scope for mortgage design, and how alternative designs can beneficially reduce the negative effects of high mortgage debt.

The ARM example is a case of a mortgage design that involves state contingency in payments relative to the standard non-state-contingent fixed-rate mortgage. Mortgage payments were lower in the crisis, since interest rates were positively correlated with household income. There are other forms of state contingency that may also be beneficial. Eberly and Krishnamurthy (2014) propose a mortgage with features of both ARMs and fixed-rate mortgages. Their mortgage is a fixed-rate mortgage with the option to convert to an ARM, or prepay. This small variant on the standard design retains state contingency in payments through the option to convert to an ARM. Guren, Krishnamurthy, and McQuade (2016) study this and other mortgage designs in a general equilibrium model that quantifies the utility to benefits to households of more state contingency in mortgage contracts. Finally, Mian and Sufi (2015) have advocated for indexation of mortgage principal to a local house price index. Such a design can also reduce the negative effects of housing debt.

## 5. Summary

Macroprudential policies aimed at crisis prevention and crisis management are primarily about managing the financial-sector and household debt cycles. I posit that minimal innovations to mortgage contracts that create state contingency can deliver considerable social benefits. I reach this conclusion because *ex post* tools to deal with household mortgage debt are few and face practical implementation challenges. That is, improved mortgage designs are practically the only macroprudential approach to deal with the real economic costs of high levels of household-sector debt. In contrast, the institutional design of central banks as well as the significant impetus

underlying post-crisis regulatory reforms provide macroprudential tools to manage financial-sector debt.

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